

UNECE

Smart Sustainable Cities Profile

GRODNO, BELARUS



UNITED NATIONS

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PREFACE

The Smart Sustainable City Profile of Grodno (Grodno City Profile) was developed upon the request of the Grodno City Hall with funds from the United Nations Development Account (UNDA) 12th tranche project “Smart Sustainable Cities for the 2030 Agenda for Sustainable Development and the New Urban Agenda in the UNECE Region”. The project supports the transition of selected beneficiary cities towards smartness and sustainability with a view to accelerating the implementation of SDG 11 and other urban-related Sustainable Development Goals (SDGs).

The development of the City Profile was led by the Housing and Land Management Unit of the UNECE Division of Forests, Land and Housing working closely with the Grodno City Hall and the Government of Belarus. The Profile provides the outcomes of the city evaluation against the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) along with action-oriented recommendations for the consideration of the Grodno City Hall and the Government of Belarus.

The KPIs for SSC is a public and freely available standard developed by the United Nations Economic Commission for Europe (UNECE) and the International Telecommunication Union (ITU) in the context of the United for Smart Sustainable Cities (U4SSC) initiative. U4SSC is coordinated by UNECE, ITU and the United Nations Human Settlements Programme (UN-Habitat) and is supported by 14 other United Nations agencies.¹

¹ For up-to-date information on cities under KPI evaluation by UNECE, see <https://unece.org/housing/sustainable-smart-cities#:~:text=A%20smart%20sustainable%20city%20is,as%20well%20as%20cultural%20aspects>.

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ABBREVIATIONS AND ACRONYMS

BYN	Belarusian ruble
CO ₂	carbon dioxide
COVID-19	coronavirus disease 2019
EIB	European Investment Bank
EUR	euro
FEZ	GrodnoInvest Free Economic Zone
GDP	gross domestic product
GHG	greenhouse gas
KPIs for SSC	Key Performance Indicators for Smart Sustainable Cities
ICT	information and communications technology
IT	information technology
ITU	International Telecommunication Union
OECD	Organisation for Economic Co-operation and Development
PM	particulate matter
SDGs	Sustainable Development Goals
SMEs	small and medium-sized enterprises
UN-Habitat	United Nations Human Settlement Programme
UNCT	United Nations Country Team
UNECE	United Nations Economic Commission for Europe
UNICEF	United Nations Children's Fund
USD	United States dollar
WHO	World Health Organization

Units of measurement

km	kilometre
km ²	square kilometre
kWh	kilowatt-hour
m ²	square metre
µg	microgram

Exchange rate as of 11 June 2021

1 BYN = 0.40 USD

1 BYN = 0.33 EUR

All USD and EUR equivalent provided in this publication are approximate values based on these exchange rates.

EXECUTIVE SUMMARY

Grodno is the third largest city and key administrative, industrial, and cultural centre in the Republic of Belarus. The city has a population of over 390,000 people and its urban economy is predominantly based on tourism, the production of nitrogen fertilizers, food and engineering products, furniture, tobacco and hosiery. Official statistics suggest that only 0.3 per cent of the working population is unemployed, which is significantly lower than the national average (4.9 per cent). There are 60 industrial enterprises located in Grodno and 78.5 per cent of employment is concentrated in small and medium enterprises.

The municipal budget of Grodno prioritizes spending on social and cultural infrastructure and services, which make up 81.9 per cent of the total city budget, amounting to 378 million Belarusian ruble (BYN) (approximately USD 151.7 million) in 2021. As such, Grodno is one of the country's major educational and health-care centres, with over 147 educational and health-care facilities. The city has a well-established public transport system, with 91 routes stretching across 1,300 kilometres. Moreover, Grodno showcases a high number of integrated green spaces, which cover over 30 per cent of the city's urban footprint. In this context, the city is actively conducting urban rewilding activities and has committed to planting over 7,000 trees and bushes each year.

The economic base of Grodno was heavily impacted by the COVID-19 pandemic, majorly due to the city's high dependence on exports (e.g. international cargo shipments), as well as lower revenues from tourism. As a result, the municipal budget of Grodno shrunk by 2.6 per cent or BYN 9.5 million (USD 3.8 million) in 2020. Vulnerable groups and families with children have been among the most heavily impacted groups, together with low-income families and part-time employees. Official statistics suggest that over the course of 2020, a total of 300 legal entities and 3,000 individual entrepreneurs in Grodno received various types of government support. The combined effects of these measures are estimated to have helped create 522 additional jobs in the city.

The outcomes of the evaluation, supported by the review of documentary data sources and feedback sessions with local experts, provided the basis for the following recommendations:

1. **Improve urban governance for sustainable development, and the access and availability of urban data.**
2. **Improve the water and sanitation infrastructure.**
3. **Improve solid waste management.**
4. **Improve public building sustainability and reduce energy consumption.**
5. **Improve the public transport infrastructure.**

GENERAL OVERVIEW

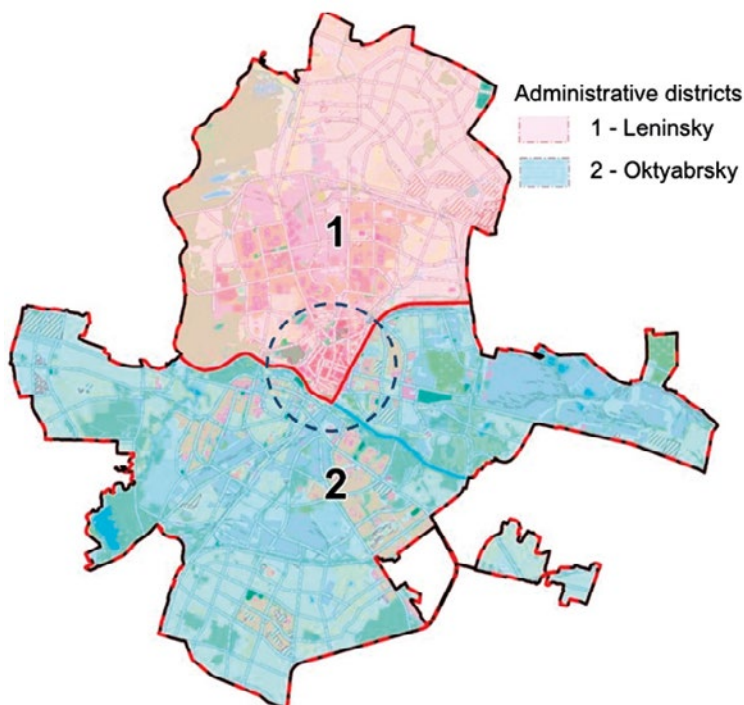
At 390,757 people and 142 square kilometres (km²) Grodno is the country's third largest city and major administrative, industrial and cultural centre in the Republic of Belarus. Grodno is located in the western-most part of the country, on the banks of the River Neman. The border with Poland and Lithuania is 15-km and 30-km away, respectively. Administratively, it is divided into two districts - Oktyabrskiy and Leninskiy.

Grodno is a city with a rich history and cultural and architectural heritage. The city centre alone hosts 388 of 451 historical and cultural sites. The city offers numerous tourist attractions, including the Grodno Regional Philharmonic, the Drama Theatre, the Puppet Theatre and other cultural institutions, including 36 museums. Tourism is, therefore, a key sector supporting local economic development and as such, Grodno boasts an extensive hospitality base, including 12 hotels and over 440 restaurants. A visa-free policy (<https://grodnovisafree.by/en/>) has been in force in the Grodno Region since October 2016. This allows tourists

and entrepreneurs from dozens of countries to visit the Region without the need for a visa. Since then, more than 260,000 visa-free foreign tourists from 87 different countries have visited the city.

In terms of urban economic outlook, the city specializes in the production of nitrogen fertilizers, food products, furniture, engineering products, tobacco, and hosiery products. The city is also an important educational and health hub within Belarus. As such, Grodno hosts a total of 147 educational facilities, including 4 higher education institutions, 97 pre-school education establishments, 41 general secondary education establishments, 4 institutes for special education, 2 social education establishments, 2 institutions for additional education for children and youths, and one health education institution. There are four hospitals, five specialized centres, two dispensaries, nine health clinics, one dental clinic, one beauty and health centre and one emergency medical assistance station located in the city.

Figure 1: Administrative boundaries of Grodno



Source: Presentation of Grodno at the UNECE 69th session of the Commission, 20-21 April 2021.

Grodno has a well-developed public transport network. The route network for urban passenger transport is more than 1,300 km in length and has 91 routes - 55 bus routes, 19 trolley bus routes, and 17 express routes (for shuttlebuses). The city has recently completed the construction of a new six-lane highway with an interchange, and construction work is underway for a fourth automobile bridge across the River Neman. This bridge will connect residential and industrial areas in the city and help create the city's belt road. At 44.5 km², green areas are a key feature of the cityscape of Grodno and take up over 30 per cent of the city's footprint. The largest green urban area stretches across 4 parks – Kolozhsky, forest park Physhki, Rumlevo and Lososno. Furthermore, each year the city plants 7,000 new trees and bushes. Other infrastructure projects include the construction of a football stadium, a health clinic in the Vishneveys neighbourhood, a kindergarten, an outpatient clinic, and a school in the Olshanka neighbourhood.

| **Figure 2:** Green areas in Grodno



Source: Presentation of Grodno at the UNECE 69th session of the Commission, 20-21 April 2021.

LEGAL AND INSTITUTIONAL FRAMEWORK FOR URBAN DEVELOPMENT

The executive and administrative power of the city lies with the Grodno City Executive Committee (hereafter, City Council). Equivalent to a Mayor's Office, the City Council is further subdivided into 15 departments². Grodno has dedicated departments for matters related to urban development, such as Department for Architecture and Urban Planning and the Housing Department. Overall, departments, ranging from Economics, Financial Management, Trade and Services, Education, Culture, oversee the day-to-day management of the city. Legislative power in Grodno lies with the Grodno City Council of Deputies. Additionally, the Grodno Oblast Executive Committee.

Administratively, Grodno is divided into two districts, Oktyabrskiy and Leninskiy. Each district has its own powers and responsibilities, as defined by national and regional legislation. The territorial development policy of Grodno is guided by its Master Plan, which is currently valid until 2030. The Master Plan is based on socioeconomic analyses and forecasts and provides the framework for a wide range of urban development programmes and projects. Setting out the strategic direction for the utilization of Grodno's urban space and natural resources, the current Master Plan focuses on the preservation of the environment and historical and cultural values. This document envisions the construction of five new buildings, which are expected to be delivered between 2020 and 2024.

Through the Presidential Decree on the Development of Entrepreneurship,³ which came into force in 2017, the mechanisms of cooperation between businesses and State bodies were reformed. The key provision of this Decree is to reduce to the lowest possible level the control of the State over businesses. Furthermore, the "One Window" service,⁴ introduced by the Government of Belarus in 2018, guides administrative processes in the city insofar as it facilitates direct interaction between citizens and city officials. The service provides inhabitants with advice on filling in administrative documents and is a convenient, one-stop office for instigating administrative processes and receiving decisions.

Grodno cooperates with regional authorities on the implementation of the Grodno Region Investment Programme, facilitating the implementation of its most important development initiatives. The development of the city is guided by the Presidential Decree on the Development of Entrepreneurship, which aims to reduce to the lowest possible level the control of the State over businesses.

2 Grodno Regional Executive Committee, Official Portal. Available at <https://grodno-region.by/ru>.

3 Republic of Belarus, Decree on the Development of Entrepreneurship, Decree of the President of the Republic of Belarus No. 7 of 23 November 2017. Available at <https://pravo.by/document/?guid=12551&p0=Pd1700007&p1=1>.

4 Republic of Belarus, Decree on One-Window Service, Decree of the President of the Republic of Belarus No. 202 of 24 May 2018. Available at http://president.gov.by/ru/official_documents_ru/view/ukaz-202-ot-24-maja-2018-g-18791/.

FUNDING AND FINANCING FRAMEWORK FOR URBAN DEVELOPMENT

In 2020, the municipal budget of Grodno amounted to BYN 378 million (USD 151.7 million). Spending from the budget is guided by an expenditure strategy. Under the current budget, Grodno prioritizes spending on social and cultural infrastructure and services, which make up 81.9 per cent of the total budget. Key budget lines include spending on school maintenance (46.5 per cent) and healthcare infrastructure and services (29.3 per cent). Moreover, the city budget allocates BYN 2.7 million (USD 1.08 million) for social institutions and BYN 0.9 million (USD 360,000) for the purchase of equipment and other fixed assets.

For 2020, BYN 44.2 million (USD 17.7 million), or 11.6 per cent of the total budget, was dedicated to spending on housing and communal services and housing construction. Out of this amount, BYN 0.5 million (USD 200,000) was allocated for major repairs, reconstruction and modernization of the thermal energy infrastructure; BYN 4.8 million (USD 1.92 million) for purchasing and replacing elevators in communal buildings; BYN 6.9 million (USD 2.76 million) for major repairs and modernization of the housing stock; and BYN 2.1 million (USD 840,000) for standard repairs. The amount of BYN 9 million (USD 3.6 million) or 2.4 per cent of the total went into subsidizing the extensive public transport system of Grodno.

Furthermore, Grodno allocated funding (around BYN 168,000 or USD 67,200) to co-finance energy-efficient retrofits in educational institutions, such as the replacement of old windows with energy-saving polyvinyl chloride windows. Over the past years, Grodno worked on the implementation of the State Housing Construction Programme 2016-2020⁵ and provided EUR 0.8 million (BYN 2.4 million or USD 960,000) to implement the Infrastructure for Housing Subprogramme.⁶ Moreover, the Grodno Region Innovation Fund⁷ allocates funds on a competitive basis for implementing innovative projects, completing scientific research, and developing industry laboratories.

Figure 3: Residential building with 120 units that are up to 61 per cent more efficient than first-generation energy-efficient homes in Grodno



Source: Presentation of Grodno at the UNECE 69th session of the Commission, 20-21 April 2021.

In recent years, Grodno implemented major urban infrastructure projects in, inter alia, waste treatment, energy-efficient housing, sustainable public transport and landscaping. In 2017, Grodno inaugurated a waste management facility, which currently treats 162,000 tons of waste per year. In 2020, the waste treatment facility generated and sold 6,000 tons of recycled materials, which accounted for over 25 per cent of the total revenue of the waste complex. In 2021, the city is planning to install additional equipment and upscale recycled material recovery to up to close to 94,000 tons per year (58 per cent of the total). In 2017, the city finished work on an energy-efficient residential building with 120 housing units. The building utilizes innovative technologies for heat recuperation from the ground and good ventilation, as well as engineering solutions geared towards reducing

5 Republic of Belarus, Decision on the State Program "Housing Construction 2016-2020", Decision of the Council of Ministers of the Republic of Belarus No. 325 of 21 April 2016. Available at <https://pravo.by/document/?guid=3961&p0=C21600325>.

6 Ibid.

7 Republic of Belarus, Decree on the Procedure for the Formation and Use of Means of Innovation Funds, Presidential Decree No. 357 of 7 August 2012. Available at http://president.gov.by/ru/official_documents_ru/view/ukaz-357-ot-7-avgusta-2012-g-1414/.

energy consumption. Thanks to these approaches, the average heat consumption in the building is 15 kWh per cubic which is much lower compared to first generation energy-efficient homes in Grodno.

Furthermore, in 2019, the World Bank, the European Investment Bank (EIB) and the Global Environment Facility selected Grodno as a pilot for the implementation of a project on the modernization of the thermal energy infrastructure in residential buildings.⁸ The project aims at improving energy efficiency in 250 multi-apartment residential buildings in Grodno and Mogilev oblasts and is expected to deliver key KPI outcomes such as reduced natural gas consumption, increase biomass fuel storage capacity, district heating networks upgrades and lower heat consumption and ultimately more comfortable living conditions. The total project cost was estimated at just over USD 202.2 million and received USD 99.3 million from the World Bank and European Investment Bank, respectively, in addition to USD 3.65 million from the Global Environment Facility.

8 World Bank, "Belarus to Enhance Energy Efficiency with Support from the World Bank", 30 October 2019. Available at <https://www.worldbank.org/en/news/press-release/2019/10/30/belarus-to-enhance-energy-efficiency-with-support-from-the-world-bank>.

EVALUATION OF GRODNO AGAINST THE KEY PERFORMANCE INDICATORS

To support Grodno's commitment to becoming smarter and more sustainable, the city was evaluated using the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) between 2019 and 2021. This is a United Nations standard on smart sustainable cities developed by UNECE and ITU in 2015.⁹

The KPIs for SSC have been tested and implemented in over 150 cities worldwide.¹⁰ In the period 2019-2023, UNECE has been undertaking the evaluation of 17 Norwegian cities, Bishkek (Kyrgyzstan), Tbilisi (Georgia), Tirana (Albania), Podgorica (Montenegro), Almaty (Kazakhstan), and Nur-Sultan (Kazakhstan). The KPIs for SSC consists of 91 indicators at the intersection of the three dimensions of sustainability (economy, environment, and society and culture) and information and communication technologies (ICTs). The KPIs are outlined in the Collection Methodology for Key Performance Indicators for Smart Sustainable Cities. The evaluation of the city performance against the KPIs for SSC was supported by the Protocol on the Evaluation of City Performance against the Key Performance Indicators for Smart Sustainable Cities.

Assessment of the performance of Grodno against the KPIs was carried out across each of the three dimensions - Economy, Environment and Society and Culture. For each dimension, a general overview is provided which precedes the discussion on the performance of Grodno against the respective indicators of each dimension. The overview aims at providing an evidence-based context and is based on documentary data sources. The KPI Evaluation highlights the key findings of the data collected through the KPIs for SSC methodology.

The graph below visualizes the performance of the city against the KPIs for SSC. Follow up discussions in this section outline the performance of Grodno in relation to the three dimensions of the KPIs for SSC and relevant

city actions, with a view to identifying the challenges to and opportunities for making the city smarter and more sustainable.

The study suffers from limitations due to a lack of data in all domains of the KPIs for SSC methodology. Grodno reported data on 59 indicators out of 108¹¹. Data was missing for 49 indicators. Specifically, reporting for each dimension were as follows: 27 out of 51 economy indicators, 20 out of 28 environment indicators, and 12 out of 29 society and culture indicators. The indicators are also divided into "core" and "advanced" indicators. Out of the 67 core indicators, 45 were reported, and 17 out of 41 advanced indicators were reported.

Improving sustainable development depends on access to, and availability of, urban data. Grodno is, therefore, encouraged to supply urban data on the following areas:

Economy dimension

- **Transport:** share of journeys taken by private vehicles, public transport, walking, cycling, or paratransit; public transport network access; dynamic public transport information; amount of shared vehicles; and amount of shared bicycles
- **ICT infrastructure:** public Wi-Fi spots; 3G and 4G wireless broadband coverage; wireless broadband subscriptions; and household internet access
- **Employment:** tourism industry employment and youth unemployment rate
- **Buildings:** integrated building management systems and public building sustainability.

Environment dimension

- **Air quality,** especially through the online monitoring of PM10 and PM2.5 emissions and greenhouse gas emissions
- **Energy:** public building energy consumption

9 The KPIs for SSC standard was endorsed by the UNECE Committee on Urban Development, Housing and Land Management in 2016 (ECE/HBP/2016/4) and was brought under the U4SSC initiative. U4SSC associates 16 United Nations agencies and supports the evaluation of cities' performance using the KPIs and the implementation of SSC solutions through the development of guidelines, studies, city action plans, and capacity-building events.

10 These include Voznesensk (Ukraine), Goris (Armenia), Pully (Switzerland), Dubai (United Arab Emirates), Singapore (Singapore), Shanghai (China), Buenos Aires (Argentina), and Moscow (Russia).

11 There are 91 KPIs in total; the additional sub-indicators used for some KPIs account for the higher total (108).

ECONOMY – AN OVERVIEW

Grodno hosts favourable conditions for conducting business activities; for instance, through the visa-free policy which allows for the influx of foreign capital into the city. The GrodnoInvest Free Economic Zone (FEZ),¹² established in 2002, supports the economic development of the city. Residents of GrodnoInvest are subject to a special legal regime, including tax and customs benefits which reduce the cost of conducting business activities. The Gross Domestic Product (GDP) of FEZ in 2021 amounted to USD 1.6 billion.¹³

Currently, one-third of the city's budget is generated through tax revenue from around 3,500 private businesses in Grodno. Annually, 250 new private companies register in the city and at the end of 2020, the city registered an increase of 539 companies city-wide despite the impacts of the COVID-19 pandemic. In 2019, Grodno was named the "Best regional centre for business in Belarus"¹⁴ in a country-wide competition. Official statistics suggest that the unemployment rate in Grodno is extremely low. The number of unemployed citizens dropped by 36.7 per cent between 2015 and 2019 (from 7,677 to 4,858), and the unemployment rate fell from 1.3 per cent to 0.3 per cent of the economically active population. This resulted from the implementation of a State programme focusing on social protection and the reduction of unemployment.

Grodno specializes in producing nitrogen fertilizers, food products, furniture, engineering and tobacco products, and hosiery. All the cord fabric production in Belarus is concentrated in the Grodno region, as well as the production of polyamides in their primary form and gloves. Roughly 90 per cent of the country's nitrogen fertilizers and 80 per cent of its hosiery production takes place in Grodno. Manufacturing is concentrated in the city's industrial complex and is made up of 60 major enterprises. Furthermore, the city is home to Grodno Azot, Neman tobacco factory, Grodno Meat Processing Plant, Milk World, and Conte Spa.

The most developed sector in the city is the services sector, which includes 5,450 establishments. The IT sector has also been rapidly developing thanks to export-oriented business models. In 2016, the first subsidiary branch of the Hi-Tech Park Belarus, whose headquarters is based

in Minsk, was established in Grodno.¹⁵ This Park includes an education centre delivering training for IT companies countrywide. In this context, Grodno is a regional leader in terms of computer services exports per capita.

In order to increase access to ICTs in Grodno, all multi-apartment residential buildings are connected to the internet through fibre optic connection. Furthermore, the city offers free access to real-time public transport information through numerous third-party applications. Electronic information boards, developed via a public-private partnership, are currently being installed at transport stops. Since 2020, it has been possible to pay for public transport using QR codes and a mobile application. Since 2019, Grodno has been extending the bicycle network. Currently, the length of the network is 20 km and by 2030, it will be 130 km.

To support further economic development, the city will implement the e-government strategy *Informatization Development Strategy of Belarus for 2016-2022*. The strategy aims to improve the provision of services electronically, including providing 75 per cent of administrative procedures and public services electronically. Grodno will also focus on maintaining high levels of employment from 2020 to 2024.

Figure 4: Construction work underway for a new bridge across the River Neman



Source: Presentation of Grodno at the UNECE 69th session of the Commission, 20-21 April 2021.

¹² GrodnoInvest, "Developing business in Grodno region". Available at <https://grodnoinvest.by/en>.

¹³ GrodnoInvest, "About Free Economic Zone". Available at <https://grodnoinvest.by/en/grodnoinvest/about/>.

¹⁴ Republican Confederation of Entrepreneurship, "Results of the Competition 'The Best City (District) and Region for Business in Belarus'". Available at <https://rce.by/news/news26-0919.php>.

¹⁵ Hi Tech Park Belarus. Available at <https://www.park.by/en/>.

ECONOMY – KPI EVALUATION

The evaluation of Grodno against the KPIs revealed a strong performance in the Economy sphere. Based on data reported on 27 of the 51 indicators, the evaluation revealed high levels of employment, a large number of small and medium-sized enterprises (SMEs), and strong performance in the area of ICT infrastructure. The evaluation showed that only 0.3 per cent of the population is unemployed, which is below the national average of 4.9 per cent.¹⁶ SMEs account for 78.5 per cent of all enterprises in the city. With reference to the ICT infrastructure, the city reported that 75.2 per cent of households have a fixed broadband subscription. The city did not provide information about public Wi-Fi spots, 3G and 4G wireless broadband coverage, wireless broadband subscriptions, or household internet access. At the time of the evaluation, 2.2 per cent of the city labour force worked in the ICT sector, which is relatively high in comparison with Organisation for Economic Co-operation and Development (OECD) countries at 3 per cent.¹⁷

100 per cent of the drainage and stormwater system is monitored by ICTs, and all households are served by solid waste collection. Furthermore, Grodno has all five urban development and spatial planning documents that promote compact development, connectivity, integration of mixed land use, social inclusion, and resilience to climate change. A high 3.3 per cent of the city is designated as car-free pedestrian zones. Regarding electricity supply, all households in the city have access to electricity, and this connection is very reliable. Customers experience an average of only 0.1 interruptions to electricity supply per year. Similarly, 72.4 per cent of the supply system is monitored by ICTs, and 65.6 per cent of installed electricity metres are “smart” metres. However, almost none of the population (0.1 per cent) has demand response capabilities for their electricity supply.

The water and sanitation indicators also scored well as 95.6 per cent of the city households have a basic water supply and access to potable water. 96 per cent have access to basic sanitation facilities, and 94.4 per cent are served by wastewater collection. While 100 per cent of the water distribution system is monitored by ICTs, only 1.1 per

cent of water metres installed are “smart” water metres. Also, 13.2 per cent of water is lost in the water distribution system and should be minimized.

Grodno has an extensive public transport system (289.3 km per 100,000 inhabitants) that is higher than Minsk’s (159 km per 100,000 inhabitants)¹⁸ and a good flow of traffic. However, none of the major streets in Grodno is monitored using ICTs, and none of the road intersections has adaptive traffic-control measures. Furthermore, the bicycle path network is not extensive - measuring 4.95 km per 100,000 inhabitants - and only a very small number of passenger vehicles (0.08 per cent) are registered as low-emission vehicles.

Grodno did not report any data on the following indicators:

- Shared vehicles
- Shared bicycles
- Use of paratransport for commuting
- Use of bicycles for commuting
- Walking to work
- Use of public transport for commuting
- Use of private vehicles for commuting
- Public transport network access
- Dynamic public transport information
- Public Wi-Fi spots
- 3G and 4G wireless broadband coverage
- Wireless broadband subscriptions
- Household internet access
- Tourism industry employment
- Youth unemployment rate
- Public sector e-procurement
- E-government
- Publicly available data sets
- Number of patents
- Research and development expenditure
- Integrated building management systems
- Public building sustainability.

16 World Bank, “Unemployment, total (% of total labor force) (modeled ILO estimate) – Belarus”, DataBank. Available at <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=BY>.

17 OECD, *OECD Digital Economy Outlook 2017* (Paris, OECD Publishing, 2017). Available at <https://www.oecd-ilibrary.org/docserver/9789264276284-en.pdf?expires=1596108721&id=id&accname=quest&checksum=B0600CD875F431BBBD4652E5FB9354AE>.

18 UNECE, *Sustainable Urban Mobility and Public Transport in UNECE Capitals*, Transport Trends and Economic Series (WP5), 2015. Available at <https://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/ECE-TRANS-245.pdf>.

ENVIRONMENT – AN OVERVIEW

The purpose of the Government programme “Comfortable housing and a favourable environment”¹⁹ is to ensure good living conditions in Belarus. This involves improving communal facilities and reducing the cost of rents and communal services. The programme also comprises the sub-programme “Clean Water” which aims to provide all households in Grodno with potable water supply.

One of the major goals of Grodno is to reduce its energy consumption. As part of the “Energy saving 2016-2020” programme,²⁰ Grodno developed annual energy-saving plans to reduce energy consumption in the manufacturing sector and to increase the use of renewable sources of energy. In 2019, the realization of this programme led to a reduction in energy consumption of 67,500 tons of standard fuel. Furthermore, Grodno is implementing a programme to extend the public electric vehicle charging network which comprised 14 charging stations in 2019. The programme is funded by the public and private sectors. In 2020, the Government of the Republic of Belarus approved the proposal for tax refunds for purchasing electric vehicles. The city is also developing an environmentally friendly transport infrastructure, which is based on an extensive public transport network. There are 88 trolleybuses serving city inhabitants daily and 15 of these are self-driving. Grodno annually develops a plan for planting trees and shrubs.

The city promotes the segregation and recycling of solid waste. In 2017, it opened a facility for recycling and mechanically sorting waste. In 2019, the facility processed around 140,000 tons of garbage, 17.5 per cent of which was recycled. As a result of the decision by the city administration to construct garbage chutes in apartment buildings and to install garbage container areas for separated garbage collection in all courtyards, 843 garbage containers were installed. In the period 2020-24, Grodno will apply a waste-to-energy approach to waste sorting. It will produce fuel pellets out of solid waste from the waste-sorting facility. The city will also further promote waste segregation among the population.

In 2020-2024, the city authorities plan to increase the number of green spaces in the city by creating new parks in both old and new neighbourhoods. The city also plans to further implement the State Energy Conservation Programme, and to introduce new measures to increase the use of electricity as a source of energy (as opposed to, for instance, gas).

19 Summary report of the Republic of Belarus in compliance with article 7 of the Protocol on Water and Health. Available at https://unece.org/fileadmin/DAM/env/water/Protocol_reports/reports_pdf_web/2019_reports/Belarus_summary_report_4th_cycle_23Apr19_ENG.pdf.

20 Republic of Belarus, Resolution on the approval of the State Program “Energy Saving” for 2016-2020, Resolution of the Council of Ministers of the Republic of Belarus No. 248 of 28 March 2016. Available at <https://energoeffect.gov.by/programs/govpogram20162020/2016-2020>.

ENVIRONMENT – KPI EVALUATION

Regarding the KPIs falling under the environment subdimension, the city of Grodno reported data for 20 out of 28 indicators. The city performed well in relation to air quality; however, performance could be improved in the areas of public space and nature, energy, water and sanitation, and waste management.

The evaluation showed strong performance in air quality. Grodno reported 0.4 µg of nitrogen dioxide per m³ of air, 0.7 µg of sulphur dioxide, and 25.7 µg of ozone, all of which are well below WHO limits.

Regarding the water and sanitation infrastructure indicators, the evaluation revealed that 99.9 per cent of water samples complied with the drinking water standards of WHO, and the water consumption levels are relatively low, at 156.6 litres per day per capita. 100 per cent of wastewater undergoes primary and secondary treatment; however, none undergoes tertiary treatment.²¹

The public space and nature indicators revealed that Grodno has large green areas, which amount to 756 hectares per 100,000 inhabitants. However, only 0.7 per cent of the city area is made up of protected natural areas.²² Regarding waste measures and how solid waste is processed, the evaluation highlighted that no waste is burned in open areas, incinerated, or disposed of in open dumps. 95.7 per cent of waste is disposed of into landfills, and only 4.3 per cent of solid waste is recycled. In comparison, 46 per cent of waste in the European Union, Iceland, Norway and Switzerland was recycled in 2017.²³ In relation to energy production and consumption, electricity consumption is very high, at 5,319 kWh per year per inhabitant, and only 5.4 per cent of electricity comes from renewable sources of energy. Grodno has a low level of residential thermal energy consumption, at 13.8 gigajoules per year per inhabitant.

Grodno did not report on the following indicators: greenhouse gas emissions; air pollution – PM2.5; air pollution – PM10; public building energy consumption; recreational facilities; green area accessibility; exposure to noise; and exposure to electromagnetic fields.

21 Primary treatment screens sewage sediment to remove larger debris. Secondary treatment reduces Biological Oxygen Demand (BOD10) to acceptable levels by microbial oxidation using activated sludge or a trickle filter. Tertiary treatment reduces BOD still further through micro straining or filtering, the microbial removal of phosphates and nitrates, and disinfection using chlorine or ozone.

22 A protected area is a clearly defined geographical space, recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

23 European Environment Agency, "Waste recycling, 2021", Eionet Database. Available at <https://www.eea.europa.eu/data-and-maps/indicators/waste-recycling-1/assessment-1>.

SOCIETY AND CULTURE – AN OVERVIEW

Grodno is investing in improving road safety. The Grodno City Executive Committee created a commission on road safety, which approves road safety plans in urban areas, especially near schools. The implementation of these plans has resulted in a reduction in accidents.

To improve neighbourhood safety and quality of environment, the city introduced the “Courtyards without cars” policy in 2018. The policy puts forward a requirement to place car parks outside of residential areas. To improve the quality of education, the mayor of Grodno introduced weekly meetings between heads of schools and pre-schools in the city, at which city authorities support the resolution of any emerging problems.

The city is improving access to adequate and affordable housing for large families. It planned the construction of 600 new apartments in 2020, which complements the state efforts to support these families using debt-relief measures and subsidies. It also provides preferential access to public/municipal housing so that large families can acquire access to housing within one year of joining the waiting list. The Government introduced a measure whereby developers constructing housing for those in need are limited to earning only 5 per cent in profit. Regarding health care, in 2019, the city began construction of a modern cancer centre, which will serve not only the city but also the entire region of Grodno.

Grodno offers good access to cultural events and facilities. Every two years, it hosts the Republican Festival of National Cultures²⁴ – a festival which celebrates peace and an appreciation of national art. In 2018, the Festival was attended by more than 270,000 people representing 36 nationalities. Other cultural events in Grodno include the Big Mini festival of street art and the Kazyuki artisans’ festival in honour of St. Casimir.

The city is investing in the digitization of public services. In the period 2020-2024, Grodno plans to improve access to ICTs in schools and to increase the amount of open electronic educational resources. It plans to digitize medical records and improve connectivity between health-care organizations. Building on the visa-free regime for foreign tourists, Grodno plans to further strengthen its tourism sector by restoring the Old Castle and redeveloping the Grodno Zoo.

As part of the State Programme “Comfortable Housing and a Friendly Environment”,²⁵ Grodno will work to improve housing maintenance and the thermal energy infrastructure and will renovate and refurbish old housing stock and facilities, such as elevators. It will also improve urban waste management, electricity and the clean water supply infrastructure, and provide access to gas in villages around Grodno.

²⁴ Republican Festival of National Cultures. Available at <https://nationalcultures.by/national-cultural-associations-festival/>.

²⁵ Approved by Resolution of the Council of Ministers of the Republic of Belarus No. 50 of 28 January 2021. For more information, see https://unece.org/sites/default/files/2022-06/Belarus_summary_report_5th_cycle_20Apr22_ENG.pdf.

SOCIETY AND CULTURE – KPI EVALUATION

The final section of the evaluation pertains to society and culture. The evaluation revealed a generally good performance in this area. Regarding health care, 100 per cent of inhabitants are covered by basic health insurance, and all have electronic health records. There are 676 doctors per 100,000 inhabitants in the city. In comparison, the average number of doctors per 100,000 inhabitants in Belarus is 519, 425 in Germany, and 327 in France.²⁶

Regarding safety, the time taken for emergency services to respond to calls is extremely fast, at 6.26 minutes (below the European average of 8.96 minutes)²⁷. The fire service is well-staffed, at 114 firefighters per 100,000 inhabitants, and there are very few traffic fatalities, at 0.8 per 100,000 inhabitants. The evaluation also revealed that a relatively high proportion of students (65 per cent) have classroom access to ICT facilities, and 100 per cent of the school-age population is enrolled in schools. The evaluation also indicated that none of the city population lives in informal settlements.²⁸

Lastly, regarding the indicators pertaining to social inclusion, the evaluation revealed that voter participation is very high (70.3 per cent of eligible voters voted in the most recent local elections). However, performance in relation to the gender income equality indicator was not good; female hourly earnings are only 71.9 per cent of male earnings, compared to 85.2 per cent on average in the European Union.²⁹

Grodno did not report on the following indicators:

- Violent crime rate
- Police service staff
- At-risk population
- Resilience plans
- Disaster-related economic losses
- Natural disaster-related deaths
- In-patient hospital beds
- Life expectancy
- Childcare availability
- Poverty
- Gini coefficient
- Adult literacy
- Higher education degrees
- Housing expenditure
- Cultural infrastructure
- Cultural expenditure
- Local food production.

26 World Health Organization, *Medical doctors (per 10,000 population)*. Available at [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-\(per-10-000-population\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-(per-10-000-population)).

27 Statista, *Average answer time of calls made to emergency services in selected European countries in 2019*. Available at <https://www.statista.com/statistics/794483/average-answer-time-of-calls-made-to-emergency-services/>.

28 The proportion of the population living in informal settlements was reported by Grodno and measured using the national definition of informal settlements.

29 Eurostat, *Gender pay gap statistics*, Data for November 2021. Available at [https://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_pay_gap_statistics#:~:text=For%20the%20economy%20as%20a,in%20Estonia%20\(Figure%201\)](https://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_pay_gap_statistics#:~:text=For%20the%20economy%20as%20a,in%20Estonia%20(Figure%201)).

SOCIO-ECONOMIC IMPACTS OF THE COVID-19 PANDEMIC IN GRODNO

Overview

Following the detection of the first case of the COVID-19 outbreak on 28 February 2020, Belarus did not apply highly stringent measures to contain the spread of the pandemic.³⁰ Movement within the country did not suffer significant restrictions and schools and universities continued to hold in-person teaching. Mask-wearing in closed spaces such as public transport did not become mandatory until mid-November 2020.

According to a report published by the United Nations Country Team (UNCT) Belarus in March 2021, the lax approach of Belarus towards COVID-19 management has been guided by pre-existing macroeconomic challenges. Official statistics suggest that the Belarusian economy did not suffer as much from the COVID-19 pandemic compared to other countries. Where other economies in the region registered GDP losses close to double digits in 2020, the national GDP of Belarus shrunk by only 1 per cent compared to 2019.³¹

However, the outbreak of the COVID-19 pandemic imposed a significant challenge on the Belarusian economy and society, especially on vulnerable groups. Over the next years, the path of Belarus to economic recovery may also be hampered by structural macroeconomic challenges, European Union sanctions and continued economic slowdowns faced by the country's key trade partners.³² Exports account for over half of the country's GDP³³ and as COVID-19 continues to impose challenges to trade and tourism, economic growth from these sectors is not

expected to go back to pre-pandemic levels in the near future. To boost the domestic economy and prevent the mass liquidation of enterprises, the Government earmarked BYN 110 million (USD 43.5 million) with measures geared towards the support of the real economy and the protection of the consumer market³⁴.

Economy and unemployment

The economic base of Grodno was heavily impacted by the pandemic, majorly due to the city's high dependence on exports (e.g. international cargo shipments), as well as lower revenues from tourism. In 2020, the municipal budget of Grodno, which totalled just over BYN 378 million (USD 151.7 million), was reduced by 2.6 per cent or about BYN 9.5 million (USD 3.8 million). Budget losses from own-source revenues accounted for slightly over BYN 1 million (USD 400,000) compared to 2019. These reductions stemmed from revenue losses from land tax on organizations (8 per cent of the year-on-year loss), lower corporate real estate tax revenue (10 per cent) and lower revenues from taxes on individual entrepreneurs and individuals (82 per cent).

Most policy responses were coordinated at the national level. In this context, Government support targeted the preservation of jobs to avoid mass liquidation of enterprises and ensuing economic fallout. In 2020, through Presidential Decree No. 143³⁵ and Presidential Decree No. 178³⁶, a total of 300 legal entities and 3,000 individual entrepreneurs in Grodno received various types of Government support. The combined effect of these measures is estimated to have

30 United Nations Country Team Belarus, *UNCT Belarus' COVID-19 Socioeconomic Response Plan (SERP): Achievements and Plans*, 29 March 2021. Available at https://belarus.un.org/sites/default/files/2021-03/SERP_EN_23%20March_0.pdf.

31 National Statistical Committee of the Republic of Belarus, *Dynamics of Gross Domestic Product in 2021-2022*, <https://www.belstat.gov.by/en/ofitsialnaya-statistika/real-sector-of-the-economy/national-accounts/current-data/gdp-and-grp/dynamics-of-gross-domestic-product-in/>.

32 Data provided by Grodno focal points to the United Nations Economic Commission for Europe in June 2021.

33 National Statistical Committee of the Republic of Belarus, "Dynamics of Gross Domestic Product in 2021-2021". Available at <https://www.belstat.gov.by/ofitsialnaya-statistika/realny-sector-ekonomiki/vneshnyaya-torgovlya/>.

34 KPMG, "Belarus, Government and institution measures in response to COVID-19", 29 April 2020. Available at <https://home.kpmg/xx/en/home/insights/2020/04/belarus-government-and-institution-measures-in-response-to-covid.html>.

35 Republic of Belarus, Decree on Support of the economy, Presidential Decree No. 143 of 24 April 2020. Available at <https://president.gov.by/bucket/assets/uploads/documents/2020/143uk.pdf>.

36 Republic of Belarus, Decree on temporary state support measures for tenants and certain categories of citizens, Presidential Decree No. 178 of 28 May 2020. Available at <https://president.gov.by/ru/documents/ukaz-no-178-ot-28-maya-2020-g>.

helped create 522 additional jobs in the city.³⁷ Furthermore, Presidential Decree No. 131³⁸ provided major financial incentives to health workers during the pandemic. Health workers in Grodno received BYN 6.4 million (around USD 2.5 million) directly from the city's budget as compensation for the extra hours needed to treat patients during the pandemic.

Through the Grodno City Executive Committee Decision No. 219 of 27 March 2020 "On the Amount of Rent", legal entities engaged in activities most exposed to the adverse effects of the epidemiological situation, were granted reduced rental rates on municipal property. Official statistics for the first quarter of 2021 suggest that the unemployment rate in Grodno was in the range of 0.3 - 0.4 per cent of the economically active population.³⁹ By the end of 2020, the total net number of newly registered and liquidated legal entities in the city amounted to 539.

In the first quarter of 2021 (January-April), almost all sectors of the urban economy showed signs of economic recovery compared to 2020.⁴⁰ The Grodno City Executive Committee reported that SMEs produced about 30 per cent of the city's economic activity and that the number of registered individual entrepreneurs was increasing. It was only in the light industry and in the production of building materials where economic volumes were lower than in the first quarter of 2020. The current key priorities of city officials, as reported by the Department of Economy, are the economic restructuring of unprofitable organizations⁴¹ and the provision of wage increases for workers.

Vulnerable groups

The socio-economic impacts of the COVID-19 pandemic have been felt particularly hard by the most vulnerable groups, which are mostly concentrated in small cities⁴² such as Grodno. According to the Federation of Trade Unions, by April 2020, 15,000 employees were on leave of absence

nationwide, 11,000 worked part-time and 20,000 were on unpaid or partially paid leave. Furthermore, the pandemic put at least 78,000 people employed in micro- and small enterprises at risk of losing their job. Over 36,000 self-employed individuals were bound to lose at least half of their income, and informal workers, which constitute over 8 per cent of the country's workforce, are likely to have suffered most from travel restrictions and a recession. Other vulnerable groups most affected by the COVID-19 pandemic are stateless persons, refugees, asylum seekers and migrant workers⁴³.

The crisis also significantly affected families with children. A survey conducted by the United Nations Children's Fund (UNICEF) revealed that more than half of Belarusian parents suffered an income decrease, with major impacts concentrated on those with low incomes or working part-time. Less than one-third of Belarusian parents had a similar economic behaviour compared to pre-pandemic. In this context, every second parent had to postpone buying clothes for their children and one in four did so to save up for food supplies.⁴⁴ Single-parent households suffered major impacts as these are mostly headed by women who are employed in crisis-hit sectors such as services and textiles⁴⁵.

Education

In Grodno, all educational institutions operated in-person teaching throughout the pandemic. The Grodno City Executive Committee mandated the use of sanitary and anti-epidemiological measures to prevent the spread of COVID-19. Furthermore, the Department of Education of the City Executive Committee and the educational institutions of Grodno ensured the availability of modern information technologies for teaching. Excerpts of video lessons and supplementary education materials from

37 Data provided by the Grodno focal point to UNECE.

38 Republic of Belarus, Decree on Material incentives for health workers, Presidential Decree No. 131 of 16 April 2020. Available at <https://pravo.by/document/?guid=12551&p0=P32000131&p1=1>.

39 Data provided by the Grodno focal point to UNECE.

40 Grodno Regional Executive Committee.

41 As of 1 May 2021, there were 53 unprofitable organizations in Grodno.

42 UNCT Belarus' COVID-19 Socioeconomic Response Plan (SERP): Achievements and Plans.

43 Ibid.

44 UNICEF, "First wave results: Well-being of families with children". Available at https://www.unicef.by/well-being_en/.

45 UNCT Belarus' COVID-19 Socioeconomic Response Plan (SERP): Achievements and Plans.

teachers' classes were offered for those interested via the internet portal and thematic social media channel "Education in Grodno".⁴⁶

Overall, there are widespread concerns regarding increased inequalities in education due to the digital divide. As outlined in the previous section, household spending on non-essential items went down during the pandemic, meaning not all Belarusian families are able to equally afford internet access or relevant technological equipment.⁴⁷

Basic medical supplies and food

Throughout the pandemic, Belarus received several international financial aid packages for medical supplies. In May 2020, the World Bank approved a USD 109 million-package to help address immediate needs such as the purchasing of modern ventilators, pain medication and personal protective equipment for health workers.⁴⁸ At the beginning of 2021, the Government signed agreements with UNICEF and UNDP, respectively, for the purchase of similar products, for a total of almost USD 17 million⁴⁹.

Since the beginning of the pandemic, the Grodno City Organization of the Belarusian Red Cross Society has been aiding vulnerable categories of citizens affected by the socio-economic consequences of COVID-19. Such support has been handed to residents in the form of vouchers worth BYN 150 for the purchase of food and basic necessities in Grodno retail chains. Over the period from 01 December 2020 to 01 May 2021, the Grodno City Organization of the Belarusian Red Cross issued 201 vouchers to the most vulnerable categories of citizens.

Since March 2020, the "Social Service Centre of Kastychnitsky District of Grodno" and "Social Service Centre of Leninsky District of Grodno" (hereinafter referred to as the Centres) established a telephone hotline to respond to urgent requests for food and basic medical supplies. This service targets disabled people and the elderly. Between March 2020 and mid-May 2021, the hotline received 347 requests for the delivery of food and basic necessities such as medical products. Besides this programme, social workers of the Centres delivered food and basic necessities

to inhabitants who benefitted from the home care services of the Centres. In total, 1,382 people benefitted from such services between February 2020 and May 2021.

Transport

Border closures and isolation related to quarantine measures have contributed to the slowdown in cargo and passenger transportation services and logistics. In January-December 2020, the growth rate of transport services exports stood at 91 per cent. In Grodno, the urban transport passenger turnover⁵⁰ in 2020 decreased by almost 25 per cent from the previous year, majorly due to COVID-19-induced restrictions on international tourism. Through the mobile app Oplati (Pay), the city now operates a contactless fare payment system.

46 Education in Grodno. Available at obr.grodno.by.

47 UNCT Belarus' COVID-19 Socioeconomic Response Plan (SERP): Achievements and Plans.

48 "World Bank Supports Belarus' COVID-19 Response with €90 Million Financing", 23 May 2020. Available at <https://www.worldbank.org/en/news/press-release/2020/05/22/world-bank-supports-belarus-covid19-response-with-eur90-million-financing>.

49 UNCT Belarus' COVID-19 Socioeconomic Response Plan (SERP): Achievements and Plans.

50 Passenger turnover is calculated by multiplying the number of passengers transported to transportation distance.

RECOMMENDATIONS

Based on the evaluation report and the review of documentary data, including information provided by the city, it is recommended that Grodno:

1. Improve urban governance for sustainable development, and the access and availability of urban data.

The 2030 Agenda for Sustainable Development requires coherent multilevel mechanisms for urban governance to address different territorial realities. Partnerships with the business community and the use of innovative financing mechanisms are also encouraged, as they can serve as accelerators of progress towards sustainable development.

Data plays a key role in designing efficient and effective urban interventions and in improving quality of life and ensuring that no one is left behind. For instance, measuring and addressing the high level of noise in the city is important, as prolonged exposure to excessive noise can lead to hearing loss. Low air quality is associated with health issues, such as respiratory illnesses. It also has particularly negative effects on the physical and cognitive development of children. Addressing these issues is a prerequisite for sustainable development so that “no one will be left behind”.

Improving access to high-quality urban data cannot be achieved without improving methodologies and standards for collecting and managing these data. In this context, policymakers are encouraged to work towards standardized methods for collecting and aggregating city data to establish national estimates on urbanization, thus improving access to open-source data. Throughout this process, it is essential to address the issue of privacy. Efforts should also be made to improve the capacities of urban data producers, especially the national statistical offices and other organizations that make up the national statistical systems, including local and national governments, to produce, collect, manage, analyze and disseminate data.

2. Improve the water and sanitation infrastructure.

Addressing the unsustainable consumption of natural resources such as water is a prerequisite for the successful implementation of the 2030 Agenda for Sustainable Development in the UNECE region. is one of the fundamentals of urban management based on the principles of the circular economy. It requires cities to take decisive action to develop and implement policies, programmes, projects and technologies that promote sharing, recycling, refurbishing, re-using, replacing, and digitizing natural resources.⁵¹

Water quality and the efficiency and effectiveness of the water and wastewater infrastructures and facilities have a considerable impact on the quality of life and the environment. In this regard, the city should improve its existing water and sanitation infrastructure. Furthermore, it is important to implement ICT technologies to measure the use of natural resources.

3. Improve solid waste management.

Effective and efficient waste management is a prerequisite for sustainable development. Solid waste treatment and waste collection have a considerable influence on the quality of life and the environment.

The production of waste not only consumes resources (e.g. land) and energy but also has a negative impact on air quality. Landfills emit a significant amount of methane and, when burned, waste contributes to CO₂ emissions. Both methane and CO₂ are greenhouse gases (GHGs), the emission of which should be decreased in line with international standards such as the United Nations Framework Convention on Climate Change (2016). Inefficient waste management can have a negative impact on the local climate as it could block drainage, causing flooding during heavy rainfalls.

⁵¹ ITU, *U4SSC: A guide to circular cities* (United for Smart Sustainable Cities, June 2020). Available at <https://www.itu.int/pub/T-TUT-SMARTCITY-2020-1>.

Solid waste pollution carries with it potentially adverse effects on the environment and health. As such, the city should increase the volume of waste recycled, while simultaneously decreasing the amount put into open-air dumps, incinerated, burned or disposed of in landfills. There is a need to: (i) develop infrastructure and technologies that enable the use of waste for energy generation; (ii) promote sustainable material cycles via design control; and (iii) encourage residents and businesses to sort and recycle their solid waste.⁵²

Local waste management policies should also be climate-neutral, based on the principles of circular economy, and reflect the capacities of organizations directly managing solid waste collection and processing. Solid waste management should be included in sustainable housing strategies and policies, as this waste is generated during housing construction and demolition, and from household usage⁵³ suggesting that particular attention should be paid to the waste products of the construction sector.

There is a need to promote solutions that allow for the integration of waste management into water and energy management. Initiatives aiming to optimize water consumption, reduce GHGs and energy consumption, and decrease waste-processing costs should be promoted and scaled up.

4. Improve public building sustainability and reduce energy consumption.

Improving public building sustainability leads to improved environmental quality and quality of life. Buildings account for a significant proportion of GHG emissions and resources used in cities. Constructing, operating, refurbishing and maintaining public buildings consumes significant amounts of energy.

High use of energy for buildings is associated with potential adverse effects on the environment, especially when the production of energy is based on fossil fuels. However, it is estimated that existing technologies can reduce energy consumption by 30 to 50 per cent in buildings without significantly increasing investment costs.

Improving the energy performance of housing contributes to the increased comfort of living, reduced energy bills, alleviation of fuel poverty, mitigation of GHG emissions, and job creation⁵⁴.

In line with the KPI evaluation, the city is encouraged to take steps towards decreasing levels of energy consumption and improving the overall sustainability of public buildings. This concerns especially the energy efficiency of the old building stock and office buildings, whose life-cycle energy (primary) requirement⁵⁵ is in a range of 250–550 kWh/m² per year (compared to conventional residential buildings, with an energy requirement of 150–400 kWh/m² per year).

The city is encouraged to further work with the business community and academia to develop innovative policy solutions that stimulate demand for energy savings and energy efficiency. This mainly concerns the development of new technologies and designs that allow sharing, recycling, refurbishing, re-using, replacing, and digitizing the use of energy, on the one hand, and the development of passive and active technologies that allow the reduction of energy demand during the building's life cycle, on the other hand.

The city should also promote initiatives that aim to decrease electricity waste and loss, and work with the national Government, the business community and academia to this end. This could include incentivizing the production and use of energy-efficient and “smart” appliances (whose functioning can be linked to consumer behaviour) by households.

5. Improve the public transport infrastructure.

A well-designed, efficient public transport system is the backbone of sustainable, smart urban development. It prompts the equal redistribution of the benefits of urbanization and facilitates the reduction of socioeconomic inequalities in cities. Over recent decades, the transport infrastructure has benefitted from access to innovative ICT and solutions, which provide dynamic public transport information, including traffic monitoring and intersection control.

52 *Climate Neutral Cities: How to make cities less energy and carbon intensive and more resilient to climatic challenges* (United Nations publication, 2011). Available at https://unece.org/DAM/hlm/documents/Publications/climate.neutral.cities_e.pdf.

53 UNECE, *Geneva UN Charter on Sustainable Housing*, 2015. Available at <https://unece.org/housing/charter>.

54 UNECE, “UNECE studies and networks will help reduce buildings’ energy consumption”, 29 November 2018. Available at <http://www.unece.org/info/media/presscurrent-press-h/sustainable-energy/2018/unece-studies-and-networks-will-help-reduce-buildings-energy-consumption/doc.html>.

55 The life-cycle energy (primary) requirement is the assessment of the energy needs of a building throughout its life cycle.

The evaluation of Grodno against the KPIs for SSC reaffirms the city priorities to further invest in the transport infrastructure, and especially to improve intersection control and traffic monitoring, increase the share of low-carbon-emission passenger vehicles (currently 0.08 per cent of all vehicles), and develop a bicycle lane network. It is also important to improve the modal split, including increasing the amounts of journeys made by public transport. This requires comprehensive action to develop relevant solutions, taking into account a range of factors such as the cost of owning, driving and parking private vehicles, and the quality and cost of alternative transport modes such as public transport and cycling.

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Smart Sustainable Cities Profile

Grodno, Belarus

Grodno is the third largest city and key administrative, economic and cultural centre in the Republic of Belarus. It has a favourable business environment, with tourism accounting for the largest share of the city's gross domestic product followed by the fertilizer, food, furniture, tobacco and hosiery industries. In 2019, the city registered a low unemployment rate of only 0.3 per cent, which was below the national average of 4.9 per cent.

The outbreak of the COVID-19 pandemic in 2020 marked a period of significant challenge for the economy of Grodno, due in part to the city's high dependence on exports and lower tourism revenues. Moreover, the negative effects of the COVID-19 pandemic were disproportionately felt by most vulnerable groups, including low-income families, families with children, and part-time employees. The coordinated response of the local government, coupled with assistance from the central Government, helped the city regain its pre-pandemic income growth levels by 2021.

The Smart Sustainable City Profile of Grodno tracks the city's progress in transitioning to a smart, sustainable city using the UNECE Key Performance Indicators (KPIs) for Smart Sustainable Cities (SCC), developed jointly with the International Telecommunication Union (ITU) in the context of the United for Smart Sustainable Cities (U4SSC) initiative. The Grodno City Profile provides recommendations for upscaling the city's urban development efforts and supporting the successful achievement of the Sustainable Development Goals (SDGs).

UNECE supports countries to achieve the SDGs of the 2030 Agenda for Sustainable Development. Through its Committee on Urban Development, Housing and Land Management, UNECE cooperates with cities to help achieve, in particular, SDG 11 (Sustainable Cities and Communities). Further to promoting resilient and smart sustainable cities, the Committee works to promote affordable, adequate and affordable housing, and transparent and efficient land use and property registration.

For more information on the work of the UNECE Committee on Urban Development, Housing and Land Management, please visit <https://unece.org/housing>.

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