

Future Technologies Activity

Innovate Moldova



MOLDOVA FUTURE PARK

Concept for Developing a Technology and Science Park

High quality infrastructure for advanced companies and talent, linked to digital technology, science, entrepreneurship and innovation





MOLDOVA FUTURE PARKS

Concept for Developing a Science and Technology Park

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These exceptional individuals have generously shared their knowledge and insights, which have played an instrumental role in shaping the vision and objectives of the Moldova Future Parks concept.

EXECUTIVE SUMMARY

SETTING UP MOLDOVA FUTURE PARK

The Government of Moldova intends to develop an Innovation and Technology Park (ITP), referred to as the Moldova Future Park, that is designed on smart city principles with high-quality infrastructure to attract advanced companies and talent, linked to digital technology, R&D, and innovation.

The Moldova Future Park will be initially focused on globally trending ‘DeepTech’ horizontals (e.g., AI, data science, robotics, material sciences, biotechnology, autonomous vehicles, Internet of Things (IOT), Industry 5.0, etc.). It is also expected to specialize in several verticals where Moldova has comparative advantage, such as HealthTech, Energy, AgriTech, and FinTech. The Moldova Future Park will aim to increase national wealth and technology startups growth, while fostering entrepreneurship, research, and collaboration.

The core mission of this park will be to develop an international, attractive, knowledge-based working, development and living environment that would increase the competitive ability of people and companies, bring talents home to implement their potential, and inspire the birth of new business models.

INVESTMENT OPPORTUNITY

Developing the Moldova Future Park has strong market justification and economic development potential that leverages Moldova’s competitive advantages. The robust and rapidly growing IT sector in Moldova, supported by visionary governmental policies and initiatives, provides a solid foundation for the establishment of a technology park. The strong potential for technological innovation is evidenced by Moldova’s rank of 62nd out of 132 countries for ICT Infrastructure in the *Global Innovation Index 2021*. Moldova’s robust digital infrastructure, boasting 98% 4G coverage and ranking fifth globally for affordable broadband, positions it as the perfect testing ground for cutting-edge mobility solutions. The Law on IT Parks, offering a 7% single tax on turnover for Moldova’s IT firms, stands as a compelling incentive. The country’s IT sector has outpaced the global average, boasting a remarkable 40% growth from 2017 to 2021. Contributing 4.2% to the GDP, with revenues hitting US\$731 million in 2022—five times the figure from 2018—the sector showcases a threefold increase in the last five years. Furthermore, IT exports surged to US\$455 million in 2022, constituting 11% of total Moldovan exports, highlighting strong regional competitiveness.

The Moldova Future Park will align with the ITP model, as defined by the International Association of Science and Innovation Parks (IASP), in which the park “stimulates and manages the flow of knowledge and technology amongst universities,

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R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities”. IASP notes that successful ITPs specialize in ICT, biotechnology, engineering, energy, and artificial intelligence, while presence of university links, coupled with talent and prestige, plays a vital role in their success. The Moldova Future Park concept draws inspiration from the successful Ülemiste City in Tallinn, a similar park that houses 500 companies and 16,000 talents from 73 different nations. It has become the third-largest economy in Estonia.

The **Moldova Future Park is proposed for development in line with the vision for a modern smart city mixed-use business district that balances business campuses, R&D with non-university associated features.** The goal is to create a thriving hub with top-notch facilities, resources, and networking in a location close to urban areas. The aim is more than just a business district – it is a lively community drawing in talent and enterprises.

Health technology should be a key cluster for Moldova Future Park due to the country's well-established medical infrastructure, high medical skills, and advancements in areas like brain surgery and fertilization, coupled with untapped potential in medical tourism, where the country's commendable medical services and competitive rates position it as a global contender, with projections indicating a 20% CAGR, reaching \$50 million by 2030, local startups like Eliri and CorLabTech exemplifying the emerging intersection of health and technology, while the Medical University Testimitanu has a growing number of international students.

MODOVA FUTURE PARK SIZE AND RESIDENTS. KNOWLEDGE FIRST.

Based on regional experience of similar parks (such as Ulemiste City in Tallinn, Estonia and Malaga Tech Park in Spain), the size of Moldova and its IT sector, **the Moldova Future Park is proposed to have 100 hectares that will be developed gradually in several stages over a course of 5-10 years.** The team analyzed 3 scenarios – 50, 100 and 280 hectares. The economic impact analysis demonstrates that the larger the site the larger the long-term economic and fiscal stimulus that is creates.

The park area should have low-rise and low-density construction, and enable sufficient green space (at least 25%), and up to 60% to be allocated for construction development. Moldova Future Park campus should be developed as a mixed-use micro-city, predominantly with business buildings (up to 70%), but also anchoring a university with educational and R&D spaces (approx. 10% or 10 ha) and residential facilities such as hotels, co-living areas (approx. 10% or 10 ha) that will enable to host students, researchers, international workforce on campus driving community and innovation in the park.

The envisioned residents will include global corporations, local and international tech- and innovation-focused businesses, startups, universities and R&D actors, specialized public

agencies, and other actors that will create, develop and commercialize new technologies, products and services.

The park will have universities as anchors of talent to create a knowledge environment beyond just buildings. The Technical University of Moldova emerges as a key partner, poised to drive a specialized campus focusing on R&D and deep technology. Nicolae Testemitanu State University of Medicine and Pharmacy also seeks to anchor the park and intends to develop a new educational building focused on healthcare technology to accommodate its growing number of international students, currently nearly 2,000 (or 33% of the total 6,000 students) from 35 different countries. Additionally, there's a visionary plan to establish a U.S.-accredited private technical university, co-located in the Park, with ongoing discussions with Washington State University for undergraduate programs in engineering and technology, aiming to reach 500-800 graduates per year in a Moldova campus.

It is envisioned to co-locate the headquarters of key public and semi-public institutions within Moldova Future Park, such as the Moldova Innovation Technology Park (MITP) with its virtual tech community of 1,300 IT firms, and the Moldova e-Governance Agency. This decision not only enhances operational efficiency but solidifies the park's role as a central nexus for advancing the digital landscape and fostering innovation, creating synergies and facilitating streamlined communication, collaboration, and knowledge exchange between the Government and private sector.

The initial residents of Moldova Future Park will primarily comprise local IT companies, aligning with the global trend where 41.4% of park residents originate locally. Ulemiste City in Tallinn also started with local Estonian IT companies as its foundational residents, after which global firms like Ericsson came. The expert team interviewed over 40 Moldova-based businesses, from startups to international firms, and there is strong interest to relocate in the future park. Technology developers are interested in the Park to access resources, talent, funding, and a supportive ecosystem. They want state-of-the-art facilities and infrastructure to ensure a great working environment for their people. Health technology firms are interested in accessing specialized facilities and expertise for research and development. They aim to innovate in medical devices, robotics, data analytics, pharmaceuticals, and other related areas. Particularly important is leveraging on-site laboratories and prototyping facilities to ensure regulatory compliance and certifications as part of the healthcare solution commercialization process (especially when thinking about EU market standards). This requires Moldova Future Park to be an **Innovation Sandbox**.

BUSINESS MODEL AND CONTRIBUTION TO NEW JOBS AND INVESTMENT

Job Creation: It is conservatively estimated that Moldova Future Park, spanning 100 hectares, will create and host **21,600 tech-centric jobs**. Anticipating the relocation of 50% of Moldova's 27,480 ICT workforce and generating 8,000 new jobs within the park, aligning with the best practice of clustering 50% of a region's technology force in

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technology parks, Moldova Future Park plans strategic co-location with universities to produce 5,000 to 15,000 graduates over ten years. This estimation, grounded in international data and the Ulemiste Estonia case study, reflects the advantageous location of Moldova Future Park and positions it as a dynamic employment hub, aligning with international best practices and strategic advantages.

Investment: The Moldova Future Park may generate an estimated **200M Euro in private investment in greenfield construction as well as public investment in common infrastructure** (roads, green areas, educational and scientific facilities). This scenario assumes low density and low-rise of construction and green development that are principles for a modern, attractive and forward looking Moldova Future Park.

Business Model: Several different investment and management models are investigated with the ultimate conclusion that the Concession model is most suitable. This is based on the ability of the Government of Moldova to task one or several private contractors (or consortium thereof) with responsibility for designing, building, financing, operating, and maintaining the Future Park to optimize the commercial upside. This would empower government to provide a regulatory and oversight role without investing significant resources into the management of a facility that international practice has shown is generally not a strength of public agencies. However, the high capital costs for this greenfield development could create a commercial viability constraint for a private development model, which necessitates further analysis of possible blended finance scenarios to ensure market interest in development of the site.

Regulatory Framework: The current legal framework for ITPs in Moldova is not fit for purpose with the proposed business model and park formation process. Several strategic amendments are essential to ensure that the recommended implementation approach for the Moldova Future Park is legally viable. The Law on Industrial Parks 182/2010, that is currently under revision, requires alignment and consistency with the governance regime for ITPs.

Economic Benefits: The economic impact potential of the Future Park is undeniable, both in quantitative and qualitative terms due to expected benefits stemming from tax revenue, job creation, foreign investment, market development, 'brain gain', and other related factors. A simplified economic impact analysis of two policy options demonstrated **forecasted economic returns by 2052 totaling US\$1.28 billion** (with a 7% single tax regime under Law on IT Parks) **or US\$0.8 billion** (with standard taxation) in net present value.

IMPLEMENTATION TIMELINE

It is estimated that greenfield development of the proposed 100 hectares adjacent to the Chisinau Arena could take 5 years for the initial development zone. Not all 100 hectares are expected to be developed immediately, with the disaggregation of the available land into distinct development parcels with additional zones being developed based on market demand and investor interest. The development of the Future Park may be staggered to

follow the launch of the AgriTech Park that has been proposed separately with support from the Future Technologies Activity (FTA). It is likely that at least 1-year will be required to complete preparatory investment due diligence and manage procurement preparation. A high-level implementation timeline is illustrated in *Figure 1*.

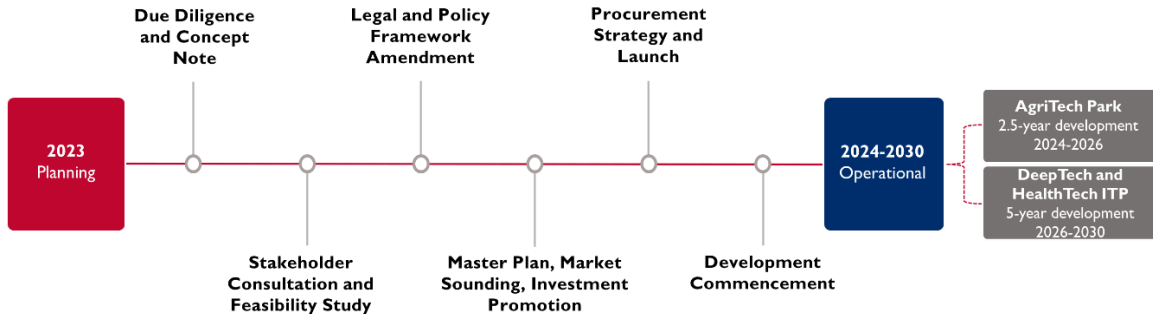


Figure 1: Forecasted Implementation Timeline

This schedule is indicative at this stage and will require validation through a detailed feasibility study. Nevertheless, implementation of the Moldova Future Park appears to be viable pending further confirmation of the implementation details.

NEXT STEPS

The analysis and findings provide strong indications for the viability of the Moldova Future Park, including consultation with key stakeholders (public, private, donors, and academia). The long-term impact potential of the park is immense in terms of talent development, job creation, tax revenue, foreign investment, 'brain gain', market development, and capital mobilization. Nevertheless, designing and implementing a successful Future Park in the proposed model on a greenfield site will be a capital-intensive undertaking that requires careful analysis to optimize the likelihood for successful implementation.



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ACRONYMS

AgriTech	Agricultural Technology
BOT	Build-Operate-Transfer
DBFOM	Design, Build, Finance, Operate, and Maintain
DCF	Discounted Cash Flow
DeepTech	DeepTechnology
EPC	Engineering, Procurement, and Construction
ERR	Economic Rate of Return
FTA	Future Technologies Activity
GDP	Gross Domestic Product
HealthTech	Health Technology
IASP	International Association of Science and Innovation Parks
IOT	Internet of Things
ITP	Innovation and Technology Park
PPP	Public-Private Partnership

SECTION NO. I

INTRODUCTION

STUDY PURPOSE

Objective and Outcome

The Future Technologies Activity (FTA) is tasked with completing an analysis of the implementation options for several 'Future Parks' in Chisinau. Specific focus is devoted to scrutinizing the viability of the establishment of a single park with several clusters or verticals at various campuses, or separate independent parks that are developed in isolation from the others. This is to be achieved through market analysis, site options assessment, business model evaluation, legal and regulatory review, tenants and partnership options mapping, and high-level financing forecast.

The basis of this study is the Ministerial Order (9 June 2023) signed by Deputy Prime Minister for Digitalization and Minister of Economy Dumitru Alaiba establishing a *Working Group on Development of the Innovation and Technology Park and Identification of Land Options*. Moreover, further support for this study has been found through partnerships with the Ministry of Health that signed a Ministerial Order in June 2023, formalizing a *Working Group on Development of HealthTech Park and Identification of Land Options*, with the Medical University Testemiteanu as a key partner. The final partner is the Ministry of Agriculture which approved a Ministerial Order intended to launch a *Working Group on Development of the AgTech Park and Identification of Land Options*, with the Technical University of Moldova.

The intended outcome is a comprehensive conceptual deconstruction of the Innovation & Technology Park (ITP) model, including the value of a national vision, economic benefits, success factors, and implementation challenges. The final Concept Note will inform the Government of Moldova's decision to allocate land for the development of Moldova Future Park, which is a precursor step to the completion of a more detailed feasibility study. This analysis will be guided by a series of recommendations presented in this study regarding site location/s, key stakeholders, regulatory and policy decisions, financing options, and implementation phasing.

Moldova Future Park

Intensive dialogue between the FTA team and key institutional stakeholders over several months led to broad consensus on the need to develop Concept Notes for two (2) separate Future Parks. One will specialize in agricultural technology while the other focuses on advanced manufacturing, machine learning, electronics, material sciences, and healthcare. Both of these Future Parks will align with the ITP model as defined by IASP, which is analyzed in detail later.

This Concept Note is focused on the viability for developing Moldova Future Park, a science, innovation and technology physical park, specializing in deep technology, such as

AI, data science, robotics, as well as verticals in HealthTech, material science, biotechnology, electronics, autonomous vehicles, financial technology (FinTech), energy, environment, Internet of Things (IOT), Industry 5.0, and other related areas.¹

Developing an ITP has strong market justification and economic development potential that leverages Moldova's competitive advantages. Unlike the brownfield AgriTech Park at the Mircesti Campus, this facility would be developed on a greenfield site adjacent to the Chisinau Arena just North of the Technical University campus in Stauceni. Moreover, this ITP is proposed for development in line with the vision for a modern smart city mixed-use business district that balances business campuses, R&D with non-university associated features (e.g., shops, cafes, restaurants, retail, residential accommodation, etc.).

Given the facility would not be inherently educational in focus, there is greater complexity in the business model and financing strategy that need to be addressed. For instance, the Moldova Future Park could feature commercial offices, laboratories and workshops, public green spaces, residential buildings, incubation and acceleration services, and conferences / exhibition spaces. The greater degree of investment complexity does not change the ultimate determination that this concept warrants further investigation through feasibility study, zoning plans and market sounding under a phased development approach.

¹ A separate Concept Note has been prepared for an Agricultural Technology (AgriTech) Park. The AgriTech Park is proposed for development at a separate site with a distinct management and business model.

SECTION NO. 2

ANALYZING MOLDOVA FUTURE PARK MODEL

INVESTMENT RATIONALE

Innovation and Technological Advancement

Digital technologies and information networks are rapidly transforming industries globally. However, this rarely happens organically, and smart, forward-looking policy that emphasizes strategic collaboration with private enterprise is essential. Creating an innovation ecosystem to maximize economic productivity is a complex and costly endeavor.

The objective is to foster collective efforts within the ecosystem to drive priority investments and policy initiatives, thereby creating jobs, cultivating new markets, increasing fiscal revenue, attracting investment, and improving competitiveness. Key benefits of this approach to innovation policy include:

- **Cultivating high-value industries** by fostering collaboration among government, private sector, civil society, academia, finance, and development partners.
- **Accelerating the digital transition** through technological advancements, including a shift to the digital, circular, and green economy.
- **Attracting investment** from large and small businesses in strategic industries that leverage existing or latent comparative advantages.
- **Establishing strategic partnerships between ecosystem actors**, especially universities, investors, developers, banks, incubators, accelerators, think tanks, specialized government agencies, and others.
- **Fostering disruptive entrepreneurship** by creating space for the testing and scaling of innovative ideas and new technologies.
- **Stimulating job creation**, particularly in high-value and sustainable industries.
- **Establishing a national vision and brand for excellence and economic opportunity** that retains existing talent and attracts foreign businesses and innovators.

Figure 2 provides a graphic representation of these key policy objectives. While these are undoubtedly important and valuable policy objectives, the challenge lies in defining strategies and approaches to achieve the desired outcomes of growth through innovation and technological advancement.

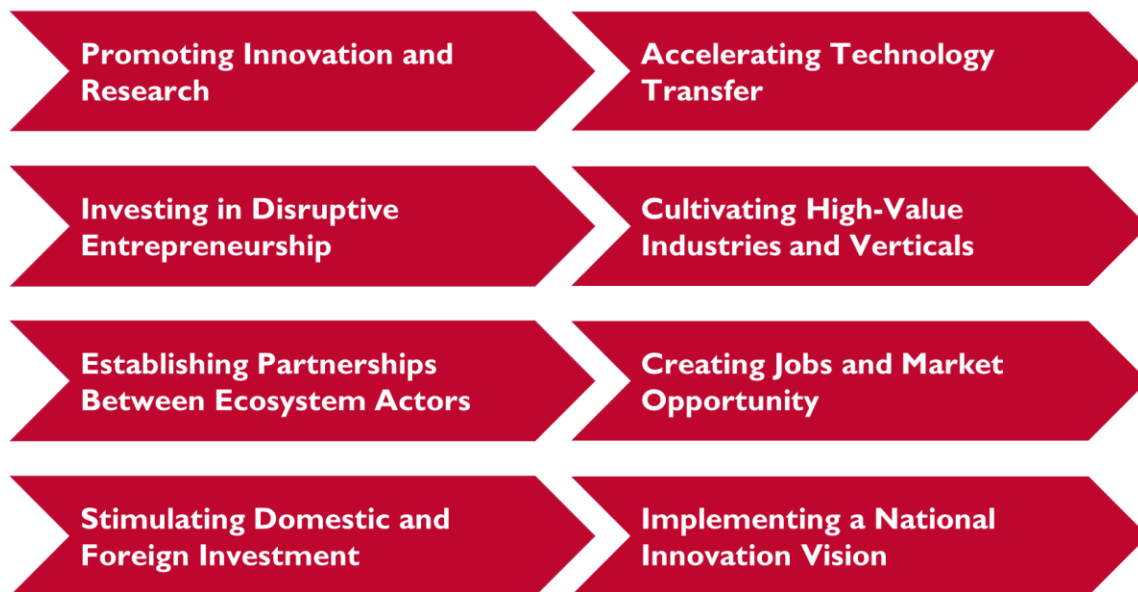


Figure 2: Policy Goals Underpinning Development of ITPs Globally

It is in the context that the Moldova Future Park can have a transformative effect on the innovation ecosystem in Chisinau and nation-wide.

Moldova Future Park Model

A policy tool of immense value to advance to this agenda is Moldova Future Park. According to the International Association of Science and Innovation Parks (IASP), Moldova Future Park “stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities”.²

ITPs are established with the ultimate purpose of increasing national wealth and technology startups growth, while fostering research, collaboration, and entrepreneurship. This is accomplished by creating a physical area or campus where established businesses, start-ups, researchers, academia, specialized public agencies, and other stakeholders come together to create, develop, and commercialize new technologies, products, and services. An essential feature of the model is the establishment of a supportive ecosystem that offers infrastructure, modern facilities, resources, accommodation options, and networking opportunities in a location that is accessible to a nearby urban area/s. The goal is not to create a simple business or office district, but a vibrant and dynamic community that attracts talented individuals and enterprises to base their operations within its boundaries.

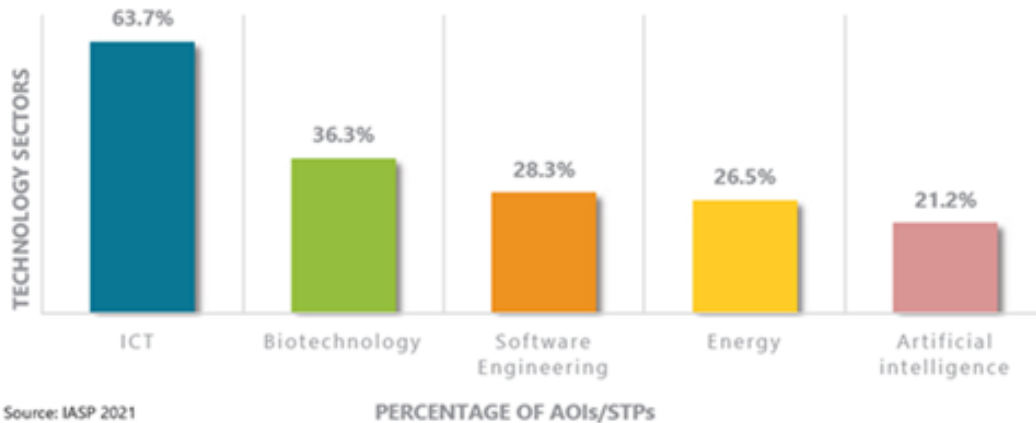
- **Economic Development:** As outlined above, policymakers recognize that innovation is a driver of economic growth, and ITPs have proven capacity to attract

² IASP. (2023). Definitions. Retrieved from: <https://www.iasp.ws/our-industry/definitions>.

- investment, create job opportunities, and contribute to local and national economies by fostering the growth of technology-focused industries.
- **Promoting Innovation and Research:** ITPs stimulate innovation and research in various technological domains. By bringing together diverse stakeholders, including researchers, engineers, entrepreneurs, and academics, ITPs encourage the cross-pollination of ideas and expertise, leading to the development of cutting-edge technologies.
 - **Technology Transfer:** the transfer of dynamic technology and knowledge from academic institutions and research centers to commercial enterprises is directly catalyzed by ITPs. This is essential to bridge the gap between theoretical research and practical applications, leading to the development of market-ready products and services.
 - **Entrepreneurship and Startups:** ITPs provide a supportive environment for startups and entrepreneurs to develop their ideas into viable businesses. They offer access to mentorship, funding, networking events, and business development resources, which are crucial for the success of early-stage ventures.
 - **Collaboration and Networking:** By bringing together businesses, research institutions, and other stakeholders, ITPs facilitate collaboration and networking. This can lead to partnerships, joint projects, and knowledge-sharing that can accelerate technological advancements.
 - **Infrastructure and Facilities:** developing state-of-the-art infrastructure, laboratories, workshops, testing facilities, and other resources are costly or simply unavailable for individual companies or startups to establish themselves on their own. ITPs create centralized facilities that incentivize businesses, start-ups, and researchers to operate from the campus, thereby capitalizing on modernized facilities and services.
 - **Talent Development:** ITPs contribute to the development of a skilled workforce by offering training programs, workshops, events, seminars, competitions and challenges, and educational initiatives that align with the needs of technology and science focused industries.
 - **Attracting Foreign Investment:** Well-established ITPs can attract foreign investors and multinational corporations looking to tap into local innovation ecosystems. This can lead to technology transfer, knowledge exchange, and global collaboration.

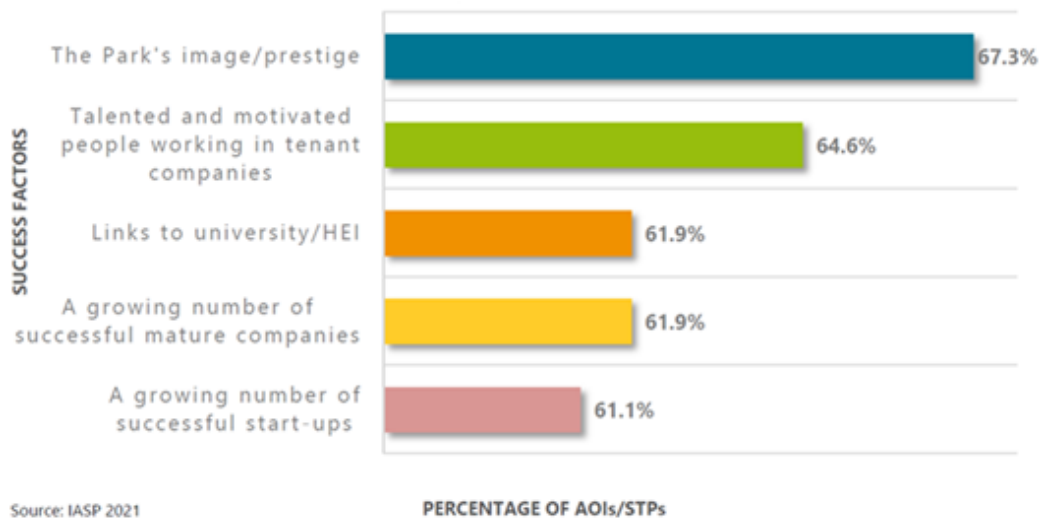
Key Pillars and Success Factors

The IASP regularly collects statistics to monitor trends in the area of innovation and science and technology park industry throughout the world. According to IASP, **ITPs tend to specialize in ICT, along with biotechnology, engineering, energy and artificial intelligence**, as illustrated in *Figure 3*.



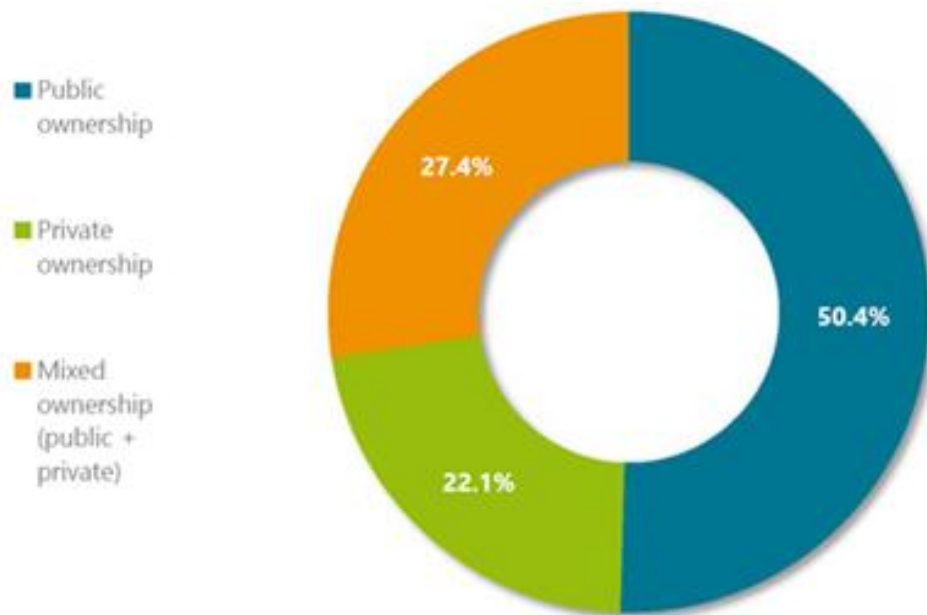
Source: IASP 2021
 Figure 3: Main Technology Sectors found in Science and Technology Parks

Furthermore, IASP’s data indicates that **links to a university**, alongside talent and prestige, are key factors contributing to the success of ITPs. This is highlighted in Figure 4.



Source: IASP 2021
 Figure 4: Key Factors Contributing to Success of Science and Technology Parks

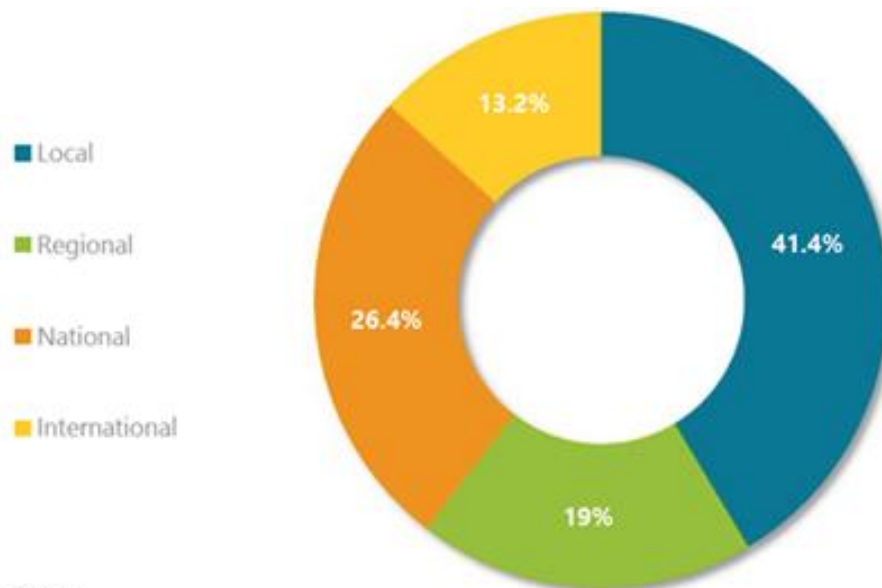
Additionally, the government has a key role in developing successful parks, with **77.8% of case studies globally being publicly owned or having mixed ownership**, as evidenced in Figure 5.



Source: IASP 2021

Figure 5: Percentage of Ownership for ITPs

Finally, the strong connection of ITPs to their local areas is highlighted by the fact that **41.4% of companies** studied by IASP are of local origin, which is presented in Figure 6. This also shows their importance as local innovation actors, especially with respect to accelerators and startups. Parks attract regional and national companies, and a smaller but significant percentage (13.2%) of global companies.



Source: IASP 2021

Figure 6 Origin of Resident Companies in Innovation and Technology Parks

International and Regional ITP Examples

There are numerous examples of successful ITPs internationally. Leading examples internationally are summarized in *Table 1*.

Table 1: International ITP Case Studies

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
One-North, Singapore	One of the pioneers for the ITP model, One-North is a vibrant research and business park that was developed with the aim of creating a conducive environment for innovation, research, entrepreneurship, and technology-driven industries (namely in biomedical sciences, information communications technology, media, physical sciences, and engineering). The park is located near major educational institutions such as the National University of Singapore (NUS), Nanyang Technological University (NTU), and Singapore University of Technology and Design (SUTD).	Ownership/Founders: Part of the National Development Plan by the government of Singapore, Developed and partially owned by Jurong Town Corporation (JTC)	The Park is reportedly covers an area of 200 hectares in size (approximately 494 acres).	Queenstown, Singapore	Multiple, categorized per location; <ul style="list-style-type: none"> · Vista: Commercial & Lifestyle; · Nepal Hill: Talent Development; · Fusionopolis: ICT, Media, Science and Tech; Lauch Pad: Start-Ups and Incubators; · Ayer Rajah: Emerging Industries; · Mediapolis: Infocom Tech; · Wessex: Residences; · Biopolis: Biomedical & Life Sciences 	<p>Partners</p> <ul style="list-style-type: none"> · AWWA · Migrant Workers' Centre · Movement for the Intellectually Disabled of Singapore (MINDS) · SG Cares · South West Community Development Council · Waterways Watch Society. <p>Tenants</p> <ul style="list-style-type: none"> · Agency for Science, Technology and Research (A*STAR) · Autodesk · Equinix · ESSEC Business School · GlaxoSmithKline (GSK) · Infinite Studios

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
						<ul style="list-style-type: none"> · INSEAD Asia Campus · Lucasfilm · Mediacorp · Procter & Gamble (P&G) · Seagate · 99.co
Stanford Research Park, USA	<p>Located adjacent to Stanford University, this park is another early example of a planned research and development campus. It has been instrumental in fostering collaboration between academia and industry. Situated in the heart of Silicon Valley, the park benefits from the global reputation of leading technology companies, venture capital firms, and entrepreneurial culture. The park offers state-of-the-art facilities, research labs, and office spaces that are conducive to research and innovation; these resources are crucial for companies working on cutting-edge technologies.</p>	<p>Ownership: Stanford University</p> <p>Founders: Stanford University and Palo Alto City Council</p>	<p>The Park is reportedly covers an area of 208 hectares (approximately 514 acres).</p>	Palo Alto, California	R&D, software and hardware development (medical, spacecraft, social media), engineering.	<ul style="list-style-type: none"> · Tenants: · VMware · Tesla · Dupont · Ford · HP · Cooley LLP · Wilson Sonsini Goodrich & Rosati · Stanford Genome Technology Center · Jazz Pharmaceuticals · Lockheed Martin · PARC (a Xerox Company) · MZ · Electric Power Research Institute · Foley & Lardner · Rubrik · SAP · StartX · TIBCO

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
						<ul style="list-style-type: none"> · Varian · Rivian
Zhongguancun Science Park, China	Often referred to as China's Silicon Valley, this park in Beijing is a hub for electronics and hardware, biotechnology, telecommunications, artificial intelligence, big data, advanced manufacturing, media and creative industries, aerospace and defense, and financial technology. The park is a key policy example of China's ambitions to becoming a global technology leader, with focus on developing cutting-edge solutions across a spectrum of high growth potential industries.	<p>Ownership: Government of China</p> <p>Founder: Pioneered by Chen Chunxian, a researcher at the Chinese Academy of Sciences and later supported by the government of China under the government's strategy of Developing the Nation Through Science and Education.</p>	The park reportedly covers an area of 500 hectares (approximately 1,236 acres)	Beijing, China	electronic information, bio-medicine, energy and environmental protection, new materials, advanced manufacturing, aerospace engineering, R&D and services	<ul style="list-style-type: none"> · The most prominent companies that originated in Zhongguancun include Stone Group, Founder Group, and Lenovo Group, and home to world renowned academic institutions as Peking University and Tsinghua University. · Many world-renowned technology companies built their Chinese headquarters and research centers in Zhongguancun Technology Park, including: <ul style="list-style-type: none"> · Google · Intel · AMD · Oracle Corporation

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
						<ul style="list-style-type: none"> · Motorola · Cogobuy Group · IBM · Sony · Solstice · Ericsson · Microsoft (Microsoft Research Asia)
Technopark Zurich, Switzerland	<p>This park provides a platform for startups, spin-offs, and technology companies specializing in telecommunications, software development, electronics, and advanced engineering. The park has a close relationship with ETH Zurich, one of the most renowned universities for science, technology, engineering, and mathematics globally, which greatly bolsters the attractiveness of Technopark Zurich for researchers, businesses, start-ups, and students.</p>	<p>Ownership/Founders: Technopark Zürich is managed as a privately funded foundation, and the property landlords are Swiss Life and Zürcher Kantonalbank, which also serve as main sponsors of the park along with Credit Suisse and UBS Switzerland.</p>	<p>The park is reportedly covers an area of approx.47,000 square meters (4.7 ha)</p>	Zurich, Switzerland	<p>Science & Technology (AI and Data Science), R&D, Medical and Health, Finance, Logistics, and Energy.</p>	<ul style="list-style-type: none"> · Technopark has numerous strategic collaborative partners to facilitate the transfer of knowledge and technology and the development of start-up companies: · Centre Suisse d'Électronique et de Microtechnique (CSEM), · CTI-Start-up · Division of Business and Economic Development of the Canton of Zürich · EMPA Dübendorf · ETH Zurich · FHS St.Gallen · glaTec · International Association of

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
						Science Parks (IASP) <ul style="list-style-type: none"> · Swisspark · University of St. Gallen · University of Zurich, venturelab · Zurich University of Applied Sciences (ZHAW).
Paris-Saclay, France	<p>Located on the outskirts of Paris, this €5 billion 'super park' is currently under development, but when completed will benefit from the rich cultural scene, tourist attractions, and international connections that the 'city of love' enjoys. Moreover, Paris-Saclay is partnered with some of France's most prestigious academic and research institutions, including École Polytechnique, Université Paris-Sud, and numerous research centers. The park will be organized according to several specific clusters or 'poles' which each</p>	<p>Ownership/Founders: The Paris-Saclay Development Authority partnering with University of Paris-Saclay</p>	<p>The Park is reportedly covers an area of 2,230 hectares (approximately 5,510 acres).</p>	<p>Several neighboring cities and places (Plateau de Saclay, Saint-Quentin-en-Yvelines, Versailles, Massy, Essonne, vallée de l'Yvette), Île-de-France, France</p>	<p>Education, R&D, Health, Energy, Future Mobility, Digital Tech, Aerospace, Cybersecurity & Defense, Foodtech, A.I. & Quantum Tech.</p>	<ul style="list-style-type: none"> · Université Paris-Saclay · DIRECCTE Île-de-France · Business France · Paris Région Entreprises, the Paris Region Economic Development Agency · Paris Île-de-France Regional Chamber of Commerce and Industry · Yvelines departmental council (Conseil départemental des Yvelines) · Essonne departmental council (Conseil

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
	focus on specific research areas, including renewable energy, sustainable production, digital technology, and life sciences.					<ul style="list-style-type: none"> départementale de l'Essonne) · Paris-Saclay urban community (Communauté d'agglomération Paris-Saclay) · Saint-Quentin-en-Yvelines urban community (Communauté d'agglomération Saint-Quentin-en-Yvelines)

There are also several noteworthy examples of successful and economically significant **ITPs in Central and Eastern Europe and the Balkans**. These are summarized in *Table 2*.

Table 2: Regional ITP Case Studies

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
Malaga TechPark	A public-private initiative with its shareholders that include the University of Malaga, Malaga City Council, Unicaja Bank and Regional Council of Andalusia. Moldova has ongoing cooperation with Malaga TechPark with several study visits	<p>Ownership: Regional Council of Andalusia, the Malaga City Council, Unicaja Bank, the University of Malaga</p> <p>Founders: Andalusian Regional Government and Málaga Municipal Council</p>	The Park reportedly covers the total surface area of 2,000,000m ² (200 ha), the park is divided into 410,000m ² (41ha, 20%) of	Malaga, Spain	Education, R&D, Biomedical Science, Engineering, Information Technology (Electronics, Information, Computing and ICT), Blockchain,	<ul style="list-style-type: none"> · Malaga TechPark is the world headquarters of the International Association of Science Parks and Areas of Innovations (IASP) and Association of Science and Technology Parks.

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
	and experience exchange. Malaga Tech Park hosts the world headquarters of the International Association of Science and Innovation Parks (IASP) that Tracom Industrial Park recently became a member of with FTA support. Tracom and FTA visited Malaga Tech Park, and a Partnership Agreement was negotiated to be signed in fall 2023 between Malaga Tech Park / Malaga University, with Tracom, Moldova Technical University, and Moldova State University. The goal is to share experience in building the innovation and technology ecosystem.		building space, 900,000m ² (90 ha, 45%) of gardens and 20.000m ² (20 ha, 10%) shared with the University of Malaga.		Incubator and Accelerator.	<ul style="list-style-type: none"> The park also fostered a strategic alliance with University of Malaga and the house of big corporation such as Google, Ericsson, Accenture, Telefónica and Vodafone, and others.
Ülemiste City, Estonia	This revolutionary park is a modern business district in Tallinn that combines office spaces, research facilities, living areas, and community green space as part of an integrated urban	Ownership: Ülemiste City is developed by two separate companies. A third of the territory is being developed by Technopolis Ülemiste AS, 51% of which is	The Park is reportedly covers an area of 37 hectares	Tallinn, Estonia	Real Estate, Education, Health, Energy.	<ul style="list-style-type: none"> Mainor Ulemiste, Technopolis Ulemiste, Estonian Entrepreneurship University of Applied Science

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
	development approach to driving innovation and attracting talent. The combination of world class infrastructure, smart city technologies, proximity to Tallin University of Technology, and a pronounced focus on developing a vibrant social atmosphere, position Ülemiste as a true city of the future. With a diverse industry focus, the campus has become a beacon for innovators and established businesses in electronics, finance, creative industries, and ICT, among other areas.	owned by the Finnish company Technopolis Plc. Two thirds of the campus is being developed by Mainor Ülemiste AS, the majority shareholder being AS Mainor. Founder: Ülo Pärnits				<ul style="list-style-type: none"> · Tallinn International School · Ülemiste Health Centre · Dvigatel-Energeetika
Technopark Sofia, Bulgaria	This park is a leader in Eastern Europe specializing in ICT, software development, electronics manufacturing, cybersecurity, e-commerce, healthcare, and engineering services. With access to the dynamic start-up ecosystem in the capital	Ownership/Founders: Undisclosed group of entrepreneurs and engineers	The Park reportedly covers an area of 60 hectares.	Sofia, Bulgaria	ICT, software development, electronics manufacturing, cybersecurity, e-commerce, healthcare, and engineering services	<ul style="list-style-type: none"> · Undisclosed.

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
	city of Sofia, Technopark has advanced incubation and acceleration services with subsidized office space, as well as regular networking and business engagement events to develop a strong 'community of practice'.					
Brno Technology Park, Czech Republic	Located in the second largest city in the Czech Republic, this technology park supports research, development, and innovation across various sectors. It provides a collaborative environment for startups, researchers, and companies. The park also provides specialized laboratories, prototyping spaces, and workshops for specialized technologies available to tenants. In addition, high level incubation services are provided to eligible start-ups through business mentoring, coaching, grant funding, and networking opportunities. The park covers an area of 24	<p>Ownership: The Statutory City of Brno and Brno University of Technology</p> <p>Founders: The Statutory City of Brno and Brno University of Technology</p>	The park layout is reportedly divided into several zones, which will be constructed in phases to reach a total built-up area of approx. 135,000 m2 (135ha). The first phase of construction has been implemented, providing a total of 56,500 m2 of space for rent	Brno, Czech Republic	Robotics and Plant Automation, Off-Land Transportation, and Micromachines and Nanotechnology	<ul style="list-style-type: none"> - Brno University of Technology - Headquarters of IBM, Red Hat, Vodafone Czech Republic, Hewlett Packard, Y-Soft, S.A.B Aerospace and others.

Park Name / Country	Description	Ownership Structure and Founders	Size	Location	Industries / Verticals	Partners
	hectares (approximately 59 acres).					
Tehnopolis Innovation and Entrepreneurship Center, Montenegro	Situated in Nikšić, this park aims to promote innovation and entrepreneurship in Montenegro. There is limitation on specific industries that can be catered to by the park, although there is focus on digital technologies, creative industries, environmental sciences, tourism services, and software development, all of which align with the development priorities as set out in national policy.	<p>Ownership: Government of Montenegro</p> <p>The Ministry of Economic Development is in charge of supervising the Park.</p> <p>Founder: Government of Montenegro</p>	The Park is reportedly covers an area of 16 hectares	Montenegro	R&D, Science and Technology, Information System and Software Development and Tourism.	Partners during the establishment of Tehnopolis: <ul style="list-style-type: none"> - Ministry of Agriculture, Forestry and Water Management - Investment and Development Fund - the Municipality of Niksic.

This selection of international and regional examples highlights the broad-based acceptance of this model as a valuable and impactful innovation policy tool. The economic benefits are unquestionable, with clear and quantifiable outcomes of ITP implementation that can be replicated in Moldova.

Case Study: Ülemiste City, Estonia - Inspiring Moldova's Future Park Vision

Ülemiste City (Tallinn, Estonia) is a very suitable example project for Moldova's DeepTech Future Park concept based on its scale and specialization. However, it should be noted that Ülemiste City is developed as private investment, where the private investor purchased the land from the municipality, whereas the proposed site location in Chisinau is publicly owned land.

Introduction:

Ülemiste City, located in Tallinn, Estonia, stands as a remarkable example of a thriving technology and innovation park, offering valuable insights and inspiration for the establishment of a similar venture in Moldova. With a vision centered around creating a knowledge-based environment, Ülemiste City has become a dynamic hub for talents, companies, and educational institutions, contributing significantly to Estonia's economic landscape.

Key Figures:

Ülemiste City spans 36 hectares with a building right of 700,000 square meters, of which approximately 200,000 square meters have been developed. The park houses 500 companies and hosts a diverse community of 16,000 talents representing 73 different nations. Collaborations with over 20 universities and the provision of 200+ free training courses underscore its commitment to fostering knowledge and skill development. With 100+ events annually and 30,000 participants, Ülemiste City has established itself as a vibrant and engaging ecosystem.

Mission: Developing an international, attractive, knowledge-based working, development and living environment that would increase the competitive ability of people and companies, bring talents home to implement their potential, and inspire the birth of new business models.

Strategic Advantages:

Ülemiste City in numbers:

- 36ha
- 700 000m² building right
- ~200 000m² developed
- 500 companies
- 16 000 talents
- 73 different nations
- 20+ cooperating universities
- 200+ free of charge training courses for the community
- 100+ events per year
- 30 000 participants in events
- ~30M€ operator revenue (2023)
- 2B€ total turnover in Ülemiste City (2020)
- 3rd biggest economic region in Estonia

Location:

- Key international transportation hub (Tallinn airport & Rail Baltic terminal, entrance of main national highways),
- Proximity to city center
- Accessibility with all modes of transportation

Concept:

- Holistic approach to human-centric innovation park development
- Research-based Future City concept
- Focus domains: Economy, Knowledge, Services, Environment, Community

Strategy:

- Mix of industries and company sizes, 90+% occupancy
- Co-development with strategic partners (real-estate, academia, community)
- Close partnership with City of Tallinn

Services:

- Health district
- Education services
- Data
- Innovation Test City

1. Location: Ülemiste City benefits from a strategic location as a key international transportation hub, with proximity to Tallinn airport, Rail Baltic terminal, and major national highways. Its accessibility by various modes of transportation enhances its appeal.
2. Concept: The park adopts a holistic approach to human-centric innovation park development, embodying the Research-based Future City concept. It focuses on key domains such as Economy, Knowledge, Services, Environment, and Community.
3. Strategy: Ülemiste City's strategy involves a mix of industries and company sizes, maintaining a remarkable 90+% occupancy rate. Co-development with strategic partners, including real estate, academia, and the community, is a key aspect. The park also maintains a close partnership with the City of Tallinn.
4. Services: Ülemiste City provides a range of services, including a health district, educational services, data infrastructure, and an Innovation Test City. This diversity of services contributes to the park's comprehensive and supportive ecosystem.

Results:

As of 2023, Ülemiste City boasts an operator revenue of approximately 30 million euros, contributing to its status as the third-largest economic region in Estonia. With a total turnover of 2 billion euros in 2020, Ülemiste City has proven its economic significance and impact on the national scale.

Lessons for Moldova:

Moldova can draw valuable lessons from Ülemiste City's success, particularly in adopting a holistic approach to technology park development. Emphasizing a strategic mix of industries, co-development with key partners, and a strong focus on human-centric innovation, Ülemiste City provides a blueprint for establishing a vibrant and competitive technology park in Moldova. The integration of diverse services and close collaboration with the government further strengthen the park's role as a catalyst for economic growth and innovation. Moldova can leverage its own strengths and vision to create a technology park that attracts talents, fosters collaboration, and contributes significantly to the country's economic development.

Ülemiste City Sandbox and Environment

City with a vision

Ülemiste City is an international and diverse environment focused on creating a knowledge-based working, growth and living environment for talents that supports the competitiveness of every member of the community in the world, attracts talents to come back home who have left and inspires the birth of new business models.

Vision: Ülemiste City is the best well-known, renowned and desired business, living and studying environment for talents – smart experts, managers and companies who impact the (world) economy through their action.

MARKET AND INVESTMENT JUSTIFICATION

POLICY PRIORITIES

Since securing independence in 1991, the Government of Moldova (GOM) has launched a series of economic and political reforms that include country-wide privatization, financial and trade liberalization, and democratization. In recent years, substantial improvements have been made to modernize the economic structure and promote private sector led growth. According to the *Investment Guide 2020*,³ this includes the following initiatives:

- Adopting free-market economic reforms
- Establishing legal protections for intellectual property
- Reforming regulations to stimulate entrepreneurship
- Promoting investment in special economic zones
- Developing incentives for foreign investors
- Setting up a preferential tax regime for certain strategy sectors
- Identifying seven (7) priority areas for investment and export promotion⁴

Forward-looking interventions and policies like the *National Strategy for Investment Attraction and Export Promotion 2016-2020* have led to positive results. For example, Moldova ranked an impressive 64th out of 132 countries in the *Global Innovation Index 2021*.⁵ According to the Ease of Doing Business Index, Moldova increased from 86th in 2012 to 48th in 2019 out of 190 countries.⁶ Finally, the *Global Competitiveness Report 2019* ranked Moldova as 86th out of 141 countries.⁷ Evidently, Moldova performs well according to these metrics for a small landlocked country that only broke free from Soviet-era economic policies 30 years ago.

Encouraging competition and innovation through strategic policy formulation has led to private investors from Europe and the United States to explore commercial opportunities in the ICT, agricultural and energy sectors.⁸ This increased investor interest is partially attributable to sweeping policy adjustments intended to harmonize national legislation

³ The Moldovan Investment Agency. (2020). *Investment Guide*. Available at: https://invest.gov.md/attached_files/2021/03/04//Investment%20Guide.pdf.

⁴ Agriculture and food, automotive industry, business services such as business process outsourcing, clothing and footwear, electronics, Information and Communication Technologies (ICT), and machinery.

⁵ World Intellectual Property Organization. (2021). *Global Innovation Index 2021*. Retrieved from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf.

⁶ Trading Economics. (2022). *Ease of Doing Business in Moldova*. Available at: <https://tradingeconomics.com/moldova/ease-of-doing-business#:~:text=Moldova%20is%20ranked%2048%20among%20190%20economies%20in.and%20a%20record%20low%20of%2044%20in%202016>.

⁷ World Economic Forum. (2019). *Global Competitiveness Report*. Available at: https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.

⁸ U.S Department of State. (2022). *Investment Climates in Moldova*. Available at: <https://www.state.gov/reports/2022-investment-climate-statements/moldova/>

with the European Union's (EU) standards and requirements.⁹ To illustrate the impact of these enabling environment reforms, the United Nations Conference on Trade and Development (UNCTAD) recorded US\$503 million (M) in Foreign Direct Investment (FDI) to Moldova in 2019.¹⁰ This is a significant improvement on the €143M in FDI inflows that was recorded in 2016,¹¹ at which time the effects of massive theft of US\$1.2 billion (B) from the banking system were still being felt.¹²

ANALYZING MARKET TRENDS

Technology development and digital innovation are dynamic but underdeveloped components of Moldova's economy, contributing about 3.1% of Gross Domestic Product (GDP). There is growing emphasis on the need to invest in and promote the growth of a hyper-modern and highly innovative economy. This must be achieved through coordinated policy and regulatory strategies that mobilize private capital, foster an enabling business environment, strengthen educational institutions, establish modern Research and Development (R&D) infrastructure, nurture the entrepreneurial culture, and forge catalytic partnerships with industry leaders.

This is essential given the largely untapped potential of entrepreneurship and market-led development in Moldova. Key barriers include scarce resources within the private sector to accelerate digital transformation, the risk of capital flight and expertise drain, lack of targeted financing for ICT/digital innovation start-ups, constrained access to finance for SMEs, inadequate coordination within the innovation ecosystem, and a disjoint between R&D, business innovation, and public policy. Addressing these challenges is pivotal to driving investment, technological leapfrogging, and innovation, which are directly linked to sustainable and long-term economic growth.

Although there are challenges to be overcome, Moldova has natural strengths and competitive advantages that must be accounted for as part of Moldova Future Park design. This includes:

- **Human Capital:** Well-educated population with strong tertiary system and particular emphasis on technical education in mathematics, engineering, robotics, software development, light manufacturing, and related fields. This has led to a global reputation, especially in IT outsourcing and software development as several international companies are capitalizing on the availability of skilled professionals at competitive costs.
- **Agriculture:** Strong potential to drive innovation and enhance value through AgriTech, which would align with the economic importance of agriculture to Moldova as well as with global demand and megatrends. Leveraging digital enablers

⁹ The Moldovan Investment Agency. (2020). Investment Guide. Available at: https://invest.gov.md/attached_files/2021/03/04//Investment%20Guide.pdf.

¹⁰ UNCTAD. (2021). World Investment Report. Available at: <https://unctad.org/webflyer/world-investment-report-2021>.

¹¹ UNCTAD. (2017). Investment Policy Review; South-East Europe. Available at: https://unctad.org/en/PublicationsLibrary/diaepcb2017d6_en.pdf.

¹² U.S Department of State. (2022). Investment Climates in Moldova. Available at: <https://www.state.gov/reports/2022-investment-climate-statements/moldova/>

- like robotics, drones, farm management platforms, Internet of Things (IOT) remote sensors, bioengineering and genetic engineering, pest and disease control, and climate resilient crop varieties would chart a new course for Moldova away from labor and resource intensive agronomic practices that are a constraint to growth.
- **Health:** Immense market potential to link technology and innovation with healthcare services and products, such as in telemedicine, remote patient monitoring, digital diagnostics and imaging, wearable medical devices, healthcare data analytics, surgical robotics, IOT medical equipment, and even interoperable blockchain technology (i.e., for patient records and invoicing / billings). This would not only benefit the domestic healthcare sector, but also create export opportunities for foreign markets, and possibly position Moldova as an affordable medical tourism destination.
 - **Innovation Policy:** lack of existing ITPs creates an advantage for a new park due to the lack of competition and strong investment upside for potential private sector partners that see the ‘first mover’ opportunity. Combined with a clear government focus on embracing innovation policy to support start-ups, academic institutions, and established businesses with policy incentives and regulatory frameworks, the time is ripe to capitalize on this momentum.
 - **Urban Integration:** Unlike some other European capitals, there is publicly owned land with close proximity to Chisinau that could be made available to accommodate Moldova Future Park. Situating Moldova Future Park in an urban location which is accessible to students, researchers, and professionals has immense value as an important strategic consideration for prospective tenants and partners. This will also be a critical factor in whether Moldova Future Park emerges as a ‘9-5 business district’ that becomes a ghost city in the evenings and on weekends, or if it becomes a vibrant community and destination for leisure and recreation in its own right. This potential is only amplified by the prospect of developing multiple campuses that are linked by urban green development corridors and smart city design features (e.g., cycling paths, EV buses, walking boulevards, etc.). This approach could revitalize and modernize entire neighborhoods within which Moldova Future Park is situated, as well as those adjacent.

There is a clear investment rationale underpinning this study and recent government efforts to explore the viability of Moldova Future Park model. With these factors in mind, it is necessary to examine the implementation vision that should guide the development of Moldova Future Park in Moldova. This discussion is highly important and influential for the decision of whether there should be one or multiple ITPs, which is a seminal issue to be addressed by this Concept Note.

Moldova’s IT Sector and Advanced Technologies a Key Success Factor

The Moldovan economy is increasingly characterized by the development of entrepreneurship and innovation in Information and Communications Technology (ICT)

and the ‘knowledge economy’.¹³ This is the result of a policy effort to develop high value-added industries, promote investment, and enhance competitiveness through collaboration between government, private enterprise, civil society, academia, financial institutions, and development partners. Moldova’s vision is to become a top regional destination for high value-added tech products and services.

Responsible for approximately 10% of national GDP, there is clear evidence of positive spillover benefits and growth impacts from the ICT sector on other key industries.¹⁴ In fact, agriculture was identified in a recent study as the highest priority sector in terms of requiring innovation and technology transfer to bolster productivity, increase resistance to drought and floods, and increase the efficiency of inputs and production systems.¹⁵

The strong potential for technological innovation is evidenced by Moldova’s rank of 62nd out of 132 countries for ICT Infrastructure in the *Global Innovation Index 2021*.¹⁶ Moldova was also recognized as achieving a superior position in the overall country ranking than was expected for its level of development for the eleventh consecutive year.¹⁷ Moreover, the ICT sector was recognized as a core driver for Moldova’s categorization as a lower middle-income country.¹⁸

Strong Local Digital Connectivity Infrastructure is an Ideal Test Ground for Cutting Edge Mobility Solutions

The robust local digital connectivity infrastructure serves as a major attraction and a strategic advantage for establishing a technology park in Moldova, positioning it as an ideal test ground for cutting-edge mobility solutions. The growth of Moldova’s ICT sector has also been complimented with the launch of 3G networks in 2008 (population coverage reached 100% in 2018) and LTE becoming available in 2012 and covering almost 97% of the population. Additionally, 76% of the population have access to and

Moldovan connectivity is one of the best in the region and globally

- 98% fiber coverage
- 98% 4G coverage
- One of the highest Internet average speed (43,52 Mbps in 2017)
- 76% Internet penetration (for digital literacy and access to networks)
- 5th in the world for broadband affordability

¹³ International Telecommunication Union. (2017). ICT-Centric Innovation Ecosystem Country Review: Republic of Moldova. Retrieved from: <https://www.itu.int/hub/publication/d-inno-md-2018-01/>; United Nations Industrial Development Organization. (2020). *The Innovation Ecosystem of Moldova (Report prepared under UNIDO Country Programme for Moldova 2019-2023)*. Retrieved from: https://www.unido.org/sites/default/files/files/2021-02/Report_on_Innovation_Ecosystem_of_Moldova.pdf.

¹⁴ International Trade Administration U.S. Department of Commerce. (2021). *Moldova - Country Commercial Guide (Information and Communication Technology)*. International Trade Administration. Retrieved from: <https://www.trade.gov/country-commercial-guides/moldova-information-and-communication-technology>

¹⁵ United Nations Industrial Development Organization. (2020). *The Innovation Ecosystem of Moldova (Report prepared under UNIDO Country Programme for Moldova 2019-2023)* (p. 27). Retrieved from: https://www.unido.org/sites/default/files/files/2021-02/Report_on_Innovation_Ecosystem_of_Moldova.pdf.

¹⁶ World Intellectual Property Organization. (2021). *Global Innovation Index 2021*. Retrieved from: https://www.wipo.int/global_innovation_index/en/2021/.

¹⁷ Ibid.

¹⁸ Ibid (p. 141). Retrieved from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf

regularly use the internet.¹⁹ This extensive and high-speed connectivity not only facilitates seamless data transfer but also creates an environment conducive to the development and testing of innovative mobility solutions. The 76% internet penetration rate is a testament to the nation's commitment to digital literacy and ensuring widespread access to networks, providing a solid foundation for the technology park's success. Moldova's remarkable achievement of ranking fifth in the world for broadband affordability further underscores its commitment to creating an environment that encourages technological innovation. This exceptional digital connectivity, characterized by widespread coverage, high speeds, and affordability, positions Moldova as a prime location for companies and startups working on mobility solutions to thrive and test their innovations in real-world scenarios within the technology park.

Moldova's Thriving IT sector

The thriving IT sector in Moldova stands as a magnetic force for the establishment of a Moldovan DeepTech Park, offering a fertile ground for innovation and technological advancement. The government's forward-thinking approach is evident through its strategic initiatives, such as the Strategy for IT industry and digital innovation development (2018-2023) and the Digital Transformation Strategy (2023-2030). These policies provide a roadmap for the sector's growth and development, creating an environment conducive to technological breakthroughs.

Crucially, the Law on IT Parks, with its provision of a 7% single tax on turnover for IT firms residing in Moldova, serves as a powerful incentive. The recent government draft amendments, extending the validity of this law until 2035, showcase a long-term commitment to supporting the IT sector. This stability is attractive to businesses and investors looking for a secure and supportive environment.

In addition to tax incentives, Moldova has implemented facilitative policies for remote work, introducing an IT visa that streamlines permits for international tech professionals. The government's package of contactless business further promotes digitalization, making business operations in Moldova appealing to investors, startups, and the diaspora.

The impressive growth of the IT sector underscores its significance in the Moldovan economy. Accounting for 4.2% of the GDP, with a threefold increase in the past five years, the sector's revenue reached US\$731 million in 2022, marking a fivefold growth since 2018. IT exports surged to US\$455 million in 2022, constituting 11% of total Moldovan exports. This is a remarkable progression from 5% in 2018. These IT advantages are further illustrated in *Figure 7*.

¹⁹ International Telecommunications Union. (2020). Status of Digital Agriculture in 18 Countries of Europe and Central Asia. (p. 32). Retrieved from: https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2020/Series%20of%20Webinars/20-00244_Status_digital_Agriculture-revFAOV4.0-MASTER-FILE-20-JUNE_REVIEW-FAO_PL_print%20%28002%29.pdf.



Figure 7: Moldova's IT Advantages Fueling the Future Park

The Moldova Innovation Technology Park (MITP), acting as a virtual hub, has 1340 residents and a total turnover of 528 million USD in 2022. This virtual park, offering a single 7% tax incentive, can serve as a nucleus for the envisioned technology park. With 211 companies in the IT sector attracting foreign investments from 38 countries, including the EU and the US, Moldova's IT landscape proves its international appeal. These companies, along with others, can potentially become residents of the future technology park, contributing to its vibrancy and global connectivity.

In conclusion, the robust and rapidly growing IT sector in Moldova, supported by visionary governmental policies and initiatives, provides a solid foundation for the establishment of a DeepTech Future Park. The sector's economic impact, coupled with favorable policies and international attractiveness, positions Moldova as an ideal destination for innovation and technological collaboration. The proposed technology park can leverage this thriving ecosystem to propel itself into a hub of technological excellence and economic growth.

Moldova's Comparative IT Advantage will Draw Global and Regional Players

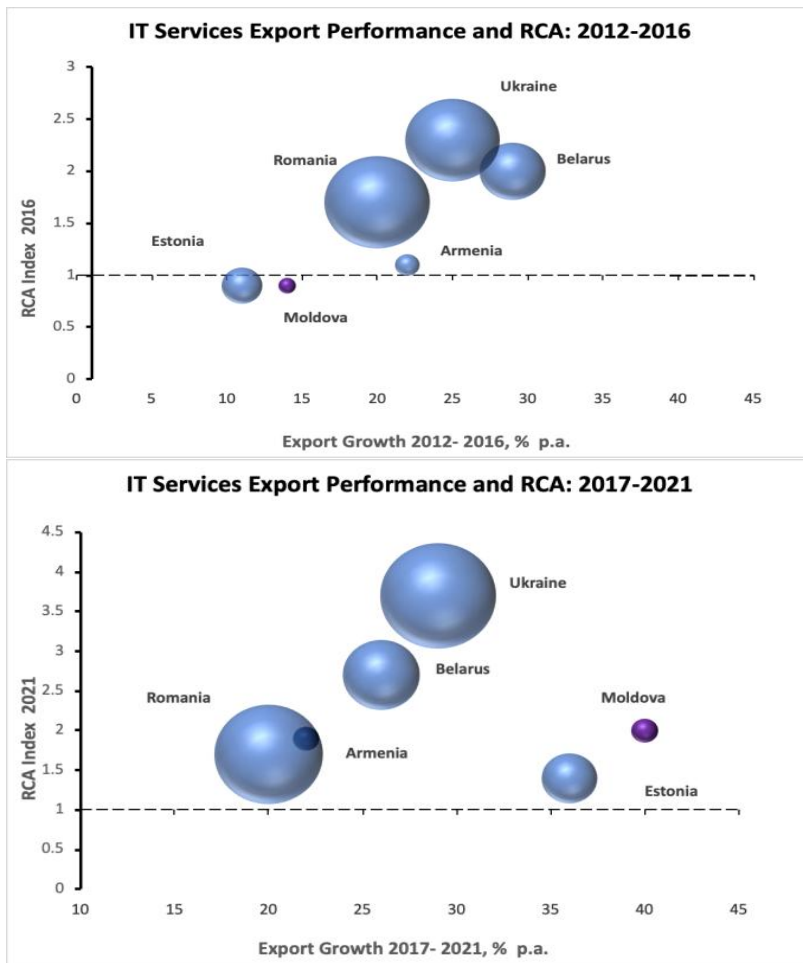
Moldova's remarkable ascent in the IT services sector, particularly in the last five years, positions the country as a formidable player in the regional landscape, thereby offering a robust advantage for the development of a technology park. The comprehensive analysis of Moldova's competitiveness against benchmarked countries like Armenia, Belarus, Ukraine, Estonia, and Romania reveals a compelling story of growth and transformation.

First and foremost, Moldova's achievement of the highest annual average export growth among the benchmarked countries, reaching an impressive 40% in the 2017-2021 period, is a testament to the dynamic nature of its IT sector. This significant improvement, compared to the 14% growth in the previous five-year period, underscores the country's capacity for rapid adaptation and expansion in the tech services domain.

Equally noteworthy is the evolution of Moldova's Revealed Comparative Advantage (RCA) index, a crucial indicator of competitiveness. The shift from a sub-threshold RCA index of 0.9 in 2016 to a robust index of 2.0 showcases Moldova's commitment to enhancing its competitiveness. Surpassing regional benchmarks like Romania, Estonia, and Armenia, Moldova's newfound strength positions it as a prime location for hosting tech firms within a technology park.

In comparison to regional competitors, Moldova's IT export growth has outpaced the world market by approximately four times, highlighting the extraordinary momentum gained since the adoption of Law No. 77. The visual representation in *Figure 8* illustrates the substantial competitive positioning achieved by Moldova in comparison to its peers.

Figure 8: Regional IT Competitiveness Metrics 2012-2021



Notes: The bubble sizes are scaled representing the value of exports in 2016 on the top chart, and 2021 on the bottom chart. Source: Fiscal impact assessment of the extension of the law on it parks by FTA, 2023

While acknowledging Moldova's remarkable progress, it is essential to recognize the intensifying competition within the region for attracting investments into the IT sector. The competitiveness strength of all regional competitors is evident, with even the lowest RCA index among them standing at a commendable 1.4.

Ukraine and Belarus, as particularly strong performers in 2016, have sustained their competitiveness with remarkable export growth and rising RCA indexes. Their ability to maintain such robust performance indicates not only the viability but the potential for further growth in the IT sector. With RCA indexes of 3.7 and 2.7 in 2021, and the share of IT service exports in services exports reaching 37.3% and 29.5%, respectively, these countries exemplify the possibilities for continued expansion in the tech services domain.

In conclusion, Moldova's outstanding competitiveness gains in the IT services sector, as evidenced by substantial export growth, an improved RCA index, and a growing share of IT exports, make it an ideal location for developing a technology park. The country's demonstrated ability to outperform regional and global benchmarks positions it as a strong contender for hosting tech firms, research, and innovation within a vibrant and thriving technological ecosystem.

Health Technology – a Key ITP Cluster

The Moldova Future Park has a unique opportunity to establish health technology as a key cluster, leveraging the country's well-established medical infrastructure, high medical skills, medical and technological advancements (in areas such as brain surgery, fertilization), and untapped potential in medical tourism.

Moldova's medical services, known for their commendable quality and competitive rates, position the country as a strong contender in the global market. The concept of medical tourism, still in its early stages, represents vast untapped potential, constituting only 5% of the market with a value of \$30 million in 2022. Projections suggest a compelling Compound Annual Growth Rate (CAGR) of 20%, reaching \$50 million by 2030. Local startups like Eliri, focusing on nanotech solutions for fertility, and CorLabTech, specializing in the digitalization of medical records, exemplify the emerging intersection of health and technology in Moldova. The American Chamber of Commerce in Moldova (AmCham) is keen on curating a health tech cluster, with leading health players such as Bayer, MedPark International Hospital, and dentistry labs among its members. A burgeoning knowledge wave and a new community bridging technology and education are evident, as seen in the collaborative efforts of Startup Moldova and the Medical University Testimianu, organizing the first Health Tech Forum in 2022. The forum, focusing on digital education in the medical system, online medical services, telemedicine, digitalization of medical services, online medical appointments, and electronic patient records, underscores the growing synergy between health and technology in Moldova. This presents a compelling foundation for the Moldova Future Park to catalyze innovation, research, and development in the burgeoning field of health technology.

Investing in Healthcare Technology

Investing in healthcare technology and innovation can realize numerous benefits to Moldova's healthcare system, such benefits include:

- **Enhanced patient outcomes:** Cutting-edge technologies such as virtual consultations and remote monitoring can help improve patient outcomes by enabling better access to care, reducing costs, and broadening the reach of healthcare services.²⁰
- **Increased efficiency:** Investments in healthcare technology can drive efficiency gains by streamlining processes, reducing administrative burdens, and improving coordination among healthcare providers.²¹
- **Expanded access to care:** Telehealth solutions can enable patients to receive care remotely, reducing the need for in-person visits and expanding access to healthcare services, especially for those in remote or underserved areas.²²
- **Improved cost-effectiveness:** By leveraging technology, healthcare systems can optimize resource allocation, reduce waste, and improve cost-effectiveness.²³
- **Accelerated adoption of innovation:** Investing in healthcare technology can facilitate the adoption and spread of innovative solutions across the healthcare system, leading to faster improvements in patient care.²⁴
- **Preparedness for future challenges:** Technological advancements can help healthcare systems better respond to emerging challenges, such as pandemics or natural disasters, by enabling rapid data sharing, remote monitoring, and efficient resource allocation.²⁵

The challenges and opportunities for the development of the healthcare system of Moldova are well supported through international and regional activities and policy. The case for investment in HealthTech is assumed by those activities and policies but also through the significant international case for the development of healthcare and healthcare technology focused research and innovation parks. The international case for healthcare technology research parks cites the aims of enhancing economic growth and improving patient safety in an improved health and care service.²⁶

Health Tech parks also known as research and innovation parks, technology parks, science parks, research parks, innovation centers, and technopoles, are important policy components of healthcare technology research and innovation ecosystems. They are managed by specialized professionals who aim to increase the wealth of their community by promoting the culture of innovation and the competitiveness of associated businesses

²⁰ Gupta, D. (2023, February). *What Is Fueling Investor Excitement In Healthtech?* Retrieved from AppInventiv: <https://appinventiv.com/blog/increasing-investment-in-healthcare-technology/>

²¹ Amato, K. (2021, February). *Healthcare Investing Trends Report*. Retrieved from HIMMS: <https://www.himss.org/resources/healthcare-investing-trends-report>

²² Amato, K. (2021, February). *Healthcare Investing Trends Report*. Retrieved from HIMMS: <https://www.himss.org/resources/healthcare-investing-trends-report>

²³ Amato, K. (2021, February). *Healthcare Investing Trends Report*. Retrieved from HIMMS: <https://www.himss.org/resources/healthcare-investing-trends-report>

²⁴ The Health Foundation. (2022, February). *Adoption and spread of innovation and technology in the NHS*. Retrieved from The Health Foundation: <https://www.health.org.uk/what-we-do/supporting-health-care-improvement/adoption-and-spread-of-innovation-and-technology-in-the-nhs>

²⁵ The Health Foundation. (2022, February). *Adoption and spread of innovation and technology in the NHS*. Retrieved from The Health Foundation: <https://www.health.org.uk/what-we-do/supporting-health-care-improvement/adoption-and-spread-of-innovation-and-technology-in-the-nhs>

²⁶ UK Department of Health and Social Care. (2022, October). *Over £800 million to boost innovation, growth and improve patient safety*. Retrieved from Gov.uk: <https://www.gov.uk/government/news/over-800m-to-boost-innovation-growth-and-improve-patient-safety>

and knowledge-based institutions. These parks stimulate and manage the flow of knowledge and technology among health and healthcare technology focused universities, R&D institutions, companies, and markets. They facilitate the creation and growth of innovation-based companies through incubation and spin-off processes.²⁷

With this context in mind, emphasizing health technology within Moldova Future Park is expected to act as a catalyst for regional economic development and to promote economic growth specific to the challenges of the Moldovan healthcare system. Importantly, it would create synergy across healthcare technology innovation players by generating new and valuable information through human interaction.

SWOT ANALYSIS

Developing an advanced digital solutions and healthcare technology focused ITP in Moldova can significantly benefit the national healthcare sector and innovation ecosystem. However, it also entails several risks and requires specific success conditions for successful establishment and operation. To frame these considerations, the following 'SWOT' analysis was supported by semi-structured meetings and site visits by FTA personnel:

Strengths

- **Government Support:** Strong support and incentives from the Moldovan government can significantly ease regulatory and funding challenges. Current policies and activities including the digitization of services, for example the mCabinet Citizen portal, illustrate strong government support.
- **Strategic Partnerships:** Collaboration between academia, local and international healthcare institutions, universities, and research centers is already considered a strength and can be further strengthened through the development of a DeepTech and HealthTech ITP to leverage expertise, resources, and talent.
- **Access to diverse talent pools:** The stakeholders interviewed illustrated a strong and diverse talent pool available to support the activities of Moldova Future Park.
- **Credibility of Proven Companies:** The stakeholders interviewed illustrated the availability of strong, proven companies that could be highly suitable as tenants, investors, and partners at Moldova Future Park. The companies were diverse in nature and their roles within the healthcare and technology industries.
- **Strong Interest in Digital Maturity:** The stakeholders engaged suggested that there is already a strong interest in the development of healthcare technology and an enthusiasm to further develop digital maturity.
- **Existing Collaborations and Partnerships:** There is already strong collaboration between the very organizations that would further benefit by the development of Moldova Future Park. The stakeholders suggested that such collaboration would be further strengthened by the development of the park.

²⁷ Interreg Europe. (2022, January). *Technology Parks to promote regional economic transformation*. Retrieved from Interreg Europe: <https://www.interregeurope.eu/find-policy-solutions/stories/technology-parks-to-promote-regional-economic-transformation>

Weaknesses

- **Health and eHealth Strategy:** The delivery of healthcare services is considered to be inconsistent and not supported by a clear health or e-health strategy. The stakeholders consider this as key to the success of the park to ensure that the park supports a circular process to inform and deliver government policy.
- **Limited Clinical Trials:** Currently the activity for clinical trials in Moldova is limited but it is recognized that growth is occurring. That growth requires further support and investment to drive activity in Moldova Future Park.
- **Availability of Modern Manufacturing and Research Facilities:** much of the technology discussed with the potential stakeholders is not currently developed within Moldova. While that also presents itself as an opportunity for Moldova Future Park there is a risk that this pattern continues with an international dependency for the park's immediate development and success.
- **Talent Retention:** Attracting and retaining healthcare technology talent, including researchers, engineers, and healthcare professionals, can be competitive and may require incentives. Doubt was raised in Moldova's ability to support innovation due to resource and skills shortages. here is a risk that the current talent challenges for the region will undermine the success of the park in the immediate.

Opportunities

- **Research Advancements:** Moldova Future Park can serve as a hub for cutting-edge research in healthcare technology. It can support research in areas such as medical devices, pharmaceuticals, telemedicine, digital health solutions. The availability of 'sandbox' research and development facilities was seen as key by the stakeholders.
- **Interdisciplinary Collaboration:** Proximity to various healthcare-related disciplines, including medicine, biotechnology, informatics, and engineering, encourages interdisciplinary collaboration. The ability for experts from different fields to be able to collaborate on complex healthcare challenges is key. International collaboration between the park and other parks and stakeholders was identified.
- **Technology Transfer:** The park can facilitate the transfer of technology and knowledge from academia to industry. Universities and research institutions within the park can collaborate with healthcare companies to bring research findings to the market.
- **Clinical Trials:** The availability of clinical research facilities can attract pharmaceutical companies, medical device manufacturers, and researchers to conduct clinical trials. This can accelerate the development and approval of new healthcare technologies and therapies.
- **Innovation Ecosystem:** The Moldova Future Park fosters an innovation-friendly environment where startups and established companies can develop and test new healthcare solutions. Incubators and accelerators can support early-stage ventures.

- **Access to Data** - Collaboration with healthcare providers can provide access to valuable healthcare data for research, development, and improving patient care. This data can be used for analytics, machine learning, and predictive modelling.
- **Talent Attraction:** The R&D park's resources, collaborative opportunities, and innovative environment can attract top talent in healthcare technology, including researchers, engineers, data scientists, and healthcare professionals. Moldova Future Park was seen as key to reversing the talent drain from Moldova.
- **Infrastructure and Resources:** State-of-the-art facilities, laboratories, and equipment can support research and development efforts. High-performance computing clusters and cloud resources can accelerate data analysis and computational research.
- **Regulatory Support:** The park can provide guidance and expertise on navigating complex healthcare regulations and standards. This support is crucial for ensuring compliance and product safety.
- **Commercialization:** The park can offer pathways for commercialization, helping startups and companies bring healthcare technologies to market. This includes access to funding, mentorship, and partnerships.
- **Global Networking:** The Moldova Future Park can connect healthcare technology innovators to international networks, facilitating collaboration with global partners, investors, and customers.
- **Development of Emerging and Relevant Technology:** Moldova Future Park can support the development of technologies, such as telecare and telemedicine, that improve access to healthcare services, especially in underserved areas.
- **Healthcare Education and Training:** The park can offer educational and training programs for healthcare professionals, researchers, and entrepreneurs, ensuring a skilled workforce for the future.

Threats

- **Government Support:** Whilst also cited as a strength, concerns were raised on government support for private sector healthcare vendors and suppliers. Health and support e-health strategy should consider the total healthcare ecosystem and the important role the private sector plays.
- **Digital Maturity:** Whilst low digital maturity is an opportunity for Moldova Future Park it has resulted in there being limited meaningful healthcare data available to support research and development activities for dry laboratory activity.
- **Health and eHealth Strategy:** The delivery of healthcare services is considered to be inconsistent and not supported by a clear health or ehealth strategy. The stakeholders consider this as key to the success of the park to ensure that the park supports a circular process to inform and deliver government policy.
- **Lack of Resource:** current talent migration and movement represents a consistent challenge to Moldova and to the development of the park. Whilst the park will help to mitigate that challenge it is an immediate risk to the success of the proposed development.

TECHNOLOGY VERTICALS

DeepTech Verticals

As a rapidly advancing field, DeepTech covers a broad range of technological based on scientific and engineering breakthroughs with strong commercialization potential.²⁸ Definitions on verticals and research clusters vary given the relatively nascent stage of literature on the topic. However, with reference to international dialogue and the experience of other DeepTech ITPs (such as DTU Science Park in Denmark²⁹ and Ideon in Sweden³⁰), key thematic focus areas can be identified that have relevance as targets for the Moldova Future Park. These are summarized as follows:

Artificial Intelligence (AI) and Machine Learning (ML)

- AI and ML involve the development of algorithms and systems that can learn and make intelligent decisions, with transformative applications across industries such as healthcare, finance, agriculture, and manufacturing. There are consumer applications with large language models as exemplified by ChatGPT developed by OpenAI. Research on 'ethical AI' remains a rapidly developing field with the potential for new market entrants such as from disruptive Moldovan enterprises. There is also immense commercial potential in the complex and competitive field of quantum computing, which is directly linked to AI developments.

Robotics and Automation

- Development of autonomous machines and automation technologies with commercial applications in manufacturing and automated assembly, agro-industry, healthcare, logistics and warehousing, and e-commerce. Investing in this vertical would create commercial opportunities to modernize and optimize the efficiency of critical industries in Moldova with numerous opportunities for innovation both in hardware and software.

Advanced Materials

- Research focused on the development of novel materials, advanced composites, and polymers (including nanomaterials) with enhanced properties, such as high-strength, lightweight conductivity, flexibility, and recyclability. The commercial applications across industries are virtually limitless, covering FMCG, retail, textiles, energy, manufacturing, electronics, aerospace, defence, and others.

Blockchain and FinTech

- Digital banking, peer-to-peer lending, InsureTech, and decentralized blockchain ledger technology that underpins cryptocurrencies like Bitcoin through secure payment solutions, with scalable commercial applications in supply chain transparency / traceability. As blockchain and FinTech continues to disrupt the

²⁸ BVP. (2023). State of DeepTech. Retrieved from: <https://www.bvp.com/atlas/state-of-deep-tech>; DeepTech Alliance. (2023). About. Retrieved from: <https://www.deeptechalliance.org/>; IFC. (2020). Hibino et al. (2023). Utilization of Tangible and Intangible Assets of Science Parks to Lead Innovation in a Deep Tech Sector. Retrieved from: <https://ieeexplore.ieee.org/document/10216911>; Deep Tech Solutions for Emerging Markets. Retrieved from: <https://www.ifc.org/content/dam/ifc/doc/mgrt/emcompass-note-94-web.pdf>.

²⁹ DTU Science Park. (2023). Home. Retrieved from: <https://dtusciencepark.com/>.

³⁰ Ideon. (2023). Home. Retrieved from: <https://ideon.se/>.

financial sector, Moldova can position itself as a hub for innovation in financial inclusion, decentralized banking, and MSME lending.

Cybersecurity

- Software developments designed to protect computer systems, digital networks, and data integrity from increasingly prevalent cyber-attacks. Becoming a hub for cybersecurity solutions would enable Moldova to export expertise and services to other markets.

Clean and Renewable Energy

New energy technologies related to solar and wind installations, batteries and storage, consumption efficiency, grid integration, green buildings, and hydrogen cells. Investing in this space is essential to Moldova's domestic sustainability and green transition objectives, and it could also position Moldova as an exporter of affordable clean energy solutions to developing markets.

Biotechnology and Life Sciences

- R&D in biology and genetics to create new products and technologies, including pharmaceuticals, genetic engineering, and bioinformatics. By fostering a strong biotech sector, the Future Park can contribute to healthcare innovation, agricultural advancements, and biopharmaceutical exports. This cluster is further examined in the Healthcare Verticals summarized in the next sub-section.

Healthcare Verticals

To act as a catalyst for regional economic development and to promote address challenges facing the Moldovan healthcare system, it is important that the Moldova Future Park targets healthcare technology verticals. Moldova Future Park should act as a supporter of the development of the Moldovan healthcare system through healthcare technology innovation with the innovations and ideas both driving and supporting government healthcare strategy. Without a specific focus on target verticals there is a risk that a park exists as an 'island' of innovation without impacting the domestic market.

When considering the healthcare technology verticals, the building blocks to develop a healthcare ecosystem should be considered. Healthcare systems strive to shift across from being reactive, to being proactive, to being predictive. This transformation aims to improve patient outcomes by focusing on prevention and early intervention.

Traditionally, healthcare systems have been designed to address acute illnesses and provide reactive care. However, with the rise of chronic diseases and an aging population, there is a need to prioritize general health and identify risk factors before illnesses escalate. By adopting a proactive model, healthcare providers can promote patient education, implement screening campaigns, and empower individuals to take charge of their own health.

Predictive medicine, preventative medicine, personalized medicine, and participatory medicine are some of the approaches that can help transition from reactive to proactive care. These strategies involve leveraging connected devices to provide healthcare

information, increasing focus on positive health outcomes, and empowering citizens with medical knowledge.³¹ As such, the healthcare technology verticals in Moldova should include:

- **Electronic Health Records:** An electronic health record (EHR) is the systematized collection of patient and population electronically stored health information in a digital format. These records can be shared across different health care settings. For Moldova such technology can enhance the management and monitoring of payment and insurance systems and supporting public health initiatives in non-communicable diseases such as diabetes.
- **Health Analytics:** the process of examining data to find trends, patterns, insights, and conclusions. It uses quantitative and qualitative techniques to acquire, manage, analyze, interpret, and transform data into accurate, consistent and timely information. For Moldova health analytics would act as a natural extension to the collection of data in EHR's and support a vast array of public health and research and development initiatives.
- **Telemedicine:** the remote diagnosis and treatment of patients by means of telecommunications technology. For Moldova, telemedicine can support the monitoring of non-communicable disease including diabetes and cancer and also communicable in tuberculosis and HIV especially in the work mobile population.
- **Biopharmaceuticals And Biotechnology:** Biotechnology is the use of biology to solve problems and make useful products. It has many applications in healthcare and medicine, such as producing therapeutic proteins and drugs, developing vaccines, diagnosing diseases, and personalizing treatments. For Moldova this could well support research and treatment of tuberculosis
- **Genomics:** Genomics healthcare is a medical discipline that involves using genomic information about an individual as part of their clinical care and health outcomes. Genomics healthcare can help to predict, diagnose, and treat diseases more precisely and personally by studying the genes (DNA) and their interaction with health. Genomics healthcare is an emerging and transforming field of medicine. For Moldova genomics can act as an extension of health analytics into personalized care
- **Material Science:** Design and discovery of new biomaterials, with particular emphasis in hydrogels, to promote tissue regeneration for a variety of medical applications. Processing of biomaterials into complex 3D structures. Additive manufacturing of biodegradable scaffolds (metallic, polymeric and composites) for tissue engineering (bone, cartilage, skin).
- **Regenerative Medicine:** Regenerative medicine deals with the "process of replacing, engineering or regenerating human or animal cells, tissues or organs to restore or establish normal function". This field holds the promise of engineering damaged tissues and organs by stimulating the body's own repair mechanisms to functionally heal previously irreparable tissues or organs. For Moldova

³¹ Wise, A., Macintosh, E., Rajakulendran, N., & Khayat, Z. (2016, March). *Transforming health: Shifting from reactive to proactive and predictive care*. Retrieved from MaRS: <https://www.marsdd.com/news/transforming-health-shifting-from-reactive-to-proactive-and-predictive-care/>

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biopharmaceuticals and biotechnology, material science and regenerative medicine act as complementary activities and enhance the agriculture and agricultural technology activities and investments.

Although these specific verticals are proposed, technology develops rapidly and in unforeseen ways. Thus, Moldova Future Park should be defined with flexible thematic or vertical priorities. This will enable a range of businesses and researchers to operate out of the park in future even if their technology, product, or service is not currently considered to be a priority.

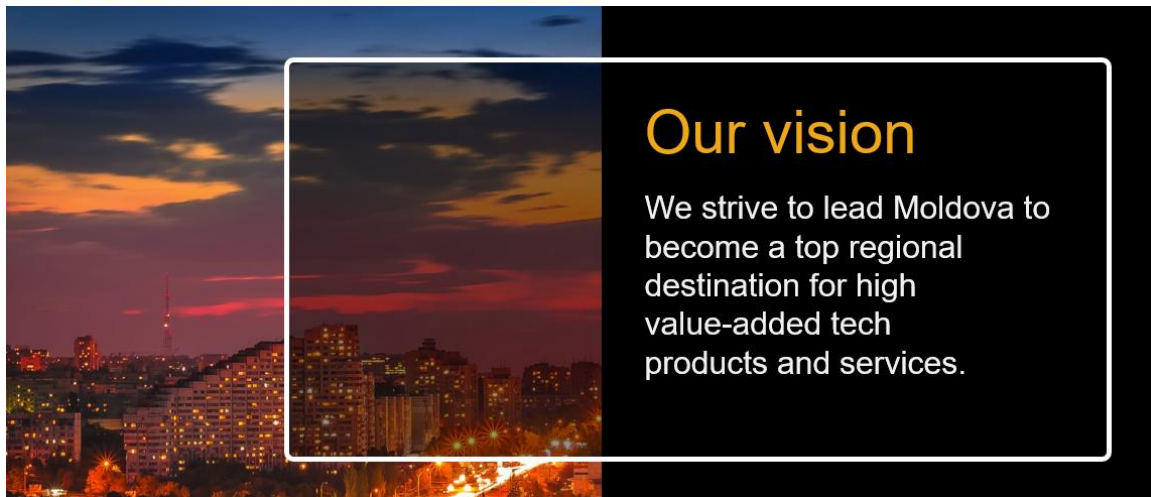
VISUALIZING THE DEEPTECH ITP IN MOLDOVA

POLICY ENVIRONMENT AND IMPLEMENTATION STRATEGY

National Vision

Establishing Moldova Future Park cannot be successfully achieved without a robust national policy vision. Although this can be achieved on a park-by-park basis, there should be an enabling policy environment within which all ITPs must operate. This is especially important in the case of Moldova which is on the precipice of establishing its first such park, but which should be incorporated in a national overarching vision. The vision pursued by Moldova's Ministry of Economic Development and the Moldova Innovation Technology Park institution states the Moldova strives to become a top regional destination for high value-added tech products and services, as illustrated in *Figure 9*. This vision needs to be further enhanced through the lens of the Future Park.

Figure 9: Moldova IT Sector Vision Formulated by Moldova Innovation Technology Park (2023)



A clear and well-defined national vision provides a strategic direction, alignment of goals, and a framework for coordinated efforts among various stakeholders. The benefits of such a unifying policy include the following:

- **Strategic Alignment:** Defines the overarching goals and objectives for Moldova Future Park in alignment with other national economic, social, and technological development strategies considering the unique position of Moldova amongst peers and competitors.
- **Resource Allocation:** Guides the allocation of resources, including funding, infrastructure, and human capital, which is essential to prioritize investments and

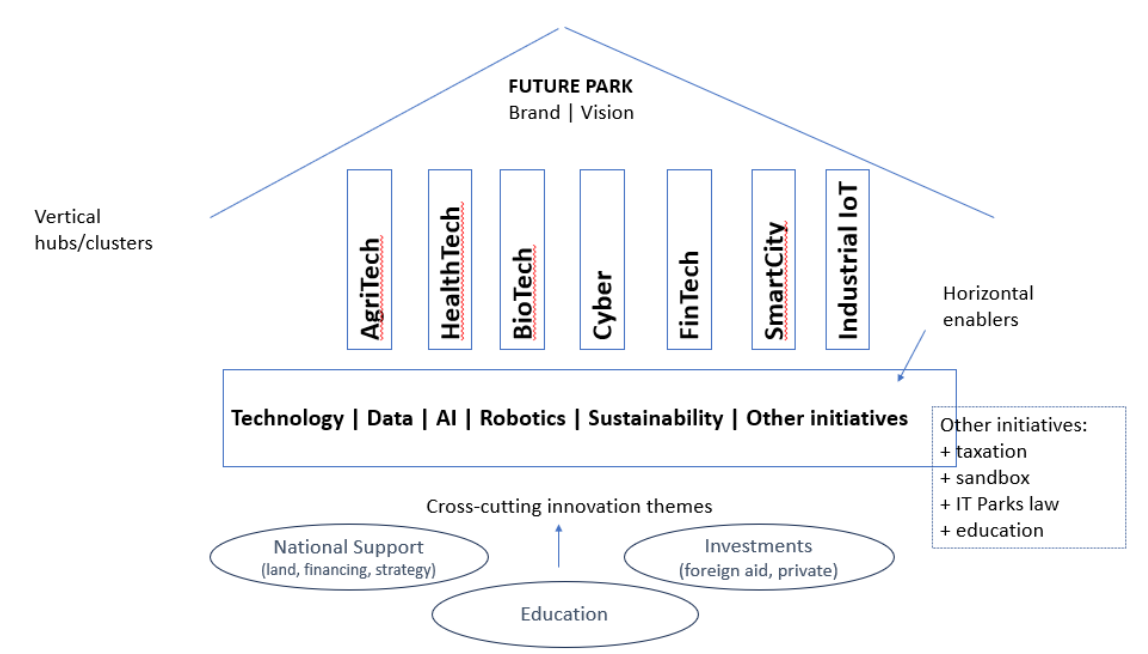
- ensure efficient utilization of available resources, such as through financial incentives and benefits for tenants to base their operations in the park.
- **Consistency and Continuity:** Provides stability and predictability across political cycles and changes in leadership, which is the bedrock for long-term planning, as well as being a key consideration for potential investors, partners, and tenants.
 - **Investor Confidence:** Instills confidence in investors, both domestic and international, by demonstrating Moldova's commitment to fostering innovation and research among technology focused enterprises.
 - **Stakeholder Engagement:** Fosters collaboration and a common purpose among various stakeholders, including government agencies, academic institutions, business associations, investors, banks, community groups, incubators, and media agencies.
 - **Public Awareness and Support:** Disseminates information and cultivates broad-based support implementation for Moldova Future Park by ensuring all stakeholders are aware of the economic importance of this initiative over the long-term (e.g., for job creation, talent retention, market competitiveness, smart city development, etc.).
 - **Global Positioning:** Places Moldova Future Park within the context of global trends and competition and positions Moldova as an attractive destination for innovation and investment on the international stage with major industry leaders and regional innovators.

In the case of Moldova, a clear national vision for the development of Moldova Future Park will serve as a roadmap to create a thriving ecosystem of innovation, technology, and entrepreneurship.

Making Vision a Reality

While a national vision is essential to guide the development of Moldova Future Park, there are several other practical factors that have to shape the design and management of park campuses. Several of these factors have been deduced from a detailed review of international best practice examples, as succinctly summarized in the previous section. Of particular note is regulating the built environment within which Moldova Future Park is developed, as well as the 'horizontal enablers' that turn vision into reality. These are summarized in turn below.

Moldova Future Park concept



Built Environment

As a physical campus, ITPs have an important urban planning dimension that cannot be overlooked as part of the implementation framework. This requires adherence to green development, urban corridor, and smart city principles that feature sustainability, technology, accessibility, services, and community. Key considerations in this regard include:

- **Integrated Planning:** development of a holistic and integrated master plan that considers environmental, economic, and social aspects. This should encompass development zoning, architectural style guide (e.g., building height and density, street sizing and signage, landscaping, pathways, and walkways, etc.), public amenities, safety and security (e.g., security gates, CCTV, well-lit areas, etc.), disability access, as well as toilets and breastfeeding rooms.
- **Mixed-Use Facilities:** Provide a range of facilities on Moldova Future Park campus to appeal to a broad range of tenants, but also to potential investors and developers. This could include offices, laboratories, workshops, data centers, residential apartments, restaurants, cafes, retail stores, fitness centers, art gallery / cultural center, incubation hubs, performance theatre, and public plaza. The goal should be to create a recreational hub for the broader community in Chisinau where the MOLDOVA FUTURE PARK is an attraction and destination unto itself, while also serving stakeholders in the innovation ecosystem.
- **Green Spaces:** Integration of parks, green roofs, urban gardens, water features, mini urban forests, and other public spaces to minimize Moldova Future Park environmental footprint, provide recreational areas, improve air quality, and deliver a high-quality experience to visitors and tenants.

- **Sustainable Infrastructure:** adherence to minimum performance specifications and standards regarding green and energy efficient buildings, water-saving measures, waste management systems, nature-based solutions integration, low-carbon development, and other relevant factors.
- **Smart Mobility:** inclusion of accessibility routes (bikes, walking paths, trams, etc.), which should also feature real-time transit information, helpful signage (distance / travel time) and intelligent traffic management. As a general rule, car and moped / motorcycle parking should be included, but to the degree possible minimized in favor of a strong public transport network and ride-sharing services.
- **Digital Connectivity:** installation of high-speed internet access throughout Moldova Future Park to enable smart technologies, data sharing, and IOT applications that enhance efficiency and user experience.

By accounting for the importance of the built environment, Moldova Future Park that embraces green urban development and smart city principles can benefit both its residents and the broader community. This is imperative to avoid developing a university campus or a simple business district that becomes a 'ghost town' outside of office hours, but instead creating a dynamic urban space that attracts a broad range of 'users' (and therefore generates revenue outside of rental income).

Horizontal Enablers

Moldova Future Park must be able to cater to a range of possible tenants and residents over the short- and long-term given innovation and technology is ever evolving. This requires careful consideration of the horizontal enablers that will facilitate the success of various verticals or industries within the park through the provision of foundational services and amenities. These include the following:

- **Big Data, AI and IoT:** Access to data analytics tools and artificial intelligence capabilities will help businesses make informed decisions and develop data-driven solutions, which may well be unaffordable without centralized services.
- **Testing and Experimentation (Sandbox):** Shared experimentation and test-before-invest facilities for SMEs, startups, industrial stakeholders, and academia, especially in 5G technologies, Internet of Things (for manufacturing, agriculture, health, smart city & mobility solutions) where Moldova has competitive advantage, and the Future Park small-scale city-like infrastructure is appropriate for simulation and testing. Moldovan Ministry of Energy announced the intent to develop an innovation sandbox for energy (including smart grids, micro grids, storage technology), and this vertical can be tested in the park. Likewise, during stakeholder interviews Bayer Moldova and Eliri nanotech startup expressed interest in sandboxed environment for HealthTech, while Orange Systems in Big Data, 5G and future network technologies, as well as application of technologies for smart city, agriculture and health.
- **Incubation/Acceleration Programs & Startup Zone:** Programs that support early-stage startups by providing mentorship, business coaching, grant funding, and investment pitch advice, all of which help nurture innovation amongst new business

- ventures. Moldova has around 115 tech startups that emerged in the recent years raising 11million Eur investments in 2022. The Park should have small (2-10 people) startup offices available at discounted rates to early-stage startups. There is a network of six local accelerators – Dreamups, XY Partners, YEP, Tekwill, Technovator, Startup Moldova – and growing, that will serve as pivot for the Park. International accelerators will be invited to expand presence, like Techstars, or regional Estonia, Romania- and Ukraine-based such as Startup Wise Guys or EO business incubator that Moldova already has ongoing cooperation with.
- **University Education, Research and Development Facilities:** Shared research laboratories, testing facilities, and commercial offices that provide a platform for collaboration among researchers, startups, and established companies. Partnerships with universities and research institutions facilitate the transfer of cutting-edge research and technology to practical applications. Education buildings of universities should be anchored in the park’s campus to ensure a pipeline of students. There is interest from Technical University of Moldova and Medical University Testemitanu to locate new specialized education and research campuses in the park, and develop joint technology transfer projects. Likewise, there is interested to bring an international US-accredited University by private investors. Moldovan Universities have access to local research funds and Horizon EU funds that can be used to anchor practical research projects with businesses.
 - **Collaboration & Event Spaces:** Shared coworking spaces, innovation hubs, and collaborative zones encourage interaction and cross-pollination of ideas, especially across industries and verticals (rather than creating silos in pursuit of specialization that can be achieved other ways). Regular events, seminars, conferences, and workshops that facilitate knowledge exchange, collaboration, and the creation of valuable connections among stakeholders. Moldova Future Park should become the location for flagship Moldovan technology events, such as Moldova Digital Summit and Startup Moldova Summit, but also position itself to attract regional tech events.
 - **Investor Networks:** Access to venture capital firms, angel investors, and other sources of funding through networks with foreign universities and ‘sister’ ITPs can significantly help start-ups and entrepreneurs secure the financial resources needed to scale. The park should attract local business angels networks such as [BAM Business Angels Moldova](#) and [Mozaic](#), but also establish bridges with regional venture capital funds, such as U.ventures (Ukraine) and Startup Wise Guys (Estonia).
 - **Talent Development:** Initiatives for skills development, training programs, and education partnerships ensure a skilled workforce aligned with the needs of emerging industries.
 - **Legal and Regulatory Support:** Clear legal frameworks, intellectual property protections, investment incentives, and streamlined licensing / permitting regulations reduce red tape and promote productivity. Moldova Future Park infrastructure can host the offices of the [Administration of Moldova Innovation](#)

[Technology Park](#) to provide its residents to the 7% single tax and other regulatory support and development opportunities.

- **Campus Governance:** Establishing a clear governance structure that involves public oversight and private management ensures effective coordination and management of Moldova Future Park ecosystem while maximizing the commercial upside of the park.
- **Marketing and Promotion:** Promoting Moldova Future Park's strengths, success stories, and unique offerings helps attract talent, investors, and partners.

These enablers are essential for creating a dynamic and collaborative environment within Moldova Future Park, driving innovation across multiple sectors, and enabling the growth of a diverse range of industries. Often overlooked in unsuccessful ITPs, horizontal enablers are hallmarks of all successful ITPs in an analogous way to the built environment.

These enablers are essential for creating a dynamic and collaborative environment within the park, driving innovation across multiple sectors, and enabling the growth of a diverse range of industries. In light of this framing, it is now necessary to evaluate the suitability of the proposed Moldova Future Park site.

SITE SELECTION

Available Land

The FTA team completed several site visits in July-September 2023 for the Moldova Future Park. Each of the possible locations were evaluated through the prism of art. 5 of *Law no. 182/ 2010 regarding industrial parks*, which stipulates that “[t]he land intended for the industrial park, together with the buildings and utilities located on it, must cumulatively meet the following conditions:

- a) to be free of any burdens.
- b) not to be the subject of litigation pending examination and/or resolution in courts or arbitration.
- c) to have access to transport routes.
- d) the connection of the park's technical and production infrastructure to public utilities should be accessible.
- e) to have an area of at least 5 hectares.
- f) to be in the use of the applicant for the title of industrial park for a period of at least 30 years or in his property.”

In the context of the ITP, there is one (1) site of particular relevance and suitability for placement of the park, which is adjacent to the Chisinau Arena in Stauceni. Other locations were considered with key institutional decision-makers, but they were largely determined to be unsuitable.

Located to the north of the main Technical University campus and adjacent to Arena Chisinau in the Stauceni area, the site is an estimated 284 hectares in total size, as illustrated in *Figure 10*. This site is located approximately 12-minutes away from The

Triumphal Arch in central Chisinau by car (and a short 5-minute drive from the Technical University campus which is immediately south).

With the exception of the arena, which is immediately adjacent to the available land, the site is entirely greenfield. Although it reportedly took substantial time to get utilities connected for the arena, it should not be an overly costly exercise to extend these services to the proposed campus site. However, there could be substantial costs associated with grading and clearing the greenfield land to be suitable for commercial development. This could also involve a lengthy timeline for the site to be fully operational in this location.



Figure 10: Technical University Stauceni A

Being situated next to the Arena and in close proximity to the Technical University plus the surrounding urban area also offers unique potential to create a vibrant location. Visitors attracted to sporting events and performances at the arena would have a host of leisure and recreation opportunities at their doorstep, such as restaurants and cafes.

The public transport system could also undergo a major upgrade to service both Moldova Future Park but also the arena more efficiently. Ultimately, the major benefit of this

location is the expansive size that could serve as the basis for a very significant ITP with a diverse range of facilities within a uniquely curated built environment that features green space and public spaces.

Uncertainties

While there are clearly identified strengths and certain weaknesses for each of these proposed sites, there are several unanswered questions that are essential to clarify before selecting the final location for Moldova Future Park campus (or campuses as the case may be). These are:

- **Site Parameters:** the exact boundary needs to be mapped with consideration of where it adjoins privately owned property, other publicly land parcels, or land that is under conservation and sustainable management ordinances.
- **Land Ownership:** rights of ownership need to be established in accordance with legal processes to ensure that there is valid legal authority to grant, lease, or otherwise assign developments rights for the purpose of Moldova Future Park. It is recommended that the state retains land ownership and provides land on a concession basis for developers and residents.
- **Utility Services:** whether utility services are currently available at the site or could be provided to the site within a reasonable period (such as within 1 year), covering water supply, wastewater and sanitation, telecommunications, power, and waste collection.
- **Zoning Restrictions:** Current zoning for the land is agricultural and it requires change of zoning. Determination of possible development restrictions that may apply to the construction of certain facilities within each location, such as due to the prevalence of residential homes, biodiversity hotspots, or other factors in the vicinity. The site zoning should allow for multi-purpose buildings and educational institutions, including housing, leisure and catering, health, conference halls, workshops, laboratories, and public green spaces.
- **Facility Status:** catalogue of all on-site facilities, their exact location and condition, and the ownership status of all such facilities.

Pending clarification of these issues, the recommendation for the optimal site must account for the likely size and scope of Moldova Future Park.

Size and Scope

Based on regional experience of similar parks (such as Ulemiste City in Tallinn, Estonia and Malaga Tech Park in Spain), the size of Moldova and its IT sector, the Moldova Future Park is proposed to have 100 hectares that will be developed gradually in several stages over a course of 5-10 years. The team analyzed 3 scenarios – 50, 100 and 280 hectares. The economic impact analysis demonstrates that the larger the site the larger the long-term economic and fiscal stimulus that it creates. The park area should have low-rise and low-density construction, and enable sufficient green space (at least 25%), and up to 60% to be allocated for construction development. Moldova Future Park campus should be developed as a mixed-use micro-city, predominantly with business buildings (up to 70%),

but also anchoring a university with educational and R&D spaces (approx. 10% or 10 ha) and residential facilities such as hotels, co-living areas (approx. 10% or 10 ha) that will enable to host students, researchers, international workforce on campus driving community and innovation in the park.

The park is proposed to encompass a substantial land area, ensuring ample space for an array of facilities that align with the success factors described in preceding sections. Moreover, Moldova Future Park campus should ideally have the capacity to accommodate both immediate needs and future expansion as the park grows and evolves over time. To ensure a well-informed and successful assessment of required land parcel, the size of Moldova Future Park should be scoped in line with the built environment and horizontal enablers in mind.

In line with the experience of other ITPs internationally and based on the FTA team’s expertise, an **approximate allocation of available land** could be divided as follows:

Functional Allocation

- Offices 60%
- Service 10%
- Residential 10%
- University 10%
- Other 10%

Area Allocation

- Buildings 60%
- Infrastructure 15%
- Green Space 25%

Tenant Allocation

- Big Business 50%
- SMEs 30%
- Startups 10%
- Services 10%

To further illustrate the development options and land use scenarios, *Table 3* provides additional detail on functional land use, tenant allocation, and investment scenarios.

Table 3: Scenarios for Future Parks Land Sizing

Future Parks Land Use Scenarios		Scenario 1	Scenario 2 (Recommended)	Scenario 3
		50 ha	100 ha	280 ha
Functional allocation of land (by hectares)				
Offices	60%	30	60	168
Service	10%	5	10	28

Residential (hotel, co-living, dorms)	10%	5	10	28
University (R&D facility)	15%	7.5	15	42
Other	10%	5	10	28
Area allocation (by hectares)				
Buildings	60%	30	60	168
Infrastructure (roads, parking, utility, etc)	15%	7.5	15	42
Green space	25%	12.5	25	70
Tenant Allocation (by people)	0.08 people/m ²	10,800 people	21,600 people	60,480 people
Global/Large businesses	40%	4320	9220	26716
SMEs	30%	3240	6480	18144
University/education/R&D	10%	1080	2160	6048
Startups	5%	540	1080	3024
Services (accelerators, consultancy, etc)	10%	1080	2160	6048
Government and development institutions	5%	540	500	500
Built area (m²)				
Buildings and other built areas (m ² /ha; medium scenario; low density)	4,500 m ² /ha	135,000 m ²	270,000 m ²	756,000 m ²
Estimated investment private sector greenfield (Eur/m ²)	800	€108,000,000	€216,000,000	€604,800,000

The purpose of this Concept Note is to define the recommended size of land required for the Moldova Future Park. That is impossible to do accurately without first completing a detailed feasibility study. Instead, the general principle should be to secure access to a large parcel of land available for the purpose of Park development under a phased implementation plan that can be tested in a feasibility study. This determination will have to account for the size of land that the government can foreseeably extend utility services as a likely cost it will bear, which is a fiscal consideration based on budget constraints.

For the purpose of the Feasibility Study, it is recommended that 100 hectares is allocated to the ITP. This land allocation recommendation is based on several factors. Firstly, according to the National Bureau of Statistics, the target industries represent 40,800 total employees (ICT 27,480 employees; and Professional, Scientific, and Technical Activities 13,366).³² This is a major proportion of the overall workforce nationwide. In addition, in 2022 there were 66,682 Moldovan students. With 15,682 studying abroad, that leaves 50,999 nationwide, which is evidence of a massive talent base that need local job opportunities to reverse the brain drain that is currently constraining Moldova's competitiveness. Finally, the economic impact analysis presented later in this section demonstrates that the larger the site the larger the long-term economic and fiscal stimulus that is created. The entire 100-hectares does not need to be developed immediately, but

³² Agriculture 151,978 employees (34,474 formal); ICT 27,480 employees; and Professional, Scientific, and Technical Activities 13,366.

a phased development plan could be analyzed in the feasibility study to select the optimal approach. This issue is scrutinized further in relation to Moldova Future Park business model, but it is recommended that a large swathe of land is allocated for the purpose of the feasibility study.

Once the land is allocated (from stakeholder meetings it is assumed these sites are publicly owned land), then the final determination of site size and scope should be made through market analysis and market consultation as part of the Feasibility Study. This will then lead to the development of minimum performance specifications and standards for site development that reflect the national vision (built environment strategy and horizontal enablers). Dependent on the final business model, the development of the site could then be put out as a competitive public tender that allows interested investors and developers to submit bids within the designated boundaries. This would allow the government to review proposals to see which provides the best value in terms of size and scale within the available land restrictions and development guidelines. Bidders would also propose the revenue share, concession fee, or lease payment that they have modelled to be viable. This ensures the government has a clear understanding of the direct financial returns it will receive as part of the evaluation process.

Estimation of Jobs in the Moldova Future Park

We propose a conservative estimate of creating and hosting 21,600 tech-centric jobs within the 100 ha Moldova Future Park. This projection carefully considers the relocation of a portion of the existing Moldova ICT sector workforce, which currently stands at 27,480 (estimated at 50%, or 13,000 jobs), and anticipates the generation of new jobs by the park's residents (estimated at 8,000 jobs). Adhering to best practices, approximately 50 percent of a region's tech force is recommended to reside in clustered technology parks. For Moldova, this translates to an estimated 13,000 seats in the Moldova Future Park, anchored by the existing ICT workforce base. The creation of an additional 8,000 jobs within the park over a lifespan of 10 years is deemed feasible, driven by the strategic collaboration with universities. The park's plan includes co-locating a university—a synergistic partnership involving Moldova Technical University, Medical University Testemitanu, and an accredited US University. This collaboration is expected to provide a robust pipeline of 500 to 1,500 students per year, resulting in 5,000 to 15,000 fresh graduates produced by the park's partner universities over the course of a decade. IN addition, the number of jobs created by Moldova Future Park is estimated at 21,600 jobs for a 100-hectare park, informed by international data and the Ulemiste Estonia case study (0.08 jobs per m²). The rationale for this estimation is grounded in the findings of the European Union's Public-Private Partnerships for Science and Technology Parks study, which analyzed various established innovation parks (from 0.01 employees to 0.09 employees per built square meter), including Ulemiste City in Estonia. Ulemiste City's average of 0.08 employees per built square meter serves as a benchmark, reflecting a higher density of employment in technology parks. Considering the similarities in location and strategic advantages, Moldova Future Park is anticipated to yield a comparable or potentially higher number of jobs. The choice of the higher end of the spectrum aligns

with the park's advantageous location in the capital city and near educational institutions, positioning it as a dynamic hub for employment.

Detailed Rationale for Moldova Future Park Jobs Creation Potential

The estimation of 21,600 tech-centric jobs for a 100-hectare Moldova Future Park is underpinned by a meticulous rationale that considers both the existing Moldova IT sector workforce, the anticipated job creation within the park, and international experience.

1. Relocation of Existing Workforce: Given the current Moldova IT sector workforce of 27,480, our estimation assumes a conservative relocation of 50%, or approximately 13,000 jobs, to Moldova Future Park. This aligns with best practices that suggest clustering about 50% of a region's tech force in technology parks. By anchoring a significant portion of the existing ICT workforce, the park immediately establishes a solid foundation for growth and innovation.

2. Anticipation of New Jobs: Our projection also accounts for the creation of new jobs within Moldova Future Park. To achieve this, the strategy involves co-locating universities, including Moldova Technical University, Medical University Testemitanu, and potentially an accredited U.S. University. This partnership is estimated to yield a pipeline of 500 to 1,500 students per year, translating to 5,000 to 15,000 fresh graduates over a span of 10 years. These graduates are expected to contribute to the creation of new jobs within the park, fostering innovation and driving economic growth.

3. Feasibility within a 10-Year Lifespan: The projection of creating an additional 8,000 jobs within a 10-year lifespan of Moldova Future Park is grounded in the realistic expectation of steady growth. The co-location of universities, the establishment of partnerships, and the continuous development of the park's ecosystem create a conducive environment for sustainable job creation.

4. Benchmarking against international experience: Additionally, the rationale for estimating the total jobs that can be hosted by Moldova Future Park is grounded in the findings of the Public-Private Partnerships for Science and Technology Parks study conducted by the European Union in 2020 (See Table below). By analyzing the data from various established innovation parks, including Ulemiste City in Estonia, we derived an average number of employees per built square meter.

The study provides insights into the correlation between the built area of an innovation park, the number of companies it accommodates, and the resultant employment figures. Notably, the data from Ulemiste City, a comparable use case in Estonia, serves as a valuable benchmark for Moldova Future Park due to its similarities in location, being situated in the capital city and in close proximity to universities.

Ulemiste City's average of 0.08 employees per built square meter signifies a higher density of employment in the technology park. Considering that Moldova Future Park will be strategically located in the capital city and near educational institutions, it is reasonable to

anticipate that it could yield a comparable or potentially higher number of jobs. Therefore, the choice of taking the higher end of the spectrum (0.08) from the study's data aligns with the expectations of Moldova Future Park benefiting from its advantageous location.

In summary, the rationale for estimating the total jobs is based on a thorough examination of established innovation parks, particularly Ulemiste City, and the application of relevant data from the European Union study. By selecting the higher end of the average number of employees per built square meter, the potential of Moldova Future Park to be a dynamic hub for employment is emphasized, leveraging its strategic location and proximity to educational institutions. *Table 4 and 5* provide further detail on the basis of these calculations.

Table 4: Rationale for Estimating Jobs Created by Science and Innovation Parks (EU experience)

Year of Creation	Built area, [m2]	Number of companies	Number of employees	Average number of employees per built m2
2002	372,000	260	3,900	0.01
2005	34,000	70	1,300	0.04
2006	7,000	78	596	0.09
1994	770,000	1,000	35,000	0.05
Ulemiste City (Estonia use case)	200,000	500	16,000	0.08
Average				0.05

Source: Public Private Partnerships for Science and Technology Parks study, European Union, 2020

Table 5: Estimating Job Creation Scenarios at the Moldova Future Park

Moldova Future Park	Scenario 1 (low)	Scenario 2 (medium)	Scenario 3 (high)
Average number of employees per built m2, jobs	0.01	0.05	0.08
Envisioned avg number of employees per built m2			
50 ha (135,000m2)	1,415	7,002	10,800
100 ha (270,000 m2)	2,831	14,003	21,600
280 ha (756,000 m2)	7,926	39,209	60,480

PARTNERS, TENANTS AND TALENT BASE

Talent Base

ITP will source its talent from the pool of local technology professionals, as well as students. According to the National Bureau of Statistics, the target industries represent **40,800 total employees (ICT 27,480 employees; and Professional, Scientific, and Technical Activities 13,366)**.³³ This is a major proportion of the overall

³³ Agriculture 151,978 employees (34,474 formal); ICT 27,480 employees; and Professional, Scientific, and Technical Activities 13,366.

workforce nationwide. In 2022 there were **66,682** Moldovan students. With 15,682 studying abroad, that leaves 50,999 nationwide, which is evidence of a massive talent base that need local job opportunities to reverse the brain drain that is currently constraining Moldova’s competitiveness.

Local IT Workforce – Major Traction for Moldova Future Park

The Moldovan technology park is poised for success due to the robust and growing local tech workforce. With a total of 27,480 employees in 2022, including an impressive 22,000 IT professionals, the country has experienced a remarkable 42% increase in its IT workforce over the past five years (2018-2022). An annual influx of 2,000 graduates, equipped with graduate and undergraduate degrees in IT, Engineering, and Mathematics, adds a continuous stream of fresh talent to the tech ecosystem. Notably, 3,500 students are enrolled in IT programs, and approximately 5,000 are pursuing engineering programs, indicating a strong pipeline for future professionals. The fact that 6% of the total graduates have specialized in Computer Science underscores the emphasis on cutting-edge skills.

- Moldova ICT workforce – 27,480 employees in 2022, including – 22,000 IT professionals.
- IT workforce increased by 42% in 5 years, 2018-2022
- 2,000 graduates yearly with graduate and undergraduate degrees in IT, Engineering and Mathematics.
- 3,500 students enrolled in IT programs, and ca. 5,000 in engineering programs.
- 6% of the total number of graduates have been studying Computer Science.

The local workforce's diversity extends beyond numbers, encompassing a wide range of technological expertise.

Moldova boasts proficiency in mainstream coding languages such as Java, .NET, and PHP, making it an attractive destination for global corporations and startup initiatives. Furthermore, the workforce exhibits a keen understanding of emerging technologies, including databases, mobility, cloud computing, and big data. This proficiency in deep tech applications positions Moldova as a competitive player in the global tech landscape, appealing to companies seeking advanced skill sets for innovative projects. The combination of a growing talent pool, diverse skill sets, and a focus on both established and emerging technologies establishes the Moldovan tech workforce as a major traction point for the success of the technology park.

Education Anchors

Local University Anchors

The Technical University of Moldova (TUM) is interested in being a key partner for the Future Park as a driver of a specialized campus focusing on R&D and deep technology. TUM’s long-standing history, specialized focus, and commitment to excellence make it an ideal anchor for a technology park. The institution not only produces skilled graduates, 11,500 students in 2023 across 150 specialties with 11 faculties including electronics, energetics, microelectronics, computer science, mechanical engineering, design, but also provides the infrastructure and environment necessary for fostering innovation and technological advancements in the region.

As the only higher education institution for engineering in Moldova, TUM brings a specialized focus on engineering and technology. This specialization is crucial for the

establishment of a technology park, as it ensures a pool of talent with the necessary skills and knowledge in the fields of electronics, telecommunications, energetics, computer science, mechanical engineering, and more. TUM's offering of about 150 specialties and specializations across 11 faculties demonstrates a diverse range of expertise. This diversity is valuable for a technology park, as it allow' for a multifaceted approach to innovation. TUM also has strong internationalization (including under Erasmus+) and international cooperation with frontier EU and US Universities, among which Transilvania University and Politehnica Bucuresti in Romania, Virginia State University and Washington State University in the US, Aalborg University in Denmark, and others.

Nicolae Testemițanu State University of Medicine and Pharmacy in Moldova (Moldova Medical University) is a reputable institution for medical education not only in Moldova, but also in the region. The University is also interested in becoming a partner and anchor resident of the Moldova Future Park, namely to develop a new designated education building focused on healthcare and technology. The University currently has 6,101 students, of which 1,992 (or 33%) are international students from 35 different countries, which is the highest international students per headcount in Moldova. The University has strong scientific areas, including molecular technology in health, human nutrition, clinical optometry, mental health, and biomedicine.

Establishing an American-Accredited University

There is interest from local investors to establish a U.S.-accredited private technical university in Chisinau, Moldova with a goal of becoming a regional technical hub for southeastern Europe. This US-accredited University would be co-located in Moldova Future Park on 10-12 ha of land, focusing on engineering and technology studies and reaching about 500-800 graduates per year or a total undergraduate population of up to 3,000. The key principles are that the university would be a U.S.-accredited technical university; with an affiliation with a reputable U.S. university; offering 4-year undergraduate technical degrees; a full, self-contained university campus; with a co-located private sector technology park and close interactions between the private sector companies and the student and faculty population.

The principle ideas are summarized as follows:

- The university would target a mix of domestic and international students. Comparable U.S.-accredited universities in the region have international student mixes that range from 50-80% of the overall student population.
- The university would be a technical university as opposed to a general liberal arts school. The curriculum and activities would be designed in close collaboration with the private sector although starting areas of study are anticipated to focus around technical and agrotech degrees.
- Field study work will be designed into the academic program with a capstone applied field project with a private or public sector organization in the student's academic major or area of interest. The field study requirement is intended to provide our graduates a professional head-start gained from the hands-on experience with private sector companies.

- The university concept and design are built around a long-term goal of reaching 500 to 800 graduates per year or a total undergraduate population of up to 3000. We expect to reach this target in up to 10 years. A set of 9 comparable U.S.-accredited universities in the region range in size from 1000 to 5,774 undergraduate students, placing us in the middle of the range in terms of student population.
- We anticipate a full western-style campus and are seeking 10-12 hectares of land on which we would construct an expected 23,000 square meters of building facilities including classrooms, administrative facilities, dining halls, community areas, an advanced library and commercial zones.
- In addition to the above facilities, we envision on-campus residences for undergraduate students. On-campus living will be mandatory for at least the first year of attendance. Higher education has always been about more than academics. The relationships you build will last a lifetime and are often as valuable as the classroom lessons learned. A major pillar of the university vision is to build long lasting relationships among the students and a sense of community that will extend beyond graduation.

Headquartering Public Institutions in the Park

The strategic decision to house the headquarters of key public and semi-public institutions within the premises of Moldova Future Park is paramount for positioning the park as a central hub and a comprehensive point of interaction with the government. This move fosters seamless collaboration between the park and vital public entities that lead the IT sector and digitalization efforts in Moldova. Notable examples from other countries, such as Diia City establishing its offices in the Unit City technology park in Kiev or Startup Estonia relocating its offices to the Ulemiste City tech park in Tallinn, demonstrate the effectiveness of this approach. By co-locating the Moldova Innovation Technology Park (MITP) and the e-Governance Agency within Moldova Future Park, synergies are created, facilitating streamlined communication, collaboration, and knowledge exchange. This concentration of public and semi-public institutions within the park not only enhances operational efficiency but also solidifies the park's role as a central nexus for advancing the digital landscape and fostering innovation in Moldova.

Relocating Moldova Innovation Technology Park offices. Proposed in the initial phase of development is the relocation of the headquarters of the Moldova Innovation Technology Park (MITP) office, which presently leases office space in downtown Chisinau. MITP, currently joining over 1,300 IT firms as virtual residents, offers more than just access to the 7% single tax incentive. It provides comprehensive development programs for startups, facilitates HR and talent acquisition, and engages in international promotion efforts. By moving the MITP headquarters to Moldova Future Park, it will act as a magnetic force, attracting tenants and catalyzing the growth of tech firms on both local and international fronts. This strategic move will also foster trust and connections between the public and private sectors, as well as among the technology residents within the park.

Market Assessment and Potential Resident interviews

On the basis of international, stakeholder and market engagement a range of companies have been identified as immediate stakeholder partners and anchor tenants for the planned innovation and technology park. These are broken into categories as summarized in Table 6.

Table 6: Mapping Target Partners

Category	Interests	Contributions	Illustrative Partners
Universities and R&D	Universities and research institutions are primarily interested in technology parks as an avenue to foster innovation, collaborate with industry, and commercialize research findings. They seek opportunities to bridge the gap between academia and industry and provide students with practical experience and job creation. Also important to these partners is leveraging the park to attract funding and partners for R&D projects, as well as supporting technology transfer and IP commercialization.	Universities bring cutting-edge research and innovation to the park. They contribute by conducting R&D activities, developing new technologies, and creating IP. Importantly, universities and R&D institutions also provide a pool of highly educated and skilled individuals, including researchers, scientists, and students, who can collaborate with companies and startups within the park.	<ul style="list-style-type: none"> · Technical University of Moldova · University of Medicine Testmitanu · National Agency for Research Development (NARD) · Agency of Innovation and Technology Transfer (AITT) · Academy of Sciences · Asociatia Bioinformatica · Institute of Emergency Medicine
Technology Developers	Technology developers, both local and international, are interested in ITPs to access resources, talent, funding, and a supportive ecosystem. They aim to accelerate product development, gain market exposure, and tap into regional markets. Accessing state-of-the-art facilities and infrastructure is a highly desirable advantage of becoming a partner and resident. Moreover, collaborating with other companies and institutions is a distinct commercial advantage to expand their market presence and customer base. Finally, technology firms that become residents of ITPs are often highly motivated by fiscal incentives (namely tax,	Technology developers contribute to the ITP ecosystem by developing and implementing new technologies, products, and services. Ultimately, this is the core outcome and objective of developing an ITP for government, which cannot be achieved without attracting this market segment. They drive innovation within the park's ecosystem while creating jobs, attracting investors, and establishing commercial linkages with a range of sectors and industries that may otherwise be lacking.	<ul style="list-style-type: none"> · Endava · Amdaris · Oracle · Moldcell · Synergy IT · DAS Solutions · ITSG Global · Bayer · Pentalog · IQVIA

	labor, and licensing related benefits).		
HealthTech Firms	Health technology firms are interested in ITPs to access specialized facilities and expertise for research and development specifically related to the healthcare sector. They aim to innovate in medical devices, robotics, data analytics, pharmaceuticals, and other related areas. These firms have a strong interest in conducting R&D in state-of-the-art laboratories, as well as collaborating with other healthcare institutions and academic partners in a controlled environment. Particularly important is leveraging on-site laboratories and prototyping facilities to ensure regulatory compliance and certifications as part of the healthcare solution commercialization process (especially when thinking about EU market standards).	Health technology firms bring expertise in healthcare R&D as a priority cluster for the Moldova Future Park. They contribute to advancements in healthcare technology which is a major priority for the Medical University Testemitanu as a strategic partner for the park. Health technology firms may collaborate with healthcare institutions, universities, and startups to develop innovative solutions for the healthcare sector.	<ul style="list-style-type: none"> · ImunoTechnoMed · InVitro Diagnostics · Buddy Healthcare · Aprioit · Health Outsourced · Eliri
Start-Ups	Start-ups are interested in ITPs as they offer a supportive ecosystem for innovation, access to funding, business mentoring, investor pitch coaching, and networking opportunities. They seek to accelerate their growth and gain a competitive edge which is hard to do in a competitive market, especially in industries featuring rapidly developing technology. In addition, accessing affordable office space and high-quality infrastructure in a desirable urban location is highly attractive for your entrepreneurs. Furthermore, raising capital from investors within the Moldova Future Park or which park management brings to the site will be an extremely compelling value-add. Finally, opportunities for collaboration and partnerships with other startups and companies can have	Start-ups are at the forefront of innovation, often bringing disruptive ideas and technologies to ITPs. They drive innovation and experimentation with fresh perspectives and disruptive business models, services, and products. Moreover, they create jobs and employment opportunities for young people and recent university graduates, which is important to key university partners at the Moldova Future Park. Start-ups are also active networkers which is important to fostering collaboration with other park tenants, leading to potential partnerships, knowledge sharing, and joint ventures.	<ul style="list-style-type: none"> · Fitsko · WOOP mask · Evolutio · Respiro · PlusUs · ITON · Easyplan · HeyDaddy · Fagura · AnaBot · Iteora · Rinf Tech

	a catalytic effect on start-ups, which is essential to their ability to scale.		
Accelerators	Incubators and accelerators are interested in ITPs to provide startups with a conducive environment for growth and innovation. They seek access to a pool of potential investees and support resources, while providing start-ups with co-working spaces, mentorship, and access to funding. Building a community of entrepreneurs and fostering collaboration is a highly desirable opportunity for these organizations given the impact it has on accelerating the development of early-stage companies.	Incubators and accelerators will play a vital role in nurturing and supporting early-stage start-ups within the park. They offer mentoring, resources, and funding opportunities, which is essential to creating a thriving entrepreneurial culture and fostering a sense of community. Furthermore, the success of start-ups and entrepreneurs that graduate from incubators and accelerators will enhance the Future Parks reputation and attractiveness to future tenants.	<ul style="list-style-type: none"> · Fabrication Laboratory · UpFactory · Tekwill · Microlabs · Business Angels Moldova

ECONOMIC IMPACT

With a labor productivity of only US\$13.88 (GDP per hour worked), Moldova lags behind other European countries. For comparison, according to the International Labor Organization, Romania has a labor productivity of US\$36.86, in Estonia it is US\$43.86, and in Ireland US\$121.95. As illustrated in *Figure 11*, there is clear potential to leverage the productivity enhancing impact of ICT and research to improve the economic performance of agriculture in Moldova.

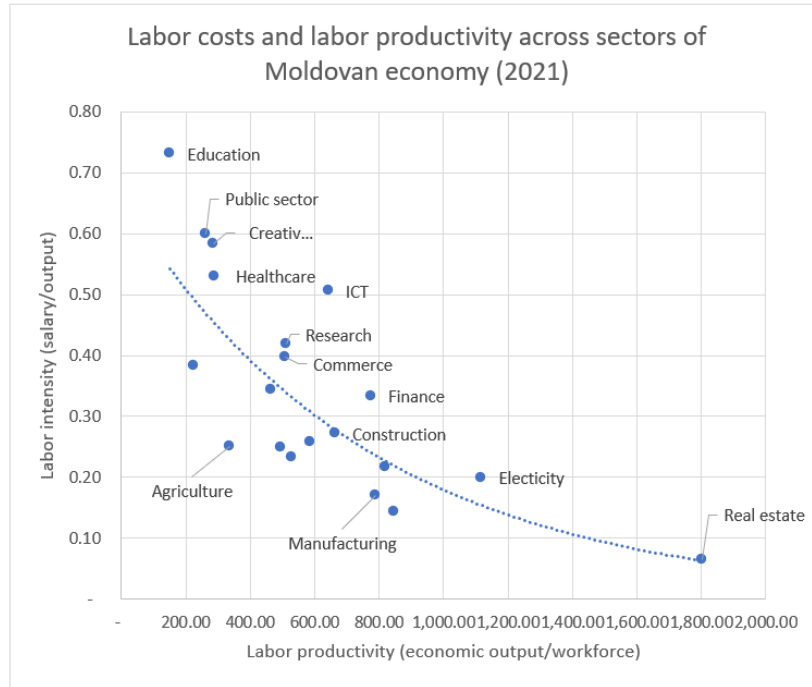


Figure 11: Labor Productivity in Moldova

Investment in intellectual capital paves the way to a knowledge-based economy in which the production and use of knowledge, information, and innovation are key drivers of economic growth and development. In this model, the generation, application, and dissemination of knowledge play a central role in creating wealth, improving productivity, and enhancing overall well-being. As a result, the economic impact from investment in both the AgriTech Park and Moldova Future Park could be immense.

A simplified economic impact analysis was completed as part of the due diligence process to examine possible economic ramifications of investment in the two proposed parks. Two policy options were analyzed, with the distinction between Policy Option 1 and Policy Option 2 based on the projected impact of adopting (or not) tax incentives on the lower occupancy rates at the park, limited foreign direct investment attraction, and lower number of jobs that are expected to be created.

Figure 12 demonstrates a forecasted US\$1.28 billion in economic returns by 2052 for the Moldovan state from development of the Future Moldova Park (100 hectares). This scenario includes the use of a unified 7% tax rate for all businesses operating out of the parks, based on Law no77 on IT Parks, and taxes as basis the pessimistic scenario for job creation and investment based on Tracom Industrial Park current data.

Policy Option 1 envisioning 7% tax rate

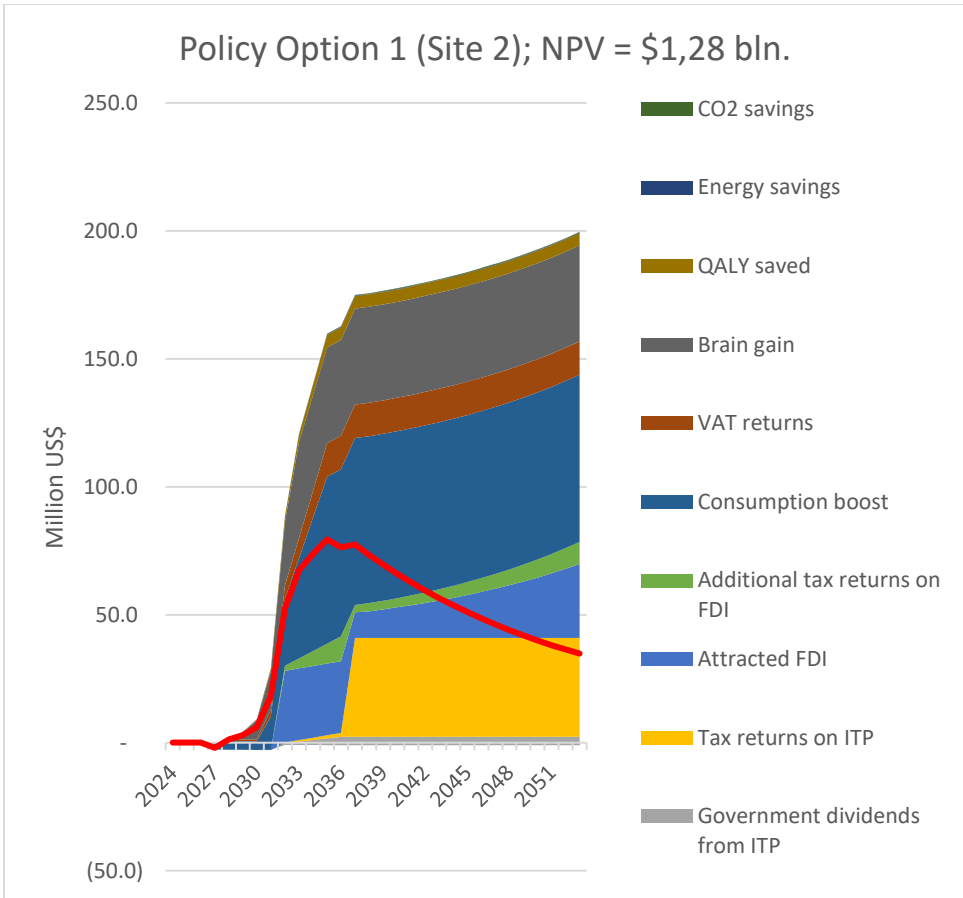


Figure 12: Economic Returns Forecast – Policy Option 1

Even in the event the Moldovan government prefers to adopt a standard salary tax (45%) and profit tax (12%), the development of both proposed parks would result in economic returns totaling US\$0.8 billion by 2052 (in net present value terms). This scenario is visualized in *Figure 13*. The lower economic impact is a result of the reduced ‘ripple effects’ of the lowered tax rate that are expected for job creation, occupancy rates, and foreign investment.

Policy Option 2 with standard taxation

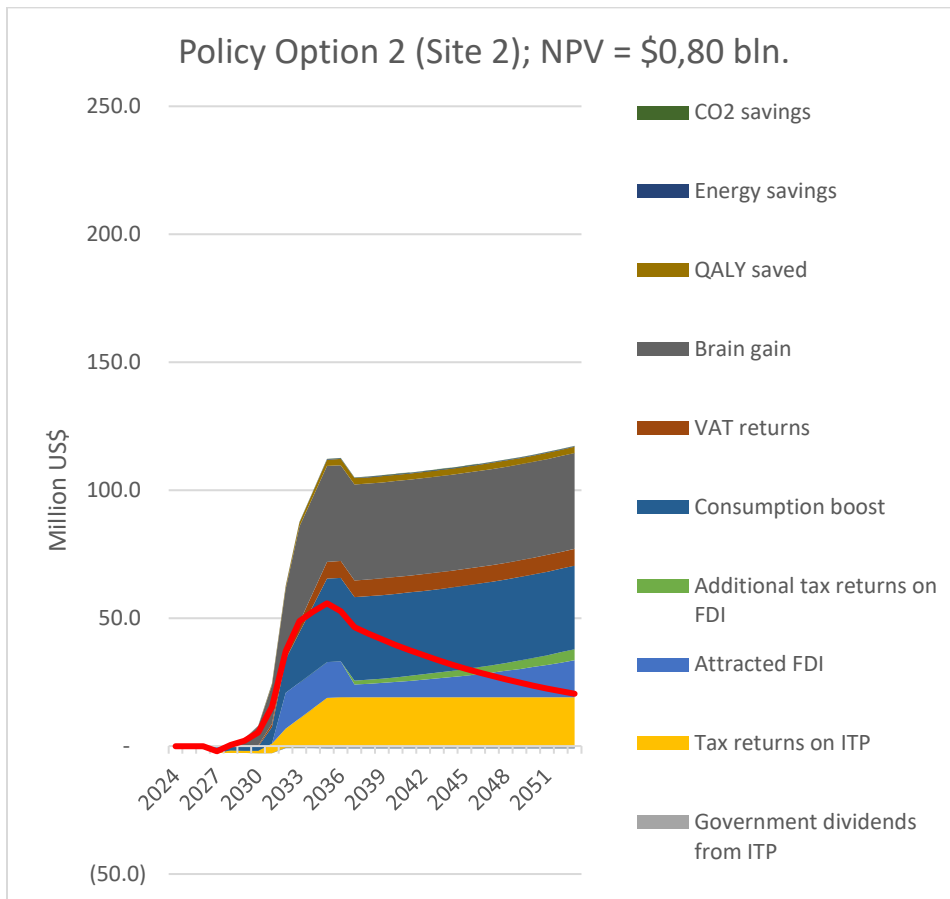


Figure 13: Economic Returns Forecast – Policy Option 2

Although the economic impact of adopting the reduced 7% tax rate is self-evident, the economic rationale behind investing in both parks is strong even without this fiscal incentive. The key factors underlying the cost-benefit assessment with both policy options can be grouped into the five (5) following categories:

Administrative

- Medium management costs
- High management costs in case of Public Investment
- Use of existing legal framework for industrial parks
- Use of the unified tax regime analogous to residents of IT Parks

Fiscal

- Forgone revenues from conversion of agricultural land
- Reduced opportunity gains from lease of public assets (30% discount)
- Increased VAT revenues from domestic production
- Increased unified tax revenues or corporate and personal income tax revenues depending on the selected policy option
- Increased VAT returns as a result of consumption boosted by higher disposable incomes of the households with new jobs

Economic

- Job creation
- Increased labor productivity
- Increased share of the high value added sectors
- Better integration of R&D in the business processes
- Fully integrated value chains
- Increased FDI & exports
- Increased number of innovation-driven startups
- Accelerated technological change
- Transition towards a knowledge based economy

Social

- Reversal of the brain drain by creating employment opportunities
- Increased disposable income for households
- Improved quality of life for the residents
- Gains in the Health Adjusted Life-Expectancy (HALE) at birth and at 60 years
- Stronger community connections

- Decreased gender gap
- Non-discriminatory employment

Environmental

- Lower greenhouse emissions due to efficient energy consumption
- Green energy production (solar panels)
- Smaller ecological footprint from non-invasive agricultural practices
- Reduced carbon emissions due to eco-friendly transportation network and green zoning (rooftop terraces, recreating parks)
- Waste recycling

In addition, the core assumptions that informed the economic modelling can be summarized as:

- Creation of 6,500 new jobs (pessimistic scenario used for projections) across the high value-added sectors, which can be improved .
- 7% unified tax for the residents of ITPs (based on Law No. 77 on IT Parks) for Policy Option 1.
- 42% salary tax and 12% profits tax as the standard policy approach for Policy Option 2.
- US\$100-200 million attracted as foreign direct investment depending on tax rate.
- 5,000 Moldovans choose to study in the home country as opposed to studying abroad (currently 15,7k or 24% of total Moldovan students).
- Utility bill reductions of 30% compared to less energy-efficient buildings.
- Increased Healthy Average Life Expectancy (HALE) at birth from 64.54 years and at 60 from 14.55 (Moldova, 2019) to 69.24 and 17.29 (Estonia, 2019) for the residents of Moldova Future Park.
- 50% reduction of the utility bill due to energy efficient consumption.
- 40% reduction of the CO₂ emissions as compared with the national average of emissions from economic activity due to greening and solar paneling.

More detailed information on the assumptions and calculations is available in the economic impact analysis model that is submitted alongside this Concept Note.

Although it was not captured in the economic analysis, it is important to note that the proposed sites for the Moldova Future Park are located in relatively close proximity, with an approximately 10-to-15-minute drive (8 kilometers). The direct distance is approximately 4.5 kilometers. This creates significant potential for urban corridors between these campuses, such as through cycling routes, forested walkways, green public transport routes, and tramlines. These campus linkages could be achieved in a socially acceptable manner through the Stauceni neighborhood. It is not necessarily part of the short-term site selection rationale, but planning for the integration of the two park locations would further amplify and reinforce the economic returns of developing both parks as proposed.

Limitations

It is important note a key limitation in the economic model. The underlying financial analysis was adapted from the forecasts utilized in the AgriTech Park Concept Note (with adjustments in scale from 37 hectares to 100 hectares), as well as evidence and data on jobs and investment from Tracom Industrial Park as the most successful parks in Moldova so far. While there are significant differences in the scope and structure of these parks, the baseline financial data was deemed suitable as an approximate benchmark for the economic impact analysis. This is due in large part to the economic benefits forecast not being significantly impacted by capital cost and revenue assumptions which are commercial viability considerations. Nevertheless, a detailed economic cost-benefit analysis will be required at the feasibility study stage to calculate the expected Economic Rate of Return (ERR), which will be based on a Discounted Cash Flow (DCF) analysis. This DCF model will be based on a detailed financial assessment covering capital and operational costs as well as revenue forecasts. A summary overview of the considerations in developing this detailed model is provided below.

Development Costs

The capital costs of site development have yet to be clearly forecast and will also need to be the subject of detailed investigation in the feasibility study. Getting accurate build costs per square meter for different cost categories is essential. This would generally include the following categories:

- **Site Preparation:** land clearing and grading.
- **Infrastructure and Utilities:** transport and parking access, cycle paths and walkways, water and wastewater, drainage, power, waste management, etc.
- **Building Construction:** offices, residential apartments, restaurants, cafes, retail stores, green space and public leisure areas, fitness centers, art gallery / cultural center, incubation hubs, performance theatre, and public plaza, etc.
- **Technology Infrastructure:** data centers, telecommunications, fiber optic cables, etc.
- **Specialized Facilities and Amenities:** laboratories, workshops, incubation centers, etc.
- **Furniture, Fixtures, and Equipment (FF&E):** internal fit-out costs.
- **Security and Safety Systems:** security gates, CCTV, street lighting, etc.
- **Energy Efficiency:** rooftop solar panels, Heating, Ventilation and Air Conditioning (HVAC), etc.

Importantly, there will be different build costs and revenue assumptions within these categories. For example, the cost of building commercial offices will greatly differ from apartments and restaurants (especially for high end versus more affordable venues). Once these build costs are finalized, the available site land should be divided into development zones in line with the Functional Allocation and Area Allocation provided above (or to reflect updated allocations at the feasibility study stage). A master plan will then establish potential building height and density restrictions. With these key data points in hand, it

will then be possible to forecast capital investment costs required to develop Moldova Future Park that reflects the national vision in terms of built environment and horizontal enablers. It will also be possible to estimate commercial revenue generated by lease fees and other on-site commercial activities. Importantly, the expected development cost estimates would vary significantly between different development zones that are expected to be constructed under a phased approach.

GOVERNANCE FRAMEWORK

The current regulatory framework is not suitable for the development of ITPs in the manner envisioned by the FTA team and institutional stakeholders. Revisions will be required to enable a more flexible process of park formation and management. To this end, the sections below examine key challenges under the current framework, before then examining the process for establishing Moldova Future Park.

Legal and Regulatory Considerations

Depending on the final business model that is selected, and regardless of the number of sites selected, there will be several ramifications in terms of the applicable legislative and regulatory framework. The process of creating industrial parks, as well as their operation, is regulated by *Law no. 182/2010 regarding industrial parks*. The law provides that:

- 1) Industrial parks can be created at the initiative of:
 - a. central specialized bodies of the public administration.
 - b. local public administration authorities, including the Gagauzia autonomous territorial unit.
 - c. state/municipal enterprises.
 - d. commercial companies registered in the Republic of Moldova.
- 2) The initiators stipulated in paragraph 1) letters a. and b., have the power to create a commercial company with public or public-private capital or will transmit the public property assets intended for the creation of the industrial park to an enterprise selected on the basis of a competition according to the Law on Public-Private Partnership. Upon request, this entity can obtain the title of industrial park in accordance with art. 11. Importantly, this can only occur after the completion of a feasibility study.
- 3) The initiators stipulated in paragraph 1) letters c. and d. can also be applicants for the industrial park title.

To obtain the title of industrial park, the applicant submits to the Ministry of Economy the application for obtaining the title of industrial park, accompanied by set of documents:

- copies of the incorporation documents of the industrial park title applicant.

- copies of documents confirming the right of use for at least 30 years or the right of ownership over the land and buildings intended for the creation of the industrial park.
- the location plan of the land intended for the industrial park.
- the statement of the holder or owner of the land regarding the fulfilment of the conditions provided by law.
- opinions of the owners of public utility networks.
- the cadastral file regarding the change of land use or the authorization for the construction of the object, in there is a case.
- the agreement of the local council in whose jurisdiction the land intended for the industrial park is located.
- the feasibility study regarding the creation of the industrial park.

If, following the examination of the application and the set of documents, the decision to grant the industrial park title was taken, the Ministry of Economy will present the draft decision in question to the Government for approval.

The industrial park title can be granted to an enterprise with the status of a legal person and the legal form of organization of a state/municipal enterprise or a commercial company with public, public-private, or private capital. This assumes the obligation to administer the industrial park and provide services to the residents of the industrial park.

The industrial park title is granted for a period of 30 years. The assignment of the rights and obligations of the managing company to another company or its reorganization must be conditioned by the verification of the conditions mentioned above and the issuance of the corresponding opinion of the Ministry of Economy and the approval of the respective changes by Government decision.

In order to facilitate the creation and operation of the industrial park, the state, in the person of the central and local public administration authorities, grants the holder of the industrial park title and its residents the following facilities:

- exemption from the compensation of losses caused by the exclusion of land from the category of agricultural land according to the Law on the normative price and the method of sale-purchase of land.
- alienating free of charge or lending publicly owned assets to the managing enterprise for the creation and development of the industrial park at the decision of their owner according to the Law on the administration and denationalization of public property.
- the right to privatize the public property land related to the constructions at the normative price of the land, established at the time of its use by the managing company or leased to the residents of the industrial park, only after the procurement and/or commissioning of the constructions and installations with industrial purpose and related, according to the Law on the normative price and the method of sale-purchase of land.

- granting fiscal facilities according to the Fiscal Code.
- the application by the managing company of the reduction coefficient up to 0.3 of the tariffs for the annual payment for the lease of public property land, established according to the Law on the normative price and the method of sale-purchase of the land, or of the basic tariff for the annual rent of public property assets, established by the state budget law for the respective year.
- optimization of state controls over resident activity
- the allocation of the financial means for the creation of the technical and production infrastructure.

Considering that the park could be founded as a PPP, the provisions of *Law no. 179/ 2008 regarding the Public-Private Partnership* are important to be followed as procedure. Furthermore, the *Civil Code of the Republic of Moldova* provides a general framework for civil relations between the park founder and stakeholders. In addition, the *Fiscal Code*, which is approved annually, provides a budgetary framework which needs to be followed by public institutions, which can be the founders of the park.

Depending on the juridical form the park founding company will take, several laws would be relevant to be complied with. This includes *Law no. 1134/ 1997 regarding joint stock companies*, *law no. 135/ 2007 regarding limited liability companies*, *Law no. 81/ 2004 regarding investments in entrepreneurial activity*, *Law no. 160/ 2011 regarding the regulation by authorization of the entrepreneurial activity*.

Regarding the land and buildings intended for the creation of the industrial park that belong to the Republic of Moldova, the provisions of the following documents are relevant:

- *Law no. 121/ 2007 regarding the administration and denationalization of public property.*
- *Law no. 668/ 1995 for the approval of the List of units whose land intended for agriculture remains the property of the state**
- *Government Decision no. 91/ 2019 for the approval of the Regulation on the capitalization of public property of the state,*
- *Government Decision no. 161/ 2019 regarding the approval of the list of publicly owned lands of the state under the administration of the Public Property Agency,*
- *Government Decision no. 901/ 2015 for the approval of the Regulation on the method of transmission of public property.*

Legal or Regulatory Challenges

The current wording of art. 6 of *Law no. 182/ 2010* limits the subjects that can initiate and request to obtain the industrial park title. For example, the public institutions (UTM and ADMA) that could be involved in the creation of the park are not the subject of the mentioned article. Therefore, it would be appropriate to complete art. 6 para. (1) with a new subject “public institution”. Such a change will entail the adjustment of *Law no. 179/ 2008* regarding PPPs.

In this context, it is important to note that the Ministry of Economic Development and Digitization has announced that it is drafting a Government Decision regarding the approval of the draft law to amend *Law no. 182/2010* regarding industrial parks,³⁴ upon the approval of the draft law for the amendment of *Law no. 182/2010*.

In the same vein, and considering current legislation, in the case of publicly owned agricultural lands of the Republic of Moldova that are analyzed as viable options for the creation and operation of the park, their administration and management must be thoroughly checked according to *Law no. 668/1995*, *Government Decision no. 161/2019*. If it is deemed appropriate to change the administrator or manager, it will be necessary to amend *Law no. 668/1995* and *Government Decision no. 161/2019*.

Finally, the draft Government decision is in the approval process for the draft law regarding the list of agricultural lands that are the exclusive property of the state. This implies the repeal of *Law no. 668/1995*.³⁵

Recommendations for Compliance and Risk Mitigation

Cooperation between central public authorities is necessary to promote the normative acts to amend *Law no. 182/2010* and *Law no. 179/2008*. Namely, this should involve the Ministry of Economic Development and Digitization, the Ministry of Agriculture and Food Industry (founder of ADMA), ADMA, the Ministry of Education and Research (founder of Technical University of Moldova), the Technical University of Moldova, and the Public Property Agency.

It is recommended that the Ministry of economic Development and Digitization, the Ministry of Agriculture and Food Industry (the founder of ADMA), ADMA, the Ministry of Education and Research, UTM, and the Public Property Agency examine the potential obsolescence of *Law no. 226/2018* regarding scientific-technological parks and innovation incubators. This leads to the possible promotion of normative acts repealing *Law no. 226/2018* with the integration of relevant legal norms in the content of *Law no. 182/2010*.

Environmental Regulation

There is an important environmental element to ITP development that must not be overlooked. This includes *Law no. 86/2014* regarding environmental impact assessment, which provides that “(1) The initiator who plans to carry out an activity indicated in Annex no. 1 or no. 2 submits a written request regarding the planned activity to the competent authority. The application is submitted after carrying out the feasibility study on the planned activity... (3) For the activities that are not indicated in annex no. 1 or no. 2, but for which the legislation provides for the issuance of the ecological expertise opinion, the initiator who plans to carry out the activity or the public authorities, through the one-stop shop, will submit the simplified application regarding the planned activity (without indicating the solutions regarding the place

³⁴ <https://particip.gov.md/ro/document/stages/a-nunt-privind-initierea-procesului-de-elaborare-a-proiectului-hotararii-guvernului-cu-privire->

³⁵ <https://cancelaria.gov.md/sites/default/files/document/attachments/nu-558-app-2023.pdf>.

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and type of technologies used, but with the indication of the possible impact on the environment and the social and economic aspects of this impact).

Considering the legal provisions, the activity planned within the park is not indicated in annex no. 1 or no. 2 of Law no. 86/ 2014, respectively this activity will not have an impact on the environment.

Additionally, the activity that is planned to be carried out within the park does not require ecological expertise either, under the conditions of art. 6 of Law no. 851/1996 on ecological expertise, establishes that “(1) The state ecological expertise is carried out for the intended objects and economic activities that have not been subjected to environmental impact assessment and influence the environment and/or provide for the use of natural resources, regardless of destination, location, the type of property and the subordination of these objects, the volume of capital investments, the source of financing and the execution method of the construction works. (2) The project documentation for the fields and activities established in annex no. 1 to this law is compulsorily submitted to the state ecological expertise. (3) If the activity projects mentioned in paragraph (2) of this article and specified in annex no. 1 to this law fall under annex no. 1 or annex no. 2 to Law no. 86/2014 on the evaluation impact on the environment and were subjected to the assessment of the impact on the environment, the ecological expertise of the project documentation is not carried out”.

From the analysis of Annex no. 1 of Law no. 851/1996, the activity planned within the park is not listed in this list. In conclusion, we appreciate that the activity of the park will not have a negative impact on the environment.

GOVERNANCE, BUSINESS MODEL AND FINANCING STRATEGY

PARK FORMATION PROCESS

The process for authorization and development of Moldova Future Park with the current regulatory framework can be summarized as follows:

- Concept Note approved by the relevant line Ministry.
- Ministry and university as administrator of the land initiates a Feasibility Study.
- The Ministry of Economy and Digitalization must be the entity that approves the Feasibility Study after positive review from the Public Property Agency.
- If the Feasibility Study is approved, the Ministry of Economy and Digitalization drafts a government decision to authorize the park.
- Government decision reviewed and commented on by interested entities, which establishes the authority to launch the park administration company.
- The park is initiated by an authorized entity with the establishment of an Administration Company owned by the government with the possibility of private participation in the Council of the company.

The proposed amendments to the legal framework summarized above would enable a similar but slightly different process, which is summarized as follows:

- Concept Note approved by the relevant line Ministry, which in the case of the Moldova Future Park is the Ministry of Economy and Digitalization.
- The Ministry of Economy and Digitalization and Technical University initiates the Feasibility Study.
- The Ministry of Economy and Digitalization reviews and may approve the Feasibility Study.
- If the Feasibility Study is approved, the Ministry of Economy and Digitalization drafts a government decision to authorize the park, which includes the authority to launch the park Administration Company.
- Government decision reviewed and commented on by interested entities.
- The park is initiated by the Technical University with the establishment of an Administration Company, which is a wholly public entity responsible for regulatory oversight of the park.
- The Technical University launches the Foundation as trustee responsible for operational oversight of the park reporting to the Administration Company, which can have participation from external organizations (e.g., ADMA, USAID, JICA, foreign universities, investors, etc.).

This process would enable a business model that is most suitable for the development of the ITP which does not align with the current regulatory framework. This business model is described further below.

GOVERNANCE

The governance model for Moldova Future Park is designed as a public-private partnership with a triple helix approach, ensuring representation from all key stakeholders—government, academia, and the private sector. Flexibility of governance structure is critical, so that the project remains open to newcomers that may want to jump-in at a later stages of development.

Government role in governance model should be to provide policy direction and ensure that the Moldova Future Park supports the broader national innovation vision, retaining some level of influence on strategic decision making. It is advised for the Government not to get involved in daily administration, and transfer development/commercial risk and administrative efficiency to the private sector player(s).

Rationale:

5. **Triple Helix Principles:** The triple helix approach acknowledges the importance of collaboration between government, academia, and the private sector. This model ensures that decision-making and strategic goals are balanced and aligned with the effective and efficient operation of technology parks. The triple helix has proven to be successful globally, fostering innovation, growth, and sustainable development.
6. **Academic Leadership:** Academia plays a pivotal role in delivering high-quality human capital essential for the growth and expansion of the park. The inclusion of academia in the governance model ensures a strong link to universities, which, according to IASP's data, is a key factor contributing to the success of innovation and technology parks (ITPs). The University will also ensure that adequate investments are made in laboratories, common areas and amenities to enable delivery of high-quality research/technology, startups, cross-fertilization for driving innovation.
7. **Government's Role (steer not manage):** The government's involvement is crucial for the development of successful parks, with a majority of case studies globally being publicly owned or having mixed ownership. The government provides policies, public funding, and development funds critical for the park's success. In most instances, public partners tend not to be directly involved in the day-to-day management of science and technology Parks.

Typically, public partners provide input and guidance through dedicated advisory bodies, such as Steering Committees, and may have representation on the board of directors.

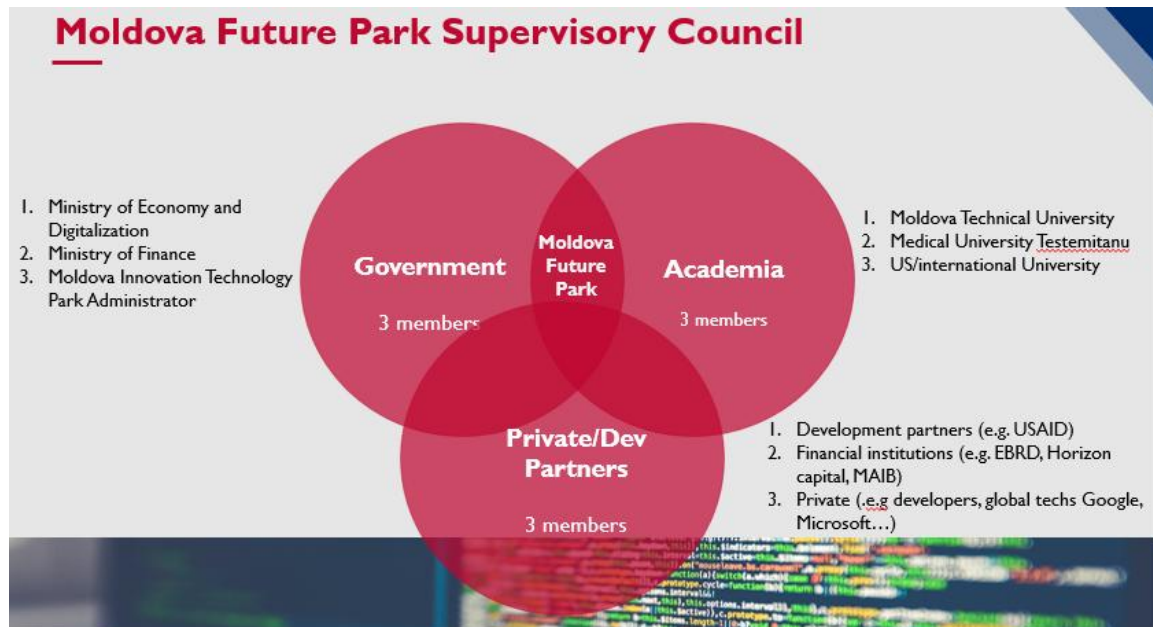
4. Private partners. It is advised that the Government relinquishes control of significant real estate assets to private sector developers, managers, operators or tenants, thereby transferring commercial development risks to the private sector. At the same time, the Government/public sector partner(s) should retain some amounts of surface space for adequate investments in common areas, educational spaces & laboratories, amenities, etc. Administrative efficiency of the park is also a core factor, and therefore it should be transferred to the private sector solely or in a mixed public private formula. Therefore, the private sector should be adequately represented in the board of directors of the Park.

5. Development partners. Given that Moldova relies on development partners, they can have a key role to play in steering the development of Moldova Future Park, whether by participation in the governance, providing funding for the Park's infrastructure and soft programs anchored with the Park (research, education, business development, startup support, etc).

Possible Supervisory Council Structure for the Moldova Future Park

The Moldova Future Park should have a Supervisory Council, as required to be established based on the current Law on Industrial Parks. The proposed role for the Supervisory Council would be as outlined above primarily to steer the strategic development of the Park, ensure a balance between private sector led commercial development and common innovation infrastructure retained in (semi)public ownership, such as education spaces, laboratories, startup areas, amenities and other common areas, as well as attract high-caliber private investors and residents and structure and manage the concession contracts. The administrative daily management is proposed to be externalized to private partner.

The possible Supervisory Council structure for the Moldova Future Park is proposed to include representatives from each stakeholder group, and keep Government participation in the board in representational not dominating capacity:



Government (3 members):

- Ministry of Economy and Digitalization (leading policies in ICT, digitalization, innovation economy).
- Ministry of Finance (responsible for public funding and development funds allocated for the park).
- Moldova Innovation Technology Park (representing the key IT sector public-private institution, overseeing tax incentives, including the application of the 7% single tax under Law 77).

Academia (3 members):

- Moldova Technical University and Medical University Testemitanu (leading public universities and key partners for the park, focusing on engineering/IT and medical education and research).
- Another academic member, potentially from a US-accredited university to be co-located on the campus, or another international university.

External Partners from development & private sector (3 members):

- Representatives of private sector with reputable experience in technology, finance, investment, and innovation.
- Inclusion of development institutions (USAID, EU), banks (IFIs, DFIs, local reputable), or investment funds.

This governance model aims to foster collaboration, innovation, and sustainable growth by leveraging the strengths and contributions of each stakeholder in the triple helix—government, academia, and the private sector.

BUSINESS MODEL AND FINANCING APPROACH

There are several different business models that can be selected for the development of Moldova Future Park. The viability and suitability of these models are dependent on several factors, especially the Moldovan legal framework, desired degree of public financing and private sector investment, preferred risk allocation structure.

In practice, there are similarities and overlaps between business models that have been applied in various countries, and Moldova Future Park in Chisinau may well combine several elements from different models to suit the development objectives. The goal for this Concept Note is not to definitively select the development approach and business model, but to consider the options and provide an initial recommendation, which must be validated through subsequent stakeholder dialogue and feasibility testing. For the purposes of this study, the primary models under consideration are:

Concession

- In this model, a private developer bids on a competitively procured PPP contract which grants them the right and obligation to invest in designing, building, operating, and maintaining all on-site infrastructure and facilities. The private entity then holds a contract from government for a specified period (usually 30+ years), during which time revenue is generated through user fees, lease agreements, and services provided within the park. Throughout the contract duration, ownership of the land will remain at all times with government, although the concessionaire would own the assets it develops as an important tool to access collateralized debt financing (otherwise it must rely solely on project finance for projected cash flow).
- The revenue generated during this period is the basis of cost recovery both for capital costs of infrastructure and on-site facility development as well as operational costs for ongoing management and maintenance services. Typically, this model involves the structuring of a concession fee, which is effectively a lease fee or management fee which is paid to government on a quarterly or annual basis measured as a percentage of revenue (not profit).
- This is an integrated approach in which the private contractor will usually be a consortium of firms composed of an anchor investor, real estate developer, and Engineering, Procurement, and Construction (EPC) firm. In addition, the concession model involves a high degree of risk transfer from government to the private sector as the contractor is responsible for maximizing the commercial upside for Moldova Future Park to generate a return on its investment, while also making the stipulated concession payments. Finally, it is important to note that in this model the concessionaire must develop and manage the site in compliance with minimum performance specifications and standards related to the built environment and horizontal enablers.

- PPP regulatory frameworks are complex, and the viability of this option will be significantly impacted by the Moldovan legal system. In turn, the perception of investor's regarding the effectiveness of this regulatory system and procurement process will be highly influential. In some jurisdictions, a concession contract may be equated to the Build-Operate-Transfer (BOT) model. However, generally speaking, the major difference is that the BOT mechanism is generally used for specific or more discrete developments, such as toll roads and power plants, and revenue is generally received from payments by government (such as performance- or volume-based payments), rather than raised from user fees and rental income.

Mixed-Use Real Estate Development

- In this model, a private real estate developer takes the lead in constructing Moldova Future Park while collaborating with the government on planning, regulatory support, and alignment with public objectives. The developer generates revenue through leasing, rental income, and property sales. Essential infrastructure for Moldova Future Park is generally not financed by the real estate developer but is installed and maintained by government (e.g., water and wastewater, power supply, telecommunications, waste management, etc.). A common feature of this model is the ability of the private developer to acquire from government ownership of the land, which it can then sell and/or lease to third parties.
- Even if the ownership of land is transferred to the developer, it would still be bound by the conditions set out in a Request for Proposals (RFP) which establishes minimum performance specifications and standards that reflect public policy objectives. The successful bidder would then be empowered to develop the site in line with the parameters of its proposal for mixed-use commercial, research, recreational, and retail spaces.
- Although this model is much simpler than the Concession or BOT approach, it can result in a loss of control while the risk of infrastructure financing and site preparation rests with government. The risk of losing control over the site development is amplified by situations in which ownership of the land changes hands to the developer.

Public Development

- In this model, the government takes the lead in designing, building, financing, and managing the site in partnership with universities and research institutions. This generally includes the development of all infrastructure and utility networks, as well as on-site facilities. Significant risk is borne by the government in this model as it must recoup investments through user fees, rental income, and tariffs for utility services provided to tenants / residents.
- The upside of this model is the speed at which the government can develop a site without needing to procure the services of a private developer. There is also commonly a perception among politicians and civil servants that this option offers the greatest fiscal upside as all revenue generated will accrue directly to government unlike the Concession / BOT and private development models.

- However, there is the risk that government agencies, which generally lack expertise in commercial property management, could create a site that does not meet the expectations of prospective tenants or investors. In addition, government developments are often bound by ‘lowest cost’ specifications due to budget limitations, which means the site does not reflect the high standards for built environment and horizontal enablers that are a hallmark of the most successful ITPs internationally. In turn, public management of Moldova Future Park can result in sub-optimal commercial management which means revenue from tenants and user fees are not maximized to the degree a private developer could achieve (which in turn impacts tax revenue).
- Government may, as the landowner, elect to establish a master plan and zoning classification that enables it to develop some on-site buildings and facilities while selling other land parcels for individual investors to develop independently. Although this could be appealing for some businesses, the risk is again a loss of control as land owning developers may build their facilities in a silo or in isolation from the broader ITP vision. If not well regulated, this can create ‘pockets’ within Moldova Future Park that are not well integrated within the broader site.

Development Corporation

- In this model, a Development Corporation would be established as a specialized entity by a combination of private investors, developers, management entity or entities, and public agencies. The benefit of this approach is a combination of industry expertise, centralized coordination and public oversight, resource mobilization, and flexibility in terms of the exact responsibilities and rights over Moldova Future Park that are entrusted to the Development Corporation. This approach can also be more holistic than others as the Development Corporation could fulfill a range of critical functions, such as master planning and zoning, infrastructure development, business support services, real estate management, partnership building, events and networking, incubation support, regulatory and permitting assistance for tenants, and asset maintenance.
- In some situations, a Development Corporation could be a purely private entity which is somewhat analogous to the Concession model, albeit without falling under the PPP regulatory framework. In most international examples, the government will be a minority shareholder in the corporation, which ensures it has a ‘seat at the table’ while most of the financing risk is transferred to the majority private sector shareholders. In both approaches, ownership of the land is maintained by government, but the Development Corporation may own the on-site facilities that it builds for the purpose of collateralized debt financing. While the government could authorize the Development Corporation to sell certain land parcels directly to private buyers in line with the zoning plan (or do so directly itself), there is not generally a need to do so due to the partnership with a real estate developer/s that are part of the majority shareholder group. In this way, the government would receive revenue from its minority equity interest in addition to periodic lease fees that are measured as a percentage of revenue (which would be completely transparent given the government’s stake within the corporation).

- The greatest benefit of this model is empowering private investors and developers to maximize the commercial potential of Moldova Future Park campus in a way government cannot, while also ensuring control over the development through public oversight and coordination (such as with respect to minimum performance specifications and standards). Furthermore, the Development Corporation could be subject to additional governance oversight from a Supervisory Council or Board of Directors composed of relevant Ministries, specialized public agencies, partner universities, business associations, and other relevant entities. This oversight body would have responsibility for political coordination and consensus building, policy measures such as investment incentives, regulatory compliance oversight, and financial accountability.
- The downside to this model is the potential complexity of governance and financial arrangements. There is also the risk of undue political influence over ITP management from the government as a minority shareholder. In addition, the process through which the Development Corporation is formed and how investors, developers, real estate managers, and other partners are selected must be clarified in line with the current regulatory framework (or amendments proposed to streamline the existing framework). These factors can be addressed through proactive planning and political coordination, but it can lead to a longer ‘runway’ before shovels hit the ground as compared to other implementation options.

Recommendation

Ultimately, each of these models may be viable for the development of a successful and impactful ITP in Chisinau. The main objective should be to find a balance between the maintenance of political oversight and accountability to execute the national vision with the ability of private developers, investors, and other partners to maximize the economic and commercial potential of Moldova Future Park.

On the basis of intensive stakeholder dialogue, market analysis, and site visits, the ‘Concession’ model is recommended for the Moldova Future Park. An illustrative business model and financing scheme is provided in *Figure 14*. Although this graphical representative of a Concession financing structure is for a single ITP, it is possible and recommended that several concession contracts are developed for a larger site. For instance, the proposed site allocation is for 100 hectares at the Stauceni location. Not all of the 100 hectares need to be developed immediately, and it could be parceled into distinct ‘zones’ that are developed and managed by different concessionaires. This could allow for one concessionaire to prepare R&D facilities with office space and laboratories, while other zones are focused on mixed-use commercial facilities like restaurants and cafes, residential accommodation and business hotels, and public green space with sporting facilities. The phased development of a large 100-hectare site would also allow for periodic adjustment of the design vision across each zone to reflect demand and changing market dynamics within Chisinau.

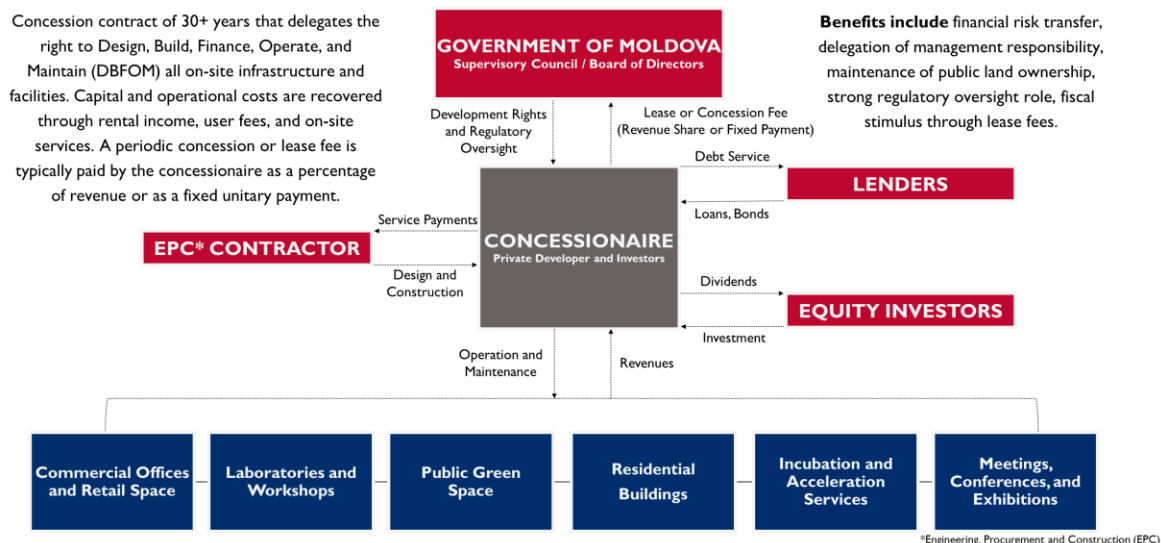


Figure 14: Moldova Future Park Business Model

Another important note to make is that a concession contract usually involves a full suite of services for the private consortium to Design, Build, Finance, Operate, and Maintain (DBFOM) the project. However, if the Moldova Future Park site is divided into different development zones, then different business models could be proposed for each of the concessions. For example, one zone may involve a comprehensive DBFOM concession, whereas another might involve a DBO model where financing and maintenance responsibility is not delegated to a private contractor but could be provided by government or another actor. This is a particularly important consideration as it relates to the possibility of leveraging concessional blended finance to cover capital costs of site development, rather than seeking this from the private contractor (e.g., for land grading, utility connections, transport networks, etc.).

The main takeaway for the purpose of this Concept Note is that a phased site development strategy with flexible financing options allows the Government of Moldova to optimize the economic benefit and commercial viability of the proposed ITP. Feedback from the private sector through market sounding is essential to validate and challenge conclusions and assumptions from the feasibility study.

IMPLEMENTATION STRATEGY

On the basis of stakeholder dialogue, market analysis, site visits, and internal FTA team dialogue, the viability of the Moldova Future Park has been determined to be ‘high’. This warrants further investigation through feasibility study and market sounding. It is estimated that greenfield development of the Stauceni / Chisinau Arena site may require up to 5 years, although this is only for the first development phase for a portion of the 100 hectares with other zones to be developed later. This could be accelerated depending on the financing model that is selected, as well as whether only part of the 100-hectares proposed for the site is developed in the short-term. *Figure 15* illustrates the implementation process.

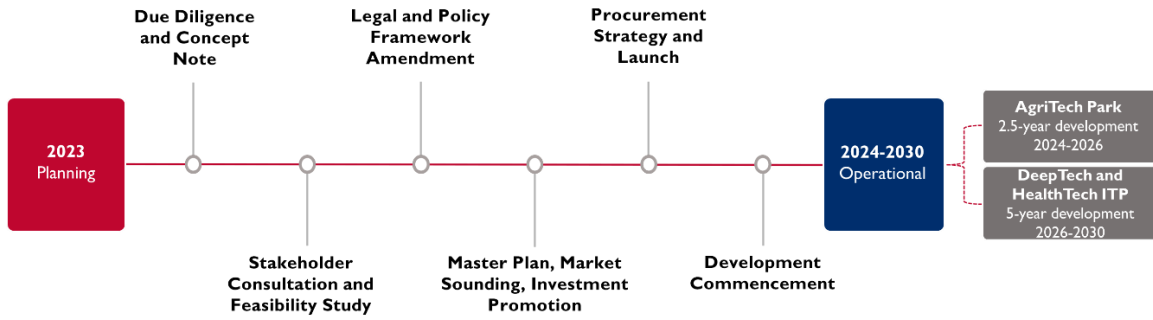


Figure 15: Forecasted Implementation Timeline

This schedule is indicative at this stage and will require validation through a detailed feasibility study. Nevertheless, implementation of the Moldova Future Park ITP appears to be highly viable pending further confirmation of the implementation details.