

IT sector in the Republic of Belarus 2023



NATIONAL AGENCY OF
INVESTMENT AND PRIVATIZATION
REPUBLIC OF BELARUS

Contents

1. Current state of the industry	4
1.1. Key industry indicators.....	4
1.2. Legal environment.....	6
1.3. Research base.....	7
1.4. Staffing.....	10
1.5. Technologies.....	12
1.6. Industrial and territorial clusters.....	15
2. Resource and raw material base	17
3. Production infrastructure	19
3.1. Availability of industrial sites, buildings, structures and offices.....	19
3.2. Engineering infrastructure.....	21
4. Market Overview	23
4.1. Main trends.....	23
4.2. Production.....	27
4.3. Consumption.....	29
4.4. Foreign trade.....	30
4.5. Key Players.....	32
5. Investment potential and prospects for the development of the industry	33
5.1. Investments and investment attractiveness of the industry.....	33
5.2. Export potential of the industry.....	34
5.3. Prospects for the development of the industry.....	35
6. Investment climate	36
6.1. Macro indicators.....	36
6.2. Ratings.....	36
6.3. Preferential regimes.....	37
6.4. Investor Roadmap.....	39
7. Information about NAIP	40

Information technology

Information and communication technologies (ICT) cover information processes and methods of working with information carried out using telecommunications and computer technology.

The ICT sector includes the following types of economic activity according to the national classification of types of economic activity NCRB 005-2011 "Types of economic activity":



ICT industries

production of electronic elements;
production of electronic circuit boards; production of computers and peripheral equipment; production of communication equipment; production of electronic household appliances; production of magnetic and optical media;



ICT trade branches

wholesale of computers, peripheral computer equipment and software; wholesale of electronic and communication equipment and their parts;



ICT service branches

publishing computer games; publishing other software; activities in the field of wired communications; activities in the field of wireless communications; activities in the field of satellite communications; other activities in the field of telecommunications; activities in the field of computer programming; consulting services in the field of computer technology; etc.

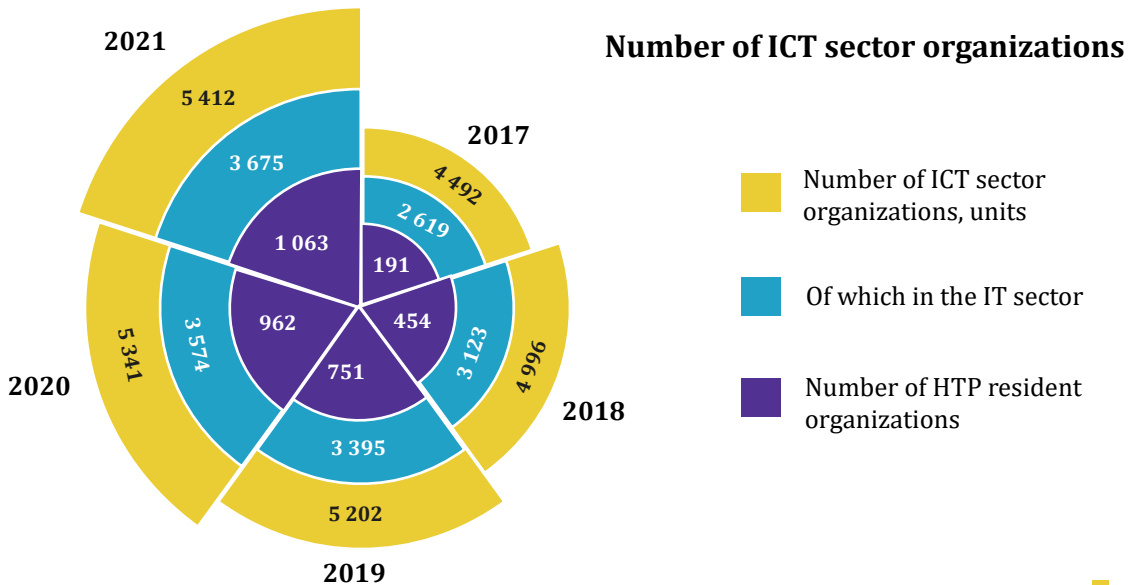
The information technology (IT) industry is part of the ICT sector. The IT industry is one of the fastest growing sectors of the Belarusian economy, which is of strategic importance for the country's economy. It has the highest level of integration into the global economy compared to other sectors of Belarus.

The IT industry has been around for decades. And during this time, Belarus has gained a reputation as a leading IT country in the Eastern European region. This situation will continue in the future thanks to the «IT-country» project. "IT-country" is a program for creating a modern digital economy in the Republic of Belarus. The main driver of the project is the business community of the country, and its mission is to make information technology the main source of income for citizens, business and the state.

1. Current state of the industry

1.1. Key industry indicators

Over the past 6 years, the number of organizations in the industry has increased by 36.60% (in the IT industry, this figure is 58.20%), production volume – by 113.56% (in the IT industry – 201.80%), the number of employees of organizations – by 45.89% (in IT – 101.61%), average monthly salary – by 83.42%, gross value added – by 140.79% (in IT – 175.78%), net profit – by 100.21%. The share of ICT sector expert services in the total volume of services exports is increasing every year and amounts to over 30%. It is particularly worth highlighting that in HTP the number of companies increased 5.6 times (560.25%) from 161 companies in 2016 to 1,063 in 2021.



he main indicators of the development of the IT sector

Indicator	2017	2018	2019	2020	2021
The volume of manufacture of products (works, services) ICT, million dollars	3743.2	4209.1	5201.3	5474.7	6299.3
The volume of manufacture of IT products (works, services), million dollars	1709	2118.9	2952.3	3396.1	3983.1
Gross value added of the IT sector, million dollars	1751.1	2155.1	2913.9	3348.2	3957.6
Gross value added of the ICT sector, million dollars	2866.7	3333.5	4172	4481.5	5167.6
The share of the gross value added of the ICT sector in the gross domestic product, in %	5.2	5.6	6.5	7.3	7.6
The list number of employees of organizations in the ICT sector on average per year, people	92193	100655	111316	118778	124598
The list number of employees of IT organizations, people	50484	59755	71511	80060	88459
Nominal accrued average monthly salary of employees of organizations in the ICT sector, USD	1204.9	1376.3	1503.3	1689.2	1855.3
Net profit (loss) of ICT sector organizations, USD million	571.8	712.2	935.6	1093.4	1004.7
Profitability of sales of ICT sector organizations, in %	19.4	18.7	18.1	18.7	17.9
The share of ICT goods in the total volume of exports of goods, in %	1	1	1.1	1.4	1.4
The share of ICT services in the total volume of services exports, %	18.4	21	25	30.7	31.3

1.2. Legal environment

The development of the IT industry is the driver of the country's economy. A turning point in this sense was the creation of the Hi-Tech Park (Decree No. 12 “On the Information Technology Park”, 2005), where the principle of extraterritoriality was introduced, which allowed the residents of the Park to place an office in any locality of the republic.



In 2018, Decree No. 8 “On the Development of the Digital Economy” was signed, which secured a special legal regime for HTP residents until 2049, which gave a powerful impetus to attracting new organizations to the Park, including large foreign companies.

The decree expanded the types of activities that residents could engage in, including activities in the field of esports, artificial intelligence and blockchain technologies, developments in the field of biotechnology, medicine, aviation and space technologies, unmanned transport management systems, cryptocurrency exchanges and much more. At the same time, there are no restrictions on the amount of revenue from additional activities.

Decree No. 8 made it possible to conclude foreign economic transactions electronically using the Internet. The ability to make transactions with electronic money without a number of restrictions has become available. The permissive procedure for opening accounts in non-resident banks has been canceled. The Decree also allowed the use of a number of institutions of English law: a convertible loan, an option and an option agreement, a non-competition agreement and a ban on poaching, compensation for property losses.

Decree No. 8 provides for benefits in the form of exemption from income tax, VAT, offshore duty, customs duties and more. In addition, some types of activities are not recognized as an object of taxation.

In general, the development of the ICT industry is laid down in the state program “Digital Development of Belarus” for 2021-2025. Source. The main goal of the program is the introduction of information and communication and advanced production technologies in the national economy and the sphere of human activity.

1.3. Research base

Belarus is one of the countries with a high level of scientific and technological development. This status is confirmed by the country's high positions in the Global Innovation Index (Global Innovation Index - 32.6: 62nd place out of 132 countries). Thus, according to the subindex "human capital and research" Belarus ranks 38th out of 132 countries, according to the subindex "knowledge and technological output" - 37th place, "training of specialists in science and technology" - 11th place in the world. The overall position of Belarus in this rating remains at an average level due to the lack of data on a number of parameters and a low rating on the "Institutions" subindex - 85.

Activities in the field of ICT are included in the priority areas of scientific, scientific, technical and innovative activities for 2021-2025 and are designated as "Digital information and communication and interdisciplinary technologies based on their production".



The document defines such relevant areas of scientific research as the development of information society, electronic state and digital economy; mathematics and modeling of complex functional systems; information and control systems; smart city technologies; big data technologies; artificial intelligence and robotics; digital spatial models and augmented reality technologies; aerospace and geoinformation technologies; communication tools and methods data transmission; high-performance computing facilities; physics of fundamental interactions of the micro- and macrocosm, emerging technologies (quantum, cognitive, neurocyph, anthropomorphic)

Within the framework of the direction “Digital information and communication and interdisciplinary technologies based on their production”, projects will be carried out on:



- development of intelligent systems for design and technological design and production preparation, automation and robotization of production processes, including the full life cycle of manufactured products using digital technologies (“Industry 4.0”);



- implementation of hardware and software solutions using artificial intelligence, big data databases for the Internet of things, industrial Internet, cloud technologies, intelligent electronic terminals;



- development and implementation of technological solutions in the implementation of the smart city concept;



- production of optoelectronic equipment based on thermal imaging, laser systems, optical and mechanical products for dual and special purposes;



- creation of automated laser systems for macro- and micro-processing of products;



- development of new systems, equipment and materials for 3D printing of complex products;



- production of matrices for information processing systems of spacecraft, devices of powerful power and high-voltage electronics, high-frequency microcircuits and microsystems, heterogeneous integrated circuits with micromechanical, optoelectronic, magnetically sensitive complex functional blocks;



- development of scientific and information computer networks, as well as improvement and creation of information resources and systems of scientific and technical information.

The centers of scientific research and development are both public and private organizations. In addition to universities and scientific schools, after the entry into force of Decree No. 8, HTP residents were also able to engage in fundamental and applied research, experimental developments in the field of natural and technical sciences.

A Digital Development Center has been created for practical support of digitalization issues and their accelerated implementation. It provides assistance to government agencies and organizations in the preparation and implementation of measures in the field of digital development.

A Center for Advanced Research in the Field of Digital Development will also be established. He will form proposals on draft forecasts of digital development, indicators of the level of digital development of industries and regions, collect information to assess the effectiveness of the implementation of measures included in the programs in the field of digital development. This center will be assigned organizational support for the examination of events in the field of digital development with the involvement of specialists from government agencies and organizations, residents of the Hi-Tech Park.

If talking about quantitative indicators of branch science in 2021, then 23 organizations (5.17%) were engaged in scientific research and development in the field of information technology, in which 383 (1.49%) people worked, including 9 candidates of sciences. For comparison, in general, in 2021, 445 organizations with a total number of 25644 people were engaged in scientific research and development, of which 2569 (10.4%) candidates and 550 (2.1%) doctors of sciences.

In 2021, the industry spent 4650.96 thousand US dollars on internal research and development, which is 1.45% of the total research and development costs.



1.4. Staffing

The main suppliers of IT specialists in Belarus:

- Belarusian State University of Informatics and Radioelectronics
- Belarusian State University
- Gomel State University named after F.Skoriny
- Belarusian State Technological University (Faculty of Information Technologies)
- Belarusian National Technical University (Faculty of Information Technologies and Robotics)
- Belarusian State University of Economics (Faculty of Digital Technologies)
- Yanka Kupala Grodno State University (Faculty of Mathematics and Computer Science)
- Polotsk State University (Faculty of Information Technology)

In general, specialists are trained by 32 faculties (HTP handbook for applicants to IT specialties for 2021).

The HTP directory included such specialties as:



- Programmer (Software Engineer)
- Software Testing Specialist (Tester)
- Business Analyst (Business Analyst)
- Software Quality Assurance Specialist (QA Engineer)
- Data Scientist
- Data Analyst
- SEO Specialist
- Technical Writer
- Web Designer (Web Designer)
- 3D Designer (3D Artist)
- UX/UI Designer
- Game Designer
- IoT Specialist (Internet of Things Specialist)
- Cyber Security Specialist





In the system of statistical indicators, these specialties are grouped into the profile of training “Engineering and Technology”. About 21.2 thousand students graduate in the profile “Engineering and Technology”. In 2021, 11.0 thousand of them received higher education (19.86% of the total number of graduates), the rest (10.2 thousand) – specialized secondary education (30.63%).

At the moment, the number of students receiving higher education in the profile is 53.5 thousand, receiving specialized secondary education is 39.3 thousand. At the moment, 1,434 people are studying in the magistracy, 893 people were graduated from the magistracy in 2021.

Belarusian universities have about 70 specialties that train IT specialists. Every year universities introduce new IT specializations, such as information systems and technologies in the gaming industry, programmable mobile systems, geoinformation systems, production based on 3D technologies, information security software for mobile systems.

If we consider school education, then since 2016 in Belarus, on the initiative of HTP resident companies and with the support of the Ministry of Education, a project has been launched to teach students of grades 2-6 programming skills in the Scratch environment.

1.5. Technologies



Healthcare

On the basis of the consulting centers of healthcare institutions “1st city Tuberculosis Dispensary” and “2nd city tuberculosis dispensary”, the unified telemedicine system of Minsk for digital fluorography is functioning and is constantly being improved. There is also a telemedicine system for digital mammography based on the consulting center of the Minsk City Clinical Oncology Dispensary and 7 city polyclinics.

Active work is underway on the formation of e-health in the country, within which it is planned to switch to the use of integrated electronic medical records containing all medical information about the patient, starting from his birth.



Education

The project “Electronic School” is being implemented in this area. His online services “Electronic diary/The electronic journal” allows to organize in electronic form in the school an individual accounting of the results of the development of educational programs by students, as well as the storage of these data in archives. Also, access control systems are being implemented in the country's schools, allowing real-time identification of all school visitors, students and staff.



Transport

To date, electronic toll collection systems, cashless payments, dynamic weighing of vehicles and others are used.

The Belarusian Railway uses technologies to ensure the safety of cargo en route (electronic seal), introduces a system for selling travel documents (tickets) for trains with unnumbered seats through self-service terminals, the Internet and mobile devices.



Agricultural industry

The precision farming system has become a new stage in the development of IT agronomy. Also, this system provides electronic storage of the history of field work and information about harvests, which allows you to more accurately predict yields.



Housing and communal services

Since 2015, the portal “Мой город” 115.bel has been successfully operating, where online applications for solving utility problems are collected and processed, in 2019 it was updated and received a new name “Мая республика”. Today, its functionality can be used in all localities of the country.

To organize the work of dispatching services of housing and communal services enterprises, to streamline and improve the efficiency of their work, an automated system “Dispatching Service” is used.

In order to efficiently use resources (electricity, gas, water, heat) in residential buildings and optimize the processes of taking their readings, work is underway to create a single unified republican platform for intelligent buildings to provide remote collection, analysis, storage of readings from all resource meters in residential buildings and their transfer to interested departments.



Fuel and energy complex

Currently, a pilot project (based on Smart Grid technologies) for autonomous generation, transmission and distribution of electric energy is being implemented at substations.

The creation of a full-scale automated system for monitoring and accounting of electric energy (ASKUE), which is designed to collect, process, store and visualize information about the production, import, export, transfer (distribution) and sale (sale) of electric energy (capacity), is continuing.



Construction

In this area, the task of digital transformation of the life cycle management of construction objects is being actively solved, in particular, the transition to the use of BIM technologies (information modeling technologies), the design of objects in 3D format.

Pilot projects based on the design of objects in 3D format have been launched in Belarus on the basis of three enterprises: JSC “MAPID”, UE “Minskmetrostroy”, JSC “Gomel DSK”.



Forestry

As part of ensuring the digital transformation of the forest industry, a unified state automated information system for accounting for wood and transactions with it is being developed in order to ensure the rational use of forest resources and maximize profits from logging and wood sales by improving management and reducing labor costs.



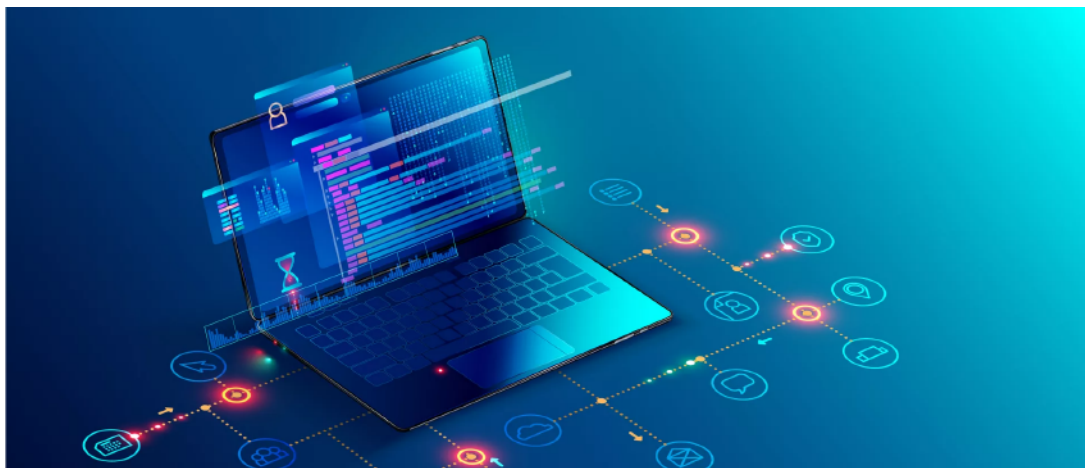
Nature and environmental protection

To assess, account for, and develop measures to reduce emissions of pollutants in order to improve the quality of atmospheric air in settlements with a population of over 100 thousand people, a project is being implemented to develop electronic environmental maps of cities.



Regional informatization

The work on regional informatization is carried out through the consistent implementation of the Smart Cities project of Belarus, which has been launched in eleven cities (districts) of the country with a population of more than 80 thousand people (Orsha, Baranovichi, Pinsk, Novopolotsk, Polotsk, Mozyr, Lida, Borisov, Soligorsk, Molodechno, Bobruisk), identified by the Head of State as potential centers economic growth, in accordance with the developed Comprehensive Plans for Accelerated Development, with the prospect of further systematic digitalization of all regions. Every year new solutions and electronic services appear in various industries and regions, which bring the level and quality of life of the population to a fundamentally new level. As a result of such transformations, new knowledge is provided to a person, new economic relations are built.



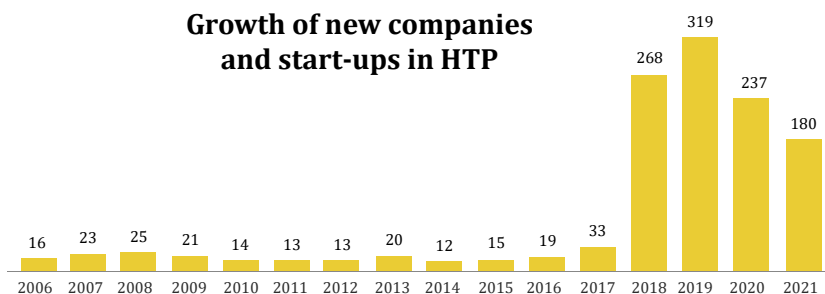
1.6. Industrial and territorial clusters

Hi-Tech Park (HTP).

Hi-Tech Park (HTP). Established in 2005 by the decision of the President of the Republic of Belarus, HTP has become the leading cluster of IT and high technologies in Eastern Europe and the CIS. After the adoption of the Decree of the President of the Republic of Belarus “On the development of the digital economy” in 2017, the export of HTP exceeded 1 billion US dollars.

By the end of 2021, the volume of HTP production amounted to 2093.8 million US dollars, showing a record growth of 157%. More than 73 thousand people worked in the Park. This is 1.7% of the employed in the economy of Belarus, which produced 4.8% of the country's GDP. The most important factor is the export orientation of HTP. In 2021, HTP exports amounted to 3157 million US dollars.

In five years, the number of registered HTP residents has increased by more than 5 times. At the moment, 1065 companies are HTP residents.



Today, the park provides equal opportunities for both large shaft-forming enterprises with thousands of employees and small businesses of 3-5 people. In addition, 122 development centers of international companies are concentrated in HTP today.

The hi-tech Park is the development of the regions. The HTP residents outside Minsk are 117 companies, where about 4,000 jobs have been created. At the same time, HTP residents created more than 8 thousand new jobs in 2021.

More than 35% of HTP residents are enterprises with foreign capital. Over the five years of HTP 2.0 (2017-2021), the Park has attracted a total of more than 1.5 billion US dollars of foreign investment. The amount of foreign direct investment in 2021 amounted to 529.5 million US dollars.

Scientific and Technological Association "Infopark"

In addition to HTP, there is also a Scientific and Technological Association "Infopark". Its creation was a consequence of the appearance of the Decree of the President of the Republic of Belarus dated May 03, 2001 No. 234 "On state support for the development and export of information technologies". And all this time, the Association has been acting as a locomotive for the developing sector of the digital economy of Belarus. Currently, the Association unites 45 companies of various forms of ownership.

Following the goal of developing international cooperation, in 2008 the Infopark Association became a member of the European IT Association DIGITALEUROPE, and in 2018 – a member of the European Digital SME Alliance. GITALEUROPE», а в 2018 году – членом European Digital SME Alliance.



In 2012, the Infopark Association joined the WITSA Global Alliance of Information Technologies and Services, which unites companies operating in the digital economy sector worldwide.

In 2015, the Infopark Association signed an agreement on cooperation in improving the legal framework for the development of the ICT sector with the Ministry of Communications and Informatization of the Republic of Belarus, the Association of Information and Communication Technology Organizations Belinfocom and the Telecommunications Industry Union, and also concluded a cooperation agreement with the National Bank of the Republic of Belarus, which became the beginning of close cooperation in conducting research and planning the digital transformation of the financial sector of the Belarusian economy.

The Infopark Association is open to cooperation for the implementation of promising ideas and projects aimed at developing the domestic information technology development industry, creating favorable conditions for the activities of IT companies and expanding contacts and cooperative ties of its members with interested partners in Belarus and abroad. Source

2. Resource and raw material base

From the point of view of statistics information-communication infrastructure characterized by the following indicators.

Indicator	2016	2017	2018	2019	2020
Subscribers of all types of data transmission – total. thousand	12 109.0	12 773.9	13 573.1	13 710.4	13 943.8
of which:					
without Internet access	1 025.1	974.7	781.2	656.5	783.7
with Internet access	11 083.8	11 799.2	12 792.0	13 053.9	13 160.0
individuals	9 773.5	10 527.5	11 338.3	11 401.7	11
of which:					
Fixed access	2 924.8	3 021.7	3 038.3	3 036.2	3 083.2
of which broadband access	2 924.8	3 012.4	3 038.2	3 035.9	3 073.3
wireless access	6 846.7	7 505.5	8 299.9	8 365.6	8 325.1
of which broadband access	5 614.0	6 428.5	7 339.1	7 543.5	7 674.4
legal entities and individual entrepreneurs	1 310.4	1 271.7	1 453.7	1 652.2	1 751.8
of which:					
Fixed access	142.8	151.4	163.3	179.0	182.3
Of which broadband access	142.8	150.9	163.3	179.0	182.3
Wireless access	1 166.7	1 120.3	1 290.3	1 473.2	1 569.5
of which broadband access	788.1	789.1	821.9	913.7	979.5
External Internet bandwidth. Gbit/s	1 104.1	1 338.2	1 480.3	1 551.2	1 933.0

In general, there is a tendency of increasing subscribers of all types of data transmission, and also increase of external Internet bandwidth. According to the most recent data at the beginning of 2022 number of subscribers increase to 3.42 million, and bandwidth increase to 2230 Gbit/s. This is due to attraction of users to a more “heavy” multimedia content and an increased quality of data transmission services.

If we consider the indicators in percentage terms, as well as data transfer rates, then the use of ITC by the population and organizations looks like this.

Indicator	2016	2017	2018	2019	2020
Subscribers and users of fixed broadband Internet access per 100 inhabitants	32.4	33.5	34.0	34.2	34.8
of which by speed:					
256 Kb/s - less 2 Mb/s	1.9	1.2	1.0	0.7	0.5
2 Mb/s - less 10 Mb/s	20.4	16.0	13.3	11.6	10.9
10 Mb/s - less 30 Mb/s	6.5	8.3	8.0	7.5	5.8
30 Mb/s - less 100 Mb/s	3.6	7.5	10.7	10.0	9.0
100 Mb/s and over		0.5	1.0	4.5	8.6
Mobile cellular telephone subscriptions per 100 inhabitants	67.6	76.4	86.5	89.9	92.6
Share of households with Internet access in the total number of households. %	70	74	78	80	82

In general, there is a fairly high digitalization of the population. About a third of Internet users use fixed broadband Internet access. However, 18% of non-households do not have Internet access. It is also particularly worth highlighting that only about 42% of the population uses the Internet to carry out financial transactions and only about 24% use the Internet to interact with authorities.

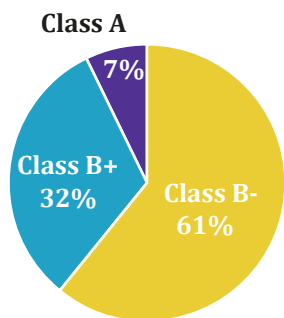


3. Production infrastructure

3.1. Availability of industrial sites, buildings, structures and offices

Commercial real estate (offices, buildings, structures)

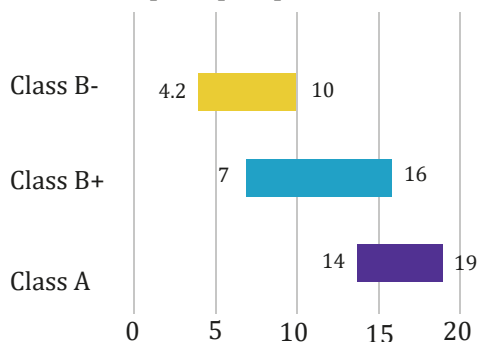
Offer on the office market, sq. m.



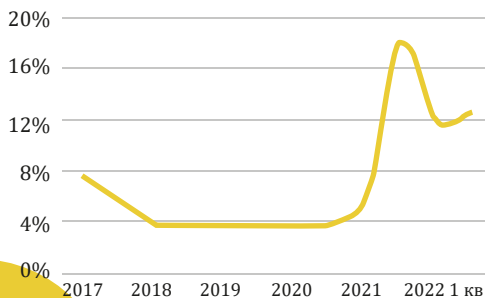
The classified market of commercial offices in Minsk is almost 1015 thousand square meters of rental space (GLA). The main volume of the offer, over 615 thousand square meters, falls on the class "B-". The class of offices "B+" has about 325 thousand sq. m. of space. Class A offices are the least represented. It includes only 4 office facilities with a total rental area of 72 thousand sq. m.

Rental rates in terms of euros have a steady downward trend. There is a high probability that the rental rates for offices in euro terms in the market as a whole will be lower by 30-35% to the level of December 2021-January 2022.

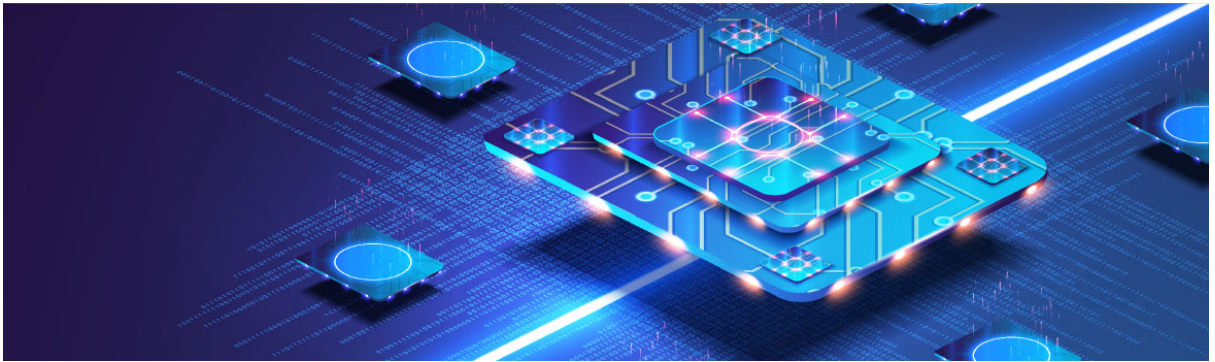
Ranges of rates by class at the moment,
Euro per sq. m. per month.



Percentage of vacant premises in the office

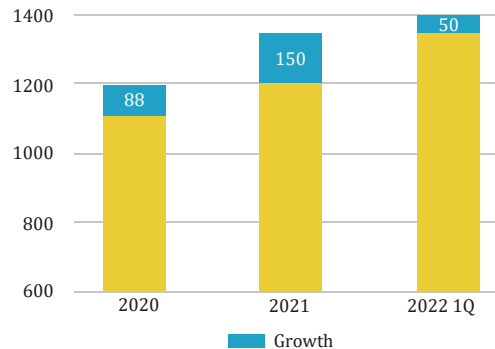


Since the beginning of 2022, there has been a slowdown in the dynamics of vacant space, since during the first quarter, both the release of offices and their absorption were mainly rotational in nature and could not have a significant impact on the current trend.

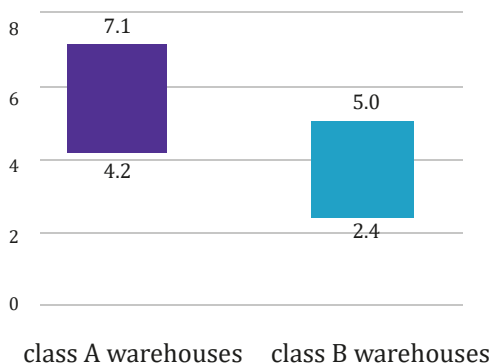


The supply of warehouses on the market increased significantly in 2021, when almost 150 thousand square meters of new warehouses were put into operation in Minsk, its suburbs and adjacent territories to the metropolitan agglomeration. This is one of the best commissioning volumes in the history of the modern warehouse logistics market, which dates back to 2008 (since the implementation of the Logistics System Development Program of the Republic of Belarus for the period 2008-2015)

Dynamics of the growth of the supply of space in modern warehouses (logistics complexes), thousand sq. m.



Dynamics of rental rates for high-quality modern warehouses in Minsk and suburbs, in euros per 1 sq. m.

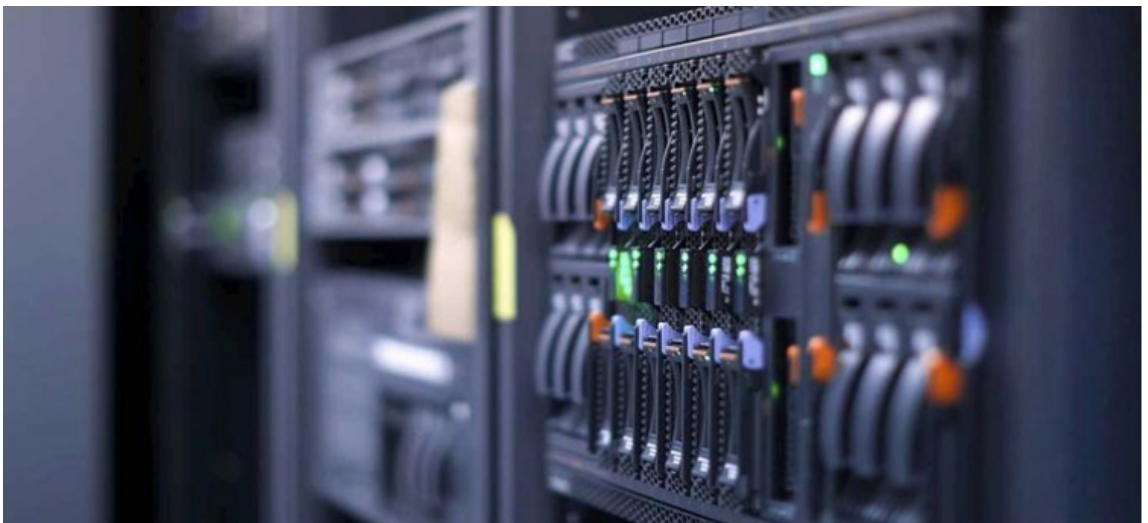


In a situation of consistently high demand, typical for 2021 and the first quarter of 2022, rental rates, even denominated in euros, remained at the same level. In the warehouse segment, there were significantly fewer appeals to owners with questions of revising rates and/or fixing the exchange rate at a certain level, which was typical for office and retail segments. Therefore, the rates at the end of the first quarter of 2022 remained at a comparable level with the rates at the end of 2021, mainly in the market. There will be no significant reduction in rates in the warehouse segment in the near future. It is predicted that the possible decrease will be a maximum of 8-10%.

3.2. Engineering infrastructure

The main services provided by telecommunication operators are broadband Internet access and IP television. Telecommunication operators of the Republic of Belarus offer all these services in one package. Nevertheless, operators are "looking ahead" and take into account the appearance of promising services in the near future (for example, high-definition television) that require an order of magnitude higher speeds. For example, some operators carry out the laying of fiber-optic communication lines to residential buildings, after which the connection of end subscribers occurs via local Ethernet networks. This approach corresponds to the concept of FTTB (Fiber To The Building – the concept of building optical access networks, implying bringing optical fiber to a residential or administrative building) and allows data transmission at speeds up to 100 Mbit/s.

The provision of services using the xPON technology (Passive Optical Network – technology of passive optical broadband access networks) in the Republic of Belarus began in December 2011. This technology is considered as an effective way of developing an access network capable of providing both existing and new telecommunication services with consistently high quality. In 2019, work was completed to bring a fiber-optic communication line to each apartment of the city's multi-apartment development. In 2020, the construction of fiber-optic communication lines to settlements with more than 100 households was completed. At the same time, in 2021, the construction of fiber-optic communication lines to 122 settlements with the number of households 50-100 was carried out. At the beginning of 2022, the total number of subscribers connected via fiber-optic communication lines amounted to more than 2.83 million.



Since 2010, approaches to the development of communications have been changed in the republic. The main direction of development is the introduction of the IMS (IP Multimedia Subsystem) software and hardware platform, a standard network architecture for the provision of all types of telecommunications services, which allowed telecommunication operators to provide them with a full range of telecommunications services, including telephone communication, over a single subscriber line when connecting their customers to the data transmission network.

In 2011, in order to build a multiservice telecommunication network in the republic, work was carried out on the installation and configuration of transport gateway equipment in the regional centers of the republic, on the installation and integration of equipment into the existing telecommunication network, after which the IMS platform was put into commercial operation and since July 2011, subscribers were connected to the telecommunication network using it. The number of subscribers connected to the IMS platform by the end of 2021 amounted to 3.73 million.

In 2008, equipment for the provision of television services over IP protocol (IP-TV) was put into operation on data transmission networks - this is a service that allows the user to receive a certain set of multimedia content through a data transmission network. Today, this technology is a direct competitor to cable, terrestrial and satellite television. However, unlike the traditional broadcasting model, when the same content is delivered to all subscribers, and the broadcast goes on regardless of whether someone is watching it or not, the content within the IP television model is delivered to a specific user or a group of users strictly at their request. According to the data of the state statistical reporting by the end of 2021, the total number of subscribers of IP-TV services amounted to more than 2.33 million throughout the republic.

In December 2015, the construction of a fourth-generation cellular mobile telecommunication network using LTE technology was launched, which allows the end user to receive not only traditional services, such as video content, watching television programs in real time with high speed and high quality, but also to develop fundamentally new services. On December 23, 2015, the launch of the fourth generation cellular mobile telecommunication network was carried out in all regional centers of the Republic of Belarus. As of January 1, 2022 LTE cellular mobile telecommunication services are available to 97.4% of the population of the Republic of Belarus.

4. Market Overview

4.1. Main trends

The most important areas of digitalization of the economy around the world: the introduction of 5G technology, the Internet of Things, big data processing systems, cloud technologies, machine learning, 3D modeling and visualization technologies.

The International Telecommunication Union (ITU) has combined the priority directions of ICT development into 8 blocks: networks of the future, automation, 5G, Internet of Things, optical technologies, emerging technologies, socially significant technologies, connected transport.

Future networks (pre-Network 2030)

- new architectures (Decentralised.D2D)
- new interfaces (FVCN)
- new technologies (QKDN)
- new services (Holographic copies and avatars)
- new testing/monitoring methods

5G

- 5G RAN (New Radio)
- 5G Network Slicing
- 5G Private networks
- Ultra reliable and Low Latency Communications (URLLC)
- XR(AR/VR/MR/SR.panoramic video)
- interconnect and roaming

Optical technologies

- New coherent optical technologies (e.g. 800 Gbps)
- All-Optical-Networks

Socially relevant

- Green ICT
- ICT for eHealth
- ICTS for rural areas
- ICT services by persons with disabilities
- ICTS for Disaster response and Recovery

Efficiency and automation

- Big Data and BI
- AI/ML
- Erge/ Cloud Computing
- Autonomous networks
- Core network virtualization
- OpenRAN/ VirtualRAN
- Energy-efficiency
- SD-WAN
- Co-development and sharing
- ICT infrastructure
- Hyperscale Data Centers

Internet of things (IoT)

- IoT Security
- Industry 4.0 (IIoT)
- Drones
- LPWAN technologies

Evolving technologies

- eSIM
- 4G interconnect and roaming
- Counterfeit/Stolen Mobile Device Database
- NNAI - Digital Objects Identification (e.g. DOA. IMEI)
- IMS (VxLTE. VxWiFi. RCS)

Connected transport

- V2X
- ITS
- Self-driving cars

The key trend in the development of ICT is the development of technologies in the field of cybersecurity. Taking into account the growing pace of digitalization, protection from cyber threats is a very relevant direction, especially in line with the “Industry 4.0” concept. This underlines the need to increase cyber resilience against the risks of compromising physical security, service failures, identity theft, forced production downtime, intentional damage to equipment, causing financial and reputational losses. It is especially relevant when implementing ICT and automating processes in such areas as manufacturing, smart cities, healthcare, energy, critical infrastructure, trade, the Internet of Things, banks and the financial sector.

In addition, an actual trend is the introduction of the fifth generation of communication. GSMA (GSM Association – the world association of mobile Operators) predicts that in the CIS by 2025 the share of 5G technologies will be about 9%, 4G will take up to 70%, 2G and 3G will be rationalized. Smartphone penetration will grow to 86%. There is no unified vision regarding 6G yet.

A very trending topic is the provision of broadband Internet access via low-orbit satellites. A number of global projects are implementing these technologies. At the same time, there will be an increase in the Internet of Things at the expense of the industrial sector:

It is expected that the rapid introduction of digital technologies and services will continue, and most products and services will need additional digitalization. It is predicted that investments in digital business transformation will remain the main IT trend until 2024. The use of SaaS services will also grow.





The main advantage of SaaS for business is that there is no need to purchase and maintain certain IT solutions. There is no need to spend resources on deploying and managing the necessary infrastructure and software. Subscription solutions provide flexibility and scalability of the business, as well as optimal budget management – this explains their demand in modern conditions. There is also a demand for the "everything as a service" (XaaS) model.

Cloud services for remote work are still the most popular, and the use of virtual desktop infrastructure (VDI) is also actively developing. This is a set of technologies that allows you to centrally manage the work processes of a digital workspace in a virtualized infrastructure and provide your employees with secure remote access to the company's internal resources.

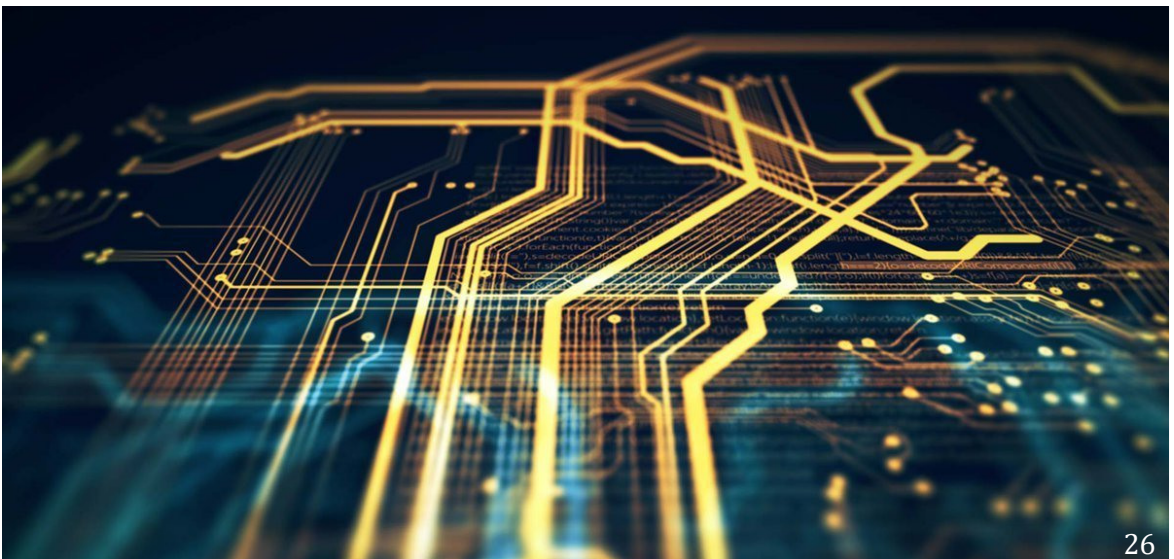
Automation also remains one of the main trends for 2022 and beyond. Moreover, companies that automate not individual processes, but the work of the company in a complex will benefit. Platforms combining ITSM (IT Service Management, IT Service management) and BPM tools (Business Process Management, business process management) allow automating the company's work in a complex, as well as improving the quality of IT services and reducing the cost of providing them. Automation based on such platforms covers all the main communication channels used in the company, and allows you to change processes and manage them in a single information field.

It is assumed that in the near future, technologies that provide communication with customers and between employees of the company will account for up to 50% of all IT costs.

The information technology market can be divided into five key segments. Spending on hardware, software and IT services (traditional segments) accounts for more than half of global IT spending. Another important part of IT costs is the cost of communication services. The latter segment includes spending on various emerging technologies that do not fit into any of the above segments. One of the largest traditional segments of the IT market in terms of expenses is hardware. The growth in the volume of information stimulates the demand for equipment such as servers and data storage systems.

The IT market in the Republic of Belarus is primarily a market for outsourcing IT services. According to the Belarus IT CEO Club survey, 84% of companies are engaged in outsourcing and only 16% identified themselves as grocery companies. In addition to IT outsourcing, Belarusian IT companies are also engaged in the development of embedded and custom software, testing, web design, business process outsourcing, consulting and other services. The main export direction of IT services for these companies are the markets of the USA, Canada and Europe (more than 86%), which allows them to receive large orders in foreign currency.

The demand for IT services is provided by the growing variety and complexity of the corporate IT systems used, which require high costs for installation, integration, training and maintenance. IT outsourcing (transfer of IT infrastructure support and maintenance functions to third-party organizations) is one of the promising areas in this market. The category of solutions for database management and analytics is also developing dynamically (the average annual growth rate is more than 8%). There is a consistently high demand for enterprise resource management and customer relations solutions, as well as security solutions. Among the strategic directions of IT development, cloud technologies, big data analytics, integration of mobile devices and social networks into the corporate environment occupy a special place.



4.2. Production

The production of the domestic IT industry is characterized by the following indicators.

Indicators in millions of dollars	2016	2018	2020
Total:	2,734.96	4,005.01	5,164.41
of which, HTP residents	898.67	1,629.73	2,884.62
Technical means:	190.68	345.98	367.77
of which, HTP residents	0.00	10.26	6.23
Software:	365.77	708.15	1,322.67
of which, HTP residents	277.72	544.54	1,223.17
Consulting services on technical means related to their acquisition, installation and operation:	6.04	15.21	9.84
of which, HTP residents	1.36	2.94	3.90
Software maintenance, software consulting services:	112.70	159.98	278.39
of which, HTP residents	38.49	76.90	188.07
Consulting services on information support and data processing; data preparation and input services:	43.77	60.36	91.43
of which, HTP residents	0.05	2.99	28.95
Services for the development of automated information systems, systems for scientific research, design and management systems based on databases, system and application software:	379.35	654.66	854.45
of which, HTP residents	362.35	636.21	834.93
Maintenance and repair services of office equipment for offices, electronic computers and peripheral and network equipment used in conjunction with it	49.31	67.23	68.06
Electronic information services	11.57	15.70	23.78
Telecommunication services	1,245.22	1,500.71	1,428.86
of which, telematics and data transmission services	385.39	622.76	759.74
Training services in the field of information and communication technologies	1.01	3.44	0.41

Slightly more than half (55.86%) of the manufactured and shipped products are generated by HTP residents. They also almost completely close such areas as software development and development of automated information systems, systems for scientific research, design and management systems based on databases, system and application software.

The most promising segments in the ICT sector are telecommunications services (27.67%), software (25.61%), services for the development of automated information systems, systems for scientific research, design and management systems based on databases, system and application software (16.54%).

In general, over the period 2016-2020, the increase in the volume of ICT production amounted to 88.83% (base in millions of US dollars), that is, it almost doubled; for HTP residents – 220.99%, that is, it increased 3.2 times.

In the regional context (for 2020), the main production is concentrated in Minsk (93.38%) and the Minsk region (2.05%).



4.3. Consumption

The consumption of products /services of the IT industry can be estimated on the basis of the costs of organizations for the development, implementation and use of digital technologies, on the basis of the use of ICT by the population, as well as on the basis of sales of ICT equipment by wholesale organizations.

The costs of organizations for the development, implementation and use of digital technologies

Indicator	Millions of dollars	%
Total, including:	1,069.17	100.00
purchase of machinery and equipment related to the development, implementation and use of digital technologies, as well as for their maintenance, modernization, current and major repairs carried out on their own	286.76	26.82
software acquisition	171.14	16.01
payment for telecommunication services	92.09	8.61
employee training related to the development, implementation and use of digital technologies	2.01	0.19
payment for the services of third-party organizations and specialists related to the development, implementation and use of digital technologies	274.29	25.66
other costs for the development, implementation and use of digital technologies	242.85	22.71

According to statistics, slightly more than 25% of all costs are expenses for the purchase of machinery and equipment related to the development, implementation and use of digital technologies, as well as for their maintenance, modernization, maintenance and overhaul. Another 25% of expenses go to pay for the services of third-party organizations and specialists related to the development, implementation and use of digital technologies. The consumption of the ICT industry itself is 32.51% and is almost entirely concentrated in Minsk (93.39%).

The consumption of products/services of the industry by the population can be traced by coverage indicators. In 2020, 70.2% of the population used personal computers, 98.1% – televisions, 98.7% – mobile phones, 85.1% – the Internet, 97.9% used cellular communications.

From the point of view of sales of ICT equipment, the picture looks like this.

Sale of ICT equipment by wholesale organizations

Product name	In total, in millions of dollars.	of them of domestic production	Domestic to total sales in %
Radio, TV and video equipment and DVD	135.9	5.2	3.8
Office equipment and equipment	501.7	15.7	3.1
Electronic equipment and its parts	83.0	1.1	1.4
Radio, TV and video equipment and DVD	247.7	23.5	9.5

Total sales of ICT equipment amount to 968.3 million US dollars, domestic goods – 45.5 million US dollars (4.7%).

4.4. Foreign trade

Foreign trade in the IT industry can be divided into trade in goods and trade in services.

The export of ICT goods is presented in the table below.

Export of ICT goods	2016	2017	2018	2019	2020
Total, including:	259.2	299.8	346.2	374.4	404.9
Communication equipment	15.1	25.1	28.3	28.8	32.9
Computers and peripheral equipment	15.5	34.9	32.6	36.1	44.8
Household electronic appliances	30.0	63.1	106.2	136.0	172.4
Other ICT components and products	198.6	176.7	179.1	173.5	154.7
The share of ICT goods in the total volume of exports of goods, percent	1.1	1.0	1.0	1.1	1.4

The leading position is occupied by household electronic appliances (42.58% by 2020), as well as other components and ICT products (38.21%). The latter group includes such products as computer devices, magnetic tapes and disks, smart cards, antennas and antenna reflectors, printed circuits, cathode ray tubes for televisions and video monitors, display tubes for data output/graphics, microwave tubes, electronic lamps, diodes, transistors, thyristors, photosensitive semiconductor devices, photovoltaic cells, LEDs, piezoelectric crystals, processors and controllers, storage devices, amplifiers, telescopic sights and periscopes, lasers, liquid crystal devices.

The import of ICT goods is presented in the table below.

Import of ICT goods in millions of dollars	2016	2017	2018	2019	2020
Total, including:	909.7	1,130.0	1,406.3	1,481.6	1,296.1
Communication equipment	367.3	459.7	557.0	564.4	490.5
Computers and peripheral equipment	198.6	269.8	355.0	324.4	307.9
Household electronic appliances	138.3	178.8	233.8	259.6	223.6
Other ICT components and products	205.6	221.6	260.5	333.1	274.1
The share of ICT goods in the total volume of exports of goods, percent	3.3	3.3	3.7	3.8	4.0
Import of ICT goods in millions of dollars	2016	2017	2018	2019	2020

The leading position is occupied by communication equipment (37.84%), computers and peripherals are in second place (23.76%). In general, the republic imports ICT goods 3-4 times more than it exports.

The export of ICT services is presented below.

Export of ICT services in millions of dollars	2016	2017	2018	2019	2020
Total, including:	1,152.4	1,445.3	1,840.5	2,392.5	2,685.2
telecommunication services	190.0	234.5	248.1	264.2	154.8
computer services	951.5	1,195.9	1,573.0	2,105.3	2,509.9
information services	10.8	15.0	19.4	23.0	20.5
The share of ICT services in the total volume of services exports, percent	16.8	18.4	21.0	25.0	30.7

The leading position is occupied by computer services (93.47%), accounting for 28.7% of the total export of services of the republic.

The import of ICT services is less than the export of services.

Import of ICT services in millions of dollars	2016	2017	2018	2019	2020
Total, including:	231.6	236.1	279.1	403.9	423.1
telecommunication services	110.6	122.0	143.9	171.1	122.9
computer services	113.2	106.0	127.0	223.5	291.2
information services	7.8	8.1	8.2	9.2	9.0
The share of ICT services in the total volume of services exports, percent	5.4	5.0	5.5	7.2	8.7

4.5. Key Players

Best Mobile Developers in Belarus 2022



NewIT

R>ght

Studio Right

LOVATA

LOVATA



MEGA.BY



SKY INCOM

Top Software Developers in Belarus 2022



BelHard
Development



WEB Secret



MEDIALIME

dash
BOUQUET

DashBouquet

Best Design Agencies in Belarus 2022



Borovoy Studio



IQUADART

Red Graphic

Red Graphic

N NORT

Nort Digital Agency

5. Investment potential and prospects for the development of the industry

5.1. Investments and investment attractiveness of the industry

There is a stable inflow of foreign investments in the ICT sector (table below).

Investment in the ICT sector

Indicator	2016	2017	2018	2019	2020
Investments in fixed assets received in the ICT sector, USD million.	327.18	345.94	380.67	361.48	296.64
to the total volume of investments in fixed assets, %	3.50	3.20	3.10	2.60	2.50
Investments in fixed assets received in the IT industry, USD million.	35.02	31.62	56.19	58.67	73.76
to the total volume of investments in fixed assets, %	0.40	0.30	0.50	0.40	0.60
Foreign investments received in the ICT sector organizations, USD million.	366.70	509.20	585.80	715.40	642.80
to the total volume of foreign investments, %	4.30	5.20	5.40	7.10	7.40
Foreign investments received in the organizations of the industry FROM, million dollars.	194.80	221.00	256.00	293.20	363.20
to the total volume of foreign investments, %	2.30	2.30	2.40	2.90	4.20

Over the period from 2016 to 2021, investments in fixed assets in the IT industry increased by 138.73% (accounting for 0.7% of total investments in fixed assets), and foreign investments - by 186.81%. Foreign investments in IT account for 6.4% of the total volume of foreign investments in the republic.

The IT industry can be described as one of the most attractive in terms of investment. This is facilitated by the special management regime of the residents of the Hi-Tech Park, as well as a set of preferences for them.



5.2. Export potential of the industry

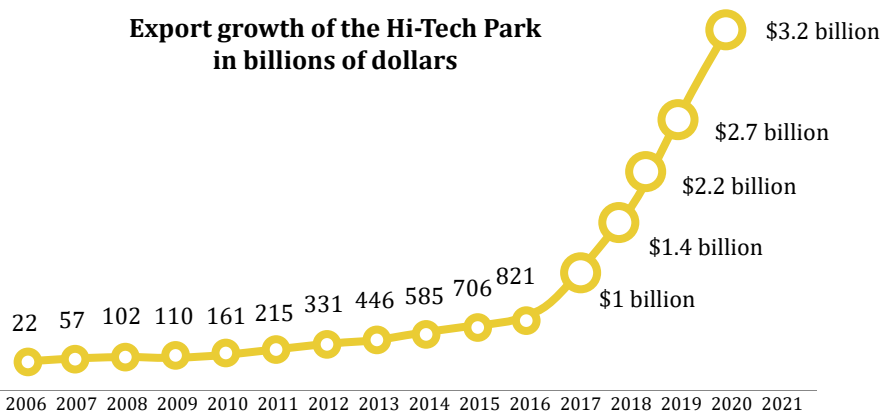
The United Nations Conference on Trade and Development (UNCTAD) has published statistics for 2021, including exports of computer services from UN member states. According to the data presented, in 2021, the export of computer services per capita in Belarus increased by 20% and amounted to \$320. A year earlier, this figure reached \$267.

At the end of the year, Belarus is among the leaders of Eastern European countries in this indicator. The Czech Republic and Romania also entered the TOP 3.

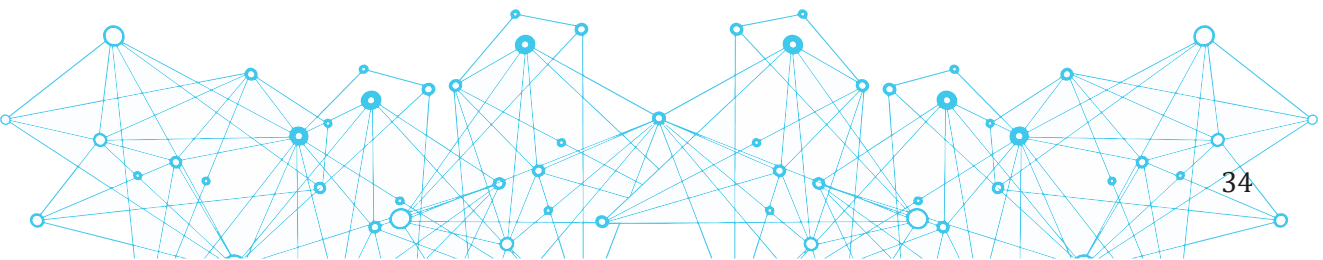
Within a single country, this parameter characterizes the level of development of the IT sector and its significance for the national economy. By the end of 2021, the export of computer services per capita in Hungary amounted to \$276, Poland – \$266, the USA – \$135, South Korea - \$156, Japan - \$75, Russia – \$44, Georgia - \$35.

In Belarus, the export of computer services is provided by the resident companies of the Hi-Tech Park. In 2021, the total export of HTP reached \$ 3.2 billion, the Park accounts for more than 30% of all exports of services to Belarus.

The dynamics of increasing exports from HTP is presented below.



Since 2016, export growth has been exponential, which indicates that there are strong prospects for investing in the industry.



5.3. Prospects for the development of the industry

The state program "Digital Development of Belarus" for 2021-2025 provides for the implementation of measures to create (develop) a modern information and communication infrastructure, the introduction of digital innovations in the sectors of the economy and technologies of "smart cities", as well as ensuring the information security of such solutions (currently 82 events). The improvement of the e-government infrastructure will continue through the creation (development) of a number of interdepartmental information systems that ensure the implementation of state electronic services.

As a result of its implementation, it is planned to further increase the technological level of Belarus' development both nationally and globally, to form a unified architecture of state data and their management policy. And this means creating a digital information ecosystem. Most of the state functions and business processes of organizations will be transferred to electronic form.

If we consider industry solutions, then such areas as public administration (e-Governance), industrial production (Industry 4.0), paperless trade systems (e-Trade), housing and communal services (Smart City), transport and logistics (Intelligent Transport System), energy and petrochemicals (Smart Grid) are promising, agriculture (e-Agriculture), science and education (Science 2.0, Smart Learning).



Moreover, the industry as a whole will undergo serious changes in connection with the transition from digitalization of individual EAEU member states to a single digital market.

Every year, the number of companies, startups and employees in the industry is growing, the volume of foreign investment, wages and gross value added in general is growing. Taking into account the preferences and benefits provided, the IT sector is one of the most promising sectors in the republic.

For foreign investors, such areas as the development of games and mobile applications are the most popular for investment. Fintech, medical technologies, e-commerce and web platforms are also popular.

6. Investment climate

6.1. Macro indicators

In general, the main macroeconomic indicators have positive dynamics. Thus, the GDP for 2021 at current prices amounted to \$68.23 billion. In comparable prices, GDP grew by 2.3% compared to 2020 and 6.1% compared to 2015.

Labor productivity, respectively, amounted to 3.2% compared to 2020 and increased by 11.5% since 2015. The growth of industrial production in 2021 compared to 2020 amounted to 6.5%, compared to 2015 – 19.3%. The growth of real wages in 2021 compared to 2020 amounted to 4.4%, compared to 2015 – 40.8%.

The growth of exports of goods in 2021 compared to 2020 amounted to 32.5%, compared to 2015 – 49.9%. In 2021, the inflow of foreign investments into the economy of the Republic of Belarus amounted to USD 8.7 billion, of which 75.39% – direct, 0.05% – portfolio, 24.56% – other foreign investments. Foreign direct investment on a net basis (excluding debt to a direct investor for goods, works, services) amounted to 15.26%.

6.2. Ratings

To date, the Republic of Belarus has made significant progress in the digital sphere. A developed and world-standard data transmission network, reliable data storage and processing centers, identification mechanisms, online payment systems, modern electronic services and information security tools have been created.

Belarus holds a leading position in the introduction of information and communication technologies in the CIS region.

According to the International Telecommunication Union, according to the ICT index, the country ranks 32nd out of 176 countries.

Belarus took the 14th place in the overall Postal Development Rating (2IPD) and became the leader in the regional group among the countries of Eastern Europe and the CIS

In the UN report on readiness for e-government in 2020, the country was in the 40th position.

According to the "Global Innovation Index 2021", the Republic of Belarus ranked 16th among 132 countries in terms of "Access to ICT" in terms of "Export of ICT services" (telecommunications, computer and information) in the total volume of foreign trade, the Republic of Belarus ranked 11th in the world.

6.3. Preferential regimes

The extraterritorial principle. The legal regime of the Hi-Tech Park operates throughout the territory of Belarus. The company can be registered and located anywhere in the country.

37 types of activities. In addition to traditional software development, companies can develop many areas of high-tech business: from robotics and the Internet of Things to cryptocurrency mining.

Institutes of "English law" for investors. HTP residents can use institutions that have become an international standard – options, convertible loans, joint stock agreements, agreements prohibiting the poaching of employees, non-competition agreements.

Simplified document flow at the conclusion of transactions. HTP residents may conclude foreign economic transactions with foreign counterparties through the exchange of electronic messages and other messages via digital systems; HTP foreign counterparties may not sign primary accounting documents; legislation on the procedure for conducting and controlling foreign trade transactions does not apply to foreign trade transactions of HTP residents.

Convenient relocation and visa-free entry. HTP residents do not need to obtain special permits related to the employment of foreigners. A foreign employee of a resident company can obtain a temporary residence permit in a simplified manner. Visas for foreign workers and founders of HTP residents have been canceled. The maximum allowable period of their temporary stay has been increased to 180 days.

Legal conditions for running a crypto business. Comprehensive legal regulation allows HTP residents to provide crypto exchange services, exchange cryptocurrencies, as well as attract financing through ICO and TSO.



Tax benefits:

0%

- VAT
- income tax
- offshore fee
- customs duties on the import of technological equipment
- tax on income of foreign organizations, including when selling their shares (stakes) in HTP resident companies
- VAT and income tax on mining, purchase/sale and exchange of cryptocurrencies, other operations with tokens
- property tax*
- land tax**

9%

income tax***

5%

tax on income of foreign organizations****

* in relation to objects located on the territory of the HTP (with the exception of leased by HTP residents).

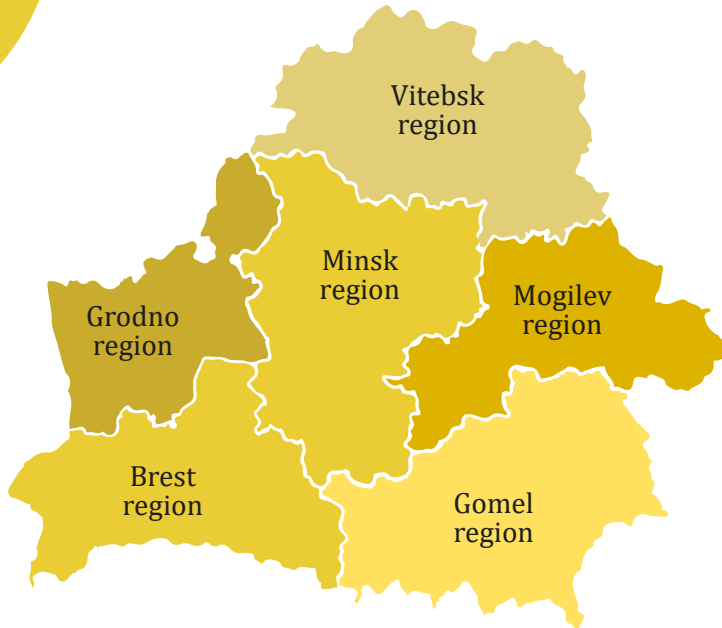
** in relation to land plots within the boundaries of the HTP for the period of construction on them by residents, but not more than 3 years, capital structures (buildings, structures) intended for the activities of HTP residents.

*** In 2021-2022, a rate of 13% is applied as part of measures aimed at combating the COVID-19 pandemic.

**** not operating in the Republic of Belarus through a permanent representative office, when paying dividends to a foreign organization from a HTP resident.



6.4 Investor Roadmap



Investment projects and PPP
>1000

Investment ideas
>700

Concessions
9

**Manufacturing sites
and real estate**
>900

Land plots
>1000



map.investinbelarus.by

More investment projects and ideas, as well as land plots and real estate objects for the implementation of investment projects can be found on the interactive portal "Investor's Roadmap"

National Agency of Investment and Privatization

The Agency is a state institution that provides assistance at no cost or foreign investors interested in launching a business in Belarus:

- provision of information about investment opportunities, preferential regimes and benefits granted, economic sectors and legislation
- provision of up-to-date information about investment projects
- assistance in selection of sites and premises
- search for prospective partners for investment projects, arranging meetings and negotiations for establishing cooperation
- providing a platform for negotiations and support during negotiations
- organization of visits to the Republic of Belarus (schedule development, visa support)
- representation of investor's interests during negotiations with governmental representatives concerning implementation of investment projects, as well as improvement of investment climate in the Republic of Belarus
- aftercare

Follow us: /investinbelarus



+375 17 200 81 75
+375 17 226 41 66

mail@investinbelarus.by
www.investinbelarus.by



+375 17 226 47 98