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# BELARUS



## Chapter I

# ECONOMIC OVERVIEW

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### General overview

Belarus is an export-oriented country in Eastern Europe neighbouring and with strong historical ties to the Russian Federation, the Baltics, Poland and Ukraine. It retained much of its diversified production structure following independence from the Soviet Union, through a significantly slower and more gradual transition to a market economy. The past “golden” decade has seen stable growth and an expanding, export-oriented information and communication technology (ICT) services sector, fuelled in part by reforms that increased openness and macroeconomic stability. The private sector, especially in regard to innovation, is hamstrung by the dominance of State-owned assets, burdensome regulations and ambitious but at times inefficient support mechanisms. Boosting broader experimentation with ideas to create value and increase productivity will be essential for Belarus to sustain growth in the medium and long term.

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### Reform process

Following the dissolution of the Soviet Union, in contrast to many post-Soviet states, Belarus took a cautious, gradual approach to the transition from a planned to a market economy. This has included modest structural reforms, mainly concentrated in restructuring, rather than offloading. With little progress on privatization, State-owned enterprises (SOEs) (box I.1) have inhibited the development of the private sector as a potential driver for growth and continue to impede productivity (World Bank, 2018). Belarus ranked 49th of 190 economies in the 2020 *Doing Business* indicators, after moving up 42 positions since 2010 (when it ranked 91st), a reflection of concerted efforts to streamline administrative procedures. It lags far behind in several areas particularly important for promoting innovation, such as credit and equity capital and insolvency resolution.

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### GDP growth

GDP growth, at 3.1 per cent in 2018, declined to 1.2 per cent in 2019; the ICT sector alone contributed 0.5 percentage points, the same amount as the combined contribution of the agriculture, transport and industry sectors.<sup>1</sup> The country’s strong relationship with the Russian Federation has ensured below-market energy supplies, government revenue from reselling and sustainable access to credit, fuelling growth and productivity. Recent reforms have stabilized the currency and reduced inflation, increased macroeconomic stability, simplified some areas of regulation and increased openness to trade and investment

(figure I.1). GDP per capita (current international US dollars) has been rising, from \$5,023 in 2016 to \$6,663 in 2019. National incomes have risen steadily, driving consumption, and GDP per capita based on purchasing power parity (current international US dollars) increased from \$17,726 in 2016 to \$19,943 in 2019, the highest in the Eastern Europe and the South Caucasus (EESC) sub-region (World Bank, 2020a).

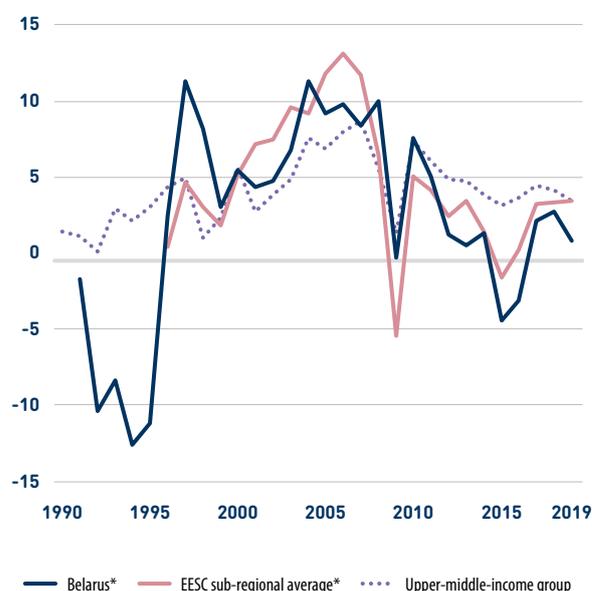
Despite having recovered from a two-year decline, the Belarusian economy remains vulnerable to external shocks while SOE debt remains high. It still made up 14 per cent of GDP in 2019. Gross capital formation in Belarus in 2019 was almost 29 per cent of GDP, the highest in the EESC sub-region, ahead of Georgia (27 per cent). Nonetheless, new and sustainable drivers of growth will be needed to compensate for diminished returns. Belarus recorded the lowest share of remittances in the EESC sub-region, amounting to 2.3 per cent of GDP in 2019 (World Bank, 2020a), and labour productivity has slowed since 2010, weakening growth in real income, pensions and wages.

The ratio of government expenditure to GDP has been declining since 2015 but remained above 35 per cent in 2018, whereas public debt grew to 36.7 per cent of GDP that year, further constraining fiscal space. A recent increase in the current account deficit to 1.8 per cent of GDP in 2019 – mainly caused by the recent decrease in merchandise exports and tensions in energy relations with the Russian Federation, resulting in lower energy subsidies (energy taxes) – is straining the economy and intensifying the need to enhance productivity.<sup>2</sup> If not addressed, lack of productivity in combination with the country's vulnerability to external shocks may significantly impede further growth of the economy.

## Foreign direct investment

Foreign direct investment (FDI) in Belarus has maintained a steady share of GDP over the past decade, accounting for 2.02 per cent in 2019 (World Bank, 2020a), slightly higher than in Armenia (1.86 per cent) or in Ukraine (1.98 per cent). Efforts have been made to protect investors and attract efficiency-seeking FDI. In addition to seven free economic zones, Belarus has constructed the High-Tech Park (HTP) and the Great Stone Industrial Park (GSIP) (in partnership with China), providing a preferential tax system among other benefits (chapter IV). Nonetheless, SOEs receive a substantial share of capital investment (box I.1), which they use much less effectively than does the private sector (World Bank, 2018). As government revenue decreases further, including through the impact of pandemic-related restrictions and falling global demand, the need to allocate systematically – to allocate resources to better use – will grow more pronounced. The vehicle for this, of course, is broad experimentation with new ideas, mostly through the nascent but hamstrung private sector.

**Figure I.1 • Annual GDP growth, 1990–2019 (Per cent)**



Source: UNECE, based on data from the World Bank (2020a).

\*Missing data for the Republic of Moldova (1990–1995); Belarus, Armenia, Azerbaijan and Belarus (1990).

## Box I.1 State-owned enterprises

The share of SOEs in Belarus is significantly high than in other transition economies. Specifically, in 2019, 12.4 per cent of firms were either fully or partially State-owned. They owned 67.6 per cent of overall fixed assets in 2016 and employed approximately 56.7 per cent of the labour force in 2018, though their value added to revenue was only a third of that of private firms. Despite preferential treatment, such as better access to (in)direct financial support from the Government, the competitive performance of SOEs is inhibited by structural weaknesses and inefficient corporate governance.

*Source: IMF (2017), Belstat (2019).*

## Sectoral composition

The country remains the most diversified economy in the EESC sub-region with developed, largely export-oriented industry; several pockets of high value added production; and a solid tradition and institutional basis for advanced applied research, maintained from the Soviet era. Since the 1990s agricultural production has plummeted, accounting for barely 6.4 per cent of GDP in 2018, and nearly 60 per cent of agricultural production is concentrated in highly subsidized State-owned farms, a legacy of the Soviet Union's agriculture policy (World Bank, 2018). Nevertheless, Belarus remains the third largest producer of rye and flax fibre globally. Services accounted for 47.7 per cent of GDP in 2018, followed by manufacturing (21.5 per cent), mainly driven by the manufacture of food products and refined petroleum (World Bank, 2020b). Although the petroleum sector is riddled with inefficient SOEs (IMF, 2017), the modest scale of reform efforts in this sector continues to prevent the further diversification of the economy.

## Demographics

The population growth rate in Belarus between 1994 and 2013 was consistently negative, with values between 0 and -1 per cent. The rate increased to a peak in 2015 (0.159 per cent), but in 2018 again turned negative, at -0.16 per cent (World Bank, 2020a). Although outmigration has remained relatively low, between 1991 and 2018 the share of the rural population declined consistently, from 33.6 per cent to 21.4 per cent. Unemployment has been declining since 2017 and was at 4.6 per cent of the total labour force (modelled estimate from the International Labour Organization (ILO)) in 2019, the lowest in the region (World Bank, 2020).

## External position

The economy is highly export-oriented, with total trade at 139.34 per cent of GDP (World Bank, 2020b) and a diversified export structure. Belarus is a member of the Eurasian Economic Union along with the Russian Federation, Kazakhstan, Armenia and Kyrgyzstan.

In addition, foreign trade potential is being explored with more distant country partners – the GSIP is a free economic zone, part of the New Silk Road project with China. Following the accession of Belarus to the World Trade Organization (WTO) in 1993, the country initiated a bilateral Partnership and Cooperation Agreement with the European Union (EU) in 1995; it has yet to be ratified.<sup>3</sup> The largest potential for the economy is in the country's diversified, export-oriented manufacturing sector, specifically in mechanical engineering, metallurgy, pharmaceuticals and electronics. Demand for ICT services exports has experienced significant growth and, next to transportation services, has been one of the main drivers of overall services exports (chapter II) (EY, 2017). In 2018, the products exported from the country were led by refined petroleum (19.7 per cent), potassic fertilizers (8.28 per cent) and delivery trucks (4.59 per cent), with the rest distributed across the HS2 categories of animal products, metals, machines, plastics and rubbers, wood products and textiles. Belarusian production depends highly on the Russian market, the destination for over 90 per cent of its agricultural exports and 38 per cent of its merchandise exports (OEC, 2020). Belarus enjoys revealed comparative advantages (RCAs)<sup>4</sup> across several product groups, such as machinery and transport equipment, crude materials and mineral fuels, as well as chemicals and related products (UNCTADstat, 2020). In line with this distribution, in 2018 the index of merchandise concentration for exports showed a value of 0.18, which makes the country's exports the second most diversified in the EESC sub-region, after Ukraine (0.14)<sup>5</sup> (UNCTADstat, 2020).

On the 2020 Competitive Industrial Performance (CIP) Index, Belarus scored highest among the EESC countries (0.063), ranking 47th out of 152 countries and confirming the high contribution of manufacturing to the national economy (UNIDO, 2020).

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## Institutional quality

Belarus scored –0.7 for institutional quality, below the EESC sub-regional average of –0.3, as proxied by an average of World Governance Indicators. This average score indicates weak performance on the rule of law, control of corruption, government effectiveness, and voice and accountability. This score reflects the gradual approach to the market economy transition that Belarus has taken and the overall emphasis on government control of the economy. In many ways this approach has served the country well. As the importance of innovation for the sustainable development of the economy grows overall, it discourages and raises the cost of capital for entrepreneurship in general – and risk-taking experimentation in particular, reflecting a systemic constraint on innovation.

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## Sustainable development

Belarus has significantly reduced poverty, with 5.6 per cent of its population living below the national poverty line in 2018 (down from 41.9 per cent in 2000). Nonetheless, certain challenges remain. The inequality in household income between the richest and poorest regions of Belarus remains substantially high due to the differences in opportunities available in certain regions (World Bank, 2018).<sup>6</sup>

A strength of Belarus is the female tertiary enrolment rate, which was as high as 95 per cent in 2018 (gross), compared with the lower rate of male enrolment, at 80 per cent. That said, significant discrepancies remain, as the labour-force participation rate (modelled ILO estimate) started declining from 58.8 per cent in 2016 to 57.7 per cent in 2019. It remained substantially lower than for men (71.8 per cent) in 2019. The lack of institutional support of women (OECD, 2015) thus leaves female entrepreneurship a largely untapped resource. There is significant underused potential to make better use of the human capital of women, especially after having invested in their education.

Despite some efforts, environmental sustainability remains a challenge. Following energy disputes with the Russian Federation, Belarus commissioned the construction of a nuclear power plant in Astravets, to be finalized in 2020. Nonetheless, challenges remain in sustainable agriculture, waste management, water pollution and public environmental awareness (UNDAF, 2015). According to the 2019 Global Innovation Index (GII), Belarus ranks 99th with regard to GDP per unit of energy use, both a country and an income-group weakness (Cornell University, INSEAD and WIPO, 2019).

## Synthesis

This table presents the main achievements of and challenges for the economic development of Belarus, based on the findings described in this chapter.

### Progress made so far

- Facilitated doing business through simplified regulatory procedures
- Diversified exports with high value added manufacturing and services
- Strong industrial development in various sectors of the economy
- Reduced poverty and gender inequality over the past decade
- Enhanced growth of ICT service exports

### Challenges ahead

- Expand structural and SOE reforms for a successful transition to a market economy.
- Increase international trade openness to reap the benefits of high value added production.
- Enhance labour productivity and competition on the domestic market to retain income growth.
- Foster, through careful and efficient use of government resources, private sector development to enable increased export diversification and innovation.

Source: UNECE.

## Notes

- <sup>1</sup> World Bank, The World Bank in Belarus, *Economic Overview*, 30 June 2020.
- <sup>2</sup> World Bank, The World Bank in Belarus, *Economic Overview*, 30 June 2020.
- <sup>3</sup> EC (European Commission), Trade Policy Belarus, 11 June 2020.
- <sup>4</sup> The RCA database, created by UNCTADstat, measures trade patterns between countries based on their relative productivity. It does not take into account national trade measures, such as subsidies and (non-)tariff regulations.
- <sup>5</sup> In a range between 0 and 1, a value closer to 0 indicates higher levels of export diversification.
- <sup>6</sup> World Bank, In Belarus, inequality between regions requires new policy approach, says World Bank report, 25 September 2018.

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## Chapter II

# INNOVATION PERFORMANCE OVERVIEW

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### Innovation climate

Belarus has significant potential for innovation and innovation-driven economic development. It has a highly educated population and a skilled workforce, a strong tradition of fundamental and applied research in several important fields, and a relatively diversified economy with a strong international position in ICT and pockets of excellence in manufacturing. These are remarkable achievements because the overall business environment is still not particularly supportive of innovation and does not sufficiently encourage experimentation and risk taking, particularly in the private sector. As a result, the country's investments in education and research have so far not resulted in as much innovation as they might, and there is significant room for policy reforms to improve the business and innovation climate so that Belarus can reach its full potential.

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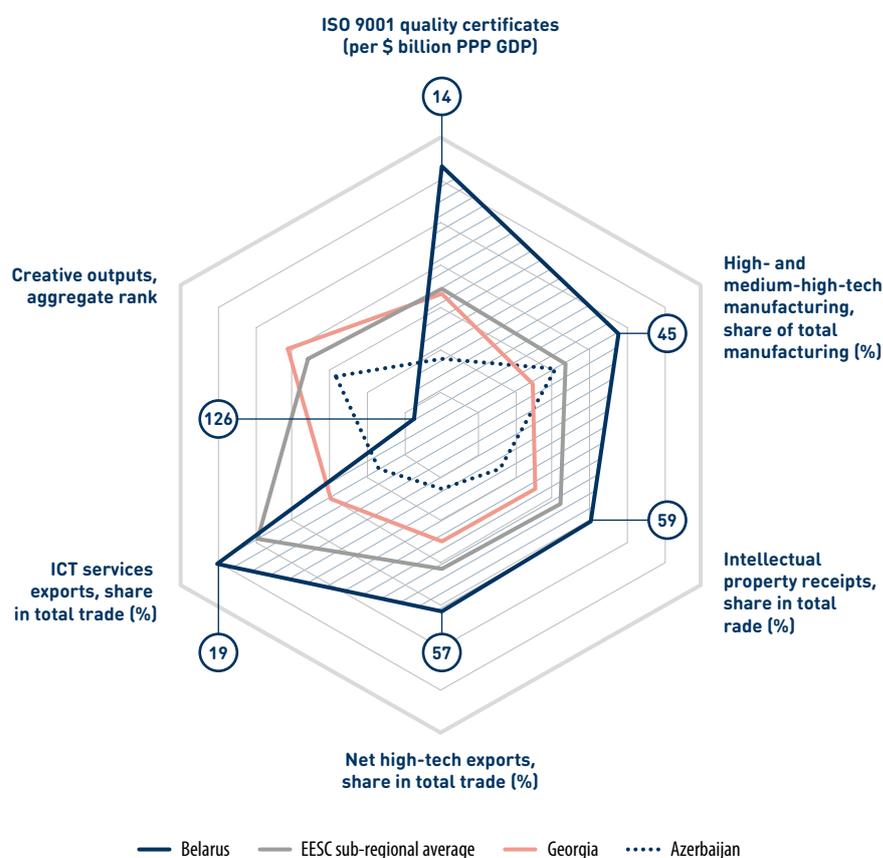
### Innovation outcomes

Belarus is ranked 72nd out of 129 economies in the 2019 GII (Cornell University, INSEAD and WIPO, 2019) and 19th among 34 upper-middle-income countries. Although its overall innovation performance is in line with its current level of development, that is still well below its 2015 rank (53rd), signalling that the economy has not improved at the same rate as its peers in the innovation sphere. Figure II.1 on the following page depicts the Belarusian innovation performance in selected output indicators, as ranked globally in the 2019 GII.

Overall, the country performs relatively well in terms of key innovation outputs, exceeding the EESC sub-regional average in five of the six categories. Belarus ranked among the global leaders in quality certificates from the International Standards Organization (ISO) (at 14th), outperforming by far the rest of the EESC countries (22.2 per \$1 billion in purchasing power parity of GDP, as opposed to 1.2 in Azerbaijan and 3.3 in Georgia, for example). This reflects the country's skilled workforce and its tradition of applied research, which enable Belarusian companies to meet international quality standards – a key prerequisite for upgrading technology, competing in foreign markets and entering international value chains.

Another area where the innovation performance of Belarus stands out is in the ICT sector. Over the past decade, the ICT sector experienced rapid growth, nearly doubling its share

**Figure II.1 • Innovation performance by selected GII indicators, 2019 ranks**



Source: UNECE, based on data from Cornell University, INSEAD and WIPO (2019).

Note: Lower values signify stronger performance.

of GDP (to approximately 5 per cent in 2017) and accounting for a significant share of intellectual property registrations (World Bank, 2018a). ICT service exports surged from 8 per cent (2010) to 18.4 per cent (2017) of total service exports, ranking the country 19th worldwide (EY, 2017). According to UNCTAD data, the share of ICT goods in total trade also increased, reaching 0.75 per cent in 2018 (from 0.52 per cent in 2015) (UNCTADstat, 2020). Belarus is ranked 32nd in the ICT Development Index, published by the International Telecommunication Union, and is considered one of the countries with good ICT infrastructure, comparing well with others across the EESC sub-region and beyond. Indeed, the number of fixed broadband subscriptions per 100 people is higher in Belarus (approximately 34 in 2018) than in Armenia (12) and Azerbaijan (19) and higher than the upper-middle-income group average (22) (World Bank, 2018a). In terms of computer software spending, however, Belarus ranked 107th in the GII, revealing that organizations place higher priority on replacing outdated equipment than on investing in software process innovation. In 2018 the highest share of ICT expenditure went to computing machinery and office equipment (24.6 per cent), followed by ICT-related services of other organizations and specialists (22.7 per cent), whereas software took up 19.3 per cent.

Belarus also has the highest share of high-tech and medium-high-tech manufacturing in total manufacturing (approximately 30 per cent) in the sub-region, and the second highest share of high-tech exports (1.8 per cent of total trade, behind only Ukraine), and scored above average on intellectual property receipts (revenues from selling or licensing Belarusian intellectual property abroad).

The National Statistical Committee of Belarus (Belstat) collects data on enterprise innovation activity every year, allowing for analysis and identification of market needs, innovation gaps and areas of competitive advantage. In 2019, 24.5 per cent of the industrial organizations surveyed (405 firms) were considered active in innovation, an increase in both share (from 15.4 per cent in 2010) and absolute number (from 324 firms in 2010) (Belstat, 2020). Although it is commendable that Belstat conducts national surveys of enterprise-level innovation activity, an expansion of the indicators measured would serve well to identify non-technological innovation trends.

The innovation output indicator on which Belarus does not perform well is creative outputs, with one of the lowest ranks in the world (126th). Although several indicators in its composite score bring its position down, including national feature films (105th), printing and other media as a percentage of manufacturing output (90th), and generic top-level domains (83rd), the main reason behind its low global positioning is lack of data on the other indicators – entertainment and media market, ICT and business model creation, and ICT and organizational model creation.

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## **Innovation activity – channels, strengths and weaknesses**

A key policy issue for Belarus is the innovation performance of the private sector, and particularly of small and medium enterprises (SMEs). Innovative, high-growth enterprises can be key drivers of overall innovation, and economic growth, competitiveness and sustainability.<sup>1</sup> Innovation across the SME sector, however, is modest – only 3.48 per cent of SMEs introduced product or process innovations in 2018, while barely 0.76 per cent introduced marketing or organizational innovations. The OECD's Project Report (2017) found that Belarusian SMEs operate on very small scales, mostly in non-innovative, low-productivity industries, which explains their limited contribution to total value added (OECD, 2017). Indeed, innovation is not a driving force in sectoral development, with the exception of a few, such as machine building and metallurgy.

Strong sectoral synergies can be a key driver of product development and knowledge transfer; however, in Belarus those synergies are weak: between 2015 and 2018 less than 0.5 per cent of SMEs collaborated with other SMEs (Belstat, 2020). In addition, with scarce venture capital and rigid support frameworks, the impediments to attaining long-term finance remain a significant constraint on the efficiency and growth of innovative SMEs (chapter IV) (EBRD, 2016).

### **International knowledge transfer**

Innovation dynamics in Belarus, as in other post-Soviet transition economies, significantly depend on absorbing new technology and research and development (R&D) spillovers

from abroad. The aggregate score on knowledge absorption ranked Belarus 101/129 in 2019, and the economy exhibited modest performance in inward FDI (chapter I). Hrechyshkina and Samakhavets (2018) suggest that although FDI is an important driver of investment by Belarus in innovation, the fluctuations of FDI investment inhibit the full exploitation of the country's innovation potential. They further highlight the importance of securing a stable flow of FDI for the innovative development of Belarus. Inward foreign investment concentrates mainly in the Minsk region (over 69 per cent), with trade and transport activities proving most attractive for foreign investors. In the 2019 GII, Belarus ranked 109th on high-tech imports, which accounted for barely 5.1 per cent of total trade, constraining further improvements of intermediary inputs and production processes, and thereby new and improved final products.

## Investment in R&D

Gross expenditure on R&D in Belarus accounted for 0.6 per cent of GDP in 2018, the highest share among the EESC countries (World Bank, 2020). The country ranked 29th in the 2019 GII, with 43 per cent of gross expenditure on R&D financed by businesses and 14.1 per cent sourced from abroad (Cornell University, INSEAD and WIPO, 2019). Nevertheless, R&D investment is still low when compared with the upper-middle-income group average (1.6 per cent in 2017) (World Bank, 2018a) – and there is no sign that Belarus is narrowing this gap.

In 2018, only 12 per cent of the expenditure on technological innovations went to R&D for new products, services and processes, while 23 per cent went to industrial designs and other pre-production activities, and 65 per cent to the acquisition of machinery and equipment related to technological innovation (Belstat, 2020). This suggests that innovation in Belarus to a large extent concentrates on modernizing machinery and using new equipment effectively yet lacks broader knowledge-intensive activities.

Most R&D is conducted in State-owned organizations that focus predominantly on technical sciences. To capitalize on its innovation capacities, Belarus needs to improve its enabling business environment and improve the ability of the business sector to absorb knowledge and apply it to innovating.

## Skills development

A principal strength of the Belarusian economy for innovative development is its abundant capabilities in both human capital and research. In 2019, 86.7 per cent of the eligible population was enrolled in tertiary education, of which 33.2 per cent were graduates in science and engineering (ranked 6th globally). The 2019 Quacquarelli Symonds university ranking includes two of the country's higher-educational institutions (HEIs). Despite the high enrolment rates, however, a slight decline since 2013 (from 93.5 per cent) (World Bank, 2018a) suggests a mismatch between the current education supply and labour-market demand.

Some 39.2 per cent of the labour force is employed in knowledge-intensive occupations, the highest share among the EESC countries. Thus, focusing on matching educational skills with the requirements of the labour market is essential for the economy to make optimal use of its human capital, as highlighted in the World Bank's Systematic Country Diagnostic report (World Bank, 2018b). Furthermore, R&D activity concentrates predominantly

in research institutes and HEIs; the largest research institution remains the National Academy of Sciences (NAS), which employs approximately 5,500 researchers. In 2018, the number of people employed in R&D grew to 27,411; the majority are employed as researchers (65 per cent), followed by supporting staff (28.8 per cent) and technicians (6.2 per cent) (Belstat, 2020).

## Synthesis

This table presents the main achievements and challenges in R&D and innovation (RDI) inputs for Belarus, based on the findings in this chapter.

### Progress made so far

- Foreign and domestic investment in R&D (still) relatively high compared with neighbouring countries
- Strong science and research tradition and high tertiary education attainment, creating a pool of highly skilled human capital
- Relatively high share of high-tech exports in total trade, as well as of medium- and high-tech manufacturing
- Rapidly growing ICT sector with a strong international competitive position in services exports

### Challenges ahead

- Increase business sector innovation by strengthening the business climate, sectoral synergies, the absorptive capacities of firms, their ability to cooperate with research institutions, and their access to risk financing.
- Match the skills acquired through education with the requirements and structure of the labour market.
- Further increase high-tech imports and FDI to boost international knowledge transfer and diffusion.
- Expand data collection on the innovation activity of firms to include indicators of non-technological innovation.

Source: UNECE.

## Note

<sup>1</sup> Apanasovich et al. (2016) studied 489 Belarusian SMEs, comparing the impact of two modes of innovation on both their technological and their organizational levels, namely technological and scientific innovation (science, technology and innovation mode) and learning-by-doing, learning-by-using and learning-by-interacting (doing-using-interacting mode). They found that a combination of the two modes is most efficient in generating technological innovation (including product and/or process innovation). They also found significant positive correlation between organizational and non-technological innovation (doing-using-interacting), providing evidence for the hypothesis that learning-by-doing could be the most efficient mode for generating product innovation. Their findings have been confirmed by several research studies that concluded that good organizational and managerial practices heavily influence the adoption of innovations and have large marginal impacts on innovative development in transition economies (OECD, 2017; EBRD, 2019).

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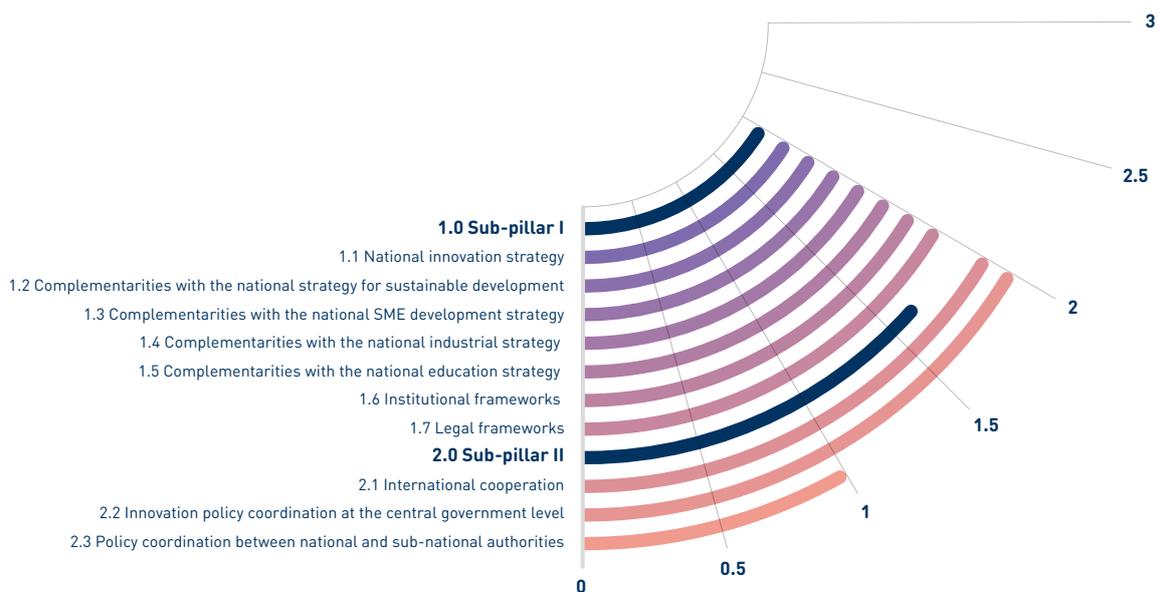
## Chapter III

# PILLAR I: INNOVATION POLICY GOVERNANCE

*The first pillar of the IPO reviews the overarching strategic, institutional and legal framework for innovation policy, as well as the competences of and coordination among government bodies involved in innovation policy. This review assesses the extent to which innovation policy governance is sound, well-structured, efficient and flexible.*

## National innovation policy governance – strengths and weaknesses

**Figure III.1 • Scoring of sub-pillars: innovation policy governance**



Source: UNECE.

Note: Each indicator is assessed using a score from 3 to 0. The highest score (3) is given to fully fledged policy initiatives and mechanisms that can provide mutual learning opportunities for the EESC sub-region. A score of 2 is assigned if a policy initiative is operational. An indicator receives 1 point if a policy initiative is under development. The lowest score (0) is given if a country does not have a specific policy mechanism, strategic document or policy initiative. The indicators are based on an extensive questionnaire answered by government agencies and external consultants. The questionnaire consists of open, binary and multiple-choice questions. Additional statistical data supplement the formal assessment framework by informing on key socioeconomic trends and context conditions. Statistical data are not directly integrated into the qualitative indicators but are used to guide scoring decisions. For more information, please refer to Methodology and Process.

Over the last few years, Belarus has developed a robust system of science and innovation, though some improvements are needed in governance, cooperation and coordination. The State Programme on Innovation Development 2016–2020 and the National Strategy of Sustainable Socioeconomic Development 2030 govern the implementation of national innovation priorities. Mechanisms developed for ex-ante and interim assessments help to make strategic initiatives more effective and enable policy learning; however, in Belarus, evaluations of policy initiatives occur sporadically and are not fully implemented. National strategies are accompanied by action plans that establish detailed measures for achieving policy objectives and set mandates for responsible government authorities. Strategies in other domains, including education and the development of SMEs, are operational and linked with the State Programme on Innovation Development. Institutional and legal frameworks are robust enough to support innovation policy. Yet, some areas for improvement remain. To successfully implement policy initiatives, government authorities for science and innovation policy need to improve the quality and capacity of governance. International cooperation in innovation activities in the business sector is rather limited because of the current investment climate in Belarus. Policy coordination between national and subnational authorities occurs sporadically and needs to be further developed.

**Table III.1 Overview of sub-pillars and indicators for innovation policy governance**

Sub-pillar I: Innovation Policy Frameworks	Sub-pillar II: Innovation Policy Coordination
National innovation strategy	International cooperation
Complementarities with other policy areas	Innovation policy coordination within the central government and between national and subnational authorities
Institutional frameworks	
Legal frameworks	

Source: UNECE.

## Sub-pillar I: Innovation policy frameworks

*Given the many government levels involved in the design and implementation of innovation policy, it is vital to have a strategic document containing the Government’s overarching vision.*

### National innovation strategy

The national science and innovation policy in Belarus is governed by numerous policy documents and national strategies. The most recent documents that set priorities for long-term development are the National Science and Technology Strategy 2018–2040 adopted by the Presidium of the NAS in 2018, the State Programme on Innovation Development 2016–2020 and the State Programme for Socioeconomic Development 2030. The latter

set out a goal to increase the share of innovative and high-tech products in exports from the current 16 per cent to 25 per cent and the number of innovative enterprises as a share in the total number of companies from the current 20 per cent to 30 per cent by 2030.

The five-year State Programme on Innovation Development 2016–2020 steers science and innovation policy in Belarus. The State Programme for Socioeconomic Development puts innovation among five key priorities for medium-term development. It also outlines national objectives to support the development of the national science and innovation ecosystem and to accelerate collaboration between academia and industry. The Government regards science and innovation as important instruments to support the green economy and meet the Sustainable Development Goals (SDGs). The SDGs are incorporated into the socioeconomic development programme and other related strategic documents.

In 2019, the State Committee for Science and Technology (SCST) started developing a concept for the State Programme on Innovation for 2021–2025 and elaborating the next cycle of R&D programmes jointly with the NAS and line ministries. The programmes will be based on the updated list of national science and technology priorities for 2021–2025, to be approved in 2020. Informed by a 2018/2019 technology foresight exercise conducted by the SCST, the list of priorities includes selected research fields. Previously, Belarus had two lists, one for research priorities and one for scientific and technological development.

By 2030, the Government plans to raise the share of public expenditure on RDI to 2.5 per cent of GDP and create favourable conditions for private investment in RDI to grow to be up to 70 per cent of all such spending. It also plans to raise the contribution of science and innovation to socioeconomic development with an increase of the share of high-tech products in industrial production to 10 per cent and an increase of labour productivity to \$50,000 per employee. This ambitious vision can be realized if Belarus succeeds in resolving structural problems in the national science and innovation system and mitigating budgetary constraints caused by the COVID-19 pandemic. In Belarus, many large firms face challenges in modernizing technical equipment and developing innovative solutions. Some private enterprises and many public companies mainly use technologies from the mid-20th century. Low levels of market competition and the dominance of SOEs in several sectors also hinder the growth of innovation.

The State Programme on Innovation Development 2021–2025 is accompanied by changes in legislation and regulations targeted at encouraging entrepreneurship, developing the national innovation infrastructure and supporting nascent industries with high potential. It contains a list of national projects that strengthen the competitive positions of Belarusian research and industry and create the conditions for economic modernization.

Public research funding is distributed mainly through State programmes for scientific research (SPSRs) and State science and technology programmes (SSTPs). They distribute about 30 per cent of overall research funding, define policy priorities and assign government authorities to specific tasks of science and innovation policy initiatives. The SSTPs give special attention to supporting research commercialization and making possible positive socioeconomic effects of scientific research. The relatively short duration of projects funded by the SSTPs poses challenges for innovation grant recipients, as certain technological applications require significantly longer durations of funding. The strict compliance requirements of the SSTPs negatively affect the risk-taking behaviour

of grant recipients and thus do not contribute to technological breakthroughs and radical innovation. Significant constraints related to the use of public funding prevent scientists and firms from being eligible to receive State support and from using it with the utmost effectiveness. The choice of projects for funding depends on their alignment with the national priorities for science and innovation development.

Innovation in the business sector is seriously constrained by high interest rates, legislative gaps in regulating FDI and weak collaboration between academia and industry (EBRD, 2016; EU4Business, 2018; UNECE, 2017). Limited access to finance for enterprises and the scarcity of skills and competences among the workforce constrain the ability of Belarusian companies to innovate. The Government is experimenting with direct and indirect support mechanisms to fuel innovation-led economic growth, some of which do not show the desired effects. For example, RDI tax incentives do not contribute as much to growth in innovation as expected. A lack of information on the availability of these incentives, complex application procedures and the associated exposure to frequent inspections and checks decreases the efficacy of such incentives. The limited linkages between academia and industry remain an acute issue, negatively affecting research commercialization and innovation in the business sector.

### **Complementarities with other policy areas**

Innovation policy in Belarus is dispersed across several strategic documents. In 2018, the Government adopted the SME promotion strategy, which seeks to increase the competitiveness of the economy by 2030. The contribution of SMEs to the economy remains limited due to imperfections of the business environment. Compared with the EU countries, where SMEs contribute to about 60 per cent of employment, in Belarus SMEs account for merely 33 per cent. The SME promotion strategy therefore aims to contribute to sustainable and inclusive economic growth and enable favourable institutional and economic conditions for entrepreneurial activities. It establishes a number of measures for increasing the gross value added by SMEs to 50 per cent by 2030, from 28.1 per cent in 2015. The Government continues on its course of removing regulatory barriers and simplifying legislation on public procurement, business establishment and insolvency. Yet, Belarus still treats public entities and private firms differently with regard to taxation, access to government support and competition policy. In order to spark growth in innovation in the country, the preferential regime for SOEs should be replaced by policy frameworks that ensure more equal treatment of private firms. Further development of SMEs is hindered largely by legal and regulatory requirements and by the nascent institutional frameworks (OECD, 2017). The country still needs a well-functioning SME development agency with a mandate to formulate, design and implement policy initiatives.

The National Industrial Development Programme, adopted in 2012, defines government actions aimed at strengthening the industrial complex in Belarus. One of its objectives is to increase the share of high-technology exports. It aims to achieve higher levels of technological intensity through a set of measures including the creation of industrial laboratories at HEIs and public research institutes, and the launch of joint research and production centres and specialized engineering centres. In addition to this programme, a number of sectoral initiatives support the development of industrial sectors. Examples include the State Programme for the Development of the Pharmaceutical Industry 2016–2020 and the State Programme for the Development of the Engineering Complex 2017–2020.

The State programme “Education and Youth Policy” was developed to improve the quality and accessibility of education in accordance with the needs of the innovation economy and the information society. The programme facilitates the satisfaction of the educational needs of citizens and supports the development of the potential of young people. Programme performance is assessed using two main indicators: improvement of the position of Belarus in the United Nations Human Development Index and involvement of young people in youth policy initiatives. The priorities of the education policy are to achieve the digital transformation of education and to modernize the technological infrastructure required for teaching.

## **Institutional frameworks**

The SCST is the major State institution supporting the formulation, design and coordination of science and innovation policy. Operating under the Council of Ministers, it is charged with the following functions:

- Formulate, implement and evaluate science and innovation policy initiatives.
- Coordinate national science and innovation policy.
- Plan the budget for research and innovation.
- Coordinate international cooperation in science, technology and innovation (STI).
- Develop national innovation infrastructure.
- Commercialize research.
- Support innovation activities in SOEs.
- Create favourable conditions for protecting intellectual property rights (IPRs).

Jointly with the NAS, the SCST develops national forecasts of science and innovation that help government institutions conceptualize policy documents. The SCST also manages allocations of the Belarus Innovation Fund (BIF) and monitors the effectiveness and the targeted use of financial resources for innovation support.

The BIF, founded in 1999, funds innovation activities in Belarus, strengthens international cooperation on science and innovation, and contributes to developing innovation infrastructure. It distributes approximately 18 per cent (\$26.6 million in 2018) of all public expenditure on R&D. It allocates funds only to projects that have a strong innovation component related to national science and innovation priorities. In addition to equity financing, the BIF provides innovation vouchers for start-ups. The vouchers have not become popular because of the complexity of the application process and the limited access to information about them. To increase the effectiveness and efficiency of funding schemes, the BIF could simplify its application procedures and streamline its reporting workflows. To support the development of radical innovations in high-risk markets, it could launch venture financing schemes that do not require full repayment in the case of project failure.

The NAS has a complex hierarchical structure that brings together the most important R&D organizations in the country. It includes some 70 research organizations as well as a number of laboratories, design bureaux, production facilities, experimental stations and other support bodies. Formally, the NAS has a very high administrative status, equivalent to or even higher than that of a ministry: it reports directly to the President and the Council of Ministers.

An important recent trend in NAS activity has been its growing emphasis on commercializing some of its R&D results. This matches a similar change in the general orientation of Belarus STI policy, as reflected in some recent legislative and regulatory changes. Thus, the downstream production facilities within the NAS, established with the specific purpose of commercializing its R&D results, have been steadily growing in both the size and the volume of their commercial output. Another recent development has been the formation of a number of clusters, in response to the recent government policy initiative supporting cluster development. Unlike in some other countries, cluster formation in Belarus is a State-led process, not the result of interactions among public and private innovation actors. The NAS coordinates fundamental research in Belarus and, similarly to the line ministries, plays the role of State customer for several ongoing SSRPs and some SSTPs. No decisions on science and innovation policy are made without the participation of the NAS.

## Legal frameworks

Belarus has a detailed legal framework for innovation policy and has worked to amend it and harmonize priorities across documents. The main legal act defining the frameworks for the development of science and technology is the Law on Innovation Policy and Innovation Activities (10 July 2012), which was developed on the basis of the Model Law on Innovation Activity No. 27-16 of the Intraministerial Assembly of the Commonwealth of Independent States. The law establishes key principles, definitions and arrangements for State innovation policy. The policy was designed on the basis of the State Innovation Development Programme, which covers a period of five years and is ratified by the President. Ministries and a broad group of government agencies can design separate innovation development programmes and strategic documents for their areas of expertise, thus contributing to the formulation of national science and innovation policy.

In 2019, an interdepartmental working group created by the SCST introduced a set of amendments to the Law on Innovation Policy and Innovation Activity that clarified its main terms and described the competences and functions of government agencies with responsibilities related to science and innovation. The amendments also set an order for designing, funding and implementing the State Programme on Innovation Development and designated funding sources for the national innovation infrastructure.

The President's Edict on STI activities (No. 197, 27 May 2019) harmonizes strategic documents, outlines new measures and approaches for accelerating research and innovation activities, and defines the functions and roles of public authorities. It sets an objective to create an enabling environment for Industry 4.0 and for the development of precision agriculture and personalized medicine in particular. It lays down a foundation for developing favourable legislative frameworks that will enable highly effective STI activities. It also calls for introducing mission-oriented research in the design of funding mechanisms for public research and expanding public-private partnerships and venture capital investment to tackle scientific and technological challenges. The Edict establishes a single list of priorities for RDI activities that will steer science and innovation starting in 2021:

- Digital transformation and ICT technologies
- Biological, pharmaceutical and chemical technologies
- Energy, construction and environmental management

- Engineering, machine building and materials science
- Agriculture and food technologies
- Social well-being and national defense

Discrepancies in legislation in Belarus need to be addressed. For instance, definitions of novelties and innovation differ in some laws, making the laws restrictive. The Government needs to pass supporting legislation to ensure the complete implementation of legal frameworks that have the desired results. The Government is already updating the Law on Innovation to align it with the current challenges and new conditions of the national science and innovation system.

Sub-pillar I IPO evaluation and recommendations			
Achievements			
<ul style="list-style-type: none"> <li>✓ Belarus has a long-standing culture of scientific research and existing centres of research excellence.</li> <li>✓ The country has a relatively long history of well-structured and systematic approaches to science and innovation policy.</li> </ul>			
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• The capacities of government agencies to support innovation policy are insufficient.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Build capacity in designing, formulating and implementing innovation policy initiatives in government agencies and foster public sector innovations to increase the effectiveness and efficiency of policymaking.</li> </ul>	Medium-term	Government
<ul style="list-style-type: none"> <li>• The potential use of policy mechanisms to support in the business sector is untapped.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Implement measures to increase innovation activities in SOEs, enable higher levels of competition in the domestic market and provide targeted support to innovative enterprises through direct and indirect support measures.</li> </ul>	Medium-term	Ministry of Economy
<ul style="list-style-type: none"> <li>• Cooperation between academia and industry and commercialization of research are both limited.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Implement concerted actions targeting the promotion of an entrepreneurial spirit among public organizations conducting RDI, increasing the quality of research and its alignment with business needs, and improving the business environment.</li> </ul>	Medium- to long-term	Government

Source: UNECE.

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## Sub-pillar II: Innovation policy coordination

*Coordinated approaches help avoid overlapping, duplicating or omitting actions required to implement innovation policy successfully.*

### International cooperation

International cooperation is an integral element of innovation policy. Among the main priorities of the State Programme for Innovative Development 2016–2020 are the development of international cooperation on STI and the export of high-technology products and technologies. Belarus has signed agreements for scientific and technical cooperation with 48 countries and participates in international projects using joint research infrastructure, including the Large Hadron Collider and nuclear research in Dubna.

As a member of the Eurasian Economic Union, Belarus actively cooperates with other member countries on science and innovation. The operational regulatory supranational body is the Eurasian Economic Commission. One of its first practical cooperative steps in supporting innovation was to establish the Centre for High Technologies, a Eurasian venture company whose mission is to support high-growth, early-stage, high-tech, innovative companies targeting the market of the Eurasian Economic Union. In 2016, an innovation fund for venture capital investment was founded jointly by the BIF and the Russian Venture Company to accelerate innovation activities. Because of constraints of the Belarusian legal system, the fund was registered in Russia, but it promotes innovation in Belarusian companies and supports joint projects between the two countries.

Restrictions on business activities and the investment climate mean that Belarus does not attract significant FDI (IMF, 2018). Yet credit resources and borrowed funds are attracted, mostly from China and the Russian Federation, and the EU to a lesser extent. The outflow of highly skilled professionals, especially in the IT sector, may undermine the future socioeconomic development of Belarus. Global competition for skilled workers is increasing. To retain the economy's qualified workforce and attract talented professionals from abroad, working conditions and career prospects in Belarus need to improve.

With regards to international comparisons, Belarus initiated the design of statistical indicators for comparative evaluation of Belarus with the other countries covered by the EU Innovation Union Scoreboard. Statistics are developed annually and published for 16 of the 25 indicators; the other indicators are not included at this stage because of data scarcity. Methodological harmonization was undertaken to update forms used for statistical reporting by institutions carrying out R&D. Other reforms addressed innovation-related statistics and the nomenclature of economic activities and products. For example, since 1 January 2016, national classifications have been harmonized with the latest relevant international versions, by activity (NACE 2008) and by product (CPA 2008).

Despite all the positive efforts to upgrade methodologies and mechanisms for collecting statistics, some important constraints remain. For instance, Belstat's enterprise survey of innovation activities focuses only on R&D expenditures and innovation output (that is, sales of innovative products). It does not cover some other critical aspects of

the innovation activity of modern firms (for example, product and process innovations, collaboration with external partners). Another challenge concerns the population of the national innovation survey, which has yet to cover a representative sample of firms from all sectors.

## Innovation policy coordination within the central government and between national and subnational authorities

The SCST is a republican government body that implements State policy and regulates and manages STI activities, as well as protection of IPRs. It coordinates activities in these areas with other republican government bodies and is subordinate to the Council of Ministers. The Council of Ministers is chaired by the Prime Minister and includes ministers and other senior officials, as well as leading national scientists. The SCST and the Council of Ministers coordinate national innovation policy at all stages, ranging from conception to final evaluations.

The national innovation system is governed by the President, the Council of Ministers, republican government bodies, the NAS, other state organizations and local governments. Regional authorities are not actively involved in formulating and designing science and innovation policy. They can allocate land within the framework of an investment agreement, but in general, this does not apply to mechanisms of innovation. Many regions (for example, Vitebsk, Gomel) have established technology parks, either directly or through their utilities, and provide direct funding support from innovation funds.

Sub-pillar II		IPO evaluation and recommendations	
Achievements			
<ul style="list-style-type: none"> <li>✓ Belarus has had long-standing cooperation in science and innovation with countries of the Commonwealth of Independent States.</li> <li>✓ Functioning coordination bodies and policy mechanisms contribute to improving innovation policy frameworks.</li> </ul>			
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• Increasing international competition for highly skilled workers makes it challenging to retain local talents.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Improve the use of HEIs as effective instruments for attracting talent from abroad and fostering international cooperation in research and innovation. Accompany this effort by creating favourable working conditions and good governance mechanisms.</li> </ul>	Medium to long term	Ministry of Education
<ul style="list-style-type: none"> <li>• Coordination of regional science and innovation policy initiatives is inefficient.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Create mechanisms for identifying and exchanging best practices in formulating and implementing regional science and innovation policy initiatives.</li> </ul>	Medium-term	SCST Ministry of Economy
<ul style="list-style-type: none"> <li>• Integration of domestic enterprises into global value chains is low.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Develop holistic approaches for integrating domestic enterprises into global value chains: harmonizing certification and standards, consulting services for domestic enterprises in management of IPRs and international marketing.</li> </ul>	Medium-term	Government

Source: UNECE.

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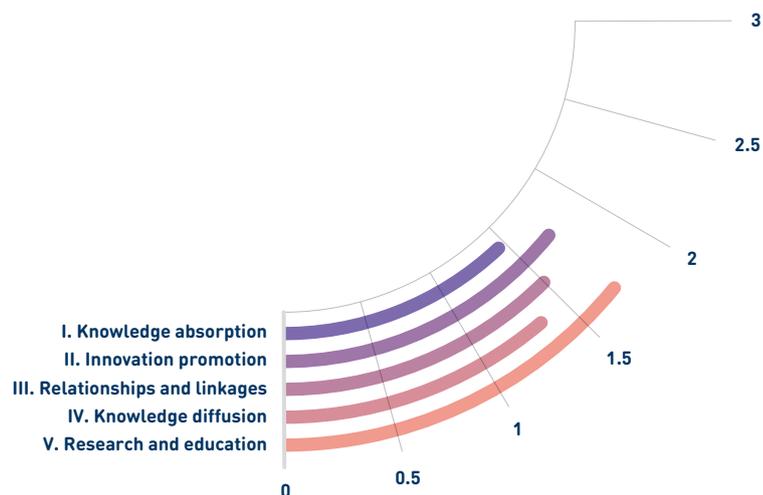
## Chapter IV

# PILLAR II: INNOVATION POLICY TOOLS

*This chapter reviews the policy mechanisms in Belarus that enable, promote and diffuse innovation. It addresses five sub-pillars: knowledge absorption, innovation promotion, relationships and linkages, knowledge diffusion, and research and education.*

## National innovation policy mix – strengths and weaknesses

**Figure IV.1 • Scoring of sub-pillars: innovation policy tools**



Source: UNECE.

Note: The IPO pillar scoring is calculated on the basis of the average quantitative assessment of individual indicators under each sub-pillar. In the evaluation all support measures in a given area are taken into account and special consideration is paid to indirect contributions from external mechanisms. The overall band score for each sub-pillar forms the following generalized categories: 0.0–0.5, No policy instruments/mechanisms exist; 0.5–1.5, Policy efforts are in their initial stage of development; 1.5–2.5, Policy efforts are evident and partial implementation takes place; 2.5+, Policy efforts are comprehensive and monitoring activities are systematic. The scores for individual indicators are as follows: 0, No policy instrument/mechanism exists; 1, A policy measure/s is/are under development /has/have partial or indirect impact; 2, A policy scheme/s is/are operational and implementation has started; 3, Implementation is advanced and evaluation/impact assessment is taking place. Policy measures with sector-specific or partial or non-targeted impact on a given area are subject to case-by-case evaluation. For a more detailed discussion of the IPO scoring methodology, please refer to Methodology and Process.

In line with the State Programme for Innovative Development 2016–2020, the innovation policy mix in Belarus aims at stimulating the development of a knowledge-based economy while harnessing growth in areas with high potential for innovation and for contributing to the Sustainable Development Goals. In this context, the IPO analysis of pillar II found that Belarus performs relatively well on the sub-pillars of *Research and education* and *Innovation promotion*, with room for improvement in the sub-pillars of *Relationships and linkages*, *Knowledge diffusion* and *Knowledge absorption* (figure IV.1). Overall, policy efforts to stimulate innovation demand and supply are evident, yet many are nascent or not implemented according to plan. Indeed, recent years have seen policy support offered for the growing ICT sector and technology start-ups, as well as an overall drive to align public inputs with market needs, including expansion of the innovation support infrastructure, higher-education reforms and support for private sector development. Among the main impediments to commercializing research and to innovation are low access to early-stage finance, a scarcity of entrepreneurial experience and weak industry-science linkages. Policy tools in these areas are often insufficiently targeted to address – and at times even incompatible with – the objective of defraying part of the risk of innovation, a situation that might discourage rather than stimulate innovative development and lead to unintended consequences such as rent-seeking, the creation of entrenched interest and undermining of market competition. Moving towards a knowledge-based economy thus requires policy support measures geared towards building a viable system that enables and promotes experimentation, harnessing the potential of the country’s pool of highly skilled human capital to drive innovative development – all within tight and, over the next decade, probably tightening fiscal conditions.

**Table IV.1 Overview of sub-pillars and indicators for innovation policy tools**

<b>Sub-pillar I: Knowledge Absorption</b>	<b>Sub-pillar II: Innovation Promotion</b>	<b>Sub-pillar III: Relationships and Linkages</b>	<b>Sub-pillar IV: Knowledge Diffusion</b>	<b>Sub-pillar V: Research and Education</b>
Promotion of public and private sector organizational and managerial practices	Business plan and start-up competitions	Innovation voucher schemes	Information and brokerage schemes for technology upgrading	Policies to increase the number of science, technology, engineering and mathematics graduates
Schemes to support the development of technical and business services	R&D loans	Cooperative R&D grants	Standards, testing and certification instruments for SMEs	Policies to foster research development
Fiscal incentives for acquiring knowledge capital	VAT exemptions	Supplier matching services	Industrial technology assistance programmes and extension services for SMEs	
	Technology incubators	S&T parks	Public procurement for innovation	
		Innovation spaces	Digitalization	
		Technology accelerators		
		Business networks and clusters		
		Academia-industry linkages		
		Diaspora networks		
		Gender equality		

Source: UNECE.

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## Sub-pillar I: Knowledge absorption

*The process of assimilating external knowledge plays a substantial role in developing dynamic core competencies, as well as in gaining competitive advantage and creating new value chains.*

### Promotion of public and private sector organizational and managerial practices

Promotion of public sector organizational and managerial practices in Belarus is not implemented under a dedicated scheme at the national level. Instead, separate support measures are in place to strengthen the managerial and organizational capacities of civil servants, as outlined in two presidential decrees: On the State Programme of Innovative Development (2017) and On the Improved Qualifications of Public Sector Personnel (2009). In line with these, the Academy of Public Administration provides short-term courses of advanced training and retraining to about 4,000 civil servants annually.<sup>1</sup> In addition, a system of seminars facilitates the exchange of good practices between State bodies, research institutes and manufacturers, and nine SOEs recently took part in an efficiency training programme funded by the EU. As SOEs account for up to 30 per cent of total value added in Belarus (IMF, 2019) and almost 20 per cent of value added was generated by corporations with more than 50 per cent state ownership (Belstat, 2020), it is essential that appropriate measures are applied to ensure high productivity and performance across all sectors so as to maintain and increase the competitiveness of the country's diversified product basket.

Promotion of organizational and management practices in the private sector is mainly supported through donor-funded and private initiatives. Entrepreneurial associations and chambers of commerce<sup>2</sup> regularly conduct seminars, consultations and round tables on matters such as business management, exports of innovative products and investment attraction. Donors such as the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO) and the Eastern Partnership provide support through international cooperation programmes such as the European Bank for Reconstruction and Development (EBRD) Advice for Small Businesses, implemented since 2011. The Government also needs to make policy efforts in response to the increasing demand for business education and the limited organizational and managerial capacities in the SME sector. Specific measures to enhance the organizational and managerial capacities of SMEs are outlined in the SME Development Strategy "Belarus is a country for successful entrepreneurship" for 2018–2030 (Belarus, Council of Ministers, 2018). According to the strategy, implementation will begin in the principal stage during 2021–2030, following completion of the State programme called Small and Medium-sized Enterprises in the Republic of Belarus for 2016–2020 (Belarus, Council of Ministers, 2016).

### Schemes to support development of technical and business services

Technical and business services (TBS) are not yet fully developed in Belarus and remain supported mainly through donor-funded projects. The EBRD's Advice for Small Businesses

programme is the most prominent example, covering up to 75 per cent of the net costs of consulting projects. Business unions provide registers of support services. The Republican Union of Employers has created a knowledge-sharing platform. The Republican Confederation of Entrepreneurship offers quality assurance and investment advice on TBS to SMEs. Recent positive developments include the establishment of several incubators and entrepreneurship support centres. In addition, a specialized government agency for SME development is being established, as highlighted in the SME Policy Index 2020 of the Organization for Economic Cooperation and Development (OECD, 2019). The agency will aim to strengthen capacities to develop TBS in response to market needs. Indeed, the EBRD Business Environment and Enterprise Surveys (BEEPS IV and V) identify rising demand for engineering and marketing services, leading to a mismatch on the TBS market, which is compounded by low awareness of the role of TBS in business development.

### Fiscal incentives for acquiring knowledge capital

Belarus provides an array of fiscal incentives to resident enterprises of its free economic zones (FEZs), the GSIP<sup>3</sup> and the HTP. Although the fiscal regimes offered by the FEZs and the GSIP aim at attracting FDI and promoting exports by producing new, high-tech and innovative products (Belarus, President of the Republic, 1996; 2012), the HTP regime emphasizes innovative development even more, which contributes significantly to the development of the ICT sector in Belarus (table IV.2). In addition to the fiscal and other benefits that these structures grant (for example, providing services, leasing land at subsidized rates), they stimulate innovation nationally through introducing fiscal incentives for knowledge-based enterprises, as envisioned in the State Programme for Innovative Development 2016–2020. Special privileges exist on the tax discount for profit from innovative and high-tech goods, the latter being granted to agents that obtain over 50 per cent of total revenue from such goods (Belarus, House of Representatives, 2009). This practice differs from fiscal policies applied elsewhere in the sub-region as it directly targets innovation and stimulates production of an approved list of innovative and high-tech goods.

**Table IV.2 Special fiscal regimes within economic zones**

Exemption	FEZs (6)	HTP	GSIP
Income tax	<p><b>10 years</b> for enterprises registered after 31 December 2011</p> <p><b>5 years</b> for enterprises registered before 31 December 2011</p> <p><i>50 per cent reduction thereafter</i></p>	<p><b>Full</b></p>	<p><b>10 years</b></p> <p><i>50 per cent reduction thereafter</i></p>
Income tax from individuals (employees)	<p>–</p>	<p><b>4 per cent reduction</b></p> <p>9 per cent income tax at HTP relative to 13 per cent nationally</p>	<p><b>4 per cent reduction</b></p> <p>9 per cent income tax at GSIP relative to 13 per cent nationally</p>
Property tax	<p><b>Full</b> for properties acquired within three years of registration, excluding property leased by residents</p>	<p><b>Full</b> excluding property leased by residents</p>	<p><b>Until 2062</b></p>
Land tax	<p><b>Full</b> for the first five years after registration</p>	<p><b>Three years</b></p>	<p><b>Until 2062</b></p>

**Table IV.2 Special fiscal regimes within economic zones (Concluded)**

Exemption	FEZs (6)	HTP	GSIP
Dividends tax	–	Full	Full for the first five years of accrual
Value added tax	Full for goods produced with imported equipment and raw materials under the free trade zone regime and sold within the Eurasian Economic Union market, conditional on payment of custom duties for these goods	Full on sales of goods and services produced in Belarus, and services provided abroad	Full on exported goods
Year established	1996 (FEZ Brest)	2005	2012
Establishing decree	Presidential Decree No. 114, 1996 On Free Economic Zones on the Territory of the Republic of Belarus	Presidential Decree No. 12, 2005 On the Hi-Tech Park	Presidential Decree No. 253, 2012 On the Chinese-Belarusian industrial park
Links to strategic policy documents and presidential decrees	National Strategy for the Sustainable Social and Economic Development of Belarus for the period until 2030	Decree No. 8, 2017 On Development of the Digital Economy	National Strategy of Industrial Development of Belarus until 2020 National Strategy for the Sustainable Social and Economic Development of Belarus until 2030
Amount of tax exempted, 2017	\$130.6 million		
Amount of tax exempted, 2018	\$168 million		

Sources: Ministry of Taxes and Belarusian Institute of System Analysis (obtained through IPO self-assessment questionnaire, 2019), Ministry of Economy (Belarus, 2020; EBRD, 2018).

## Sub-pillar I IPO evaluation and recommendations

### Achievements

- ✓ Annual training and re-training of civil servants that let them reinforce and develop professional qualifications are a positive development for public sector organizational and managerial practices.
- ✓ Fiscal incentives for innovation have been introduced that aim to drive the greater development of innovative products and high-tech goods, provided regular impact assessment takes place.

Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>Policy measures do not sufficiently address the rising demand for TBS or the need to develop good private sector organizational and management practices.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Develop targeted measures to catalyse, stimulate and improve provision of TBS by the private sector (for example, co-financing instruments, quality assurance certification).</li> <li>✓ Assess the market for TBS regularly, both to ensure a critical mass of supply and demand responses minimizing the need for intervention and to identify TBS that are new to the domestic market and have high potential for innovative development (for example, new ways to help SMEs develop internal capacities in marketing and engineering at early stages).</li> </ul>	Medium-term	Ministry of Economy
<ul style="list-style-type: none"> <li>Tax assessment is aggregate and does not differentiate the impacts of fiscal incentives, making it difficult to understand the effects of incentives on the economy and on innovation in particular.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Conduct a comprehensive assessment of the existing array of fiscal incentives quantifying the economic effects of each one to ensure efficient policy support.</li> </ul>	Short-term	Ministry of Taxes and Duties

Source: UNECE.

## Sub-pillar II: Innovation promotion

*Promoting innovation requires governments to invest in establishing platforms where young companies can develop and test innovative ideas.*

### Business plan and start-up competitions

The number of start-up events in Belarus has increased significantly in recent years – from 123 in 2014 to 418 in 2019 – signifying the immense growth of the country’s start-up movement. Each year the Ministry of Economy (MoE) approves a start-up action plan with events, including start-up weekends, project competitions, forums and master classes (Belarus, MoE, 2019). The BIF<sup>4</sup> organizes a national innovation competition that aims at commercializing selected projects and closely monitors their implementation. International donors provide further support in the field: the EU-funded project “Support to economic development at the local level in the Republic of Belarus for the period 2019–2022” stimulates entrepreneurship through competitive financial support mechanisms for business incubator, start-up and cluster projects, with a budget of \$9.5 million.<sup>5</sup>

### Support for RDI investment

Obtaining early-stage finance for risk-carrying innovative projects can be challenging for local entrepreneurs. Targeted R&D loans and guarantee schemes are not available, and concessional loans are scarce. A financial support system for SMEs established by the Development Bank in 2014 offers preferential loans to local business owners. Other direct financing instruments available are grants from domestic and international programmes, as well as venture capital. Specifically targeting innovative projects, the BIF offers competitive funding for commercializing research. It has also operated a national innovation voucher and grant scheme since 2013, to stimulate innovative development and support start-ups at all development stages (Belarus, President of the Republic, 2013). Equity financing is available through the Russian-Belarusian Venture Investment Fund (RBF)<sup>6</sup> for start-ups and SMEs. Business angel initiatives have also been emerging, accounting for most seed investment made in the country in 2017.

Nevertheless, funds under some of the schemes have yet to be allocated – the RBF’s portfolio has only one Belarusian project, and the BIF has not yet distributed any vouchers. Additional tax incentives and venture financing are needed, as highlighted in a survey of the innovative activity of 122 Belarusian industrial enterprises performed by the Institute of Economics, at the NAS, in 2017 (Trigubovich, 2017). According to a study funded by the U.S. Agency for International Development (USAID) of venture funding in Belarus, many entrepreneurs do not attempt to raise funds despite their need for seed capital. The main reasons are a lack of experience in attracting investment and a lack of relevant knowledge (Belbiz, 2017). Through Belbiz, as the implementing agency, USAID is working on the legislative framework for venture capital to amend the Tax and Civil Codes as well as the corporate laws. Working groups are reviewing proposed amendments to relevant provisions under the National Centre for Legislation and Legal Studies, the SCST and the MoE.

Funding for commercializing early-stage research can also be obtained from international funds and programmes, such as Horizon 2020, the EU's largest support programme for science and technology development, with a fund of €80 billion (Belarus, Institute of Economics of the NAS, 2019a). Coordinated by the SCST, participation by Belarus in Horizon 2020 has attracted €6.4 million for scientists in 41 projects (as of 2019) over the programme's implementation period.

## Technology incubators and accelerators

The technology incubator scene is at the initial stage of development, though the business support infrastructure consists of 25 incubators and 105 business centres. They mainly support SMEs in organizing entrepreneurial activities, rather than innovation activities. Specifically targeting innovative and science and technology development are four entities that offer incubation services, three of them technology parks. Areas that need improvement are the small scale of technology incubators, their concentration in large cities and the limited range of their services, which often do not cover all stages of development.

Private technology accelerators started to appear in 2013, with the first accelerator being TechMinsk. Four accelerators now operate in the country, providing innovative start-ups with services (IT, financial technology and the like) and private equity investment. Further developments are needed to ensure that Belarusian start-ups remain operational on the domestic market and do not relocate abroad in their search for a greater number and higher level of services, as well as quick access to significant financial resources.

### Sub-pillar II IPO evaluation and recommendations

#### Achievements

- ✓ Business plan and start-up competitions have gained popularity in recent years, supporting the growing start-up movement both nationally and regionally.
- ✓ Policy efforts have been made to expand the business support infrastructure (by establishing new incubators and business centres).
- ✓ Several schemes have been introduced to offer financial support to start-ups at the early stage of development, including competitive funding for commercializing research (through the BIF) and a venture finance mechanism (through the RBF).

Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• Despite the existing support measures, low access to finance still impedes entrepreneurs aiming to realize innovative ideas and obstructs the commercialization of scientific activity.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Expand the policy support for early-stage finance (for example, with start-up grants), and introduce direct financial support for R&amp;D (for example, credit guarantees) to foster innovation activity at all development stages and enable the commercialization of innovations.</li> </ul>	Medium-term	SCST MoE Belarusian Development Bank
	<ul style="list-style-type: none"> <li>✓ Building on ongoing initiatives, and in consultation with potential investors and international finance institutions, conduct a comprehensive assessment of the legislation, macroprudential regulation and oversight relevant to equity funding mechanisms for innovative projects (for example, domestic and foreign venture capital, private equity, pooled funds), aiming to introduce changes to streamline rules, ensure appropriate investor protection and remove unnecessary obstacles to such structures.</li> </ul>		

Sub-pillar II		IPO evaluation and recommendations (Concluded)	
Area for improvement	Recommendation	Time frame	Responsibility
	<ul style="list-style-type: none"> <li>Develop, in consultation with international finance institutions and potential investors, a road map for piloting one or more public-private venture capital funds, privately managed under a clear, SDG-related mandate, redirecting some funds from less successful instruments for this purpose, aiming to catalyse through limited government subsidy and risk defrayal the development of venture capital in Belarus while ensuring that the Government is able to capture and reinvest some of the returns from successful investment.</li> </ul>	Medium-term	SCST MoE Belarusian Development Bank
<ul style="list-style-type: none"> <li>Policy support for innovation promotion does not fully address the incomplete service portfolio of incubators and the insufficient acceleration programmes.</li> </ul>	<ul style="list-style-type: none"> <li>Assess market needs for services offered at incubators (for example, through surveys of start-ups) and integrate the most demanded services in the portfolio of the business support infrastructure (for example, market intelligence services).</li> </ul>	Short-term	MoE
	<ul style="list-style-type: none"> <li>Expand some of the incubator structures by integrating acceleration programmes to help start-ups reach the next development stages.</li> </ul>		
	<ul style="list-style-type: none"> <li>Build on the dynamics on the domestic market, enabling the use of private sector practices.</li> </ul>		

Source: UNECE.

## Sub-pillar III: Relationships and linkages

*Schemes that promote linkages between science and industries help create innovative ecosystems by assisting scientists and businesspeople in commercializing research, creating products and developing organizational processes.*

### Business networks and clusters

The role of supporting business networks in Belarus is assumed mainly by associations of commercial entities and individual entrepreneurs. The Belarusian Chamber of Commerce and Industry (BelCCI) connects its members with potential investors and partners through networking events, organizes bilateral and multilateral negotiations, and provides ad hoc supplier matching services to enterprises. BelCCI has also established a committee on industrial policy and entrepreneurship, providing a discussion platform for businesses to form a unified position on issues of industrial policy, while sustaining an open dialogue with State bodies and with foreign and international organizations. Also supporting business networks are the public association the Minsk Capital Union of Entrepreneurs and Employers and the Republican Confederation of Entrepreneurship, which manage a range of networking activities, including organizing international business-to-business events, conferences, forums and trainings. Furthermore, a centre for industrial cooperation created under the Belarusian Fund for Financial Support of Entrepreneurs will soon make available a comprehensive database of contractors and subcontractors, facilitating linkages between businesses.

Cluster development in Belarus is monitored by the MoE in line with the Concept on the Formation and Development of Innovative Industrial Clusters in the Republic of Belarus

(adopted in 2014). The MoE published an evaluation it conducted in 2019 that included an interactive map of operational, emerging and potential clusters. Four clusters operate in innovative industrial sectors (table IV.3), four are emerging, and 15 groups of business entities have been identified as potential clusters.

**Table IV.3 Operational clusters**

Cluster	Region	Number of organizations
Biotechnology and green economy	Pripyat Polesye	28
Information technology	Minsk	50
Medicine and pharmaceuticals	Vitebsk	10
Innovative instrument engineering	Minsk	10

Source: Belarus, MoE (2019).

## Innovation support infrastructure

The innovation infrastructure in Belarus has been actively developing in recent years; it comprises 25 organizations, of which 16 are technology parks, 8 are technology transfer centres and 1 is the BIF. Positive dynamics are observed in terms of the number, employment and revenues of residents of these entities, with the total volume of their production reaching approximately 0.1 per cent of GDP. In addition to an array of fiscal benefits, the HTP and the GSIP grant their residents access to an international investor network and incubation services; the latter also has an innovation centre for commercializing science and technology activity. Several other parks target innovative enterprises and high-tech industries (table IV.4), some contributing to start-up development at the regional level. Yet, only a few of the registered infrastructure elements have been successful. Many are in the initial stages of development, limiting their activity to leasing premises and physical equipment; these find themselves in need of significant investment and training. In particular, engineering and marketing services are in demand. Only a few entities provide such services, both private parks (for example, EnCata) and public organizations (for example, the Science and Technology Park Polytechnic of the Belarusian National Technical University (BNTU)). The lengthy procedures for allocating financing for developing innovative infrastructure could cause parks to pause construction for lack of funds, shifting priorities away from the development of resident firms. In addition, the start-up movement needs more support to promote innovative entrepreneurship in the regions.

The technology transfer system in Belarus plays an important role in stimulating research commercialization by providing support in three main areas: evaluation of the commercial value of science and technology activity; development of business plans for effective use of resources; and upgrading of technology for increased competitiveness. The Republican Centre for Technology Transfer (RCTT),<sup>7</sup> the leading institution, has the primary goal of enhancing cooperation between researchers, entrepreneurs and investors in Belarus,

and conducts its activity in five regional offices and 30 branches at universities, research institutes and enterprises. The RCTT project “Business Cooperation Centre EEN-Belarus” connects domestic research organizations, universities and SMEs with the Enterprise Europe Network (EEN), fostering cross-border business cooperation, technology transfer and scientific research; the project period is 2015–2021.<sup>8</sup> The IPO analysis found that awareness about the Centre and its activities, however, is not high across the business and start-up community.

**Table IV.4 Selected science and technology parks**

Name	Year of establishment	Location	Scope of activities
BNTU Science & Technology Park Polytechnic	2012	Minsk	<ul style="list-style-type: none"> <li>✓ Provide modern infrastructure and equipment to BNTU students</li> <li>✓ Assist with business planning and search for financing</li> <li>✓ Offer information, marketing and engineering services, intellectual property protection</li> </ul>
Gomel Technopark	2016	Gomel	<ul style="list-style-type: none"> <li>✓ Lease office premises and physical equipment</li> <li>✓ Provide technical and advisory assistance with the production of high-tech goods and services</li> <li>✓ Assist with foreign economic activity and promotion of manufactured high-technology products on foreign markets</li> <li>✓ Provide media coverage of the activities of incubator residents</li> </ul>
Mogilev Technopark	1998	Mogilev	<ul style="list-style-type: none"> <li>✓ Lease specially equipped premises for organizing innovative business</li> <li>✓ Provide advisory services, assisting with investor linkages, launching start-up events, and the like</li> </ul>
Minsk City Technopark	2011	Minsk (city)	<ul style="list-style-type: none"> <li>✓ Lease office, production and warehouse space to innovative start-ups</li> <li>✓ Provide support for implementing innovative projects through educational services, events and equipment sharing, as well as development of the high-tech sphere</li> </ul>
Minsk Regional Technopark	2011	Minsk (region)	<ul style="list-style-type: none"> <li>✓ Lease premises to innovative manufacturing firms</li> <li>✓ Main current activities include processing of tyres, sale of rubber crumb and textile cord</li> </ul>
Technopark Gorki	2017	Gorki	<ul style="list-style-type: none"> <li>✓ Lease premises and equipment to innovative enterprises in agriculture, agricultural biotechnologies and the green economy</li> <li>✓ Assist with commercializing agricultural high-tech and business incubation for scientific projects</li> <li>✓ Provide consulting services and assistance with foreign economic activity</li> </ul>
EnCata	2016	Minsk	<ul style="list-style-type: none"> <li>✓ Provide engineering and consulting services for product development, design engineering and prototype manufacturing</li> <li>✓ Offer software and hardware development, commercial R&amp;D</li> </ul>

Source: UNECE.

## Academia-industry collaboration and mobility

The increasing demand for business education calls for creating stronger linkages between Belarusian HEIs and industry. However, mobility between academia and industry is limited, and no policy tools are implemented to strengthen industry-research networks. Belarus also lacks a common system to stimulate research evaluation between academia and industry, although separate policy elements promote the interaction of scientists with industry. For instance, commercialization of R&D results is one of the criteria for evaluating the activities of doctoral degree candidates. Having implementation certificates indicating close collaboration with industry representatives is also an admission requirement for some technical degrees at HEIs. Bonus payments are added to researchers' remuneration on the basis of assessments of their scientific activity, including commercialization of scientific developments, inventive and patent-licensed work and participation in innovative programmes and projects.

## Diaspora networks

The need to leverage diaspora networks to drive international cooperation is included in the Programme for the Improvement of the Scientific Sphere of the Republic of Belarus (approved in 2013). Bellsa developed a database of more than 500 expatriate scientists in 2012 and studied applicable measures for cooperating with the diaspora. In addition, the Consultative Council for Belarusians Abroad at the Ministry of Foreign Affairs regularly engages with representatives of the Belarusian diaspora, promoting cooperation. Nevertheless, no dedicated scheme has been implemented to attract highly qualified specialists from the pool of nearly 5,000 Belarusian scientists working abroad today.

## Gender equality

Women's empowerment in Belarus is supported by several measures (for example, advisory legal assistance, training, financial support) outlined in the National Plan of Action for Gender Equality 2017–2020, which the Ministry of Labour and Social Protection implements. The main tool for implementing the State policy on employment<sup>9</sup> is subprogramme 1, "Promotion of employment", of the State Programme on Social Protection and Promotion of Employment for 2016–2020, highlighting several measures aimed at increasing women's rate of labour-force participation. In 2018, subsidies to start a business were provided to 761 unemployed women (44.3 per cent of all unemployed people who received a subsidy), and entrepreneurship training was provided to 494 women (64.9 per cent of all number of women who received subsidies). The legislation was examined by the National Centre for Legislation and Legal Studies to ensure the elimination of all norms discriminating against women.

Despite the lack of a dedicated initiative, the Belarusian economy fares well in terms of gender equality. The share of women business owners has been growing over time (chapter II), and women are becoming more actively involved with innovation. This is reflected in international studies, including the 2019 GII ranking of Belarus on the number of women employed who have advanced degrees (first globally), and the EBRD's BEEPS data on the share of companies with female owners who introduce innovations (43.5 per cent) and new products and services (55.1 per cent). Nonetheless, impediments to income equality persist. Potential drivers include a list of professions prohibited to women, as well as social stereotypes and gender roles.

## Sub-pillar III IPO evaluation and recommendations

### Achievements

- ✓ The Government has expanded the innovation support infrastructure, stimulating innovative activity, supporting the creation of synergies and fostering business networking.
- ✓ An assessment framework for clusters makes it possible to identify potential networks and initiatives.
- ✓ Gender-disaggregated data allow effective monitoring and policy evaluation considering equality principles.

Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• Policy support in science-industry collaboration does not sufficiently cover issues such as limited mobility and scarce industry-research networks.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Expand the cooperation between representatives of the scientific community and industry by developing effective interaction mechanisms (for example, industrial PhD programmes, sabbatical leaves, industry-funded research chairs).</li> </ul>	Medium-term	SCST Ministry of Education Ministry of Industry
	<ul style="list-style-type: none"> <li>✓ Set up a monitoring framework for linkages and collaboration between enterprises and public R&amp;D institutions that undertake innovation activity.</li> </ul>	Short-term	SCST
<ul style="list-style-type: none"> <li>• Financial support instruments for collaborative projects between industry and academia do not attract sufficient interest from qualified applicants.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Award unconditional financial support for innovative projects, to expand the pool of applicants and the impact of the scheme on innovative development.</li> </ul>	Medium-term	SCST BIF
	<ul style="list-style-type: none"> <li>✓ Introduce a financial instrument that helps defray innovation-related risk, and promote more experimentation (for example, venture capital funding, co-financing).</li> </ul>		
	<ul style="list-style-type: none"> <li>✓ Develop a set of pilot projects based on the innovation voucher scheme to demonstrate the potentials and functionality of collaborative work and expand the pool of applicants (for example, through innovation success stories, university seminars).</li> </ul>	Short-term	
<ul style="list-style-type: none"> <li>• Policy support to harness the potential of the Belarusian diaspora is not yet consolidated in a dedicated scheme.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Develop a dedicated programme for cooperation and joint activities with the Belarusian diaspora to create linkages with compatriots living abroad and draw from international experience.</li> </ul>	Medium-term	SCST NAS Belarusian Republican Foundation for Fundamental Research
	<ul style="list-style-type: none"> <li>✓ Offer incentives for Belarusian scientists to work on co-publications with compatriots living abroad.</li> </ul>		

Source: UNECE.

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## Sub-pillar IV: Knowledge diffusion

*Mechanisms that ensure equal and widespread access to information are vital to creating an innovative ecosystem in both the public and the private sector, serving as channels for the distribution and intersectoral flow of information.*

### Brokerage services for technology upgrading

A coordinated scheme for brokerage services for technology upgrading is not implemented at the national level in Belarus, yet separate initiatives contribute partially in this area. The Republican Confederation of Entrepreneurship organizes seminars, forums, international brokerage and business matchmaking events.<sup>10</sup> Also, some technology transfer centres at universities provide scientific support for implementing innovative activities, along with exhibitions, fairs and direct transaction assistance. Technology offers and requests are listed on the RCTT's website, facilitating links between entrepreneurs and public research institutions.

### Public procurement for innovation

The system of public procurement for innovation presents challenges for scientific and technical development in Belarus. Specifically, the Law on State Innovation Policy (2012) outlines the stimulation of innovative activity through public procurement as a potential support measure, yet implementation of such stimulus has not begun. The general complexity of the public procurement system is identified as a main obstruction in this regard. To avoid having pricing policies hinder entrepreneurs' access to the market, fair competition practices need to be further ensured.

### Digitalization and e-governance

The rapid growth of the IT sector in Belarus suggests the ample potential for the digital transformation of the country: in 2018, exports from the HTP grew by 38 per cent. Thus, the need to train highly skilled specialists in IT management and digital processes is growing, but is not yet sufficiently addressed. Moreover, the development of the Belarusian software industry has not yet led to digitalization of industry and the economy. Therefore, digital information, communication and interdisciplinary technologies are a priority area for national science and technology policy supporting innovation (Belarus, Institute of Economics of the NAS, 2019a). Specifically, the development of broadband infrastructure was among the objectives of the State Programme for the Development of the Digital Economy and the Information Society for 2016–2020. Despite promising developments (chapter II), further efforts are needed to ensure full-scale regional connectivity. Regular improvement of the unified portal of e-services (launched in 2003) contributes to the development of full-fledged e-governance, and plans are under way to create a national open data portal for government agencies and organizations to host publicly available information. Access to data is also enabled through the open statistics database provided by the National Statistical Committee.

## Other policy tools

The existing policy tools do not sufficiently address present gaps in knowledge diffusion in Belarus with regard to leveraging the potential of standards, testing and certification instruments for SMEs and industrial technological assistance. Nevertheless, the State Committee for Standardization of the Republic of Belarus (Gosstandart) has made efforts to provide both mandatory and voluntary conformity legislation in the form of assessments, to ensure the conformity of products and processes with technical specifications and national and international standards, in line with the technical normative legal acts. Similarly, according to the SCST, some science and technology parks have made efforts towards providing industrial technology assistance (see table IV.4), by establishing technology parks for instance in the IT sector, with support from the HTP (SCST, 2018).

Sub-pillar IV IPO evaluation and recommendations			
Achievements			
<ul style="list-style-type: none"> <li>✓ Policy support for developing the digital economy has contributed to improved e-governance and access to data.</li> </ul>			
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>The existing policy support tools do not sufficiently address issues that hinder public procurement of innovation in the public sector, impeding the competitiveness of innovative goods and services.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Stimulate innovative development on the demand side through public procurement (for example, consider adopting a pre-commercial procurement approach to drive the development of innovative solutions according to the public sector's needs).</li> </ul>	Medium-term	Ministry of Antimonopoly Regulation and Trade
<ul style="list-style-type: none"> <li>Stimulation of R&amp;D and innovation is not incorporated in the State procurement system.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Amend the national procurement legislation, selecting performers of R&amp;D activities (funded in whole or part from the State budget) in accordance with the results of the State scientific evaluation.</li> </ul>	Short-term	SCST Ministry of Antimonopoly Regulation and Trade
<ul style="list-style-type: none"> <li>Ad hoc initiatives providing industrial technology assistance and brokerage services for technology upgrading are not sufficiently matched to the needs of innovative SMEs.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Foster technological modernization in SME production processes by integrating relevant industrial technology assistance in the service portfolio of science and technology parks (for example, market intelligence services, technical assistance, mentoring).</li> </ul>	Short-term	SCST
<ul style="list-style-type: none"> <li>Policy efforts do not sufficiently ensure that high-quality IT education and training are available to the growing pool of professionals seeking employment in the IT sector.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Expand the IT training base to foster a new generation of specialists and enable the digital transformation of the economy (for example, through a specialized IT education institution or an educational programme on IT and digital transformation for managers).</li> </ul>	Medium-term	Ministry of Education, Hi-Tech Park

Source: UNECE.

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## Sub-pillar V: Research and education

*Recognizing the requirements of today's labour markets and rapidly evolving technological environment, governments have pursued a multidisciplinary approach to education through science, technology, engineering and mathematics (STEM) initiatives. Policy measures to enhance research are designed to promote research excellence, collaboration and commercialization.*

### Policies to increase the number of STEM graduates

According to Belstat's annual report on education in the country, 33.1 per cent of total enrolment<sup>11</sup> in 2018 was in STEM disciplines (Belstat, 2019). The State programme "Education and Youth Policy" and the State Programme for Innovative Development 2016–2020 include measures to increase the number of STEM graduates, including student exchange programmes, teacher industry placements and seminars by lead experts in the innovation sphere. In 2018 the Ministry of Education launched a pilot project, "Improving the activities of higher-education institutions based on the University 3.0 Model", adding a systematic interconnected study of innovation and entrepreneurship to the education programmes at HEIs, as well as high-tech projects in the framework of science-oriented training. STEM education in Belarus is further supported by the non-governmental sector: The Education for Future association, which has supported the STEM infrastructure in secondary education since its establishment in 2017, has created a network of 14 STEM centres. The association runs national STEM competitions, offers teacher training modules and envisages the establishment of STEM hubs at universities to support industry-science linkages, regional development and increased student enrolment in STEM-related fields at HEIs.

### Policies to foster research development

Research funding in Belarus is based on a broad regulatory framework and is allocated in accordance with a five-year cycle of State programmes to support scientific and innovative activities (currently in the period 2016–2020). In 2018, R&D expenditure accounted for 0.61 per cent of GDP with funds spent on experimental development (60.5 per cent), applied research (27.4 per cent) and fundamental (12.2 per cent) research. Of note is a trend of distributional changes observed in the period 2015–2018, marked by increased expenditures for experimental development on account of reduced spending for basic research (Belarus, Institute of Economics of the NAS, 2019b). This signifies that a critical mass of activities with ample potential for commercialization exists in Belarus, unlike in other countries at the same level of development. Central to innovation is the State Programme for Innovative Development (2016–2020) implemented by the SCST, which includes objectives to improve innovation policy governance, tools and processes in the country. Also in place are the State programmes for scientific research and for science and technology: 16 SSRPs and 17 SSTPs on the basis of approved priority areas, providing non-repayable funding to R&D projects.<sup>12</sup> Research organizations, however, often face difficulties in obtaining project financing, while stimulus for innovation activity in the public sector (for example, grants, scholarships) is scarce. According to the analytical

report on the scientific development of Belarus in 2017 (UNECE, 2017), 0.2 per cent of GDP was allocated to STI activity from the central government budget, out of which funding for innovative projects amounted to merely 1 per cent.<sup>13</sup> In 2017, the Council of Ministers approved a framework for competitive funding provided from the Republican Central Innovation Fund, which is a positive development in this direction.

Cross-border research cooperation is one of the priorities of the NAS, which currently comprises 38 joint international centres and 75 research institutes. Since 2017, the NAS has also been the headquarters of the International Association of Academies of Sciences, which has 15 full members including all national academies of the EESC sub-region. Belarusian researchers can also apply for funding through the Horizon 2020 programme, and the SCST each year announces calls for bilateral international projects with selected partner countries. In addition, best practices in research and innovation are continuously identified, drawing on intensive historical cooperation with EU member states, the Russian Federation, former members of the Commonwealth of Independent States and other countries worldwide. For instance, the Institute of Economics of the NAS has recently performed a number of studies to identify levers for innovation development, drawing on the Chinese experience in innovative entrepreneurship (Belarus, Institute of Economics of the NAS, 2019b), infrastructure (Belarus, Institute of Economics of the NAS, 2019c), and commercialization (Belarus, Institute of Economics of the NAS, 2019a).

## Sub-pillar V IPO evaluation and recommendations

### Achievements

- ✓ Policy efforts have been made to increase the emphasis of university curricula on STEM-related fields and to develop innovation infrastructure at Belarusian HEIs so as to boost research commercialization.
  - ✓ Regular monitoring of State programmes in research, science and technology allows for identification of potential inefficiencies and continuous improvement.

Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• Policy support to increase the number of STEM students is not consolidated in a dedicated scheme for stimulating STEM education.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Promote STEM education by developing a dedicated scheme with an action plan, outlining specific activities and incentives, including promotional instruments (for example, national STEM camps, competitions, a virtual network) and financial instruments (for example, scholarships, State-funded places in STEM-related fields).</li> </ul>	Medium-term	Ministry of Education
<ul style="list-style-type: none"> <li>• The separation of State programmes for developing STI hides the potential risks of inefficiencies and fragmentation in terms of implementing set objectives.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Leverage the well-developed monitoring system to conduct a comprehensive assessment of State programmes in innovation, science and technology to identify potential overlaps and improvements.</li> <li>✓ Consolidate STI development objectives.</li> </ul>	Medium-term	SCST NAS
<ul style="list-style-type: none"> <li>• Existing policy measures have not led to a systematic exploration of the commercialization potential of outputs from the public research system.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Expand the incentives for research and innovation to promote innovative activity in the public sector by offering additional incentives for commercialization (for example, competitive grants for selected projects and scholarships for young researchers) and ensure good working conditions (for example, modern equipment, fair remuneration).</li> </ul>	Medium-term	SCST Ministry of Education

Source: UNECE.

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## Notes

- <sup>1</sup> The pool of trainees consists of 50 categories of management personnel from various state bodies and SOEs.
- <sup>2</sup> Examples include the Belarusian Chamber of Commerce and Industry and the Republican Confederation of Entrepreneurship.
- <sup>3</sup> The GSIP was founded by an investment partnership between China and Belarus. The main shareholders are China National Machinery Industry Corporation (SINOMACH), China Merchants Group, China CAMC Engineering Co., Ltd., Harbin Investment Group Co., Ltd., Great Stone Industrial Park Administration and Duisburger Hafen AG.
- <sup>4</sup> BIF initiatives are implemented under the management of the State Committee on Science and Technology (SCST). For the period 2010–2018, 15 winners obtained commercialization certificates in the National Innovation Competition.
- <sup>5</sup> The project is implemented by the Ministry of Economy of the Republic of Belarus jointly with UNDP.
- <sup>6</sup> The RBF was established in December 2016 as an investment partnership by Belinfond (50 per cent), the Russian Venture Company (RVC) (50 per cent) and RVC Infracfund (1 per cent).
- <sup>7</sup> The RCTT was established in 2003 under the aegis of the SCST, the NAS, UNDP, and UNIDO.
- <sup>8</sup> The project BCC "EEN Belarus" was prepared by RCTT and the Republican Confederation of Entrepreneurship with the participation of the Centre of System Analysis and Strategic Research (CSASR) and the Belarusian Institute of System Analysis (BelISA).
- <sup>9</sup> The Law of the Republic of Belarus "On Employment of the Population of the Republic of Belarus" No. 125-Z, 2006.
- <sup>10</sup> The initiators of the RCE are the Minsk Capital Union of Entrepreneurs and Employers; regional business associations of Brest, Vitebsk, Grodno and Mogilev; the Republican Trade Union Sadruzhnast; regional Centres for Entrepreneurship Support; and a number of foundations, public associations and other organizations.
- <sup>11</sup> The reported share consists of 20.4 per cent in technical disciplines and 12.7 per cent in physics, mathematics, chemistry, biology and earth sciences.
- <sup>12</sup> In addition, 11 sectoral and 6 regional programmes for science and technology are active.
- <sup>13</sup> The low share attributed to innovation projects markedly implies exclusion of national innovation funds, such as the BIF.

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## Chapter V

# PILLAR III: INNOVATION POLICY PROCESSES

*Pillar III examines the underlying processes for innovation policymaking: how data, evidence and stakeholder input inform how decisions are made, put into practice, monitored and evaluated. Ten detailed policy indicators address each step in the policy process, from problem identification or market failure to policy design, implementation, evaluation, impact assessment and learning.*

*In consultation with the SCST of Belarus, UNECE selected the SSTPs for assessment, on the basis of these criteria:*

- i) The policy measure is intended to foster science, technology and innovation (STI) in the country.*
- ii) The policy measure reflects the standard innovation policy practices in the country.*

*Pillar III also derives broader policy lessons for innovation policymaking.*

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## **Innovation policy processes – strengths and weaknesses**

Government decision-making in Belarus is top-down. The planning and decision-making process of the SSTPs is well structured, as is the application and selection process. The private sector plays a limited role in their implementation, and public scrutiny of government work and participation in policy design are limited across the bodies responsible for STI policymaking. A positive development has been the adoption of the Law on Regulatory Acts (2018), which introduced regulatory impact assessment (RIA) in the process of preparing legal acts.

One of the biggest challenges for Belarus is to move from promoting technology development, which is done through industrial policy, towards promoting innovation, where the risk component of the projects financed is more important. The risk-averse aspects of the SSTPs reduce the potential for innovation. Several mechanisms have been established throughout the course of the SSTPs to monitor and evaluate them.

Overall, however, monitoring and evaluation practices across ministries and State committees still have little systemic linkage to policy design.

## Policy overall: science and technology programmes (grants)

Science and technology programmes – more commonly referred to as public grant schemes for innovation and/or R&D projects – are the most common type of funding instruments used by policymakers to address innovation-related market and system failures, such as failures of coordination and capability. Grants within such programmes vary in their size, duration, eligibility requirements (such as R&D, commercialization, collaborative innovation and purchase of equipment or services), payment procedures, repayment requirements and delivery mechanisms. Most grant types are competitively based and usually target science-industry collaboration (World Bank, 2020).

Country experiences reveal several good practices for effective grant scheme design and implementation:

- Eligibility and selection criteria need to be clear. The types of activities and expenditures eligible for support should also be specified.
- The broader national objectives should be reflected in the selection criteria and the specific objectives (World Bank, 2010). Providing grants to collaborative projects that involve firms with limited R&D experience could increase the number of SMEs performing R&D in the long term. Yet, if the objective is to increase investment by firms in R&D, the target should include economic actors that have R&D experience (Caloffi et al., 2019).
- Competitively based allocation of funds makes possible improvements in performance, unlike direct institutional allocations (Jacob, 2013).
- Marketing grants to potential beneficiaries is essential to avoid creating a small group of actors dependent on grants (World Bank, 2020).
- Automating grant application, selection and management (for example, through smart forms, standardized contracts and online applications, reporting and payments) would reduce the burden of participation for firms. Studies show that, unlike researchers, firms – particularly small ones – generally lack both the necessary resources and experience in applying for grants (World Bank, 2020).
- Transparent decision-making processes are essential. Applications should be assessed by independent experts or through a committee, both free of political interference. Maintaining separate units for policy-setting, technical evaluation, management and governance are good practices (World Bank, 2010).
- The monitoring and evaluation process should be used for learning and adapting the funding mechanism as needed (World Bank, 2020).

## Policy focus: the SSTPs

The SSTPs are one of the most comprehensive funding mechanisms in Belarus to support applied R&D in specific priority areas. They provide approximately 30 per cent of public research funding. Altogether, they are the means to reach the indicators set up in the Programme of Social and Economic Development, which is approved for five-year periods.

The SSTPs primarily aim at funding small innovation projects and applied R&D in Belarus, which, in sum, are supposed to help solve national economic problems and, individually, aim to promote linkages between academia and business. The scheme is administered by the SCST, which makes the call for proposals and coordinates the evaluation of applications and selection of beneficiaries.

The SSTPs are developed for five-year periods, usually with two years (but no more than three) allocated for R&D and design and three years for the production cycle and commercialization of the project. The SSTPs are structured around subprogrammes (17 subprogrammes in the 2016–2020 financing cycle), which are based on the list of priority scientific and technical activities in the Presidential Decree. Subprogrammes in turn include several “tasks” (projects) that receive grants. The amount of such grants is not predetermined and is proposed by applicants. In the current cycle, the amounts range from \$12 million to \$730 million.

The SSTPs have two funding modalities. For those considered to make a strong social contribution (for example, in health), the R&D stage is financed from the government budget. In all other cases, the government budget covers up to 50 per cent of the R&D costs, while the other part is funded from non-budget sources (end users, beneficiary’s own funds, investors, and the like). The budget contribution can originate from the republican budget (on the line “Financing science, technology and innovation activities”), the local (oblast) budget or the Republican Centralized Innovation Fund. The commercialization stage which includes the launch of serial production of new products piloted and tested at the R&D and design stages, is financed from non-budget sources and the Fund.

Grants can cover the following expenses:

- Materials and accessories
- Salaries of researchers and developers
- Social insurance contributions
- Business trips of researchers and developers
- Works and services of third-party organizations and individual entrepreneurs
- Overhead costs

Between 1996 and 2016, the number of SSTPs constantly decreased. The design of State measures to improve their effectiveness has focused on strengthening control over the progress of work.

**Table V.1 Overview of sub-pillars and indicators for innovation policy processes**

Sub-pillar I: Preparation	Sub-pillar II: Design	Sub-pillar III: Implementation	Sub-pillar IV: Post-implementation
Innovation foresight	Planning	Amendment of policies	Ex-post evaluation
Rationale	Decision-making	Review of the policy against its action plan	Adaptation
	Private sector consultation		
	Coherence		

Source: UNECE.

## Sub-pillar I: Preparation

*Sound preparation of policies sets the foundation for the policymaking process. Public intervention should depend on the identification of market failures as well as future trends that will affect the area of intervention.*

In the transition to a knowledge-based economy, Belarus needs to combine its sustained growth, diversified exports and growing ICT sector with a flexible support system and an enabling business environment that foster the development and realization of innovative ideas (chapter II). In this context, there is a strong policy rationale for the implementation of science and technology programmes. The preparation of the SSTPs for the upcoming five-year implementation cycle is carried out on the basis of the priority directions of scientific and technical activity. Altogether, they are the means to reach the indicators established in the Programme of Social and Economic Development.

### Innovation foresight

Until recently, foresight played a limited role in the planning of this process. Nevertheless, some elements of forecasting were used to define the national science and technology priorities and the SSTPs: since the late 1990s, jointly with the NAS, the SCST has developed national forecasts of science and technology trends that support the conceptualization of policy documents by government institutions. It assesses and analyses indicators and their values for the real sector of the economy in order to select the topics for the SSTPs. In 2019, a more comprehensive forecast was developed of scientific and technological progress for 2021–2025 and until 2040. Priority areas of scientific, technological and innovation activities for 2021–2025 were approved by the President in May 2020 and hence the resulting SSTPs are closely linked to the outcomes of this forecast.

Thus, foresight takes place in Belarus but tends to be ad hoc and is not subject to continuous revision and impact assessment. This state of affairs means that individual innovation policy measures may not be grounded in agreed, realistic assumptions from which the key performance indicators (KPIs) follow in some fashion, and it is not possible to monitor and evaluate at the impact level in a concerted fashion.

### Policy rationale

The SSTPs were conceived in the mid-1990s and initially modelled on the Soviet Union's Republican Science and Technology Programmes. After independence, they were addressed in Paragraph 11, Scientific and technical programmes, in Law No. 2105-XII, "About fundamentals of the State scientific and technical policy" (19 January 1993). The rationale was "to implement the State scientific and technical policy in priority areas of State, sectoral, regional, interstate scientific and technical activities". The first list of scientific and technical programmes for 1993–1995 was formed at a time when the Government lacked clear ideas about the scientific priorities of the new republic. As a basis, it used the direction of research carried out in the Soviet Union in the framework of the Republican Science and Technology Programmes for the 13th five-year plan (1991–1995). As a result, the list included 34 programmes.

Although the Government designs scientific priorities today more comprehensively, at that time it conducted no market failure analysis to validate the implementation of the SSTPs. In terms of ex-ante evaluation, according to the Regulation of the Council of Ministers Decision No. 961, 31.08.2005, each draft SSTP should contain a forecast of the social and economic effectiveness of the proposed programme – for the programme as a whole, as well as for each task. Feasibility studies are also conducted.

## Broader policy issues

In a positive development, the adoption of Law No. 130-3, “On Normative Legal Acts” (17 July 2018) introduced RIA in the process of preparing legal acts. Several RIA methodologies have been developed. The National Centre for Legislation and Legal Research has been assigned the task of preparing guidelines on the procedures for RIA and for legal monitoring of implementation (Forbici and Lovitt, 2018). It is not yet clear how comprehensive and meaningful the RIA process will be; however, its full implementation would allow policymakers to predict the impact of State legal regulations and reveal excessive liabilities, prohibitions and restrictions of regulations, as well as unreasonable expenditures of economic entities, and on that basis make the most objective legal decisions (Belyaev and Mordosevich, 2017).

Sub-pillar I IPO evaluation and recommendations			
Achievements			
<ul style="list-style-type: none"> <li>✓ Some technology foresight practices take place, to define the priority areas of the SSTPs and other innovation policy documents.</li> <li>✓ The Government passed a law that introduces RIA in the process of preparing legal acts.               <ul style="list-style-type: none"> <li>✓ Several RIA methodologies have been developed.</li> </ul> </li> </ul>			
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• Foresight practices occur ad hoc.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Integrate technology foresight practices into the policy processes in relevant line ministries and State committees to capture future trends and perspectives for research activities that are subsequently incorporated or adjusted in a long-term strategic direction of its innovation development. Foresight should also be re-focused on financing innovation rather than modernizing or developing technology.</li> </ul>	Medium-term	SCST MoE Ministry of Industry Other line ministries
	<ul style="list-style-type: none"> <li>✓ Set up a full-scale national foresight centre to serve the needs of line ministries as well as big companies.</li> </ul>		
<ul style="list-style-type: none"> <li>• The pilot RIA needs follow-up.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Build on the efforts and experiences from piloting RIA by elaborating a timeline and a plan to institutionalize and implement RIA to ensure that evidence-based policymaking is established and carried out systematically when drafting new polices and laws. The RIA methodology should incorporate good practices, such as those elaborated by the OECD (2008); this may require an amendment to the Law on Normative Legal Acts.</li> </ul>	Medium-term	National Centre for Legislation and Legal Research of Belarus Executive authorities
<ul style="list-style-type: none"> <li>• Guidelines for RIA and systematic application of RIA are both lacking.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Establish consistent but light-touch guidelines for RIA and concretely define how RIA is applied during policymaking.</li> </ul>	Medium-term	Executive authorities

Source: UNECE.

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## Sub-pillar II: Design

*Public-private consultations are an integral part of the policy design process, to ensure policy relevance to the market and private sector needs and to confirm the commitment of relevant stakeholders to implementing it. Innovation policy is a supplementary component of a country's overarching strategy that contributes to the achievement of the broader vision and objectives of socioeconomic development. Its priorities and activities should be consistent and coherent with relevant "non-innovation" policies.*

### Planning

The planning and decision-making of the SSTPs occurs in two tiers: a call for SSTPs and a call for projects. In simple terms, the SCST launches a call for proposals and comes up with a draft list of SSTPs on the basis of proposals from State customers and the priority areas of science and innovation activities approved by the President. It then submits this list to the Government for approval.

In more detail, the procedure follows these steps:

- State customers generate proposals for SSTPs. Upon passing through sector examination councils at State customers, draft SSTPs are submitted to the SCST through the e-system "Single Examination" for evaluation.
- Thematic councils consider the draft SSTPs that pass the evaluation. Under a decision of the Government (Regulation of the Council of Ministers No. 431 of 22.05.2015), BellSA manages a large database of experts and 12 topic-specific councils of these experts. Membership of the councils is regularly updated, with new experts from the database rotating onto the councils. The outcome of the council's consideration is a recommendation for the SCST about including the draft SSTPs.
- After receiving the State evaluations, the SCST selects the SSTPs, in close coordination with the State customers and through numerous discussions in working groups, the Collegium of the SCST, a joint meeting of the Praesidium of the NAS and the Collegium of the SCST, and other fora.
- After consensus is reached on the list of SSTPs, the SCST presents the draft Government's decision to the Commission on the State S&T Policy at the Council of Ministers, which is chaired by the Prime Minister. The Commission approves or disapproves the draft Government's decision. If approved, the SCST submits the draft decision to the Council of Ministers.
- The Council of Ministers adopts the list of SSTPs through a regulation, a signal for State customers and executors to move to the second tier, the call for tasks.

In this tier, the SCST launches an open call for R&D projects (tasks). Applicants develop project proposals and submit them to the lead executing organization of the pertinent SSTP. The lead executing organization presents the submitted applications to the State customer.

- The branch scientific and technical council of a State customer pre-selects projects; the State customer presents those projects to the SCST for independent science and technology evaluation by the State, as done for the draft SSTPs.
- State expert (thematic) councils carry out independent science and technology evaluations and recommend funding.
- The SCST approves the list of projects (tasks) for each SSTP, including the funding. It then allocates the funding to the executors for a period of up to three years to conduct the R&D.
- Upon completing the R&D stage, State customers introduce the results or commercialize and sell them within the next three years.
- If the agreed sales targets are not attained, funds are expected to be returned in part to the budget.

The application and selection process for SSTPs and tasks is clearly defined in the Government's regulations and available at the websites of the SCST and State customers, as well as on the national legal portal, <http://pravo.by> (Belarus, Council of Ministers, 2005). Each SSTP has a plan that defines the scope of work; in addition, each has an R&D workplan with concrete results identified and a plan for development and implementation that includes clear deadlines, for both the volume of output and the money equivalent.

### Public-private consultation

A range of stakeholders are involved in shaping the SSTPs at the stages of evaluating and selecting the programmes and their tasks:

- Expert scientific and technical councils created under State customers.
- Experts who work as evaluators of projects (representatives of academic, higher education and branch sciences, as well as specialists of industrial organizations, including private companies).
- State (thematic) councils of experts created by the SCST.
- The Commission on State S&T Policy, which discusses and agrees on the most important political decisions (such as priorities and the list of SSTPs) before submitting them to the Council of Ministers for approval.

Thus, individual tasks are subject to three levels of expert examination, which involves at least 25 scientists and business representatives who are part of the State-owned or -affiliated groups.

State governing bodies (line ministries and committees) and the NAS also participate in developing and designing the SSTPs and pre-selecting projects. They also act as their State customers. In many cases, the majority of projects within an SSTP are implemented by R&D centres that are subordinate to the same State customer that "owns" the programme. This makes the monitoring of the projects and programme implementation easier and, probably, more effective; however, State customers may not be completely neutral in this scenario, as they may take into account the interests of their own R&D institutions and companies first. The NAS, for example, undertakes policymaking, programme design, project implementation and monitoring. Under international good practices of many

EU member states, an intermediary body should act between the policymakers and/or programme owners and the R&D and/or business players.

Involvement of international experts in the State evaluation is not obligatory; however, it is welcome. To improve the quality of applications, applicants can ask for a consultation and advice from an SSTP managing team hosted by a lead executor. The work of the managing team is covered by the SSTP budget.

## Policy coherence

Although the Government has articulated strategic priorities in R&D and innovative development and has a long-standing system for implementing the SSTPs, the continuing orientation of RDI policy recognizes the need to enhance complementarities between the SSTPs and strategic priorities (UNECE, 2017). In fact, the SSTPs are a subset of scientific programmes that are supposed to be consistent with the State Programme of Innovative Development; according to interviews with stakeholders, however, this is not the case. Innovative projects in the innovative development programme ideally should be based on the results of the SSTPs, but this is also not always the case yet. Ideally, the programme would include the implementation of projects previously elaborated within the SSTP, but in fact the programme contains strategic technological initiatives such as a nuclear power plant. Whereas the source of projects in the SSTP may be the initiative of executors, the source of projects in the State Programme of Innovative Development is national and State priorities and the nature of the projects in the programme is not in fact R&D.

## Broader policy issues

Public scrutiny of Government work and participation in policy design could be enhanced in Belarus across the bodies responsible for STI policymaking. There are no official obligations to consult publicly on new policy proposals, as stated by Law No. 130-3, "On normative legal acts" (17.07.2018). Policy drafting institutions decide whether to open the draft decision for consultation by the general public. If they do so, the proposal is placed in an online forum (<https://forumpravo.by>) or the website of the public body that developed the policy.

Overall, the views and interests of private, non-State economic actors are not sufficiently taken into account in the management of the national innovation system. To discuss draft regulations developed by executive authorities, as well as problematic issues arising for legal entities and individuals in the course of entrepreneurial activity in the STI sphere, the SCST established the Public Advisory Council in 2011. Ten of 19 members of the current Council represent business, both private and State owned.

Interdepartmental and interministerial coordination is obligatory while developing a policy (Law No. 130-3, art. 36; 17.07.2018). If a policy is initiated by a ministry or committee, the initiating body defines the list of public bodies with which the draft policy should be coordinated. In STI policy, the obligatory institutions to consult include the MoE, the NAS and the Ministry of Justice. Additional coordination depends on the content of the policy proposed. When the request to develop a policy comes from the Council of Ministers or the President, the list of public bodies to consult is usually defined by the Government or by the President's Administration.

After the consultations, the lead ministry collects and incorporates the feedback in the draft. The initiator and developer of a policy must take into account the opinions of the public bodies received in the coordination process. In case of disagreement, the public bodies involved coordinate through meetings and working groups to come to a common understanding. If they do not reach agreement, the issue is elevated to a higher level (such as the Council of Ministers).

Sub-pillar II		IPO evaluation and recommendations	
Achievements			
<ul style="list-style-type: none"> <li>✓ Political support for enhancing innovative activity in Belarus is active and high-level; this creates favourable conditions for the design of effective measures for implementing SSTPs.</li> <li>✓ Coaching is available for SSTP applicants to improve the quality of their applications.</li> <li>✓ The focus on the social returns of SSTPs is strong.</li> </ul>			
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• The private sector has only limited involvement in the SSTPs and the design of innovation policy.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Develop and pilot a concerted approach to consultations with the private sector and the broader public on the design and implementation of the SSTPs, as well as innovation policy as part of the broader, regular policy cycle and decision-making processes.</li> </ul>	Medium-term	SCST Executive authorities
<ul style="list-style-type: none"> <li>• Greater consistency is needed between the objectives of the State Programme on Innovative Development and the implementation of the SSTPs.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Align the implementation of the SSTPs more closely with the objectives of the State Programme for Innovative Development, including the allocation of public funds. The joint Inter-agency Funding Committee could perform coordination functions in this regard (UNECE, 2017).</li> </ul>	Short-term	SCST
<ul style="list-style-type: none"> <li>• State actors operate both as developers of proposals for the SSTPs and as State customers, which may create a conflict of interest.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Set up an intermediary body to act between the programme owners (policymakers) and the executors of tasks (R&amp;D and/or business players).</li> </ul>	Short-term	SCST

Source: UNECE.

## Sub-pillar III: Implementation

*Targets and time frames defined in the action plan provide a basis for regular reviews of implementation progress. Analysis of intermediate progress helps identify administrative, institutional and technical challenges faced during implementation and makes it possible to undertake necessary measures, including adjusting activity and reallocating resources.*

### Review of the policy against its action plan

The SSTPs have a long track record of improving implementation. The analysis found that the operational part of the SSTPs has been well organized, with comprehensive

instructions on a dedicated portal (Belarus, Council of Ministers, 2005) and a transparent selection process. Between 1996 and 2016, the number of SSTPs decreased steadily (from 48 to 17). Stakeholders consider the decrease as a positive trend, as a smaller number of programmes helped concentrate large resources in priority areas. During the same time, the number of scientific and technical tasks almost doubled. Overall, the share of public funds in programme financing has also decreased, with more customers providing co-financing, as has the share of unfulfilled tasks on the SSTP. Targeted and comprehensive marketing and promotion of the SSTP scheme so as to maximize the number of qualified applications have been priorities. A marketing strategy to this end was implemented through various media channels, with clear and accessible messaging.

Beneficiaries can freely spend the grant money to purchase equipment and select service providers in the market. Under the legislation, budget funds received by executors on the basis of civil law contracts for two kinds of entities – State-owned organizations and business entities in which the State has more than 25 per cent of the share capital – are extrabudgetary funds. These funds are thus spent like the beneficiaries' own funds. As a result, the conditions and procedures are equal for public and private players.

The IPO analysis points to a number of potential areas for improvement, from estimating targets to liability for not fulfilling production obligations. The design of State measures to improve the effectiveness of the SSTPs has focused on strengthening control over the progress of work. If tasks are not completely implemented, the contractor bears a proportional financial responsibility. This approach may have led to underestimation of target setting by customers as funding for research is accepted only with a high degree of certainty. Often projects aim to improve existing products and technologies, which may not produce a technological breakthrough. Contractors may be incentivized to lower the level of expected results or to turn down risky projects (Stefanin, 2009).

Some changes in the procedure for implementing the SSTPs are starting to come into effect. For the first time, circumstances have been defined that exempt the executor from liability if it does not fulfil the obligation to produce innovative products. These circumstances include emergency situations, adoption of legislative acts, decisions of international organizations prohibiting or restricting the production or sale of certain goods and liquidation of a legal entity producing goods based on innovation. Nonetheless, these are mostly external reasons: so far, no allowance is made for mistakes by developers and proposals must provide the expected outcomes.

In addition, innovations produced through the SSTPs are not supported by public procurement, which is a powerful instrument for enhancing innovation in many countries. The legal framework for public procurement in Belarus is developed independently from innovation policy; as such, innovation requirements seldom appear in public tenders.

## Broader policy issues

When implementing the tasks, small private enterprises and foreign companies practically do not participate, although both can play a key role in developing the competitiveness of the national economy. Attracting private companies to participate in competitions would help to reduce the cost of development and boost scientific and technical capacities to implement technologies and products (Stefanin, 2009).

Practical experience has indicated that further reforms are needed for the efficient management of IPRs. In particular, although the legal framework seems to contain sufficient provisions for identifying the legal owners of the IPRs originating from R&D activity supported by public funding, the implementation of those provisions is not carried out effectively. Because of ambiguities, even the leading R&D institutes performing science and technology projects under the SSTPs face difficulties in claiming legal ownership of their IPRs (UNECE, 2017).

Another issue is that most executors are State bodies, whereas most customers are State-owned enterprises. These two stakeholders have strong inherent links and a history of cooperation, so they usually agree on a task before the State bodies apply for funding. This means that competition during the selection process is limited and the executors are mostly the same from one competition to the next.

### Sub-pillar III IPO evaluation and recommendations

#### Achievements

- ✓ Belarus has a long track record of implementing the SSTPs.
- ✓ The operational part of the SSTPs is well structured, with comprehensive instructions on a dedicated portal and a transparent selection process.
- ✓ SSTP resources concentrate in priority areas of research and technological development.
  - ✓ The share of public funds in SSTP task financing is decreasing, with more customers providing co-financing as a general trend.
- ✓ The ability of beneficiaries to freely purchase goods and services at the market is a demand-driven process and a good practice example compared with obligatory service provision by selected central public institutions.

Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• The SSTPs need more focus on controlling the progress of work on SSTP tasks and the liability of customers if they do not complete tasks and attain targets.</li> </ul>	<ul style="list-style-type: none"> <li>✓ In cooperation with the NAS, identify in the SSTPs a separate category of high-risk STI aligned with the provisions of the Law on State Innovation Policy and Innovation Activities and funded by a different category of specific instruments that tolerate risk (UNECE, 2017).</li> </ul>	Short-term	SCST Executive bodies
	<ul style="list-style-type: none"> <li>✓ Assess the effectiveness of an SSTP as a whole, rather than at the task (project) level as it is done currently. This would allow for some flexibility for individual tasks to fail and others to succeed; outcomes of the programme as a whole would be in line with the predefined plans and success indicators.</li> </ul>		SCST Executive bodies
	<ul style="list-style-type: none"> <li>✓ Align the innovation policy priorities in the national legislation on public procurement in line with the international best practices, for example, the possibility of purchasing goods (works, services) resulting from SSTPs using the procurement procedure from a single source.</li> </ul>		SCST Ministry of Antimonopoly Regulation and Trade
<ul style="list-style-type: none"> <li>• Private companies do not participate sufficiently as customers in SSTP tasks.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Establish more active interaction of government bodies with the private sector in the formulation and implementation of the SSTPs. Promote the SSTPs to the private sector through targeted marketing and incentives.</li> </ul>	Short-term	SCST

Sub-pillar III		IPO evaluation and recommendations (Concluded)	
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>Little international coordination occurs in implementing and promoting SSTPs.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Provide the executors of tasks in SSTPs with additional grants for internationalizing, to cover costs related to disseminating results, participating in exhibitions, developing patent application, searching for partners for commercialization purposes abroad and so on.</li> </ul>	Medium-term	SCST
<ul style="list-style-type: none"> <li>There is a lack of provisions for identifying the legal owners of the IPRs originating from R&amp;D activity supported by public funding (UNECE, 2017).</li> </ul>	<ul style="list-style-type: none"> <li>✓ Establish the institutional and legal provisions for IPRs originating from R&amp;D activity supported by public funding, with a focus on implementation modalities and the promotion and exchange of local best practices.</li> </ul>	Medium-term	SCST

Source: UNECE.

## Sub-pillar IV: Post-implementation

*Ex-post evaluation is completed after the implementation of the action plan and based on results rather than forecasts. It helps establish the impact of policy activities on the industry in general, on specific fields or on beneficiaries. In light of experience acquired during implementation, governments introduce necessary adjustments to innovation policy measures so as to better target new or established policy objectives.*

### Ex-post evaluation

Throughout the course of the SSTPs, a number of mechanisms have been established to monitor and evaluate them. One of the most important indices is an “efficiency index”, a ratio of the proceeds of products sold to the amount of budget funds spent on implementing a programme. A programme is considered effective if this index exceeds 5. The index is not stable: it depends on the number of tasks for which products are manufactured in a certain period; for example, according to BellSA, in 2019, for the SSTPs as a whole the efficiency index is 19.2.

In addition to the State customers that monitor the implementation as SSTP owners, the SCST may ask BellSA to monitor an SSTP on a permanent basis. The accomplishment of tasks is closely benchmarked against the targets initially set. The intermediary and final results of SSTP implementation are discussed at the meetings of the SCST Collegium; afterwards the SCST reports them to the Council of Ministers. This is done each year, whereas the more comprehensive analysis is conducted at the completion of the five-year budget and programme cycle.

A chapter on implementing science and technology programmes (State, sector and regional ones) is part of the annual analytical report, “On the State and Prospects of Science Development in the Republic of Belarus”, developed jointly by the SCST and the NAS

to inform the President, the Government, the scientific and outreach community, and society as a whole about progress and challenges.

The effectiveness of budget funding for implementing the SSTPs is checked from time to time by the Ministry of Finance, the Committee of State Control and the Prosecutor General and discussed by their boards. Guidelines for assessing the results of scientific and science and technology activities are regularly updated; however, there is no independent system for assessing SSTPs, and the monitoring mentioned here focuses on outputs. Impact assessments are also lacking.

## Broader policy issues

Beyond the SSTPs, monitoring and evaluation mechanisms are well integrated into the policy practices of executive authorities dealing with STI. One point for improvement is the limited link of monitoring and evaluation with the design of future policy.

Sub-pillar IV		IPO evaluation and recommendations	
Achievements			
<ul style="list-style-type: none"> <li>✓ A number of initiatives and mechanisms have been undertaken to evaluate the SSTPs.</li> </ul>			
Area for improvement	Recommendation	Time frame	Responsibility
<ul style="list-style-type: none"> <li>• Impact assessment of SSTPs is lacking.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Ensure the independence of impact assessments, ideally by having them carried out by an external, independent assessor rather than internal staff.</li> </ul>	Short-term	SCST
<ul style="list-style-type: none"> <li>• The link between monitoring and evaluation and future policy design is limited.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Establish a more systemic linkage of monitoring and evaluation to policy design, including in government bodies responsible for STI policy.</li> </ul>	Medium-term	SCST Executive authorities

Source: UNECE.

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