

R&D & Innovation Sector in **SLOVAKIA**

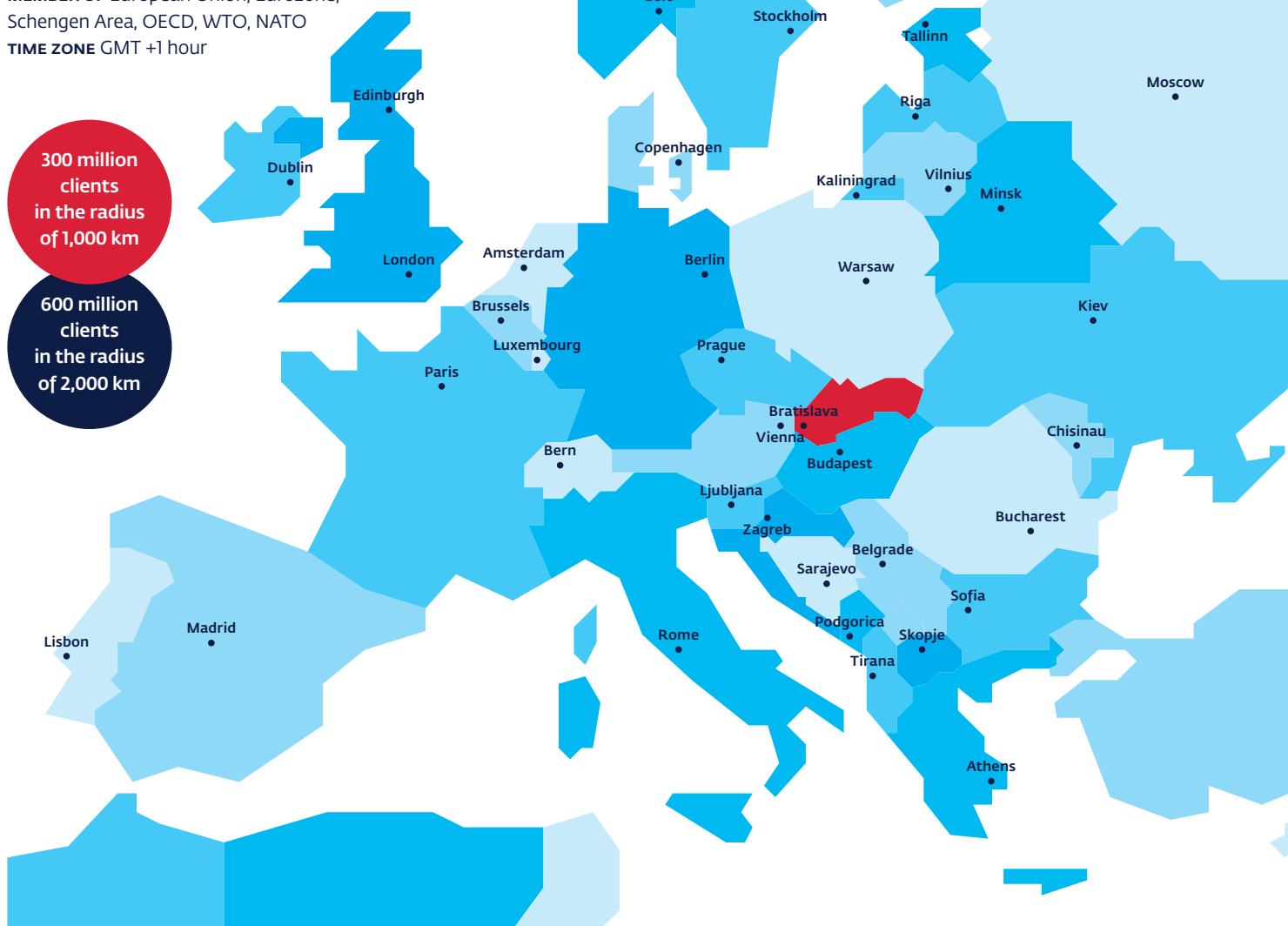


R&D & Innovation Sector in Slovakia

Despite being viewed as a production powerhouse, Slovakia sees its future mainly in high value-added projects and investments, especially in R&D and innovative operations. This publication aims to introduce both existing as well as perspective areas of the Slovak R&D environment. Moreover, it highlights key advantages for investors why to locate their research facilities in Slovakia.

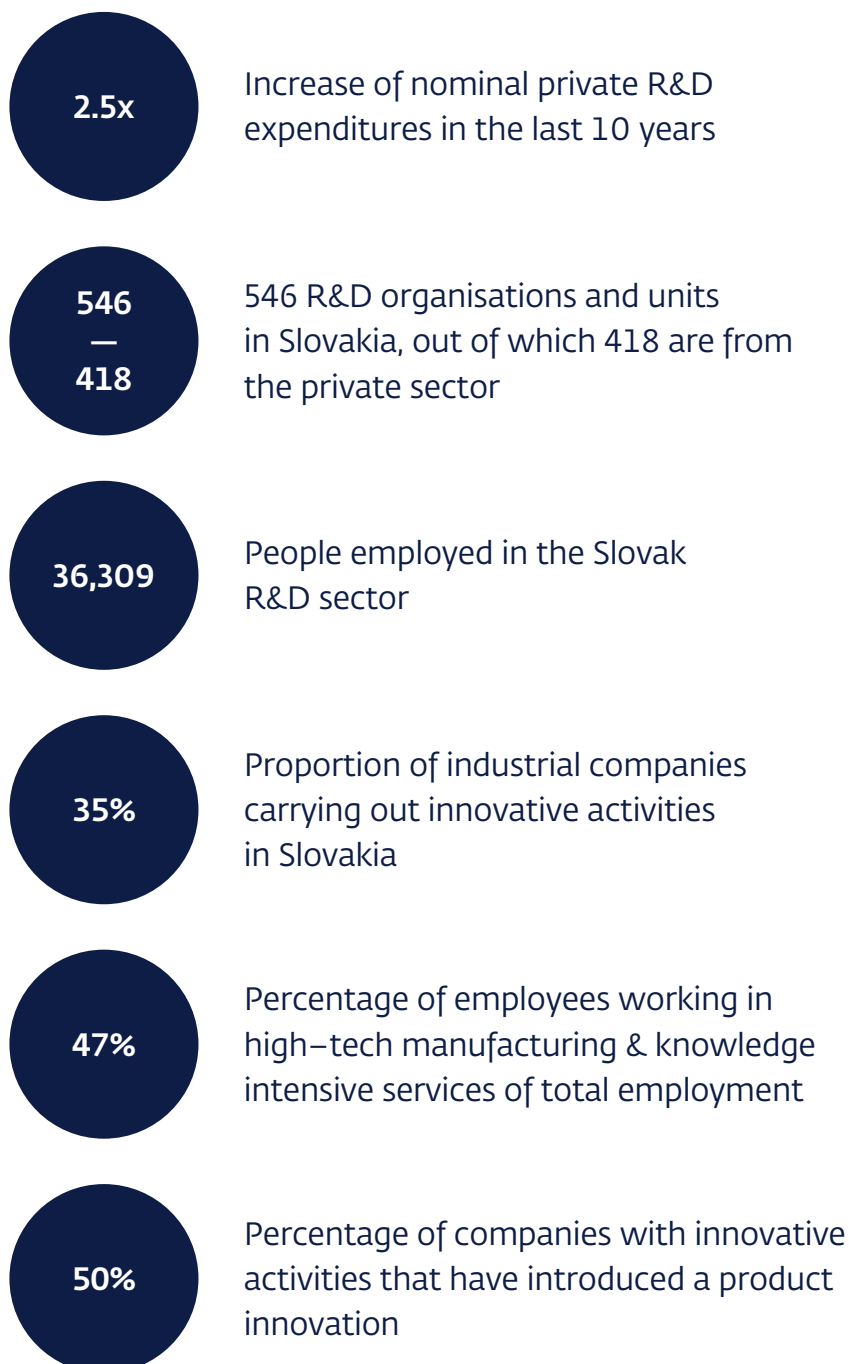


TOTAL AREA 49,035 km²
POPULATION 5.4 million
CAPITAL CITY Bratislava
MEMBER OF European Union, Eurozone, Schengen Area, OECD, WTO, NATO
TIME ZONE GMT +1 hour



Overview of the R&D Sector in Slovakia

R&D is the fundamental precondition for increasing competitiveness and maintaining sustainable development. On top of that, it is inevitable for the long-term growth of knowledge economy in Slovakia. Slovak R&D has a long tradition and is capable of delivering internationally renowned cutting-edge solutions required in today's modern era.



Top Reasons to Establish an R&D Centre in Slovakia

- 1 Additional 100% tax deduction for R&D expenses
- 2 Attractive investment incentives for R&D and technology centres
- 3 Special tax regime for intellectual property revenues (patent box)
- 4 Stable economic & political environment with Euro currency
- 5 Qualified & cost-effective human resources
- 6 Universities providing multidisciplinary talent pool of graduates & postgraduates
- 7 CEE Leader in FDI and technology transfer — the best ability to adapt new technologies
- 8 Extensive R&D & innovation infrastructure (centres of excellence, technological parks and university science parks)
- 9 Established cooperation between industry & academia
- 10 The highest rate in the CEE region of higher added-value jobs as a % of total employment

Source: Statistical Office of the Slovak Republic: Yearbook of Science and Technology (2020); Eurostat (2020); World Economic Forum (2019)

When Innovation is Tradition

Slovakia's abundant R&D potential lies mainly in its people. In the past, local inventors pushed the technological boundaries within several fields and created knowledge-based preconditions for modern industrial development. Building on this tradition of industrial innovation, many Slovak companies are pioneering development of cutting edge technologies.



AUREL STODOLA
steam and gas turbines,
arm prosthetic



SPINEA
actuators, positioners



JOZEF K. HELL
water column pumping
machines



GA DRILLING
Plasmabit® milling
and drilling



JOZEF MURGAŠ
wireless telegraph



ESET
antivirus protection



JOZEF M. PETZVAL
achromatic lens



PHOTONEO
3D technologies and
robotic vision



JÁN BAHÝĽ
helicopter, flying machines



AEROMOBIL
flying car



Examples of Other Notable Slovak Innovations

Design



ECOCAPSULE
Self-sustainable
microhomes



WERKEMOTION
Transportation &
industrial design
R&D studio



MATADOR
Mobility
solutions

Design is an integral part of developing new products. Apart from technical aspects, many Slovak companies also focus on aesthetics.

Creativity and technology also come together in game design and development, a rising segment in which Slovak companies are beginning to play an important role.

Game Development Industry



PIXEL FEDERATION
Social media
games/mobile &
web-based games



STUDIO 727
3D animations for
movies and game
development
industry



**POWERPLAY
STUDIO**
Mobile and
desktop games

ICT



INNOVATRICS
Biometrics



SOITRON
Complex IT
solutions



SYGIC
Navigation
systems

The core of Slovakia's technology potential comes from its firm base of home-grown IT companies, which are able to outrank their global competitors in several fields.

Much of Slovakia's programming potential is embedded in local businesses delivering solutions for modern cities.

Smart Cities



SENSONEO
Waste
management



CVIKER
VR/AR solutions
for property
technology

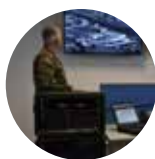


NG AVIATION
Airport
digitisation

Space, Medtech, Electronics & Automotive



TACHYUM
Universal
processors



SPACEMANIC
Satellite
components



MULTIPLEXDX
Cancer
diagnostics



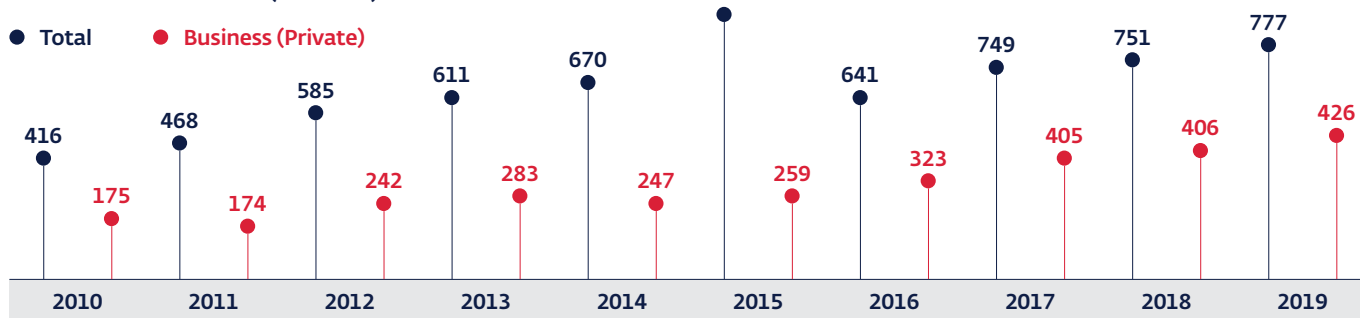
INOBAT
Batteries for
electric vehicles

There are other notable sectors in which Slovak companies manage to push the frontiers of technological advancement.

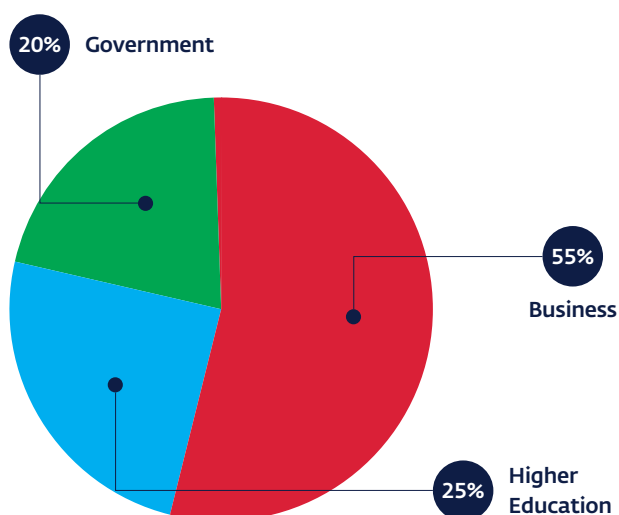
Slovak R&D Sector in Figures

In the past decade, Slovak R&D has experienced a significant growth, establishing various centres of excellence, research and technology centres. The R&D expenditures in Slovakia are driven mainly by the business sector and technical sciences.

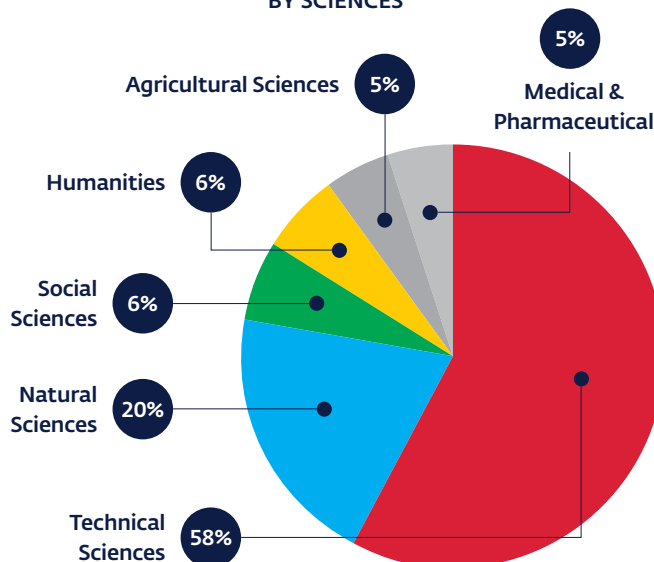
EXPENDITURES ON R&D (MIL. EUR)



BREAKDOWN OF R&D EXPENDITURES BY SOURCE OF FUNDS



BREAKDOWN OF R&D EXPENDITURES BY SCIENCES



AVERAGE GROSS MONTHLY SALARY LEVELS OF SELECTED R&D POSITIONS ACROSS SLOVAKIA

POSITION	WESTERN SLOVAKIA	CENTRAL SLOVAKIA	EASTERN SLOVAKIA
Robotics Engineer	1,800 €	1,600 €	1,500 €
Chemical Engineer	1,500 €	1,300 €	1,300 €
Hardware Engineer	1,700 €	1,500 €	1,600 €
Test Engineer	1,600 €	1,500 €	1,400 €
FEM Specialist	1,700 €	1,600 €	1,500 €
Electrical Design Engineer	1,800 €	1,600 €	1,600 €
Mechanical Design Engineer	1,700 €	1,600 €	1,500 €
Design Leader	2,400 €	2,100 €	2,200 €
Six Sigma Consultant	3,100 €	2,600 €	2,600 €

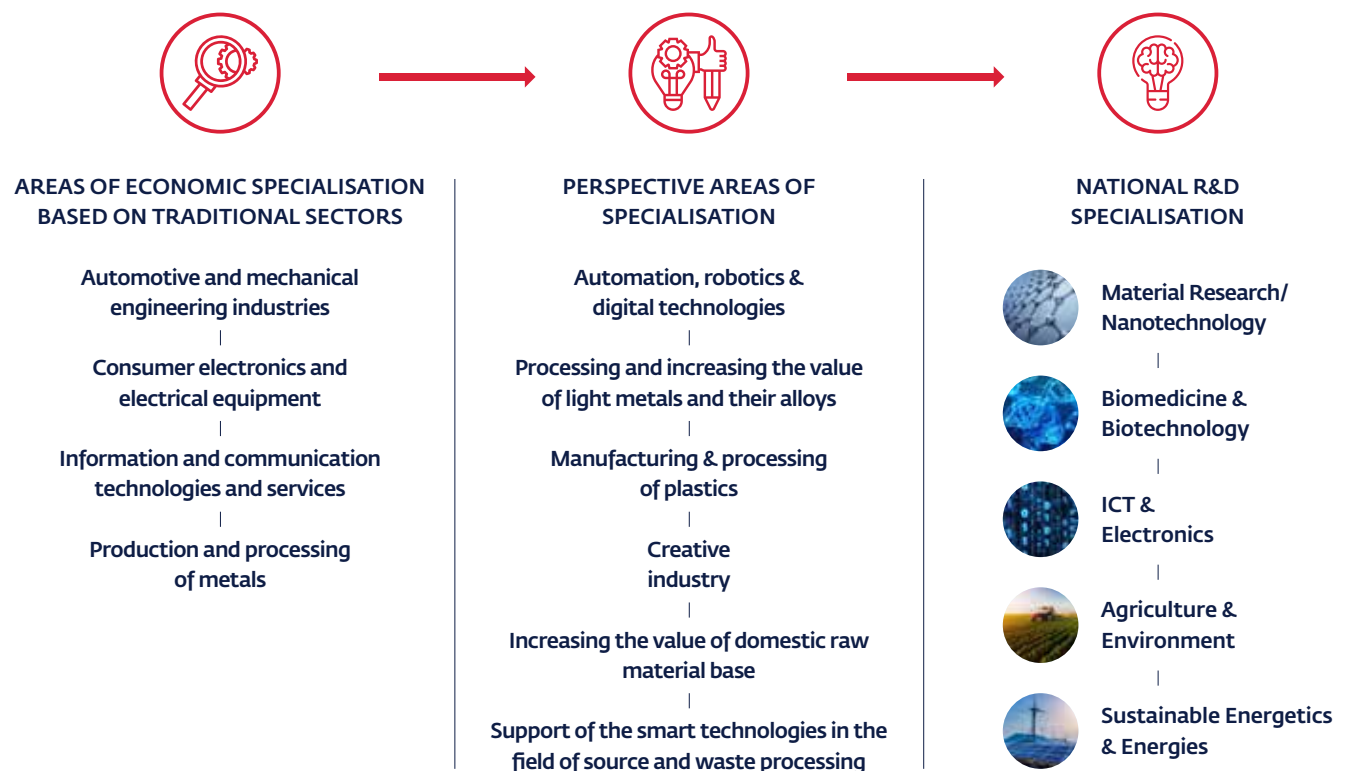
Source: Statistical Office of the Slovak Republic: Yearbook of Science and Technology (2020); Grafton Recruitment (2021)

Government Strategies for R&D and Innovation

RIS3 — Research & Innovation Strategy for Smart Specialisation of the Slovak Republic

The national R&D strategy aims to support innovation through cooperation between industry and R&D capacities. It sets goals and policy measures linked to research, innovation and education and has been assessed as the best strategy among 15 countries by the European Commission.

The strategy is built on key sources of economic growth and competitive advantages of the Slovak Republic. Taking into account the best use of synergies between traditional economic sectors and fast-growing, perspective industries, it outlines several national R&D priorities.



Intelligent Industry Action Plan of the Slovak Republic

The Action Plan outlined a set of 35 measures to be implemented by the Slovak government by the end of 2020. It aimed to create better conditions for implementing digitisation, innovative solutions and increase competitiveness of local companies on the global market. It introduced measures linked to reducing bureaucratic burdens, amending legislation, defining standards, changing education programmes and conditions on the labour market or cofinancing research.

35

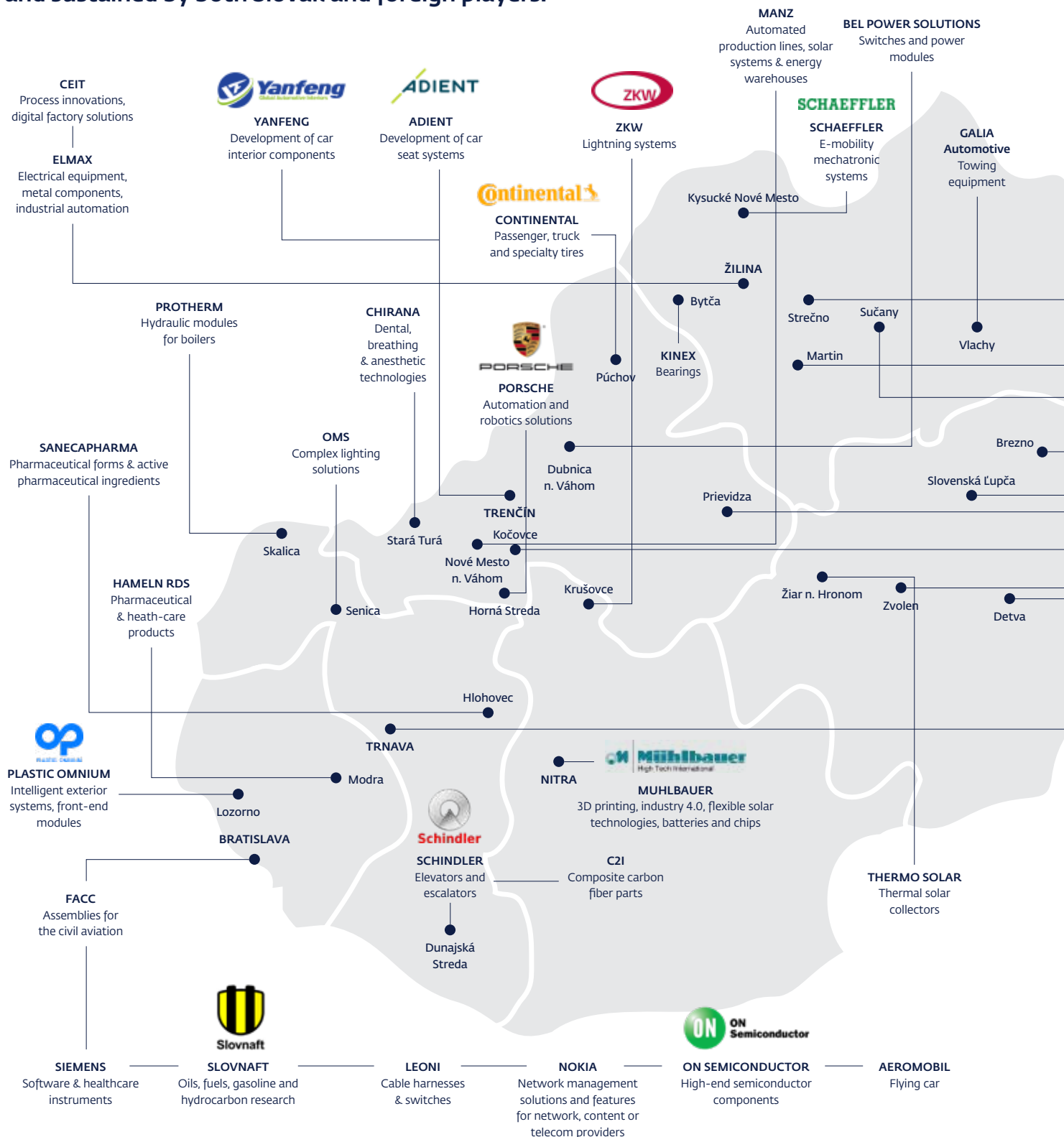
measures
for intelligent
industry

Prepared in cooperation with the representatives of industry, associations and academia, it identifies following priority areas:

- research, development and innovation
- basic principles of IT security implementation in the field of intelligent industry
- labour market and education
- reference architecture, standardisation, development of technical standards
- European and national legal frameworks
- popularisation and promotion

Network of Private R&D Operations in Slovakia

Slovakia has both substantial established and potential capabilities for the R&D. Innovation is being stimulated throughout the economy and sustained by both Slovak and foreign players.



Source: Webpages of respective companies (2021)



WHIRLPOOL
Household appliances

TATRAVAGÓNKA
Intelligent logistic systems

IMUNA
New medicines

KRAUSS MAFFEI TECHNOLOGIES
Switchboard cabinets

ROBOTEC
Robotisation & automation

WELDING
Automation welding solutions

HELLA
Lightning systems

CHEMOSVIT FOLIE
Resins, films, inks & adhesives

FRANKE
Automation solutions

VONSCH
Electronics, energy storages and software

SPINEA
EXCELLENCE IN MOTION
SPINEA TECHNOLOGIES
Mechatronic technologies, process innovations

ESOX PLAST
Plastic components

CEMM THOME
Interior lightings

ELCOM
Cash registers & industrial PCs

Svit

Poprad

Spišská Nová Ves

embraco

EMBRACO
Hermetic cooling compressors for reffridgeration

Michalovce

BIOTIKA
R&D in the field of fermentation, isolation processes and analytical chemistry

KOŠICE

Veľká Ida

IEE SENSING
Electronic sensors

HBM PHARMA
Pharmaceutical products



CONTINENTAL
Brake systems

SLAVIA
Machinery, welding tools, hydraulic components

B/S/H/
BSH DRIVES & PUMPS
Electric motors and pumps



MINEBEAMITSUMI
R&D of mechatronic drive devices and electric motors for industry

U-SHIN
Control panels and access control systems

FAURECIA
Automotive interior components

DB BIOTECH
Early cancer diagnostics

ZTS VVÚ KOŠICE
Equipment and production lines

MICHATEK

Metal and plastic components & complex assemblies

TAES

Development of production and assembly lines, CNC machines



BROSE
Mechatronic components

RUBIG
Development of solutions in the field of material technology



ZF
Powertrain modules

BOGE
Rubber and plastic components



OPTOTUNE
Industrial optical components



MATADOR
Stamping tools, industrial automation

ESET
Security software

GA DRILLING
Milling and deep-drilling

MICROSTEP
Control systems for machine tools



PHOTONEO
Robotic vision solutions



INNOVATRICS
Biometric technologies

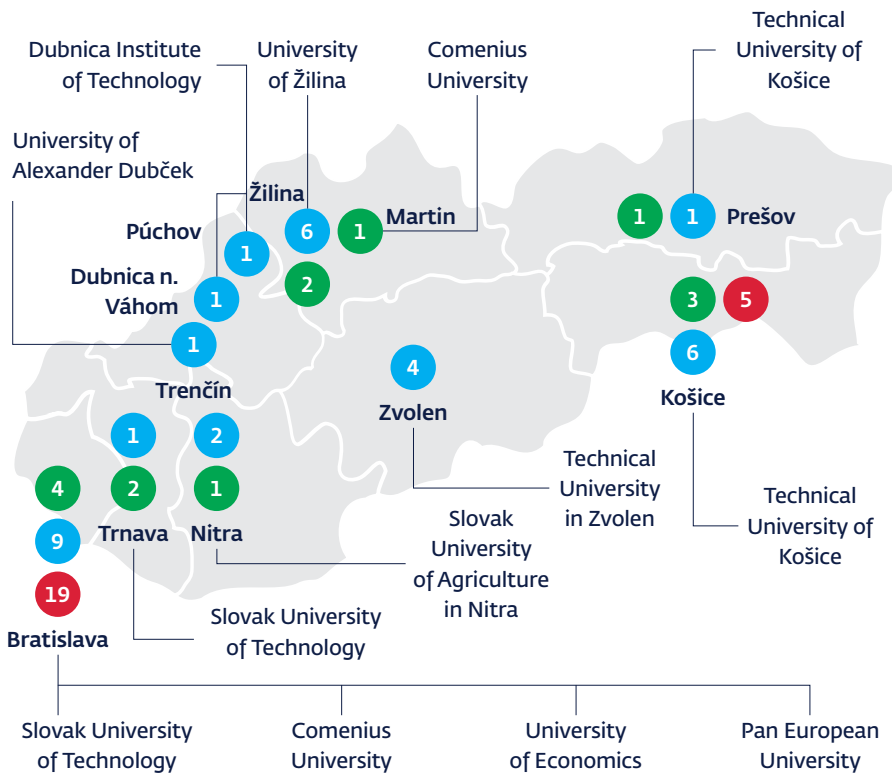
SYLEX
Optical interconnect solutions and fiber optic sensing/monitoring solutions

Favourable Public R&D & Innovation Infrastructure

The public R&D infrastructure in Slovakia consists of highly competitive technical faculties at universities located all around the country, as well as of a wide network of institutes of the Slovak Academy of Sciences. Strong cooperation partnerships of both local and foreign companies, universities and research institutions is characteristic for Slovak R&D ecosystem.

PUBLIC R&D NETWORK

Numbers in the map correspond with the number of technical/ICT faculties, university science parks & technical research institutes of the Slovak Academy of Sciences in respective cities.



24

technical institutes of the Slovak Academy of Sciences

7

technical universities

32

technical & ICT faculties

14

science parks

35 ths

students in technical & IT programmes

10 ths

graduates in technical & IT programmes

Slovak Academy of Sciences

Slovak Academy of Sciences (SAS) is a public research institution established in 1942. It consists of 69 organisations where more than 2,000 scientists & approximately 500 PhD students conduct their research in a wide range of fields.

Institute of Materials and Machine Mechanics (Bratislava)

- advanced metallic materials R&D
- Partners & International Cooperation
- European Space Agency, Hyundai Motor Europe

Institute of Electrical Engineering (Bratislava)

- semiconductors
- microelectronic sensors & detectors
- applied superconductivity
- Partners & International Cooperation
- CERN, Victoria University

Institute of Informatics (Bratislava)

- ICT
- nano- & micro-structures
- robotics
- artificial intelligence

Partners & International Cooperation

- IEEE and ESFRI

Institute of Experimental Physics (Košice)

- applied physics
- chemical sciences
- biological sciences
- nanotechnology

Partners & International Cooperation

- CERN, European Space Agency



Source: Slovak Centre of Scientific & Technical Information for the academic year 2020/2021; Slovak Academy of Sciences, SARIO (2021)

R&D Specialisation at the Largest Slovak Universities



SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA

Faculty of Electrical Engineering and IT

- National Centre of Robotics
- National Centre for Space Engineering

Partners & International Cooperation

- Siemens, Matador, Volkswagen

Faculty of Mechanical Engineering

- manufacturing technologies
- recycling of materials for the purpose of composite production

Partners & International Cooperation

- Volkswagen, Schaeffler, Brose

Faculty of Informatics & Information Technologies

- data analysis and information processing
- artificial intelligence
- cybersecurity

Partners & International Cooperation

- ESET (a specialised IT research centre in cooperation with the Faculty of Mathematics, Physics & Informatics of Comenius University)

Faculty of Material Sciences and Technology in Trnava

- SlovakION, one of the CEE's leading research centres for ion beam & plasma technologies in materials engineering & nanotechnology

Partners & International Cooperation

- Johnson Controls, Bosch

Faculty of Chemical and Food Technology

- biotechnology
- chemical and biological protection of environment

Partners & International Cooperation

- Volkswagen, Mondi, Matador

University Science Park STU, Bratislava

- ICT, electrical, chemical & civil engineering
- industrial biotechnology



COMENIUS UNIVERSITY IN BRATISLAVA

Faculty of Mathematics, Physics & Informatics

- applied mathematics & physics
- computer sciences

Partners & International Cooperation

- PwC, Accenture

Faculty of Natural Sciences

- chemistry & chemical technology
- biotechnology & life sciences

Comenius University Science Park, Bratislava

- biotechnology, biomedicine



TECHNICAL UNIVERSITY
OF KOŠICE

TECHNICAL UNIVERSITY IN KOŠICE

Faculty of Electrical Engineering and Informatics

- cybernetics and artificial intelligence
- electronics & electrical engineering

Partners & International Cooperation

- Volkswagen, Siemens, U.S. Steel, Slovak Telecom

Faculty of Mechanical Engineering

- manufacturing technologies
- green & alternative fuel mobility

Partners & International Cooperation

- Garrett Motion, Embraco, Faurecia, Magna PT

Faculty of Aeronautics

- air traffic management
- aerospace & space engineering
- aviation security and management

Partners & International Cooperation

- European Aviation Safety Agency, International Civil Aviation Organisation, International Astronautical Federation

University Science Park TECHNICOM, Košice

- ICT, electrical, mechanical, civil & environmental engineering



UNIVERSITY OF ŽILINA

Faculty of Electrical Engineering and Information Technology

- ICT applied in transport and industry
- electronic systems & networks

Partners & International Cooperation

- Siemens, Panasonic, Brose

Faculty of Mechanical Engineering

- mechanical engineering
- materials engineering
- machines and equipment design
- automation of production systems

Partners & International Cooperation

- Volkswagen, KIA Motors, Schaeffler, Whirlpool

University Science Park, Žilina

- ICT, smart industrial & transportation systems, progressive materials

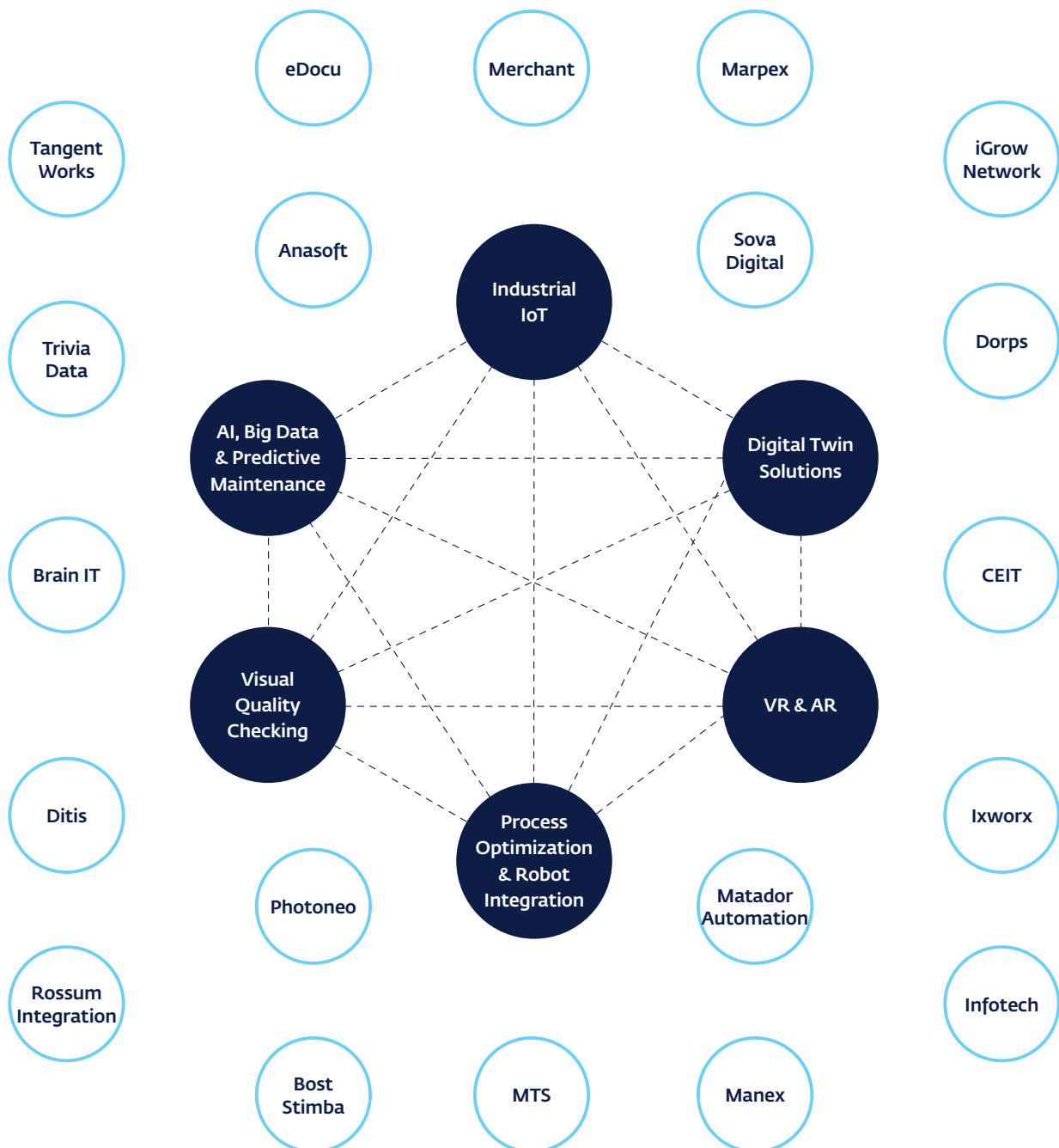
Source: Web pages of respective universities (2021)

Process Innovation Developed & Made in Slovakia

Apart from product development, Slovakia's strong industrial heritage has also created an ecosystem of local companies active in the field of production process optimisation.

As the implementation of Industry 4.0 is a necessity for all industrial facilities that want to maintain their competitive advantage, SARIO has created an entire service that aims to match the needs of the industry with the capabilities of the most advanced Slovak technology companies. From our experience, the Slovak Industry 4.0 competences focus mainly on areas highlighted below, the related companies are just examples of local providers capable of delivering state of the art solutions:

The Slovak Industry 4.0 Ecosystem



Sources: SARIO (2021)

SARIO

Innovation Sourcing

Innovate Your Business with Solutions Made in Slovakia!



SARIO Innovation Sourcing — a platform of the Slovak Investment and Trade Development Agency (SARIO) matching the needs of its major clients — large investors established in Slovakia — with capacities and competences of the most advanced and innovative Slovak technology.

SARIO organises tailor-made workshops, which on one side serve as a business development channel for Slovak solution providers, on the other are aimed to innovate technological processes of its major clients. These services are not limited to the borders of Slovakia and they also focus on venture capital related M&A matchmaking.

SARIO INNOVATION SERVICES FOCUS ON, BUT ARE NOT LIMITED TO

- **Industry** — automation, predictive maintenance, quality control, digital factory solutions
- **Product development** — design, prototyping, testing, tooling
- **Services sector** — software automation, outsourcing, cybersecurity, big data & AI

OUR TRACK RECORD (SELECTED EVENTS)

- **Jaguar Land Rover Innovation Workshop — process innovation**, Nitra (Slovakia)
- **PSA Innovation Day — process innovation**, Trnava (Slovakia)
- **VW/Audi Innovation Sourcing Day — product innovation**, Budapest, (Hungary)
- **Integr8 Conference — process innovation**, Detroit (USA)
- **MinebeaMitsumi Automation Workshop — process innovation**, Bratislava (Slovakia)
- **Mitsubishi Innovation Sourcing — M&A scouting**, Bratislava (Slovakia)

The agency plans to scale these services by addressing a wider range of clients from various sectors and identifying new potential Slovak solution providers, capable of succeeding on international markets.

www.innovatewithsario.com



“Slovak companies can bring innovation to global players! In the past 3 years more than one third of the Slovak solution providers, which participated in our workshops, got selected for follow-up meetings by our major clients. A half of these meetings ended up either with price quotation requests or pilot projects.”

Marek Kopanický, Innovation Lead & Consultant, SARIO



“Our vision is to help transform Slovakia into a technological & innovative hub and become the partner of choice for companies considering to invest in Central Europe.”

Róbert Šimončíč, CEO SARIO

Schemes Designed for Supporting R&D in Slovakia

INVESTMENT INCENTIVES FOR TECHNOLOGY CENTRES

The primary role of the investment incentives is to motivate companies to place their new investment projects in regions with higher unemployment and to attract projects with higher added value.

MAXIMUM REGIONAL INTENSITIES OF INVESTMENT INCENTIVES IN SLOVAKIA

- additional 10% for medium-sized enterprises
- additional 20% for small and micro-sized enterprises
- additional 10% for investment projects carried out in regions included in Just Transition Plan

ELIGIBLE COSTS

- Costs of land acquisition
- Costs of buildings acquisition & construction
- Costs of new technological equipment and machinery acquisition
- Intangible long-term assets — licences, patents, etc.
- Rent of new land/building

OR

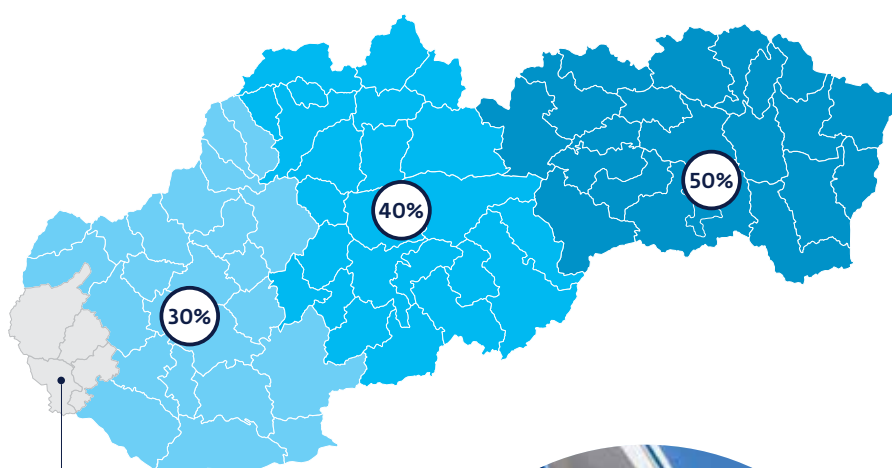
- Total wage costs of all new employees calculated over a period of 2 years

FORMS OF INVESTMENT INCENTIVES

- Corporate income tax relief
- Cash grant
- Contributions for the newly created jobs
- Rent/Sale of real estate for a discounted price

MINIMUM CONDITIONS FOR TECHNOLOGY CENTRES*

- Minimum investment of 100 ths. EUR on fixed assets in all regions
- Minimum of 10 newly created jobs
- Minimum 1.7 fold of average salary in the district paid to new employees



Bratislava region excluded



R&D EXPENSES SUPERDEDUCTION — SPECIAL R&D TAX REGIME

Companies with the R&D activities can benefit from the special tax regime. By the calculation of the income tax, the additional 100% of the R&D expenses can be deducted from the tax base. As a result, for every 100 EUR spent on the R&D activities, company can save additional 42 EUR (respecting the current income tax rate 21%).

SUPERDEDUCTION

- is automatically claimable in tax return form
- is not subject to any application procedures nor subject to an approval by any state authority
- all sectors are eligible
- is applicable throughout Slovakia
- if the claim cannot be applied in the given tax period, it is transferable to up to 5 consecutive tax periods

EXAMPLES OF DEDUCTIBLE COSTS

- Wages and related contributions
- Material and inventory
- Power and utility supplies
- Tax depreciation of long-term assets
- Certification expenses
- Specialised software licence, etc.

*Conditions differ for projects from 'Priority areas'. Please contact us at invest@sario.sk for more information.
Sources: SARIO (2021)



AIM INVESTMENT AWARDS DUBAI 2017

CEE & TURKEY REGION
Best Investment Promotion Agency in 2016



SARIO Profile

Slovak Investment & Trade Development Agency (SARIO) is a governmental investment and trade promotion agency of the Slovak Republic. The agency was established in 2001 and it operates under the Slovak Ministry of Economy.

01 INVESTMENT SERVICES

FOR POTENTIAL INVESTORS

- investment environment overview
- assistance with investment projects implementation
- starting a business consultancy
- sector and regional analyses
- investment incentives consultancy
- site location & suitable real estate consultancy

FOR ESTABLISHED INVESTORS

- identification of local suppliers, service providers
- assistance with expansion preparation and execution
- assistance with Industry 4.0 solutions and R&D implementation

02 FOREIGN TRADE SERVICES

IF YOU ARE LOOKING FOR

- Slovak supplier or sub-contractor
- information about Slovak export/trade environment
- sourcing opportunities
- forming a joint venture, production cooperation or other forms of partnership with a Slovak partner

SERVICES FOR EXPORTERS

- information on foreign territories
- customized search for foreign partners
- on-line database of business opportunities
- export Training Centre
- subcontracting assistance

03 INNOVATION SOURCING

- matching local tech companies with the operations of large companies that plan to implement innovative solutions to streamline and optimize their processes
- focused mostly on Industry 4.0 solutions such as digitalization, intelligent automation, and robotics as well as advanced and complex IT solutions for various industries
- based on a database of more than 300 local tech companies which is constantly updated and expanded

04 DIVERSIFICATION ACTIVITIES

- aimed at supporting diversification of the Slovak economy towards high-tech areas with significant growth potential
- systematic building of a knowledge base about these sectors with an aim of increasing their visibility and attractiveness for prospective investors
- focused mainly on such sectors as space, aviation, smart & green mobility, medtech, greentech, gaming, smart cities, data centers, and the hydrogen economy

**SARIO IS YOUR ONE STOP SHOP FOR INVESTMENT & TRADE IN SLOVAKIA.
TALK TO US TODAY!**

SARIO | Slovak Investment and Trade Development Agency

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