UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Project of the Republic of Belarus

Project number: ID 170165
Project title: Institutional strengthening and policy support to upgrade the component manufacturers in the automotive sector in the Republic of Belarus

Project phase: Phase II
Thematic area code: GC2 Advancing Economic Competitiveness

Starting date: Phase I: 2014–2017
Phase II: 2017–2019

Duration: Phase I: 30 months
Phase II: 15 months

Project site: Republic of Belarus

Government Coordinating agency: National Academy of Sciences of Belarus
Main counterpart: Ministry of Economy and Ministry of Industry of the Republic of Belarus
Executing agency: UNIDO
Donor: Russian Federation

Project Inputs Phase I:
- Project costs: USD 880,530
- Support costs 13%: USD 114,470
- Total project costs: USD 995,000

Project Inputs Phase II:
- Project costs: USD 398,230
- Support costs 13%: USD 51,770
- Total project costs: USD 450,000 (the Russian voluntary contribution to UNIDO IDF)

Brief description:

The overall objective of the project is to assist the automotive component suppliers in the Republic of Belarus to meet the requirements of Original Equipment Manufacturers (OEMs) and the first-tier automotive component manufacturers.

More specifically, the project foresees:

- Enhancing the performance of participating suppliers in the automotive component industry in the Republic of Belarus to ensure their international competitiveness through enterprise-oriented direct shop-floor interventions, at a first step on a pilot-bases, and finally through selected business support and advisory institutions.
- Upgrading the relevant support institutions through strengthening institutional set-up, optimization of the service portfolio and development of a base of well-trained national engineers.

Phase II is envisaged to broaden and deepen the scope and outreach of already established programme services, implemented in Phase I during the 2014–2017 period, and to ensure sustainability of the overall project by focusing on:

- The establishment of a dedicated institution;
- Formulation of terms of reference for the institution; designing its portfolio of activities to include shop-floor assistance for industrial upgrading and moving from lean management to Industry 4.0; providing trainings, using UNIDO methodology; organizing study tours and workshops; expanding the outreach of the shop-floor assistance programme to additional group of companies; raising awareness on the issues related to Industry 4.0; smart specialization models and sustainable industrial development; and leveraging multi-stakeholder engagement, partnerships and resources for industrial upgrading and diversification.
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A. CONTEXT

A.1. Origin of the project

Since 2014, the UNIDO project on Institutional Strengthening and Policy Support to Upgrade the Component Manufacturers in the Automotive Sector (Phase I), has been supporting the Republic of Belarus to upgrade its automotive industry.

Based on successful results of the Phase I of the project, the Project Steering Committee (PSC) requested UNIDO to extend the project to a second phase, with the objective to broaden and deepen the scope and outreach of already established programme services. The following results were achieved during the first phase:

- Pilot companies (30) are capacitated to use UNIDO methodologies on lean management based on training provided.
- 55 workshops were held and 180 lean agents in companies trained.
- 30 company interventions and follow-up actions were implemented.
- Study tours to Indian companies and KAMAZ (Russian Federation) organized.
- Application of the lean management in the pilot companies resulted in effective use of space and resources, and better communication within the company that resulted in increased output and productivity; economic returns exceeded BYN 1.5 m (more than USD 850,000) over the implementation period.
- Innovation survey with concerned stakeholders was conducted and report on innovation activities containing recommendations was produced.
- Achieved results led to rising demand for extending project to Phase II which will include more companies; designing and providing training on advance manufacturing methods using concepts, ideas and technologies of Industry 4.0; and ensuring the sustainability of the project by exploring possibilities for establishment of an industrial upgrading center in cooperation with Belarusian National Technical University and Retraining Institute, and the Amkodor holding.

The relevance of extending the Project to the second phase was further underlined by the accession of Belarus to the Eurasian Economic Union (EAEU). The EAEU facilitates free movement of goods, services, capital and labor and pursues coordination and harmonization of policy in the sectors determined by the Treaty and agreements within the Union. The extension of the project to Phase II will therefore address issues related to the changed customs policies and export requirements.

The extension of the project will further contribute to realizing the national development priorities of pursuing inclusive and sustainable industrial and economic development, and especially to further enhance social inclusion of disadvantaged groups such as women and youth, seeking equal representation of women and men in project relevant activities. The project is fully in line with UNIDO commitments within the United Nations Development Assistance Framework (UNDAF) for the Republic of Belarus for 2016–2020, and Outcome 2.1: By 2020, the economy’s competitiveness will have been proved through structural reform, accelerated development of the private sector and integration in the world economy.
A.2. Background and challenges

The global automotive industry is a key industrial sector with a high multiplier effect for the rest of economy. It employs around 9 million people globally, representing over 5% of the world’s total manufacturing employment. It is estimated that each direct job in the automotive industry supports at least five other indirect jobs, resulting in more than 50 million jobs. Many people are employed in related manufacturing and service companies, as the automotive industry uses very diverse primary and intermediary goods such as steel, iron, aluminum, glass, plastics, textiles, computer chips, rubber, and electrical components.

Global automotive value chains (GVCs) display strong regional integration patterns despite retaining some distinctive national and local elements. The manufacture of machinery (ISIC Rev.4 code 28) value chain is mostly influenced by the big traditional producers, which are increasingly engaged in manufacturing of motor vehicles, trailers and semi-trailers (ISIC Rev.4 code 29). The Belarusian machine-building and automotive industries are no exception in this regard. For instance, the heavy-duty vehicle sector has a developed national value chain, but more recently, there are efforts to integrate into GVC through the import of more sophisticated engine technologies for joint ventures with major Western manufacturers.

In contrast to memory chips and microprocessors in the electronics industry, or to fabric and thread in the apparel industry, automotive parts and sub-systems tend to be specific to vehicle models. Suppliers are often tied to lead firms, as the absence of open, industry-wide standards, undermines value chain modularity, limiting economies of scale in production and economies of scope in design. The need for close collaboration raises the costs for suppliers with multiple customers. Generally, design work converges into few geographic clusters, typically near the headquarters of lead firms.

In the context of the automotive industry development in Europe, the transformation process into an internationally competitive automotive industry has not been an easy process, particularly for small and medium-sized enterprises (SMEs). Today, with the ongoing outsourcing strategies of multinational manufacturers (OEMs), the globalization process has opened new markets and access to new skills and technology, but has also put immense pressure on component suppliers to continuously improve their efficiency, productivity and quality, and to become competitive on national and international markets. Economies of scale, price, quality, and the ability to deliver quickly determine the success rate in market penetration.

Based on these market realities, domestic lower tier component suppliers are faced with several challenges that need to be adequately addressed to ensure their competitiveness in global markets. OEMs have also realized that in order to maintain their own competitiveness in the global arena, it is crucial to help their suppliers meet standards of the markets they supply.

Product innovation in the form of new products or services allows firms to enter new markets and expand their operations. Introducing new production processes (process innovation) enables firms to produce a given output more efficiently, and become more productive.

Joint ventures are a well-employed strategy by Belarusian companies to leverage new technology and produce high quality products. The downside is that high quality products require advanced components (e.g. engines) produced by foreign suppliers, which increases the final product price. Specifications can either be developed jointly, in a co-design process, or suppliers produce according to rigid design instructions. Systems integration—vital for the performance of vehicles—and the growing complexity of many vehicle parts and sub-systems define how value chain linkages are forged and managed in the automotive industry.

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Product and process innovation have the potential to boost profitability and strengthen firms’ competitive positions, both nationally and internationally. Innovation through linking with global value chains can help the Belarusian automotive sector to upgrade their industry and meet demands of international markets and increase competitiveness. A recent positive example is MAZ, launching new EURO-6 compliant trucks for European customers, as well as being among the first to offer them on the Russian market.³

A.2.1 Automotive sector in Belarus

The Belarusian automotive industry shows great potential for innovation and upgrading, but faces challenges.⁴ It is strong in the production and sales of heavy-duty vehicles, where producers comply with international ISO quality accreditation and can kick-start the development of the passenger car value chain, but rarely innovate beyond their traditional products. Despite being the global top producer of heavy duty vehicles, tractors and specialized trucks, slow modernization and upgrading have become obstacles for industry diversification, creation of new value chains and maintaining competitiveness. Russia is the most important trade partner of Belarus, followed by other CIS countries. Trade to other non-CIS regions is slowly increasing but remains low. The trade structure is relatively stable, with a slight decrease in the share of vehicles, textiles and apparel on the exports side, and an increased share of oil and oil products, machinery and equipment on the imports side.

The Belarusian automotive industry’s leading players are vertical conglomerates. Ensuring governance and lower transaction costs is the underlying rational for vertically integrated firms and has contributed to a reliable supply of critical components; although within the conglomerates, often prices of intermediate goods are not subject to market benchmarks, which reduces the incentives for many companies to introduce new products and processes.

Vertically integrated enterprises are important for the Belarusian economy for job creation, as they often constitute the largest employer in small towns, making it difficult to leverage adjustments for efficiency gains by staff or other cost saving potential, particularly in wholly state owned-enterprises.⁵ Linking local SMEs, mostly parts and components suppliers, with leading firms in this industry value chain is also often difficult due to either a lack of information on relevant products in the country or other barriers to cooperation.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Main Products</th>
</tr>
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<tbody>
<tr>
<td>Minsk Automobile Plant (MAZ)</td>
<td>Vehicles and line-haul trains; truck tractors for inter-city and international transportation; tipper trucks, logging trucks, trailers and semi-trailers, buses and coaches.</td>
</tr>
<tr>
<td>MAZ-MAN</td>
<td>Heavy vehicles; truck tractors (with wheel arrangements of 4x2, 6x2 and 6x4); dump trucks (with wheel arrangements of 6x4 and 8x4); and chassis for equipment with wheel arrangements of 6x4, 6x2 and 8x4.</td>
</tr>
<tr>
<td>Belarusan Automobile Plant - BELAZ</td>
<td>Heavy and heavy-duty dump trucks, front loaders, bulldozers, and air-tows.</td>
</tr>
<tr>
<td>Minsk Tractor Plant (MTZ)</td>
<td>Agricultural vehicles, universal tractors, ranging from 50 to 280 hp (23 models); small-sized tractors ranging from 20 to 35 hp (6 models); walk-behind tractors and mini-tractors ranging from 8 to 12 hp (8 models); and utility, loading, mining, and forest exploiting equipment.</td>
</tr>
</tbody>
</table>

⁴ Sources: www.belarusdigest.com; www.select.by; www.manufacturing.net; Additional sources as indicated directly in the text.
⁵ See World Bank (2012b).
BelAgroMash - Bobruiskagromash: Agricultural vehicles; machines for liquid and solid mineral and organic fertilizer application; hay-making machines; complexes for transporting and distribution of forage; and mobile universal cattle-feeders and flax harvesters.

Amkodor: Construction vehicles; loaders, aerodrome cleaning machines; snow plugs; pavement cleaning machines; road-rollers; and forest industry equipment.

Mozyr Machine-Building Plant: Attached implements of ameliorative and road construction equipment (bulldozers, extractors, rippers); rotor road grass-mowing machines; attached implements of agricultural loaders.

Gomselmash: Self-powered combine harvesters, universal utilities, fodder-harvesting and beetroot-lifting equipment, seeding machines, grass-mowing machines, reaping machines, mini-tractors, grain combine harvesters and flax harvesters.

Lidselmash: Potato planters; cultivator-cum-ridgers; potato combine harvesters; potato-diggers; disk tillers; tractor ploughs; pneumatic planters; grain dryers and others.

According to the Ministry of Industry, there are nine automotive assemblers (including agricultural machinery manufacturers) in the Republic of Belarus. Among the main products assembled by these companies are: trailers and semi-trailers; buses and coaches; tipper and logging trucks; four-wheel-drive off-road cars; super-heavy mine trucks and tipper truck trailers; auto-loaders; and self-powered scrapers. In general, lead companies have more than one main product. Among assemblers, MAZ for instance, produces heavy vehicles, such as trucks, and it manufactures as a secondary product, buses and coaches.

The automotive parts and components’ producers have the following product structure: the top product accounting for around 52% of their production; a second and possibly third main product accounting for 18%; and the remaining 30% is spread across other products. About 70% of their intra-industry trade is in the country and mainly to one assembler and to around16 automotive parts and components manufacturers.

Table 2: The main automotive parts suppliers in Belarus

<table>
<thead>
<tr>
<th>Firm</th>
<th>Main Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minsk Motor Plant (MMZ)</td>
<td>Four- and six-cylinder diesel engines for the automobile and tractor industry; engines with boost-pressure charge.</td>
</tr>
<tr>
<td>Belshina</td>
<td>Tiers</td>
</tr>
<tr>
<td>Mogilev Automobile Plant, named after S.M. Kirov (MOAZ)</td>
<td>Self-powered scrapers; motor-vehicle trains for underground mines and tunnels; trucks for aircraft towing; auto-loaders for mining work; mixer trucks; and dump trucks.</td>
</tr>
<tr>
<td>Belkard</td>
<td>Axle drive shafts</td>
</tr>
<tr>
<td>Borisov Plant Avtogidrousilitel</td>
<td>Steering boosters; oil pumps</td>
</tr>
<tr>
<td>Grodno Automobile Unit Plant</td>
<td>Shock absorbers; brake chambers</td>
</tr>
<tr>
<td>Borisov Plant of Automobile and Tractor Electrical Equipment</td>
<td>Starter units and other electrical equipment for automobiles and tractors.</td>
</tr>
<tr>
<td>Minsk Gear Plant</td>
<td>Splined shafts and wheels for automobiles, tractors and other equipment; black work; and tractor ploughs.</td>
</tr>
<tr>
<td>Brest Electromechanical Plant</td>
<td>Pneumatic grain seeders; till-plant outfits</td>
</tr>
</tbody>
</table>

Source: The Ministry of Industry of Belarus
The most imminent, and by far potentially the most damaging weakness and threats have become loss of competitiveness; access to capital; volatile demand and pressure from buyers to cut prices, and increase quality of suppliers’ products and services. The consequences are evident throughout the industry, with vehicle manufacturers cutting down on shifts; suppliers revising their earnings expectations; and auto dealers slashing prices. These pressures are even greater for the Tier-2 and Tier-3 suppliers, who make parts for the Tier-1 suppliers. Many are likely to go out of business, or to be consolidated, because vehicle manufacturers, facing intensified market pressures, tend to pass on the pressure to their suppliers in terms of price, quality and services.

To face these challenges and increase competitiveness, countries are pursuing different approaches to increase the automotive industry’s competitiveness through the provision of policy incentives and support schemes for public-private partnerships and dialogue with the Original Equipment Manufacturers (OEMs) to incentivize them to support upgrading and strengthening of their suppliers’ capabilities.

The importance of this industry for Belarus is additionally reflected in the social and industrial development targets, set out in several policy documents and in various presidential decrees. The industry has long-standing tradition and is recognized especially amongst former Soviet Union for its competence in machine building and manufacturing. This is mainly due to well-qualified labor force in engineering, considered to be a major strength of the current industry set up.

However, the technological efforts and product specifications are directed towards meeting national and region-specific norms and standards’ requirements while still lagging behind globally accepted standards—most notably in diesel engines compliance with Euro V and VI and IIIB emission standards. This apparent gap prevents the national producers from competing in more advanced international markets, such as the neighboring EU, while there seems to be few incentives in terms of adopting international standards if they are complying with standards accepted in the Russian Federation and other countries of the former Soviet Union.

Despite the fact that the Government of Belarus is investing in attracting foreign direct investment (FDI) through establishing free economic zones and industrial parks, there is still a lack of foreign investors in the country, contrary to commonly observed global trends in the industry and in neighboring countries, where we can observe the proliferation of alliances and joint ventures between domestic and foreign manufacturers that are used as sources of technology and knowledge transfer for industrial upgrading. These trends could be a disadvantage for Belarusian automotive industry competitiveness.

Although Belarusian production of heavy-duty vehicles is the highest in the CIS region, it is still too low to create economies of scale and meet international market demand in terms of volume and standards. Producers comply with international ISO quality accreditation and can kick-start the development of the passenger car supply chain, but rarely innovate beyond their traditional playing field. Despite being home to some of the top global producers for heavy duty vehicles, tractors and specialized trucks, the industry has not been able to pull out of recession. Slow modernization and innovation have added to the problems the industry is yet to overcome. Some companies, such as MAZ, Minsk Tractor Works and Amkodor, produce innovative products but these innovations do not trickle down the supply chain, as many companies are simply relieved to meet output targets without exploring options to enhance productivity, or introduce new products.

Further, the industry relies heavily on simplistic technologies, which has attracted demand from least developed country (LDC) buyers, who could easily maintain and repair imported engines by themselves. Modern engines contain more sophisticated electronic parts, which make the “repair-yourself” reputation of Belarusian trucks, tractors and other heavy machinery, no longer an effective marketing strategy. Finally, pressures from state-owned enterprises to deliver equipment at heavily discounted prices impede profitable production.

The industry must tackle not only the exposure to the fluctuating demand, but also competitive pressures from Western and Asian producers such as Volvo, John Deere Rus, CAT, Komatsu and Terex, who also have assembly plants in the Russian Federation. In the last decade growing competitive pressure from western producers with assembly plants in Russia have contributed to the industry’s decline. These new economic competitors necessitate the implementation of structural reforms. In the advent of new technologies, such as electric vehicles and new forms of transportation,
reshaping the automotive industry in Belarus may provide a comparative advantage over its competitors in the Russian federation and Asia.

**Opportunities behind challenges**

Establishing Belarus as a low-cost alternative to the Russian Federation, with tariff-free access to the larger markets in Russia and Kazakhstan, may provide an opportunity for the automotive sector to expand through the location of foreign-owned production plants in the country. While foreign-owned firms may become competitors in the Belarusian market for domestic producers, the benefit from foreign investment may more than outweigh potential negative effects. They not only bring new capital and create opportunities for job creation, but they are also likely to create linkages with domestic sub-suppliers, leading to technology transfer, new export opportunities, new entrants by domestic firms in related industries and ultimately to productivity growth among existing Belarusian firms.

Another possibility is to expand to new markets by setting up production centers there. Recent examples include the Minsk Automobile Plant (MAZ trademark), entering into an agreement with Argentinian investors to set up a plant for truck production there as well as Minsk Tractor Works to start local production in Pakistan, in addition to establishing production lines in Lithuania, Egypt, and China. Investing abroad allows a firm to expand production at home through providing intermediate inputs for the plant abroad and so-called headquarter services for design, management, and communication, and it also enables access to foreign technology and markets.

Despite the recent slump in output, Belarus has a good international standing in the heavy-duty commercial vehicles industry with brands such as Belaz, MAZ and MTZ, who demonstrated the capability to push the innovative edge. For example, the record-breaking 450-tonne dump truck from Belaz was the winner of the Swedish Steel Prize 2014, for the company’s innovative and new construction technique in axle suspension and slew bearings. The properties of high-strength steel made the new construction possible and Belaz took full advantage of it.

Minsk Tractor Works is among the world’s leading manufacturers of wheeled tractors holding about 8–10% of the global market. The company offers over 60 models and 100 modifications of tractors for all kinds of climatic conditions. For many decades MTZ-made tractors have been successfully operated all over the world. MTZ exports to more than 60 countries worldwide, and has assembly plants in Russia, Kazakhstan, China, Algeria, Venezuela and other countries.

Belarus has also built a reputation in related industries, such as in parts manufacturing. Parts manufacturers are an important player in the automotive industry because having local production of parts is crucial in hedging against volatile oil prices. Examples of internationally successful Belarusian part suppliers are Belshina, one of the largest European tire manufacturers, and the Belarusian Steel Works (BMZ trademark) producing rolled metal products, pipes, wires, and steel fiberboard and selling them to over 100 countries worldwide.

Short-to-medium term automotive components offer the best FDI prospects within Tier 2 suppliers. Currently, Tier-1 companies seek more efficient capacities for Tier-2 investment projects. Tier-1 and OEMs tend to source supplies locally, which provides an opportunity for existing heavy machinery components — including in trucks, tractors and specialized heavy vehicles — companies in Belarus to diversify production into auto component production, which requires a sustained focus on product process and functional innovations.

**A.2.2 Automotive industry in the context of New Industrial Revolution (Industry 4.0)**

When Henry Ford introduced the assembly line in 1913, he ushered in the second Industrial Revolution — and upended the automotive industry. Now a century later, thanks to the ideas, concept and technologies of Industry 4.0, the automotive industry is again making a dramatic shift. Industry 4.0 has been a boon to the automotive industry, streamlining its operations and offering new business opportunities.

Industry 4.0 is defined by connectedness: in the Industry 4.0-ready facility, devices connect to each other and to human interfaces, providing real-time data from myriad sensors. And humans can “connect” to that data at any time. Paired with advanced analytics and machine learning, this
ecosystem of sensors, devices and humans is incredibly powerful. Industry 4.0 enables a ‘smart factory’: within modular structured smart factories, cyber-physical systems monitor processes, creating virtual of the physical world and enabling decentralized decisions. The Internet of Things (IoT) facilitates the communication and cooperation of cyber-physical systems in real time with each other and with humans, and the Internet of Services (IoS) enables the use of internal and external services by supply chains. Automation, sensors, big data, analytics and artificial intelligence (AI) make cars safer and more reliable but require increasingly efficient and robust digital power solutions. In the automotive industry, power management is often achieved by a set of power management information and communications (PMICs), as a part of the centralized embedded computer system. Semiconductor manufacturers offer a wide range of PMICs, with the latest generation including digital control and advanced communication interfaces. Most automotive facilities have not reached that perfect state of connectivity in which humans and machines seamlessly work together. But the industry has readily embraced the principles of Industry 4.0.

Supply chain leaders in every sector recognize that Industry 4.0 offers myriad benefits, all of which impact an organization's bottom line. But it confers unique advantages for the automotive industry:

- **Agile supply chain**: Both suppliers and OEMs in the automotive industry are subject to increasingly stringent fuel regulations. The result is a push for using light material with low weight that decreases demand for fuel. Industry 4.0-readiness also gives OEMs and suppliers the agility to quickly adapt manufacturing specifications in response to changing standards and buyers’ demands.

- **Self-monitoring capabilities**: As facilities increasingly move toward 24-hour production, equipment reliability becomes even more critical. Industry 4.0-enabled plants will have robust monitoring systems to identify potential maintenance issues before they cause downtime. That same technology can be used in cars themselves to decrease unexpected breakdowns.

- **Capacity for customization**: Today's car drivers consistently express the desire to customize their vehicle configuration. The traditional automotive manufacturing process does not allow such personalization. However, evolving toward Industry 4.0 would give auto manufacturers the ability to not only customize individual vehicles, but also shorten the delivery time for those vehicles.

- **Network flexibility**: Automotive manufacturers have locations all over the world. Industry 4.0-ready manufacturers also strategically connect all these locations. If production or demand fluctuates, operations can shift among facilities as needed.

The speed and variety of Industry 4.0 related innovations in various sectors is driving ever more ambitious and far reaching concepts with the potential to drastically change how societies live and work. There are also prospective disruptive impacts. Many analysts fear polarization of the labor force, with an increasing share of employment in high-skills/high-wage and low-skills/low-wage jobs and a decreasing share of employment in middle-wage jobs. As far as developing countries are concerned, a combination of low-skills, low-wages and weak education systems could hinder their ability to benefit from new technologies in the first place. With advanced educational systems, developed economies are likely to benefit the most, as new technologies will help them create a manufacturing renaissance, marked by high-skill, high-end manufacturing, located closer to end users.

Taken together, these developments would lead to the emergence of more sustainable production and consumption patterns, and could provide opportunities for developed and developing countries to achieve economic growth and sustainable development in line with the 2030 Agenda (Sustainable Development Goals (SDGs) 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 17). This model, with new technologies and energy and resource efficiency at its center, can reconnect the environmental, economic and social pillars of sustainable development.
A.3. Counterpart organizations

The main government counterparts for the project are the Ministry of Economy (MoE) and the Ministry of Industry (MoI) of the Republic of Belarus. The MoE carries out regulation and management in the area of analysis and forecast of social and economic development, and implements the state economic policy, and fosters entrepreneurship and investments. The Ministry will play a key role in the process of communication with SMEs in automotive sector.

The MoI manages over 360 enterprises with a workforce of over 300,000 employees and contribution to the country’s output of 25%. The main functions of the Ministry include:

- Managing the state-owned companies of machine-building, metal-processing, metallurgic, machine tool, radio-technical, electronic, instrument-making, electrical, optical and mechanical industry.
- Promoting development of relevant industries.
- Designing and implementing development programmes for priority industries.

The Ministry is essential for this UNIDO project in terms of establishing contacts with large enterprises, joint-stock companies and industry associations and educational establishments.

In the context of Phase II of the project, both Ministries are expected to provide active support in implementation and coordination of the project through the contribution to the work of the Project Steering Committee (PSC); attending the PSC meetings; facilitating establishment of contacts with companies and BDS providers, as well as providing in-kind contributions, such as access to premises for meetings and provision of trainings, and dedicated staff.

At the technical level, counterpart institutions of the project include:

1. State Scientific Institution “Joint Institute of Mechanical Engineering of the National Academy of Sciences of Belarus” (JIME), which is a leading research center in mechanics and mechanical engineering in Belarus.

JIME provides scientific support, and organization and coordination work related to:

- The creation of export-oriented automotive vehicles and combines that are equipped with multi-level integrated electronic adaptive control systems and diagnostic knots and aggregates that include mechatronic components and intelligent devices:
  - High-powered tractors and combines, trucks and auto trains, including multi-tier modular type;
  - Buses, including super low floors articulated in 2-3-section, with hybrid propulsion systems, mining dump truck with capacity of 95-500 tons; and
  - Multi-wheeled haulage truck; logging equipment; road building and municipal vehicles; and municipal electric vehicle.

JIME will provide expertise and support in organization of workshops and trainings related to the product and processes of upgrading and applications of Industry 4.0 in the sector.

2. Belarusian National Technical University (BNTU), which currently has more than 35,000 students and 17 faculties, including mechanical engineering, transport, marketing, management and entrepreneurship. The BNTU students and professors actively participate in international research activities. BNTU is member of FISITA, the International Federation of Automotive Engineers. BNTU experts will be a source of the national expertise, and will participate in the capacity building activities of the project. BNTU will also contribute to the organization of workshops and trainings (in-kind support), assist in conducting company surveys, and provide other support to the project implementation when required.

3. Institute for professional development and retraining of heads and experts of the industry. The institute is widely known in all regions in the Republic, and provides high quality trainings for the head and experts of Ministry of Industry of the Republic of Belarus, and other ministries and
departments. The main task of this Institute is to meet the requirements for development of highly professional personnel; to ensure the effective social and economic development and national security of the republic; and to respond to individual inquiries of citizens regarding increasing the vocational training.

A.4 Expected target beneficiaries

The core project target groups are local SMEs: Tier-2 and Tier-3 suppliers of automotive industry value chain, and the relevant business support and advisory institutions in the country at the institutional level. The target group consists of those automotive component suppliers that will take part in the training of trainers and other activities covered by this project. It is envisaged to support at least ten SMEs that are employing less than 250 persons and having an annual turnover not exceeding 50 million euro. They will be assisted by qualified international and local experts in building stronger linkages to peers and support institutions, and experimenting in the implementation of continuous improvement techniques, aimed to respond in a proactive manner to the supply chain requirements of national and international lead players in the industry value chains.

Through a demonstration and dissemination of results from the two pilot groups of SMEs, other firms will recognize that UNIDO approaches to collective efficiency, partnership building, quality and productivity enhancement, inclusion of women and youth, and environmental management can increase their competitiveness.

The second target group consists of the business support and advisory institutions, relevant to the automotive industry, including business associations, chambers of commerce, BDS providers, vocational and technical training institutions, business schools and NGOs. Experts from these institutions will benefit from the training delivered by this project on product, process, functional and value chain upgrading methodologies; on cluster development; and how to promote business linkages and partnerships at the local level.

A.5 National development framework

The Belorussian Government recognizes that the automotive industry is an important industrial sector for economic development of the country and several public programmes target the automobile industry such as:

- The State Program for Innovative Development of the Belarus Republic for 2016–2020, providing major directions for state innovative policy targeting hi-tech sectors; systems of innovation and developing innovative infrastructure in the country.
- The State Program of Social-Economic Development in Republic of Belarus for 2016–2020, providing directions for pursuing sustainable economic development and realizing the quality of life like the one in the developed countries based on innovation, diversification, creating new jobs, economic competitiveness, and FDI attraction.
- The state program on Small and Average Business in Republic of Belarus for 2016–2020, ensuring development of small and average business in Belarus.
- National Strategy for Sustainable Social and Economic Development of the Belarus Republic until 2030, designed to ensure balance between three pillars; social, economic and environmental of the development of the country.
B. REASONS FOR UNIDO ASSISTANCE

UNIDO’s ISID mandate is based on the recognition by Member States that poverty eradication “can only be achieved through strong, inclusive, sustainable and resilient economic and industrial growth, and the effective integration of the economic, social and environmental dimensions of sustainable development.” The ISID concept assumes that:

- Every country achieves a higher level of industrialization in their economies and benefits from the globalization of markets for industrial goods and services.
- No one is left behind in benefiting from industrial growth, and prosperity is shared among women and men in all countries.
- Broader economic and social growth is supported within an environmentally sustainable framework.
- The unique knowledge and resources of all relevant development actors are combined to maximize the development impact of ISID.

UNIDO’s goal of achieving ISID is explicitly recognized and anchored within the internationally agreed 2030 Agenda. Through SDG 9, the Member States of the United Nations call upon the international community to “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. ISID can therefore serve as a primary engine not only of job creation and economic growth but also of technology transfer, investment flows and skills development. In addition to Goal 9, all other SDGs incorporate some industry-related aspects and targets.

Exploiting its dense network of partnerships, UNIDO advances cooperation and provides advice and support to the formulation of innovation policies and strategies and helps develop institutional capacities to design, manage, monitor and evaluate industrial strategies and policies, including innovation policies to strengthen national, regional and sectoral systems of innovation. In 2016, UNIDO organized a panel on Industry 4.0: Opportunities and Challenges of the New Industrial Revolution for Developing Countries and Economies in Transition. The event debated how UNIDO, and the development community at large, could help developing countries and economies in transition address opportunities and challenges stemming from the Fourth Industrial Revolution in the context of 2030 Agenda and SDGs. The key conclusions from the expert discussion were:

- The importance of building awareness of the Industry 4.0 consequences for ISID and providing access to know-how, skills, education and technology.
- The potential of innovation management standards to help developing countries and economies in transition to leapfrog to Industry 4.0.

The potential of UNIDO to assist in establishing multi-stakeholder knowledge sharing platforms to create awareness of Industry 4.0 opportunities and challenges for pursuing ISID in developing countries; for sharing available tools and methods for innovation management; designing training curricula for new workforce skills requirements; exploring methods and best practices to support SME digital transformation and bridging the gender digital divide; and building awareness among policymakers and industry associations on the issues of new infrastructure, standards and policies that need to be developed or mainstreamed to correspond to the new technologies.

Through its technical cooperation activities, UNIDO specifically supports industrial innovation, product, process, functional and value chains and human skill upgrading, through tailored made curricula programmes. UNIDO programmes furthermore support the design of effective policies that support the private sector (for profit and not-for-profit) to grow and contribute to knowledge, technology and job creation, and hence economic growth. Effective policies that create an enabling environment for the private sector to grow and sustain, including affordable access to basic infrastructure, prudent legislation and provision of adequate finance, information, knowledge, skills and support.
Over the past decade, UNIDO has increasingly focused its attention on the promotion of foreign investment and technology transfer on the one hand, and on strengthening the technical and managerial capacities of SMEs to respond effectively to the challenges and opportunities posed by the process of globalization, on the other hand. By doing so, the integration of SMEs into local and global value chains is an integral part of UNIDO’s work. As national and international car manufacturers and Tier-1 suppliers are demanding increasingly high standards regarding cost, quality, delivery and, to a certain extent, engineering know-how, UNIDO seeks to support SMEs in their endeavor to follow this demand. To help overcome the constraints mentioned above, technical cooperation is required in a variety of associated institutional capacity-building measures. In this connection, UNIDO offers a wide variety of specific technical cooperation services, which can be delivered at the institutional and enterprise level as appropriate. UNIDO has both the mandate and the necessary experience and expertise to help developing countries and economies in transition to identify the bottlenecks inhibiting the establishment of linkages between foreign firms and domestic SMEs, and to support them in designing and implementing the necessary measures to overcome these constraints.

Due to its long-standing involvement in the automotive sector—through technical cooperation projects, research initiatives and global events in the fields of supplier upgrading/development, cleaner production, technology foresight, private standards, policy advisory matchmaking and investment promotion related to the automotive industry, and in particular to component manufacturers—UNIDO has acquired an in-depth understanding of the automotive sector and has established a relevant network of technical experts and collaborating institutions, which is essential for information and knowledge sharing as well as for the transfer of know-how and technology. This has allowed the Organization to deliver tailor-made services, at the institutional and enterprise level, in support of car manufacturer suppliers that are facing increasing higher standards in terms of cost, quality, delivery, and engineering know-how.

The Organization is currently implementing similar programmes in India, Russia and South Africa. Since 1999, UNIDO works with the Automotive Component Manufacturers Association of India (ACMA) to upgrade local auto component manufacturers and to train national counsellors, company experts and quality staff on the UNIDO-ACMA methodology for productivity. The project is self-financed by India, with a contribution from the Indian private sector. By 2011, 133 component manufacturers were upgraded, which resulted in an average increase in sales of 33 percent, through new customers (6 new clients per firm) and new products (30 new products per company), and in tangible benefits/cost savings—on average US$73,000 per firm. The current phase, which lasts from 2014 to 2017, targets another 153 component manufacturers in India and there will be two more phases targeting an additional 400+ suppliers. In the current phase, UNIDO undertakes the firm level innovation survey to formulate evidence based interventions to promote innovation in the automotive component industry.

Launched in 2008, a UNIDO project, together with the Automotive Cluster of Slovenia, helped set up the Automotive Cluster of the Samara Region, Russian Federation, which was registered in 2014. UNIDO also brokered many business partnerships and joint ventures between the two clusters. The project increased the productivity of 33 local component manufacturers, which led to a reduction of up to 45% in changeover time, 10% in the lead time and 15% in downtime. Concurrently, 600 CEOs, experts, managers and employees (40% female) were trained in total quality management and waste reduction techniques.

As of 2003, UNIDO has been supporting the development of a local auto component supplier industry and has already upgraded 65 local component suppliers, resulting in enhanced productivity and cost savings of almost USD7 million, with approximately half of the savings derived from lean manufacturing and half from cleaner production initiatives. The total Return on Investment (ROI) for the self-funded South African project shows a 1 to 4 ratio, meaning that for every Rand invested; savings of 4 Rand were achieved. UNIDO was also instrumental in the 2013 operationalization of the Automotive Supply Chain Competitiveness Initiative (ASCCI) that coordinates and aligns supply chain development activities in the country. UNIDO currently develops a support programme at the Tier-2 level that embraces, in addition to cost, quality and delivery components, labour and environmental issues.
In January 2017, UNIDO initiated a project on improving the quality and productivity of the automotive industry in Colombia with funding from the Korean International Cooperation Agency (KOICA). This 4-year initiative will tackle issues such as enhancing the quality and performance of lower tier suppliers, diversification of target markets for local suppliers, R&D via international experience exchange and market intelligence through the installation of a Subcontracting and Partnership Exchange (SPX) system.

Furthermore, UNIDO was instrumental in the establishment of the Serbian Automotive Cluster and is currently developing projects to support the automotive supplier industries in other countries as well.

C. THE PROJECT

C.1. Objective

The long-term objective of the UNIDO Programme for industrial upgrading and modernization of the automotive component industry in the Republic of Belarus is to assist the automotive component suppliers in the country to meet the requirements of Original Equipment Manufacturers (OEMs) and the first-tier automotive component manufacturers in the automotive industry value chain.

C.2. The UNIDO approach

Several external and internal factors play a critical role in the performance and competitiveness of SMEs. Factors related to business environment and support institutions are as important as internal factors influencing production and growth of SMEs.

UNIDO therefore will focus its technical assistance on several interrelated levels:

- Enhancing the sustainability of the project through the establishment of an industrial upgrading center; expanding the UNIDO methodology to a new pilot group of enterprises; and extending the pool of well-trained national experts and counsellors.

- Improving the performance of domestic automotive component manufacturers to facilitate their inclusion into national, regional and global supply chains and meeting requirements of leading players in value chains through providing new portfolio of services including trainings, study tours, workshops.

- Expanding the outreach of the shop-floor assistance programme to upgrade and enhance the competitiveness of an increasing number of target companies.

- Raising awareness on the issues related to Industry 4.0, sustainable industrial development, industrial diversification and smart specialization, and its implications for the automotive industry in Belarus.

- UNIDO will further consider the synergies between the lean manufacturing approach and energy management systems (i.e. losses and waste minimization) and implementing the resource efficient production and circular economy approaches.

UNIDO recognizes that stakeholder engagement and building solid partnerships are necessary to pursue successful structural transformation in developing countries. UNIDO research has shown that in developing countries and transition economies, there is no dynamic relationship between industry, public institutions and domestic knowledge centers, such as universities and technology centers, which hampers the development of regional innovation system building, crucial for creating new activities and industrial diversification.
Individual small enterprises are often unable to respond to market demands and compete in a globalized production environment. Although agglomerating at certain locations, entrepreneurs often do not share business information, discuss common problems or organize joint activities. Typically, these enterprises suffer from a low level of trust, latent conflicts and intense competition among them. As a result, they experience difficulties in achieving economies of scale and scope, such as in the purchase of equipment and raw materials; accessing finance; and taking advantage of market opportunities that require large production quantities, homogenous standards, diverse products and regular supply. Hence, they are locked within a vicious circle of stagnation and poverty.

Clusters of firms that have realized collective efficiency are better able to grow rapidly, innovate and develop product niches, access export markets and offer new employment opportunities. But in many transition economies, clusters and networks are not easy to develop and the move towards greater cooperation among cluster actors is anything but spontaneous: information flows uneasily; entrepreneurs rarely meet one another, do not have on-going relationships with BDS and are not accustomed to presenting articulated calls for action to the local policymakers.

The exchange of experiences and development of a best-practice strategy on clustering initiatives in Europe and elsewhere will be beneficial for targeted regions for the transfer of know-how on how to build and manage clusters, the promotion of cooperation between cluster members and the formation of a stable cooperation platform to new business perspectives to participant cluster companies. With the goal of establishing synergies, linkages and a continuous information exchange and dialogue between the regional clusters, the cluster development component will be based on the concept, manuals and training courses of UNIDO the Cluster Programme.

C.3. Project coordination and management

The central service module that will be offered by UNIDO for the implementation will be private sector development; the Unit heading the initiative will be PTC/TII/BCI. The potential cooperation can be established with the PTC/ENV and PTC/ENE on the areas of their expertise.

C.4. RBM code and thematic area code

GC2 Advancing Economic Competitiveness

C.5. Expected outcomes

The expected project outcome is:

Automotive component manufacturers productivity and competitiveness increased and meet requirements of leading players in respective value chains, and are successfully integrated into national, regional and global automotive value chains.

C.6. Outputs and activities

The project’s Phase I envisaged the following outputs:

Output 1: Pilot companies upgraded using UNIDO (cluster) methodologies and “demonstration effect” created.

Activities:

1.1 Organize an inception workshop in Minsk to build awareness on the achievements in Phase I of the project.
1.2 Conduct needs assessment to identify most prevailing needs of SMEs.
1.3 Adaptation of training program to the Belarusian context and development of the overall training roadmap.
1.4 Organize trainings, seminars, awareness building campaigns, exposure visits and study tours, including visits to foreign OEM producers.
1.5 Create continuous improvement and counseling programme to individual companies, including shop-floor trainings.
1.6 Identify and promote the implementation of joint SME initiatives such as the establishment of a joint certification/testing center/laboratory.

**Output 2:** Business support institution identified and enabled to provide advice and support to lower tier suppliers on various issues related to leveraging business linkages and partnerships for improving competitiveness.

**Activities:**

2.1 Conduct survey, aiming at identifying upgrading needs of BDS providers.
2.2 Develop and introduce a comprehensive service framework model for BDS providers.
2.3 Conduct training of experts and staff of partner institutions on business upgrading methodology
2.4 Conduct desk research and analysis of the Belarusian position in the automotive component industry, based on experiences in the automotive component industry in Europe.
2.5 Organize study tours and exposure visits for selected support institutions to auto-clusters in Europe.
2.6 Explore market opportunities and prospects for developing regional positioning strategies and the interregional cluster initiatives

**Phase II**

Following completion of the Phase I, the **Phase II** of the project has two outputs: 1.) New pilot companies demonstrate capabilities to use UNIDO cluster development methodologies effectively; 2.) Identified business support institutions strengthened and enabled to provide advice and support to lower tier suppliers on how to leverage promotion of business linkages and partnerships for Improving competitiveness.

**Output 1:** New pilot companies upgraded using UNIDO cluster development methodologies and “demonstration effect” created.

**Activities:**

1.1 Identify and select additional companies for inclusion in the training program and expand implementation of the shop floor assistance program to new group of companies.
1.2 Introduce and implement two-level shop-floor assistance programme to achieve a demonstration effect of UNIDO methodology effectiveness: the first level to cover master-classes for newly selected companies, as during the 1st project phase; the second level to include implementing upgrading programme for companies that have already implemented 2-3 master-classes and are ready to start more complex upgrading activities.
1.3 Produce case study, lessons learned and recommendations, for each beneficiary company.
1.4 Develop new upgrading program modules on moving from lean management to Industry 4.0 application in the industry, based on feedback from the business support institutions and companies in the automotive sector as well as findings of the UNIDO Innovation Survey for Belarus, and in cooperation with international experts and the Belorussian partners.
1.5 Carry out consultation meetings with relevant educational and training institutions to validate the new upgrading program modules, and to identify available services and material on subjects related to the issues to complement the toolkit.
1.6 Develop an overall training and counselling work plan to create synergies with the ongoing shop-floor assistance program.
1.7 Raise awareness on the issues related to Industry 4.0 and its potential for inclusive and sustainable industrial development, and industrial diversification and potential implications for the
automotive industry in Belarus through providing training, mentoring and coaching; organized workshops, EGMs and study tours.

1.8 Prepare the final report and the achieved results.

**Output 2:** Business support institution strengthened and enabled to provide advice and support to lower tier suppliers in the sector on improving competitiveness, promotion of business linkages and partnerships.

**Activities:**

2.1 Develop terms of reference for the identified partner institutions that will host the center for industrial upgrading and experts to provide services to the industry on a sustainable basis.

2.2 Identify the suitable partner(s) to host the center for industrial upgrading taking into considerations sustainability, co-financing including in-kind, outreach and existing capacities.

2.3 Formalize agreement to host the center.

2.4 Operationalize the center.

2.5 Facilitate dialogue with public stakeholders such as Ministries of Industry and Economy, academy of science, on sector-specific Industry 4.0 strategies and policies.

2.6 Produce recommendations for addressing bottlenecks in the regulatory environment and business support institutions to assist in the uptake of Industry 4.0 technologies of Belorussian automotive component suppliers.

**C.7 Gender Mainstreaming Policy**

The project aims at encouraging women and youth to participate in the envisaged workshops, trainings and study tours, and to ensure that women and men equally benefit from capacity building and other activities wherever possible. The project will also benefit from the equal participation of women and men in both project management and as beneficiaries, partners and key stakeholders of the project.
## C.8. Timeline of the activities

### Phase I

| Activity/Month                                                                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|--------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Inception Workshop                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Identify and recruit national and international experts                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Establish project steering committee                                           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Conduct a survey                                                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Identify and select pilot SMEs for inclusion in the training programmes        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Identify and select support institutions                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Adapt the training Programmes                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Develop comprehensive service framework model                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Conduct awareness workshops                                                    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Appointment of continuous improvement teams                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Firm visits by National Experts                                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Implementation of individual firms upgrading measures, including shop-floor trainings |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Training of experts and staff of partner institutions on business upgrading methodology |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Preparation of a final report and detailed case studies                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Strategic analysis of the Belarusian position in the automotive component industry |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Organize study tours and exposure visits                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Identification, promotion and implementation of joint SME initiatives          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Exploration of market opportunities                                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Development and implementation of information dissemination strategy           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

*Note: The table indicates the timeline of activities for Phase I, with some activities spread across multiple months.*
## Phase II

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<td>Facilitate dialogue with public stakeholders on sector-specific Industry 4.0</td>
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<tr>
<td>environment and business support institutions to assist in the uptake of</td>
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</tbody>
</table>
C.9. Risks

The programme is designed to circumvent several possible risks:

*Delays due to multi-stakeholder approach (Low-Medium risk)*
As the overall Programme approach integrates a number of different private and public sector partners, it is critical for the success of the Programme that all partners maintain their commitments to the Programme, otherwise the implementation of the Programme can be delayed. However with proper preparation, information sharing, inclusion of all relevant stakeholders, sound communication with the donors, optimal collaboration between the relevant stakeholders, and clear setting of milestones and targets, the risk can be minimized.

*Lack of visibility (Low-Medium risk)*
The risk of project lacking visibility and recognition required for gaining the trust of Belarusian enterprises and nationals as well as local policymakers will be addressed and mitigated through the continuation of a highly proactive and participative implementation process. It will be important to include local businesses as well as national government institutions from the very beginning in order to achieve high visibility and recognition of UNIDO’s efforts.

*Low participation rate in the project (Low-Medium risk)*
As many enterprises and institutions in Belarus are state-owned, they might lack motivation to participate in the project. This risk can be mitigated by active involvement the Ministries of Industry and Economy in the project.

*Local counterpart are not interested in hosting industrial upgrading center/ Legal framework is not allowing establishing the Center (Low-Medium risk)*
Visible results of the projects and increase in demand for the outreach of the programme can mitigate this risk.

C.10. Communication and visibility

To promote and disseminate the achievements and successes of the project, advocacy and communication activities will be undertaken during the project implementation. The promotional activities will include dissemination of information on the project implementation through the UNIDO website. The communication and visibility strategy might include:

- Press releases
- Press conferences
- Press visits
- Leaflets, brochures and newsletters
- Web sites, containing cross-links to the relevant UNIDO/ donor web-pages
- Display panels
- Commemorative plaques
- Banners
- Stickers/labels on vehicles, supplies and equipment
- Promotional items
- Photographs
- Audiovisual productions and dissemination
- Public events and visits

UNIDO will ensure publicizing the project and funding from the Russian Federation. Infrastructure-related project activities will carry out display panels describing the project (including project title, UNIDO as implementing agency and the donor). The display panels will be clearly visible so that those passing are able to read and understand the nature of the action.

All materials produced within the project will include reference to the financial support from the Russian Federation and will carry the national coat of arms with word “RUSSIA” under it. Publications in press, the beneficiaries of the project, all related publicity materials, official notices,
reports, will acknowledge that the project is carried out "with funding by the Russian Federation" (in English/ Russian and/or local language). When space allows (for example, on sign boards), the visual could be accompanied by a short explanatory text or a relevant joint message on the project (in English and/or Russian).

All project publications, in whatever form and whatever medium, including the internet, will carry the following or a similar disclaimer: “This material has been produced with the financial assistance of the Russian Federation. The views expressed herein can in no way be taken to reflect the official opinion of the Russian Federation. The United Nations did not provide formal editing to this material. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development.”

D. INPUTS

D.1. Counterpart inputs

It is envisaged that the Government of Belarus will contribute in-kind to the setup of the service within the institutional framework of the programme.

In line with established practices in the field of business partnerships, it is furthermore expected that the initiative may leverage upon national resources, including physical, human and financial, from both public and private sources. This may include provision of office and training space, substantive contribution from dedicated staff in ministries, associations and research centers as well as financial support in terms of organization of study tours.

D.2. UNIDO inputs

International staff

International expert on lean management and production in the automotive industry responsible for advising and coaching the national experts based on the UNIDO methodology on cluster development and on international approaches and best practices will be assigned to support the 15-month project implementation. Based on the experts’ experience and educational background, the fee will be set according to established UN rates.

National staff

National project coordinator and local support staff will be assigned based on specific needs identified during the project implementation. A number of local trainees will be employed to be trained on application of UNIDO methodologies. The project seeks to increase the capacity of local expertise to achieve sustainability upon completion of the project.

Subcontracts

Subcontractors are expected to support implementation of the training programmes, exposure visits and workshops for the national experts, as well as experts from selected local support institutions, to build their capacity in the field of cluster development and industrial upgrading activities relevant for the automotive industry including on Industry 4.0. Trainings for the representatives of the participating companies and cluster institutions will be organized as well.
### E. BUDGET

#### Phase I (2015-2017)

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<th>2017</th>
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#### Output 1

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Sub-Total | 390,260 | 317,140 | 173,130 | 880,530 |

Support Costs (13%) | 50,735 | 41,228 | 22,507 | 114,470 |

Total USD | 440,995 | 358,368 | 195,637 | 995,000 |

#### Phase II (2017-2019)

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Sub-Total | 44,230 | 289,000 | 65,000 | 398,230 |

Support Costs (13%) | 6,140 | 38,740 | 6,890 | 51,770 |

Total USD | 50,370 | 327,740 | 71,890 | 450,000 |
**Total budget, including Phase I and Phase II:**

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F. MONITORING, REPORTING AND EVALUATION

**Monitoring:** The Project Manager will monitor project activities on a continuous basis in order to ensure that activities occur as planned and remedial steps are taken as necessary with a special attention to KPIs for the shop floor assistance. KPIs will be established after consultations with project counterparts, and will include such indicators as reduction in changeover time, reduction in lead time and downtime, and number of proposal for joint initiative developed.

A Project Steering Committee, comprising UNIDO and counterpart institutions, will continue its operations and will oversee and validate the overall direction and policy of the project. This body will meet regularly to:

- Approve the six-monthly work plans of the project and the respective budget and monitoring its implementation.
- Ensure that the interests of all project partners are taken into consideration.
- Ensure that the inputs to be provided by the project partners are delivered in due time and quality.
- Provide advice on the promotion strategy of the project and its activities.
- Monitor through the periodic technical and financial reports the development of the activities of the projects and highlight requirements to revise the project strategy in order to meet the objectives stated in the project.

Such tools as operational work plans and back-to-office-mission reports will support the monitoring activities at the project level and facilitate the preparation of project progress reports every six months.

**Reporting:** Project progress reports will reflect all aspects of the implementation of the project during the preceding reporting period, while the final report covers all activities over the reporting period. Written progress reports will be also submitted to the Government of the Russian Federation.

The descriptive technical section of reports will contain the following elements:

- Summary and context of the project.
- Activities carried out over the reporting period as specified in the current project document.
- Problems encountered and measures applied to overcome them.
- Adjustments made in the project implementation as required.
- Assessment of obtained results using the predetermined success indicators.
- Work plans for the next period containing a definition of objectives and related performance indicators. If the report is submitted after the end of the reporting period, a new work plan, albeit provisional, should always be prepared before that date.

Financial monitoring will be exercised by UNIDO as per UNIDO’s standard financial regulations, and regular financial statements will be submitted to the Government of the Russian Federation according to a periodicity to be specified in the financial agreement between the parties.

**Evaluation:** The project will be evaluated according to the existent UNIDO practice.

**Output 1:** New pilot companies upgraded using UNIDO cluster development methodologies and “demonstration effect” created.

**Activities:**

1.1 Identify and select additional companies for inclusion in the training program and expand implementation of the shop floor assistance program to new group of companies.
1.2 Introduce and implement two-level shop-floor assistance programme to achieve a demonstration effect of UNIDO methodology effectiveness: the first level to cover master-classes for newly selected companies, as during the 1st project phase; the second level to include implementing
upgrading programme for companies that have already implemented 2-3 master-classes and are ready to start more complex upgrading activities.

1.3 Produce case study, lessons learned and recommendations, for each beneficiary company.

1.4 Develop new upgrading program modules on moving from lean management to Industry 4.0 application in the industry, based on feedback from the business support institutions and companies in the automotive sector as well as findings of the UNIDO Innovation Survey for Belarus, and in cooperation with international experts and the Belorussian partners.

1.5 Carry out consultation meetings with relevant educational and training institutions to validate the new upgrading program modules, and to identify available services and material on subjects related to the issues to complement the toolkit.

1.6 Develop an overall training and counselling work plan to create synergies with the ongoing shop-floor assistance program.

1.7 Raise awareness on the issues related to Industry 4.0 and its potential for inclusive and sustainable industrial development, and industrial diversification and potential implications for the automotive industry in Belarus through providing training, mentoring and coaching; organized workshops, EGMs and study tours.

1.8 Prepare the final report and the achieved results.

**Output 2:** Business support institution strengthened and enabled to provide advice and support to lower tier suppliers in the sector on improving competitiveness, promotion of business linkages and partnerships

**Activities:**

2.1 Develop terms of reference for the identified partner institutions that will host the center for industrial upgrading and experts to provide services to the industry on a sustainable basis.

2.2 Identify the suitable partner(s) to host the center for industrial upgrading taking into considerations sustainability, co-financing including in-kind, outreach and existing capacities.

2.3 Formalize agreement to host the center.

2.4 Operationalize the center.

2.5 Facilitate dialogue with public stakeholders such as Ministries of Industry and Economy, academy of science, on sector-specific Industry 4.0 strategies and policies.

2.6 Produce recommendations for addressing bottlenecks in the regulatory environment and business support institutions to assist in the uptake of Industry 4.0 technologies of Belorussian automotive component suppliers.
Logical Framework

<table>
<thead>
<tr>
<th>Results</th>
<th>Objectively verifiable indicators</th>
<th>Means of verification</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome/ Objective (long-term)</strong></td>
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</table>
| Automotive component manufacturers (SMEs) productivity and competitiveness increased and meet requirements of Original Equipment Manufacturers (OEMs) and Tier-1 automotive component manufacturers and are successfully integrated into national, regional and global automotive value chains, | - Volume of local auto parts sold by national lower tier component manufacturers to national or regional Tier-1 and Tier-2 suppliers that are linked to foreign OEMs.  
- Intra industry trade increased; mapping value chains in industry using BEC revised statistics. | - Statistics data  
- Company reports  
- Partnership agreements  
- Interviews with officials and company managers  
- Websites and brochures of relevant institutions (information on service portfolio) | - No major changes in the trade regulation and macro-economic conditions in and between Belarus and regional markets with the potential to affect the automotive industry and SMEs in particular  
- Participating companies will show commitment to the project and go through the entire counselling cycle as foreseen by the methodology / roadmap without interruptions or breaks  
- Firms will have continuous access to the services, case studies and training material developed through this project from local support institutions  
- Experts of local support institutions commitment to continue working in this field and provide support services to the auto-component industry after the completion of this project on a continuous basis  
- Support institutions recognize their crucial role in the development of the industry and are open to interact with the component manufacturers. |

| Outputs | | | |
| New pilot companies upgraded using UNIDO cluster development methodologies and “demonstration effect” created. | - # of service portfolios / training curricula adapted throughout the project including on Industry 4.0  
- # of companies improved competitiveness (target: at least 7 companies)  
- # of joint initiatives identified such as mentoring, coaching and case studies (target: at least 3 initiatives)  
- # of people trained (target: at least 25 and at least 25% female) | - Annual reports and statistics  
- Company performance reviews  
- Interviews with SME  
- Case studies produced  
- Meeting reports produced  
- Lists of participants of trainings  
- Final report from the project | - Selected SMEs to receive counselling service show commitment to implementation of the measures and documentation of the results |

| Business support institution strengthened and enabled to provide advice and support to lower tier suppliers in the sector on improving competitiveness, promotion of business linkages and partnerships | - # of experts from relevant support institutions participated in project activities, meeting and/or study tours (target: at least 20)  
- # of experts from relevant support institutions trained and capacitated (target: at least 20)  
- # of conferences/ workshops/ events on Industry 4.0 | - Annual reports and statistics  
- Lists of participants of trainings  
- Training and meeting protocols  
- Interviews with officials and company managers  
- Websites and brochures of relevant institutions (information) | - National experts and trained staff of support institutions are capable to counsel SMEs in implementing upgrading measures based on the trainings they receive throughout the project  
- Support institutions are committed to the project and actively support it |
- # of staff in the supported institutions that qualify as expert on UNIDO cluster development and upgrading methodologies (Target: at least 12 staff (at least 50% female) in at least 4 relevant institutions)
- # of companies with documented continuous improvement processes in place (Target: at least 10 pilot companies)

| | on service portfolio) |
G. PRIOR OBLIGATIONS AND PREREQUISITES

N/A

H. LEGAL CONTEXT