



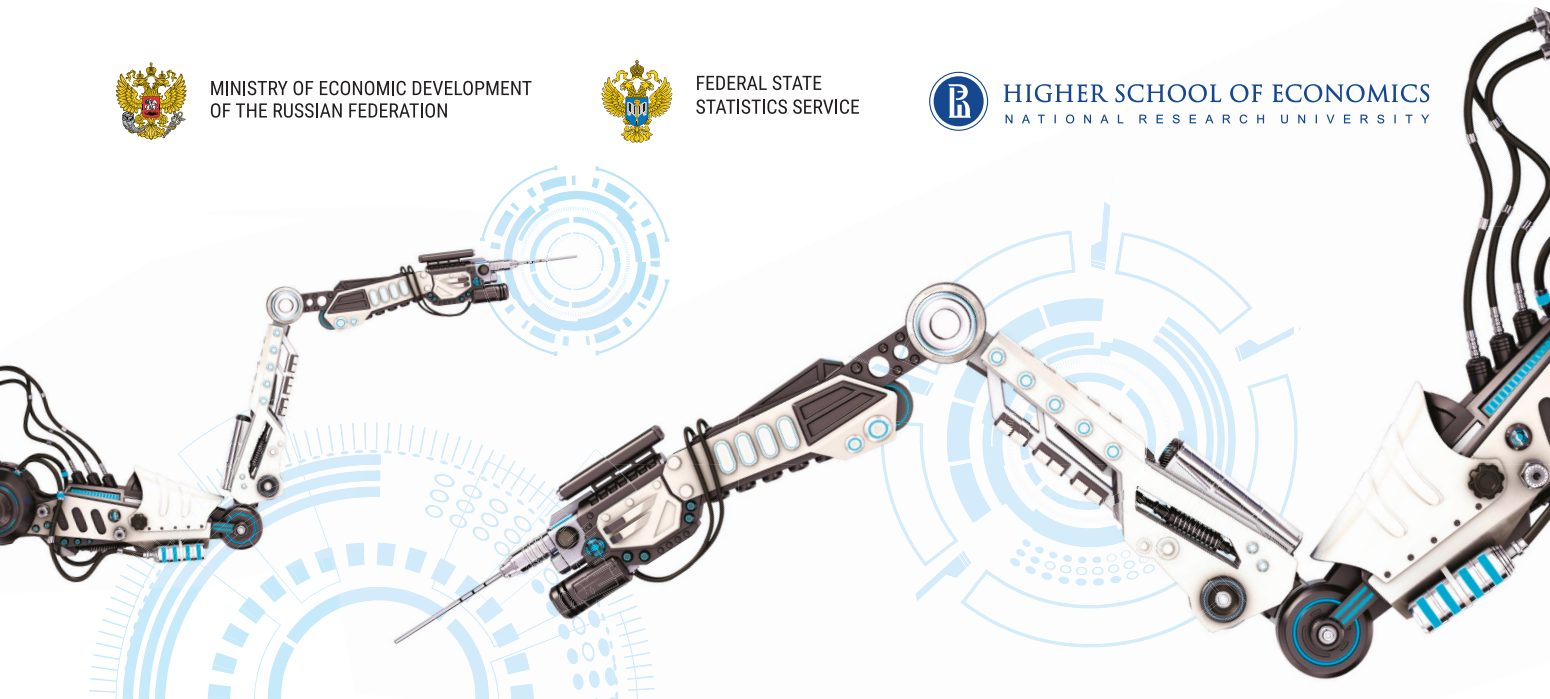
MINISTRY OF ECONOMIC DEVELOPMENT
OF THE RUSSIAN FEDERATION



FEDERAL STATE
STATISTICS SERVICE



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY



INDICATORS OF INNOVATION IN THE RUSSIAN FEDERATION

DATA BOOK



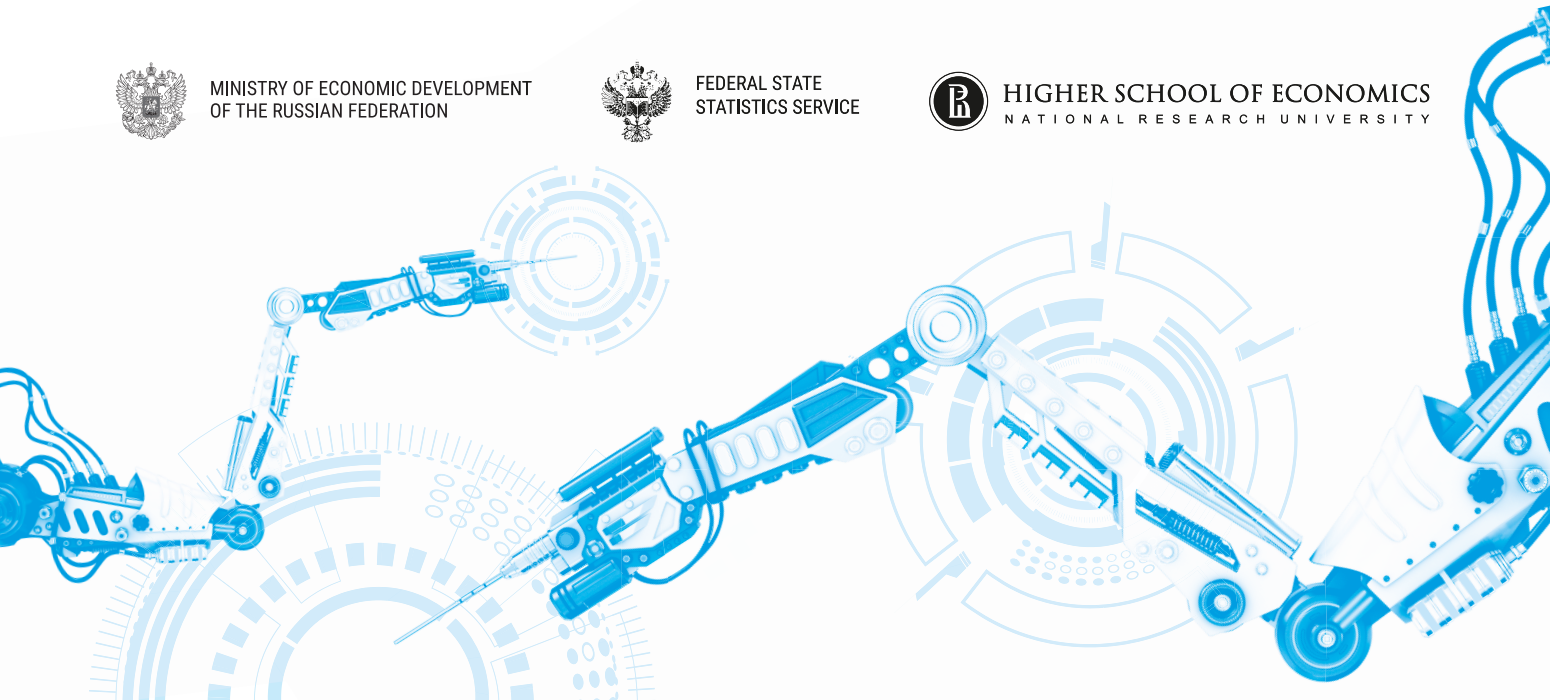
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DATA BOOK

MOSCOW 2021

Editorial Board: Leonid Gokhberg, Yaroslav Kuzminov, Irina Shapoval, and Rustam Tikhonov

Authors: Kirill Ditkovsky, Evgeniya Evnevich, Svetlana Fridlyanova, Konstantin Fursov, Leonid Gokhberg, Galina Gracheva, Irina Kuznetsova, Svetlana Martynova, Tatyana Ratay, Larisa Rosovetskaya, and Vitaliy Roud

Indicators of Innovation in the Russian Federation : Data Book / K. Ditkovsky, E. Evnevich, S. Fridlyanova et al.; National Research University Higher School of Economics. Moscow : HSE, 2021. – 276 p.

This data book contains the most recent statistical data characterising innovation processes in the economy of the Russian Federation. The methodology for the main indicators is based on the latest recommendations of international organisations in statistical measurement of innovations (Oslo Manual, 4th edition) and Community Innovation Surveys in the EU countries.

The data book provides statistical data reflecting the innovative activity of enterprises, development of product and business process innovations, input and output of innovative activities, including the degree of novelty and sales markets, sales of innovative goods and services on users' orders. The publication also includes indicators reflecting the intensity of cooperation ties with external and internal partners, features and forms of open innovations, and assessments of factors hampering innovation. Separate chapters of the data book are devoted to the innovation activity in Russian regions, environmental innovation, and international comparisons covering a wide range of indicators.

The information is broken down by types of economic activity, taking into account the level of technological efficiency of industries.

The data book includes information of the Federal State Statistics Service, Organisation for Economic Co-operation and Development (OECD), European Commission, Eurostat, national statistical agencies of foreign countries, as well as methodological and analytical studies of the HSE Institute for Statistical Studies and Economics of Knowledge.

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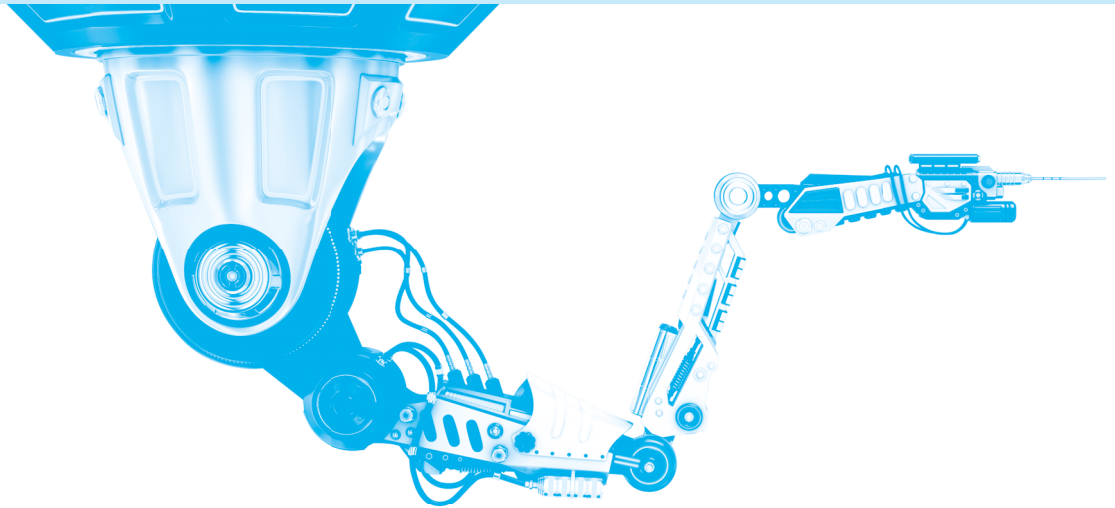
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SYMBOLS USED IN TABLES ARE:

- ... data not available and not included in the totals,
- data not applicable,
- 0.0 insignificant value.

In some tables, the sum of the breakdown may not add
to the total because of rounding.

INFOGRAPHICS ON THE INNOVATION DEVELOPMENT: 2019 RESULTS



10



Industrial
production



Services



Agriculture



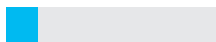
Construction

Innovation level of enterprises

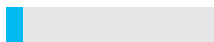
9.1%

total

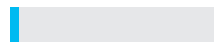
15.1%



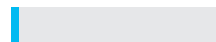
7.6%



4.2%



3.7%

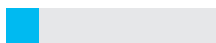


Enterprises that plan to engage in innovative activities
within the next 3 years

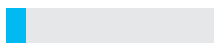
10.3%

total

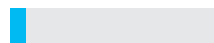
15.2%



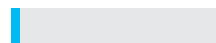
9.2%



7.3%



3.9%





Total









Industrial
production

Services

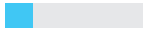
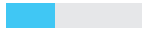
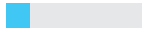
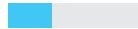
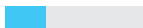
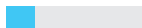

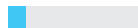
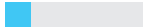
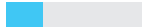
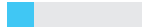

Agriculture

Construction

Enterprises that had:

product innovation	67.3%	74.6% 	62.5% 	53.9% 	54.7% 
business process innovation	62.6%	58.3% 	66.1% 	66.1% 	62.1% 

Of which the most popular:

new or improved methods for information processing or communication	27.9%	19.9% 	35.3% 	16.7% 	31.7% 
new or improved methods for producing goods or providing services (including methods for developing goods or services)	25.1%	29.4% 	20.4% 	55.6% 	12.4% 
new or improved methods for accounting or other administrative operations	23.0%	18.1% 	26.6% 	19.4% 	39.8% 

PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT HAD
PRODUCT AND BUSINESS PROCESS INNOVATION IN 2017–2019

Total

1,954.1 billion roubles

2.1%



Services

909.5 billion roubles

5.0%



Agriculture

49.4 billion roubles

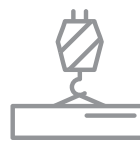
1.6%



Industrial production

984.3 billion roubles

1.6%



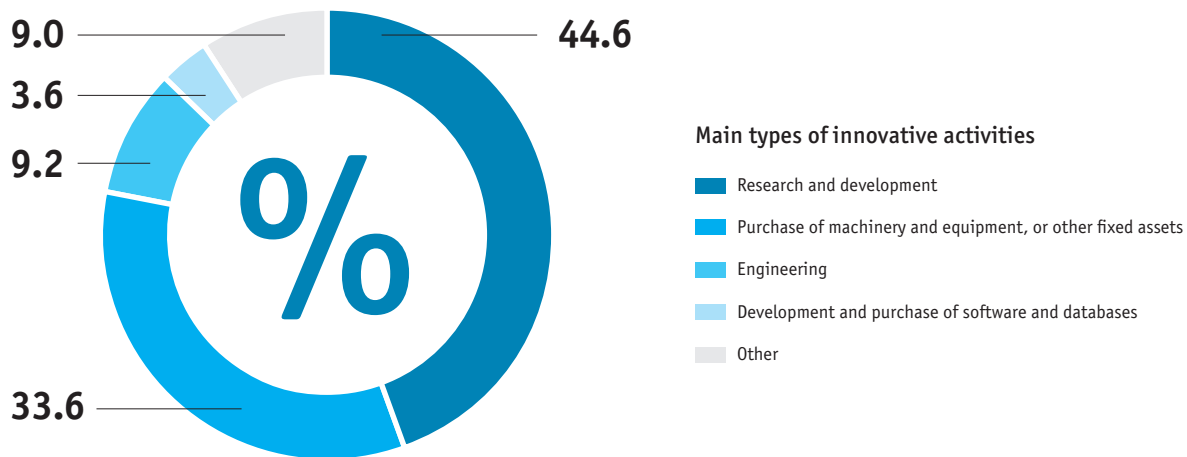
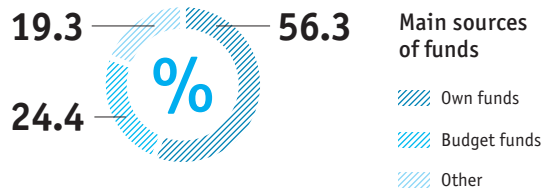
Construction

10.9 billion roubles

0.14%

1,954.1 billion roubles

total



Total

4,863.4 billion
roubles

5.3%



Services

892.4 billion
roubles

4.9%



Agriculture

69.6 billion
roubles

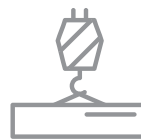
2.3%



Industrial
production

3,871.5 billion
roubles

6.1%



Construction

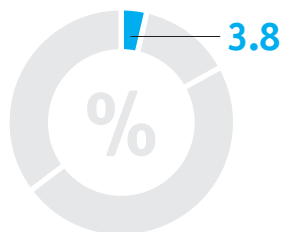
30.0 billion
roubles

0.4%

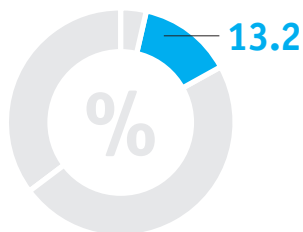
4,863.4 billion roubles

total

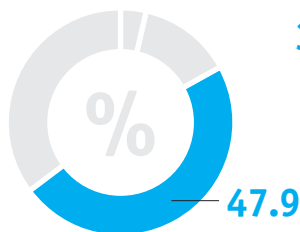
New on the
global market
(principally new)



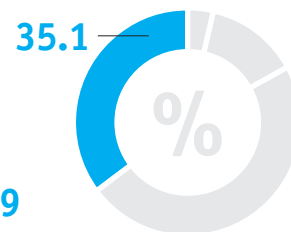
New on the
market of the
enterprise



New to the
enterprise, but not
on the market



Improved



Total

26.9%

of enterprises that produced
customised innovative goods
and services in 2017–2019



Jointly with users

10.3%

According
to an order of
a specific user

23.4%

Through users'
own efforts

3.6%

18.2%

of innovative enterprises that participated
in joint R&D projects

Main cooperation partners

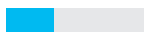
Research
institutes

51.2%



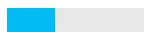
Users

34.3%



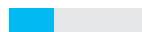
Enterprises
within a single
network

34.3%



Universities

32.0%



Suppliers

31.9%



38 thousands

joint R&D projects

MAIN INDICATORS OF INNOVATION

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Innovation activity of enterprises ¹ , <i>percentage</i>	9.5	10.4	10.3	10.1	9.9	9.3	8.4	14.6	12.8	9.1
Industrial production ²	10.8	11.1	11.1	10.9	10.9	10.6	10.5	17.8	15.6	15.1
Telecommunications; computer programming, consultancy and related activities; IT industry ³	13.6	12.1	11.7	12.2	10.7	10.8	9.3	12.4	9.5	9.8
Construction ⁴	...	...	...	...	...	2.0	1.5	9.6	7.6	3.7
Agriculture ⁵	...	...	...	...	...	...	4.0	4.6	4.2	4.2
Transportation and storage	...	...	...	...	...	...	...	...	...	2.8
Human health and social work activities	...	...	...	...	...	...	...	...	...	5.3
Innovation expenditure, <i>million roubles</i> :										
at current prices	411008.8	748540.1	915366.2	1134237.5	1231476.9	1211294.4	1298444.5	1416922.8	1484901.1	1954133.3
at constant 2010 prices ⁶	411008.8	645849.9	725214.8	853387.7	861895.9	790817.0	824618.6	854546.0	806091.5	1021982.8
Industrial production:										
at current prices	356163.5	474587.1	590341.6	756183.9	778263.5	741283.8	787232.5	856794.0	893881.3	984315.5
at constant 2010 prices	356163.5	409479.8	467708.4	568944.3	544697.3	483961.5	499957.1	516732.4	485251.2	514782.4
Telecommunications; computer programming, consultancy and related activities; IT industry:										
at current prices	40223.1	146419.4	86002.9	68115.1	48612.3	67749.9	54681.7	55565.9	61734.7	100958.0
at constant 2010 prices	40223.1	126332.5	68137.3	51249.1	34023.2	44231.8	34727.4	33511.8	33513.2	52799.5
Construction:										
at current prices	...	...	...	...	...	13.4	7.3	196.4	49.7	10930.5
at constant 2010 prices	...	...	...	...	...	8.8	4.6	118.5	27.0	5716.5

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Agriculture:										
at current prices	...	...	...	...	...	...	15073.6	15942.0	22033.3	49393.2
at constant 2010 prices	...	...	...	...	...	...	9573.0	9614.6	11961.0	25831.9
Transportation and storage:										
at current prices	...	...	...	...	...	...	...	...	...	228822.7
at constant 2010 prices	...	...	...	...	...	...	...	...	...	119670.9
Human health and social work activities										
at current prices	...	...	...	...	...	...	...	...	...	17763.8
at constant 2010 prices	...	...	...	...	...	...	...	...	...	9290.2
Innovation expenditure as a percentage of total sales	1.6	2.2	2.5	3.0	3.0	2.7	2.5	2.5	2.2	2.1
Industrial production	1.5	1.6	1.8	2.2	2.1	1.8	1.8	1.7	1.5	1.6
Telecommunications; computer programming, consultancy and related activities; IT industry:	3.0	9.4	8.6	3.7	2.5	3.4	2.4	2.4	2.6	3.2
Construction	...	...	...	...	...	0.01	0.01	0.2	0.03	0.1
Agriculture	...	...	...	...	...	...	0.9	1.0	1.2	1.6
Transportation and storage	...	...	...	...	...	...	...	...	...	2.6
Human health and social work activities	...	...	...	...	...	...	...	...	...	0.9
Sales of innovative goods and services, <i>million roubles</i> :										
at current prices	1243712.5	2106740.7	2872905.1	3507866.0	3579923.8	3843428.7	4364321.7	4166998.7	4516276.4	4863381.9
at constant 2010 prices	1243712.5	1817722.8	2276109.3	2639279.2	2505545.8	2509256.8	2771701.8	2513116.6	2451699.9	2543476.7

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Industrial production:										
at current prices	1165747.6	1847370.4	2509604.4	3072530.8	3037407.3	3258254.6	3723693.4	3403055.2	3693061.6	3871481.1
at constant 2010 prices	1165747.6	1593934.8	1988277.9	2311737.8	2125845.0	2127214.6	2364850.4	2052382.4	2004810.6	2024727.3
Telecommunications; computer programming, consultancy and related activities; IT industry:										
at current prices	62636.4	74437.8	56092.2	71094.4	62928.5	86048.9	80955.8	111254.6	138610.7	200311.3
at constant 2010 prices	62636.4	64225.9	44440.0	53490.6	44042.9	56178.7	51413.6	67097.7	75246.1	104759.9
Construction:										
at current prices	...	...	...	...	...	600.3	2351.0	152.9	48.7	29952.4
at constant 2010 prices	...	...	...	...	...	391.9	1493.1	92.2	26.4	15664.6
Agriculture:										
at current prices	...	...	...	...	...	...	22222.9	28446.0	33829.1	69559.2
at constant 2010 prices	...	...	...	...	...	...	14113.4	17155.8	18364.4	36378.4
Transportation and storage:										
at current prices	...	...	...	...	...	...	...	...	...	47469.6
at constant 2010 prices	...	...	...	...	...	...	...	...	...	24825.9
Human health and social work activities:										
at current prices	...	...	...	...	...	...	...	...	...	13710.9
at constant 2010 prices	...	...	...	...	...	...	...	...	...	7170.6
Innovative goods and services as a percentage of total sales	4.8	6.3	8.0	9.2	8.7	8.4	8.5	7.2	6.5	5.3
Industrial production	4.9	6.1	7.8	8.9	8.2	7.9	8.4	6.7	6.0	6.1

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Telecommunications; computer programming, consultancy and related activities; IT industry:	4.7	4.8	3.0	3.9	3.3	4.3	3.5	4.8	5.7	6.4
Construction	...	...	...	...	...	0.6	1.7	0.1	0.03	0.4
Agriculture	...	...	...	...	...	...	1.4	1.8	1.9	2.3
Transportation and storage	...	...	...	...	...	...	...	...	...	0.5
Human health and social work activities	...	...	...	...	...	...	...	...	...	0.7
Enterprises engaged in technological innovation as a percentage of the total number of enterprises ⁷	7.9	8.9	9.1	8.9	8.8	8.3	7.3	20.8	19.8	21.6
Industrial production	9.3	9.6	9.9	9.7	9.7	9.5	9.2	19.6	18.5	20.0
Telecommunications; computer programming, consultancy and related activities; IT industry:	10.8	9.9	10.3	10.3	9.5	9.4	7.7	15.7	14.3	17.9
Construction	...	...	...	...	...	2.0	1.1	10.5	9.5	8.2
Agriculture	...	...	...	...	...	...	3.4	5.2	5.4	6.5
Innovation activity of small enterprises ⁸ , percentage	...	5.1	...	4.8	...	4.5	...	5.2	...	5.8
Innovation expenditure in small enterprises ⁹ , million roubles:										
at current prices	...	9479.3	...	13510.5	...	12151.8	...	19220.4	...	27340.2
at constant 2010 prices	...	8178.8	...	10165.2	...	7933.6	...	11591.8	...	14298.5

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Innovation expenditure as a percentage of total sales in small enterprises:	...	0.9	...	1.0	...	0.6	...	0.8	...	1.0
Sales of innovative goods and services in small enterprises, <i>million roubles</i> :										
at current prices	...	16389.7	...	27126.6	...	31270.9	...	37523.0	...	67055.9
at constant 2010 prices	...	14141.3	...	20409.8	...	20415.8	...	22630.1	...	35069.2
Innovative goods and services as a percentage of total sales in small enterprises	...	1.5	...	2.1	...	1.6	...	1.6	...	2.4

¹ Here and below, the aggregate data for enterprises refer to the following types of economic activities: for 2019, in accordance with OKVED2 codes 01.1, 01.2, 01.3, 01.4, 01.5, 01.6, Sections B, C, D (excluding 35.14; 35.23; 35.30.6), E, F, H, Q, codes 58, 61, 62, 63, 69, 70, 71, 72, 73, 74; for 2017, OKVED2 codes 01.1, 01.2, 01.3, 01.4, 01.5, 01.6, Sections B, C, D (excluding 35.14; 35.23; 35.30.6), E, codes 43.91, 43.99, 58, 61, 62, 63, 69, 70, 71, 72, 73, 74; until 2017, in accordance with OKVED (ver. 1.1) Sections C, D, E (since 2011, excluding 40.13.2; 40.22.2, since 2014, also excluding 40.30.6), codes 64, 72, 74; since 2011, including code 73; since 2015, codes 45.21.7, 45.22, 45.25; since 2016, codes 01.1, 01.2, 01.3, 01.4.

² Here and below, the aggregate data for enterprises refer to the following types of economic activities: since 2017, in accordance with OKVED2 Sections B, C, D (excluding 35.14; 35.23; 35.30.6), E; until 2017, in accordance with OKVED (ver. 1.1): Sections C, D, E (since 2011, excluding 40.13.2; 40.22.2; since 2014, also excluding 40.30.6).

³ Here and below, the aggregate data for enterprises refer to the following types of economic activities that were the targets of statistical monitoring of innovative activities in the services sector throughout the surveyed period: since 2017, in accordance with OKVED2 codes 61, 62, 63; until 2017, in accordance with OKVED (ver. 1.1) codes 64, 72.

⁴ Here and below, the aggregate data for enterprises refer to the following types of economic activity: for 2019, in accordance with OKVED2 Section F; for 2017–2018, codes 43.91, 43.99; until 2017, in accordance with OKVED (ver. 1.1): codes 45.21.7, 45.22, 45.25.

⁵ Here and below in this section, the aggregate data for enterprises refer to the following types of economic activity: since 2017, in accordance with OKVED2 codes 01.1, 01.2, 01.3, 01.4, 01.5, 01.6; until 2017, in accordance with OKVED (ver. 1.1) codes 01.1, 01.2, 01.3, 01.4.

⁶ Here and below, the data in constant prices are calculated taking into account the GDP deflator as at April 01, 2020.

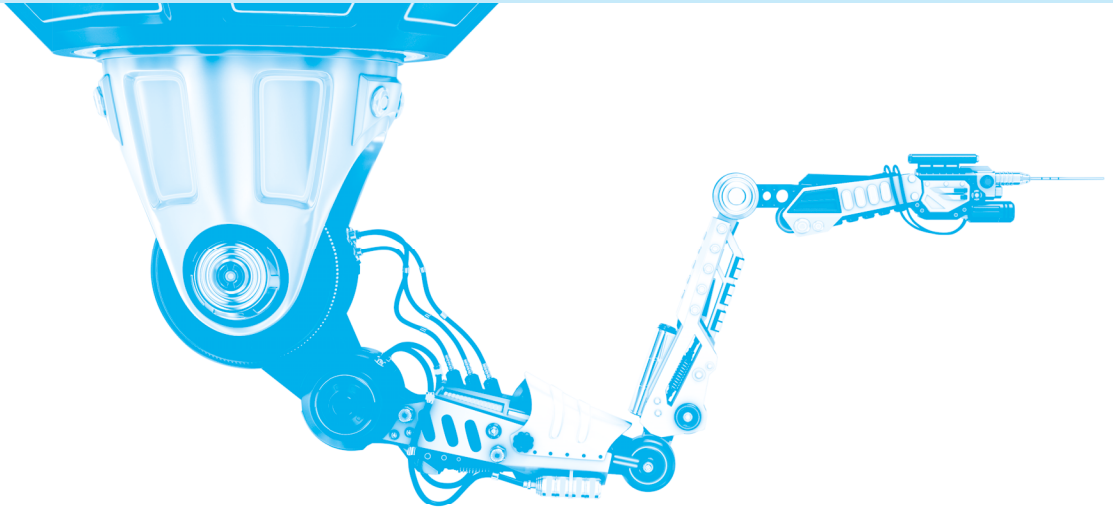
⁷ Since 2018, the indicator is calculated according to the methodology approved by Order no. 788 of Rosstat of December 20, 2019 for the purpose of information support of Clause 1e of the Decree no 204 of the President of the Russian Federation of May 07, 2018 'On the National Goals and Strategic Tasks of the Development of the Russian Federation until 2024.' Any changes in 2017 data are due to the recalculation indicators according to the specified method.

⁸ Until 2019, the indicator was calculated based on the data of small enterprises engaged in technological innovation.

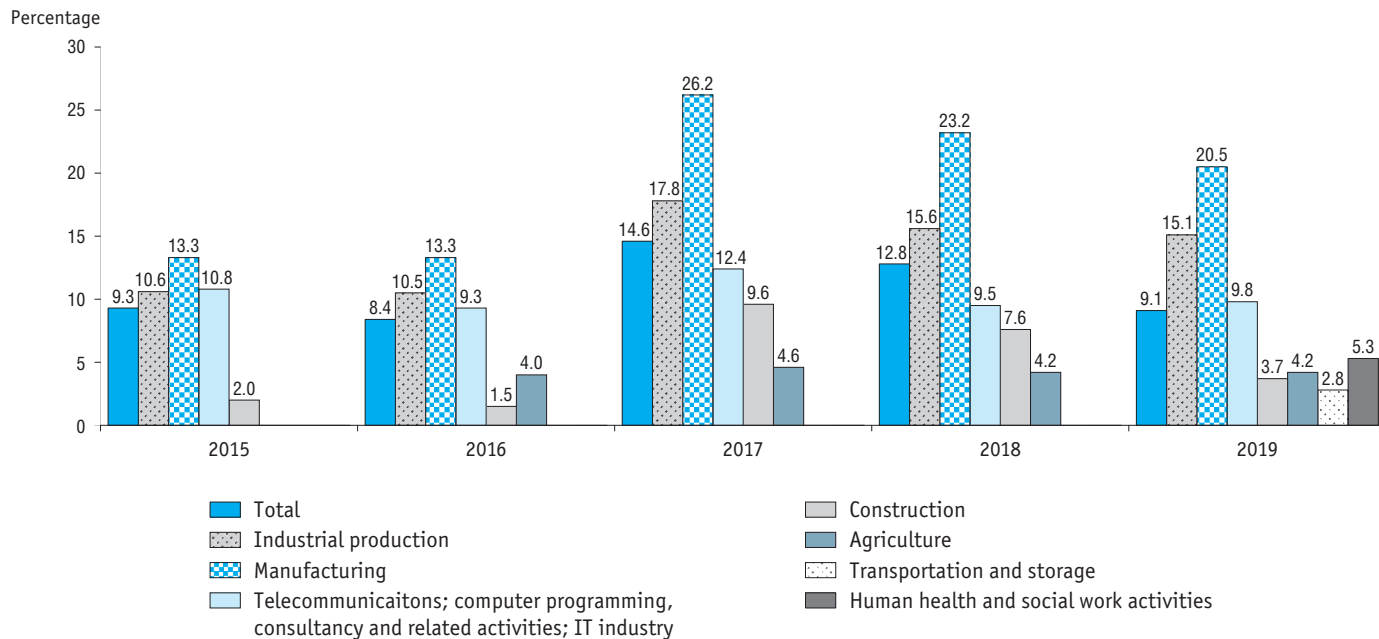
⁹ Here and below, until 2019 indicators showing innovation expenditure were calculated based on the expenditure on technological innovation data.

INNOVATION ACTIVITY OF ENTERPRISES

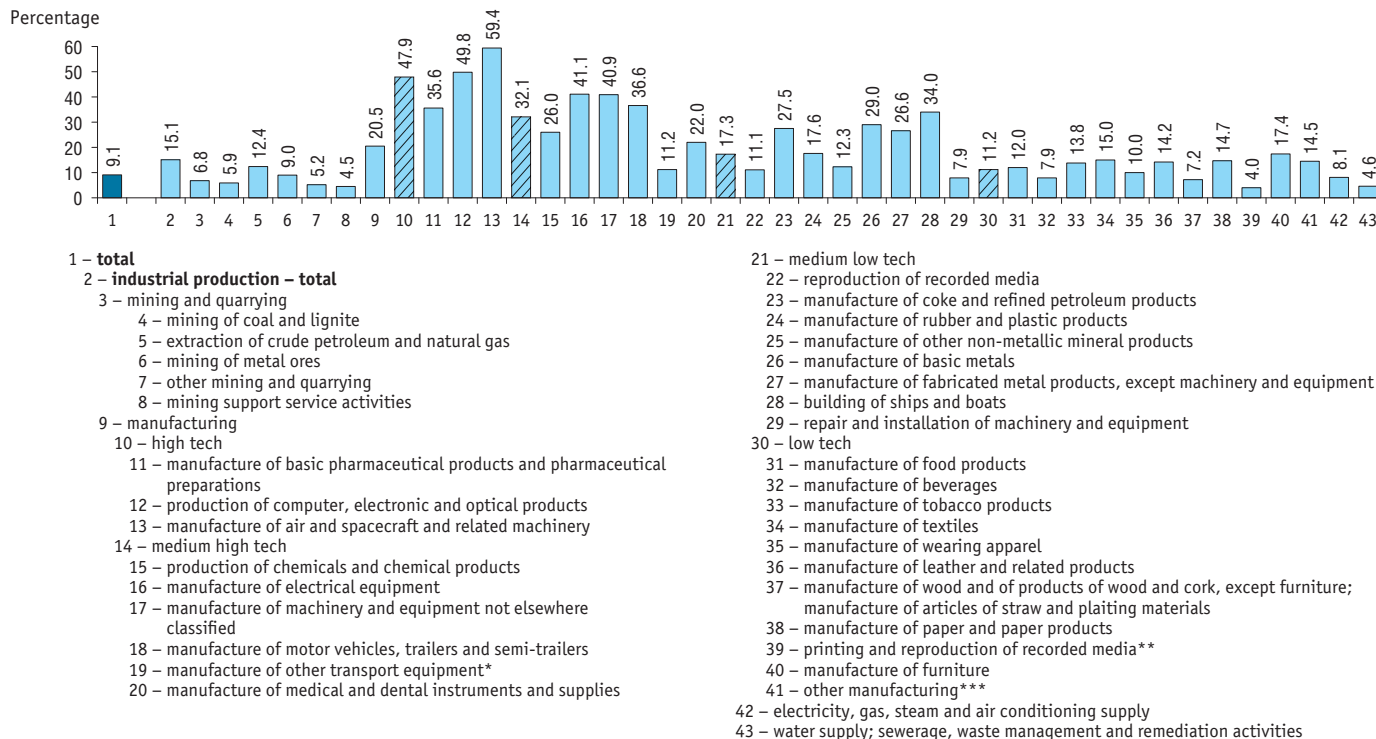
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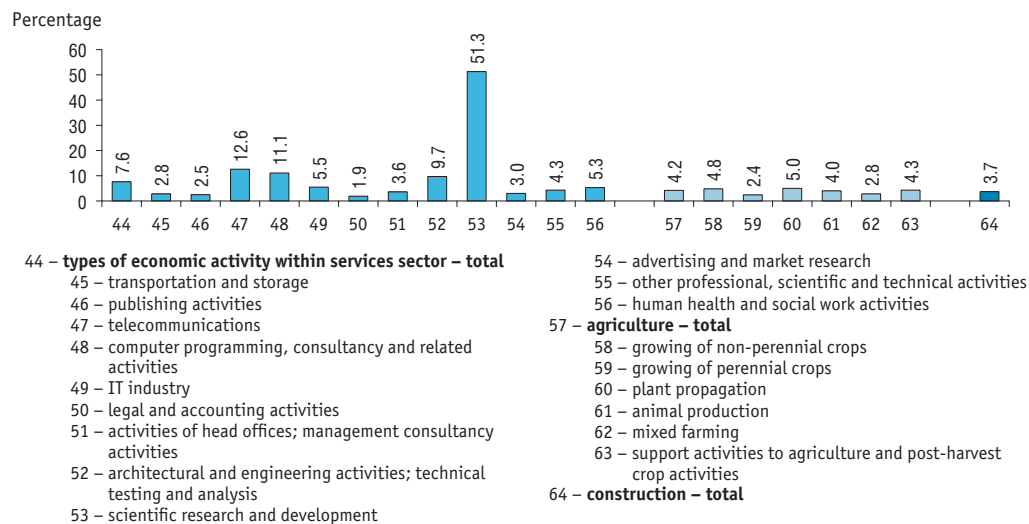
1.1. INNOVATION ACTIVITY OF ENTERPRISES



1.2. INNOVATION ACTIVITY OF ENTERPRISES BY TYPE OF ECONOMIC ACTIVITY: 2019



(continued)



* Here and below in sections 1–7, excluding building of ships and boats and manufacture of air and spacecraft and related machinery.

** Here and below in sections 1–7, excluding reproduction of recorded media (save for tables 5.17–5.20).

*** Here and below in sections 1–7, excluding manufacture of medical and dental instruments and supplies.

1.3. DISTRIBUTION OF ENTERPRISES BY TYPE OF INNOVATIVE AND ECONOMIC ACTIVITY: 2019

(as a percentage of enterprises that have had expenditure on innovative activities)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Total	41.8	50.3	8.2	16.2	4.6	14.1	25.4	9.7	3.9	12.4
Industrial production – total	47.6	51.2	10.7	14.7	6.9	20.0	22.1	11.9	4.2	14.0
Mining and quarrying	48.2	37.7	2.6	8.8	–	17.5	20.2	12.3	7.0	14.0
Mining of coal and lignite	28.6	42.9	–	–	–	14.3	14.3	–	–	14.3
Extraction of crude petroleum and natural gas	60.0	32.0	2.0	14.0	–	20.0	26.0	20.0	6.0	8.0
Mining of metal ores	46.7	46.7	–	–	–	26.7	40.0	–	6.7	–
Other mining and quarrying	29.4	52.9	5.9	–	–	11.8	–	–	5.9	29.4
Mining support service activities	44.0	32.0	4.0	12.0	–	12.0	12.0	16.0	12.0	24.0
Manufacturing	50.3	52.6	12.9	16.2	8.4	21.2	21.8	13.7	4.2	13.8
High tech	67.8	53.1	12.3	23.7	4.6	18.0	33.2	18.8	3.5	12.8
Manufacture of basic pharmaceutical products and pharmaceutical preparations	69.7	39.4	9.1	18.2	3.0	15.2	15.2	19.7	3.0	9.1
Production of computer, electronic and optical products	68.7	54.6	12.4	21.3	4.4	18.1	36.9	18.5	4.0	10.4
Manufacture of air and spacecraft and related machinery	61.5	63.5	15.4	42.3	7.7	21.2	38.5	19.2	1.9	28.8

* Here and below in table 1.4, acquisition of patent rights (alienation), licenses, industrial designs, utility models, selection achievements, integrated circuit designs, etc.; patenting (registration) of the results of intellectual activity.

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Medium high tech	56.1	49.7	11.8	14.8	6.3	24.6	19.3	14.3	4.4	14.8
Production of chemicals and chemical products	53.2	53.2	13.7	11.5	7.2	24.5	12.9	17.3	4.3	20.1
Manufacture of electrical equipment	61.1	51.1	10.7	12.2	6.9	24.4	19.8	13.7	5.3	11.5
Manufacture of machinery and equipment not elsewhere classified	59.0	45.1	13.9	16.2	6.4	23.7	20.2	14.5	3.5	9.2
Manufacture of motor vehicles, trailers and semi-trailers	55.4	53.0	7.2	16.9	4.8	28.9	24.1	10.8	1.2	19.3
Manufacture of other transport equipment	51.5	48.5	12.1	18.2	6.1	27.3	27.3	18.2	12.1	12.1
Manufacture of medical and dental instruments and supplies	20.0	40.0	6.7	33.3	–	6.7	20.0	–	6.7	40.0
Medium low tech	48.9	55.6	10.3	19.8	5.5	27.7	26.3	15.4	5.9	16.8
Reproduction of recorded media	100	–	100	100	100	–	–	–	–	–
Manufacture of coke and refined petroleum products	55.0	45.0	5.0	22.5	5.0	37.5	37.5	25.0	5.0	22.5
Manufacture of rubber and plastic products	38.2	67.6	10.3	8.8	14.7	20.6	19.1	11.8	2.9	5.9
Manufacture of other non-metallic mineral products	49.4	43.2	8.6	4.9	2.5	18.5	12.3	6.2	3.7	19.8
Manufacture of basic metals	54.2	62.7	6.0	25.3	1.2	39.8	28.9	25.3	4.8	19.3
Manufacture of fabricated metal products, except machinery and equipment	51.8	58.9	13.7	26.8	6.5	29.2	29.2	16.1	7.7	17.3

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Building of ships and boats	50.0	54.5	22.7	36.4	4.5	22.7	50.0	18.2	9.1	27.3
Repair and installation of machinery and equipment	35.7	45.2	4.8	14.3	–	21.4	26.2	7.1	9.5	11.9
Low tech	30.1	52.4	17.5	7.7	17.3	12.4	10.6	6.9	2.4	9.7
Manufacture of food products	29.0	52.2	21.0	7.2	20.3	10.9	10.1	5.8	2.2	9.4
Manufacture of beverages	42.5	47.5	22.5	7.5	30.0	20.0	12.5	15.0	5.0	12.5
Manufacture of tobacco products	25.0	25.0	–	–	25.0	50.0	–	–	–	25.0
Manufacture of textiles	45.8	41.7	12.5	8.3	4.2	8.3	8.3	8.3	4.2	4.2
Manufacture of wearing apparel	31.3	62.5	18.8	6.3	–	6.3	12.5	12.5	–	–
Manufacture of leather and related products	22.2	33.3	11.1	–	22.2	–	22.2	11.1	–	11.1
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	14.3	66.7	–	4.8	–	19.0	4.8	–	4.8	14.3
Manufacture of paper and paper products	26.1	65.2	13.0	13.0	13.0	13.0	8.7	–	–	8.7
Printing and reproduction of recorded media	40.0	60.0	–	10.0	–	–	30.0	–	–	10.0
Manufacture of furniture	7.7	53.8	–	7.7	7.7	23.1	15.4	15.4	7.7	23.1
Other manufacturing	37.5	50.0	12.5	18.8	12.5	18.8	6.3	12.5	–	6.3

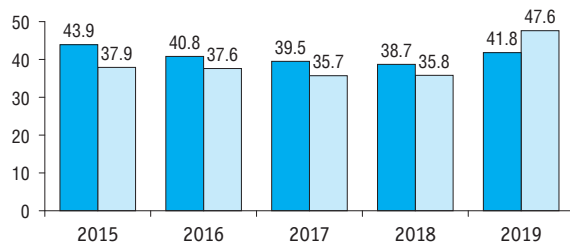
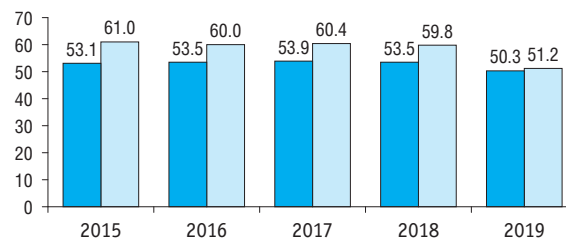
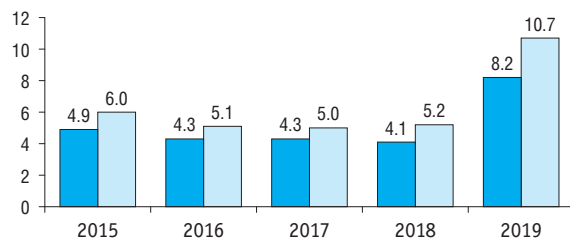
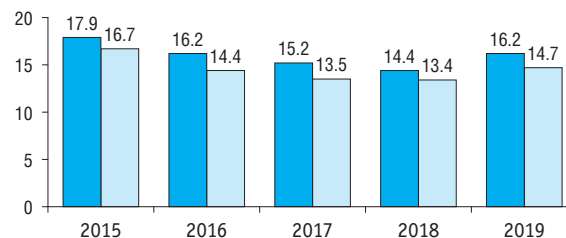
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	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Electricity, gas, steam and air conditioning supply	33.8	44.9	0.8	8.0	1.5	14.8	24.7	1.5	3.4	15.2
Water supply; sewerage, waste management and remediation activities	28.9	59.0	3.6	10.8	–	10.8	21.7	3.6	4.8	16.9
Types of economic activity within services sector – total	39.7	47.2	6.4	18.5	2.8	9.6	29.9	8.5	3.7	11.6
Transportation and storage	24.7	49.0	2.9	16.5	0.8	8.6	23.9	11.1	3.3	15.2
Publishing activities	12.5	28.1	18.8	12.5	28.1	3.1	50.0	6.3	3.1	9.4
Telecommunications	17.5	57.9	5.8	35.4	0.8	35.0	17.9	4.2	3.8	4.2
Computer programming, consultancy and related activities	38.6	42.9	10.6	16.9	2.6	6.3	54.0	10.6	1.1	19.6
IT industry	26.5	49.0	10.2	18.4	4.1	1.0	52.0	8.2	2.0	21.4
Legal and accounting activities	13.2	47.3	2.2	12.1	–	3.3	50.5	7.7	4.4	16.5
Activities of head offices; management consultancy activities	29.3	29.3	17.1	20.7	4.9	8.5	43.9	13.4	13.4	13.4
Architectural and engineering activities; technical testing and analysis	30.5	35.9	4.2	15.6	2.4	13.2	43.1	9.0	5.4	11.4
Scientific research and development	82.0	36.2	6.8	19.7	2.2	11.6	24.1	14.3	3.7	10.3
Advertising and market research	36.8	31.6	31.6	5.3	2.6	5.3	36.8	5.3	2.6	13.2
Other professional, scientific and technical activities	33.3	55.6	11.1	33.3	11.1	–	55.6	–	11.1	11.1
Human health and social work activities	18.6	60.9	3.8	15.0	3.5	2.6	24.3	2.6	3.4	10.3

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Agriculture – total	13.9	78.9	2.2	2.2	1.8	5.8	4.9	3.1	–	6.7
Growing of non-perennial crops	12.0	86.1	0.9	2.8	–	3.7	3.7	3.7	–	1.9
Growing of perennial crops	–	33.3	–	–	–	–	33.3	33.3	–	–
Plant propagation	100	–	–	–	–	–	–	–	–	–
Animal production	12.2	74.4	4.4	1.1	4.4	8.9	6.7	2.2	–	12.2
Mixed farming	16.7	50.0	–	–	–	–	–	–	–	33.3
Support activities to agriculture and post-harvest crop activities	33.3	80.0	–	6.7	–	6.7	–	–	–	–
Construction – total	24.5	47.9	10.6	21.3	6.4	16.0	27.7	3.2	7.4	8.5

1.4. ENTERPRISES BY TYPE OF INNOVATIVE ACTIVITY*

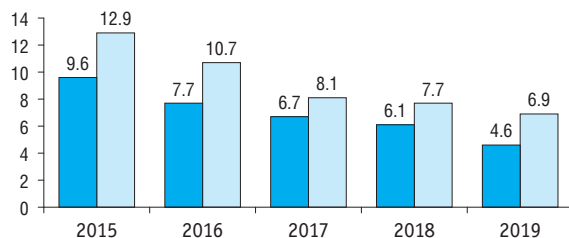
*(as a percentage of enterprises that have had expenditure on innovative activities)***Research and development****Purchase of machinery and equipment, or other fixed assets****Marketing and brand creation******Education and training of personnel**

Total

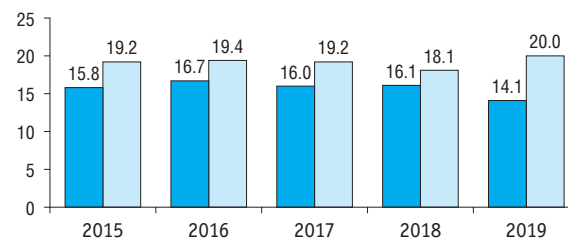
Industrial production

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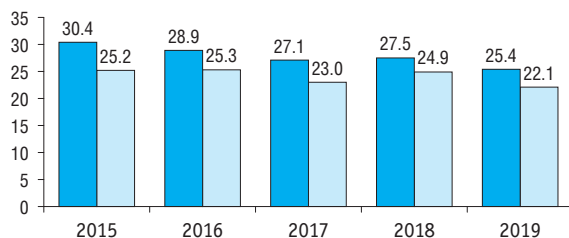
Design



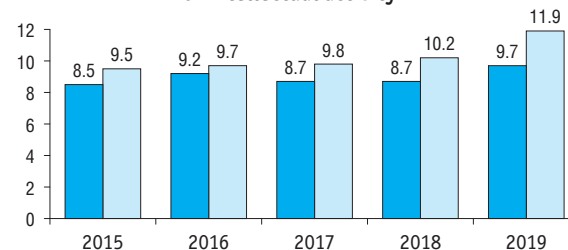
Engineering



Development and purchase of software and databases***



Acquisition of rights to the results of intellectual activity****



■ Total

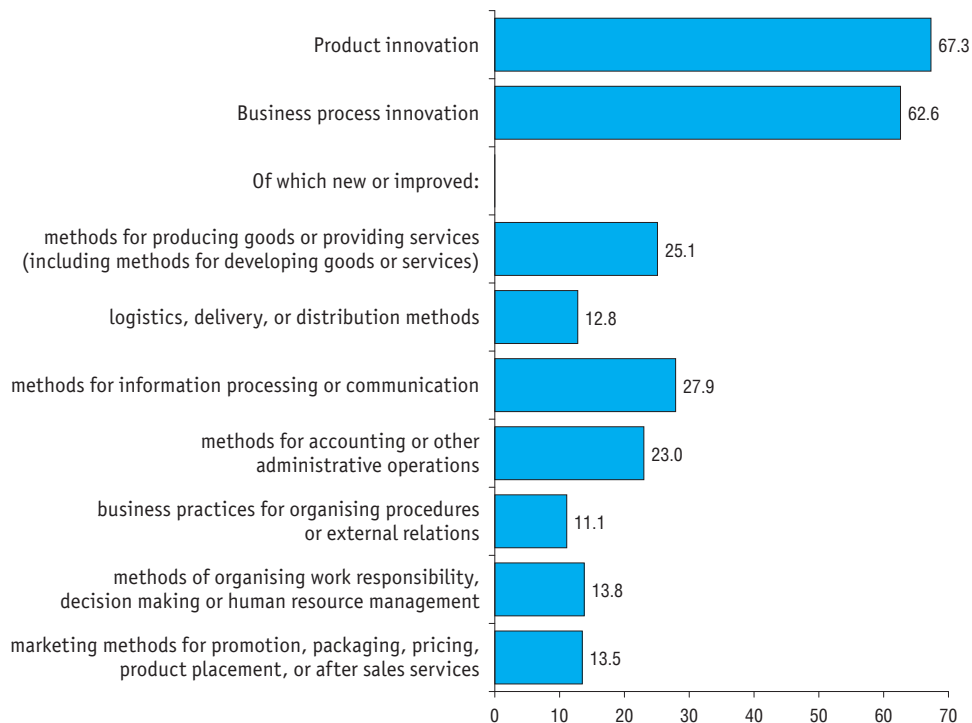
■ Industrial production

* Until 2019, indicators are calculated as a percentage of enterprises that have had expenditure on technological innovation.

** Until 2019, market research.

*** Until 2019, purchase of software.

**** Until 2019, acquisition of new technologies.

1.5. ENTERPRISES THAT ENGAGED IN PRODUCT AND BUSINESS PROCESS INNOVATION: 2017–2019*(as a percentage of all enterprises that have had completed innovation activities)*

1.6. PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT ENGAGED IN PRODUCT AND BUSINESS PROCESS INNOVATION BY TYPE OF ECONOMIC ACTIVITY: 2017–2019

(as a percentage of all enterprises that have had completed innovation activities)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Total	67.3	62.6	25.1	12.8	27.9	23.0	11.1	13.8	13.5
Industrial production – total	74.6	58.3	29.4	14.3	19.9	18.1	9.3	12.2	14.5
Mining and quarrying	38.3	70.9	36.2	11.3	14.9	27.0	6.4	13.5	5.0
Mining of coal and lignite	71.4	42.9	28.6	14.3	–	14.3	14.3	14.3	–
Extraction of crude petroleum and natural gas	28.1	80.7	36.8	5.3	14.0	43.9	5.3	12.3	3.5
Mining of metal ores	43.5	56.5	30.4	4.3	17.4	13.0	4.3	13.0	4.3
Other mining and quarrying	30.4	78.3	47.8	21.7	17.4	13.0	–	13.0	8.7
Mining support service activities	51.6	64.5	32.3	19.4	16.1	19.4	12.9	16.1	6.5
Manufacturing	82.4	55.1	28.8	14.9	17.8	16.4	9.8	11.5	16.7
High tech	88.9	52.5	28.1	15.3	22.8	18.3	11.4	12.8	14.2
Manufacture of basic pharmaceutical products and pharmaceutical preparations	94.8	43.1	31.0	6.9	10.3	15.5	3.4	3.4	5.2

(continued)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Production of computer, electronic and optical products	89.0	51.4	27.8	15.7	22.7	17.3	11.0	11.8	15.7
Manufacture of air and spacecraft and related machinery	80.9	70.2	25.5	23.4	38.3	27.7	23.4	29.8	17.0
Medium high tech	86.2	52.8	29.8	14.2	16.3	14.4	10.0	11.5	14.1
Production of chemicals and chemical products	80.0	60.0	35.6	16.3	16.9	14.4	8.1	11.9	13.1
Manufacture of electrical equipment	93.4	51.7	29.1	13.9	20.5	14.6	11.9	10.6	14.6
Manufacture of machinery and equipment not elsewhere classified	88.4	50.3	29.6	13.2	17.5	13.8	10.1	13.8	17.5

(continued)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Manufacture of motor vehicles, trailers and semi-trailers	87.5	46.2	24.0	16.3	10.6	11.5	9.6	6.7	8.7
Manufacture of other transport equipment	78.7	57.4	23.4	10.6	12.8	25.5	12.8	17.0	14.9
Manufacture of medical and dental instruments and supplies	70.6	52.9	35.3	5.9	5.9	5.9	5.9	5.9	11.8
Medium low tech	78.0	60.0	30.1	15.0	20.6	20.1	10.2	13.0	14.4
Reproduction of recorded media	–	100	–	–	100	–	100	–	–
Manufacture of coke and refined petroleum products	73.7	68.4	36.8	18.4	15.8	10.5	5.3	13.2	13.2
Manufacture of rubber and plastic products	83.7	47.7	23.3	18.6	18.6	10.5	15.1	9.3	18.6
Manufacture of other non-metallic mineral products	79.6	51.5	32.0	10.7	10.7	14.6	3.9	4.9	9.7
Manufacture of basic metals	74.1	70.6	36.5	15.3	25.9	23.5	14.1	20.0	12.9

(continued)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Manufacture of fabricated metal products, except machinery and equipment	82.3	64.6	32.0	16.6	25.7	26.9	12.0	16.6	17.7
Building of ships and boats	72.7	77.3	22.7	13.6	27.3	31.8	9.1	9.1	13.6
Repair and installation of machinery and equipment	65.5	51.7	20.7	10.3	17.2	20.7	5.2	13.8	10.3
Low tech	78.3	54.4	27.0	15.5	13.8	14.1	8.3	9.3	23.4
Manufacture of food products	82.9	51.9	28.8	12.3	12.3	11.7	8.0	9.7	24.8
Manufacture of beverages	76.9	64.6	20.0	38.5	21.5	29.2	23.1	10.8	43.1
Manufacture of tobacco products	71.4	57.1	42.9	28.6	14.3	14.3	–	–	–
Manufacture of textiles	81.5	44.4	18.5	11.1	11.1	14.8	–	7.4	14.8
Manufacture of wearing apparel	76.5	35.3	11.8	5.9	11.8	5.9	–	11.8	17.6
Manufacture of leather and related products	69.2	53.8	38.5	–	–	–	7.7	7.7	7.7

(continued)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	53.6	60.7	39.3	14.3	10.7	21.4	7.1	10.7	3.6
Manufacture of paper and paper products	69.0	65.5	20.7	13.8	20.7	10.3	3.4	3.4	20.7
Printing and reproduction of recorded media	69.2	84.6	30.8	15.4	30.8	23.1	–	15.4	15.4
Manufacture of furniture	73.3	46.7	20.0	13.3	13.3	20.0	–	–	6.7
Other manufacturing	62.5	56.3	25.0	25.0	12.5	6.3	6.3	12.5	18.8
Electricity, gas, steam and air conditioning supply	37.6	74.9	29.4	12.2	38.8	27.5	7.5	15.7	3.5
Water supply; sewerage, waste management and remediation activities	47.3	69.2	31.9	11.0	23.1	17.6	6.6	15.4	6.6

(continued)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Types of economic activity within services sector – total	62.5	66.1	20.4	11.3	35.3	26.6	12.2	15.2	12.7
Transportation and storage	56.3	74.4	17.4	26.6	44.7	35.3	16.9	18.8	14.5
Publishing activities	64.2	67.9	11.3	13.2	30.2	41.5	28.3	20.8	34.0
Telecommunications	64.5	87.5	34.5	8.6	40.9	37.1	1.6	8.3	18.8
Computer programming, consultancy and related activities	77.5	51.4	9.6	3.2	34.9	25.2	6.9	16.5	9.6
IT industry	66.4	67.2	14.3	12.6	49.6	29.4	21.0	17.6	15.1
Legal and accounting activities	51.0	55.9	3.5	6.3	22.4	41.3	4.2	12.6	7.0
Activities of head offices; management consultancy activities	48.0	72.0	11.0	6.0	30.0	38.0	23.0	17.0	27.0

(continued)

	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Architectural and engineering activities; technical testing and analysis	48.8	68.5	20.8	8.9	41.7	28.6	13.7	13.7	8.9
Scientific research and development	80.8	54.3	30.6	9.3	22.0	16.2	10.9	11.7	9.4
Advertising and market research	75.0	63.6	18.2	15.9	43.2	31.8	25.0	15.9	31.8
Other professional, scientific and technical activities	87.5	25.0	–	–	–	12.5	12.5	–	–
Human health and social work activities	49.3	68.9	16.0	10.2	40.2	21.6	13.3	18.9	10.3
Agriculture – total	53.9	66.1	55.6	13.9	16.7	19.4	8.9	10.6	9.4
Growing of non-perennial crops	50.7	71.6	59.7	13.4	16.4	23.9	7.5	9.0	3.0
Growing of perennial crops	50.0	50.0	50.0	–	–	–	–	–	–

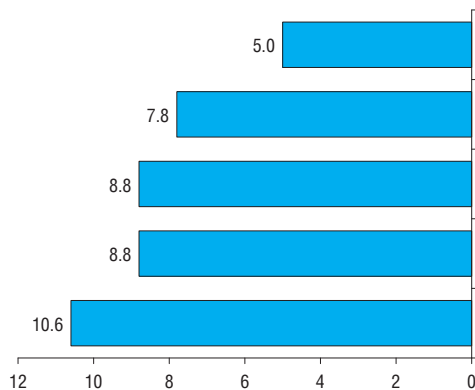
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	Product innovation	Business process innovation	Of which new or improved:						
			methods for producing goods or providing services (including methods for developing goods or services)	logistics, delivery, or distribution methods	methods for information processing or communication	methods for accounting or other administrative operations	business practices for organising procedures or external relations	methods of organising work responsibility, decision making or human resource management	marketing methods for promotion, packaging, pricing, product placement, or after sales services
Plant propagation	100	100	100	–	–	–	–	–	–
Animal production	53.1	66.7	54.3	16.0	18.5	19.8	11.1	12.3	16.0
Mixed farming	87.5	12.5	12.5	–	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	52.6	68.4	63.2	15.8	21.1	15.8	10.5	15.8	10.5
Construction – total	54.7	62.1	12.4	13.7	31.7	39.8	21.7	17.4	16.1

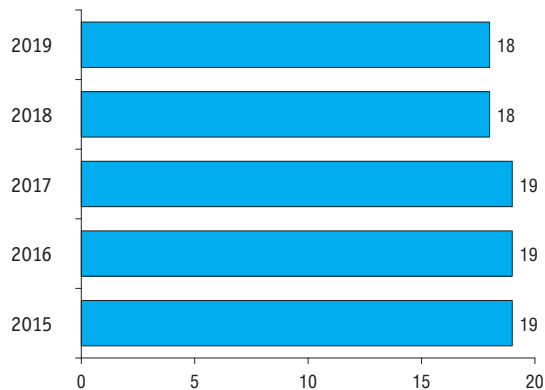
1.7. R&D UNITS IN ENTERPRISES

	2015	2016	2017	2018	2019
Number of R&D units	23224	23248	22473	24541	26649
Number of employees in R&D units	444265	433989	425795	446323	475544

Enterprises with R&D units as a percentage of the total number of enterprises



Average number of employees in R&D units



1.8. ENTERPRISES WITH R&D UNITS BY TYPE OF ECONOMIC ACTIVITY: 2019

	Enterprises with R&D units, <i>percentage</i>	Number of R&D units	Number of employees in R&D units
Total	5.0	26649	475544
Industrial production – total	9.0	5809	144936
Mining and quarrying	2.6	86	4738
Mining of coal and lignite	2.3	7	72
Extraction of crude petroleum and natural gas	2.5	15	3199
Mining of metal ores	4.8	24	477
Other mining and quarrying	1.4	11	569
Mining support service activities	2.5	29	421
Manufacturing	13.7	5521	137047
High tech	40.6	1746	53222
Manufacture of basic pharmaceutical products and pharmaceutical preparations	25.1	161	2378
Production of computer, electronic and optical products	44.0	1311	35718
Manufacture of air and spacecraft and related machinery	49.0	274	15126
Medium high tech	25.3	1863	37974
Production of chemicals and chemical products	17.8	304	6509
Manufacture of electrical equipment	35.3	512	8385
Manufacture of machinery and equipment not elsewhere classified	35.1	721	14170
Manufacture of motor vehicles, trailers and semi-trailers	26.5	241	6989

(continued)

	Enterprises with R&D units, <i>percentage</i>	Number of R&D units	Number of employees in R&D units
Manufacture of other transport equipment	7.8	73	1716
Manufacture of medical and dental instruments and supplies	8.9	12	205
Medium low tech	12.1	1657	43326
Reproduction of recorded media	11.1	1	4
Manufacture of coke and refined petroleum products	19.9	64	1945
Manufacture of rubber and plastic products	10.4	129	1142
Manufacture of other non-metallic mineral products	6.2	129	1130
Manufacture of basic metals	20.2	164	6656
Manufacture of fabricated metal products, except machinery and equipment	22.0	909	24739
Building of ships and boats	23.7	56	4770
Repair and installation of machinery and equipment	5.6	205	2940
Low tech	2.8	255	2525
Manufacture of food products	1.2	58	773
Manufacture of beverages	0.9	9	34
Manufacture of tobacco products	3.4	1	4
Manufacture of textiles	6.3	35	250
Manufacture of wearing apparel	5.8	26	306
Manufacture of leather and related products	6.7	9	115
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2.1	13	178

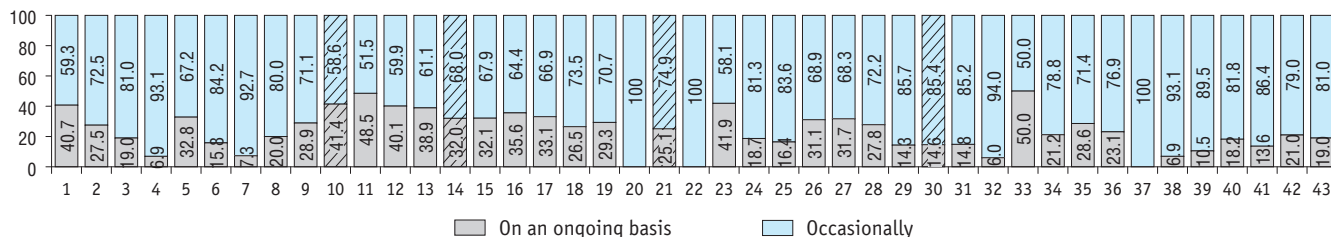
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	Enterprises with R&D units, <i>percentage</i>	Number of R&D units	Number of employees in R&D units
Manufacture of paper and paper products	7.4	31	286
Printing and reproduction of recorded media	1.0	5	68
Manufacture of furniture	11.7	37	273
Other manufacturing	9.2	31	238
Electricity, gas, steam and air conditioning supply	2.1	145	2249
Water supply; sewerage, waste management and remediation activities	0.9	57	902
Types of economic activity within services sector – total	4.0	20365	313139
Transportation and storage	0.5	96	1945
Publishing activities	0.4	28	120
Telecommunications	1.0	43	285
Computer programming, consultancy and related activities	5.6	892	18938
IT industry	1.4	405	3034
Legal and accounting activities	0.3	115	429
Activities of head offices; management consultancy activities	1.2	165	1188

(continued)

	Enterprises with R&D units, <i>percentage</i>	Number of R&D units	Number of employees in R&D units
Architectural and engineering activities; technical testing and analysis	7.4	2580	37461
Scientific research and development	47.9	15686	246676
Advertising and market research	1.2	57	1098
Other professional, scientific and technical activities	2.0	17	384
Human health and social work activities	0.6	281	1581
Agriculture – total	0.4	82	567
Growing of non-perennial crops	0.2	12	64
Growing of perennial crops	0.4	1	3
Plant propagation	2.5	1	17
Animal production	0.2	6	113
Mixed farming	0.2	1	1
Support activities to agriculture and post-harvest crop activities	1.8	61	369
Construction – total	2.3	393	16902

1.9. PERCENTAGE DISTRIBUTION OF ENTERPRISES BY R&D INTENSITY AND TYPE OF ECONOMIC ACTIVITY: 2019



1 – total

2 – industrial production – total

3 – mining and quarrying

4 – mining of coal and lignite

5 – extraction of crude petroleum and natural gas

6 – mining of metal ores

7 – other mining and quarrying

8 – mining support service activities

9 – manufacturing

10 – high tech

11 – manufacture of basic pharmaceutical products and pharmaceutical preparations

12 – production of computer, electronic and optical products

13 – manufacture of air and spacecraft and related machinery

14 – medium high tech

15 – production of chemicals and chemical products

16 – manufacture of electrical equipment

17 – manufacture of machinery and equipment not elsewhere classified

18 – manufacture of motor vehicles, trailers and semi-trailers

19 – manufacture of other transport equipment

20 – manufacture of medical and dental instruments and supplies

21 – medium low tech

22 – reproduction of recorded media

23 – manufacture of coke and refined petroleum products

24 – manufacture of rubber and plastic products

25 – manufacture of other non-metallic mineral products

26 – manufacture of basic metals

27 – manufacture of fabricated metal products, except machinery and equipment

28 – building of ships and boats

29 – repair and installation of machinery and equipment

30 – low tech

31 – manufacture of food products

32 – manufacture of beverages

33 – manufacture of tobacco products

34 – manufacture of textiles

35 – manufacture of wearing apparel

36 – manufacture of leather and related products

37 – manufacture of wood and of products of wood and cork, except furniture;

manufacture of articles of straw and plaiting materials

38 – manufacture of paper and paper products

39 – printing and reproduction of recorded media

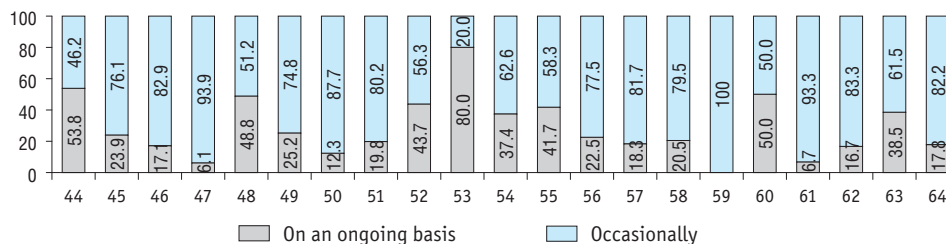
40 – manufacture of furniture

41 – other manufacturing

42 – electricity, gas, steam and air conditioning supply

43 – water supply; sewerage, waste management and remediation activities

(continued)



44 – types of economic activity within services sector – total

- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

54 – advertising and market research

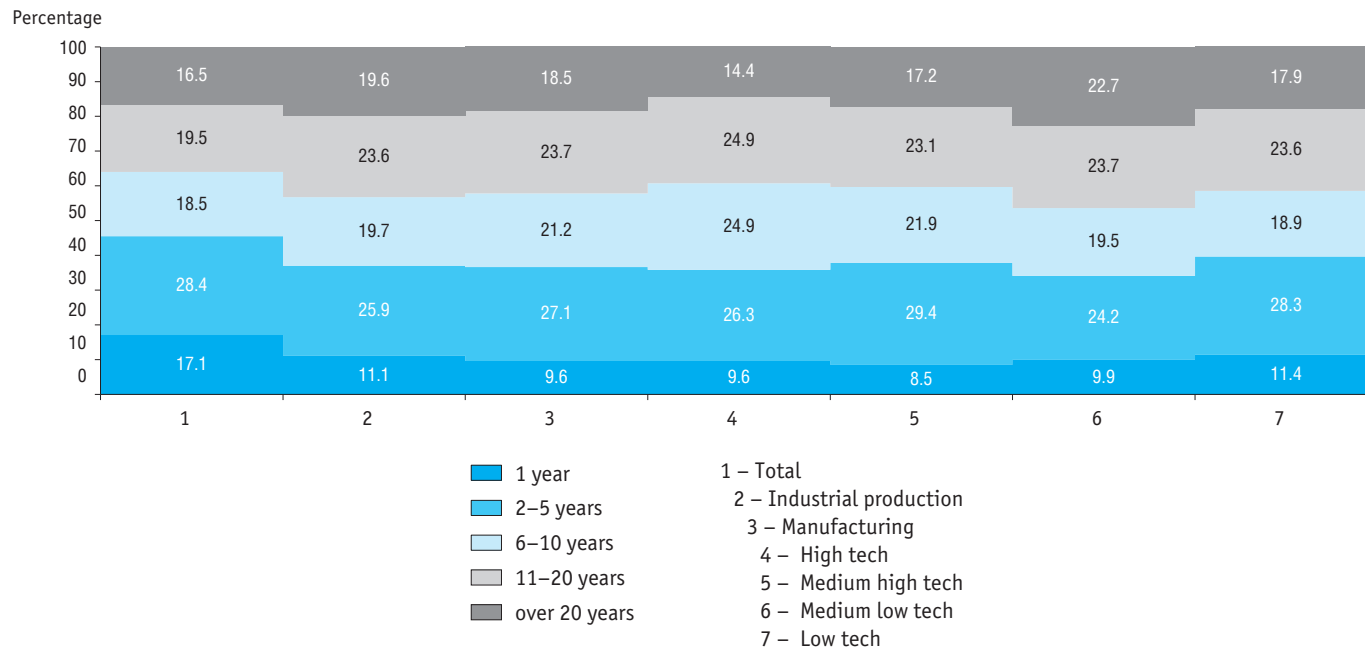
- 55 – other professional, scientific and technical activities
- 56 – human health and social work activities

57 – agriculture – total

- 58 – growing of non-perennial crops
- 59 – growing of perennial crops
- 60 – plant propagation
- 61 – animal production
- 62 – mixed farming
- 63 – support activities to agriculture and post-harvest crop activities

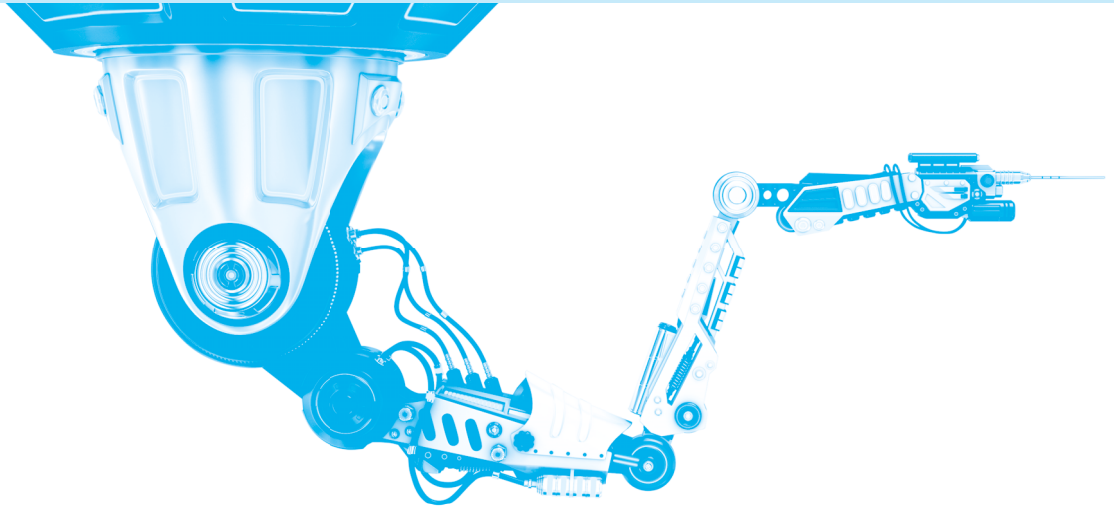
64 – construction – total

1.10. PRODUCT LIFE CYCLE AT ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES: 2019

(percentage distribution of enterprises by life cycle duration of the main good or service)

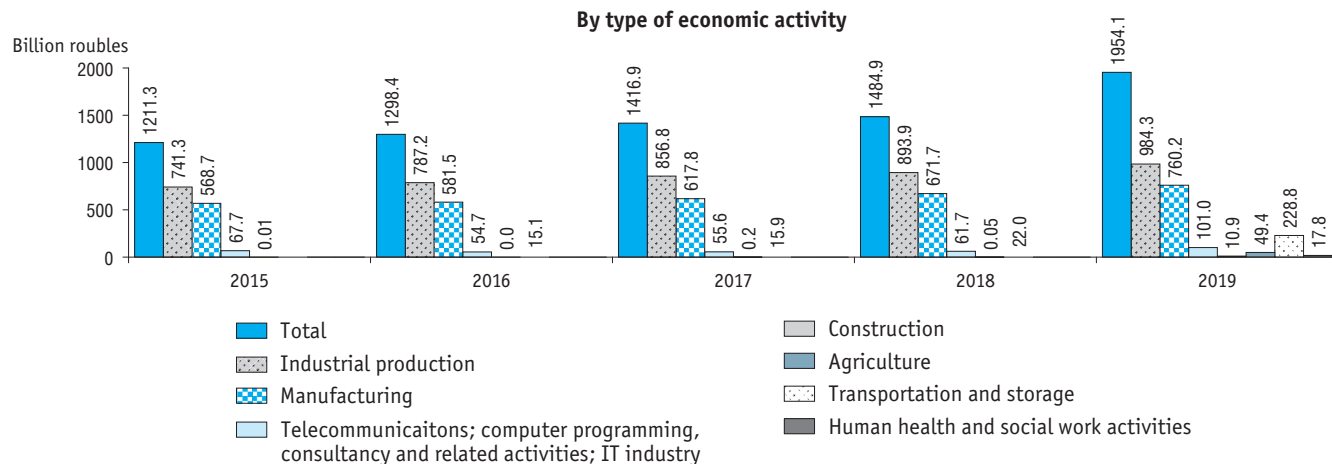
INNOVATION EXPENDITURE

2



2.1. INNOVATION EXPENDITURE

	2015	2016	2017	2018	2019
Innovation expenditure – total:					
at current prices, <i>million roubles</i>	1211294.4	1298444.5	1416922.8	1484901.1	1954133.3
at constant 2010 prices, <i>million roubles*</i>	790817.0	824618.6	854546.0	806091.5	1021982.8
as a percentage of 2010	192.4	200.6	207.9	196.1	248.7
as a percentage of total sales	2.7	2.5	2.5	2.2	2.1



* The data are calculated taking into account the GDP deflator as at April 01, 2020.

2.2. INNOVATION EXPENDITURE BY INNOVATION AND TYPE OF ECONOMIC ACTIVITY: 2019

	Innovation expenditure		Including by innovation			
	million roubles	percentage	product		business process	
			million roubles	percentage	million roubles	percentage
Total	1954133.3	100	1292797.1	100	661336.2	100
Industrial production – total	984315.5	50.4	579036.4	44.8	405279.0	61.3
Mining and quarrying	154656.0	7.9	56557.8	4.4	98098.2	14.8
Mining of coal and lignite	15051.5	0.8	14979.7	1.2	71.8	0.01
Extraction of crude petroleum and natural gas	102998.0	5.3	25008.9	1.9	77989.1	11.8
Mining of metal ores	16459.0	0.8	8684.2	0.7	7774.8	1.2
Other mining and quarrying	4243.2	0.2	1238.5	0.1	3004.6	0.5
Mining support service activities	15904.3	0.8	6646.4	0.5	9257.9	1.4
Manufacturing	760211.3	38.9	481870.5	37.3	278340.8	42.1
High tech	151744.1	7.8	113079.9	8.7	38664.3	5.8
Manufacture of basic pharmaceutical products and pharmaceutical preparations	14966.3	0.8	12038.1	0.9	2928.2	0.4
Production of computer, electronic and optical products	63810.8	3.3	53030.8	4.1	10780.1	1.6
Manufacture of air and spacecraft and related machinery	72967.0	3.7	48011.0	3.7	24956.0	3.8
Medium high tech	140622.5	7.2	74355.2	5.8	66267.3	10.0
Production of chemicals and chemical products	68586.2	3.5	27934.2	2.2	40652.0	6.1
Manufacture of electrical equipment	10493.8	0.5	8010.8	0.6	2483.0	0.4
Manufacture of machinery and equipment not elsewhere classified	22310.3	1.1	15697.4	1.2	6612.8	1.0
Manufacture of motor vehicles, trailers and semi-trailers	32726.4	1.7	16527.0	1.3	16199.3	2.4
Manufacture of other transport equipment	6443.5	0.3	6137.0	0.5	306.4	0.05
Manufacture of medical and dental instruments and supplies	62.4	0.0	48.7	0.0	13.7	0.0
Medium low tech	377064.9	19.3	240225.9	18.6	136838.9	20.7
Reproduction of recorded media	2.5	0.0	–	–	2.5	0.0
Manufacture of coke and refined petroleum products	140265.9	7.2	84406.4	6.5	55859.5	8.4

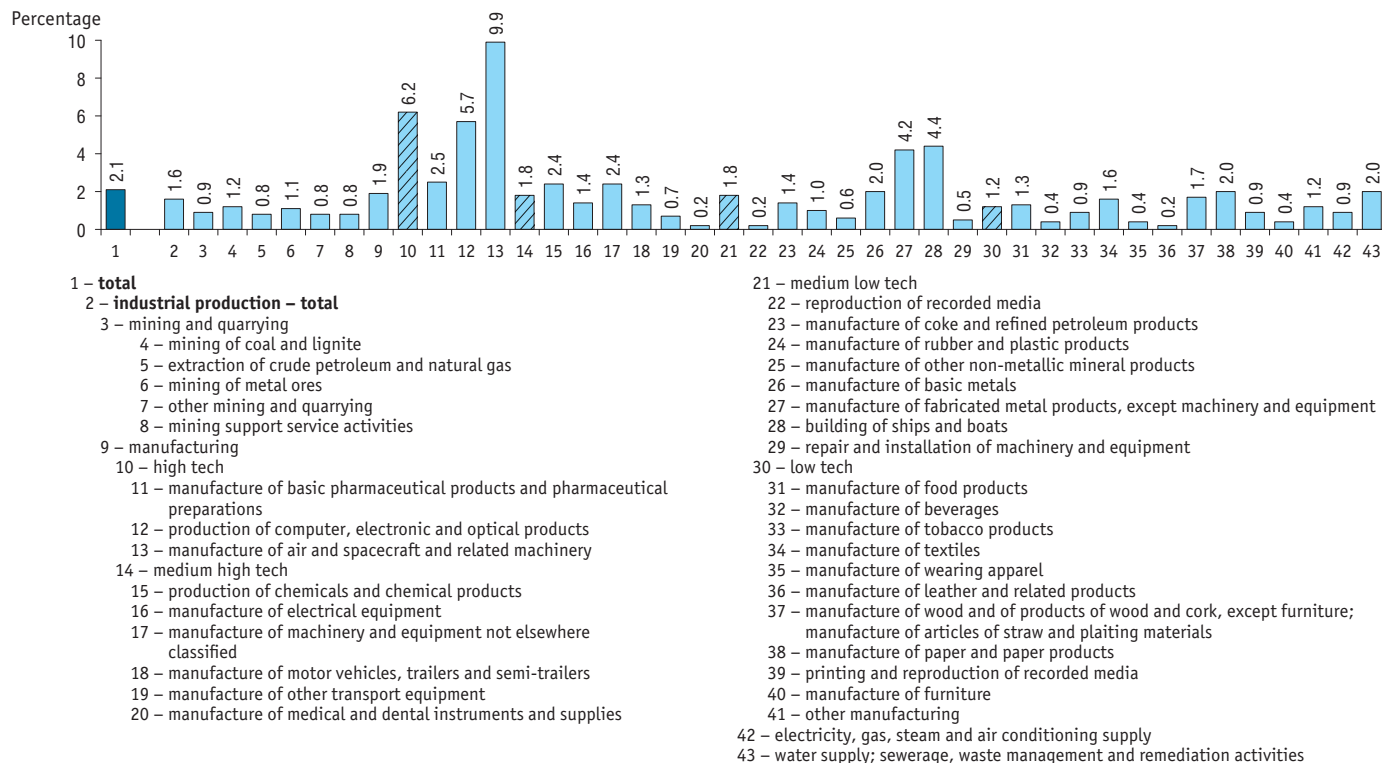
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	Innovation expenditure		Including by innovation			
	million roubles	percentage	product		business process	
			million roubles	percentage	million roubles	percentage
Manufacture of rubber and plastic products	6925.7	0.4	3858.9	0.3	3066.8	0.5
Manufacture of other non-metallic mineral products	6536.6	0.3	3762.1	0.3	2774.5	0.4
Manufacture of basic metals	133045.2	6.8	73563.9	5.7	59481.2	9.0
Manufacture of fabricated metal products, except machinery and equipment	67333.0	3.4	54545.4	4.2	12787.6	1.9
Building of ships and boats	20580.3	1.1	18043.7	1.4	2536.6	0.4
Repair and installation of machinery and equipment	2375.7	0.1	2045.5	0.2	330.2	0.05
Low tech	90779.8	4.6	54209.5	4.2	36570.3	5.5
Manufacture of food products	57910.3	3.0	39561.3	3.1	18349.0	2.8
Manufacture of beverages	2467.5	0.1	2107.9	0.2	359.6	0.1
Manufacture of tobacco products	1927.7	0.1	1906.9	0.1	20.8	0.0
Manufacture of textiles	2554.1	0.1	425.6	0.03	2128.5	0.3
Manufacture of wearing apparel	311.7	0.02	83.0	0.01	228.8	0.03
Manufacture of leather and related products	108.0	0.01	102.0	0.01	6.1	0.0
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	7943.7	0.4	7442.8	0.6	500.9	0.1
Manufacture of paper and paper products	14829.6	0.8	2016.6	0.2	12813.0	1.9
Printing and reproduction of recorded media	1175.8	0.1	51.8	0.0	1124.0	0.2
Manufacture of furniture	485.9	0.02	85.6	0.01	400.3	0.1
Other manufacturing	1065.4	0.1	426.1	0.03	639.3	0.1
Electricity, gas, steam and air conditioning supply	52995.4	2.7	32104.0	2.5	20891.4	3.2
Water supply; sewerage, waste management and remediation activities	16452.8	0.8	8504.2	0.7	7948.7	1.2

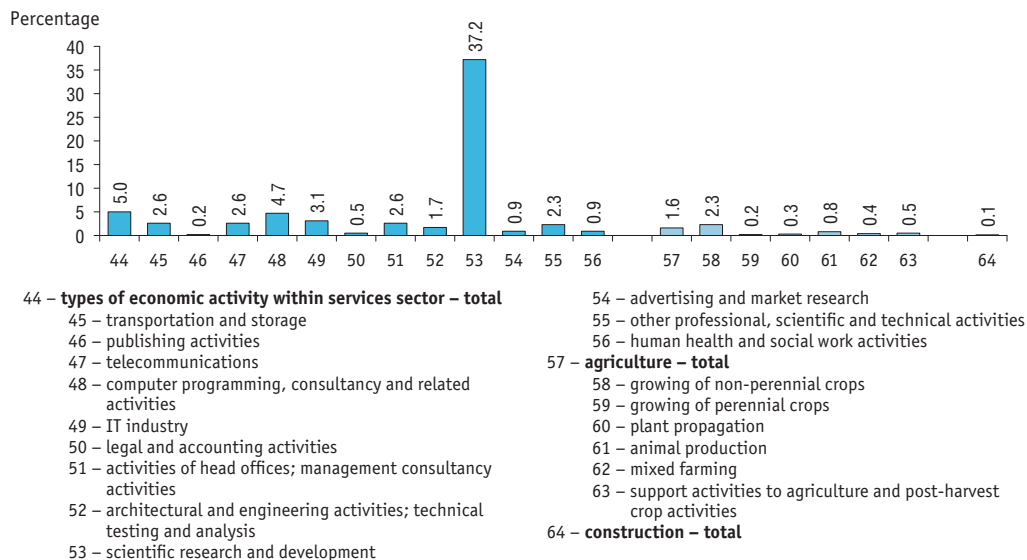
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	Innovation expenditure		Including by innovation			
	million roubles	percentage	product		business process	
			million roubles	percentage	million roubles	percentage
Types of economic activity within services sector – total	909494.1	46.5	671695.9	52.0	237798.2	36.0
Transportation and storage	228822.7	11.7	192511.1	14.9	36311.6	5.5
Publishing activities	155.6	0.01	62.2	0.0	93.4	0.01
Telecommunications	46586.5	2.4	12707.4	1.0	33879.1	5.1
Computer programming, consultancy and related activities	43229.7	2.2	20689.7	1.6	22540.0	3.4
IT industry	11141.8	0.6	7769.5	0.6	3372.4	0.5
Legal and accounting activities	1906.6	0.1	1595.6	0.1	311.0	0.05
Activities of head offices; management consultancy activities	19850.0	1.0	4146.9	0.3	15703.1	2.4
Architectural and engineering activities; technical testing and analysis	18650.3	1.0	4517.2	0.3	14133.2	2.1
Scientific research and development	516427.3	26.4	414473.3	32.1	101953.9	15.4
Advertising and market research	4395.7	0.2	2327.5	0.2	2068.3	0.3
Other professional, scientific and technical activities	564.2	0.03	559.9	0.04	4.3	0.0
Human health and social work activities	17763.8	0.9	10335.7	0.8	7428.1	1.1
Agriculture – total	49393.2	2.5	34673.9	2.7	14719.3	2.2
Growing of non-perennial crops	38976.1	2.0	27226.3	2.1	11749.8	1.8
Growing of perennial crops	62.4	0.0	0.7	0.0	61.6	0.01
Plant propagation	11.6	0.0	11.6	0.0	–	–
Animal production	10002.9	0.5	7180.2	0.6	2822.7	0.4
Mixed farming	65.3	0.0	33.6	0.0	31.7	0.0
Support activities to agriculture and post-harvest crop activities	274.9	0.01	221.5	0.02	53.4	0.01
Construction – total	10930.5	0.6	7390.9	0.6	3539.6	0.5

2.3. INTENSITY OF INNOVATION EXPENDITURE BY TYPE OF ECONOMIC ACTIVITY: 2019

(innovation expenditure as a percentage of total sales)

(continued)



2.4. INNOVATION EXPENDITURE BY TYPE OF INNOVATIVE AND ECONOMIC ACTIVITY: 2019

(million roubles)

	Innovation expenditure	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Total	1954133.3	871660.1	657000.1	7706.3	4985.5	8018.6	179017.6	69935.2	8738.7	5811.9	141259.3
Industrial production – total	984315.5	334972.4	382252.4	2898.2	1132.3	5653.4	123381.3	24109.1	5790.0	4599.7	99526.7
Mining and quarrying	154656.0	84371.5	28929.5	25.1	54.5	–	2476.7	3696.8	489.7	3435.0	31177.1
Mining of coal and lignite	15051.5	29.4	532.3	–	–	–	15.1	6.4	–	–	14468.3
Extraction of crude petroleum and natural gas	102998.0	72447.7	10466.5	0.2	46.3	–	2212.6	1245.2	427.0	3364.2	12788.4
Mining of metal ores	16459.0	4515.4	9487.9	–	–	–	136.3	2294.9	–	24.6	–
Other mining and quarrying	4243.2	935.4	1591.2	24.7	–	–	16.6	–	–	29.3	1646.0
Mining support service activities	15904.3	6443.7	6851.5	0.2	8.2	–	96.2	150.2	62.7	17.1	2274.5
Manufacturing	760211.3	242496.7	298228.0	2868.4	929.8	5341.5	118914.2	19523.8	5298.3	1032.7	65577.9
High tech	151744.1	75713.6	37343.0	1156.0	243.9	2038.9	22285.4	2032.7	1695.6	231.7	9003.4
Manufacture of basic pharmaceutical products and pharmaceutical preparations	14966.3	7393.4	5994.7	869.5	75.1	4.3	62.4	246.1	273.6	2.2	45.0
Production of computer, electronic and optical products	63810.8	39843.6	14414.5	71.6	86.3	894.4	3023.8	1174.2	784.0	60.0	3458.4
Manufacture of air and spacecraft and related machinery	72967.0	28476.6	16933.9	214.9	82.4	1140.1	19199.3	612.3	638.0	169.5	5500.0

* Here and below in table 2.5, 2.7, figure 2.6, expenditure on acquisition of patent rights (alienation), licenses, industrial designs, utility models, selection achievements, integrated circuit designs, etc.; patenting (registration) of the results of intellectual activity.

(continued)

	Innovation expenditure	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Medium high tech	140622.5	40607.7	56688.5	420.9	169.2	1774.4	25439.4	1126.3	2051.3	175.8	12169.0
Production of chemicals and chemical products	68586.2	7243.8	33052.3	129.1	36.8	20.2	18751.1	92.2	1546.9	56.6	7657.2
Manufacture of electrical equipment	10493.8	4492.9	3294.4	29.0	20.3	174.7	1496.7	270.2	18.3	47.9	649.4
Manufacture of machinery and equipment not elsewhere classified	22310.3	12291.9	7569.9	131.8	39.9	208.3	1138.2	220.5	272.0	53.7	383.9
Manufacture of motor vehicles, trailers and semi-trailers	32726.4	12756.3	11274.8	32.6	40.6	1268.3	3241.8	513.6	196.0	0.6	3401.6
Manufacture of other transport equipment	6443.5	3803.3	1484.3	98.1	30.2	102.8	805.9	29.2	18.1	10.6	60.9
Manufacture of medical and dental instruments and supplies	62.4	19.5	12.7	0.2	1.3	–	5.6	0.6	–	6.4	16.0
Medium low tech	377064.9	110183.0	147155.2	310.2	361.4	314.0	65791.4	15917.0	1530.8	602.8	34899.0
Reproduction of recorded media	2.5	1.0	–	0.5	0.1	0.9	–	–	–	–	–
Manufacture of coke and refined petroleum products	140265.9	38696.4	72503.4	68.7	39.1	120.2	13955.9	7274.1	739.3	439.6	6429.1
Manufacture of rubber and plastic products	6925.7	548.2	4760.0	24.4	3.7	148.9	1360.4	20.7	51.6	1.0	6.6
Manufacture of other non-metallic mineral products	6536.6	3737.5	1973.2	22.5	3.4	1.3	280.4	39.6	28.0	20.0	430.7
Manufacture of basic metals	133045.2	10142.0	47930.6	13.9	244.1	14.0	43417.6	7525.6	219.1	21.8	23516.5

(continued)

	Innovation expenditure	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Manufacture of fabricated metal products, except machinery and equipment	67333.0	47462.3	13431.7	158.2	46.2	24.5	1945.3	890.9	428.1	74.9	2870.8
Building of ships and boats	20580.3	8798.0	5544.8	18.9	20.6	4.2	4678.1	145.6	63.8	20.7	1285.6
Repair and installation of machinery and equipment	2375.7	797.5	1011.5	3.0	4.3	—	153.7	20.5	0.8	24.9	359.5
Low tech	90779.8	15992.3	57041.3	981.3	155.3	1214.3	5398.0	447.9	20.5	22.3	9506.5
Manufacture of food products	57910.3	11393.1	34130.9	574.3	109.9	735.7	3150.3	114.6	8.9	19.6	7672.9
Manufacture of beverages	2467.5	477.4	1596.8	162.0	1.4	59.3	70.4	14.8	10.2	1.7	73.5
Manufacture of tobacco products	1927.7	1570.3	14.5	—	—	332.6	10.2	—	—	—	0.1
Manufacture of textiles	2554.1	1391.0	1044.3	5.2	2.4	38.9	68.9	3.0	0.1	0.3	0.0
Manufacture of wearing apparel	311.7	26.3	40.5	15.1	1.2	—	9.0	218.8	0.9	—	—
Manufacture of leather and related products	108.0	2.0	48.0	0.6	—	44.6	—	0.6	0.01	—	12.2
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	7943.7	48.3	7840.5	—	0.4	—	48.7	0.2	—	0.4	5.1
Manufacture of paper and paper products	14829.6	768.0	10185.7	203.6	28.4	2.3	1890.5	57.5	—	—	1693.6

(continued)

	Innovation expenditure	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Printing and reproduction of recorded media	1175.8	118.3	1048.4	–	1.8	–	–	6.1	–	–	1.3
Manufacture of furniture	485.9	3.0	414.6	–	0.03	0.4	3.7	15.9	0.2	0.4	47.8
Other manufacturing	1065.4	194.6	677.3	20.6	9.6	0.5	146.3	16.3	0.3	–	0.1
Electricity, gas, steam and air conditioning supply	52995.4	6087.5	41350.9	1.8	137.7	311.9	1698.0	856.6	0.4	73.2	2477.4
Water supply; sewerage, waste management and remediation activities	16452.8	2016.7	13743.9	2.9	10.3	–	292.3	31.9	1.6	58.8	294.3
Types of economic activity within services sector – total	909494.1	523280.9	238576.1	4616.1	3833.7	2355.6	47930.1	45596.6	2908.4	1189.3	39207.3
Transportation and storage	228822.7	37317.2	179503.8	106.1	1122.5	1.1	4564.5	1468.6	74.4	234.8	4429.6
Publishing activities	155.6	3.9	90.7	8.3	0.1	11.5	0.01	17.4	0.04	0.1	23.5
Telecommunications	46586.5	4836.9	8446.1	1725.1	24.5	1829.3	21716.2	6732.9	82.1	162.8	1030.6
Computer programming, consultancy and related activities	43229.7	15787.4	1955.8	140.8	845.8	8.7	593.2	17554.9	889.0	4.7	5449.4
IT industry	11141.8	4690.1	1821.3	16.9	20.9	3.5	2.5	1713.9	203.7	0.4	2668.7
Legal and accounting activities	1906.6	193.1	1469.7	3.8	2.2	–	48.4	132.2	8.3	1.0	47.8
Activities of head offices; management consultancy activities	19850.0	4085.3	2013.7	27.5	23.9	8.7	146.2	12895.4	31.1	66.3	551.9

(continued)

	Innovation expenditure	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Architectural and engineering activities; technical testing and analysis	18650.3	6212.4	1813.6	10.6	18.6	9.8	454.8	926.5	110.5	307.4	8786.2
Scientific research and development	516427.3	444483.9	29353.3	1113.7	1713.8	461.4	19869.2	3620.6	1445.9	362.8	14002.7
Advertising and market research	4395.7	2411.7	318.5	1428.7	2.7	0.4	29.7	169.1	29.0	4.3	1.7
Other professional, scientific and technical activities	564.2	494.8	39.9	3.8	2.3	2.0	—	15.8	—	0.5	5.2
Human health and social work activities	17763.8	2764.3	11749.6	31.0	56.5	19.1	505.5	349.2	34.4	44.2	2210.1
Agriculture – total	49393.2	12153.4	27753.1	179.3	1.3	5.5	7485.8	31.8	12.8	—	1770.2
Growing of non-perennial crops	38976.1	8793.8	21123.3	0.03	0.4	—	7383.8	29.6	5.6	—	1639.7
Growing of perennial crops	62.4	—	61.6	—	—	—	—	0.1	0.7	—	—
Plant propagation	11.6	11.6	—	—	—	—	—	—	—	—	—
Animal production	10002.9	3180.2	6425.6	179.3	0.1	5.5	92.6	2.1	6.6	—	111.1
Mixed farming	65.3	8.2	37.7	—	—	—	—	—	—	—	19.4
Support activities to agriculture and post-harvest crop activities	274.9	159.6	105.0	—	0.8	—	9.5	—	—	—	—
Construction – total	10930.5	1253.4	8418.6	12.7	18.1	4.2	220.4	197.8	27.4	22.9	755.1

2.5. PERCENTAGE DISTRIBUTION OF INNOVATION EXPENDITURE BY TYPE OF INNOVATIVE AND ECONOMIC ACTIVITY: 2019

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Total	44.6	33.6	0.4	0.3	0.4	9.2	3.6	0.4	0.3	7.2
Industrial production – total	34.0	38.8	0.3	0.1	0.6	12.5	2.4	0.6	0.5	10.1
Mining and quarrying	54.6	18.7	0.02	0.04	–	1.6	2.4	0.3	2.2	20.2
Mining of coal and lignite	0.2	3.5	–	–	–	0.1	0.04	–	–	96.1
Extraction of crude petroleum and natural gas	70.3	10.2	0.0	0.04	–	2.1	1.2	0.4	3.3	12.4
Mining of metal ores	27.4	57.6	–	–	–	0.8	13.9	–	0.1	–
Other mining and quarrying	22.0	37.5	0.6	–	–	0.4	–	–	0.7	38.8
Mining support service activities	40.5	43.1	0.0	0.1	–	0.6	0.9	0.4	0.1	14.3
Manufacturing	31.9	39.2	0.4	0.1	0.7	15.6	2.6	0.7	0.1	8.6
High tech	49.9	24.6	0.8	0.2	1.3	14.7	1.3	1.1	0.2	5.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	49.4	40.1	5.8	0.5	0.03	0.4	1.6	1.8	0.01	0.3
Production of computer, electronic and optical products	62.4	22.6	0.1	0.1	1.4	4.7	1.8	1.2	0.1	5.4
Manufacture of air and spacecraft and related machinery	39.0	23.2	0.3	0.1	1.6	26.3	0.8	0.9	0.2	7.5
Medium high tech	28.9	40.3	0.3	0.1	1.3	18.1	0.8	1.5	0.1	8.7
Production of chemicals and chemical products	10.6	48.2	0.2	0.1	0.03	27.3	0.1	2.3	0.1	11.2
Manufacture of electrical equipment	42.8	31.4	0.3	0.2	1.7	14.3	2.6	0.2	0.5	6.2

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Manufacture of machinery and equipment not elsewhere classified	55.1	33.9	0.6	0.2	0.9	5.1	1.0	1.2	0.2	1.7
Manufacture of motor vehicles, trailers and semi-trailers	39.0	34.5	0.1	0.1	3.9	9.9	1.6	0.6	0.0	10.4
Manufacture of other transport equipment	59.0	23.0	1.5	0.5	1.6	12.5	0.5	0.3	0.2	0.9
Manufacture of medical and dental instruments and supplies	31.3	20.4	0.3	2.1	–	9.0	0.9	–	10.3	25.7
Medium low tech	29.2	39.0	0.1	0.1	0.1	17.4	4.2	0.4	0.2	9.3
Reproduction of recorded media	40.7	–	20.5	4.1	34.7	–	–	–	–	–
Manufacture of coke and refined petroleum products	27.6	51.7	0.05	0.03	0.1	9.9	5.2	0.5	0.3	4.6
Manufacture of rubber and plastic products	7.9	68.7	0.4	0.1	2.2	19.6	0.3	0.7	0.01	0.1
Manufacture of other non-metallic mineral products	57.2	30.2	0.3	0.1	0.02	4.3	0.6	0.4	0.3	6.6
Manufacture of basic metals	7.6	36.0	0.01	0.2	0.01	32.6	5.7	0.2	0.02	17.7
Manufacture of fabricated metal products, except machinery and equipment	70.5	19.9	0.2	0.1	0.04	2.9	1.3	0.6	0.1	4.3

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Building of ships and boats	42.7	26.9	0.1	0.1	0.02	22.7	0.7	0.3	0.1	6.2
Repair and installation of machinery and equipment	33.6	42.6	0.1	0.2	–	6.5	0.9	0.03	1.1	15.1
Low tech	17.6	62.8	1.1	0.2	1.3	5.9	0.5	0.02	0.02	10.5
Manufacture of food products	19.7	58.9	1.0	0.2	1.3	5.4	0.2	0.02	0.03	13.2
Manufacture of beverages	19.3	64.7	6.6	0.1	2.4	2.9	0.6	0.4	0.1	3.0
Manufacture of tobacco products	81.5	0.8	–	–	17.3	0.5	–	–	–	0.0
Manufacture of textiles	54.5	40.9	0.2	0.1	1.5	2.7	0.1	0.0	0.01	0.0
Manufacture of wearing apparel	8.4	13.0	4.8	0.4	–	2.9	70.2	0.3	–	–
Manufacture of leather and related products	1.8	44.5	0.6	–	41.3	–	0.6	0.0	–	11.3
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	0.6	98.7	–	0.01	–	0.6	0.0	–	0.01	0.1
Manufacture of paper and paper products	5.2	68.7	1.4	0.2	0.02	12.7	0.4	–	–	11.4
Printing and reproduction of recorded media	10.1	89.2	–	0.2	–	–	0.5	–	–	0.1
Manufacture of furniture	0.6	85.3	–	0.01	0.1	0.8	3.3	0.03	0.1	9.8
Other manufacturing	18.3	63.6	1.9	0.9	0.05	13.7	1.5	0.02	–	0.0

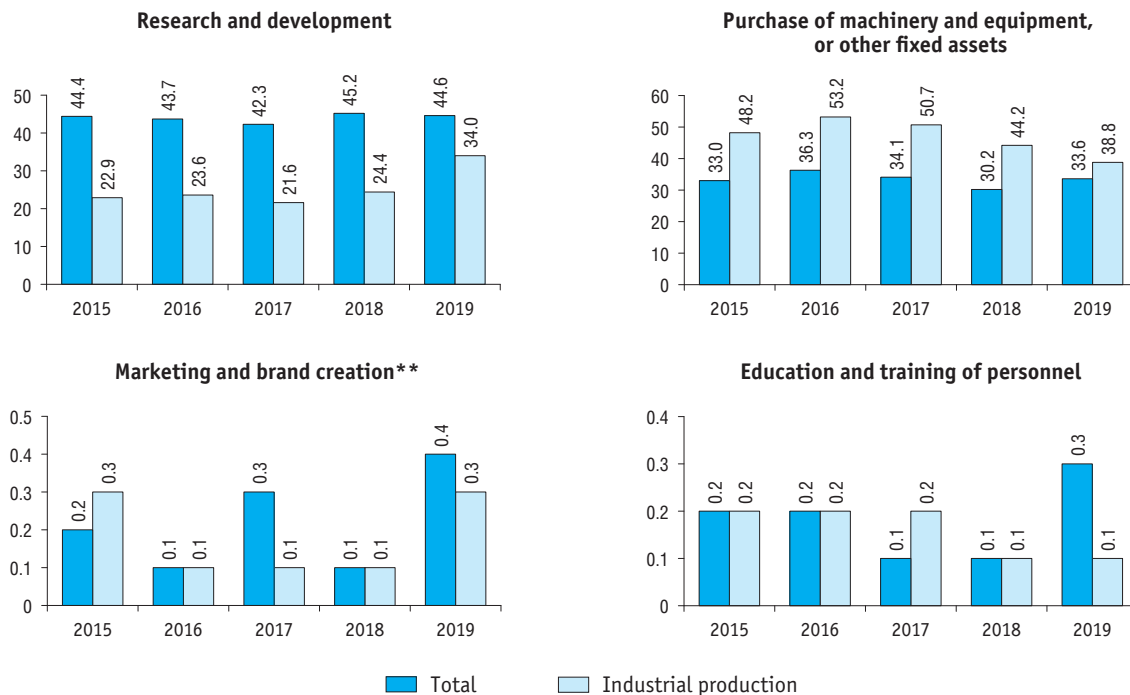
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	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Electricity, gas, steam and air conditioning supply	11.5	78.0	0.0	0.3	0.6	3.2	1.6	0.0	0.1	4.7
Water supply; sewerage, waste management and remediation activities	12.3	83.5	0.02	0.1	–	1.8	0.2	0.01	0.4	1.8
Types of economic activity within services sector – total	57.5	26.2	0.5	0.4	0.3	5.3	5.0	0.3	0.1	4.3
Transportation and storage	16.3	78.4	0.05	0.5	0.0	2.0	0.6	0.03	0.1	1.9
Publishing activities	2.5	58.3	5.3	0.05	7.4	0.01	11.2	0.02	0.1	15.1
Telecommunications	10.4	18.1	3.7	0.1	3.9	46.6	14.5	0.2	0.3	2.2
Computer programming, consultancy and related activities	36.5	4.5	0.3	2.0	0.02	1.4	40.6	2.1	0.01	12.6
IT industry	42.1	16.3	0.2	0.2	0.03	0.02	15.4	1.8	0.0	24.0
Legal and accounting activities	10.1	77.1	0.2	0.1	–	2.5	6.9	0.4	0.1	2.5
Activities of head offices; management consultancy activities	20.6	10.1	0.1	0.1	0.04	0.7	65.0	0.2	0.3	2.8

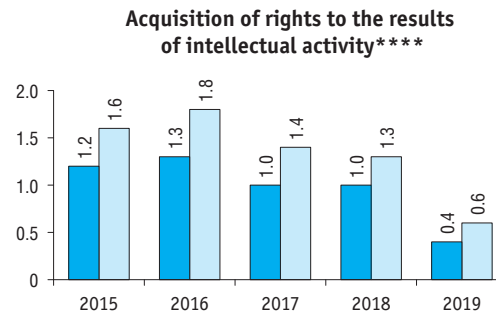
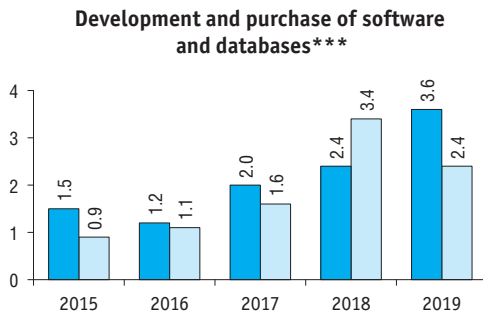
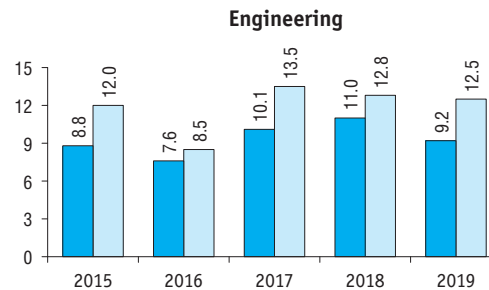
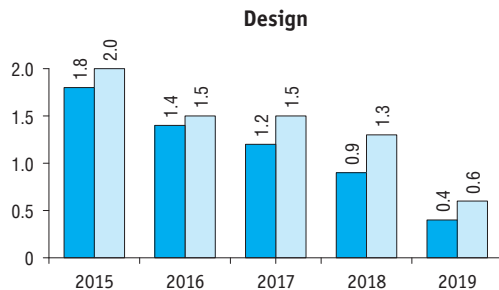
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	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Architectural and engineering activities; technical testing and analysis	33.3	9.7	0.1	0.1	0.1	2.4	5.0	0.6	1.6	47.1
Scientific research and development	86.1	5.7	0.2	0.3	0.1	3.8	0.7	0.3	0.1	2.7
Advertising and market research	54.9	7.2	32.5	0.1	0.01	0.7	3.8	0.7	0.1	0.04
Other professional, scientific and technical activities	87.7	7.1	0.7	0.4	0.4	–	2.8	–	0.1	0.9
Human health and social work activities	15.6	66.1	0.2	0.3	0.1	2.8	2.0	0.2	0.2	12.4
Agriculture – total	24.6	56.2	0.4	0.0	0.01	15.2	0.1	0.03	–	3.6
Growing of non-perennial crops	22.6	54.2	0.0	0.0	–	18.9	0.1	0.01	–	4.2
Growing of perennial crops	–	98.7	–	–	–	–	0.2	1.1	–	–
Plant propagation	100	–	–	–	–	–	–	–	–	–
Animal production	31.8	64.2	1.8	0.0	0.1	0.9	0.02	0.1	–	1.1
Mixed farming	12.5	57.7	–	–	–	–	–	–	–	29.8
Support activities to agriculture and post-harvest crop activities	58.1	38.2	–	0.3	–	3.4	–	–	–	–
Construction – total	11.5	77.0	0.1	0.2	0.04	2.0	1.8	0.3	0.2	6.9

2.6. EXPENDITURE ON SELECTED TYPES OF INNOVATIVE ACTIVITIES AS A PERCENTAGE OF THE TOTAL INNOVATION EXPENDITURE*



(continued)



■ Total ■ Industrial production

- * Until 2019, indicator was calculated based on the data of expenditure on technological innovation.
- ** Until 2019, market research.
- *** Until 2019, purchase of software.
- **** Until 2019, acquisition of new technologies.

2.7. EXPENDITURE ON THIRD-PARTY SERVICES BY TYPE OF INNOVATIVE AND ECONOMIC ACTIVITY: 2019

(as a percentage of the total innovation expenditure on the corresponding innovative activity)

	Total on payment for services of third-party enterprises	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Total	41.3	28.5	58.5	72.8	41.3	43.1	36.4	63.0	67.3	92.0	30.9
Industrial production – total	40.9	32.8	50.9	65.2	60.4	26.2	28.5	77.2	67.5	96.7	31.8
Mining and quarrying	26.1	12.7	70.5	99.4	56.6	–	80.0	33.5	99.7	99.2	7.0
Mining of coal and lignite	3.7	–	100	–	–	–	100	100	–	–	–
Extraction of crude petroleum and natural gas	17.2	3.1	84.4	–	49.3	–	77.7	85.9	99.7	100	0.2
Mining of metal ores	32.2	35.2	37.6	–	–	–	99.3	0.5	–	–	–
Other mining and quarrying	72.9	49.1	58.3	100	–	–	100	–	–	100	99.4
Mining support service activities	86.7	99.5	95.3	100	97.5	–	98.8	100	99.6	84.9	22.7
Manufacturing	44.7	38.7	54.1	64.9	58.5	26.5	26.5	85.9	64.5	89.3	42.5
High tech	28.3	19.7	44.6	96.6	32.6	15.6	2.1	50.4	40.1	81.5	83.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	45.8	44.8	36.2	99.7	9.1	9.2	72.6	77.6	97.7	2.8	5.4
Production of computer, electronic and optical products	20.4	15.0	24.9	53.8	35.4	33.9	5.3	30.6	19.4	32.3	69.3
Manufacture of air and spacecraft and related machinery	31.6	19.8	64.5	98.7	51.0	1.2	1.3	77.6	40.8	100	92.4

(continued)

	Total on payment for services of third-party enterprises	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Medium high tech	50.3	37.6	55.8	39.4	75.8	13.0	56.2	70.6	72.3	86.9	54.5
Production of chemicals and chemical products	54.4	34.5	55.0	43.8	62.4	64.8	61.3	90.2	94.0	81.3	45.2
Manufacture of electrical equipment	48.0	63.3	27.8	13.2	92.5	5.5	62.0	88.8	67.1	96.8	3.0
Manufacture of machinery and equipment not elsewhere classified	20.2	12.5	34.8	57.9	51.3	3.1	8.9	17.9	2.3	90.2	10.5
Manufacture of motor vehicles, trailers and semi-trailers	67.7	56.9	87.0	68.8	96.9	15.8	41.5	83.1	0.3	–	90.2
Manufacture of other transport equipment	27.2	30.2	6.5	6.5	87.9	1.3	51.3	16.0	56.0	52.9	64.9
Manufacture of medical and dental instruments and supplies	16.2	–	18.0	100	11.5	–	–	91.3	–	100	3.4
Medium low tech	54.6	54.8	68.9	68.6	78.4	87.3	22.1	93.0	81.6	92.6	34.3
Reproduction of recorded media	21.7	–	–	45.9	100	23.6	–	–	–	–	–
Manufacture of coke and refined petroleum products	86.8	87.5	89.1	100	98.4	100	62.1	96.2	100	100	96.9
Manufacture of rubber and plastic products	57.8	27.2	58.1	99.4	95.3	99.0	64.5	63.4	35.0	58.4	73.7
Manufacture of other non-metallic mineral products	19.6	7.1	32.4	8.5	32.5	6.8	23.6	36.4	98.2	0.04	61.7
Manufacture of basic metals	27.0	28.1	42.4	98.6	78.0	–	8.2	93.4	25.7	92.2	8.2

(continued)

	Total on payment for services of third-party enterprises	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Manufacture of fabricated metal products, except machinery and equipment	50.7	45.3	62.3	54.2	66.0	7.2	39.2	73.1	80.2	85.9	81.2
Building of ships and boats	36.4	17.2	73.4	80.6	71.4	100	11.6	60.8	99.9	98.6	90.9
Repair and installation of machinery and equipment	45.4	36.4	60.7	96.6	100	–	61.6	57.5	100	53.6	12.7
Low tech	22.2	20.5	20.4	37.2	34.4	48.7	40.8	29.5	44.2	97.5	18.9
Manufacture of food products	11.2	1.8	15.0	31.7	15.3	68.7	6.1	64.9	84.4	99.4	2.0
Manufacture of beverages	27.0	61.1	6.9	89.3	51.9	91.4	76.6	57.1	8.0	90.6	0.2
Manufacture of tobacco products	81.7	100	–	–	–	–	42.7	–	–	–	100
Manufacture of textiles	40.8	74.7	–	6.6	0.5	–	–	100	100	–	100
Manufacture of wearing apparel	7.1	53.6	8.9	23.7	34.7	–	–	0.1	34.1	–	–
Manufacture of leather and related products	39.3	5.4	–	100	–	64.8	–	100	100	–	100
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	20.6	75.2	19.8	–	100	–	95.0	100	–	100	46.6
Manufacture of paper and paper products	47.6	2.3	34.0	8.6	91.4	81.5	100	17.5	–	–	95.9

(continued)

	Total on payment for services of third-party enterprises	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Printing and reproduction of recorded media	78.8	26.8	84.9	–	60.1	–	–	44.9	–	–	100
Manufacture of furniture	77.0	–	86.2	–	–	–	1.3	100	93.0	100	0.2
Other manufacturing	27.2	42.3	22.1	80.0	83.6	100	10.8	100	69.6	–	–
Electricity, gas, steam and air conditioning supply	31.4	61.2	22.7	100	72.0	22.3	79.2	68.7	36.4	82.0	55.0
Water supply; sewerage, waste management and remediation activities	34.0	85.7	24.2	100	96.0	–	92.9	59.6	45.3	100	61.5
Types of economic activity within services sector – total	42.7	25.4	75.5	77.1	35.5	83.7	62.4	55.7	67.3	75.2	26.4
Transportation and storage	73.9	17.4	87.3	98.6	98.5	7.6	55.4	81.0	93.9	44.7	20.5
Publishing activities	6.9	–	0.1	2.8	97.3	4.8	–	32.9	100	–	17.3
Telecommunications	81.2	8.6	64.7	92.3	88.0	98.3	98.5	92.4	5.8	69.6	76.4
Computer programming, consultancy and related activities	19.1	22.3	35.3	50.2	2.1	11.1	32.5	8.5	51.7	7.0	33.5
IT industry	24.0	6.6	29.2	48.4	55.5	15.5	100	50.1	96.9	58.4	28.3
Legal and accounting activities	25.3	79.6	10.8	100	87.5	–	71.9	61.2	98.8	9.8	84.6
Activities of head offices; management consultancy activities	84.2	38.7	82.0	78.5	99.5	100	94.1	98.8	76.4	52.5	88.6

(continued)

	Total on payment for services of third-party enterprises	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Architectural and engineering activities; technical testing and analysis	38.2	48.4	29.9	90.2	85.7	40.3	12.5	45.5	91.7	98.2	30.3
Scientific research and development	27.5	26.2	42.9	90.7	8.7	31.2	27.8	59.3	73.3	87.6	16.6
Advertising and market research	27.6	10.0	45.2	49.7	100	100	100	32.0	95.9	–	95.6
Other professional, scientific and technical activities	6.5	4.4	8.6	58.4	97.7	–	–	42.0	–	–	–
Human health and social work activities	16.6	17.6	14.1	90.1	15.3	68.2	3.4	52.7	11.2	46.9	24.5
Agriculture – total	24.0	42.8	17.3	84.3	82.2	–	0.5	1.3	82.6	–	93.1
Growing of non-perennial crops	27.2	58.6	18.0	100	38.4	–	0.02	0.2	95.8	–	100
Growing of perennial crops	3.0	–	1.7	–	–	–	–	100	100	–	–
Plant propagation	–	–	–	–	–	–	–	–	–	–	–
Animal production	11.5	0.01	15.0	84.3	100	–	24.4	10.2	69.8	–	7.4
Mixed farming	–	–	–	–	–	–	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	30.4	28.4	26.6	–	100	–	100	–	–	–	–
Construction – total	51.1	45.6	56.8	81.1	78.6	77.9	30.0	30.4	30.9	21.0	7.8

2.8. INNOVATION EXPENDITURE BY SOURCE OF FUNDS AND TYPE OF ECONOMIC ACTIVITY: 2019

(million roubles)

	Innovation expenditure	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries*, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity funds	Other
Total	1954133.3	1100246.7	453919.3	22952.9	1989.0	12503.2	1640.8	79.1	362443.1
Industrial production – total	984315.5	629974.2	93694.8	5598.3	1025.3	2580.6	332.1	63.9	251378.5
Mining and quarrying	154656.0	89741.1	49.1	155.5	5.9	–	–	–	64704.4
Mining of coal and lignite	15051.5	1422.1	–	–	–	–	–	–	13629.4
Extraction of crude petroleum and natural gas	102998.0	52533.0	18.0	155.5	5.9	–	–	–	50285.6
Mining of metal ores	16459.0	16169.9	31.1	–	–	–	–	–	258.0
Other mining and quarrying	4243.2	3967.0	–	–	–	–	–	–	276.1
Mining support service activities	15904.3	15649.0	–	–	–	–	–	–	255.3
Manufacturing	760211.3	507517.3	89904.4	1530.0	1019.4	1750.7	332.1	–	158489.6
High tech	151744.1	82079.3	47208.7	186.3	853.0	5.7	–	–	21411.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	14966.3	13572.0	110.3	–	–	–	–	–	1284.0
Production of computer, electronic and optical products	63810.8	27841.7	27812.6	54.3	853.0	–	–	–	7249.2
Manufacture of air and spacecraft and related machinery	72967.0	40665.5	19285.8	132.1	–	5.7	–	–	12877.9

* Here and below in table 2.9, Albania, Bosnia and Herzegovina, Iceland, Kosovo, North Macedonia, Serbia, Turkey, and Montenegro.

(continued)

	Innovation expenditure	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries*, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity funds	Other
Medium high tech	140622.5	121733.4	4178.0	200.0	93.7	856.0	18.3	—	13561.5
Production of chemicals and chemical products	68586.2	58237.4	788.3	54.1	—	599.4	—	—	8907.1
Manufacture of electrical equipment	10493.8	9177.2	738.8	10.6	0.1	0.2	—	—	566.9
Manufacture of machinery and equipment not elsewhere classified	22310.3	16149.5	1938.4	135.3	93.6	33.8	18.3	—	3959.6
Manufacture of motor vehicles, trailers and semi-trailers	32726.4	31703.0	672.8	—	—	222.6	—	—	127.9
Manufacture of other transport equipment	6443.5	6406.2	37.3	—	—	—	—	—	—
Manufacture of medical and dental instruments and supplies	62.4	60.0	2.3	—	—	—	—	—	—
Medium low tech	377064.9	233841.5	38246.6	18.2	72.7	515.6	313.8	—	104370.3
Reproduction of recorded media	2.5	2.5	—	—	—	—	—	—	—
Manufacture of coke and refined petroleum products	140265.9	81893.1	57.0	—	—	—	—	—	58315.8
Manufacture of rubber and plastic products	6925.7	4160.4	939.5	—	—	—	—	—	1825.7
Manufacture of other non-metallic mineral products	6536.6	6030.7	161.6	1.6	—	143.3	99.4	—	199.3
Manufacture of basic metals	133045.2	92856.2	239.0	—	—	1.6	—	—	39948.4

(continued)

	Innovation expenditure	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries*, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity funds	Other
Manufacture of fabricated metal products, except machinery and equipment	67333.0	29755.8	33278.7	15.3	72.7	370.8	214.4	–	3839.7
Building of ships and boats	20580.3	16767.0	3570.8	1.3	–	–	–	–	241.3
Repair and installation of machinery and equipment	2375.7	2375.7	–	–	–	–	–	–	–
Low tech	90779.8	69863.2	271.1	1125.5	–	373.4	–	–	19146.7
Manufacture of food products	57910.3	45413.1	70.0	1125.0	–	331.6	–	–	10970.5
Manufacture of beverages	2467.5	2436.0	–	–	–	–	–	–	31.5
Manufacture of tobacco products	1927.7	1927.7	–	–	–	–	–	–	–
Manufacture of textiles	2554.1	1453.0	46.3	–	–	–	–	–	1054.8
Manufacture of wearing apparel	311.7	296.3	15.4	–	–	–	–	–	–
Manufacture of leather and related products	108.0	57.1	42.0	–	–	–	–	–	8.9
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	7943.7	1890.6	–	–	–	–	–	–	6053.1
Manufacture of paper and paper products	14829.6	14531.4	–	–	–	41.7	–	–	256.5

(continued)

	Innovation expenditure	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries*, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity funds	Other
Printing and reproduction of recorded media	1175.8	999.6	22.8	0.4	–	–	–	–	153.0
Manufacture of furniture	485.9	129.9	–	–	–	–	–	–	356.0
Other manufacturing	1065.4	728.4	74.5	–	–	–	–	–	262.5
Electricity, gas, steam and air conditioning supply	52995.4	23021.8	7.1	1504.7	0.0	739.4	0.0	63.9	27658.6
Water supply; sewerage, waste management and remediation activities	16452.8	9694.0	3734.2	2408.2	–	90.5	–	–	525.9
Types of economic activity within services sector – total	909494.1	445206.7	351947.5	17128.1	963.7	9691.4	1202.2	15.3	84541.5
Transportation and storage	228822.7	223650.3	1711.3	564.9	3.5	–	–	–	2892.6
Publishing activities	155.6	153.4	–	2.1	–	–	–	–	0.0
Telecommunications	46586.5	45080.2	1305.3	–	–	–	–	–	201.0
Computer programming, consultancy and related activities	43229.7	35970.8	2548.9	114.0	35.0	–	–	–	4561.0
IT industry	11141.8	7712.0	2330.0	803.9	1.6	4.9	–	–	289.5
Legal and accounting activities	1906.6	1665.1	0.3	84.5	89.9	–	–	–	66.8
Activities of head offices; management consultancy activities	19850.0	9461.2	540.9	346.5	–	15.3	–	0.02	9486.1

(continued)

	Innovation expenditure	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries*, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity funds	Other
Architectural and engineering activities; technical testing and analysis	18650.3	15651.5	494.4	136.6	–	3.1	3.1	–	2364.7
Scientific research and development	516427.3	98158.7	337706.7	6948.0	705.6	9646.6	1178.4	10.2	63251.5
Advertising and market research	4395.7	3730.9	–	664.8	–	–	–	–	0.1
Other professional, scientific and technical activities	564.2	79.2	461.4	2.5	0.5	20.7	20.7	–	–
Human health and social work activities	17763.8	3893.4	4848.3	7460.3	127.8	0.8	–	5.0	1428.3
Agriculture – total	49393.2	21196.6	2679.4	205.3	–	231.3	106.5	–	25080.6
Growing of non-perennial crops	38976.1	11880.2	2612.7	159.6	–	90.0	–	–	24233.6
Growing of perennial crops	62.4	62.4	–	–	–	–	–	–	–
Plant propagation	11.6	11.6	–	–	–	–	–	–	–
Animal production	10002.9	9100.8	22.1	45.7	–	34.8	–	–	799.5
Mixed farming	65.3	38.8	–	–	–	–	–	–	26.5
Support activities to agriculture and post-harvest crop activities	274.9	102.9	44.6	–	–	106.5	106.5	–	21.0
Construction – total	10930.5	3869.2	5597.5	21.2	0.0	0.0	–	0.0	1442.5

2.9. PERCENTAGE DISTRIBUTION OF INNOVATION EXPENDITURE BY SOURCE OF FUNDS AND TYPE OF ECONOMIC ACTIVITY: 2019

	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity fund	Other
Total	56.3	23.2	1.2	0.1	0.6	0.1	0.004	18.5
Industrial production – total	64.0	9.5	0.6	0.1	0.3	0.03	0.01	25.5
Mining and quarrying	58.0	0.03	0.1	0.0	–	–	–	41.8
Mining of coal and lignite	9.4	–	–	–	–	–	–	90.6
Extraction of crude petroleum and natural gas	51.0	0.02	0.2	0.01	–	–	–	48.8
Mining of metal ores	98.2	0.2	–	–	–	–	–	1.6
Other mining and quarrying	93.5	–	–	–	–	–	–	6.5
Mining support service activities	98.4	–	–	–	–	–	–	1.6
Manufacturing	66.8	11.8	0.2	0.1	0.2	0.04	–	20.8
High tech	54.1	31.1	0.1	0.6	0.0	–	–	14.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	90.7	0.7	–	–	–	–	–	8.6
Production of computer, electronic and optical products	43.6	43.6	0.1	1.3	–	–	–	11.4
Manufacture of air and spacecraft and related machinery	55.7	26.4	0.2	–	0.01	–	–	17.6
Medium high tech	86.6	3.0	0.1	0.1	0.6	0.01	–	9.6
Production of chemicals and chemical products	84.9	1.1	0.1	–	0.9	–	–	13.0
Manufacture of electrical equipment	87.5	7.0	0.1	0.0	0.0	–	–	5.4

(continued)

	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity fund	Other
Manufacture of machinery and equipment not elsewhere classified	72.4	8.7	0.6	0.4	0.2	0.1	–	17.7
Manufacture of motor vehicles, trailers and semi-trailers	96.9	2.1	–	–	0.7	–	–	0.4
Manufacture of other transport equipment	99.4	0.6	–	–	–	–	–	–
Manufacture of medical and dental instruments and supplies	96.3	3.7	–	–	–	–	–	–
Medium low tech	62.0	10.1	0.0	0.02	0.1	0.1	–	27.7
Reproduction of recorded media	100	–	–	–	–	–	–	–
Manufacture of coke and refined petroleum products	58.4	0.04	–	–	–	–	–	41.6
Manufacture of rubber and plastic products	60.1	13.6	–	–	–	–	–	26.4
Manufacture of other non-metallic mineral products	92.3	2.5	0.03	–	2.2	1.5	–	3.0
Manufacture of basic metals	69.8	0.2	–	–	0.0	–	–	30.0
Manufacture of fabricated metal products, except machinery and equipment	44.2	49.4	0.02	0.1	0.6	0.3	–	5.7
Building of ships and boats	81.5	17.4	0.01	–	–	–	–	1.2
Repair and installation of machinery and equipment	100	–	–	–	–	–	–	–

(continued)

	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity fund	Other
Low tech	77.0	0.3	1.2	–	0.4	–	–	21.1
Manufacture of food products	78.4	0.1	1.9	–	0.6	–	–	18.9
Manufacture of beverages	98.7	–	–	–	–	–	–	1.3
Manufacture of tobacco products	100	–	–	–	–	–	–	–
Manufacture of textiles	56.9	1.8	–	–	–	–	–	41.3
Manufacture of wearing apparel	95.1	4.9	–	–	–	–	–	–
Manufacture of leather and related products	52.8	38.9	–	–	–	–	–	8.3
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	23.8	–	–	–	–	–	–	76.2
Manufacture of paper and paper products	98.0	–	–	–	0.3	–	–	1.7
Printing and reproduction of recorded media	85.0	1.9	0.04	–	–	–	–	13.0
Manufacture of furniture	26.7	–	–	–	–	–	–	73.3
Other manufacturing	68.4	7.0	–	–	–	–	–	24.6

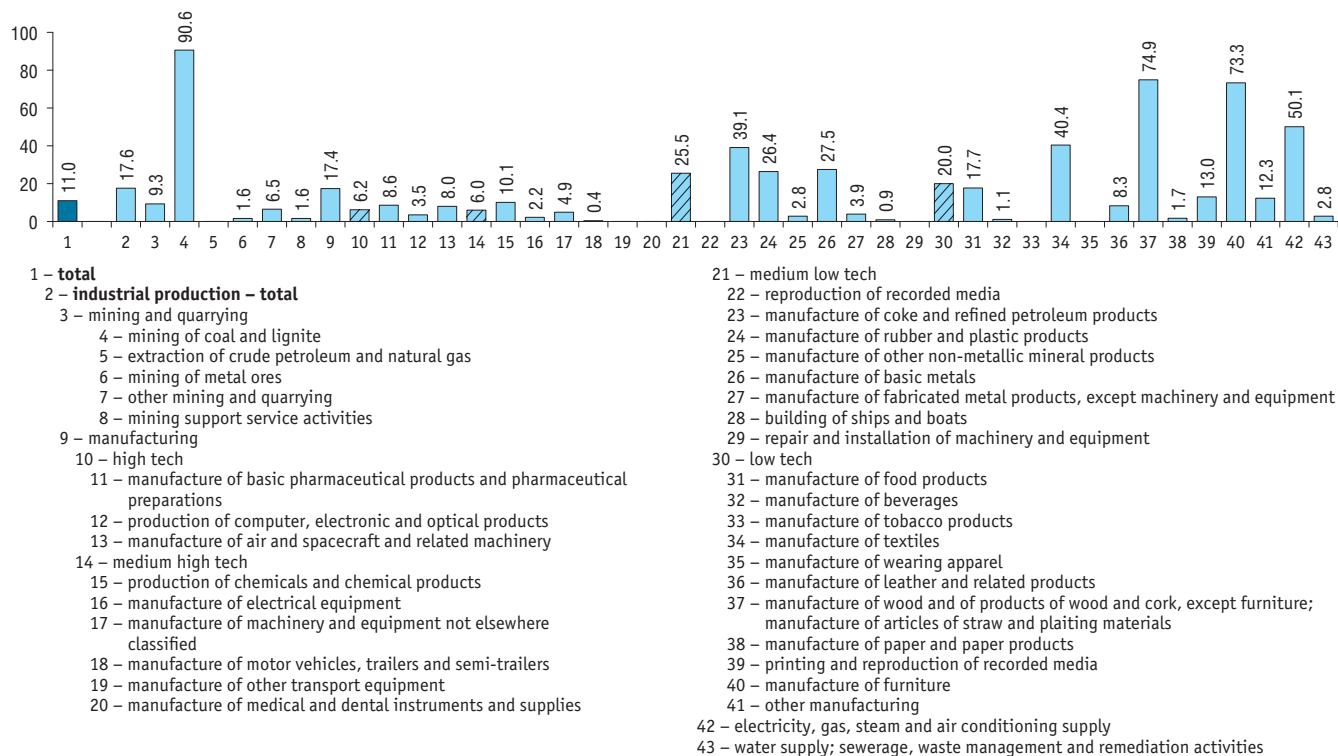
(continued)

	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity fund	Other
Electricity, gas, steam and air conditioning supply	43.4	0.01	2.8	0.0	1.4	0.0	0.1	52.2
Water supply; sewerage, waste management and remediation activities	58.9	22.7	14.6	–	0.6	–	–	3.2
Types of economic activity within services sector – total	49.0	38.7	1.9	0.1	1.1	0.1	0.0	9.3
Transportation and storage	97.7	0.7	0.2	0.0	–	–	–	1.3
Publishing activities	98.6	–	1.4	–	–	–	–	0.0
Telecommunications	96.8	2.8	–	–	–	–	–	0.4
Computer programming, consultancy and related activities	83.2	5.9	0.3	0.1	–	–	–	10.6
IT industry	69.2	20.9	7.2	0.01	0.04	–	–	2.6
Legal and accounting activities	87.3	0.02	4.4	4.7	–	–	–	3.5
Activities of head offices; management consultancy activities	47.7	2.7	1.7	–	0.1	–	0.0	47.8
Architectural and engineering activities; technical testing and analysis	83.9	2.7	0.7	–	0.02	0.02	–	12.7
Scientific research and development	19.0	65.4	1.3	0.1	1.9	0.2	0.0	12.2
Advertising and market research	84.9	–	15.1	–	–	–	–	0.0
Other professional, scientific and technical activities	14.0	81.8	0.4	0.1	3.7	3.7	–	–
Human health and social work activities	21.9	27.3	42.0	0.7	0.0	–	0.03	8.0

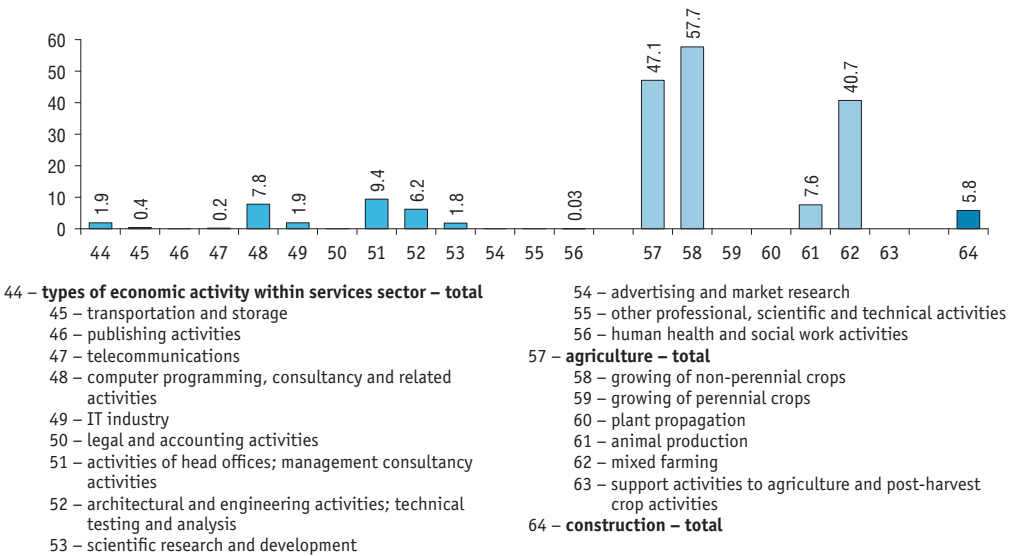
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	Enterprises' own funds	Federal budget	Regional and local budgets of the Russian Federation	Foundations for S&T and innovation	Funds from abroad	Including from EU countries, EU candidate countries, Great Britain, Liechtenstein, Norway, Switzerland	Venture capital and private equity fund	Other
Agriculture – total	42.9	5.4	0.4	–	0.5	0.2	–	50.8
Growing of non-perennial crops	30.5	6.7	0.4	–	0.2	–	–	62.2
Growing of perennial crops	100	–	–	–	–	–	–	–
Plant propagation	100	–	–	–	–	–	–	–
Animal production	91.0	0.2	0.5	–	0.3	–	–	8.0
Mixed farming	59.3	–	–	–	–	–	–	40.7
Support activities to agriculture and post-harvest crop activities	37.4	16.2	–	–	38.7	38.7	–	7.6
Construction – total	35.4	51.2	0.2	0.0	0.0	–	0.0	13.2

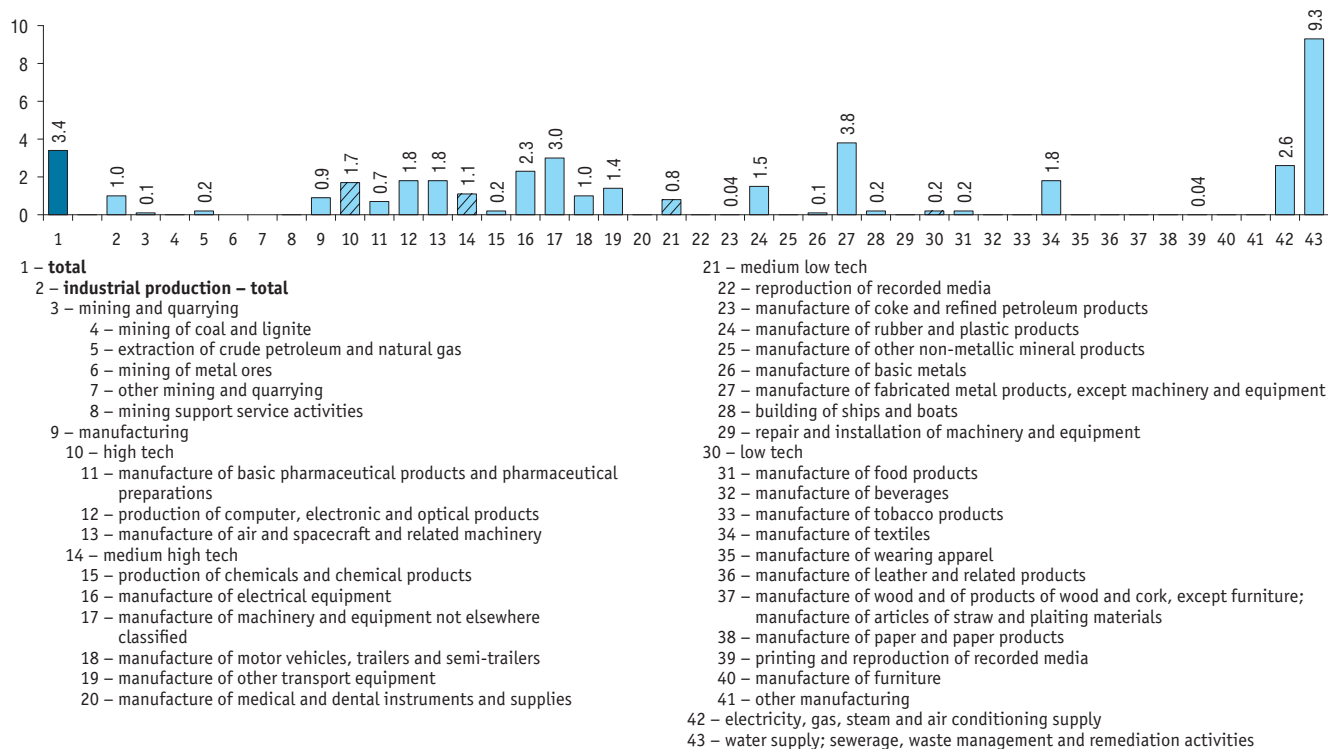
2.10. LOANS AND BORROWINGS AS A PERCENTAGE OF THE TOTAL INNOVATION EXPENDITURE BY TYPE OF ECONOMIC ACTIVITY: 2019



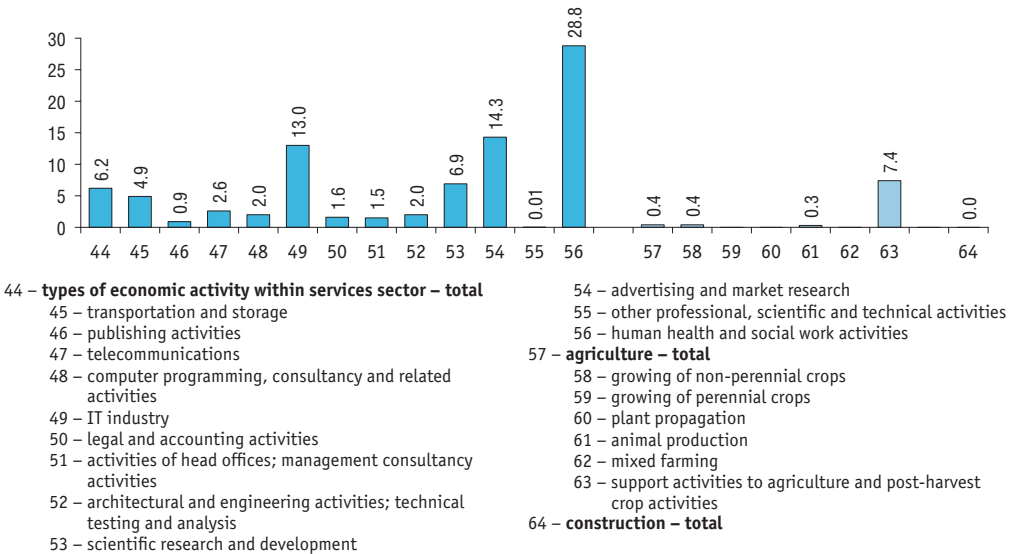
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2.11. SUBSIDIES AS A PERCENTAGE OF THE TOTAL INNOVATION EXPENDITURE BY TYPE OF ECONOMIC ACTIVITY: 2019

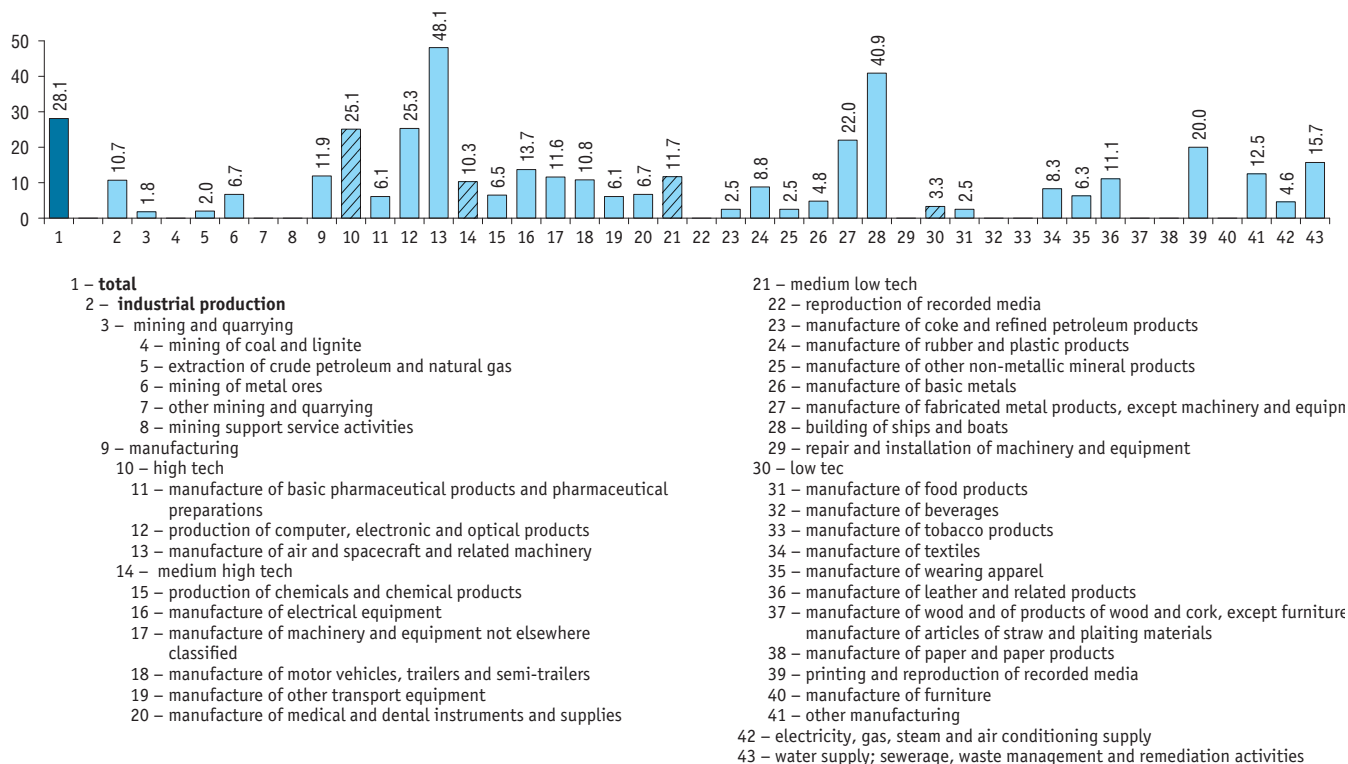


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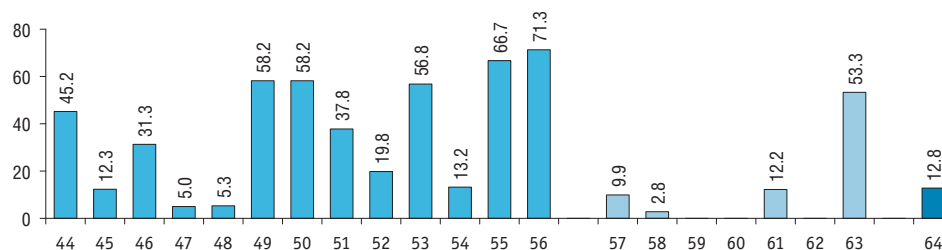


2.12. ENTERPRISES THAT RECEIVED FUNDS FROM BUDGETS OF ALL LEVELS BY TYPE OF ECONOMIC ACTIVITY: 2019

(as a percentage of all enterprises that have had expenditure on innovative activities)



(continued)

**44 – types of economic activity within services sector**

- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

54 – advertising and market research

55 – other professional, scientific and technical activities

56 – human health and social work activities

57 – agriculture

58 – growing of non-perennial crops

59 – growing of perennial crops

60 – plant propagation

61 – animal production

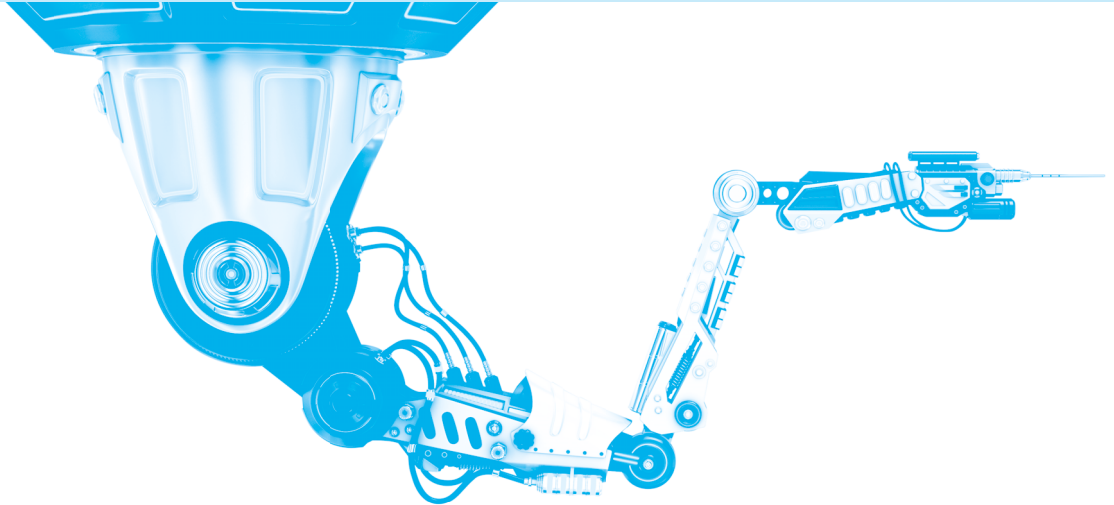
62 – mixed farming

63 – support activities to agriculture and post-harvest crop activities

64 – construction

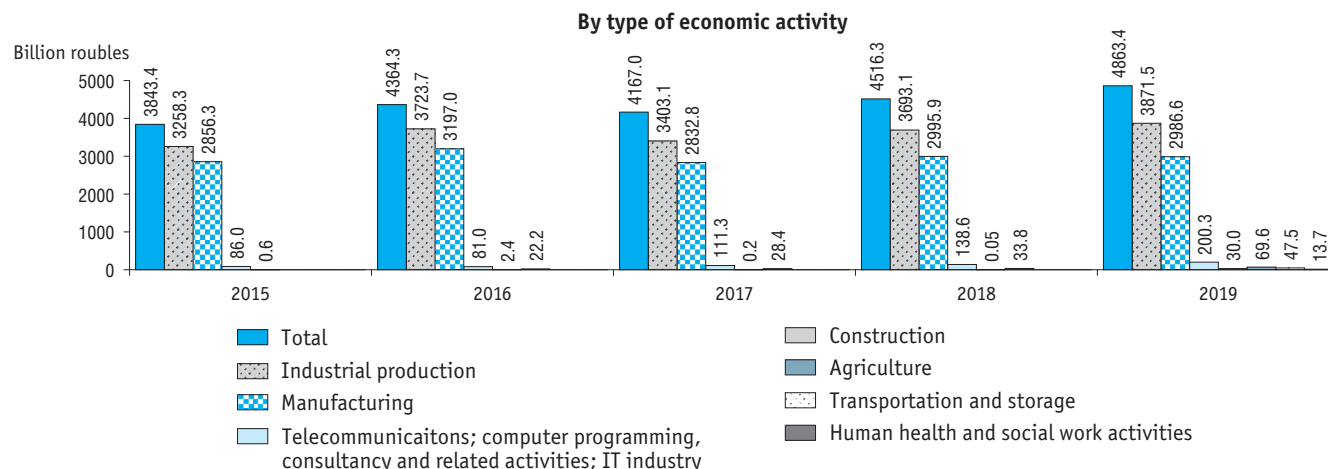
INNOVATION OUTPUT

3



3.1. SALES OF INNOVATIVE GOODS AND SERVICES

	2015	2016	2017	2018	2019
Sales of innovative goods and services – total:					
at current prices, <i>million roubles</i>	3843428.7	4364321.7	4166998.7	4516276.4	4863381.9
at constant 2010 prices, <i>million roubles*</i>	2509256.8	2771701.8	2513116.6	2451699.9	2543476.7
as a percentage of 2010	201.8	222.9	202.1	197.1	204.5
as a percentage of total sales	8.4	8.5	7.2	6.5	5.3



* Here and below in table 3.9, the data are calculated taking into account the GDP deflator as at April 01, 2020.

3.2. SALES OF INNOVATIVE GOODS AND SERVICES BY DEGREE OF NOVELTY AND TYPE OF ECONOMIC ACTIVITY: 2019

	Million roubles			As a percentage of total sales		
	total	new or technologically new	significantly improved	total	new or technologically new	significantly improved
Total	4863381.9	3156022.8	1707359.1	5.3	3.4	1.9
Industrial production – total	3871481.1	2497693.1	1373787.9	6.1	4.0	2.2
Mining and quarrying	663341.0	220309.7	443031.3	3.8	1.3	2.6
Mining of coal and lignite	113.0	113.0	–	0.01	0.01	–
Extraction of crude petroleum and natural gas	529102.1	166704.6	362397.4	4.3	1.4	3.0
Mining of metal ores	123727.5	43864.6	79862.9	8.4	3.0	5.4
Other mining and quarrying	474.1	299.3	174.8	0.1	0.1	0.03
Mining support service activities	9924.4	9328.2	596.1	0.5	0.5	0.03
Manufacturing	2986615.5	2070895.3	915720.3	7.7	5.3	2.3
High tech	444021.5	315096.8	128924.8	18.1	12.8	5.3
Manufacture of basic pharmaceutical products and pharmaceutical preparations	58728.5	56377.0	2351.5	9.9	9.5	0.4
Production of computer, electronic and optical products	186750.9	108849.8	77901.1	16.6	9.7	6.9
Manufacture of air and spacecraft and related machinery	198542.1	149870.0	48672.2	26.9	20.3	6.6
Medium high tech	879555.6	623694.8	255860.8	11.0	7.8	3.2
Production of chemicals and chemical products	159337.5	95284.4	64053.1	5.5	3.3	2.2
Manufacture of electrical equipment	75653.8	42913.5	32740.3	10.1	5.8	4.4
Manufacture of machinery and equipment not elsewhere classified	99020.3	49658.2	49362.1	10.6	5.3	5.3

(continued)

	Million roubles			As a percentage of total sales		
	total	new or technologically new	significantly improved	total	new or technologically new	significantly improved
Manufacture of motor vehicles, trailers and semi-trailers	477300.8	373219.7	104081.1	19.5	15.2	4.2
Manufacture of other transport equipment	67438.2	62015.1	5423.1	7.5	6.9	0.6
Manufacture of medical and dental instruments and supplies	804.9	603.9	201.1	2.9	2.2	0.7
Medium low tech	1325218.4	886095.1	439123.3	6.2	4.2	2.1
Reproduction of recorded media	8.5	8.5	–	0.6	0.6	–
Manufacture of coke and refined petroleum products	516784.2	347476.6	169307.6	5.1	3.4	1.7
Manufacture of rubber and plastic products	73631.7	44047.2	29584.5	10.3	6.2	4.2
Manufacture of other non-metallic mineral products	47266.6	36299.3	10967.3	4.0	3.1	0.9
Manufacture of basic metals	336582.5	181959.2	154623.3	5.0	2.7	2.3
Manufacture of fabricated metal products, except machinery and equipment	206604.6	161761.2	44843.4	13.0	10.2	2.8
Building of ships and boats	118179.8	94071.0	24108.8	25.1	20.0	5.1
Repair and installation of machinery and equipment	26160.6	20472.1	5688.4	5.1	4.0	1.1
Low tech	337820.0	246008.7	91811.3	4.6	3.4	1.3
Manufacture of food products	258561.5	203739.0	54822.5	5.7	4.5	1.2
Manufacture of beverages	16841.5	12544.0	4297.5	2.4	1.8	0.6
Manufacture of tobacco products	1274.8	1274.8	–	0.6	0.6	–
Manufacture of textiles	5641.4	5150.8	490.6	3.5	3.2	0.3
Manufacture of wearing apparel	227.7	194.8	32.9	0.3	0.2	0.04
Manufacture of leather and related products	957.4	143.8	813.6	2.1	0.3	1.8

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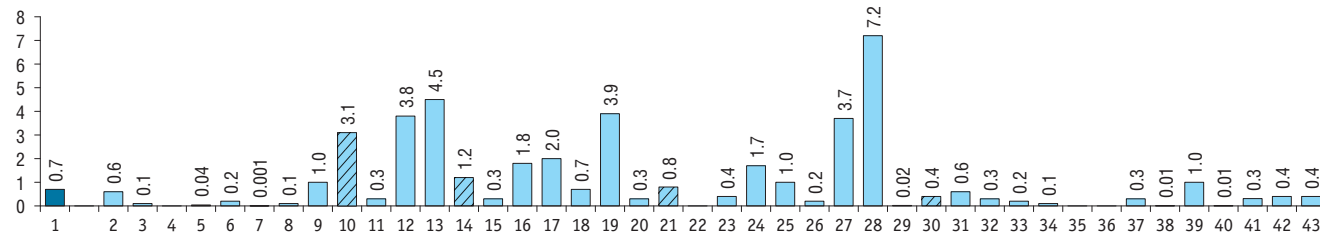
	Million roubles			As a percentage of total sales		
	total	new or technologically new	significantly improved	total	new or technologically new	significantly improved
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	8238.9	3366.1	4872.9	1.7	0.7	1.0
Manufacture of paper and paper products	31946.1	8932.6	23013.6	4.3	1.2	3.1
Printing and reproduction of recorded media	10786.9	8583.9	2203.0	8.2	6.5	1.7
Manufacture of furniture	1464.2	326.6	1137.5	1.1	0.3	0.9
Other manufacturing	1879.6	1752.2	127.3	2.0	1.9	0.1
Electricity, gas, steam and air conditioning supply	202922.3	192146.0	10776.3	3.4	3.2	0.2
Water supply; sewerage, waste management and remediation activities	18602.2	14342.1	4260.1	2.3	1.8	0.5
Types of economic activity within services sector – total	892389.2	589043.2	303346.1	4.9	3.2	1.7
Transportation and storage	47469.6	20451.5	27018.0	0.5	0.2	0.3
Publishing activities	167.2	91.0	76.2	0.2	0.1	0.1
Telecommunications	84144.8	69178.7	14966.1	4.6	3.8	0.8
Computer programming, consultancy and related activities	107004.7	73584.3	33420.3	11.5	7.9	3.6
IT industry	9161.9	5601.7	3560.1	2.5	1.5	1.0
Legal and accounting activities	4058.2	4041.3	16.9	1.1	1.1	0.0

(continued)

	Million roubles			As a percentage of total sales		
	total	new or technologically new	significantly improved	total	new or technologically new	significantly improved
Activities of head offices; management consultancy activities	24036.2	1443.7	22592.5	3.2	0.2	3.0
Architectural and engineering activities; technical testing and analysis	7983.5	6061.3	1922.2	0.7	0.5	0.2
Scientific research and development	525280.6	401242.0	124038.5	37.8	28.9	8.9
Advertising and market research	68899.6	1262.1	67637.5	14.9	0.3	14.6
Other professional, scientific and technical activities	472.2	439.6	32.6	1.9	1.8	0.1
Human health and social work activities	13710.9	5645.9	8065.0	0.7	0.3	0.4
Agriculture – total	69559.2	49569.3	19989.9	2.3	1.6	0.6
Growing of non-perennial crops	26356.7	20743.8	5612.9	1.5	1.2	0.3
Growing of perennial crops	846.7	23.6	823.1	2.1	0.1	2.0
Plant propagation	88.2	88.2	–	2.5	2.5	–
Animal production	40935.5	27587.1	13348.4	3.3	2.2	1.1
Mixed farming	1047.5	842.1	205.4	6.4	5.1	1.2
Support activities to agriculture and post-harvest crop activities	284.5	284.4	0.1	0.5	0.5	0.0
Construction – total	29952.4	19717.2	10235.2	0.4	0.3	0.1

3.3. NEW OR TECHNOLOGICALLY NEW INNOVATIVE GOODS AND SERVICES INTRODUCED ON THE MARKET OF THE ENTERPRISE BY TYPE OF ECONOMIC ACTIVITY: 2019

(as a percentage of total sales)



1 – total

2 – industrial production – total

3 – mining and quarrying

4 – mining of coal and lignite

5 – extraction of crude petroleum and natural gas

6 – mining of metal ores

7 – other mining and quarrying

8 – mining support service activities

9 – manufacturing

10 – high tech

11 – manufacture of basic pharmaceutical products and pharmaceutical preparations

12 – production of computer, electronic and optical products

13 – manufacture of air and spacecraft and related machinery

14 – medium high tech

15 – production of chemicals and chemical products

16 – manufacture of electrical equipment

17 – manufacture of machinery and equipment not elsewhere classified

18 – manufacture of motor vehicles, trailers and semi-trailers

19 – manufacture of other transport equipment

20 – manufacture of medical and dental instruments and supplies

21 – medium low tech

22 – reproduction of recorded media

23 – manufacture of coke and refined petroleum products

24 – manufacture of rubber and plastic products

25 – manufacture of other non-metallic mineral products

26 – manufacture of basic metals

27 – manufacture of fabricated metal products, except machinery and equipment

28 – building of ships and boats

29 – repair and installation of machinery and equipment

30 – low tech

31 – manufacture of food products

32 – manufacture of beverages

33 – manufacture of tobacco products

34 – manufacture of textiles

35 – manufacture of wearing apparel

36 – manufacture of leather and related products

37 – manufacture of wood and of products of wood and cork, except furniture;

manufacture of articles of straw and plaiting materials

38 – manufacture of paper and paper products

39 – printing and reproduction of recorded media

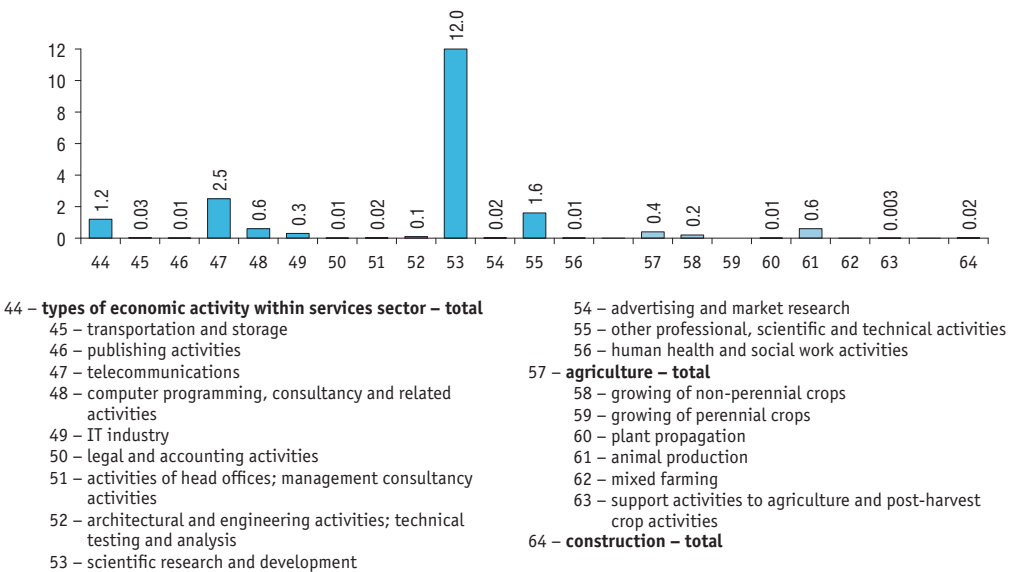
40 – manufacture of furniture

41 – other manufacturing

42 – electricity, gas, steam and air conditioning supply

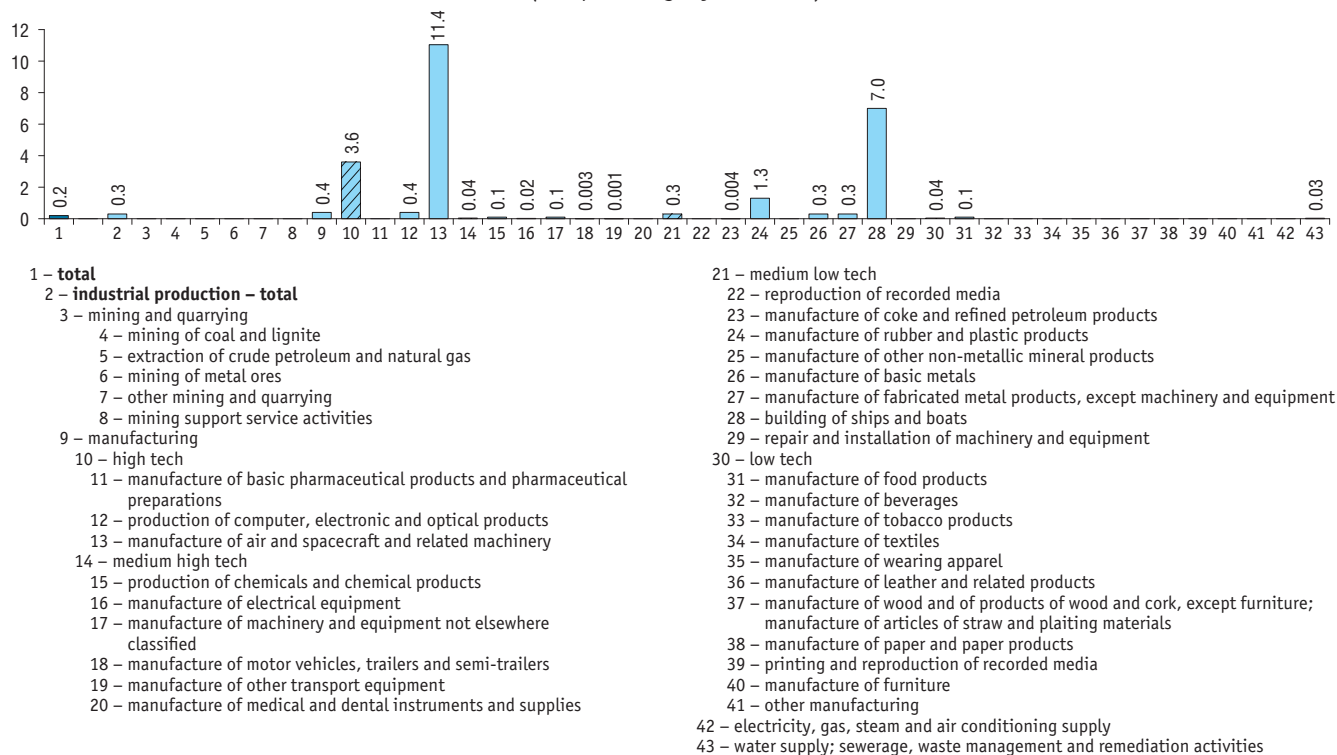
43 – water supply; sewerage, waste management and remediation activities

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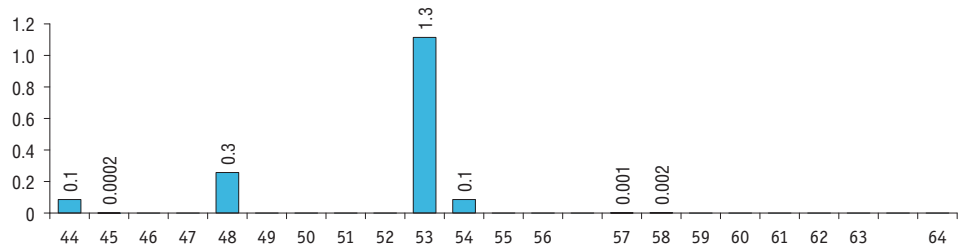


3.4. NEW OR TECHNOLOGICALLY NEW INNOVATIVE GOODS AND SERVICES INTRODUCED ON THE GLOBAL MARKET BY TYPE OF ECONOMIC ACTIVITY: 2019

(as a percentage of total sales)



(continued)



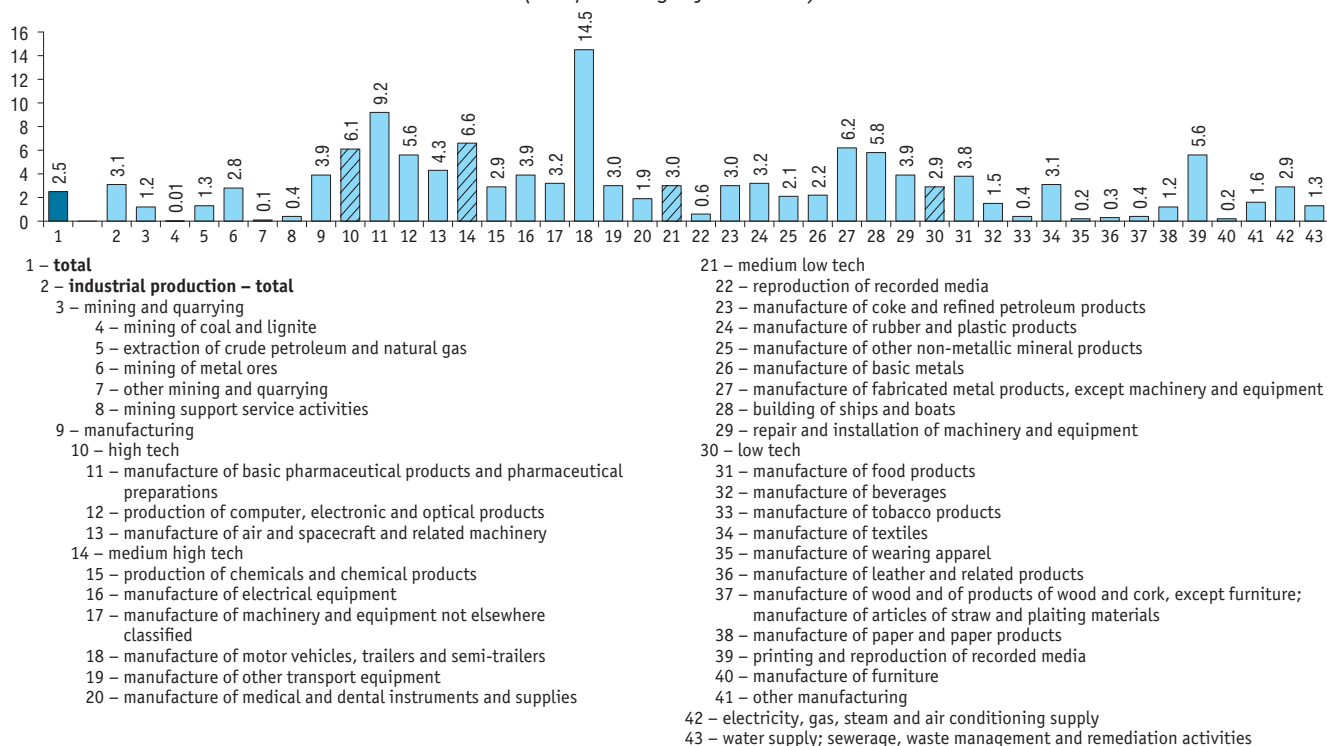
44 – types of economic activity within services sector – total

- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

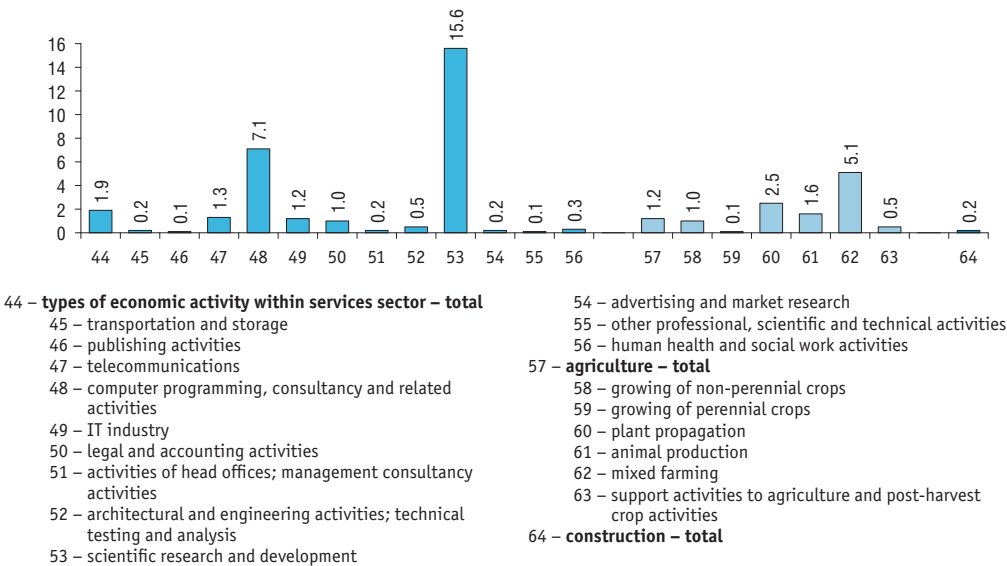
- 54 – advertising and market research
- 55 – other professional, scientific and technical activities
- 56 – human health and social work activities
- 57 – agriculture – total
- 58 – growing of non-perennial crops
- 59 – growing of perennial crops
- 60 – plant propagation
- 61 – animal production
- 62 – mixed farming
- 63 – support activities to agriculture and post-harvest crop activities
- 64 – construction – total

3.5. NEW OR TECHNOLOGICALLY NEW INNOVATIVE GOODS AND SERVICES NEW TO THE ENTERPRISE BUT NOT ON THE MARKET BY TYPE OF ECONOMIC ACTIVITY: 2019

(as a percentage of total sales)



(continued)



3.6. SALES OF INNOVATIVE GOODS AND SERVICES UNDER PUBLIC AND MUNICIPAL CONTRACTS BY TYPE OF ECONOMIC ACTIVITY: 2019

	Million roubles	As a percentage of total sales of innovative goods and services
Total	460714.3	9.5
Industrial production – total	221543.7	5.7
Mining and quarrying	93.5	0.01
Mining of coal and lignite	–	–
Extraction of crude petroleum and natural gas	93.5	0.02
Mining of metal ores	–	–
Other mining and quarrying	–	–
Mining support service activities	–	–
Manufacturing	219152.8	7.3
High tech	81786.5	18.4
Manufacture of basic pharmaceutical products and pharmaceutical preparations	1841.0	3.1
Production of computer, electronic and optical products	42184.4	22.6
Manufacture of air and spacecraft and related machinery	37761.1	19.0
Medium high tech	17630.9	2.0
Production of chemicals and chemical products	9625.0	6.0
Manufacture of electrical equipment	471.0	0.6
Manufacture of machinery and equipment not elsewhere classified	6770.1	6.8
Manufacture of motor vehicles, trailers and semi-trailers	669.3	0.1
Manufacture of other transport equipment	61.3	0.1
Manufacture of medical and dental instruments and supplies	34.2	4.2
Medium low tech	117783.6	8.9
Reproduction of recorded media	–	–

(continued)

	Million roubles	As a percentage of total sales of innovative goods and services
Manufacture of coke and refined petroleum products	–	–
Manufacture of rubber and plastic products	1290.0	1.8
Manufacture of other non-metallic mineral products	231.6	0.5
Manufacture of basic metals	129.5	0.04
Manufacture of fabricated metal products, except machinery and equipment	65477.6	31.7
Building of ships and boats	46500.1	39.3
Repair and installation of machinery and equipment	4154.9	15.9
Low tech	1951.7	0.6
Manufacture of food products	425.8	0.2
Manufacture of beverages	–	–
Manufacture of tobacco products	–	–
Manufacture of textiles	1154.3	20.5
Manufacture of wearing apparel	–	–
Manufacture of leather and related products	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	–	–
Manufacture of paper and paper products	–	–
Printing and reproduction of recorded media	–	–
Manufacture of furniture	–	–
Other manufacturing	371.6	19.8
Electricity, gas, steam and air conditioning supply	1.2	0.0
Water supply; sewerage, waste management and remediation activities	2296.3	12.3

(continued)

	Million roubles	As a percentage of total sales of innovative goods and services
Types of economic activity within services sector – total	235588.7	26.4
Transportation and storage	1312.7	2.8
Publishing activities	6.5	3.9
Telecommunications	837.0	1.0
Computer programming, consultancy and related activities	3423.8	3.2
IT industry	524.1	5.7
Legal and accounting activities	0.7	0.02
Activities of head offices; management consultancy activities	146.5	0.6
Architectural and engineering activities; technical testing and analysis	188.7	2.4
Scientific research and development	225509.2	42.9
Advertising and market research	34.6	0.1
Other professional, scientific and technical activities	20.9	4.4
Human health and social work activities	3584.1	26.1
Agriculture – total	18.9	0.03
Growing of non-perennial crops	0.0	0.0
Growing of perennial crops	–	–
Plant propagation	–	–
Animal production	10.0	0.02
Mixed farming	–	–
Support activities to agriculture and post-harvest crop activities	8.9	3.1
Construction – total	3563.0	11.9

3.7. SALES OF INNOVATIVE GOODS AND SERVICES CREATED USING INTELLECTUAL ACTIVITY RESULTS OWNED BY RUSSIAN COPYRIGHT HOLDERS BY TYPE OF ECONOMIC ACTIVITY: 2019

	Million roubles	As a percentage of total sales of innovative goods and services
Total	1204547.5	24.8
Industrial production – total	960569.1	24.8
Mining and quarrying	384019.8	57.9
Mining of coal and lignite	–	–
Extraction of crude petroleum and natural gas	362392.4	68.5
Mining of metal ores	20757.7	16.8
Other mining and quarrying	–	–
Mining support service activities	869.6	8.8
Manufacturing	414441.3	13.9
High tech	119535.1	26.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	295.3	0.5
Production of computer, electronic and optical products	80436.4	43.1
Manufacture of air and spacecraft and related machinery	38803.4	19.5
Medium high tech	98284.4	11.2
Production of chemicals and chemical products	18834.7	11.8
Manufacture of electrical equipment	6217.2	8.2
Manufacture of machinery and equipment not elsewhere classified	10560.0	10.7
Manufacture of motor vehicles, trailers and semi-trailers	59525.9	12.5
Manufacture of other transport equipment	3146.6	4.7
Manufacture of medical and dental instruments and supplies	–	–

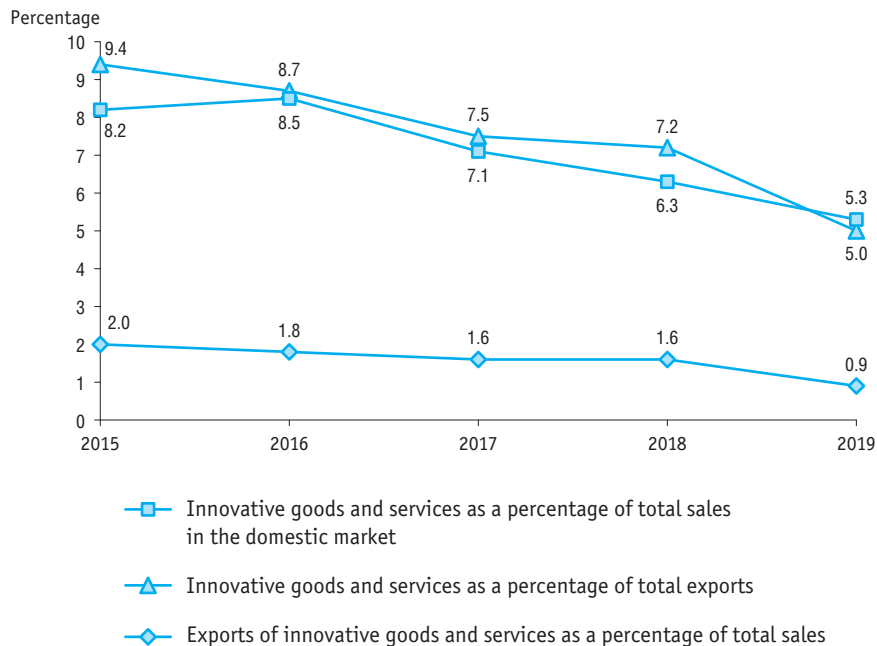
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	Million roubles	As a percentage of total sales of innovative goods and services
Medium low tech	185462.9	14.0
Reproduction of recorded media	8.5	100
Manufacture of coke and refined petroleum products	27563.0	5.3
Manufacture of rubber and plastic products	2366.8	3.2
Manufacture of other non-metallic mineral products	203.7	0.4
Manufacture of basic metals	31607.1	9.4
Manufacture of fabricated metal products, except machinery and equipment	63513.5	30.7
Building of ships and boats	56014.2	47.4
Repair and installation of machinery and equipment	4186.1	16.0
Low tech	11159.0	3.3
Manufacture of food products	1227.0	0.5
Manufacture of beverages	143.1	0.8
Manufacture of tobacco products	–	–
Manufacture of textiles	1215.8	21.6
Manufacture of wearing apparel	–	–
Manufacture of leather and related products	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	–	–
Manufacture of paper and paper products	–	–
Printing and reproduction of recorded media	8443.8	78.3
Manufacture of furniture	–	–
Other manufacturing	129.4	6.9
Electricity, gas, steam and air conditioning supply	157499.5	77.6
Water supply; sewerage, waste management and remediation activities	4608.4	24.8

(continued)

	Million roubles	As a percentage of total sales of innovative goods and services
Types of economic activity within services sector – total	242461.0	27.2
Transportation and storage	3228.5	6.8
Publishing activities	100	59.8
Telecommunications	1418.1	1.7
Computer programming, consultancy and related activities	30960.0	28.9
IT industry	4974.3	54.3
Legal and accounting activities	53.0	1.3
Activities of head offices; management consultancy activities	1186.6	4.9
Architectural and engineering activities; technical testing and analysis	1617.6	20.3
Scientific research and development	195997.9	37.3
Advertising and market research	314.2	0.5
Other professional, scientific and technical activities	29.2	6.2
Human health and social work activities	2581.6	18.8
Agriculture – total	676.6	1.0
Growing of non-perennial crops	0.8	0.0
Growing of perennial crops	–	–
Plant propagation	–	–
Animal production	671.8	1.6
Mixed farming	–	–
Support activities to agriculture and post-harvest crop activities	3.9	1.4
Construction – total	840.8	2.8

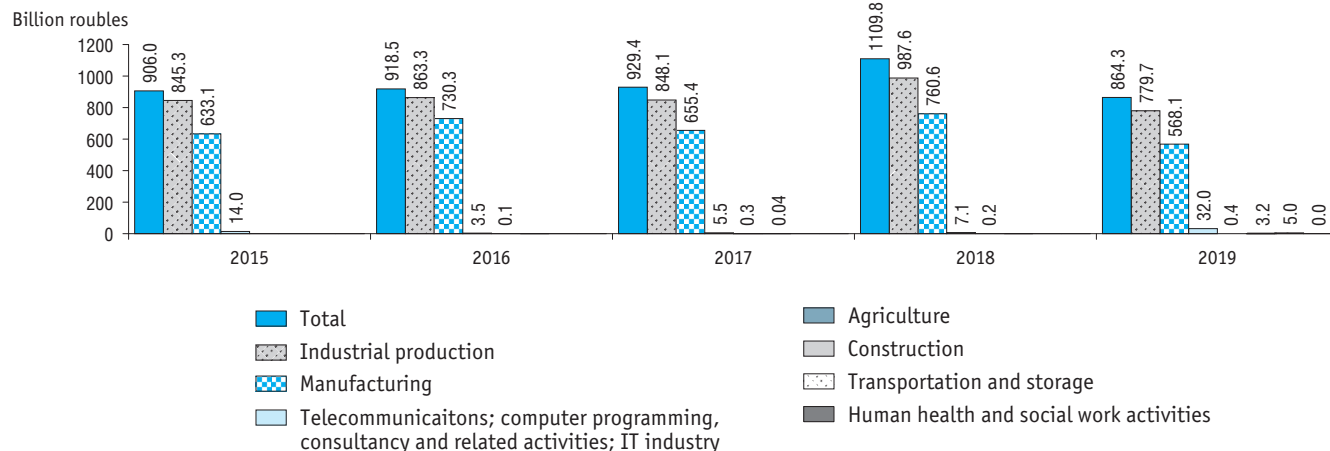
3.8. SALES OF INNOVATIVE GOODS AND SERVICES IN DOMESTIC AND FOREIGN MARKETS



3.9. EXPORTS OF INNOVATIVE GOODS AND SERVICES

	2015	2016	2017	2018	2019
Exports of innovative goods and services – total:					
at current prices, <i>million roubles</i>	906019.1	918541.0	929442.9	1109780.2	864329.5
at constant 2010 prices, <i>million roubles</i>	591512.1	583348.8	560546.9	602453.9	452031.6
as a percentage of 2010	253.4	249.9	240.1	258.1	193.6

By type of economic activity



3.10. EXPORTS OF INNOVATIVE GOODS AND SERVICES BY TYPE OF ECONOMIC ACTIVITY: 2019

	Million roubles	As a percentage of total sales of innovative goods and services	As a percentage of total exports of goods and services
Total	864329.5	17.8	5.0
Industrial production – total	779741.9	20.1	5.2
Mining and quarrying	210685.0	31.8	4.4
Mining of coal and lignite	35.3	31.3	0.01
Extraction of crude petroleum and natural gas	193389.7	36.6	5.0
Mining of metal ores	17260.0	13.9	8.1
Other mining and quarrying	–	–	–
Mining support service activities	–	–	–
Manufacturing	568096.1	19.0	5.5
High tech	145598.8	32.8	38.0
Manufacture of basic pharmaceutical products and pharmaceutical preparations	2596.8	4.4	13.2
Production of computer, electronic and optical products	41810.9	22.4	33.5
Manufacture of air and spacecraft and related machinery	101191.2	51.0	42.4
Medium high tech	113884.6	12.9	9.0
Production of chemicals and chemical products	55992.4	35.1	5.8
Manufacture of electrical equipment	3672.4	4.9	6.6
Manufacture of machinery and equipment not elsewhere classified	7102.5	7.2	10.8
Manufacture of motor vehicles, trailers and semi-trailers	41147.0	8.6	29.2
Manufacture of other transport equipment	5970.3	8.9	17.1
Manufacture of medical and dental instruments and supplies	–	–	–

(continued)

	Million roubles	As a percentage of total sales of innovative goods and services	As a percentage of total exports of goods and services
Medium low tech	287680.5	21.7	3.7
Reproduction of recorded media	—	—	—
Manufacture of coke and refined petroleum products	130227.2	25.2	2.7
Manufacture of rubber and plastic products	4339.3	5.9	9.3
Manufacture of other non-metallic mineral products	6813.1	14.4	9.3
Manufacture of basic metals	103827.8	30.8	4.1
Manufacture of fabricated metal products, except machinery and equipment	37297.5	18.1	16.1
Building of ships and boats	4348.0	3.7	7.8
Repair and installation of machinery and equipment	827.6	3.2	5.5
Low tech	20932.2	6.2	2.8
Manufacture of food products	6370.7	2.5	2.4
Manufacture of beverages	496.1	2.9	2.0
Manufacture of tobacco products	753.5	59.1	2.5
Manufacture of textiles	108.6	1.9	1.2
Manufacture of wearing apparel	6.9	3.0	1.2
Manufacture of leather and related products	3.4	0.4	0.1
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2416.1	29.3	1.2
Manufacture of paper and paper products	4834.0	15.1	2.7
Printing and reproduction of recorded media	5692.8	52.8	55.4
Manufacture of furniture	47.6	3.3	0.5
Other manufacturing	202.4	10.8	1.1
Electricity, gas, steam and air conditioning supply	—	—	—
Water supply; sewerage, waste management and remediation activities	960.8	5.2	6.8

(continued)

	Million roubles	As a percentage of total sales of innovative goods and services	As a percentage of total exports of goods and services
Types of economic activity within services sector – total	81048.3	9.1	4.0
Transportation and storage	5042.7	10.6	0.3
Publishing activities	0.2	0.1	0.01
Telecommunications	175.9	0.2	0.4
Computer programming, consultancy and related activities	31679.5	29.6	12.4
IT industry	142.6	1.6	2.2
Legal and accounting activities	0.6	0.01	0.0
Activities of head offices; management consultancy activities	9935.1	41.3	12.5
Architectural and engineering activities; technical testing and analysis	846.5	10.6	2.6
Scientific research and development	32718.6	6.2	34.6
Advertising and market research	504.2	0.7	1.7
Other professional, scientific and technical activities	–	–	–
Human health and social work activities	2.3	0.02	0.1
Agriculture – total	361.3	0.5	1.4
Growing of non-perennial crops	254.8	1.0	1.2
Growing of perennial crops	–	–	–
Plant propagation	–	–	–
Animal production	–	–	–
Mixed farming	–	–	–
Support activities to agriculture and post-harvest crop activities	106.5	37.4	61.5
Construction – total	3178.0	10.6	12.2

3.11. EXPORTS OF INNOVATIVE GOODS AND SERVICES BY COUNTRY AND TYPE OF ECONOMIC ACTIVITY: 2019

	Total, million roubles	EAEU countries*		Foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	
		Million roubles	Percentage	Million roubles	Percentage
Total	864329.5	95448.0	11.0	768881.6	89.0
Industrial production – total	779741.9	94051.1	12.1	685690.8	87.9
Mining and quarrying	210685.0	15418.5	7.3	195266.6	92.7
Mining of coal and lignite	35.3	–	–	35.3	100
Extraction of crude petroleum and natural gas	193389.7	15381.6	8.0	178008.1	92.0
Mining of metal ores	17260.0	36.8	0.2	17223.1	99.8
Other mining and quarrying	–	–	–	–	–
Mining support service activities	–	–	–	–	–
Manufacturing	568096.1	78627.8	13.8	489468.4	86.2
High tech	145598.8	4395.6	3.0	141203.3	97.0
Manufacture of basic pharmaceutical products and pharmaceutical preparations	2596.8	2041.7	78.6	555.1	21.4
Production of computer, electronic and optical products	41810.9	2116.4	5.1	39694.5	94.9
Manufacture of air and spacecraft and related machinery	101191.2	237.5	0.2	100953.7	99.8
Medium high tech	113884.6	45265.1	39.7	68619.5	60.3
Production of chemicals and chemical products	55992.4	7683.3	13.7	48309.1	86.3
Manufacture of electrical equipment	3672.4	1244.9	33.9	2427.5	66.1
Manufacture of machinery and equipment not elsewhere classified	7102.5	1344.8	18.9	5757.7	81.1
Manufacture of motor vehicles, trailers and semi-trailers	41147.0	34986.8	85.0	6160.3	15.0
Manufacture of other transport equipment	5970.3	5.4	0.1	5964.9	99.9
Manufacture of medical and dental instruments and supplies	–	–	–	–	–
Medium low tech	287680.5	26056.6	9.1	261623.9	90.9
Reproduction of recorded media	–	–	–	–	–

* Here and below in table 3.12, Armenia, Belarus, Kazakhstan, and Kyrgyzstan.

(continued)

	Total, million roubles	EAEU countries*		Foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	
		Million roubles	Percentage	Million roubles	Percentage
Manufacture of coke and refined petroleum products	130227.2	1803.2	1.4	128424.0	98.6
Manufacture of rubber and plastic products	4339.3	1866.0	43.0	2473.3	57.0
Manufacture of other non-metallic mineral products	6813.1	3694.0	54.2	3119.1	45.8
Manufacture of basic metals	103827.8	17268.3	16.6	86559.4	83.4
Manufacture of fabricated metal products, except machinery and equipment	37297.5	679.9	1.8	36617.6	98.2
Building of ships and boats	4348.0	356.1	8.2	3991.9	91.8
Repair and installation of machinery and equipment	827.6	389.0	47.0	438.6	53.0
Low tech	20932.2	2910.4	13.9	18021.7	86.1
Manufacture of food products	6370.7	1655.2	26.0	4715.5	74.0
Manufacture of beverages	496.1	186.4	37.6	309.7	62.4
Manufacture of tobacco products	753.5	29.2	3.9	724.3	96.1
Manufacture of textiles	108.6	98.6	90.8	10.0	9.2
Manufacture of wearing apparel	6.9	6.9	100	–	–
Manufacture of leather and related products	3.4	0.1	3.3	3.3	96.7
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2416.1	171.2	7.1	2244.9	92.9
Manufacture of paper and paper products	4834.0	562.2	11.6	4271.8	88.4
Printing and reproduction of recorded media	5692.8	74.9	1.3	5617.8	98.7
Manufacture of furniture	47.6	12.8	26.9	34.8	73.1
Other manufacturing	202.4	112.8	55.8	89.6	44.2
Electricity, gas, steam and air conditioning supply	–	–	–	–	–
Water supply; sewerage, waste management and remediation activities	960.8	4.9	0.5	955.9	99.5

(continued)

	Total, million roubles	EAEU countries*		Foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	
		Million roubles	Percentage	Million roubles	Percentage
Types of economic activity within services sector – total	81048.3	1348.7	1.7	79699.6	98.3
Transportation and storage	5042.7	26.8	0.5	5015.9	99.5
Publishing activities	0.2	0.2	96.4	0.01	3.6
Telecommunications	175.9	0.2	0.1	175.7	99.9
Computer programming, consultancy and related activities	31679.5	267.3	0.8	31412.2	99.2
IT industry	142.6	59.2	41.5	83.4	58.5
Legal and accounting activities	0.6	–	–	0.6	100
Activities of head offices; management consultancy activities	9935.1	92.3	0.9	9842.8	99.1
Architectural and engineering activities; technical testing and analysis	846.5	20.3	2.4	826.2	97.6
Scientific research and development	32718.6	880.8	2.7	31837.8	97.3
Advertising and market research	504.2	1.4	0.3	502.8	99.7
Other professional, scientific and technical activities	–	–	–	–	–
Human health and social work activities	2.3	0.2	7.4	2.1	92.6
Agriculture – total	361.3	45.3	12.5	316.0	87.5
Growing of non-perennial crops	254.8	45.3	17.8	209.5	82.2
Growing of perennial crops	–	–	–	–	–
Plant propagation	–	–	–	–	–
Animal production	–	–	–	–	–
Mixed farming	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	106.5	–	–	106.5	100
Construction – total	3178.0	2.8	0.1	3175.2	99.9

3.12. ASSESSMENT OF INNOVATION OUTCOMES: 2017–2019

	Enterprises indicating impact of the following innovation outcomes on their development, <i>percentage</i>			
	high	medium	low	no impact
Expansion of goods and services range	34.4	27.9	12.0	25.8
Retaining traditional sales markets	32.2	27.2	12.3	28.3
Market expansion:	24.3	28.2	13.1	34.4
in Russia	25.2	27.7	11.9	35.2
in EAEU countries	6.5	14.1	13.9	65.5
in EU countries, EU candidate countries*, Great Britain, Liechtenstein, Norway, Switzerland	2.1	6.8	10.2	81.0
in BRICS countries**	2.4	6.6	10.1	80.9
in the United States and Canada	1.6	5.1	9.5	83.8
in other countries	4.3	9.3	11.2	75.2
Goods and services quality improvement	37.7	29.5	9.4	23.5
Higher manufacturing flexibility	17.7	31.3	14.9	36.1
Production capacity increase	20.4	29.4	15.0	35.3
Lower salary costs	5.8	18.9	23.8	51.5
Lower inventory and/or material costs	9.5	27.2	22.2	41.1
Better energy efficiency in production processes (lower energy consumption or energy losses)	12.1	25.4	21.4	41.1
Better working environment and occupational health and safety	15.4	29.2	17.0	38.3
More rapid customer and supplier interaction	13.4	24.6	19.8	42.2
Improvements in internal and external communications	19.5	29.3	15.7	35.6
Expanding opportunities for data survey, processing, and analysis	20.4	28.5	15.9	35.3

(continued)

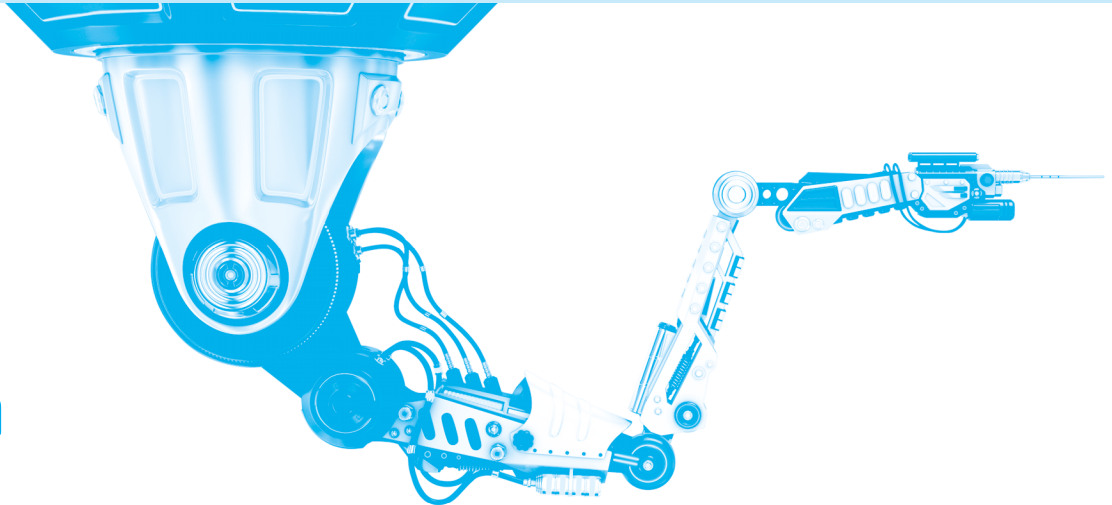
	Enterprises indicating impact of the following innovation outcomes on their development, <i>percentage</i>			
	high	medium	low	no impact
Compliance with advanced technical standards, rules, and regulations and with sanitation, veterinary and phytosanitary requirements	19.4	21.4	12.5	46.7
Higher yield and/or productivity of livestock, poultry, and aquaculture	3.0	6.6	6.2	84.2
Preservation, restoration, and improvement of soil fertility of agricultural lands	3.1	6.1	6.2	84.6
Lower effects of seasonality on agricultural production; reducing dependence on weather, climate, and other environmental conditions	1.9	5.5	6.3	86.3
Minimisation of losses of nutrition value when storing, transporting, and processing agricultural products	2.2	6.6	6.5	84.7

* Albania, Bosnia and Herzegovina, Iceland, Kosovo, North Macedonia, Serbia, Turkey, and Montenegro.

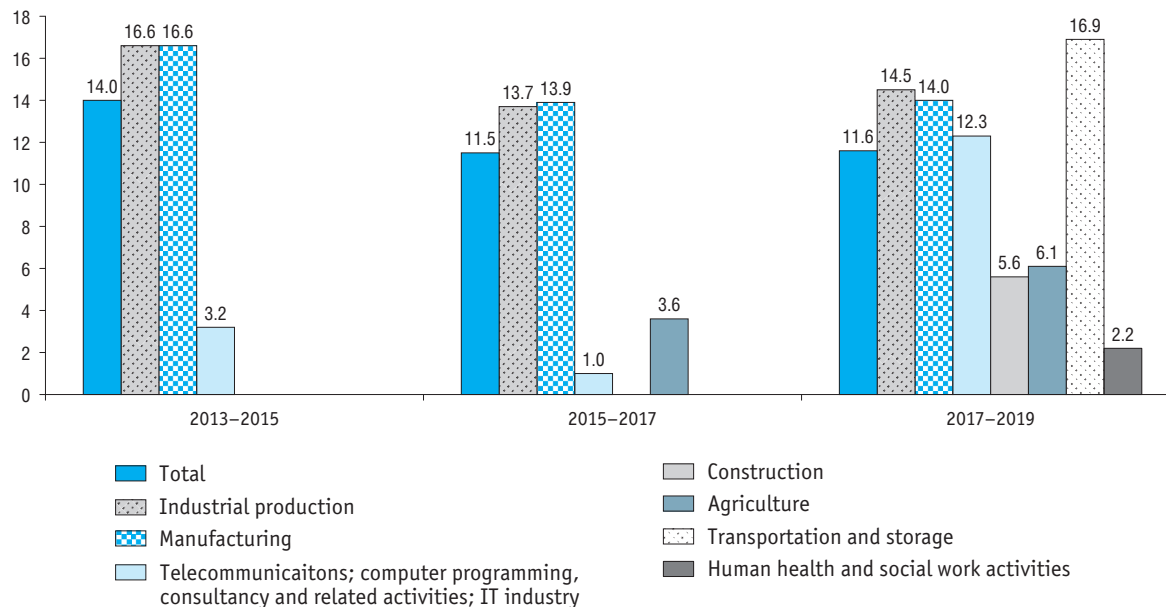
** Brazil, India, China, and South Africa.

ENVIRONMENTAL INNOVATION

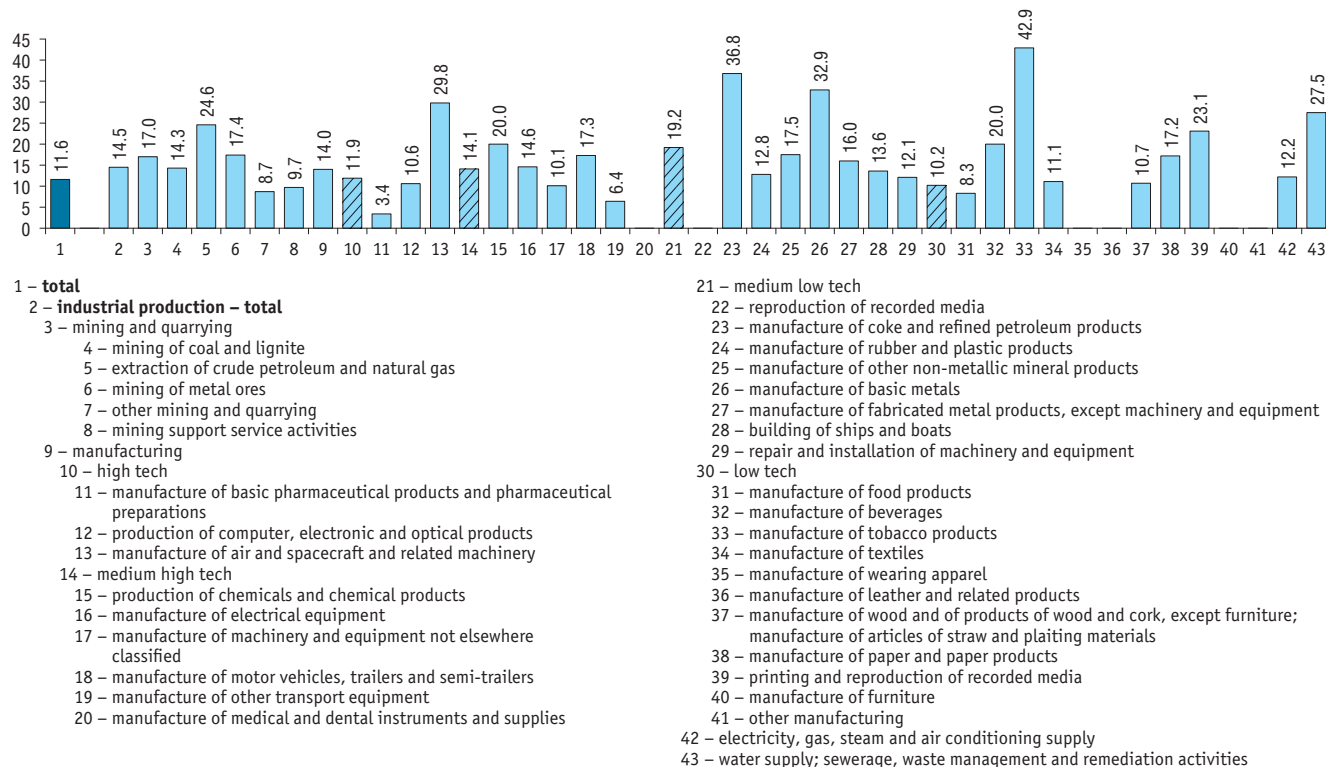
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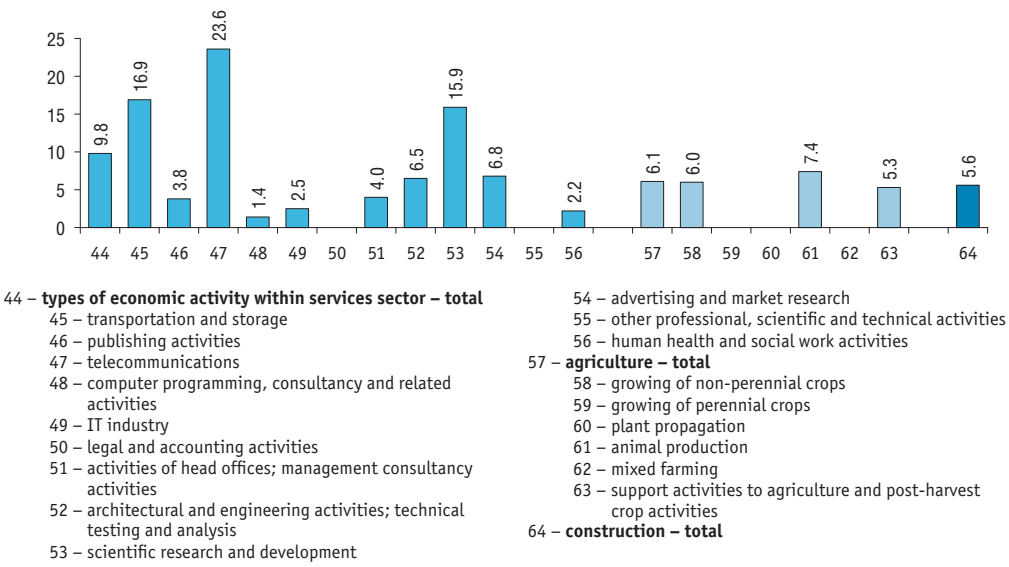
4.1. ENTERPRISES THAT ENGAGED IN ENVIRONMENTAL INNOVATION AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES THAT HAVE HAD COMPLETED INNOVATION ACTIVITIES



4.2. ENTERPRISES THAT ENGAGED IN ENVIRONMENTAL INNOVATION AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES THAT HAVE HAD COMPLETED INNOVATION ACTIVITIES BY TYPE OF ECONOMIC ACTIVITY: 2017–2019



(continued)



4.3. ENTERPRISES THAT ENGAGED IN INNOVATION IMPROVING ENVIRONMENTAL SAFETY DURING PRODUCTION OF GOODS AND SERVICES: 2017–2019

(as a percentage of all enterprises that have been engaged in environmental innovation)

	Reducing material costs per unit of goods and services output	Reducing power consumption per unit of goods and services output	Reducing carbon dioxide emission	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water, or noise pollution)	Recycling waste, water, or materials	Conserving and reproducing used natural resources
Total	44.5	54.5	35.6	33.3	68.7	38.9	30.6
Industrial production – total	53.5	52.7	41.6	35.1	78.7	53.0	34.5
Mining and quarrying	79.2	20.8	25.0	16.7	91.7	79.2	75.0
Mining of coal and lignite	–	–	–	–	100	100	100
Extraction of crude petroleum and natural gas	100	7.1	7.1	–	100	85.7	85.7
Mining of metal ores	50.0	75.0	75.0	50.0	75.0	50.0	25.0
Other mining and quarrying	50.0	50.0	100	100	100	100	100
Mining support service activities	66.7	–	–	–	66.7	66.7	66.7
Manufacturing	53.4	57.7	45.6	39.0	78.0	55.1	34.1
High tech	58.1	48.8	37.2	27.9	69.8	32.6	16.3
Manufacture of basic pharmaceutical products and pharmaceutical preparations	50.0	50.0	–	–	100	–	–
Production of computer, electronic and optical products	59.3	51.9	40.7	33.3	63.0	44.4	22.2
Manufacture of air and spacecraft and related machinery	57.1	42.9	35.7	21.4	78.6	14.3	7.1

(continued)

	Reducing material costs per unit of goods and services output	Reducing power consumption per unit of goods and services output	Reducing carbon dioxide emission	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water, or noise pollution)	Recycling waste, water, or materials	Conserving and reproducing used natural resources
Medium high tech	52.1	62.8	44.7	42.6	76.6	58.5	34.0
Production of chemicals and chemical products	53.1	59.4	34.4	34.4	78.1	59.4	43.8
Manufacture of electrical equipment	54.5	72.7	59.1	50.0	77.3	68.2	36.4
Manufacture of machinery and equipment not elsewhere classified	42.1	57.9	36.8	47.4	63.2	57.9	15.8
Manufacture of motor vehicles, trailers and semi-trailers	55.6	61.1	55.6	44.4	88.9	55.6	38.9
Manufacture of other transport equipment	66.7	66.7	33.3	33.3	66.7	—	—
Manufacture of medical and dental instruments and supplies	—	—	—	—	—	—	—
Medium low tech	45.0	50.5	44.0	33.0	76.1	59.6	37.6
Reproduction of recorded media	—	—	—	—	—	—	—
Manufacture of coke and refined petroleum products	35.7	50.0	50.0	35.7	100	57.1	42.9
Manufacture of rubber and plastic products	63.6	54.5	54.5	54.5	63.6	90.9	18.2
Manufacture of other non-metallic mineral products	27.8	33.3	38.9	27.8	66.7	55.6	27.8
Manufacture of basic metals	46.4	50.0	42.9	25.0	82.1	67.9	42.9

(continued)

	Reducing material costs per unit of goods and services output	Reducing power consumption per unit of goods and services output	Reducing carbon dioxide emission	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water, or noise pollution)	Recycling waste, water, or materials	Conserving and reproducing used natural resources
Manufacture of fabricated metal products, except machinery and equipment	50.0	57.1	39.3	35.7	67.9	53.6	50.0
Building of ships and boats	33.3	66.7	33.3	–	100	–	33.3
Repair and installation of machinery and equipment	57.1	57.1	57.1	42.9	71.4	42.9	14.3
Low tech	67.8	69.5	55.9	52.5	89.8	57.6	40.7
Manufacture of food products	72.4	72.4	44.8	51.7	89.7	51.7	34.5
Manufacture of beverages	76.9	76.9	84.6	76.9	92.3	76.9	76.9
Manufacture of tobacco products	100	100	100	–	100	100	33.3
Manufacture of textiles	–	–	–	–	66.7	–	–
Manufacture of wearing apparel	–	–	–	–	–	–	–
Manufacture of leather and related products	–	–	–	–	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	100	100	100	66.7	100	66.7	33.3
Manufacture of paper and paper products	40.0	60.0	40.0	60.0	80.0	40.0	20.0
Printing and reproduction of recorded media	33.3	33.3	33.3	33.3	100	66.7	33.3
Manufacture of furniture	–	–	–	–	–	–	–
Other manufacturing	–	–	–	–	–	–	–

(continued)

	Reducing material costs per unit of goods and services output	Reducing power consumption per unit of goods and services output	Reducing carbon dioxide emission	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water, or noise pollution)	Recycling waste, water, or materials	Conserving and reproducing used natural resources
Electricity, gas, steam and air conditioning supply	35.5	29.0	25.8	16.1	64.5	19.4	16.1
Water supply; sewerage, waste management and remediation activities	52.0	52.0	28.0	28.0	92.0	44.0	24.0
Types of economic activity within services sector – total	32.3	57.0	27.0	29.0	55.0	21.3	23.7
Transportation and storage	22.9	35.7	21.4	21.4	84.3	12.9	7.1
Publishing activities	100	50.0	–	50.0	50.0	50.0	50.0
Telecommunications	2.7	100	1.4	1.4	4.1	1.4	–
Computer programming, consultancy and related activities	100	100	33.3	66.7	100	100	100
IT industry	–	66.7	–	33.3	–	33.3	–
Legal and accounting activities	–	–	–	–	–	–	–
Activities of head offices; management consultancy activities	50.0	50.0	25.0	25.0	75.0	50.0	75.0
Architectural and engineering activities; technical testing and analysis	63.6	45.5	54.5	36.4	54.5	27.3	36.4
Scientific research and development	49.6	43.4	43.4	46.9	69.0	37.2	43.4
Advertising and market research	66.7	66.7	100	66.7	100	33.3	66.7
Other professional, scientific and technical activities	–	–	–	–	–	–	–
Human health and social work activities	41.2	47.1	29.4	41.2	52.9	5.9	23.5

(continued)

	Reducing material costs per unit of goods and services output	Reducing power consumption per unit of goods and services output	Reducing carbon dioxide emission	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water, or noise pollution)	Recycling waste, water, or materials	Conserving and reproducing used natural resources
Agriculture – total	54.5	54.5	63.6	63.6	81.8	18.2	63.6
Growing of non-perennial crops	75.0	75.0	75.0	75.0	100	25.0	100
Growing of perennial crops	–	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–	–
Animal production	50.0	33.3	50.0	66.7	66.7	16.7	50.0
Mixed farming	–	–	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	–	100	100	–	100	–	–
Construction – total	55.6	44.4	33.3	66.7	77.8	44.4	55.6

4.4. ENTERPRISES THAT ENGAGED IN INNOVATION IMPROVING ENVIRONMENTAL SAFETY AS A RESULT OF THE CUSTOMER'S USE OF INNOVATIVE GOODS AND SERVICES: 2017–2019

(as a percentage of all enterprises that have been engaged in environmental innovation)

	Reducing energy consumption or loss of energy resources	Reducing environmental pollution (air, soil, water, or noise pollution)	Improving the possibilities of recycling goods after use
Total	57.2	55.3	27.0
Industrial production – total	52.7	64.4	34.8
Mining and quarrying	87.5	79.2	75.0
Mining of coal and lignite	100	100	100
Extraction of crude petroleum and natural gas	92.9	85.7	85.7
Mining of metal ores	50.0	50.0	25.0
Other mining and quarrying	100	100	100
Mining support service activities	100	66.7	66.7
Manufacturing	52.8	63.6	33.8
High tech	48.8	65.1	11.6
Manufacture of basic pharmaceutical products and pharmaceutical preparations	50.0	50.0	–
Production of computer, electronic and optical products	51.9	70.4	18.5
Manufacture of air and spacecraft and related machinery	42.9	57.1	–
Medium high tech	53.2	58.5	41.5
Production of chemicals and chemical products	46.9	50.0	46.9
Manufacture of electrical equipment	59.1	77.3	50.0
Manufacture of machinery and equipment not elsewhere classified	52.6	47.4	31.6
Manufacture of motor vehicles, trailers and semi-trailers	55.6	66.7	33.3
Manufacture of other transport equipment	66.7	33.3	33.3
Manufacture of medical and dental instruments and supplies	–	–	–
Medium low tech	51.4	65.1	30.3
Reproduction of recorded media	–	–	–

(continued)

	Reducing energy consumption or loss of energy resources	Reducing environmental pollution (air, soil, water, or noise pollution)	Improving the possibilities of recycling goods after use
Manufacture of coke and refined petroleum products	57.1	71.4	28.6
Manufacture of rubber and plastic products	54.5	72.7	54.5
Manufacture of other non-metallic mineral products	44.4	55.6	27.8
Manufacture of basic metals	50.0	60.7	17.9
Manufacture of fabricated metal products, except machinery and equipment	57.1	67.9	35.7
Building of ships and boats	66.7	100	33.3
Repair and installation of machinery and equipment	28.6	57.1	28.6
Low tech	57.6	67.8	44.1
Manufacture of food products	65.5	75.9	27.6
Manufacture of beverages	76.9	84.6	76.9
Manufacture of tobacco products	100	100	100
Manufacture of textiles	–	33.3	33.3
Manufacture of wearing apparel	–	–	–
Manufacture of leather and related products	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	33.3	66.7	66.7
Manufacture of paper and paper products	20.0	20.0	20.0
Printing and reproduction of recorded media	–	–	33.3
Manufacture of furniture	–	–	–
Other manufacturing	–	–	–
Electricity, gas, steam and air conditioning supply	38.7	54.8	16.1
Water supply; sewerage, waste management and remediation activities	36.0	72.0	32.0

(continued)

	Reducing energy consumption or loss of energy resources	Reducing environmental pollution (air, soil, water, or noise pollution)	Improving the possibilities of recycling goods after use
Types of economic activity within services sector – total	63.3	42.0	16.7
Transportation and storage	40.0	45.7	5.7
Publishing activities	50.0	50.0	50.0
Telecommunications	97.3	1.4	–
Computer programming, consultancy and related activities	100	100	66.7
IT industry	33.3	–	–
Legal and accounting activities	–	–	–
Activities of head offices; management consultancy activities	50.0	50.0	25.0
Architectural and engineering activities; technical testing and analysis	36.4	45.5	36.4
Scientific research and development	58.4	61.9	31.0
Advertising and market research	66.7	66.7	33.3
Other professional, scientific and technical activities	–	–	–
Human health and social work activities	64.7	58.8	11.8
Agriculture – total	54.5	81.8	18.2
Growing of non-perennial crops	75.0	100	25.0
Growing of perennial crops	–	–	–
Plant propagation	–	–	–
Animal production	33.3	66.7	16.7
Mixed farming	–	–	–
Support activities to agriculture and post-harvest crop activities	100	100	–
Construction – total	44.4	77.8	44.4

4.5. PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT ENGAGED IN ENVIRONMENTAL INNOVATION BY OBJECTIVE AND TYPE OF ECONOMIC ACTIVITY: 2017–2019

	Enterprises that engaged in environmental innovation by objective					
	ensuring compliance with modern technical regulations, rules, and standards	ensuring compliance with the expected tightening of legal provisions	availability of government grants, subsidies, or other financial incentives following introduction of environmental innovation	compliance with the market (consumers) requirements that force to introduce environmental innovations	voluntary adherence to the general principles of environmental protection	minimisation of the consequences of adverse climate changes, as well as the consequences of natural and man-made emergencies
Total	87.5	48.2	12.3	43.7	83.5	47.9
Industrial production – total	88.3	54.8	11.4	51.2	84.4	49.4
Mining and quarrying	91.7	16.7	4.2	8.3	87.5	83.3
Mining of coal and lignite	–	100	100	–	–	–
Extraction of crude petroleum and natural gas	100	–	–	–	92.9	92.9
Mining of metal ores	100	25.0	–	25.0	100	75.0
Other mining and quarrying	100	100	–	–	100	100
Mining support service activities	66.7	–	–	33.3	66.7	66.7
Manufacturing	88.5	58.4	11.8	54.8	85.6	49.2
High tech	88.4	48.8	7.0	32.6	86.0	34.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	100	–	–	50.0	100	50.0
Production of computer, electronic and optical products	92.6	59.3	11.1	40.7	88.9	33.3
Manufacture of air and spacecraft and related machinery	78.6	35.7	–	14.3	78.6	35.7

(continued)

	Enterprises that engaged in environmental innovation by objective					
	ensuring compliance with modern technical regulations, rules, and standards	ensuring compliance with the expected tightening of legal provisions	availability of government grants, subsidies, or other financial incentives following introduction of environmental innovation	compliance with the market (consumers) requirements that force to introduce environmental innovations	voluntary adherence to the general principles of environmental protection	minimisation of the consequences of adverse climate changes, as well as the consequences of natural and man-made emergencies
Medium high tech	90.4	61.7	10.6	56.4	88.3	50.0
Production of chemicals and chemical products	84.4	56.3	6.3	56.3	87.5	46.9
Manufacture of electrical equipment	95.5	72.7	9.1	63.6	90.9	68.2
Manufacture of machinery and equipment not elsewhere classified	89.5	47.4	10.5	36.8	89.5	36.8
Manufacture of motor vehicles, trailers and semi-trailers	94.4	72.2	16.7	66.7	88.9	50.0
Manufacture of other transport equipment	100	66.7	33.3	66.7	66.7	33.3
Manufacture of medical and dental instruments and supplies	–	–	–	–	–	–
Medium low tech	87.2	55.0	8.3	56.9	80.7	49.5
Reproduction of recorded media	–	–	–	–	–	–
Manufacture of coke and refined petroleum products	85.7	64.3	14.3	85.7	85.7	57.1
Manufacture of rubber and plastic products	72.7	36.4	18.2	36.4	90.9	54.5
Manufacture of other non-metallic mineral products	77.8	44.4	–	55.6	72.2	44.4
Manufacture of basic metals	96.4	64.3	10.7	60.7	89.3	50.0

(continued)

	Enterprises that engaged in environmental innovation by objective					
	ensuring compliance with modern technical regulations, rules, and standards	ensuring compliance with the expected tightening of legal provisions	availability of government grants, subsidies, or other financial incentives following introduction of environmental innovation	compliance with the market (consumers) requirements that force to introduce environmental innovations	voluntary adherence to the general principles of environmental protection	minimisation of the consequences of adverse climate changes, as well as the consequences of natural and man-made emergencies
Manufacture of fabricated metal products, except machinery and equipment	85.7	50.0	7.1	50.0	71.4	50.0
Building of ships and boats	100	100	–	100	100	33.3
Repair and installation of machinery and equipment	100	57.1	–	28.6	71.4	42.9
Low tech	88.1	66.1	23.7	64.4	89.8	57.6
Manufacture of food products	86.2	62.1	10.3	58.6	93.1	55.2
Manufacture of beverages	92.3	76.9	76.9	92.3	92.3	76.9
Manufacture of tobacco products	100	66.7	–	100	100	100
Manufacture of textiles	66.7	33.3	–	33.3	66.7	66.7
Manufacture of wearing apparel	–	–	–	–	–	–
Manufacture of leather and related products	–	–	–	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	100	66.7	33.3	66.7	66.7	33.3
Manufacture of paper and paper products	80.0	80.0	–	40.0	100	20.0
Printing and reproduction of recorded media	100	66.7	–	33.3	66.7	33.3
Manufacture of furniture	–	–	–	–	–	–
Other manufacturing	–	–	–	–	–	–

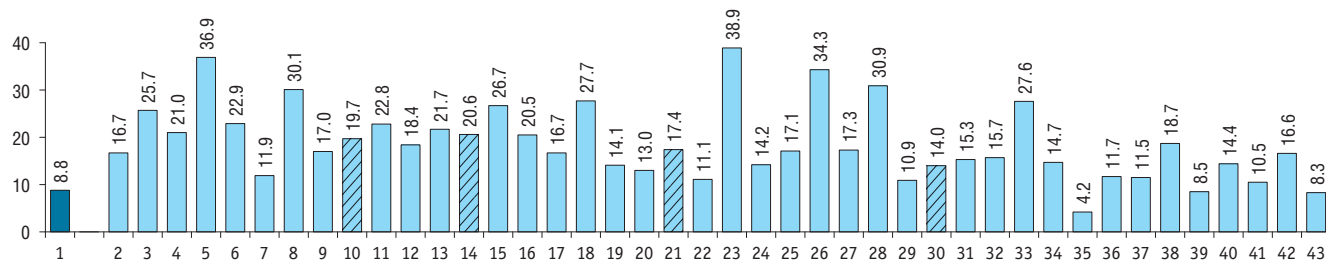
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	Enterprises that engaged in environmental innovation by objective					
	ensuring compliance with modern technical regulations, rules, and standards	ensuring compliance with the expected tightening of legal provisions	availability of government grants, subsidies, or other financial incentives following introduction of environmental innovation	compliance with the market (consumers) requirements that force to introduce environmental innovations	voluntary adherence to the general principles of environmental protection	minimisation of the consequences of adverse climate changes, as well as the consequences of natural and man-made emergencies
Electricity, gas, steam and air conditioning supply	83.9	38.7	9.7	45.2	67.7	29.0
Water supply; sewerage, waste management and remediation activities	88.0	68.0	16.0	56.0	88.0	44.0
Types of economic activity within services sector – total	86.7	38.7	11.3	32.7	82.7	44.7
Transportation and storage	92.9	67.1	–	15.7	85.7	70.0
Publishing activities	100	50.0	50.0	50.0	100	100
Telecommunications	97.3	1.4	1.4	2.7	98.6	1.4
Computer programming, consultancy and related activities	66.7	66.7	33.3	66.7	100	100
IT industry	33.3	–	–	33.3	33.3	33.3
Legal and accounting activities	–	–	–	–	–	–
Activities of head offices; management consultancy activities	100	75.0	25.0	50.0	100	50.0
Architectural and engineering activities; technical testing and analysis	72.7	36.4	36.4	72.7	90.9	45.5
Scientific research and development	80.5	46.0	20.4	54.9	70.8	54.9
Advertising and market research	100	66.7	33.3	100	100	66.7
Other professional, scientific and technical activities	–	–	–	–	–	–
Human health and social work activities	70.6	23.5	11.8	35.3	70.6	41.2

(continued)

	Enterprises that engaged in environmental innovation by objective					
	ensuring compliance with modern technical regulations, rules, and standards	ensuring compliance with the expected tightening of legal provisions	availability of government grants, subsidies, or other financial incentives following introduction of environmental innovation	compliance with the market (consumers) requirements that force to introduce environmental innovations	voluntary adherence to the general principles of environmental protection	minimisation of the consequences of adverse climate changes, as well as the consequences of natural and man-made emergencies
Agriculture – total	90.9	72.7	54.5	63.6	81.8	81.8
Growing of non-perennial crops	100	100	75.0	75.0	100	100
Growing of perennial crops	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–
Animal production	83.3	50.0	33.3	50.0	66.7	66.7
Mixed farming	–	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	100	100	100	100	100	100
Construction – total	77.8	55.6	33.3	66.7	77.8	55.6

4.6. ENTERPRISES THAT USE ENVIRONMENT POLLUTION CONTROL SYSTEM AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES BY TYPE OF ECONOMIC ACTIVITY: 2019



1 - total

2 - industrial production - total

3 - mining and quarrying

4 - mining of coal and lignite

5 - extraction of crude petroleum and natural gas

6 - mining of metal ores

7 - other mining and quarrying

8 - mining support service activities

9 - manufacturing

10 - high tech

11 - manufacture of basic pharmaceutical products and pharmaceutical preparations

12 - production of computer, electronic and optical products

13 - manufacture of air and spacecraft and related machinery

14 - medium high tech

15 - production of chemicals and chemical products

16 - manufacture of electrical equipment

17 - manufacture of machinery and equipment not elsewhere classified

18 - manufacture of motor vehicles, trailers and semi-trailers

19 - manufacture of other transport equipment

20 - manufacture of medical and dental instruments and supplies

21 - medium low tech

22 - reproduction of recorded media

23 - manufacture of coke and refined petroleum products

24 - manufacture of rubber and plastic products

25 - manufacture of other non-metallic mineral products

26 - manufacture of basic metals

27 - manufacture of fabricated metal products, except machinery and equipment

28 - building of ships and boats

29 - repair and installation of machinery and equipment

30 - low tech

31 - manufacture of food products

32 - manufacture of beverages

33 - manufacture of tobacco products

34 - manufacture of textiles

35 - manufacture of wearing apparel

36 - manufacture of leather and related products

37 - manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

38 - manufacture of paper and paper products

39 - printing and reproduction of recorded media

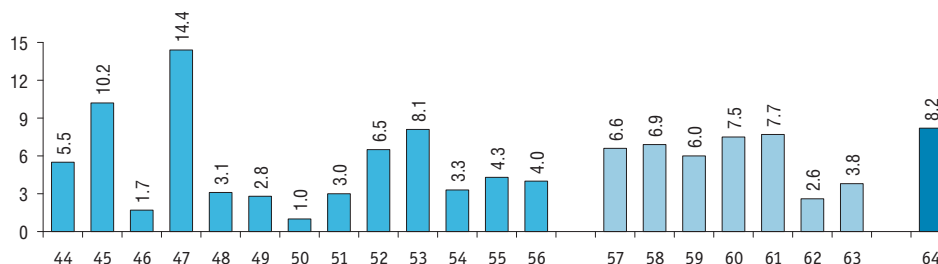
40 - manufacture of furniture

41 - other manufacturing

42 - electricity, gas, steam and air conditioning supply

43 - water supply; sewerage, waste management and remediation activities

(continued)



44 – types of economic activity within services sector – total

- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

54 – advertising and market research

- 55 – other professional, scientific and technical activities
- 56 – human health and social work activities

57 – agriculture – total

- 58 – growing of non-perennial crops
- 59 – growing of perennial crops
- 60 – plant propagation
- 61 – animal production
- 62 – mixed farming
- 63 – support activities to agriculture and post-harvest crop activities

64 – construction – total

4.7. SPECIAL EXPENDITURE RELATED TO ENVIRONMENTAL INNOVATION BY TYPE OF ECONOMIC ACTIVITY: 2019

	Million roubles	Percentage
Total	27073.0	100
Industrial production – total	26019.9	96.1
Mining and quarrying	499.5	1.8
Mining of coal and lignite	–	–
Extraction of crude petroleum and natural gas	420.2	1.6
Mining of metal ores	23.0	0.1
Other mining and quarrying	56.0	0.2
Mining support service activities	0.3	0.0
Manufacturing	22098.2	81.6
High tech	3761.4	13.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	11.1	0.04
Production of computer, electronic and optical products	66.2	0.2
Manufacture of air and spacecraft and related machinery	3684.2	13.6
Medium high tech	3828.9	14.1
Production of chemicals and chemical products	2934.2	10.8
Manufacture of electrical equipment	57.7	0.2
Manufacture of machinery and equipment not elsewhere classified	15.2	0.1
Manufacture of motor vehicles, trailers and semi-trailers	781.5	2.9
Manufacture of other transport equipment	39.8	0.1
Manufacture of medical and dental instruments and supplies	0.6	0.0
Medium low tech	10662.1	39.4
Reproduction of recorded media	–	–
Manufacture of coke and refined petroleum products	3324.2	12.3

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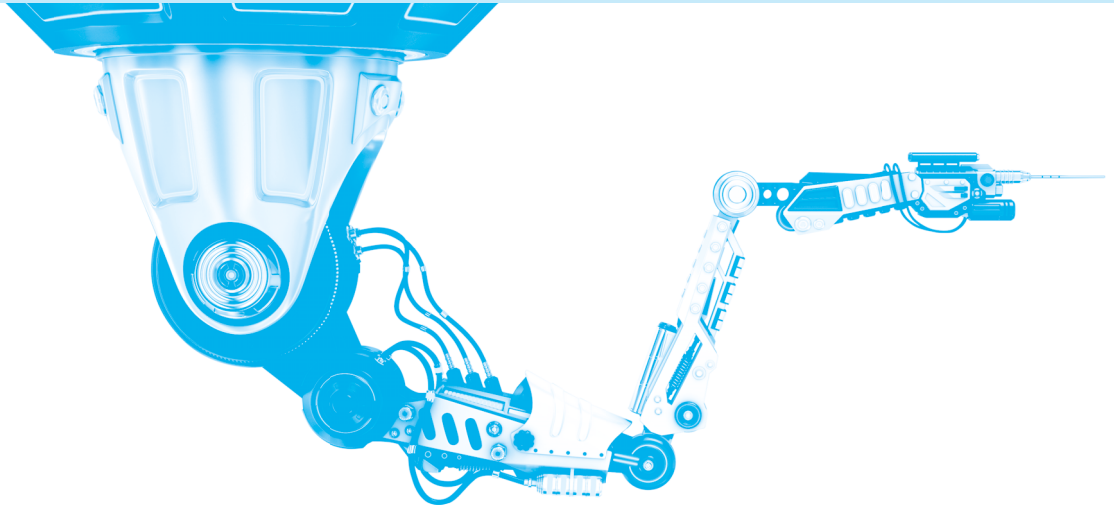
	Million roubles	Percentage
Manufacture of rubber and plastic products	78.2	0.3
Manufacture of other non-metallic mineral products	346.9	1.3
Manufacture of basic metals	6836.9	25.3
Manufacture of fabricated metal products, except machinery and equipment	38.1	0.1
Building of ships and boats	32.7	0.1
Repair and installation of machinery and equipment	5.0	0.02
Low tech	3845.9	14.2
Manufacture of food products	522.9	1.9
Manufacture of beverages	0.01	0.0
Manufacture of tobacco products	23.0	0.1
Manufacture of textiles	0.1	0.0
Manufacture of wearing apparel	–	–
Manufacture of leather and related products	0.0	0.0
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2.1	0.01
Manufacture of paper and paper products	3233.1	11.9
Printing and reproduction of recorded media	64.5	0.2
Manufacture of furniture	–	–
Other manufacturing	–	–
Electricity, gas, steam and air conditioning supply	56.8	0.2
Water supply; sewerage, waste management and remediation activities	3365.4	12.4

(continued)

	Million roubles	Percentage
Types of economic activity within services sector – total	904.0	3.3
Transportation and storage	395.9	1.5
Publishing activities	–	–
Telecommunications	0.0	0.0
Computer programming, consultancy and related activities	0.8	0.0
IT industry	0.01	0.0
Legal and accounting activities	0.0	0.0
Activities of head offices; management consultancy activities	86.9	0.3
Architectural and engineering activities; technical testing and analysis	105.9	0.4
Scientific research and development	312.4	1.2
Advertising and market research	0.2	0.0
Other professional, scientific and technical activities	–	–
Human health and social work activities	2.0	0.01
Agriculture – total	137.0	0.5
Growing of non-perennial crops	–	–
Growing of perennial crops	–	–
Plant propagation	–	–
Animal production	137.0	0.5
Mixed farming	–	–
Support activities to agriculture and post-harvest crop activities	–	–
Construction – total	12.0	0.04

COOPERATION AND OPEN INNOVATIONS

5



5.1. COOPERATION IN DEVELOPING PRODUCT AND BUSINESS PROCESS INNOVATION BY TYPE OF ECONOMIC ACTIVITY: 2017–2019

(as a percentage of all enterprises that have had completed innovation activities of each type)

	Enterprises for which product innovations were developed				Enterprises for which business process innovations were developed			
	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts
Total	27.3	20.2	4.8	54.7	41.3	25.5	5.5	35.9
Industrial production – total	23.1	22.0	5.0	57.5	34.5	28.6	5.7	39.7
Mining and quarrying	42.6	31.5	–	31.5	57.0	27.0	2.0	23.0
Mining of coal and lignite	60.0	20.0	–	20.0	100	–	–	–
Extraction of crude petroleum and natural gas	37.5	50.0	–	12.5	58.7	34.8	2.2	13.0
Mining of metal ores	60.0	20.0	–	20.0	61.5	30.8	–	7.7
Other mining and quarrying	14.3	42.9	–	42.9	27.8	27.8	5.6	38.9
Mining support service activities	43.8	18.8	–	56.3	70.0	10.0	–	45.0
Manufacturing	21.2	22.3	5.4	58.8	28.5	29.0	6.1	44.4
High tech	14.7	25.6	5.3	57.2	23.3	20.1	5.8	52.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	27.3	27.3	5.5	41.8	28.0	20.0	4.0	48.0
Production of computer, electronic and optical products	13.2	22.5	4.8	62.6	22.9	15.3	5.3	59.5
Manufacture of air and spacecraft and related machinery	5.3	42.1	7.9	47.4	21.2	39.4	9.1	30.3

(continued)

	Enterprises for which product innovations were developed				Enterprises for which business process innovations were developed			
	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts
Medium high tech	21.7	20.8	6.6	59.0	25.8	27.8	7.1	47.9
Production of chemicals and chemical products	27.3	25.0	6.3	47.7	27.1	32.3	5.2	42.7
Manufacture of electrical equipment	19.1	15.6	5.0	68.8	25.6	20.5	5.1	55.1
Manufacture of machinery and equipment not elsewhere classified	15.6	17.4	6.0	68.9	23.2	22.1	9.5	55.8
Manufacture of motor vehicles, trailers and semi-trailers	23.1	23.1	8.8	52.7	25.0	39.6	8.3	37.5
Manufacture of other transport equipment	29.7	35.1	13.5	37.8	22.2	29.6	11.1	48.1
Manufacture of medical and dental instruments and supplies	41.7	25.0	–	41.7	55.6	33.3	–	11.1
Medium low tech	22.6	25.5	5.6	54.6	28.7	33.1	6.7	39.9
Reproduction of recorded media	–	–	–	–	–	–	–	100
Manufacture of coke and refined petroleum products	21.4	39.3	–	39.3	30.8	50.0	3.8	15.4
Manufacture of rubber and plastic products	22.2	18.1	5.6	56.9	31.7	39.0	7.3	26.8
Manufacture of other non-metallic mineral products	40.2	17.1	7.3	50.0	37.7	34.0	3.8	39.6
Manufacture of basic metals	17.5	34.9	9.5	41.3	23.3	41.7	6.7	33.3

(continued)

	Enterprises for which product innovations were developed				Enterprises for which business process innovations were developed			
	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts
Manufacture of fabricated metal products, except machinery and equipment	14.6	29.9	3.5	62.5	23.0	28.3	8.8	49.6
Building of ships and boats	37.5	31.3	6.3	37.5	35.3	41.2	–	35.3
Repair and installation of machinery and equipment	18.4	13.2	7.9	71.1	36.7	6.7	10.0	56.7
Low tech	24.0	18.7	3.7	63.7	34.5	31.3	4.4	40.2
Manufacture of food products	25.1	16.5	3.4	61.5	32.4	28.0	4.9	39.6
Manufacture of beverages	34.0	38.0	2.0	64.0	47.6	50.0	2.4	42.9
Manufacture of tobacco products	20.0	40.0	20.0	80.0	25.0	50.0	25.0	75.0
Manufacture of textiles	13.6	13.6	–	81.8	25.0	25.0	–	58.3
Manufacture of wearing apparel	7.7	7.7	–	84.6	50.0	33.3	–	16.7
Manufacture of leather and related products	22.2	22.2	–	55.6	28.6	42.9	–	28.6
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	40.0	20.0	6.7	46.7	35.3	23.5	5.9	41.2
Manufacture of paper and paper products	15.0	15.0	–	70.0	26.3	26.3	–	47.4
Printing and reproduction of recorded media	22.2	33.3	22.2	33.3	27.3	45.5	9.1	27.3
Manufacture of furniture	–	–	18.2	81.8	57.1	14.3	14.3	14.3
Other manufacturing	10.0	10.0	–	80.0	33.3	22.2	–	44.4

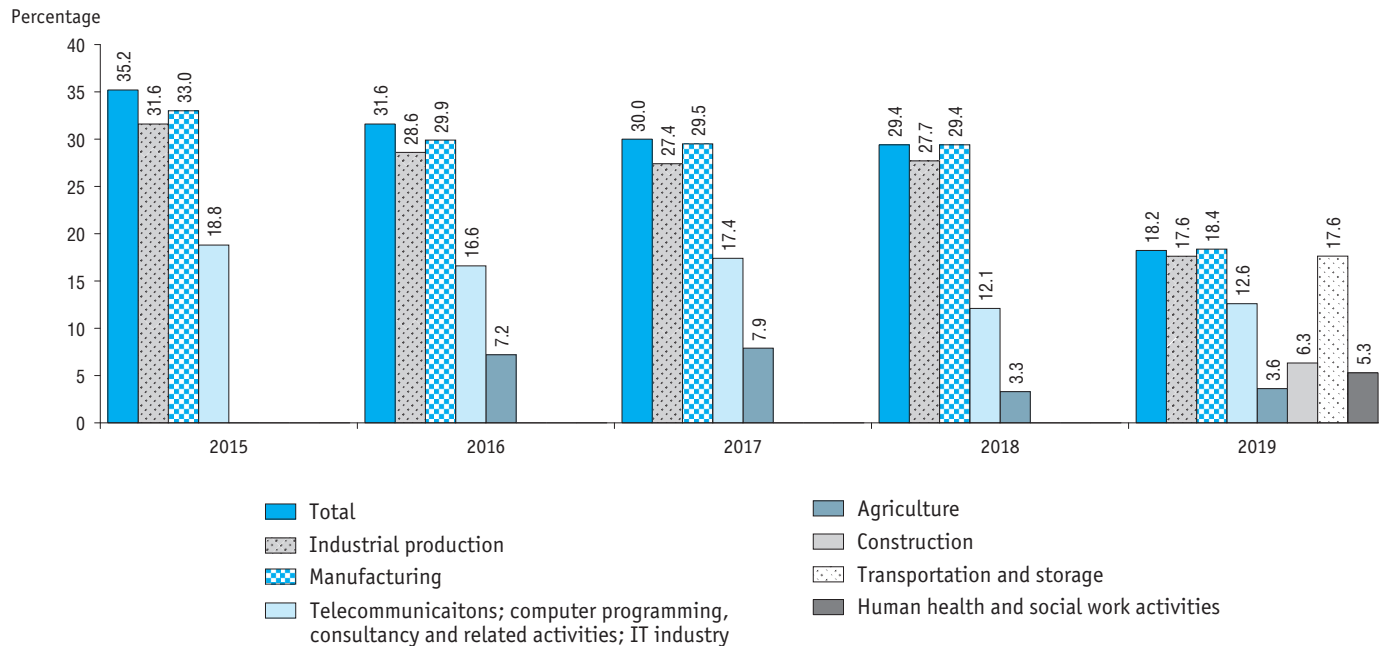
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	Enterprises for which product innovations were developed				Enterprises for which business process innovations were developed			
	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts
Electricity, gas, steam and air-conditioning supply	41.7	15.6	1.0	44.8	57.6	24.1	4.2	24.6
Water supply; sewerage, waste management, and remediation activities	34.9	11.6	2.3	62.8	42.9	36.5	7.9	23.8
Types of economic activity within services sector – total	30.5	18.5	4.3	52.3	44.9	23.2	5.1	33.6
Transportation and storage	37.3	36.9	2.1	27.9	40.9	33.4	3.9	25.6
Publishing activities	44.1	5.9	5.9	44.1	44.4	16.7	2.8	41.7
Telecommunications	31.2	9.4	1.5	59.9	59.9	16.8	–	24.1
Computer programming, consultancy and related activities	11.8	17.8	6.5	68.0	17.9	22.3	15.2	56.3
IT industry	46.8	17.7	6.3	36.7	53.8	27.5	1.3	25.0
Legal and accounting activities	45.2	12.3	4.1	53.4	62.5	13.8	6.3	32.5
Activities of head offices; management consultancy activities	31.3	16.7	6.3	45.8	43.1	25.0	9.7	25.0
Architectural and engineering activities; technical testing and analysis	30.5	14.6	3.7	56.1	40.0	28.7	6.1	30.4
Scientific research and development	14.0	20.4	3.3	68.6	23.6	17.9	4.9	62.6
Advertising and market research	27.3	24.2	3.0	45.5	35.7	21.4	7.1	35.7
Other professional, scientific and technical activities	14.3	–	14.3	71.4	50.0	–	–	50.0
Human health and social work activities	51.5	12.9	7.0	35.8	58.3	24.5	5.9	20.1

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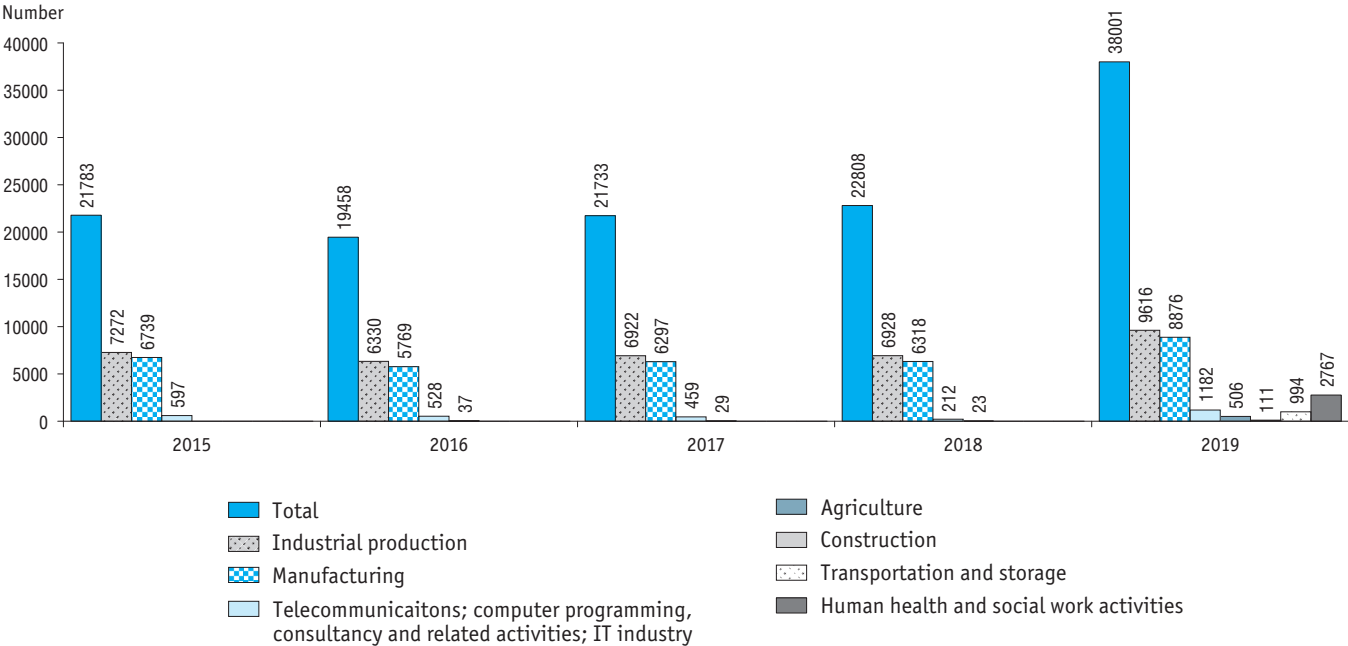
	Enterprises for which product innovations were developed				Enterprises for which business process innovations were developed			
	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts	mainly by other enterprises	jointly with other enterprises	by changing or modifying products developed by another enterprise	mostly through their own efforts
Agriculture – total	35.1	18.6	5.2	52.6	47.9	26.1	8.4	31.9
Growing of non-perennial crops	38.2	11.8	5.9	61.8	52.1	25.0	6.3	37.5
Growing of perennial crops	–	–	–	100	50.0	50.0	–	–
Plant propagation	–	–	–	100	–	–	–	100
Animal production	27.9	25.6	7.0	46.5	40.7	29.6	11.1	31.5
Mixed farming	42.9	14.3	–	42.9	100	–	–	–
Support activities to agriculture and post-harvest crop activities	60.0	20.0	–	40.0	61.5	15.4	7.7	15.4
Construction – total	46.6	18.2	10.2	45.5	64.0	23.0	10.0	28.0

5.2. ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS*



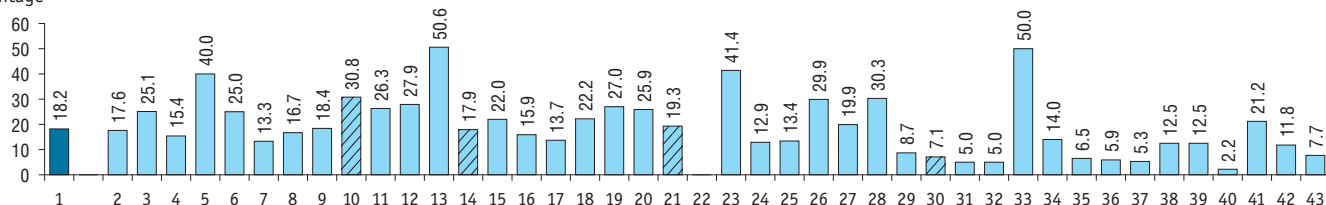
* Here and below in figures 5.3, 5.4, 5.10, tables 5.5, 5.6, 5.7, 5.8, 5.9, the 2019 indicators are calculated for enterprises that engaged in innovative activities; here and below in figure 5.3, until 2019, the indicators are calculated for enterprises that engaged in technological innovation.

5.3. JOINT R&D PROJECTS



5.4. ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS BY TYPE OF ECONOMIC ACTIVITY: 2019

Percentage



1 – total

2 – industrial production – total

3 – mining and quarrying

4 – mining of coal and lignite

5 – extraction of crude petroleum and natural gas

6 – mining of metal ores

7 – other mining and quarrying

8 – mining support service activities

9 – manufacturing

10 – high tech

11 – manufacture of basic pharmaceutical products and pharmaceutical preparations

12 – production of computer, electronic and optical products

13 – manufacture of air and spacecraft and related machinery

14 – medium high tech

15 – production of chemicals and chemical products

16 – manufacture of electrical equipment

17 – manufacture of machinery and equipment not elsewhere classified

18 – manufacture of motor vehicles, trailers and semi-trailers

19 – manufacture of other transport equipment

20 – manufacture of medical and dental instruments and supplies

21 – medium low tech

22 – reproduction of recorded media

23 – manufacture of coke and refined petroleum products

24 – manufacture of rubber and plastic products

25 – manufacture of other non-metallic mineral products

26 – manufacture of basic metals

27 – manufacture of fabricated metal products, except machinery and equipment

28 – building of ships and boats

29 – repair and installation of machinery and equipment

30 – low tech

31 – manufacture of food products

32 – manufacture of beverages

33 – manufacture of tobacco products

34 – manufacture of textiles

35 – manufacture of wearing apparel

36 – manufacture of leather and related products

37 – manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

38 – manufacture of paper and paper products

39 – printing and reproduction of recorded media

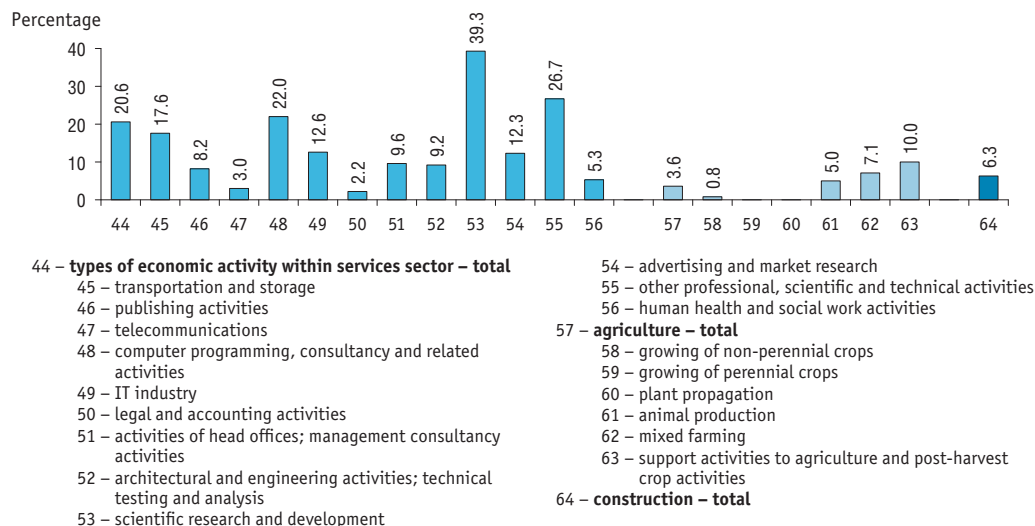
40 – manufacture of furniture

41 – other manufacturing

42 – electricity, gas, steam and air conditioning supply

43 – water supply; sewerage, waste management and remediation activities

(continued)



5.5. PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS BY PARTNER AND TYPE OF ECONOMIC ACTIVITY: 2019

	Enterprises that engaged in joint R&D projects by partner						
	enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Total	34.3	34.3	31.9	8.5	11.5	51.2	32.0
Industrial production – total	36.3	26.8	39.4	6.4	11.6	44.9	29.0
Mining and quarrying	56.5	–	47.8	–	6.5	63.0	19.6
Mining of coal and lignite	50.0	–	–	–	–	100	–
Extraction of crude petroleum and natural gas	58.3	–	62.5	–	4.2	50.0	25.0
Mining of metal ores	62.5	–	25.0	–	–	100	25.0
Other mining and quarrying	50.0	–	50.0	–	25.0	75.0	25.0
Mining support service activities	50.0	–	37.5	–	12.5	50.0	–
Manufacturing	36.3	30.6	38.8	7.2	12.1	43.6	30.3
High tech	39.2	39.2	34.4	9.5	6.3	45.0	31.2
Manufacture of basic pharmaceutical products and pharmaceutical preparations	28.0	8.0	24.0	4.0	12.0	52.0	24.0
Production of computer, electronic and optical products	43.0	45.5	36.4	11.6	5.0	43.8	28.9
Manufacture of air and spacecraft and related machinery	34.9	39.5	34.9	7.0	7.0	44.2	41.9

(continued)

	Enterprises that engaged in joint R&D projects by partner						
	enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Medium high tech	30.8	29.9	32.6	4.9	11.6	40.2	25.4
Production of chemicals and chemical products	33.3	19.6	35.3	2.0	17.6	58.8	33.3
Manufacture of electrical equipment	24.4	37.8	26.7	4.4	13.3	44.4	28.9
Manufacture of machinery and equipment not elsewhere classified	27.0	31.7	27.0	6.3	9.5	34.9	23.8
Manufacture of motor vehicles, trailers and semi-trailers	36.6	34.1	29.3	7.3	7.3	24.4	17.1
Manufacture of other transport equipment	35.3	29.4	52.9	—	5.9	47.1	23.5
Manufacture of medical and dental instruments and supplies	42.9	14.3	71.4	14.3	14.3	—	14.3
Medium low tech	43.7	27.7	46.0	8.5	17.4	50.7	38.0
Reproduction of recorded media	—	—	—	—	—	—	—
Manufacture of coke and refined petroleum products	37.5	4.2	54.2	—	33.3	62.5	33.3
Manufacture of rubber and plastic products	21.1	42.1	36.8	5.3	10.5	36.8	10.5
Manufacture of other non-metallic mineral products	44.0	12.0	48.0	4.0	—	24.0	20.0
Manufacture of basic metals	37.0	21.7	37.0	4.3	30.4	69.6	63.0

(continued)

	Enterprises that engaged in joint R&D projects by partner						
	enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Manufacture of fabricated metal products, except machinery and equipment	53.2	40.3	51.9	11.7	14.3	54.5	41.6
Building of ships and boats	50.0	50.0	40.0	30.0	10.0	50.0	20.0
Repair and installation of machinery and equipment	50.0	8.3	41.7	16.7	8.3	8.3	25.0
Low tech	19.6	13.7	52.9	3.9	13.7	23.5	15.7
Manufacture of food products	21.1	10.5	42.1	5.3	15.8	15.8	5.3
Manufacture of beverages	–	–	66.7	–	–	33.3	–
Manufacture of tobacco products	–	–	100	–	–	–	–
Manufacture of textiles	16.7	16.7	33.3	16.7	16.7	33.3	50.0
Manufacture of wearing apparel	–	50.0	50.0	–	–	50.0	50.0
Manufacture of leather and related products	–	–	100	–	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	–	–	50.0	–	50.0	–	–
Manufacture of paper and paper products	–	33.3	83.3	–	16.7	50.0	33.3
Printing and reproduction of recorded media	50.0	–	–	–	–	–	50.0
Manufacture of furniture	–	100	100	–	100	100	–
Other manufacturing	57.1	–	57.1	–	–	14.3	–

(continued)

	Enterprises that engaged in joint R&D projects by partner						
	enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Electricity, gas, steam and air-conditioning supply	20.0	4.0	36.0	–	8.0	48.0	24.0
Water supply; sewerage, waste management, and remediation activities	23.1	15.4	53.8	7.7	15.4	38.5	15.4
Types of economic activity within services sector – total	32.6	40.1	25.4	10.2	11.3	57.5	35.0
Transportation and storage	31.1	6.6	31.1	1.6	29.5	27.9	19.7
Publishing activities	20.0	40.0	–	–	40.0	–	–
Telecommunications	33.3	22.2	44.4	–	11.1	–	55.6
Computer programming, consultancy and related activities	37.3	49.3	31.3	14.9	26.9	9.0	11.9
IT industry	17.6	35.3	58.8	–	35.3	11.8	5.9
Legal and accounting activities	100	–	33.3	33.3	66.7	33.3	33.3
Activities of head offices; management consultancy activities	38.5	23.1	30.8	7.7	30.8	23.1	38.5
Architectural and engineering activities; technical testing and analysis	40.0	30.0	18.0	10.0	10.0	30.0	24.0
Scientific research and development	32.1	44.9	23.0	10.9	6.0	72.7	40.6
Advertising and market research	33.3	11.1	22.2	–	44.4	22.2	22.2
Other professional, scientific and technical activities	25.0	50.0	50.0	25.0	25.0	50.0	50.0
Human health and social work activities	28.0	28.0	36.0	12.0	16.0	26.0	30.0

(continued)

	Enterprises that engaged in joint R&D projects by partner						
	enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Agriculture – total	45.5	36.4	36.4	–	9.1	18.2	18.2
Growing of non-perennial crops	–	–	100	–	–	–	–
Growing of perennial crops	–	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–	–
Animal production	66.7	33.3	33.3	–	16.7	16.7	16.7
Mixed farming	–	–	100	–	–	–	–
Support activities to agriculture and post-harvest crop activities	33.3	66.7	–	–	–	33.3	33.3
Construction – total	33.3	47.6	47.6	9.5	23.8	9.5	9.5

5.6. JOINT R&D PROJECTS BY PARTNER AND TYPE OF ECONOMIC ACTIVITY: 2019

	Joint projects – total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Total	38001	5216	15507	9112	737	1005	9749	1878
Industrial production – total	9616	1461	2511	3920	266	368	1621	544
Mining and quarrying	493	157	–	146	–	7	177	23
Mining of coal and lignite	2	1	–	–	–	–	2	–
Extraction of crude petroleum and natural gas	303	122	–	84	–	1	81	20
Mining of metal ores	60	15	–	14	–	–	38	2
Other mining and quarrying	59	4	–	4	–	4	47	1
Mining support service activities	69	15	–	44	–	2	9	–
Manufacturing	8876	1274	2503	3656	265	352	1374	488
High tech	3559	365	1016	1836	45	85	359	114
Manufacture of basic pharmaceutical products and pharmaceutical preparations	231	25	6	12	3	58	113	15
Production of computer, electronic and optical products	1889	267	748	815	37	15	170	58
Manufacture of air and spacecraft and related machinery	1439	73	262	1009	5	12	76	41

(continued)

	Joint projects – total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Medium high tech	1518	340	341	496	23	67	256	90
Production of chemicals and chemical products	270	58	27	45	3	32	79	29
Manufacture of electrical equipment	338	48	53	165	9	12	75	17
Manufacture of machinery and equipment not elsewhere classified	475	161	116	140	4	16	35	20
Manufacture of motor vehicles, trailers and semi-trailers	302	53	109	75	6	4	48	17
Manufacture of other transport equipment	120	15	35	63	–	2	19	6
Manufacture of medical and dental instruments and supplies	13	5	1	8	1	1	–	1
Medium low tech	3622	544	1107	1246	193	189	735	274
Reproduction of recorded media	–	–	–	–	–	–	–	–
Manufacture of coke and refined petroleum products	230	34	1	36	–	55	84	25
Manufacture of rubber and plastic products	396	7	276	48	3	4	62	2
Manufacture of other non-metallic mineral products	60	15	13	24	8	–	12	8
Manufacture of basic metals	1245	190	265	338	107	109	185	115

(continued)

	Joint projects – total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Manufacture of fabricated metal products, except machinery and equipment	1465	272	446	660	32	19	377	115
Building of ships and boats	155	14	65	125	40	1	14	3
Repair and installation of machinery and equipment	71	12	41	15	3	1	1	6
Low tech	177	25	39	78	4	11	24	10
Manufacture of food products	29	4	3	11	3	4	3	2
Manufacture of beverages	11	–	–	10	–	–	1	–
Manufacture of tobacco products	7	–	–	7	–	–	–	–
Manufacture of textiles	18	1	1	12	1	1	2	3
Manufacture of wearing apparel	34	–	30	2	–	–	1	1
Manufacture of leather and related products	2	–	–	2	–	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	14	–	–	12	–	2	–	–
Manufacture of paper and paper products	17	–	3	9	–	2	6	3
Printing and reproduction of recorded media	12	11	–	–	–	–	–	1
Manufacture of furniture	3	–	2	1	–	2	1	–
Other manufacturing	30	9	–	12	–	–	10	–

(continued)

	Joint projects – total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Electricity, gas, steam and air-conditioning supply	172	26	5	68	–	4	56	28
Water supply; sewerage, waste management, and remediation activities	75	4	3	50	1	5	14	5
Types of economic activity within services sector – total	27768	3256	12670	5157	468	626	7843	1329
Transportation and storage	994	564	169	133	3	127	200	23
Publishing activities	12	2	8	–	–	2	–	–
Telecommunications	62	4	21	23	–	8	–	6
Computer programming, consultancy and related activities	747	334	443	83	36	97	11	18
IT industry	373	15	90	235	–	41	11	3
Legal and accounting activities	74	6	–	50	15	3	2	1
Activities of head offices; management consultancy activities	166	96	24	10	5	16	10	6
Architectural and engineering activities; technical testing and analysis	449	48	159	81	12	10	104	57
Scientific research and development	21984	2133	9170	4373	378	286	7450	1169
Advertising and market research	65	32	1	2	–	15	5	10
Other professional, scientific and technical activities	75	2	25	45	5	2	2	3
Human health and social work activities	2767	20	2560	122	14	19	48	33

(continued)

	Joint projects – total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Agriculture – total	506	489	266	7	–	1	282	2
Growing of non-perennial crops	4	–	–	4	–	–	–	–
Growing of perennial crops	–	–	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–	–	–
Animal production	30	27	3	2	–	1	1	1
Mixed farming	1	–	–	1	–	–	–	–
Support activities to agriculture and post-harvest crop activities	471	462	263	–	–	–	281	1
Construction – total	111	10	60	28	3	10	3	3

5.7. PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS BY PARTNER COUNTRY AND TYPE OF ECONOMIC ACTIVITY: 2019

	Enterprises that engaged in joint R&D projects by partner country					
	Russia	EAEU countries*	EU countries, EU candidate countries**, United Kingdom, Liechtenstein, Norway, Switzerland	United States and Canada	BRICS countries***	other countries
Total	94.9	11.0	15.3	6.1	8.4	8.9
Industrial production – total	94.5	7.1	12.8	3.3	4.6	4.5
Mining and quarrying	97.8	4.3	6.5	4.3	–	4.3
Mining of coal and lignite	100	–	–	–	–	–
Extraction of crude petroleum and natural gas	100	–	–	–	–	–
Mining of metal ores	100	12.5	25.0	12.5	–	12.5
Other mining and quarrying	100	–	25.0	25.0	–	25.0
Mining support service activities	87.5	12.5	–	–	–	–
Manufacturing	93.8	8.0	14.3	3.5	5.2	4.6
High tech	97.4	4.2	4.8	1.6	3.2	3.2
Manufacture of basic pharmaceutical products and pharmaceutical preparations	92.0	4.0	12.0	4.0	8.0	8.0
Production of computer, electronic and optical products	99.2	5.0	5.0	1.7	2.5	2.5
Manufacture of air and spacecraft and related machinery	95.3	2.3	–	–	2.3	2.3
Medium high tech	92.0	12.5	17.0	3.1	7.6	5.8
Production of chemicals and chemical products	90.2	13.7	29.4	5.9	9.8	7.8
Manufacture of electrical equipment	97.8	11.1	11.1	4.4	8.9	2.2

(continued)

	Enterprises that engaged in joint R&D projects by partner country					
	Russia	EAEU countries*	EU countries, EU candidate countries**, United Kingdom, Liechtenstein, Norway, Switzerland	United States and Canada	BRICS countries***	other countries
Manufacture of machinery and equipment not elsewhere classified	95.2	12.7	6.3	–	3.2	3.2
Manufacture of motor vehicles, trailers and semi-trailers	80.5	12.2	29.3	4.9	9.8	9.8
Manufacture of other transport equipment	94.1	17.6	11.8	–	11.8	11.8
Manufacture of medical and dental instruments and supplies	100	–	–	–	–	–
Medium low tech	94.8	8.0	19.2	6.6	4.7	3.3
Reproduction of recorded media	–	–	–	–	–	–
Manufacture of coke and refined petroleum products	91.7	4.2	41.7	25.0	–	–
Manufacture of rubber and plastic products	89.5	10.5	36.8	5.3	10.5	5.3
Manufacture of other non-metallic mineral products	80.0	12.0	28.0	–	–	–
Manufacture of basic metals	97.8	8.7	26.1	8.7	4.3	6.5
Manufacture of fabricated metal products, except machinery and equipment	100	7.8	3.9	1.3	6.5	2.6
Building of ships and boats	100	10.0	10.0	10.0	10.0	10.0
Repair and installation of machinery and equipment	91.7	–	8.3	8.3	–	–

(continued)

	Enterprises that engaged in joint R&D projects by partner country					
	Russia	EAEU countries*	EU countries, EU candidate countries**, United Kingdom, Liechtenstein, Norway, Switzerland	United States and Canada	BRICS countries***	other countries
Low tech	84.3	2.0	17.6	–	3.9	9.8
Manufacture of food products	84.2	5.3	15.8	–	5.3	5.3
Manufacture of beverages	100	–	–	–	–	33.3
Manufacture of tobacco products	50.0	–	50.0	–	–	–
Manufacture of textiles	100	–	16.7	–	–	–
Manufacture of wearing apparel	100	–	–	–	–	–
Manufacture of leather and related products	–	–	–	–	–	100
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	100	–	50.0	–	–	50.0
Manufacture of paper and paper products	66.7	–	16.7	–	16.7	–
Printing and reproduction of recorded media	100	–	–	–	–	–
Manufacture of furniture	100	–	–	–	–	–
Other manufacturing	85.7	–	28.6	–	–	14.3
Electricity, gas, steam and air-conditioning supply	100	–	2.0	–	2.0	–
Water supply; sewerage, waste management, and remediation activities	100	–	–	–	–	15.4

(continued)

	Enterprises that engaged in joint R&D projects by partner country					
	Russia	EAEU countries*	EU countries, EU candidate countries**, United Kingdom, Liechtenstein, Norway, Switzerland	United States and Canada	BRICS countries***	other countries
Types of economic activity within services sector – total	95.3	14.1	17.4	8.2	11.4	12.4
Transportation and storage	90.2	3.3	4.9	4.9	–	4.9
Publishing activities	100	–	–	–	–	–
Telecommunications	100	11.1	11.1	–	–	11.1
Computer programming, consultancy and related activities	85.1	11.9	10.4	10.4	4.5	9.0
IT industry	94.1	11.8	11.8	11.8	–	11.8
Legal and accounting activities	100	–	–	–	–	–
Activities of head offices; management consultancy activities	100	7.7	7.7	–	15.4	–
Architectural and engineering activities; technical testing and analysis	96.0	8.0	10.0	2.0	4.0	4.0
Scientific research and development	96.5	16.9	21.1	8.9	14.4	15.1
Advertising and market research	88.9	11.1	11.1	33.3	22.2	11.1
Other professional, scientific and technical activities	100	–	–	25.0	–	–
Human health and social work activities	96.0	6.0	10.0	4.0	6.0	4.0

(continued)

	Enterprises that engaged in joint R&D projects by partner country					
	Russia	EAEU countries*	EU countries, EU candidate countries**, United Kingdom, Liechtenstein, Norway, Switzerland	United States and Canada	BRICS countries***	other countries
Agriculture – total	81.8	36.4	36.4	27.3	27.3	27.3
Growing of non-perennial crops	100	–	–	–	–	–
Growing of perennial crops	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–
Animal production	83.3	33.3	33.3	16.7	33.3	16.7
Mixed farming	100	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	66.7	66.7	66.7	66.7	33.3	66.7
Construction – total	95.2	–	–	–	4.8	–

* Here and below in table 5.8, Armenia, Belarus, Kazakhstan, and Kyrgyzstan.

** Here and below in table 5.8, Albania, Bosnia and Herzegovina, Iceland, Kosovo, North Macedonia, Serbia, Turkey, and Montenegro.

*** Here and below in table 5.8, Brazil, India, China, and South Africa.

5.8. PERCENTAGE DISTRIBUTION OF JOINT R&D PROJECTS BY PARTNER COUNTRY: 2019

	Joint projects – total	Of which by partner country, <i>percentage</i>					
		Russia	EAEU countries	EU countries, EU candidate countries, United Kingdom, Liechtenstein, Norway, Switzerland	United States and Canada	BRICS countries	other countries
Total	38001	92.0	2.1	4.5	0.9	1.0	1.4
Industrial production – total	9616	92.4	2.6	3.9	1.2	1.1	1.0
Manufacturing	8876	92.0	2.7	4.0	1.3	1.2	0.9
Types of economic activity within services sector – total	27768	92.6	1.9	3.9	0.7	0.9	1.5
Telecommunications; computer programming, consultancy and related activities; IT industry:	1182	93.1	1.8	1.4	2.5	0.4	1.5
Transportation and storage	994	98.6	0.2	0.6	0.3	–	0.3
Human health and social work activities	2767	99.5	0.3	0.4	0.2	0.1	0.1
Agriculture – total	506	45.3	6.3	51.4	2.2	2.4	4.2
Construction – total	111	99.1	–	–	–	0.9	–

5.9. PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS BY TYPE OF COOPERATION TIES AND ECONOMIC ACTIVITY: 2019

	Enterprises that engaged in joint R&D projects by type of cooperation ties		
	permanent cooperation	project-based cooperation	informal cooperation
Total	42.5	77.4	10.2
Industrial production – total	41.2	76.6	7.6
Mining and quarrying	41.3	84.8	6.5
Mining of coal and lignite	50.0	50.0	–
Extraction of crude petroleum and natural gas	45.8	83.3	4.2
Mining of metal ores	50.0	87.5	25.0
Other mining and quarrying	75.0	75.0	–
Mining support service activities	–	100	–
Manufacturing	43.3	74.6	8.4
High tech	40.7	77.2	5.3
Manufacture of basic pharmaceutical products and pharmaceutical preparations	28.0	84.0	–
Production of computer, electronic and optical products	47.1	73.6	5.0
Manufacture of air and spacecraft and related machinery	30.2	83.7	9.3
Medium high tech	44.2	70.1	11.2
Production of chemicals and chemical products	47.1	74.5	21.6
Manufacture of electrical equipment	42.2	73.3	6.7
Manufacture of machinery and equipment not elsewhere classified	46.0	61.9	11.1
Manufacture of motor vehicles, trailers and semi-trailers	36.6	75.6	7.3
Manufacture of other transport equipment	47.1	64.7	5.9
Manufacture of medical and dental instruments and supplies	57.1	71.4	–
Medium low tech	46.9	77.9	8.5
Reproduction of recorded media	–	–	–

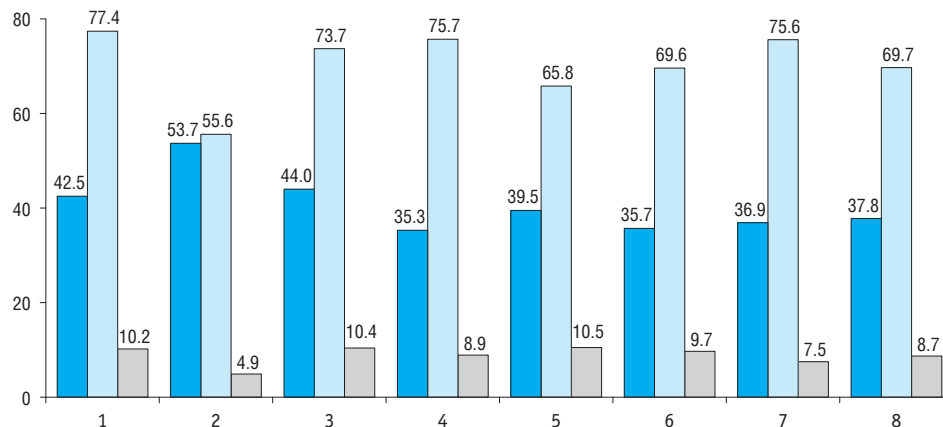
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	Enterprises that engaged in joint R&D projects by type of cooperation ties		
	permanent cooperation	project-based cooperation	informal cooperation
Manufacture of coke and refined petroleum products	41.7	75.0	8.3
Manufacture of rubber and plastic products	26.3	78.9	10.5
Manufacture of other non-metallic mineral products	32.0	76.0	8.0
Manufacture of basic metals	45.7	84.8	10.9
Manufacture of fabricated metal products, except machinery and equipment	58.4	79.2	6.5
Building of ships and boats	50.0	80.0	20.0
Repair and installation of machinery and equipment	50.0	50.0	–
Low tech	33.3	70.6	7.8
Manufacture of food products	31.6	68.4	5.3
Manufacture of beverages	66.7	66.7	–
Manufacture of tobacco products	50.0	50.0	–
Manufacture of textiles	33.3	83.3	–
Manufacture of wearing apparel	100	–	50.0
Manufacture of leather and related products	–	100	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	–	50.0	50.0
Manufacture of paper and paper products	16.7	83.3	16.7
Printing and reproduction of recorded media	50.0	50.0	–
Manufacture of furniture	100	–	–
Other manufacturing	14.3	100	–
Electricity, gas, steam and air-conditioning supply	10.0	98.0	–
Water supply; sewerage, waste management, and remediation activities	53.8	69.2	–

(continued)

	Enterprises that engaged in joint R&D projects by type of cooperation ties		
	permanent cooperation	project-based cooperation	informal cooperation
Types of economic activity within services sector – total	43.4	78.6	12.0
Transportation and storage	26.2	82.0	–
Publishing activities	60.0	60.0	–
Telecommunications	33.3	88.9	–
Computer programming, consultancy and related activities	46.3	67.2	9.0
IT industry	58.8	82.4	–
Legal and accounting activities	66.7	33.3	66.7
Activities of head offices; management consultancy activities	46.2	69.2	23.1
Architectural and engineering activities; technical testing and analysis	26.0	76.0	12.0
Scientific research and development	46.7	80.5	13.1
Advertising and market research	33.3	77.8	11.1
Other professional, scientific and technical activities	25.0	75.0	–
Human health and social work activities	30.0	70.0	18.0
Agriculture – total	45.5	36.4	54.5
Growing of non-perennial crops	–	100	–
Growing of perennial crops	–	–	–
Plant propagation	–	–	–
Animal production	50.0	16.7	66.7
Mixed farming	–	100	–
Support activities to agriculture and post-harvest crop activities	66.7	33.3	66.7
Construction – total	47.6	76.2	–

5.10. R&D COOPERATION BY TYPE OF COOPERATION TIES: 2019

(as a percentage of all enterprises that engaged in joint projects)

1 – total

2 – enterprises within a single network (group of companies, holding company, consortium, association, etc.)

3 – consumers of goods and services

4 – suppliers of equipment, materials, components, software

5 – competitors in the industry

6 – consulting firms, IT services providers

7 – research institutes

8 – higher education institutions

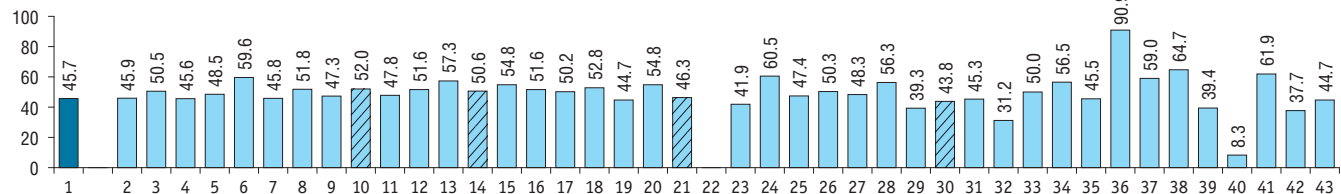
Permanent cooperation

Project-based cooperation

Informal cooperation

5.11. ENTERPRISES THAT ENGAGED IN COOPERATION WITHIN A SINGLE NETWORK* BY TYPE OF ECONOMIC ACTIVITY: 2019

(as a percentage of all enterprises that belong to a network)



1 – total

2 – industrial production – total

3 – mining and quarrying

4 – mining of coal and lignite

5 – extraction of crude petroleum and natural gas

6 – mining of metal ores

7 – other mining and quarrying

8 – mining support service activities

9 – manufacturing

10 – high tech

11 – manufacture of basic pharmaceutical products and pharmaceutical preparations

12 – production of computer, electronic and optical products

13 – manufacture of air and spacecraft and related machinery

14 – medium high tech

15 – production of chemicals and chemical products

16 – manufacture of electrical equipment

17 – manufacture of machinery and equipment not elsewhere classified

18 – manufacture of motor vehicles, trailers and semi-trailers

19 – manufacture of other transport equipment

20 – manufacture of medical and dental instruments and supplies

21 – medium low tech

22 – reproduction of recorded media

23 – manufacture of coke and refined petroleum products

24 – manufacture of rubber and plastic products

25 – manufacture of other non-metallic mineral products

26 – manufacture of basic metals

27 – manufacture of fabricated metal products, except machinery and equipment

28 – building of ships and boats

29 – repair and installation of machinery and equipment

30 – low tech

31 – manufacture of food products

32 – manufacture of beverages

33 – manufacture of tobacco products

34 – manufacture of textiles

35 – manufacture of wearing apparel

36 – manufacture of leather and related products

37 – manufacture of wood and of products of wood and cork, except furniture;

manufacture of articles of straw and plaiting materials

38 – manufacture of paper and paper products

39 – printing and reproduction of recorded media

40 – manufacture of furniture

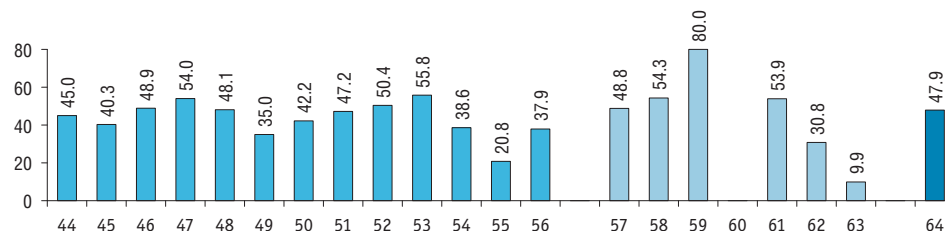
41 – other manufacturing

42 – electricity, gas, steam and air conditioning supply

43 – water supply; sewerage, waste management and remediation activities

* Acquisition (transfer) of scientific and technical knowledge (technologies), financial resources, business functions (production functions); exchange of employees.

(continued)

**44 – types of economic activity within services sector – total**

- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

54 – advertising and market research

55 – other professional, scientific and technical activities

56 – human health and social work activities

57 – agriculture – total

58 – growing of non-perennial crops

59 – growing of perennial crops

60 – plant propagation

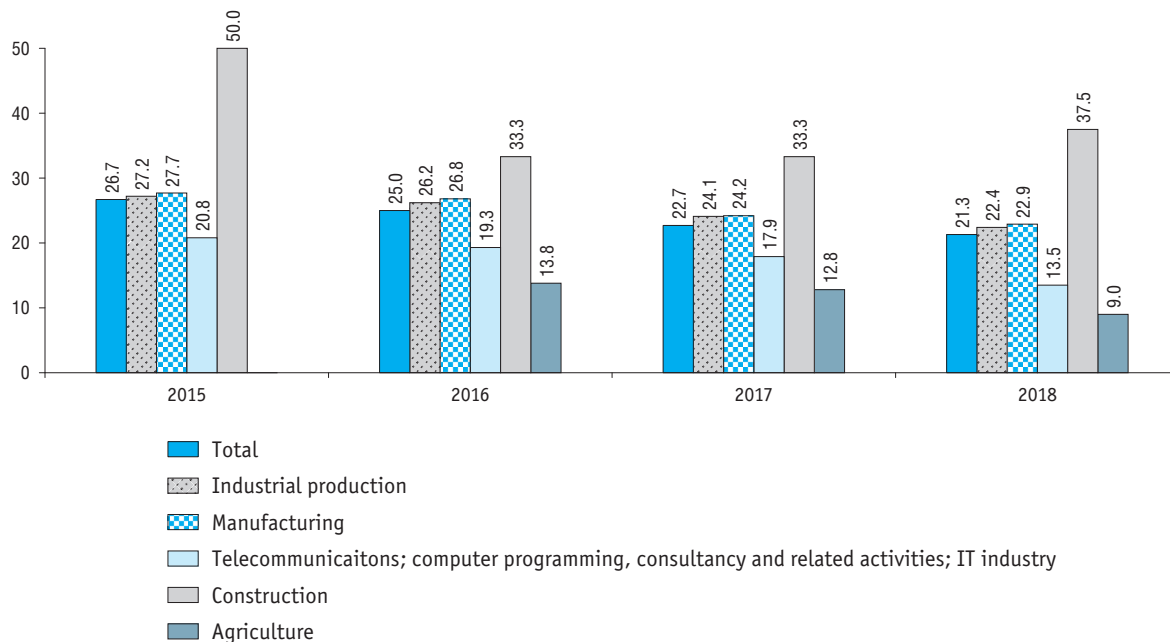
61 – animal production

62 – mixed farming

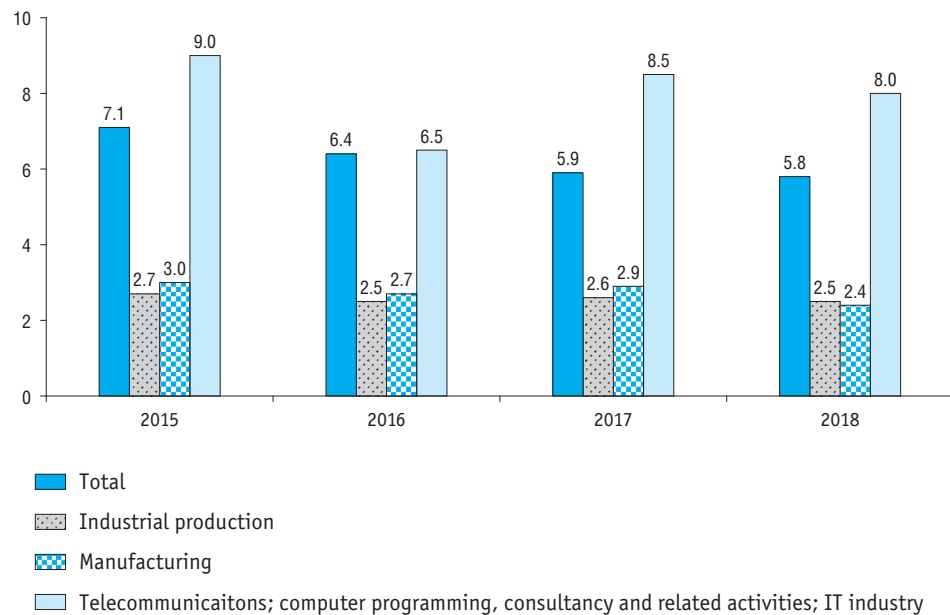
63 – support activities to agriculture and post-harvest crop activities

64 – construction – total

5.12. ENTERPRISES THAT ACQUIRED NEW TECHNOLOGIES AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES*



* Here and below in figure 5.13, table. 5.14, 5.15, 5.16, 5.17, the indicators are calculated for enterprises that had expenditure on technological innovation.

5.13. ENTERPRISES THAT TRANSFERRED NEW TECHNOLOGIES AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES

5.14. ENTERPRISES THAT ENGAGED IN TECHNOLOGICAL EXCHANGE AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES BY TYPE OF ECONOMIC ACTIVITY: 2018

	Enterprises that acquired new technologies	Enterprises that transferred new technologies
Total	21.3	5.8
Industrial production – total	22.4	2.5
Mining and quarrying	18.4	7.0
Mining of coal and lignite	40.0	–
Extraction of crude petroleum and natural gas	19.0	12.1
Mining of metal ores	–	–
Other mining and quarrying	11.8	–
Mining support service activities	28.6	4.8
Manufacturing	22.9	2.4
High tech	28.4	3.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	22.2	1.9
Production of computer, electronic and optical products	29.0	2.8
Manufacture of air and spacecraft and related machinery	32.6	6.5
Medium high tech	22.7	2.8
Production of chemicals and chemical products	19.0	1.5
Manufacture of electrical equipment	24.1	3.8
Manufacture of machinery and equipment not elsewhere classified	20.9	1.7
Manufacture of motor vehicles, trailers and semi-trailers	29.8	2.4
Manufacture of other transport equipment	25.8	12.9
Manufacture of medical and dental instruments and supplies	16.7	–
Medium low tech	28.3	2.6
Manufacture of coke and refined petroleum products	37.1	5.7

(continued)

	Enterprises that acquired new technologies	Enterprises that transferred new technologies
Manufacture of rubber and plastic products	23.3	2.7
Manufacture of other non-metallic mineral products	18.1	1.2
Manufacture of basic metals	33.3	1.2
Manufacture of fabricated metal products, except machinery and equipment	28.3	4.2
Building of ships and boats	57.1	–
Repair and installation of machinery and equipment	30.0	–
Low tech	13.3	0.9
Manufacture of food products	11.1	0.4
Manufacture of beverages	13.6	–
Manufacture of tobacco products	–	–
Manufacture of textiles	4.0	4.0
Manufacture of wearing apparel	13.3	–
Manufacture of leather and related products	12.5	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	30.4	–
Manufacture of paper and paper products	18.8	–
Printing and reproduction of recorded media	20.0	13.3
Manufacture of furniture	11.1	–
Other manufacturing	36.4	–
Electricity, gas, steam and air-conditioning supply	19.1	1.5
Water supply; sewerage, waste management, and remediation activities	26.0	2.6

(continued)

	Enterprises that acquired new technologies	Enterprises that transferred new technologies
Types of economic activity within services sector – total	21.1	12.4
Transportation and storage	...	...
Publishing activities	22.2	–
Telecommunications	5.4	–
Computer programming, consultancy and related activities	21.6	22.7
IT industry	30.6	12.2
Legal and accounting activities	34.2	–
Activities of head offices; management consultancy activities	14.3	2.4
Architectural and engineering activities; technical testing and analysis	21.4	10.7
Scientific research and development	23.9	18.4
Advertising and market research	16.7	5.6
Other professional, scientific and technical activities	40.0	–
Human health and social work activities	...	...
Agriculture – total	9.0	–
Growing of non-perennial crops	6.4	–
Growing of perennial crops	–	–
Plant propagation	–	–
Animal production	12.2	–
Mixed farming	–	–
Support activities to agriculture and post-harvest crop activities	25.0	–
Construction – total	37.5	–

5.15. IMPORTS AND EXPORTS OF TECHNOLOGIES BY ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES BY TYPE OF ECONOMIC ACTIVITY: 2018

	Enterprises that acquired new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies			Enterprises that transferred new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies		
	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia
Total	29.6	3.9	25.7	19.6	7.6	12.1
Industrial production – total	36.5	5.0	31.5	12.1	6.9	5.2
Mining and quarrying	14.3	–	14.3	–	–	–
Mining of coal and lignite	100	–	100	–	–	–
Extraction of crude petroleum and natural gas	–	–	–	–	–	–
Mining of metal ores	–	–	–	–	–	–
Other mining and quarrying	50.0	–	50.0	–	–	–
Mining support service activities	–	–	–	–	–	–
Manufacturing	41.1	5.8	35.3	15.9	9.1	6.8
High tech	39.0	5.0	34.0	9.1	9.1	–
Manufacture of basic pharmaceutical products and pharmaceutical preparations	50.0	–	50.0	–	–	–
Production of computer, electronic and optical products	32.9	5.5	27.4	14.3	14.3	–
Manufacture of air and spacecraft and related machinery	60.0	6.7	53.3	–	–	–
Medium high tech	46.1	3.9	42.2	18.8	12.5	6.3
Production of chemicals and chemical products	50.0	3.8	46.2	50.0	50.0	–

(continued)

	Enterprises that acquired new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies			Enterprises that transferred new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies		
	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia
Manufacture of electrical equipment	46.9	3.1	43.8	20.0	20.0	–
Manufacture of machinery and equipment not elsewhere classified	47.2	5.6	41.7	–	–	–
Manufacture of motor vehicles, trailers and semi-trailers	44.0	4.0	40.0	50.0	–	50.0
Manufacture of other transport equipment	37.5	–	37.5	–	–	–
Manufacture of medical and dental instruments and supplies	–	–	–	–	–	–
Medium low tech	38.8	9.4	29.5	15.4	7.7	7.7
Manufacture of coke and refined petroleum products	69.2	23.1	46.2	–	–	–
Manufacture of rubber and plastic products	23.5	11.8	11.8	–	–	–
Manufacture of other non-metallic mineral products	60.0	–	60.0	100	–	100
Manufacture of basic metals	33.3	7.4	25.9	–	–	–
Manufacture of fabricated metal products, except machinery and equipment	36.2	8.5	27.7	14.3	14.3	–
Building of ships and boats	37.5	25.0	12.5	–	–	–
Repair and installation of machinery and equipment	25.0	–	25.0	–	–	–

(continued)

	Enterprises that acquired new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies			Enterprises that transferred new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies		
	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia
Low tech	39.3	3.3	36.1	25.0	–	25.0
Manufacture of food products	36.7	–	36.7	–	–	–
Manufacture of beverages	50.0	16.7	33.3	–	–	–
Manufacture of tobacco products	–	–	–	–	–	–
Manufacture of textiles	–	–	–	–	–	–
Manufacture of wearing apparel	50.0	–	50.0	–	–	–
Manufacture of leather and related products	–	–	–	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	28.6	–	28.6	–	–	–
Manufacture of paper and paper products	50.0	–	50.0	–	–	–
Printing and reproduction of recorded media	66.7	33.3	33.3	50.0	–	50.0
Manufacture of furniture	–	–	–	–	–	–
Other manufacturing	50.0	–	50.0	–	–	–
Electricity, gas, steam and air-conditioning supply	19.6	2.0	17.6	–	–	–
Water supply; sewerage, waste management, and remediation activities	5.0	–	5.0	–	–	–

(continued)

	Enterprises that acquired new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies			Enterprises that transferred new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies		
	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia
Types of economic activity within services sector – total	17.0	2.1	14.9	22.3	7.8	14.5
Transportation and storage	...	...	...	...	...	...
Publishing activities	37.5	–	37.5	–	–	–
Telecommunications	9.1	–	9.1	–	–	–
Computer programming, consultancy and related activities	4.8	–	4.8	31.8	9.1	22.7
IT industry	6.7	–	6.7	50.0	16.7	33.3
Legal and accounting activities	3.7	–	3.7	–	–	–
Activities of head offices; management consultancy activities	–	–	–	–	–	–
Architectural and engineering activities; technical testing and analysis	20.6	5.9	14.7	23.5	5.9	17.6
Scientific research and development	21.9	2.6	19.4	18.5	7.6	10.9
Advertising and market research	–	–	–	100	–	100
Other professional, scientific and technical activities	–	–	–	–	–	–
Human health and social work activities	...	...	...	...	...	...

(continued)

	Enterprises that acquired new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies			Enterprises that transferred new technologies outside Russia as a percentage of the total number of enterprises that acquired new technologies		
	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia	total	in CIS countries	in foreign countries excluding the CIS countries, Baltic States, Republic of Georgia
Agriculture – total	31.6	–	31.6	–	–	–
Growing of non-perennial crops	60.0	–	60.0	–	–	–
Growing of perennial crops	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–
Animal production	30.0	–	30.0	–	–	–
Mixed farming	–	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	–	–	–	–	–	–
Construction – total	–	–	–	–	–	–

5.16. TECHNOLOGY ACQUISITION BY ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES BY TYPE OF ECONOMIC ACTIVITY: 2018

	Enterprises that acquired new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	purchase of equipment	targeted recruitment of skilled professionals	other
Total	23.9	14.8	7.5	57.0	13.7	19.8
Industrial production – total	22.7	15.4	7.9	61.7	10.4	17.3
Mining and quarrying	42.9	23.8	–	42.9	–	14.3
Mining of coal and lignite	–	–	–	100	–	–
Extraction of crude petroleum and natural gas	63.6	27.3	–	27.3	–	9.1
Mining of metal ores	–	–	–	–	–	–
Other mining and quarrying	–	–	–	100	–	–
Mining support service activities	33.3	33.3	–	33.3	–	33.3
Manufacturing	23.1	14.0	9.3	62.1	12.6	17.5
High tech	25.0	19.0	9.0	70.0	18.0	20.0
Manufacture of basic pharmaceutical products and pharmaceutical preparations	50.0	25.0	25.0	66.7	8.3	8.3
Production of computer, electronic and optical products	21.9	21.9	5.5	67.1	21.9	20.5
Manufacture of air and spacecraft and related machinery	20.0	–	13.3	86.7	6.7	26.7
Medium high tech	26.6	18.8	15.6	55.5	9.4	10.2
Production of chemicals and chemical products	26.9	30.8	15.4	50.0	11.5	19.2

(continued)

	Enterprises that acquired new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	purchase of equipment	targeted recruitment of skilled professionals	other
Manufacture of electrical equipment	28.1	15.6	9.4	56.3	6.3	9.4
Manufacture of machinery and equipment not elsewhere classified	19.4	16.7	11.1	63.9	11.1	5.6
Manufacture of motor vehicles, trailers and semi-trailers	32.0	8.0	28.0	40.0	8.0	12.0
Manufacture of other transport equipment	37.5	37.5	25.0	75.0	12.5	–
Manufacture of medical and dental instruments and supplies	–	–	–	100	–	–
Medium low tech	22.3	10.1	6.5	56.1	12.2	24.5
Manufacture of coke and refined petroleum products	38.5	30.8	7.7	23.1	15.4	61.5
Manufacture of rubber and plastic products	17.6	–	5.9	52.9	17.6	17.6
Manufacture of other non-metallic mineral products	20.0	13.3	–	66.7	6.7	13.3
Manufacture of basic metals	18.5	25.9	11.1	44.4	11.1	25.9
Manufacture of fabricated metal products, except machinery and equipment	21.3	2.1	8.5	72.3	12.8	17.0
Building of ships and boats	37.5	–	–	37.5	12.5	25.0
Repair and installation of machinery and equipment	16.7	–	–	58.3	8.3	33.3

(continued)

	Enterprises that acquired new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	purchase of equipment	targeted recruitment of skilled professionals	other
Low tech	14.8	4.9	3.3	77.0	11.5	13.1
Manufacture of food products	13.3	3.3	–	76.7	3.3	16.7
Manufacture of beverages	–	16.7	–	100	–	–
Manufacture of tobacco products	–	–	–	–	–	–
Manufacture of textiles	–	–	–	–	100	–
Manufacture of wearing apparel	–	–	–	100	–	–
Manufacture of leather and related products	–	–	–	100	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	–	–	–	71.4	42.9	–
Manufacture of paper and paper products	16.7	–	16.7	100	16.7	16.7
Printing and reproduction of recorded media	66.7	–	–	66.7	–	–
Manufacture of furniture	–	–	–	–	–	100
Other manufacturing	50.0	25.0	25.0	50.0	25.0	25.0
Electricity, gas, steam and air-conditioning supply	15.7	29.4	2.0	56.9	–	13.7
Water supply; sewerage, waste management, and remediation activities	10.0	–	–	85.0	–	25.0

(continued)

	Enterprises that acquired new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	purchase of equipment	targeted recruitment of skilled professionals	other
Types of economic activity within services sector – total	26.6	14.5	7.1	48.6	20.2	23.8
Transportation and storage	...	...	...	...	...	...
Publishing activities	25.0	–	–	25.0	–	50.0
Telecommunications	9.1	9.1	–	54.5	9.1	45.5
Computer programming, consultancy and related activities	42.9	19.0	–	33.3	9.5	19.0
IT industry	26.7	6.7	6.7	40.0	6.7	33.3
Legal and accounting activities	25.9	3.7	–	63.0	7.4	14.8
Activities of head offices; management consultancy activities	50.0	–	–	16.7	–	66.7
Architectural and engineering activities; technical testing and analysis	14.7	2.9	–	52.9	20.6	29.4
Scientific research and development	27.7	21.3	12.3	49.7	27.7	18.7
Advertising and market research	33.3	–	–	100	33.3	–
Other professional, scientific and technical activities	–	–	–	–	–	100
Human health and social work activities	...	...	...	...	...	...

(continued)

	Enterprises that acquired new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	purchase of equipment	targeted recruitment of skilled professionals	other
Agriculture – total	21.1	5.3	5.3	52.6	10.5	26.3
Growing of non-perennial crops	40.0	–	–	20.0	20.0	40.0
Growing of perennial crops	–	–	–	–	–	–
Plant propagation	–	–	–	–	–	–
Animal production	20.0	–	10.0	70.0	10.0	20.0
Mixed farming	–	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	–	25.0	–	50.0	–	25.0
Construction – total	–	–	–	66.7	–	33.3

5.17. TECHNOLOGY TRANSFER BY ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES BY TYPE OF ECONOMIC ACTIVITY: 2018

	Enterprises that transferred new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	sale of equipment	transfer of skilled professionals after being recruited	other
Total	42.4	44.6	12.1	9.8	5.4	12.1
Industrial production – total	46.6	22.4	17.2	15.5	6.9	10.3
Mining and quarrying	100	–	–	–	–	–
Mining of coal and lignite	–	–	–	–	–	–
Extraction of crude petroleum and natural gas	100	–	–	–	–	–
Mining of metal ores	–	–	–	–	–	–
Other mining and quarrying	–	–	–	–	–	–
Mining support service activities	100	–	–	–	–	–
Manufacturing	31.8	29.5	22.7	20.5	6.8	13.6
High tech	36.4	45.5	18.2	9.1	–	9.1
Manufacture of basic pharmaceutical products and pharmaceutical preparations	100	100	–	–	–	–
Production of computer, electronic and optical products	42.9	42.9	14.3	–	–	14.3
Manufacture of air and spacecraft and related machinery	–	33.3	33.3	33.3	–	–
Medium high tech	25.0	31.3	25.0	18.8	6.3	6.3
Production of chemicals and chemical products	–	50.0	50.0	–	–	–

(continued)

	Enterprises that transferred new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	sale of equipment	transfer of skilled professionals after being recruited	other
Manufacture of electrical equipment	40.0	–	20.0	40.0	20.0	–
Manufacture of machinery and equipment not elsewhere classified	–	66.7	–	33.3	–	–
Manufacture of motor vehicles, trailers and semi-trailers	50.0	50.0	–	–	–	50.0
Manufacture of other transport equipment	25.0	25.0	50.0	–	–	–
Manufacture of medical and dental instruments and supplies	–	–	–	–	–	–
Medium low tech	30.8	15.4	23.1	23.1	7.7	30.8
Manufacture of coke and refined petroleum products	–	–	–	50.0	50.0	100
Manufacture of rubber and plastic products	–	50.0	–	50.0	–	–
Manufacture of other non-metallic mineral products	100	–	–	–	–	–
Manufacture of basic metals	100	–	100	–	–	100
Manufacture of fabricated metal products, except machinery and equipment	28.6	14.3	28.6	14.3	–	14.3
Building of ships and boats	–	–	–	–	–	–
Repair and installation of machinery and equipment	–	–	–	–	–	–

(continued)

	Enterprises that transferred new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	sale of equipment	transfer of skilled professionals after being recruited	other
Low tech	50.0	25.0	25.0	50.0	25.0	–
Manufacture of food products	–	–	–	100	–	–
Manufacture of beverages	–	–	–	–	–	–
Manufacture of tobacco products	–	–	–	–	–	–
Manufacture of textiles	–	–	–	–	100	–
Manufacture of wearing apparel	–	–	–	–	–	–
Manufacture of leather and related products	–	–	–	–	–	–
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	–	–	–	–	–	–
Manufacture of paper and paper products	–	–	–	–	–	–
Printing and reproduction of recorded media	100	50.0	50.0	50.0	–	–
Manufacture of furniture	–	–	–	–	–	–
Other manufacturing	–	–	–	–	–	–

(continued)

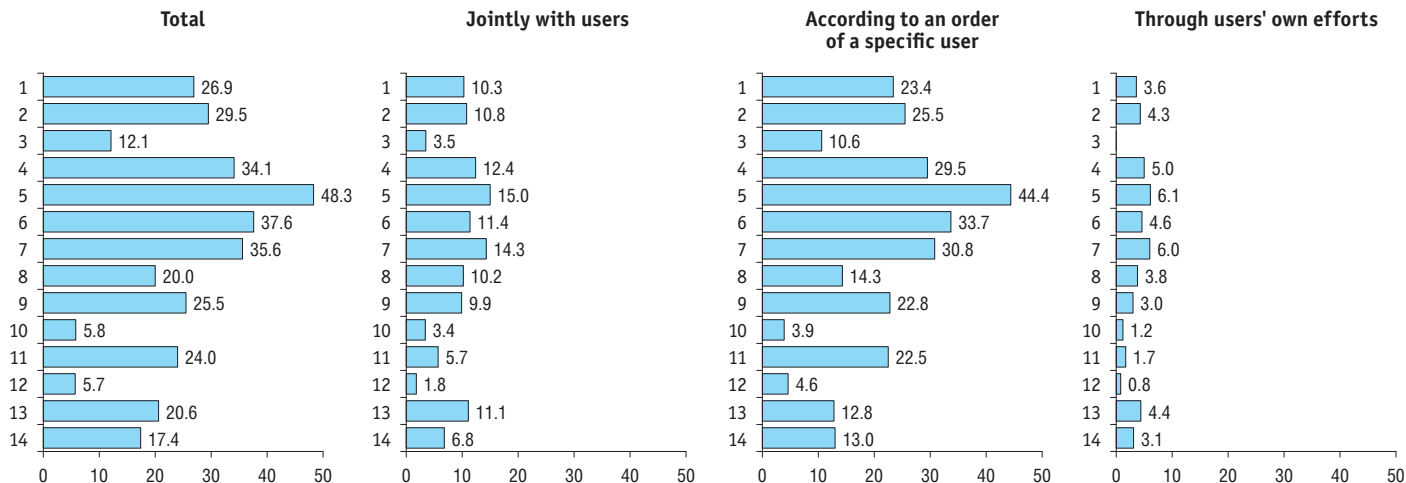
	Enterprises that transferred new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	sale of equipment	transfer of skilled professionals after being recruited	other
Electricity, gas, steam and air-conditioning supply	100	–	–	–	–	–
Water supply; sewerage, waste management, and remediation activities	50.0	–	–	–	50.0	–
Types of economic activity within services sector – total	41.0	52.4	10.2	7.8	4.8	12.7
Transportation and storage	...	...	...	...	...	...
Publishing activities	–	–	–	–	–	–
Telecommunications	–	–	–	–	–	–
Computer programming, consultancy and related activities	22.7	45.5	–	13.6	4.5	22.7
IT industry	33.3	–	16.7	16.7	16.7	16.7
Legal and accounting activities	–	–	–	–	–	–
Activities of head offices; management consultancy activities	–	100	–	–	100	–
Architectural and engineering activities; technical testing and analysis	29.4	35.3	5.9	11.8	–	29.4
Scientific research and development	47.1	58.0	12.6	5.9	4.2	8.4

(continued)

	Enterprises that transferred new technologies, <i>percentage</i>					
	patent rights, licenses, industrial designs, utility models, selection achievements	research and development results	know-how, technology transfer agreements	sale of equipment	transfer of skilled professionals after being recruited	other
Advertising and market research	–	100	–	–	–	–
Other professional, scientific and technical activities	–	–	–	–	–	–
Human health and social work activities
Agriculture – total	–	–	–	–	–	–
Construction – total	–	–	–	–	–	–

5.18. ENTERPRISES THAT SOLD CUSTOMISED INNOVATIVE GOODS AND SERVICES BY TYPE OF ECONOMIC ACTIVITY: 2017–2019

(as a percentage of all enterprises that have had completed innovative activities)



1 – Total

2 – Industrial production – total

3 – Mining and quarrying

4 – Manufacturing

5 – High tech

6 – Medium high tech

7 – Medium low tech

8 – Low tech

9 – Types of economic activity within services sector – total

10 – Transportation and storage

11 – Telecommunications; computer programming, consultancy and related activities; IT industry

12 – Human health and social work activities

13 – Agriculture – total

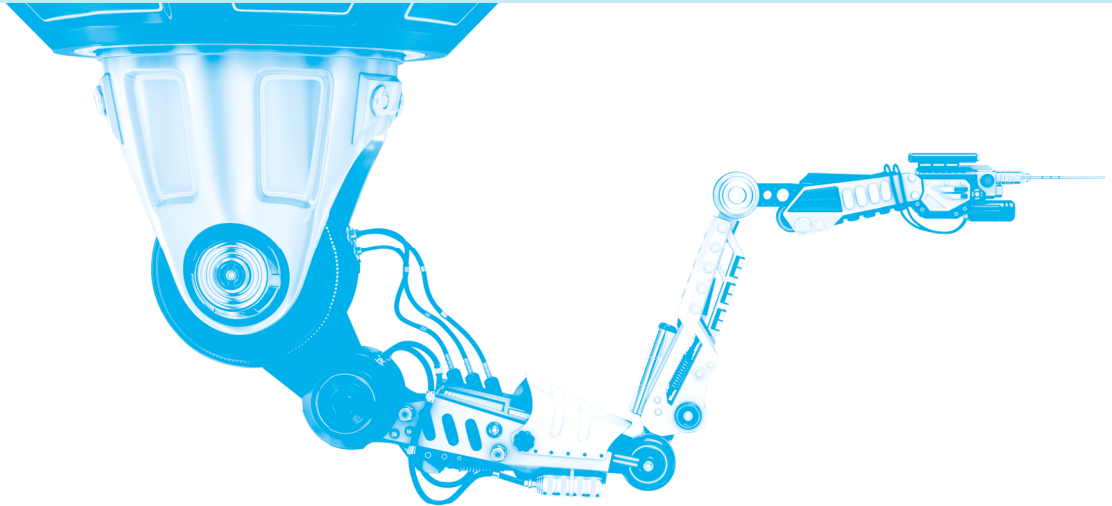
14 – Construction – total

5.19. ASSESSMENT OF INFORMATION SOURCES FOR INNOVATION: 2016–2018

	Enterprises indicating significance of the information source, <i>percentage</i>			
	main or decisive	significant	insignificant	not in use
In-house sources				
Internal sources of the enterprise	10.8	17.1	13.8	58.2
Enterprises within a single network (group of companies, holding company, consortium, association, etc.)	6.0	8.8	10.2	75.0
Market sources				
Suppliers of equipment, materials, components, software	3.8	19.1	17.4	59.7
Suppliers of raw materials	3.4	16.2	17.6	62.8
Competitors in the industry	3.1	14.6	17.3	65.0
Consumers of goods and services	8.3	16.8	13.9	61.0
Facilitating agencies (trade, distribution, sales)	1.5	9.1	17.9	71.5
Consulting firms, it services providers	1.1	7.7	19.2	72.0
Institutional sources				
Research institutes	1.8	7.4	15.0	75.8
Higher education institutions	1.1	8.2	17.0	73.7
Law and executive authorities	4.4	13.2	14.9	67.6
Other sources				
Conferences, seminars, and symposia	2.7	17.3	18.5	61.4
Scientific and technical literature	2.8	15.8	17.7	63.6
Exhibitions, fairs, other promotional activities	2.8	15.9	17.8	63.5
Internet (social networks, web portals, crowdsourcing, etc.)	6.5	22.7	15.1	55.8
Professional associations	2.0	10.9	18.4	68.8
Informal methods	1.2	9.5	20.6	68.7
Information about patents	1.0	7.0	18.4	73.6
Other	0.7	6.2	24.8	68.3

FACTORS HAMPERING INNOVATION DEVELOPMENT

6



6.1. ASSESSMENT OF FACTORS HAMPERING INNOVATION ACTIVITY: 2017–2019

	Enterprises indicating significance of factors hampering their innovation activity, <i>percentage</i>			
	main or decisive	significant	insignificant	no such factors
Economic factors				
Lack of own funds	10.1	16.5	10.9	33.1
Lack of financial support from the government	7.0	14.4	11.0	36.6
Lack of loans or direct investment	3.8	10.6	13.6	40.2
Low demand for new goods and services	4.5	9.8	13.6	38.9
High cost of introducing innovations	8.3	15.9	8.2	35.3
High economic risks	6.5	14.5	9.6	35.5
Extremely competitive market	4.9	13.3	12.3	36.9
Internal factors				
Low innovation potential of the enterprise	4.9	9.8	14.5	37.5
Lack of qualified personnel	3.8	10.2	16.5	39.2
Lack of information about new technologies	2.3	7.7	18.0	39.9
Lack of information about sales markets	2.2	7.4	17.0	41.3
Underdeveloped cooperation links	1.9	6.2	15.6	41.2
Inconsistency with enterprise's priorities	4.1	6.2	13.8	41.0
Other factors				
Lack of legislative documents regulating and stimulating innovation activity, imperfect existing technical regulations, rules, standards when it comes to advanced manufacturing technologies	2.4	8.1	14.2	38.0

(continued)

	Enterprises indicating significance of factors hampering their innovation activity, <i>percentage</i>			
	main or decisive	significant	insignificant	no such factors
Underdeveloped innovation infrastructure (intermediary, information, legal, banking, and other services)	2.2	8.1	15.8	37.9
Unclear economic benefits from the use of intellectual property	3.4	9.7	12.2	38.1
Delayed effects of S&T innovations	2.6	8.0	11.8	40.4
Regulatory risks associated with ensuring the consistency of the quality of agricultural products	1.6	4.5	9.2	51.2
Natural, climatic, and biological risks associated with living systems used in agricultural activities	1.6	4.2	9.6	51.6

6.2. ENTERPRISES THAT TERMINATED INNOVATIVE ACTIVITIES BY TYPE OF ECONOMIC ACTIVITY: 2017–2019

	Enterprises which innovative activities have been seriously delayed, stopped, or have not started as a percentage of the total number of enterprises			Number of innovative projects		
	seriously delayed	stopped	not started	seriously delayed	stopped	not started
Total	6.7	6.3	7.2	32062	27078	29991
Industrial production – total	7.8	7.1	8.0	11548	7696	8436
Mining and quarrying	6.0	5.7	6.8	602	587	640
Mining of coal and lignite	0.9	0.5	0.5	6	5	5
Extraction of crude petroleum and natural gas	5.8	5.6	7.2	116	111	131
Mining of metal ores	2.5	1.4	2.8	16	9	19
Other mining and quarrying	6.7	7.1	7.4	155	155	150
Mining support service activities	7.8	7.6	9.0	309	307	335
Manufacturing	9.2	8.2	9.0	9008	5184	5675
High tech	14.2	12.0	11.4	3916	458	417
Manufacture of basic pharmaceutical products and pharmaceutical preparations	13.1	13.9	10.9	108	133	89
Production of computer, electronic and optical products	14.5	11.4	11.5	3748	264	286
Manufacture of air and spacecraft and related machinery	14.7	12.6	11.9	60	61	42
Medium high tech	11.1	9.2	9.6	1374	1239	1282
Production of chemicals and chemical products	10.8	9.5	10.2	293	284	362
Manufacture of electrical equipment	14.5	11.2	10.3	323	326	243

(continued)

	Enterprises which innovative activities have been seriously delayed, stopped, or have not started as a percentage of the total number of enterprises			Number of innovative projects		
	seriously delayed	stopped	not started	seriously delayed	stopped	not started
Manufacture of machinery and equipment not elsewhere classified	11.5	9.7	10.4	427	359	377
Manufacture of motor vehicles, trailers and semi-trailers	12.9	9.7	8.9	178	130	136
Manufacture of other transport equipment	5.9	5.9	6.6	129	116	129
Manufacture of medical and dental instruments and supplies	6.5	5.7	10.6	24	24	35
Medium low tech	8.4	7.4	8.2	1821	1651	1848
Reproduction of recorded media	–	–	11.1	–	–	2
Manufacture of coke and refined petroleum products	10.4	7.6	7.6	77	59	45
Manufacture of rubber and plastic products	9.5	8.4	8.3	265	244	258
Manufacture of other non-metallic mineral products	6.5	6.1	7.4	342	332	398
Manufacture of basic metals	11.9	10.0	10.7	177	152	177
Manufacture of fabricated metal products, except machinery and equipment	10.2	8.6	9.5	486	419	468
Building of ships and boats	7.2	3.1	5.2	10	12	10
Repair and installation of machinery and equipment	6.9	6.5	7.3	464	433	490
Low tech	7.9	7.6	9.0	1897	1836	2128
Manufacture of food products	7.3	7.1	8.0	816	802	937
Manufacture of beverages	12.4	12.7	12.7	430	431	433

(continued)

	Enterprises which innovative activities have been seriously delayed, stopped, or have not started as a percentage of the total number of enterprises			Number of innovative projects		
	seriously delayed	stopped	not started	seriously delayed	stopped	not started
Manufacture of tobacco products	–	–	17.2	–	–	5
Manufacture of textiles	7.7	7.0	10.1	78	74	93
Manufacture of wearing apparel	7.8	7.8	8.4	96	96	102
Manufacture of leather and related products	5.0	5.0	9.2	19	19	28
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	6.6	6.2	8.3	141	123	160
Manufacture of paper and paper products	6.7	5.8	6.7	76	69	77
Printing and reproduction of recorded media	9.7	8.5	10.7	142	129	159
Manufacture of furniture	5.3	5.7	6.1	45	44	52
Other manufacturing	7.0	6.1	14.0	54	49	82
Electricity, gas, steam and air conditioning supply	4.9	4.8	5.3	1041	1030	1145
Water supply; sewerage, waste management and remediation activities	6.2	5.9	7.6	897	895	976
Types of economic activity within services sector – total	6.6	6.2	7.1	17032	16005	17753
Transportation and storage	4.8	4.7	5.9	2518	2471	2924
Publishing activities	5.5	5.1	6.1	542	524	574

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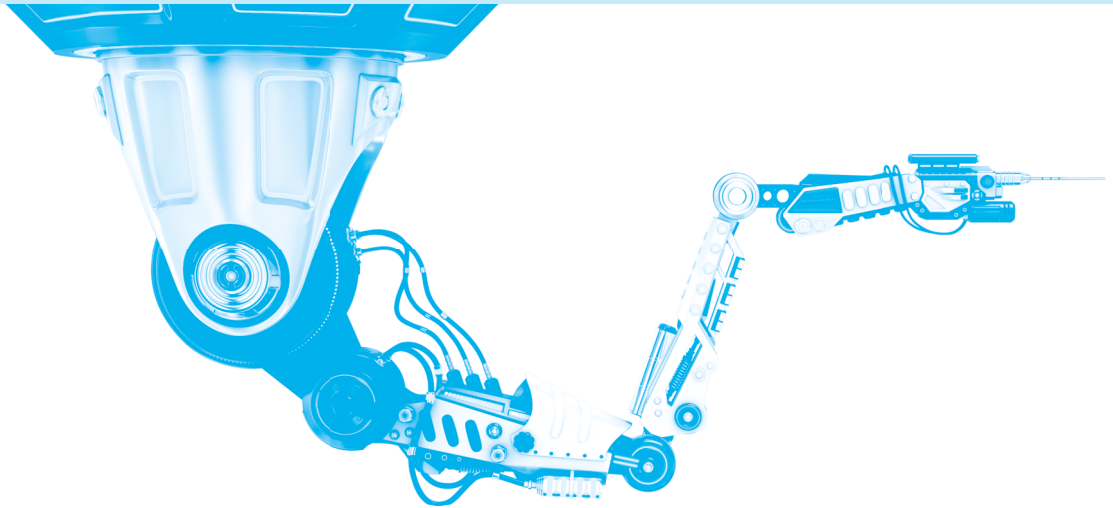
	Enterprises which innovative activities have been seriously delayed, stopped, or have not started as a percentage of the total number of enterprises			Number of innovative projects		
	seriously delayed	stopped	not started	seriously delayed	stopped	not started
Telecommunications	6.3	5.9	5.9	574	543	557
Computer programming, consultancy and related activities	7.9	7.8	7.9	867	831	860
IT industry	6.0	6.0	6.1	610	603	607
Legal and accounting activities	6.2	6.0	6.8	1934	1845	2026
Activities of head offices; management consultancy activities	7.0	6.8	7.5	1070	1050	1122
Architectural and engineering activities; technical testing and analysis	6.8	6.3	6.9	1520	1459	1581
Scientific research and development	12.9	10.9	11.7	1618	1140	1531
Advertising and market research	7.8	7.3	9.5	751	696	787
Other professional, scientific and technical activities	5.2	4.9	5.7	74	69	74
Human health and social work activities	6.4	6.2	7.1	4954	4774	5110

(continued)

	Enterprises which innovative activities have been seriously delayed, stopped, or have not started as a percentage of the total number of enterprises			Number of innovative projects		
	seriously delayed	stopped	not started	seriously delayed	stopped	not started
Agriculture – total	5.1	5.0	6.2	1447	1448	1626
Growing of non-perennial crops	6.1	5.9	7.5	667	663	765
Growing of perennial crops	6.7	6.7	7.9	64	64	70
Plant propagation	–	–	–	–	–	–
Animal production	4.7	4.6	5.8	529	532	594
Mixed farming	1.4	1.2	1.8	23	26	30
Support activities to agriculture and post-harvest crop activities	5.3	5.1	5.7	164	163	167
Construction – total	5.4	5.1	6.3	2035	1929	2176

INNOVATIVE AND NON-INNOVATIVE ENTERPRISES: DEVELOPMENT POTENTIAL

7



7.1. ENTERPRISES THAT PLAN TO ENGAGE IN INNOVATIVE ACTIVITIES IN 2020–2022 BY TYPE OF ECONOMIC ACTIVITY

(percentage)

	Enterprises that plan to engage in innovative activities	Of which	
		enterprises that engaged in innovative activities	enterprises that did not engage in innovative activities
Total	10.3	53.5	6.0
Industrial production – total	15.2	57.5	7.7
Mining and quarrying	13.1	59.0	9.7
Mining of coal and lignite	10.5	53.8	7.8
Extraction of crude petroleum and natural gas	27.0	78.3	19.8
Mining of metal ores	10.7	53.1	6.5
Other mining and quarrying	9.2	43.3	7.3
Mining support service activities	10.2	50.0	8.3
Manufacturing	18.9	59.2	8.5
High tech	40.2	68.1	14.5
Manufacture of basic pharmaceutical products and pharmaceutical preparations	40.4	80.0	18.6
Production of computer, electronic and optical products	39.7	66.8	12.8
Manufacture of air and spacecraft and related machinery	42.7	61.2	15.5
Medium high tech	24.8	58.6	8.9
Production of chemicals and chemical products	24.9	67.2	10.0
Manufacture of electrical equipment	29.3	58.3	9.1

(continued)

	Enterprises that plan to engage in innovative activities	Of which	
		enterprises that engaged in innovative activities	enterprises that did not engage in innovative activities
Manufacture of machinery and equipment not elsewhere classified	26.6	52.6	8.6
Manufacture of motor vehicles, trailers and semi-trailers	27.9	61.1	8.8
Manufacture of other transport equipment	13.5	63.5	7.2
Manufacture of medical and dental instruments and supplies	22.0	59.3	11.5
Medium low tech	15.3	54.4	7.1
Reproduction of recorded media	11.1	100	–
Manufacture of coke and refined petroleum products	23.7	63.8	8.5
Manufacture of rubber and plastic products	17.6	61.2	8.3
Manufacture of other non-metallic mineral products	13.0	49.2	7.9
Manufacture of basic metals	26.4	61.7	11.9
Manufacture of fabricated metal products, except machinery and equipment	20.2	55.4	7.3
Building of ships and boats	30.9	75.8	7.8
Repair and installation of machinery and equipment	6.9	34.1	4.5
Low tech	14.6	60.3	8.9
Manufacture of food products	17.8	65.1	11.3
Manufacture of beverages	11.5	85.0	5.2
Manufacture of tobacco products	20.7	100	8.0

(continued)

	Enterprises that plan to engage in innovative activities	Of which	
		enterprises that engaged in innovative activities	enterprises that did not engage in innovative activities
Manufacture of textiles	15.7	53.5	9.1
Manufacture of wearing apparel	10.4	54.8	5.4
Manufacture of leather and related products	17.5	58.8	10.7
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	8.3	34.2	6.3
Manufacture of paper and paper products	14.7	45.8	9.4
Printing and reproduction of recorded media	9.2	50.0	7.5
Manufacture of furniture	10.6	37.0	5.0
Other manufacturing	12.7	57.6	5.1
Electricity, gas, steam and air-conditioning supply	9.9	48.6	6.5
Water supply, sewerage, waste management and remediation activities	6.4	39.9	4.8
Types of economic activity within services sector – total	9.2	52.8	5.6
Transportation and storage	7.6	53.2	6.3
Publishing activities	4.8	37.7	4.0
Telecommunications	16.7	74.8	8.3
Computer programming, consultancy and related activities	17.4	69.8	10.9

(continued)

	Enterprises that plan to engage in innovative activities	Of which	
		enterprises that engaged in innovative activities	enterprises that did not engage in innovative activities
IT industry	9.5	57.0	6.8
Legal and accounting activities	3.7	35.8	3.0
Activities of head offices; management consultancy activities	6.1	47.1	4.6
Architectural and engineering activities; technical testing and analysis	7.0	30.9	4.5
Scientific research and development	37.3	58.4	15.0
Advertising and market research	4.4	35.6	3.4
Other professional, scientific and technical activities	5.2	46.7	3.3
Human health and social work activities	7.4	47.5	5.2
Agriculture – total	7.3	39.1	5.9
Growing of non-perennial crops	6.9	31.1	5.6
Growing of perennial crops	6.3	33.3	5.7
Plant propagation	5.0	50.0	2.6
Animal production	9.3	51.7	7.5
Mixed farming	2.4	14.3	2.0
Support activities to agriculture and post-harvest crop activities	4.8	36.7	3.4
Construction – total	3.9	22.3	3.2

7.2. AVERAGE NUMBER OF EMPLOYEES IN ENTERPRISES BY LEVEL OF EDUCATION AND TYPE OF ECONOMIC ACTIVITY: 2019

	Enterprises that engaged in innovative activities		Enterprises that did not engage in innovative activities	
	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>
Total	6066220	41.2	11947631	32.2
Industrial production – total	4109357	36.6	3821677	29.3
Mining and quarrying	419329	42.8	587295	30.4
Mining of coal and lignite	17048	22.9	131664	23.2
Extraction of crude petroleum and natural gas	248608	47.7	61143	53.3
Mining of metal ores	77913	28.9	89325	22.0
Other mining and quarrying	34424	36.6	65465	21.8
Mining support service activities	41336	52.5	239698	33.9
Manufacturing	3095617	35.1	2072877	28.1
High tech	596044	42.9	93416	43.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	50007	47.7	29368	45.7
Production of computer, electronic and optical products	305951	46.1	45788	47.1
Manufacture of air and spacecraft and related machinery	240086	37.8	18260	32.8
Medium high tech	915980	33.4	370376	32.3
Production of chemicals and chemical products	243243	37.7	75287	39.0
Manufacture of electrical equipment	141669	35.4	53575	37.3

(continued)

	Enterprises that engaged in innovative activities		Enterprises that did not engage in innovative activities	
	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>
Manufacture of machinery and equipment not elsewhere classified	224081	35.3	73484	32.7
Manufacture of motor vehicles, trailers and semi-trailers	202363	28.8	58812	32.0
Manufacture of other transport equipment	100890	25.4	98664	23.9
Manufacture of medical and dental instruments and supplies	3734	33.5	10554	37.0
Medium low tech	1238917	34.8	702025	28.8
Reproduction of recorded media	90	88.9	142	84.5
Manufacture of coke and refined petroleum products	121137	55.4	19722	40.9
Manufacture of rubber and plastic products	60472	27.6	75864	29.9
Manufacture of other non-metallic mineral products	91509	26.4	200394	23.6
Manufacture of basic metals	417866	31.8	99774	28.2
Manufacture of fabricated metal products, except machinery and equipment	338980	36.2	129946	29.6
Building of ships and boats	134023	29.3	18385	31.4
Repair and installation of machinery and equipment	74840	36.9	157798	32.9
Low tech	344676	27.0	907060	24.2
Manufacture of food products	179861	25.7	533114	22.8
Manufacture of beverages	23687	40.2	71247	36.9

(continued)

	Enterprises that engaged in innovative activities		Enterprises that did not engage in innovative activities	
	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>
Manufacture of tobacco products	2905	44.7	2907	55.8
Manufacture of textiles	17422	27.2	31640	21.7
Manufacture of wearing apparel	15495	16.6	29937	17.9
Manufacture of leather and related products	10205	20.3	18138	18.1
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	22616	19.2	85993	18.3
Manufacture of paper and paper products	42534	30.8	51799	28.6
Printing and reproduction of recorded media	5528	41.8	27280	33.6
Manufacture of furniture	13844	24.5	36188	22.5
Other manufacturing	10579	31.5	18817	32.3
Electricity, gas, steam and air conditioning supply	483747	44.1	863836	33.8
Water supply; sewerage, waste management and remediation activities	110664	25.7	297669	23.0
Types of economic activity within services sector – total	1750083	53.9	6421783	36.3
Transportation and storage	344684	42.5	1965910	29.3
Publishing activities	3497	69.2	41562	64.4

(continued)

	Enterprises that engaged in innovative activities		Enterprises that did not engage in innovative activities	
	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>
Telecommunications	177237	60.2	146918	63.0
Computer programming, consultancy and related activities	58884	86.7	146089	77.3
IT industry	17588	76.3	144054	70.0
Legal and accounting activities	33560	57.0	194688	73.2
Activities of head offices; management consultancy activities	27182	56.4	125024	64.8
Architectural and engineering activities; technical testing and analysis	97611	81.4	256425	56.8
Scientific research and development	587013	64.9	44115	58.5
Advertising and market research	18123	38.8	45541	70.0
Other professional, scientific and technical activities	1105	59.6	24790	31.5
Human health and social work activities	383599	31.4	3286667	30.1

(continued)

	Enterprises that engaged in innovative activities		Enterprises that did not engage in innovative activities	
	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>	Average number of employees, <i>headcount</i>	Of whom with higher education, <i>percentage</i>
Agriculture – total	90679	17.8	755924	15.8
Growing of non-perennial crops	37933	16.1	251728	16.3
Growing of perennial crops	725	14.9	16932	14.1
Plant propagation	320	31.3	1877	18.1
Animal production	48467	18.1	436201	13.6
Mixed farming	1811	9.6	10717	17.1
Support activities to agriculture and post-harvest crop activities	1423	61.9	38469	36.6
Construction – total	116101	27.0	948247	28.6

7.3. EMPLOYEES IN ENTERPRISES THAT ENGAGED IN R&D BY TYPE OF ECONOMIC ACTIVITY: 2019

	Employees who performed R&D	
	as a percentage of the total number of employees in enterprises	as a percentage of the number of employees in enterprises that have been engaged in innovative activities
Total	2.6	7.8
Industrial production – total	1.8	3.5
Mining and quarrying	0.5	1.1
Mining of coal and lignite	0.05	0.4
Extraction of crude petroleum and natural gas	1.0	1.3
Mining of metal ores	0.3	0.6
Other mining and quarrying	0.6	1.7
Mining support service activities	0.1	1.0
Manufacturing	2.7	4.4
High tech	7.7	8.9
Manufacture of basic pharmaceutical products and pharmaceutical preparations	3.0	4.8
Production of computer, electronic and optical products	10.2	11.7
Manufacture of air and spacecraft and related machinery	5.9	6.3
Medium high tech	3.0	4.1
Production of chemicals and chemical products	2.0	2.7
Manufacture of electrical equipment	4.3	5.9
Manufacture of machinery and equipment not elsewhere classified	4.8	6.3
Manufacture of motor vehicles, trailers and semi-trailers	2.7	3.5
Manufacture of other transport equipment	0.9	1.7
Manufacture of medical and dental instruments and supplies	1.4	5.5

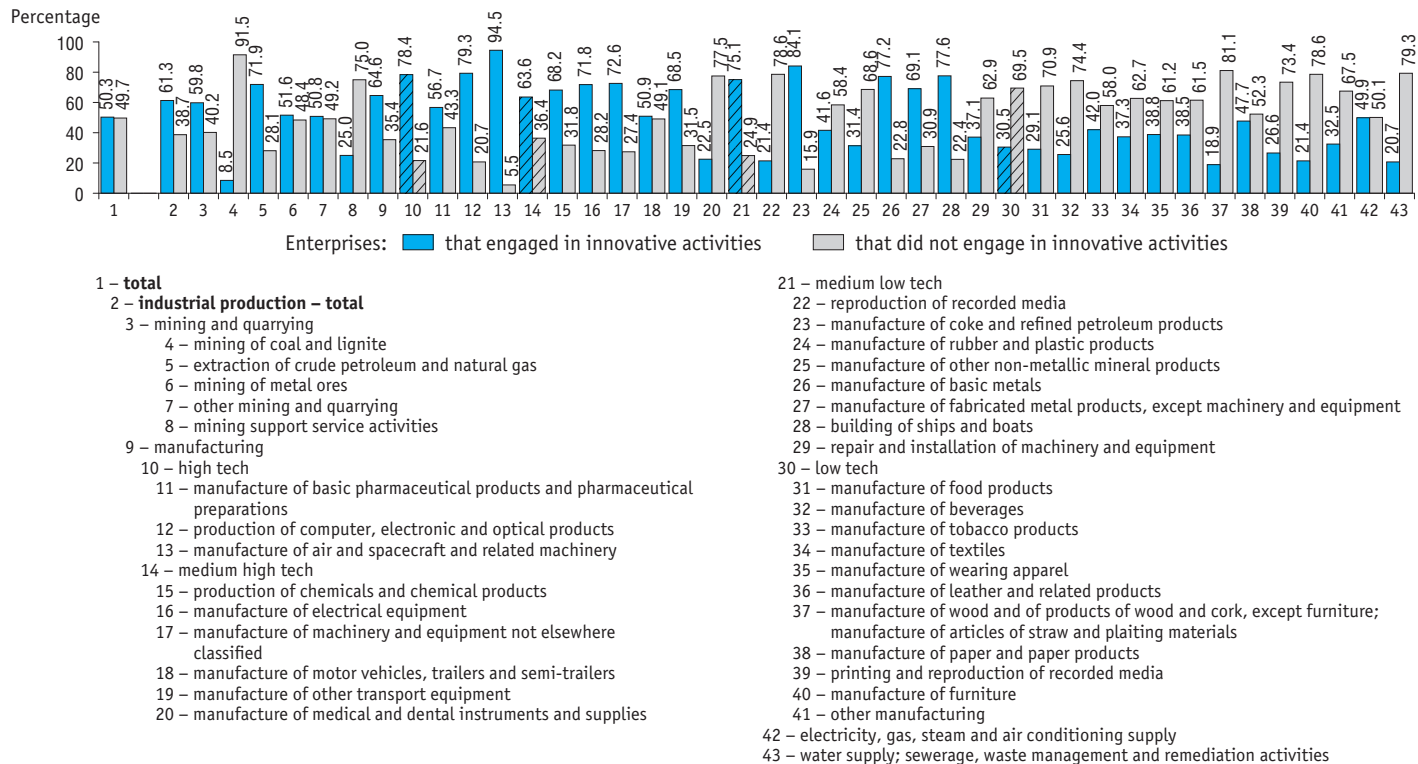
(continued)

	Employees who performed R&D	
	as a percentage of the total number of employees in enterprises	as a percentage of the number of employees in enterprises that have been engaged in innovative activities
Medium low tech	2.2	3.5
Reproduction of recorded media	1.7	4.4
Manufacture of coke and refined petroleum products	1.4	1.6
Manufacture of rubber and plastic products	0.8	1.9
Manufacture of other non-metallic mineral products	0.4	1.2
Manufacture of basic metals	1.3	1.6
Manufacture of fabricated metal products, except machinery and equipment	5.3	7.3
Building of ships and boats	3.1	3.6
Repair and installation of machinery and equipment	1.3	3.9
Low tech	0.2	0.7
Manufacture of food products	0.1	0.4
Manufacture of beverages	0.04	0.1
Manufacture of tobacco products	0.1	0.1
Manufacture of textiles	0.5	1.4
Manufacture of wearing apparel	0.7	2.0
Manufacture of leather and related products	0.4	1.1
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	0.2	0.8
Manufacture of paper and paper products	0.3	0.7
Printing and reproduction of recorded media	0.2	1.2
Manufacture of furniture	0.5	2.0
Other manufacturing	0.8	2.2
Electricity, gas, steam and air conditioning supply	0.2	0.5
Water supply; sewerage, waste management and remediation activities	0.2	0.8

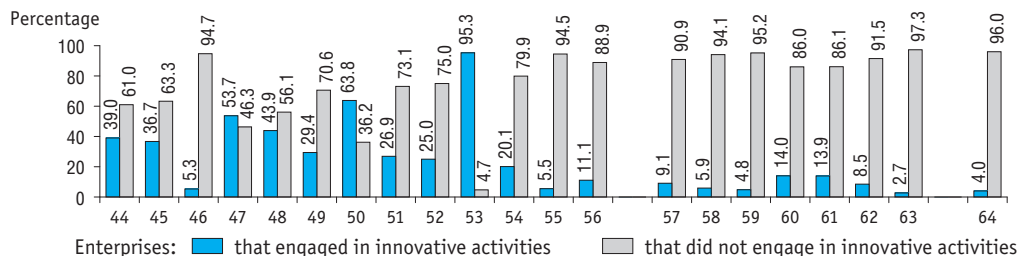
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	Employees who performed R&D	
	as a percentage of the total number of employees in enterprises	as a percentage of the number of employees in enterprises that have been engaged in innovative activities
Types of economic activity within services sector – total	3.8	17.9
Transportation and storage	0.1	0.6
Publishing activities	0.3	3.4
Telecommunications	0.1	0.2
Computer programming, consultancy and related activities	9.2	32.2
IT industry	1.9	17.3
Legal and accounting activities	0.2	1.3
Activities of head offices; management consultancy activities	0.8	4.4
Architectural and engineering activities; technical testing and analysis	10.6	38.4
Scientific research and development	39.1	42.0
Advertising and market research	1.7	6.1
Other professional, scientific and technical activities	1.5	34.8
Human health and social work activities	0.04	0.4
Agriculture – total	0.1	0.6
Growing of non-perennial crops	0.02	0.2
Growing of perennial crops	0.02	0.4
Plant propagation	0.8	5.3
Animal production	0.02	0.2
Mixed farming	0.01	0.1
Support activities to agriculture and post-harvest crop activities	0.9	25.9
Construction – total	1.6	14.6

7.4. SALES OF GOODS AND SERVICES PRODUCED THROUGH ENTERPRISES' OWN EFFORTS BY TYPE OF ECONOMIC ACTIVITY: 2019



(continued)



44 – **types of economic activity within services sector – total**

- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

54 – advertising and market research

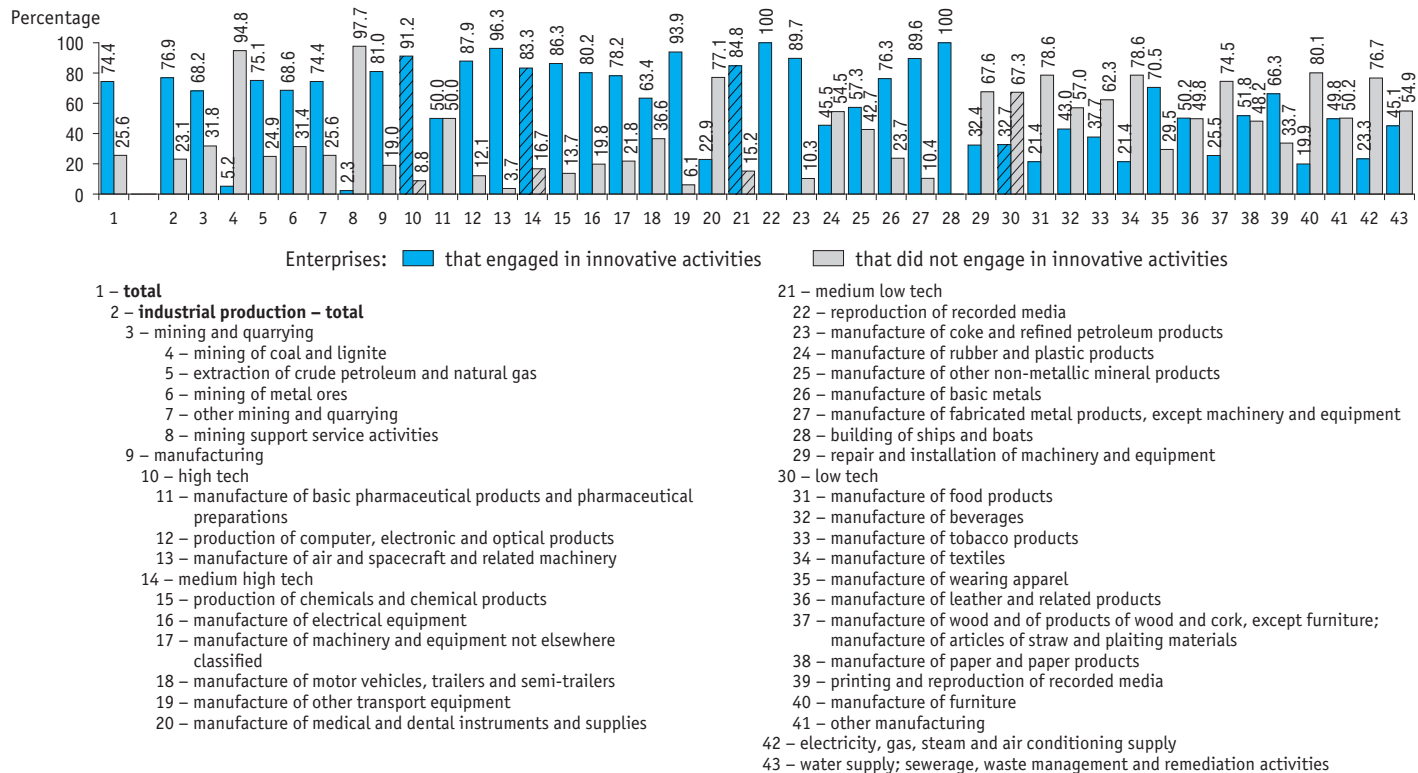
- 55 – other professional, scientific and technical activities
- 56 – human health and social work activities

57 – **agriculture – total**

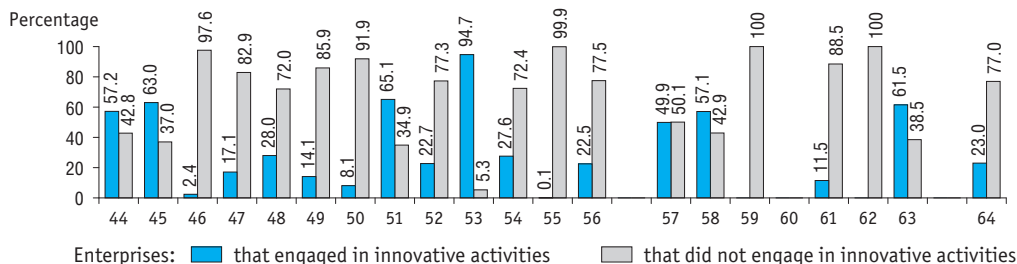
- 58 – growing of non-perennial crops
- 59 – growing of perennial crops
- 60 – plant propagation
- 61 – animal production
- 62 – mixed farming
- 63 – support activities to agriculture and post-harvest crop activities

64 – **construction – total**

7.5. EXPORTS OF GOODS AND SERVICES PRODUCED THROUGH ENTERPRISES' OWN EFFORTS BY TYPE OF ECONOMIC ACTIVITY: 2019



(continued)



44 – **types of economic activity within services sector – total**

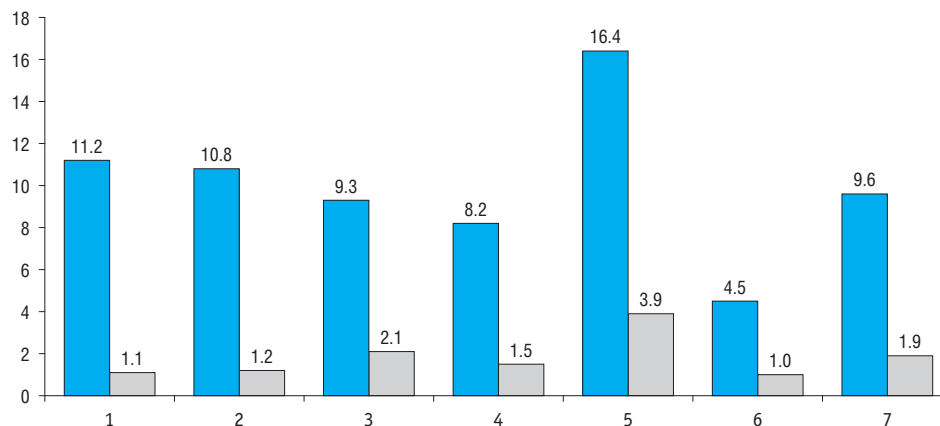
- 45 – transportation and storage
- 46 – publishing activities
- 47 – telecommunications
- 48 – computer programming, consultancy and related activities
- 49 – IT industry
- 50 – legal and accounting activities
- 51 – activities of head offices; management consultancy activities
- 52 – architectural and engineering activities; technical testing and analysis
- 53 – scientific research and development

57 – **agriculture – total**

- 54 – advertising and market research
- 55 – other professional, scientific and technical activities
- 56 – human health and social work activities
- 58 – growing of non-perennial crops
- 59 – growing of perennial crops
- 60 – plant propagation
- 61 – animal production
- 62 – mixed farming
- 63 – support activities to agriculture and post-harvest crop activities
- 64 – **construction – total**

7.6. ENTERPRISES INDICATING THE FOLLOWING INVENTIONS AND R&D RESULTS PROTECTION METHODS AS MAIN: 2017–2019

(as a percentage of the total number of enterprises that engaged and did not engage in innovative activities)



Enterprises:

■ that engaged in innovative activities

■ that did not engage in innovative activities

Formal methods:

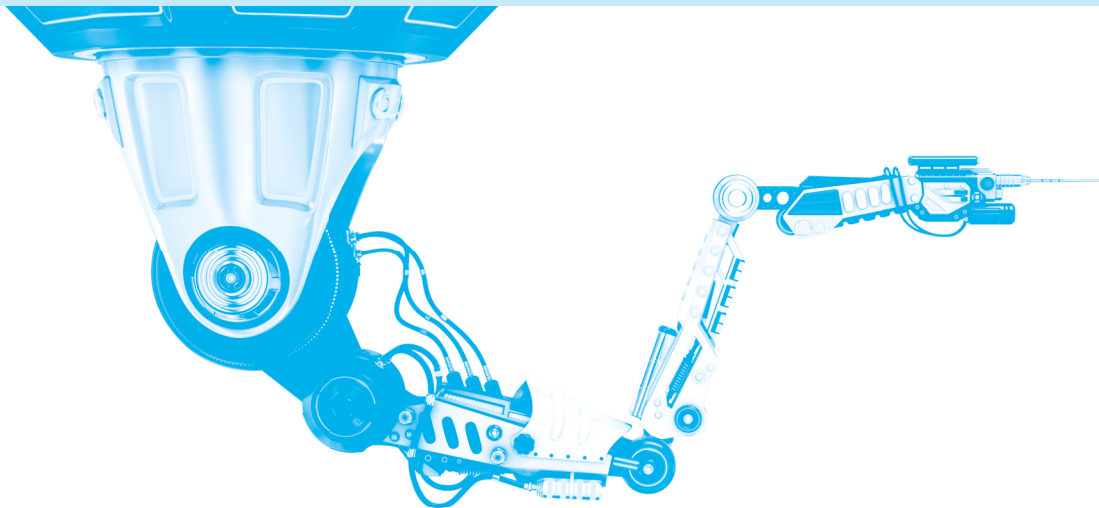
- 1 – inventions, industrial designs and utility models patenting (in the reporting year)
- 2 – valid patents maintenance
- 3 – trade mark registration
- 4 – copyright protection

Informal methods:

- 5 – preservation of trade secrets, confidentiality and know-how protection
- 6 – product design complexity gaining competitive advantage over competitors regarding goods and services development and launch terms

INNOVATION ACTIVITY IN RUSSIAN REGIONS

8



8.1. INNOVATION ACTIVITY OF ENTERPRISES: 2019

	Percentage		Percentage
Russia	9.1	Vologda Region	11.6
Central Federal District	10.8	Kaliningrad Region	4.4
Belgorod Region	15.1	Leningrad Region	8.1
Bryansk Region	10.1	Murmansk Region	9.6
Vladimir Region	10.5	Novgorod Region	9.8
Voronezh Region	13.4	Pskov Region	5.8
Ivanovo Region	10.0	St Petersburg	15.4
Kaluga Region	11.5	Southern Federal District	7.5
Kostroma Region	4.6	Republic of Adygea	4.4
Kursk Region	5.4	Republic of Kalmykia	1.5
Lipetsk Region	11.1	Republic of Crimea	4.6
Moscow Region	8.6	Krasnodar Region	4.3
Orel Region	10.4	Astrakhan Region	7.2
Ryazan Region	11.8	Volgograd Region	4.9
Smolensk Region	8.4	Rostov Region	17.6
Tambov Region	10.2	Sevastopol	6.0
Tver Region	12.1	North Caucasian Federal District	1.7
Tula Region	11.7	Republic of Dagestan	0.5
Yaroslavl Region	10.6	Republic of Ingushetia	0.8
Moscow	12.1	Kabardino-Balkarian Republic	3.9
North-Western Federal District	10.1	Karachay-Cherkess Republic	5.7
Republic of Karelia	7.1	Republic of North Ossetia–Alania	1.6
Komi Republic	7.2	Chechen Republic	0.2
Arkhangelsk Region	4.0	Stavropol Region	5.1
Nenets Autonomous Region	2.7		

(continued)

	Percentage		Percentage
Volga Federal District	11.6	Siberian Federal District	7.5
Republic of Bashkortostan	10.3	Altai Republic	5.3
Mari El Republic	11.3	Republic of Tuva	5.6
Republic of Mordovia	21.2	Republic of Khakassia	3.4
Republic of Tatarstan	17.4	Altai Region	12.9
Udmurt Republic	10.6	Krasnoyarsk Region	6.9
Chuvash Republic	15.0	Irkutsk Region	5.4
Perm Region	8.7	Kemerovo Region	4.4
Kirov Region	14.6	Novosibirsk Region	7.9
Nizhny Novgorod Region	13.7	Omsk Region	7.5
Orenburg Region	5.6	Tomsk Region	14.8
Penza Region	13.1	Far Eastern Federal District	6.0
Samara Region	10.2	Republic of Buryatia	5.2
Saratov Region	6.1	Republic of Sakha (Yakutia)	3.9
Ulyanovsk Region	14.6	Trans-Baikal Region	3.8
Ural Federal District	9.3	Kamchatka Region	13.1
Kurgan Region	9.8	Primorsky Region	5.7
Sverdlovsk Region	11.6	Khabarovsk Region	8.1
Tyumen Region	6.9	Amur Region	5.1
Khanty-Mansi Autonomous Region – Yugra	5.0	Magadan Region	13.3
Yamal-Nenets Autonomous Region	5.4	Sakhalin Region	5.0
Chelyabinsk region	10.5	Jewish Autonomous Region	4.3
		Chukotka Autonomous Region	7.8

8.2. PERCENTAGE DISTRIBUTION OF ENTERPRISES BY TYPE OF INNOVATIVE ACTIVITY: 2019

(as a percentage of enterprises that had expenditure on innovative activities)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Russia	41.8	50.3	8.2	16.2	4.6	14.1	25.4	9.7	3.9	12.4
Central Federal District	48.5	49.1	10.6	15.9	4.7	14.3	26.5	11.9	4.1	10.7
Belgorod Region	21.0	76.5	5.9	3.4	5.0	6.7	12.6	0.8	0.8	2.5
Bryansk Region	20.7	63.8	6.9	6.9	3.4	19.0	6.9	6.9	—	10.3
Vladimir Region	45.9	45.9	2.7	16.2	4.1	9.5	17.6	6.8	—	17.6
Voronezh Region	37.9	59.2	9.7	10.7	3.9	7.8	21.4	7.8	1.0	10.7
Ivanovo Region	42.1	47.4	—	21.1	—	10.5	15.8	10.5	—	5.3
Kaluga Region	55.3	42.6	8.5	10.6	6.4	27.7	31.9	8.5	2.1	10.6
Kostroma Region	12.5	50.0	6.3	25.0	12.5	18.8	50.0	12.5	12.5	18.8
Kursk Region	33.3	50.0	12.5	16.7	—	8.3	29.2	8.3	4.2	16.7
Lipetsk Region	26.2	73.8	3.3	14.8	4.9	23.0	16.4	3.3	1.6	—
Moscow Region	59.7	45.0	10.0	14.7	4.3	16.6	23.2	16.6	5.2	10.0
Orel Region	30.4	69.6	13.0	26.1	13.0	17.4	13.0	—	4.3	8.7
Ryazan Region	59.0	56.4	12.8	20.5	5.1	20.5	35.9	10.3	10.3	15.4
Smolensk Region	34.4	37.5	6.3	34.4	15.6	28.1	21.9	9.4	3.1	9.4
Tambov Region	40.0	44.3	11.4	7.1	—	14.3	7.1	5.7	2.9	1.4
Tver Region	25.7	60.8	5.4	18.9	4.1	13.5	21.6	2.7	4.1	13.5
Tula Region	42.9	44.6	8.9	30.4	3.6	16.1	23.2	7.1	5.4	14.3
Yaroslavl Region	61.7	51.1	6.4	19.1	4.3	12.8	21.3	10.6	8.5	19.1
Moscow	61.9	39.4	15.3	18.0	5.0	13.3	37.8	18.3	5.5	12.2

* Acquisition of patent rights (alienation), licenses, industrial designs, utility models, selection achievements, integrated circuit designs, etc.; patenting (registration) of the results of intellectual activity.

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
North-Western Federal District	45.3	48.1	8.6	18.8	5.7	17.1	28.8	11.0	5.9	10.3
Republic of Karelia	20.8	41.7	4.2	12.5	4.2	8.3	45.8	16.7	–	4.2
Komi Republic	22.5	70.0	–	17.5	2.5	7.5	12.5	5.0	–	17.5
Arkhangelsk Region	34.8	43.5	8.7	8.7	8.7	8.7	30.4	8.7	–	26.1
Nenets Autonomous Region	33.3	33.3	33.3	–	–	–	33.3	–	–	–
Vologda Region	23.8	50.0	4.8	11.9	2.4	11.9	28.6	11.9	4.8	21.4
Kaliningrad Region	29.4	64.7	5.9	23.5	–	11.8	17.6	11.8	11.8	5.9
Leningrad Region	36.5	55.8	9.6	7.7	3.8	26.9	15.4	7.7	5.8	11.5
Murmansk Region	18.9	45.9	8.1	18.9	5.4	8.1	27.0	2.7	10.8	8.1
Novgorod Region	53.8	50.0	7.7	23.1	3.8	23.1	23.1	3.8	–	19.2
Pskov Region	33.3	33.3	5.6	5.6	11.1	16.7	33.3	5.6	–	5.6
St Petersburg	59.8	44.5	11.0	23.3	7.0	19.6	32.9	14.0	7.6	7.0
Southern Federal District	32.9	60.6	3.7	7.7	1.8	9.5	19.5	6.3	2.4	8.7
Republic of Adygea	–	25.0	25.0	25.0	25.0	50.0	25.0	–	–	–
Republic of Kalmykia	66.7	66.7	–	33.3	–	–	–	–	–	–
Republic of Crimea	32.3	58.1	6.5	6.5	6.5	–	9.7	3.2	9.7	9.7
Krasnodar Region	53.3	35.0	4.2	12.5	1.7	5.0	15.8	9.2	–	10.8
Astrakhan Region	4.3	56.5	–	4.3	4.3	13.0	26.1	8.7	4.3	13.0
Volgograd Region	40.5	57.1	7.1	11.9	4.8	19.0	28.6	14.3	2.4	14.3
Rostov Region	24.5	74.3	2.6	4.9	0.4	10.6	20.0	4.2	2.6	6.8
Sevastopol	60.0	40.0	–	–	–	–	40.0	–	–	–

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
North Caucasian Federal District	39.6	52.8	9.4	9.4	7.5	11.3	11.3	7.5	3.8	7.5
Republic of Dagestan	33.3	66.7	16.7	16.7	—	—	33.3	16.7	—	16.7
Republic of Ingushetia	—	100	—	—	—	—	—	—	—	—
Kabardino-Balkarian Republic	40.0	40.0	20.0	20.0	—	—	—	—	—	—
Karachay-Cherkess Republic	83.3	16.7	—	—	16.7	—	16.7	—	—	—
Republic of North Ossetia–Alania	33.3	66.7	—	33.3	—	33.3	—	—	—	—
Chechen Republic	—	100	—	—	—	—	—	—	—	—
Stavropol Region	36.7	53.3	10.0	6.7	10.0	16.7	10.0	10.0	6.7	10.0
Volga Federal District	40.0	49.6	8.1	16.7	5.4	13.9	24.5	8.6	3.8	13.3
Republic of Bashkortostan	45.5	50.4	5.8	14.0	4.1	11.6	22.3	9.9	2.5	14.0
Mari El Republic	33.3	29.2	4.2	16.7	12.5	16.7	16.7	4.2	4.2	8.3
Republic of Mordovia	44.9	48.3	7.9	19.1	7.9	9.0	24.7	2.2	7.9	3.4
Republic of Tatarstan	44.6	49.0	7.4	11.9	1.5	13.9	19.8	11.9	3.0	13.9
Udmurt Republic	28.8	47.5	11.3	17.5	2.5	7.5	31.3	10.0	6.3	5.0
Chuvash Republic	34.4	65.6	10.0	18.9	5.6	16.7	28.9	5.6	3.3	12.2
Perm Region	56.8	49.4	8.6	21.0	4.9	25.9	25.9	19.8	2.5	21.0
Kirov Region	31.4	51.4	7.1	10.0	8.6	12.9	15.7	1.4	5.7	21.4
Nizhny Novgorod Region	47.4	51.9	9.1	18.8	5.2	13.6	27.3	8.4	1.9	17.5
Orenburg Region	31.6	40.4	3.5	7.0	1.8	17.5	26.3	1.8	3.5	17.5
Penza Region	35.7	40.5	11.9	14.3	14.3	13.1	27.4	6.0	3.6	8.3

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Samara Region	33.1	50.6	8.7	24.4	8.1	15.7	25.0	9.3	5.8	16.3
Saratov Region	51.2	48.8	7.0	18.6	2.3	18.6	25.6	14.0	2.3	7.0
Ulyanovsk Region	31.5	50.6	6.7	16.9	2.2	6.7	24.7	6.7	2.2	10.1
Ural Federal District	46.0	46.0	8.3	22.0	4.6	14.0	25.4	14.9	4.0	19.1
Kurgan Region	21.6	78.4	5.4	24.3	8.1	10.8	18.9	10.8	–	16.2
Sverdlovsk Region	52.6	43.7	8.9	18.5	5.9	14.8	27.4	19.3	3.0	16.3
Tyumen Region	45.2	33.7	6.7	29.8	1.9	9.6	28.8	7.7	7.7	22.1
Khanty-Mansi Autonomous Region – Yugra	41.9	29.0	3.2	38.7	3.2	12.9	41.9	6.5	6.5	16.1
Yamal-Nenets Autonomous Region	47.6	42.9	9.5	19.0	–	–	28.6	14.3	4.8	19.0
Chelyabinsk region	47.3	51.4	10.8	16.2	4.1	20.3	20.3	18.9	2.7	21.6
Siberian Federal District	32.8	50.9	7.3	16.1	4.9	16.1	26.9	7.8	2.9	16.8
Altai Republic	10.0	80.0	–	20.0	–	10.0	20.0	–	–	40.0
Republic of Tuva	5.0	75.0	–	5.0	–	–	25.0	–	–	5.0
Republic of Khakassia	27.3	18.2	–	9.1	–	9.1	27.3	9.1	–	36.4
Altai Region	24.2	68.5	9.7	11.3	5.6	5.6	14.5	3.2	1.6	3.2
Krasnoyarsk Region	31.8	48.2	7.1	18.8	5.9	18.8	37.6	9.4	2.4	17.6
Irkutsk Region	37.5	47.9	2.1	12.5	4.2	25.0	31.3	12.5	2.1	14.6
Kemerovo Region	27.8	55.6	5.6	25.0	2.8	25.0	38.9	11.1	–	13.9
Novosibirsk Region	37.6	42.6	9.9	15.8	7.9	24.8	22.8	9.9	2.0	15.8
Omsk Region	33.8	46.5	4.2	18.3	4.2	16.9	33.8	5.6	2.8	23.9
Tomsk Region	49.4	36.5	10.6	20.0	3.5	14.1	27.1	10.6	9.4	30.6

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Far Eastern Federal District	32.3	50.4	2.5	19.5	1.8	12.4	26.2	3.2	2.8	12.4
Republic of Buryatia	71.4	35.7	7.1	14.3	7.1	14.3	28.6	–	–	7.1
Republic of Sakha (Yakutia)	46.2	34.6	3.8	15.4	–	15.4	19.2	3.8	7.7	26.9
Trans-Baikal Region	28.6	57.1	7.1	28.6	–	28.6	21.4	7.1	7.1	14.3
Kamchatka Region	19.6	78.3	2.2	26.1	–	6.5	32.6	–	–	2.2
Primorsky Region	33.3	42.9	4.8	16.7	4.8	14.3	21.4	4.8	4.8	16.7
Khabarovsk Region	21.6	52.9	–	25.5	–	13.7	43.1	3.9	–	11.8
Amur Region	50.0	34.6	3.8	19.2	7.7	3.8	30.8	7.7	7.7	11.5
Magadan Region	20.8	70.8	–	20.8	–	8.3	12.5	–	–	8.3
Sakhalin Region	40.9	27.3	–	13.6	–	13.6	9.1	4.5	–	13.6
Jewish Autonomous Region	30.0	40.0	–	–	–	20.0	10.0	–	10.0	–
Chukotka Autonomous Region	14.3	42.9	–	–	–	14.3	28.6	–	–	42.9

8.3. INNOVATION EXPENDITURE: 2019

	Million roubles	As a percentage of total sales
Russia	1954133.3	2.1
Central Federal District	844271.4	3.0
Belgorod Region	30653.0	2.8
Bryansk Region	2200.8	0.8
Vladimir Region	14058.5	2.7
Voronezh Region	22435.0	2.8
Ivanovo Region	195.3	0.1
Kaluga Region	5128.5	0.5
Kostroma Region	748.3	0.4
Kursk Region	3449.0	0.7
Lipetsk Region	30970.7	3.8
Moscow Region	132824.0	2.6
Orel Region	962.0	0.1
Ryazan Region	4575.8	1.6
Smolensk Region	3803.2	1.3
Tambov Region	8225.5	3.5
Tver Region	4742.6	1.1
Tula Region	56822.0	6.9
Yaroslavl Region	6531.4	1.3
Moscow	515945.9	3.6
North-Western Federal District	186847.1	1.8
Republic of Karelia	4524.9	1.8
Komi Republic	8833.8	0.9
Arkhangelsk Region	2574.9	0.3
Nenets Autonomous Region	39.8	0.01

(continued)

	Million roubles	As a percentage of total sales
Vologda Region	1762.9	0.2
Kaliningrad Region	5943.6	0.8
Leningrad Region	35512.8	2.4
Murmansk Region	1504.5	0.3
Novgorod Region	1366.5	0.6
Pskov Region	284.2	0.1
St Petersburg	124539.1	2.8
Southern Federal District	79455.8	1.1
Republic of Adygea	28.2	0.04
Republic of Kalmykia	18.4	0.2
Republic of Crimea	764.1	0.4
Krasnodar Region	28211.2	0.7
Astrakhan Region	2673.4	0.5
Volgograd Region	10654.1	1.0
Rostov Region	36551.8	2.9
Sevastopol	554.7	3.5
North Caucasian Federal District	5189.2	0.6
Republic of Dagestan	313.9	0.2
Republic of Ingushetia	1.9	0.02
Kabardino-Balkarian Republic	235.8	0.5
Karachay-Cherkess Republic	49.4	0.1
Republic of North Ossetia–Alania	20.0	0.1
Chechen Republic	12.9	0.02
Stavropol Region	4555.3	0.9

(continued)

	Million roubles	As a percentage of total sales
Volga Federal District	437296.2	2.9
Republic of Bashkortostan	28961.8	1.2
Mari El Republic	822.3	0.5
Republic of Mordovia	8295.6	3.1
Republic of Tatarstan	107097.7	3.3
Udmurt Republic	5156.1	0.7
Chuvash Republic	9212.5	3.5
Perm Region	28086.1	1.5
Kirov Region	6425.3	2.1
Nizhny Novgorod Region	155191.2	8.0
Orenburg Region	13977.1	1.3
Penza Region	5177.1	2.1
Samara Region	51893.8	2.9
Saratov Region	8083.2	1.2
Ulyanovsk Region	8916.3	2.3
Ural Federal District	110966.3	0.7
Kurgan Region	1141.8	0.6
Sverdlovsk Region	34943.7	1.3
Tyumen Region	52588.7	0.5
Khanty-Mansi Autonomous Region – Yugra	31319.3	0.5
Yamal-Nenets Autonomous Region	7408.1	0.3
Chelyabinsk region	22292.1	1.2
Siberian Federal District	174632.0	1.8
Altai Republic	113.9	0.8
Republic of Tuva	2302.0	5.3

(continued)

	Million roubles	As a percentage of total sales
Republic of Khakassia	171.7	0.1
Altai Region	7056.1	1.7
Krasnoyarsk Region	69861.2	2.3
Irkutsk Region	40265.7	2.6
Kemerovo Region	10158.1	0.6
Novosibirsk Region	9163.0	1.1
Omsk Region	18201.1	1.6
Tomsk Region	17339.3	2.5
Far Eastern Federal District	115475.2	2.5
Republic of Buryatia	6063.7	3.5
Republic of Sakha (Yakutia)	4800.7	0.4
Trans-Baikal Region	944.0	0.4
Kamchatka Region	1074.5	0.6
Primorsky Region	3220.5	0.5
Khabarovsk Region	28532.8	5.0
Amur Region	2507.8	1.1
Magadan Region	517.8	0.3
Sakhalin Region	66821.6	5.5
Jewish Autonomous Region	574.0	2.5
Chukotka Autonomous Region	417.8	0.4

8.4. PERCENTAGE DISTRIBUTION OF INNOVATION EXPENDITURE BY TYPE OF INNOVATIVE ACTIVITY: 2019

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Russia	44.6	33.6	0.4	0.3	0.4	9.2	3.6	0.4	0.3	7.2
Central Federal District	41.9	36.9	0.7	0.5	0.4	10.7	5.0	0.4	0.1	3.4
Belgorod Region	15.7	79.2	0.6	0.01	0.5	1.7	2.2	0.0	0.1	0.02
Bryansk Region	38.9	45.8	0.2	0.01	0.01	11.1	0.3	0.3	–	3.4
Vladimir Region	40.2	54.9	0.1	0.1	0.1	0.3	0.1	2.3	–	1.9
Voronezh Region	40.1	47.9	0.3	0.03	0.0	2.0	0.6	0.03	0.1	9.0
Ivanovo Region	60.0	37.4	–	0.2	–	1.9	0.4	0.03	–	0.1
Kaluga Region	67.2	18.3	0.04	0.01	0.04	9.8	2.1	0.04	0.0	2.5
Kostroma Region	44.1	48.8	0.6	0.03	0.2	0.8	0.9	4.2	0.2	0.2
Kursk Region	24.7	67.9	0.02	0.1	–	1.8	2.6	0.0	0.6	2.4
Lipetsk Region	2.7	63.4	0.01	0.03	0.05	33.6	0.1	0.02	0.04	–
Moscow Region	80.1	15.7	1.4	0.2	0.04	1.4	1.0	0.1	0.1	0.1
Orel Region	6.2	51.1	1.7	0.4	1.2	36.3	0.5	–	0.4	2.2
Ryazan Region	23.2	50.2	0.2	0.4	0.1	3.4	2.2	3.0	0.3	17.1
Smolensk Region	7.7	43.4	0.4	1.1	0.3	22.2	1.4	0.2	0.0	23.2
Tambov Region	6.4	73.9	0.3	0.2	–	18.9	0.1	0.1	0.02	0.01
Tver Region	35.4	48.9	0.04	0.9	0.02	10.8	1.1	0.02	1.1	1.7
Tula Region	27.9	6.4	0.0	0.1	0.03	63.5	0.9	0.8	0.01	0.4
Yaroslavl Region	41.2	39.3	0.2	0.1	0.03	13.2	1.9	0.02	0.1	4.0
Moscow	38.6	39.6	0.7	0.7	0.6	7.0	7.6	0.5	0.2	4.6

* Acquisition of patent rights (alienation), licenses, industrial designs, utility models, selection achievements, integrated circuit designs, etc.; patenting (registration) of the results of intellectual activity.

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
North-Western Federal District	39.8	39.4	0.3	0.1	0.7	5.5	5.0	0.6	1.9	6.6
Republic of Karelia	31.1	68.0	0.02	0.01	0.0	0.8	0.1	0.03	–	0.01
Komi Republic	1.8	51.4	–	0.3	0.01	9.2	0.2	0.02	–	36.9
Arkhangelsk Region	14.8	81.2	0.2	0.05	0.2	0.02	2.3	0.1	–	1.3
Nenets Autonomous Region	1.0	97.8	1.0	–	–	–	0.1	–	–	–
Vologda Region	32.2	45.8	8.6	0.1	0.0	0.5	1.4	1.1	0.1	10.3
Kaliningrad Region	3.7	18.9	0.02	0.04	–	0.3	11.9	7.0	56.6	1.7
Leningrad Region	2.4	69.6	0.6	0.01	0.0	14.5	0.1	0.0	0.0	12.7
Murmansk Region	21.7	61.5	1.2	0.2	0.4	0.5	1.1	0.0	0.7	12.7
Novgorod Region	33.6	59.4	0.01	0.4	0.0	5.7	0.8	0.0	–	0.2
Pskov Region	33.9	46.8	8.0	0.4	1.7	7.3	1.6	0.1	–	0.01
St Petersburg	56.1	28.4	0.1	0.1	1.1	3.4	6.8	0.6	0.2	3.2
Southern Federal District	45.3	42.1	0.2	0.05	0.05	4.7	0.6	0.6	0.1	6.3
Republic of Adygea	–	13.9	12.9	0.7	0.5	18.1	53.9	–	–	–
Republic of Kalmykia	97.1	2.2	–	0.8	–	–	–	–	–	–
Republic of Crimea	54.4	40.2	0.2	0.5	0.1	–	0.2	0.01	0.5	3.9
Krasnodar Region	53.2	29.8	0.4	0.05	0.01	8.3	0.7	0.04	–	7.6
Astrakhan Region	0.2	73.5	–	0.0	0.8	9.5	0.02	0.4	0.0	15.6
Volgograd Region	55.1	40.7	0.03	0.04	0.1	0.6	1.0	0.2	1.0	1.2
Rostov Region	38.7	50.5	0.1	0.05	0.0	2.9	0.4	1.2	0.0	6.2
Sevastopol	97.1	2.4	–	–	–	–	0.4	–	–	–

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
North Caucasian Federal District	22.5	69.4	0.7	0.01	0.2	5.4	0.1	1.3	0.2	0.3
Republic of Dagestan	65.9	11.1	0.05	0.01	—	—	0.7	20.4	—	1.8
Republic of Ingushetia	—	100	—	—	—	—	—	—	—	—
Kabardino-Balkarian Republic	90.7	9.2	0.1	0.02	—	—	—	—	—	—
Karachay-Cherkess Republic	96.6	1.5	—	—	0.6	—	1.4	—	—	—
Republic of North Ossetia–Alania	82.1	16.7	—	0.2	—	1.0	—	—	—	—
Chechen Republic	—	100	—	—	—	—	—	—	—	—
Stavropol Region	15.0	77.4	0.8	0.01	0.3	6.2	0.05	0.04	0.2	0.2
Volga Federal District	46.6	32.9	0.1	0.1	0.4	9.0	1.0	0.6	0.1	9.2
Republic of Bashkortostan	26.8	65.7	0.3	0.3	0.1	1.9	1.3	2.1	0.6	0.9
Mari El Republic	14.7	26.4	1.4	0.1	36.7	6.0	8.9	0.02	0.2	5.6
Republic of Mordovia	19.3	71.1	1.5	0.05	1.3	5.7	0.5	0.3	0.2	0.05
Republic of Tatarstan	43.0	17.6	0.1	0.04	0.0	18.4	0.9	0.2	0.01	19.8
Udmurt Republic	30.0	38.9	0.2	0.1	1.1	14.8	2.3	0.3	0.04	12.2
Chuvash Republic	25.8	69.0	0.1	0.1	0.1	2.1	0.9	0.1	0.1	1.8
Perm Region	68.0	19.1	0.2	0.1	0.1	3.4	1.3	0.3	0.04	7.4
Kirov Region	49.0	35.7	0.02	0.1	0.04	8.2	5.7	0.1	0.02	1.0
Nizhny Novgorod Region	58.9	33.3	0.03	0.1	0.01	2.5	0.4	0.1	0.01	4.6
Orenburg Region	2.5	46.4	0.0	0.1	0.0	21.0	1.3	0.3	0.05	28.4
Penza Region	55.3	38.1	0.4	0.1	0.4	3.9	0.6	0.05	0.1	1.0

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and databases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Samara Region	46.3	35.5	0.1	0.2	2.6	6.5	1.6	2.6	0.2	4.5
Saratov Region	15.5	16.4	0.1	0.1	0.01	66.6	0.6	0.1	0.01	0.6
Ulyanovsk Region	23.7	45.5	0.04	0.04	0.02	4.1	0.9	0.04	0.0	25.6
Ural Federal District	51.0	30.6	0.1	0.1	0.1	5.8	2.1	0.4	0.3	9.5
Kurgan Region	17.3	77.4	0.03	0.2	0.4	3.0	0.3	0.04	–	1.3
Sverdlovsk Region	35.8	43.0	0.1	0.1	0.2	15.6	1.7	0.8	0.1	2.7
Tyumen Region	60.1	22.2	0.03	0.1	0.0	0.7	2.9	0.1	0.6	13.0
Khanty-Mansi Autonomous Region – Yugra	66.4	23.0	0.0	0.2	0.0	0.4	1.4	0.0	0.03	8.7
Yamal-Nenets Autonomous Region	80.7	13.1	0.0	0.01	–	–	4.7	0.8	0.1	0.6
Chelyabinsk region	55.2	28.5	0.1	0.1	0.1	2.3	1.0	0.5	0.05	12.3
Siberian Federal District	48.3	27.6	0.1	0.1	0.8	13.9	6.0	0.2	0.01	3.0
Altai Republic	9.8	67.2	–	0.1	–	7.8	0.04	–	–	15.0
Republic of Tuva	0.01	8.5	–	0.02	–	–	91.5	–	–	0.01
Republic of Khakassia	25.3	16.1	–	0.02	–	0.3	20.4	0.02	–	37.9
Altai Region	47.7	46.8	0.4	0.1	0.3	0.7	0.2	0.02	0.03	3.8
Krasnoyarsk Region	79.9	16.5	0.0	0.1	0.05	1.5	0.4	0.2	0.0	1.4
Irkutsk Region	11.0	32.7	0.0	0.02	2.5	46.8	0.8	0.1	0.0	6.0
Kemerovo Region	11.2	19.7	0.9	0.3	0.03	1.0	66.5	0.01	–	0.3
Novosibirsk Region	47.6	26.6	0.7	0.2	1.2	16.8	5.2	0.2	0.03	1.4
Omsk Region	25.8	56.3	0.1	0.1	1.3	12.1	2.0	0.3	0.0	2.0
Tomsk Region	60.6	30.2	0.1	0.1	0.01	2.9	0.6	0.01	0.03	5.4

(continued)

	Research and development	Purchase of machinery and equipment, or other fixed assets	Marketing and brand creation	Education and training of personnel	Design	Engineering	Development and purchase of software and data-bases	Acquisition of rights to the results of intellectual activity*	Planning, development, and implementation of new business methods, organisation of workplaces and networking	Other
Far Eastern Federal District	53.6	7.4	0.2	0.1	0.01	3.6	0.6	0.0	0.3	34.1
Republic of Buryatia	81.2	16.2	1.7	0.0	0.0	0.05	0.9	–	–	0.0
Republic of Sakha (Yakutia)	43.4	28.1	0.5	0.7	–	3.3	1.5	0.0	0.6	21.9
Trans-Baikal Region	33.7	34.3	0.1	0.1	–	21.1	9.9	0.0	0.6	0.2
Kamchatka Region	19.1	66.9	0.1	0.4	–	7.0	5.7	–	–	0.7
Primorsky Region	36.5	9.4	0.1	0.1	0.1	44.4	3.4	0.01	0.3	5.7
Khabarovsk Region	4.6	6.1	–	0.2	–	7.4	0.7	0.01	–	81.0
Amur Region	39.6	22.0	3.0	1.4	0.1	0.2	2.4	0.01	11.9	19.4
Magadan Region	27.9	55.3	–	0.4	–	4.3	1.1	–	–	11.0
Sakhalin Region	75.3	2.7	–	0.04	–	0.2	0.1	0.0	–	21.7
Jewish Autonomous Region	58.3	32.4	–	–	–	8.0	1.2	–	0.0	–
Chukotka Autonomous Region	13.3	84.5	–	–	–	0.1	2.0	–	–	0.1

8.5. INNOVATION EXPENDITURE FROM BUDGET FUNDS: 2019

(as a percentage of the total innovation expenditure)

	Budget funds – total	Of which	
		federal budget	budgets of Russian regions and local budgets
Russia	24.4	23.2	1.2
Central Federal District	31.0	29.6	1.4
Belgorod Region	12.2	2.3	10.0
Bryansk Region	26.2	20.4	5.8
Vladimir Region	20.9	20.5	0.4
Voronezh Region	37.4	36.8	0.7
Ivanovo Region	42.8	42.4	0.4
Kaluga Region	10.1	9.4	0.7
Kostroma Region	0.03	0.03	0.0
Kursk Region	2.6	1.9	0.7
Lipetsk Region	0.4	0.2	0.2
Moscow Region	67.0	64.6	2.4
Orel Region	6.0	5.6	0.4
Ryazan Region	13.6	13.5	0.05
Smolensk Region	27.7	27.6	0.1
Tambov Region	4.4	4.1	0.3
Tver Region	25.0	15.4	9.5
Tula Region	18.4	18.4	0.04
Yaroslavl Region	11.0	10.9	0.1
Moscow	27.5	26.6	0.9
North-Western Federal District	12.7	10.9	1.7
Republic of Karelia	1.9	1.6	0.3
Komi Republic	0.6	0.1	0.5

(continued)

	Budget funds – total	Of which	
		federal budget	budgets of Russian regions and local budgets
Arkhangelsk Region	50.7	41.3	9.4
Nenets Autonomous Region	0.1	–	0.1
Vologda Region	7.4	6.6	0.8
Kaliningrad Region	2.0	0.3	1.7
Leningrad Region	0.7	0.6	0.01
Murmansk Region	35.6	27.2	8.4
Novgorod Region	27.5	26.0	1.5
Pskov Region	–	–	–
St Petersburg	16.7	14.6	2.2
Southern Federal District	18.6	17.5	1.1
Republic of Adygea	–	–	–
Republic of Kalmykia	75.7	75.7	–
Republic of Crimea	48.7	47.6	1.1
Krasnodar Region	5.2	4.9	0.4
Astrakhan Region	0.5	0.5	0.01
Volgograd Region	0.3	0.3	0.0
Rostov Region	35.2	33.1	2.1
Sevastopol	8.0	8.0	–
North Caucasian Federal District	6.2	4.4	1.8
Republic of Dagestan	26.1	26.1	–
Republic of Ingushetia	–	–	–
Kabardino-Balkarian Republic	14.8	14.8	–
Karachay-Cherkess Republic	72.4	52.7	19.7
Republic of North Ossetia–Alania	79.8	79.8	–
Chechen Republic	–	–	–
Stavropol Region	3.4	1.5	1.9

(continued)

	Budget funds – total	Of which	
		federal budget	budgets of Russian regions and local budgets
Volga Federal District	26.2	25.4	0.7
Republic of Bashkortostan	5.7	4.6	1.2
Mari El Republic	0.1	0.1	0.01
Republic of Mordovia	7.6	2.5	5.0
Republic of Tatarstan	4.8	3.8	1.0
Udmurt Republic	12.0	9.6	2.4
Chuvash Republic	37.8	36.9	1.0
Perm Region	45.5	45.2	0.3
Kirov Region	43.3	41.2	2.0
Nizhny Novgorod Region	41.0	41.0	0.02
Orenburg Region	0.2	0.1	0.2
Penza Region	55.9	55.4	0.5
Samara Region	35.4	34.2	1.2
Saratov Region	7.3	7.0	0.3
Ulyanovsk Region	19.1	17.6	1.5
Ural Federal District	16.7	16.3	0.4
Kurgan Region	10.0	9.9	0.1
Sverdlovsk Region	19.2	18.8	0.4
Tyumen Region	0.7	0.3	0.5
Khanty-Mansi Autonomous Region – Yugra	0.01	–	0.01
Yamal-Nenets Autonomous Region	0.7	0.03	0.7
Chelyabinsk region	50.9	50.8	0.1

(continued)

	Budget funds – total	Of which	
		federal budget	budgets of Russian regions and local budgets
Siberian Federal District	22.4	21.0	1.4
Altai Republic	28.0	14.3	13.8
Republic of Tuva	6.8	1.0	5.8
Republic of Khakassia	35.5	35.2	0.3
Altai Region	16.1	7.4	8.7
Krasnoyarsk Region	37.9	37.8	0.1
Irkutsk Region	5.3	1.7	3.6
Kemerovo Region	1.2	1.1	0.03
Novosibirsk Region	34.4	34.2	0.2
Omsk Region	21.0	20.3	0.7
Tomsk Region	11.8	11.4	0.4
Far Eastern Federal District	3.7	3.1	0.6
Republic of Buryatia	10.2	10.2	–
Republic of Sakha (Yakutia)	5.9	5.5	0.3
Trans-Baikal Region	–	–	–
Kamchatka Region	27.6	5.5	22.1
Primorsky Region	13.4	13.2	0.2
Khabarovsk Region	6.9	6.9	0.02
Amur Region	1.0	1.0	0.03
Magadan Region	48.0	18.9	29.2
Sakhalin Region	0.4	0.0	0.4
Jewish Autonomous Region	11.7	11.7	–
Chukotka Autonomous Region	1.6	0.1	1.5

8.6. SALES OF INNOVATIVE GOODS AND SERVICES: 2019

	Million roubles	As a percentage of total sales
Russia	4863381.9	5.3
Central Federal District	1425670.3	5.0
Belgorod Region	150727.9	13.9
Bryansk Region	16261.0	5.9
Vladimir Region	34001.3	6.5
Voronezh Region	57946.9	7.3
Ivanovo Region	7938.1	4.6
Kaluga Region	17575.5	1.8
Kostroma Region	5376.4	3.0
Kursk Region	26754.2	5.5
Lipetsk Region	56295.0	7.0
Moscow Region	299890.3	5.8
Orel Region	6528.9	0.5
Ryazan Region	28477.8	9.7
Smolensk Region	15222.4	5.2
Tambov Region	15999.7	6.7
Tver Region	24306.6	5.6
Tula Region	67069.2	8.2
Yaroslavl Region	29493.3	6.0
Moscow	565805.9	3.9
North-Western Federal District	591698.8	5.6
Republic of Karelia	5719.5	2.2
Komi Republic	15680.1	1.6
Arkhangelsk Region	13089.6	1.8
Nenets Autonomous Region	15.2	0.0

(continued)

	Million roubles	As a percentage of total sales
Vologda Region	23338.4	2.8
Kaliningrad Region	1195.2	0.2
Leningrad Region	29055.7	2.0
Murmansk Region	26705.1	4.7
Novgorod Region	2507.2	1.1
Pskov Region	2639.5	0.9
St Petersburg	471768.4	10.5
Southern Federal District	196630.6	2.7
Republic of Adygea	7264.1	11.1
Republic of Kalmykia	152.1	1.6
Republic of Crimea	194.5	0.1
Krasnodar Region	94788.7	2.3
Astrakhan Region	1329.7	0.3
Volgograd Region	29336.5	2.7
Rostov Region	62676.2	4.9
Sevastopol	888.8	5.7
North Caucasian Federal District	44225.5	5.3
Republic of Dagestan	514.8	0.4
Republic of Ingushetia	40.6	0.4
Kabardino-Balkarian Republic	296.7	0.6
Karachay-Cherkess Republic	199.2	0.3
Republic of North Ossetia–Alania	148.8	0.4
Chechen Republic	26.6	0.04
Stavropol Region	42998.8	8.7

(continued)

	Million roubles	As a percentage of total sales
Volga Federal District	1716539.3	11.3
Republic of Bashkortostan	152873.1	6.5
Mari El Republic	16364.5	10.6
Republic of Mordovia	63526.0	23.8
Republic of Tatarstan	582676.4	18.1
Udmurt Republic	74298.4	10.4
Chuvash Republic	24761.5	9.3
Perm Region	223397.9	12.0
Kirov Region	29363.7	9.8
Nizhny Novgorod Region	266444.5	13.7
Orenburg Region	41663.7	3.7
Penza Region	21014.5	8.4
Samara Region	164854.9	9.3
Saratov Region	13457.7	2.0
Ulyanovsk Region	41842.4	11.0
Ural Federal District	501088.9	3.3
Kurgan Region	6936.0	3.5
Sverdlovsk Region	168148.7	6.3
Tyumen Region	229058.8	2.1
Khanty-Mansi Autonomous Region – Yugra	43164.2	0.8
Yamal-Nenets Autonomous Region	14305.2	0.5
Chelyabinsk region	96945.4	5.4
Siberian Federal District	248562.0	2.6
Altai Republic	197.6	1.4
Republic of Tuva	61.5	0.1

(continued)

	Million roubles	As a percentage of total sales
Republic of Khakassia	540.4	0.2
Altai Region	13167.2	3.1
Krasnoyarsk Region	143245.7	4.7
Irkutsk Region	14362.8	0.9
Kemerovo Region	17431.1	1.0
Novosibirsk Region	24521.5	2.9
Omsk Region	15543.0	1.3
Tomsk Region	19491.2	2.8
Far Eastern Federal District	138966.5	3.0
Republic of Buryatia	2433.1	1.4
Republic of Sakha (Yakutia)	7162.8	0.6
Trans-Baikal Region	342.6	0.2
Kamchatka Region	2132.1	1.2
Primorsky Region	49766.5	8.3
Khabarovsk Region	62799.0	10.9
Amur Region	2560.5	1.1
Magadan Region	1618.7	0.8
Sakhalin Region	8924.9	0.7
Jewish Autonomous Region	338.0	1.5
Chukotka Autonomous Region	888.3	0.8

8.7. ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS BY PARTNER: 2019

(as a percentage of enterprises that engaged in innovative activities)

	Total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Russia	18.2	6.3	6.3	5.8	1.5	2.1	9.3	5.8
Central Federal District	20.9	7.2	8.2	7.1	2.3	2.7	11.2	6.2
Belgorod Region	7.3	2.4	0.6	4.3	0.6	1.2	4.3	2.4
Bryansk Region	12.0	6.0	2.4	2.4	–	–	3.6	–
Vladimir Region	15.6	2.3	7.0	3.9	–	1.6	8.6	3.1
Voronezh Region	9.3	2.7	3.3	3.8	1.1	–	6.0	2.2
Ivanovo Region	8.6	1.4	4.3	2.9	–	–	2.9	1.4
Kaluga Region	26.0	8.3	8.3	6.3	4.2	2.1	13.5	6.3
Kostroma Region	11.1	–	–	3.7	–	3.7	7.4	–
Kursk Region	10.2	2.0	4.1	2.0	–	2.0	8.2	4.1
Lipetsk Region	8.0	1.1	2.3	1.1	–	2.3	2.3	2.3
Moscow Region	24.3	11.0	11.2	8.9	3.5	2.1	15.1	7.1
Orel Region	6.6	1.6	1.6	3.3	–	–	–	–
Ryazan Region	15.1	5.4	2.2	5.4	3.2	4.3	7.5	4.3
Smolensk Region	13.8	3.1	7.7	1.5	–	1.5	4.6	3.1
Tambov Region	13.2	6.6	–	2.6	–	–	6.6	3.9
Tver Region	13.8	6.9	1.7	0.9	0.9	–	8.6	2.6
Tula Region	15.3	4.5	5.4	8.1	–	0.9	6.3	6.3
Yaroslavl Region	20.2	4.6	8.3	6.4	1.8	4.6	9.2	10.1
Moscow	29.0	9.7	12.3	10.2	3.4	4.4	15.5	9.1

(continued)

	Total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
North-Western Federal District	18.6	5.7	7.1	5.5	1.8	1.8	10.0	6.3
Republic of Karelia	10.3	5.1	5.1	7.7	–	–	5.1	2.6
Komi Republic	10.0	3.3	–	1.7	–	–	3.3	5.0
Arkhangelsk Region	9.6	1.9	3.8	1.9	1.9	1.9	3.8	1.9
Nenets Autonomous Region	–	–	–	–	–	–	–	–
Vologda Region	6.2	0.9	2.7	1.8	–	–	4.4	2.7
Kaliningrad Region	17.1	2.4	7.3	–	–	4.9	2.4	4.9
Leningrad Region	18.2	8.1	6.1	3.0	3.0	2.0	13.1	5.1
Murmansk Region	11.8	2.9	4.4	4.4	–	1.5	7.4	1.5
Novgorod Region	21.3	8.5	19.1	4.3	2.1	2.1	2.1	4.3
Pskov Region	7.9	2.6	–	7.9	–	–	2.6	–
St Petersburg	24.4	7.3	8.9	7.5	2.5	2.2	13.9	9.1
Southern Federal District	11.6	3.4	3.1	4.0	0.8	1.0	5.5	3.5
Republic of Adygea	13.3	–	–	–	–	–	13.3	6.7
Republic of Kalmykia	25.0	–	25.0	–	–	–	25.0	–
Republic of Crimea	24.0	10.0	4.0	6.0	2.0	6.0	10.0	2.0
Krasnodar Region	10.2	4.8	3.0	3.0	0.6	0.6	4.8	3.0
Astrakhan Region	7.5	2.5	2.5	2.5	–	2.5	–	2.5
Volgograd Region	18.3	6.1	4.9	11.0	2.4	2.4	7.3	6.1
Rostov Region	9.6	1.5	2.8	3.3	0.5	0.3	5.1	3.5
Sevastopol	5.6	5.6	–	–	–	–	–	–

(continued)

	Total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
North Caucasian Federal District	16.0	5.6	5.6	2.4	0.8	–	6.4	5.6
Republic of Dagestan	15.8	10.5	5.3	–	–	–	10.5	–
Republic of Ingushetia	–	–	–	–	–	–	–	–
Kabardino-Balkarian Republic	25.0	–	8.3	–	–	–	16.7	16.7
Karachay-Cherkess Republic	6.7	–	6.7	–	–	–	6.7	6.7
Republic of North Ossetia–Alania	28.6	14.3	14.3	14.3	–	–	–	14.3
Chechen Republic	–	–	–	–	–	–	–	–
Stavropol Region	16.7	6.1	4.5	3.0	1.5	–	4.5	4.5
Volga Federal District	16.6	6.0	5.3	6.3	1.3	2.1	6.5	5.2
Republic of Bashkortostan	14.0	5.4	3.2	5.0	0.9	1.4	6.8	5.0
Mari El Republic	7.4	1.9	5.6	–	–	–	–	–
Republic of Mordovia	7.8	3.4	1.7	1.7	–	–	0.9	3.4
Republic of Tatarstan	15.3	7.1	5.1	7.1	1.1	2.0	5.9	4.5
Udmurt Republic	16.1	5.9	4.2	8.5	0.8	1.7	5.9	6.8
Chuvash Republic	23.1	7.4	6.6	7.4	0.8	3.3	5.8	5.8
Perm Region	26.5	8.8	7.5	10.9	2.0	5.4	11.6	11.6
Kirov Region	7.3	1.8	2.8	2.8	0.9	0.9	4.6	0.9
Nizhny Novgorod Region	19.7	7.2	8.3	6.2	1.7	2.4	9.0	7.2
Orenburg Region	17.9	7.7	2.6	6.4	1.3	3.8	7.7	3.8
Penza Region	16.2	6.3	6.3	6.3	2.7	0.9	8.1	4.5

(continued)

	Total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Samara Region	19.2	5.9	5.5	7.5	1.2	3.1	7.1	4.3
Saratov Region	19.2	4.0	7.1	9.1	2.0	2.0	6.1	6.1
Ulyanovsk Region	12.6	5.5	3.9	3.9	1.6	–	3.1	3.1
Ural Federal District	19.3	8.1	4.8	4.8	1.1	1.9	9.9	6.2
Kurgan Region	15.2	6.1	3.0	1.5	1.5	–	9.1	4.5
Sverdlovsk Region	24.2	9.4	7.2	5.3	1.3	0.9	14.2	9.4
Tyumen Region	13.3	5.2	2.4	3.6	0.4	2.4	5.2	2.8
Khanty-Mansi Autonomous Region – Yugra	10.0	5.0	–	3.8	–	3.8	5.0	–
Yamal-Nenets Autonomous Region	20.4	8.2	6.1	8.2	2.0	2.0	6.1	4.1
Chelyabinsk region	20.5	10.3	4.6	6.7	1.5	3.6	9.2	5.6
Siberian Federal District	18.5	5.9	6.1	5.0	1.2	2.7	11.3	6.6
Altai Republic	8.3	8.3	8.3	–	–	–	8.3	8.3
Republic of Tuva	–	–	–	–	–	–	–	–
Republic of Khakassia	10.5	5.3	5.3	5.3	–	5.3	5.3	–
Altai Region	9.3	3.1	3.1	4.9	–	–	6.8	2.5
Krasnoyarsk Region	16.5	6.5	4.1	4.7	1.8	5.3	10.0	5.3
Irkutsk Region	24.2	4.0	3.0	4.0	–	1.0	19.2	6.1
Kemerovo Region	19.0	5.1	3.8	8.9	–	5.1	5.1	6.3
Novosibirsk Region	24.9	6.6	10.2	4.6	2.0	3.0	16.2	9.6
Omsk Region	13.3	6.2	6.2	5.3	1.8	2.7	4.4	1.8
Tomsk Region	28.7	10.1	10.9	5.4	2.3	2.3	17.8	15.5

(continued)

	Total	Of which by partner						
		enterprises within a single network (group of companies, holding company, consortium, association, etc.)	consumers of goods and services	suppliers of equipment, materials, components, software	competitors in the industry	consulting firms, IT services providers	research institutes	higher education institutions
Far Eastern Federal District	15.3	4.0	3.1	2.7	0.2	0.4	9.9	6.7
Republic of Buryatia	30.0	10.0	6.7	6.7	–	3.3	16.7	10.0
Republic of Sakha (Yakutia)	13.0	2.2	4.3	2.2	–	2.2	13.0	8.7
Trans-Baikal Region	8.3	–	–	–	4.2	–	4.2	8.3
Kamchatka Region	7.4	1.9	1.9	–	–	–	7.4	1.9
Primorsky Region	25.0	3.4	6.8	2.3	–	–	15.9	11.4
Khabarovsk Region	14.9	4.1	2.7	2.7	–	–	8.1	8.1
Amur Region	10.0	2.5	–	7.5	–	–	5.0	2.5
Magadan Region	9.4	6.3	–	–	–	–	9.4	3.1
Sakhalin Region	17.1	11.4	2.9	5.7	–	–	5.7	5.7
Jewish Autonomous Region	8.3	–	–	–	–	–	8.3	–
Chukotka Autonomous Region	–	–	–	–	–	–	–	–

8.8. PERCENTAGE DISTRIBUTION OF RUSSIAN REGIONS BY MAIN INNOVATION ACTIVITY INDICATORS: 2019

	Rank of Russian region by indicators:		
	innovation activity of enterprises	expenditure on technological innovation as a percentage of total sales	innovative goods and services as a percentage of total sales
Central Federal District	2	1	4
Belgorod Region	5	17	3
Bryansk Region	34	49	28
Vladimir Region	29	19	25
Voronezh Region	11	16	21
Ivanovo Region	35	76	38
Kaluga Region	22	62	53
Kostroma Region	69	66	44
Kursk Region	59	52	32
Lipetsk Region	24	6	22
Moscow Region	40	21	29
Orel Region	30	79	72
Ryazan Region	18	32	13
Smolensk Region	41	35	34
Tambov Region	33	10	23
Tver Region	17	42	31
Tula Region	19	2	19
Yaroslavl Region	27	34	27
Moscow	16	7	39
North-Western Federal District	3	5	2
Republic of Karelia	49	29	50
Komi Republic	47	46	54
Arkhangelsk Region			
Nenets Autonomous Region	80	85	85
Arkhangelsk Region excluding the Autonomous Region	75	50	40

(continued)

	Rank of Russian region by indicators:		
	innovation activity of enterprises	expenditure on technological innovation as a percentage of total sales	innovative goods and services as a percentage of total sales
Vologda Region	21	74	46
Kaliningrad Region	72	47	80
Leningrad Region	42	24	52
Murmansk Region	38	71	36
Novgorod Region	36	56	61
Pskov Region	53	77	65
St Petersburg	4	18	10
Southern Federal District	5	6	7
Republic of Adygea	71	82	6
Republic of Kalmykia	82	75	55
Republic of Crimea	68	69	83
Krasnodar Region	73	53	49
Astrakhan Region	48	59	78
Volgograd Region	67	44	48
Rostov Region	2	15	35
Sevastopol	52	8	30
North Caucasian Federal District	8	8	3
Republic of Dagestan	84	73	74
Republic of Ingushetia	83	84	76
Kabardino-Balkarian Republic	76	64	70
Karachay-Cherkess Republic	55	78	77
Republic of North Ossetia–Alania	81	81	75
Chechen Republic	85	83	84
Stavropol Region	64	45	16

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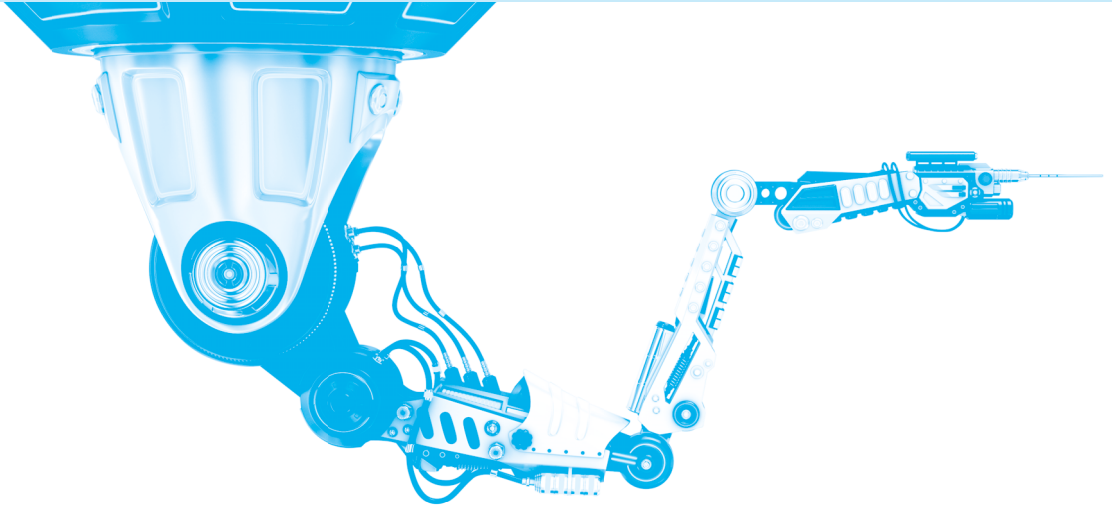
	Rank of Russian region by indicators:		
	innovation activity of enterprises	expenditure on technological innovation as a percentage of total sales	innovative goods and services as a percentage of total sales
Volga Federal District	1	2	1
Republic of Bashkortostan	31	39	24
Mari El Republic	23	63	9
Republic of Mordovia	1	13	1
Republic of Tatarstan	3	12	2
Udmurt Republic	26	51	11
Chuvash Republic	6	11	15
Perm Region	39	33	5
Kirov Region	8	27	12
Nizhny Novgorod Region	10	1	4
Orenburg Region	57	37	41
Penza Region	14	28	17
Samara Region	32	14	14
Saratov Region	51	40	51
Ulyanovsk Region	9	25	7
Ural Federal District	4	7	5
Kurgan Region	37	58	42
Sverdlovsk Region	20	36	26
Tyumen Region			
Khanty-Mansi Autonomous Region – Yugra	65	60	68
Yamal-Nenets Autonomous Region	58	70	73
Tyumen Region excluding autonomous regions	25	54	20
Chelyabinsk region	28	38	33

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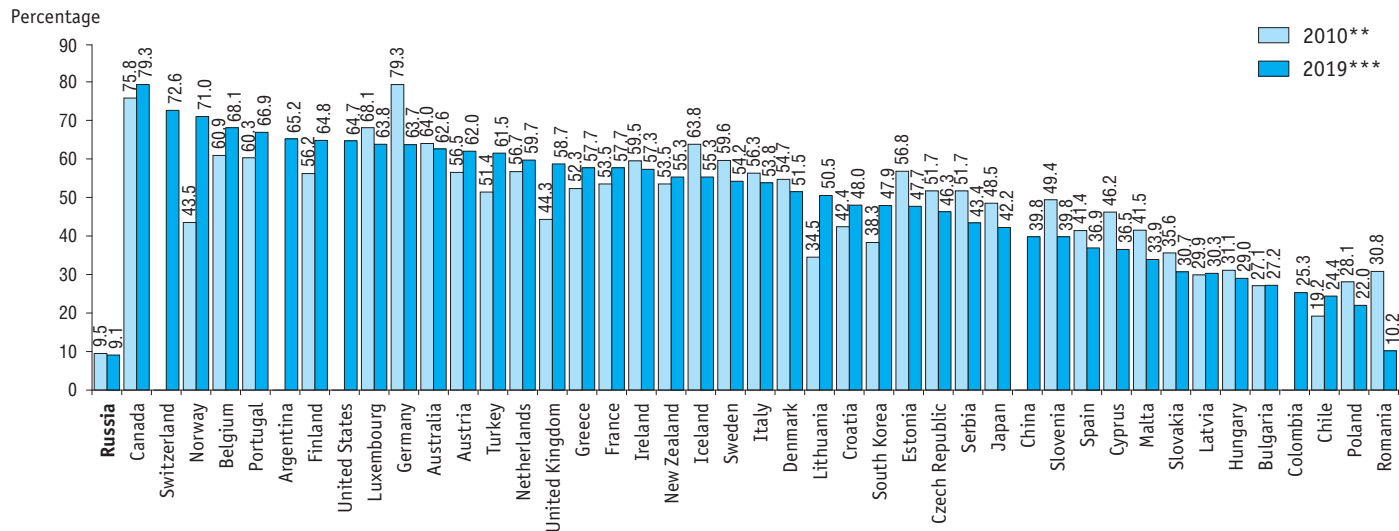
	Rank of Russian region by indicators:		
	innovation activity of enterprises	expenditure on technological innovation as a percentage of total sales	innovative goods and services as a percentage of total sales
Siberian Federal District	6	4	8
Altai Republic	61	48	57
Republic of Tuva	56	4	82
Republic of Khakassia	79	80	79
Altai Region	15	30	43
Krasnoyarsk Region	50	26	37
Irkutsk Region	60	20	64
Kemerovo Region	70	57	63
Novosibirsk Region	44	41	45
Omsk Region	46	31	59
Tomsk Region	7	23	47
Far Eastern Federal District	7	3	6
Republic of Buryatia	62	9	58
Republic of Sakha (Yakutia)	77	67	71
Trans-Baikal Region	78	65	81
Kamchatka Region	13	55	60
Primorsky Region	54	61	18
Khabarovsk Region	43	5	8
Amur Region	63	43	62
Magadan Region	12	72	67
Sakhalin Region	66	3	69
Jewish Autonomous Region	74	22	56
Chukotka Autonomous Region	45	68	66

INTERNATIONAL COMPARISONS

9



9.1. INNOVATION ACTIVITY OF ENTERPRISES*



* Here and below in this section, for Russia, the aggregate data for enterprises refer to the following types of economic activities: for 2019, in accordance with OKVED2 codes 01.1, 01.2, 01.3, 01.4, 01.5, 01.6, Sections B, C, D (excluding 35.14; 35.23; 35.30.6), E, F, H, Q, codes 58, 61, 62, 63, 69, 70, 71, 72, 73, 74; for 2010, in accordance with OKVED (ver. 1.1) Sections C, D, E, codes 64, 72, 74. The 2019 data are based on the Innovation Activity Survey that meets the latest international standards (the Oslo Manual 4th edition and the CIS-2018 European Innovation Survey).

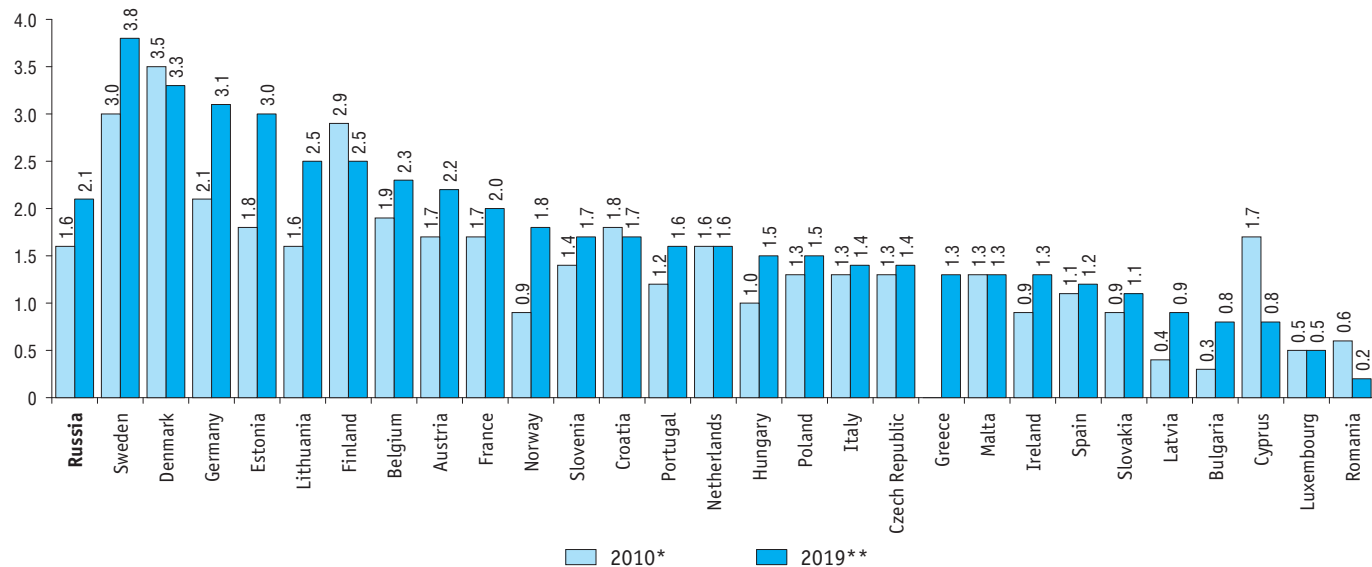
** The data for the EU countries, Iceland, Norway, Serbia, Turkey are based on the European Innovation Survey results (2008–2010). For other countries: Australia (2010–2011), Canada (2007–2009), New Zealand (2009–2011), South Korea (2005–2007, manufacturing), Chile (2009–2010), and Japan (2009–2011).

*** The data for the EU countries, Iceland, Norway, Serbia, Turkey and Switzerland are based on the European Innovation Survey (2008–2010). For other countries, Australia (2016–2017), Argentina (2014–2016, manufacturing), Canada (2015–2017), China (2014–2016), Colombia (2015–2016, manufacturing), New Zealand (2015–2017), South Korea (2015–2017), United States (2015–2017), Chile (2015–2016), and Japan (2015–2017).

Sources: Eurostat; materials of national statistical services.

9.2. INTENSITY OF INNOVATION EXPENDITURE

(innovation expenditure as a percentage of total sales)



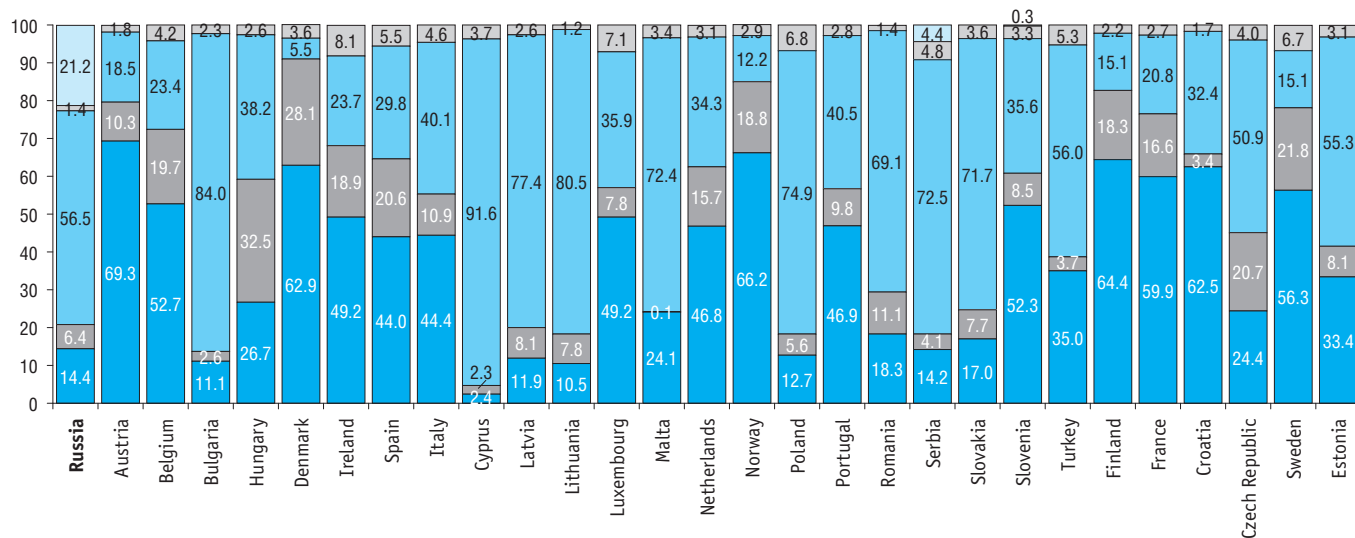
* The data for EU countries and Norway are based on the European Innovation Survey (2008–2010).

** The data for EU countries and Norway are based on the European Innovation Survey (2014–2016).

Source: Eurostat.

9.3. PERCENTAGE DISTRIBUTION OF INNOVATION EXPENDITURE BY TYPE

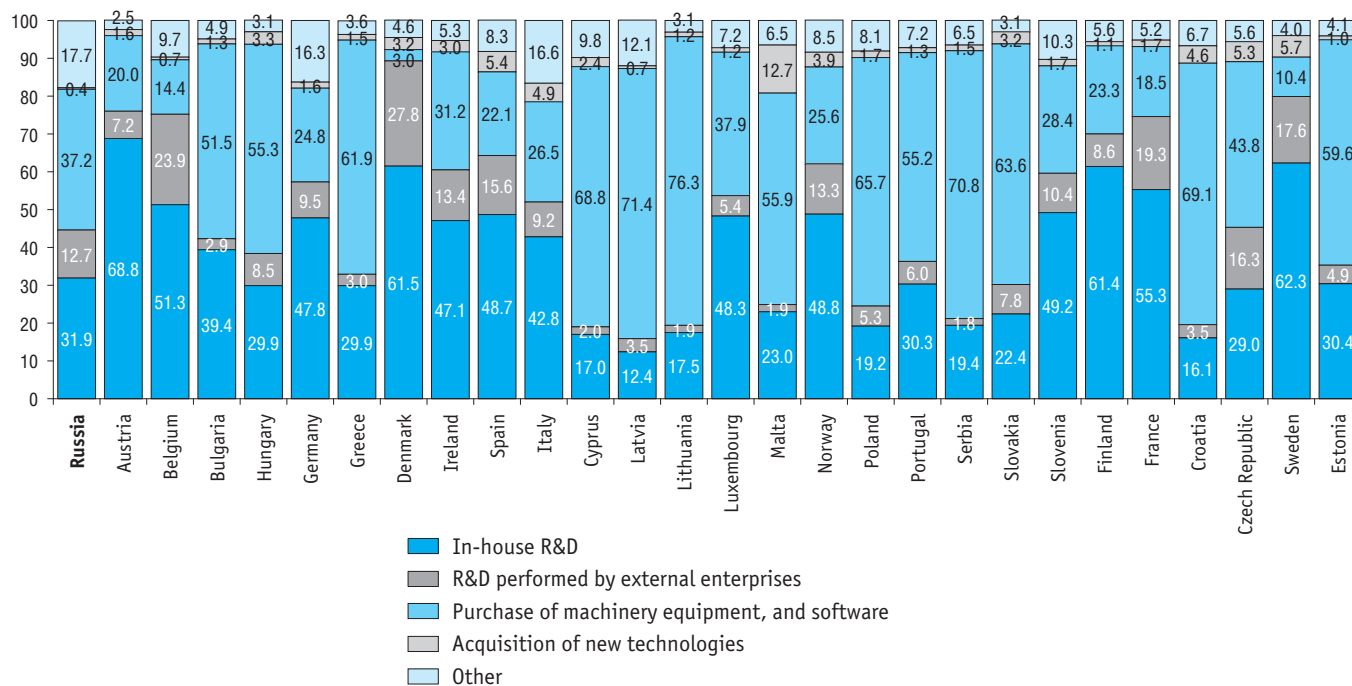
2010*



- In-house R&D
- R&D performed by external enterprises
- Purchase of machinery equipment, and software
- Acquisition of new technologies
- Other

(continued)

2019**

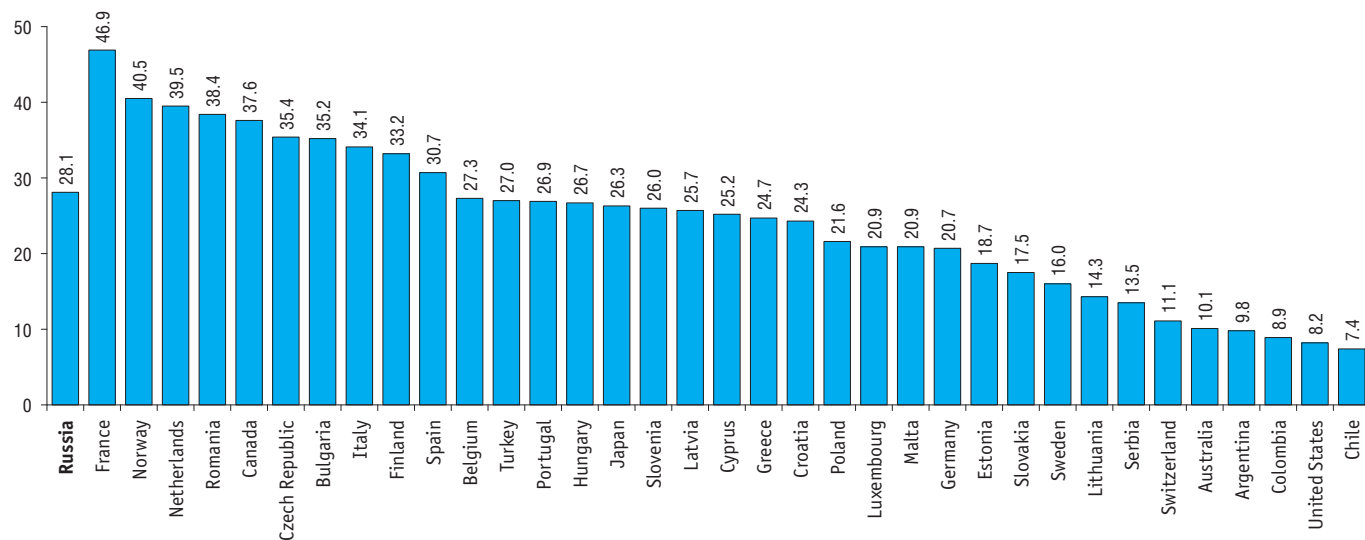


* The data for EU countries and Norway are based on the European Innovation Survey (2008–2010).

** The data for EU countries and Norway are based on the European Innovation Survey (2014–2016).

Source: Eurostat.

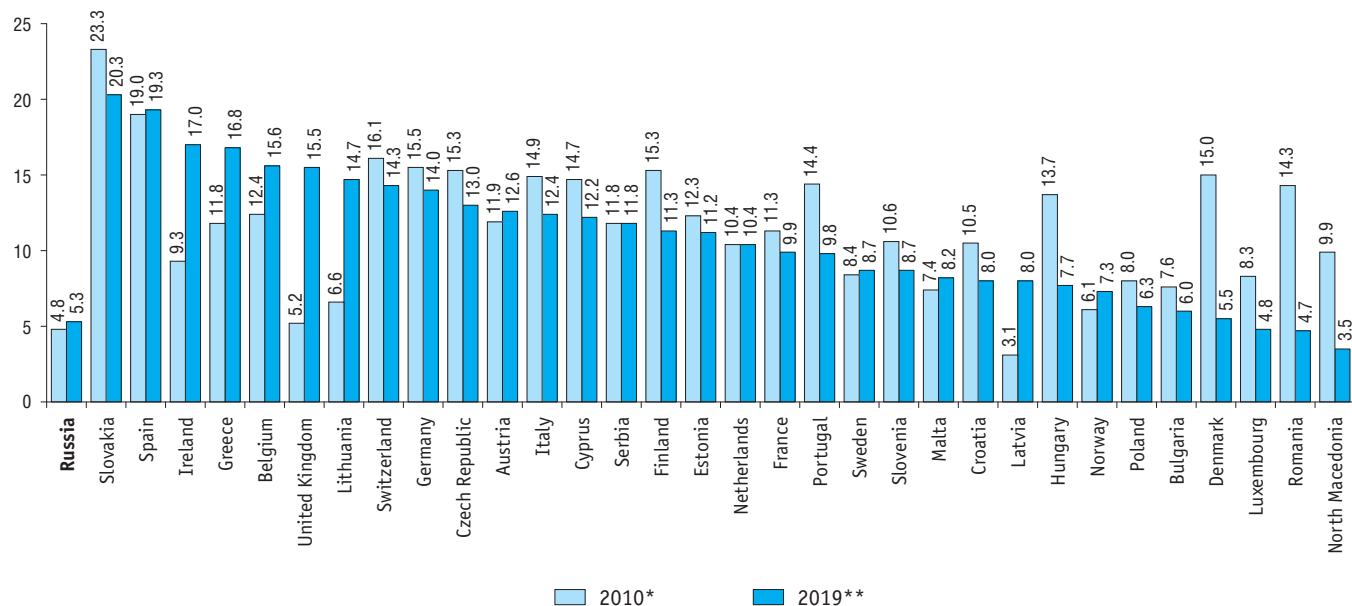
9.4. ENTERPRISES THAT RECEIVED FUNDS FROM BUDGETS OF ALL LEVELS: 2019*

(as a percentage of all enterprises that have had innovation expenditure)

* The data for the EU countries, Norway, Serbia, Turkey, and Switzerland are based on the European Innovation Survey (2014–2016). For other countries: Australia (2016–2017), Argentina (2014–2016, manufacturing), Canada (2015–2017), Colombia (2015–2016, manufacturing), USA (2015–2017), Chile (2015–2016), and Japan (2015–2017).

Sources: Eurostat; materials of national statistical services.

9.5. INNOVATIVE GOODS AND SERVICES AS A PERCENTAGE OF TOTAL SALES



* The data for EU countries, Norway, Serbia, and Switzerland are based on the European Innovation Survey (2008–2010).

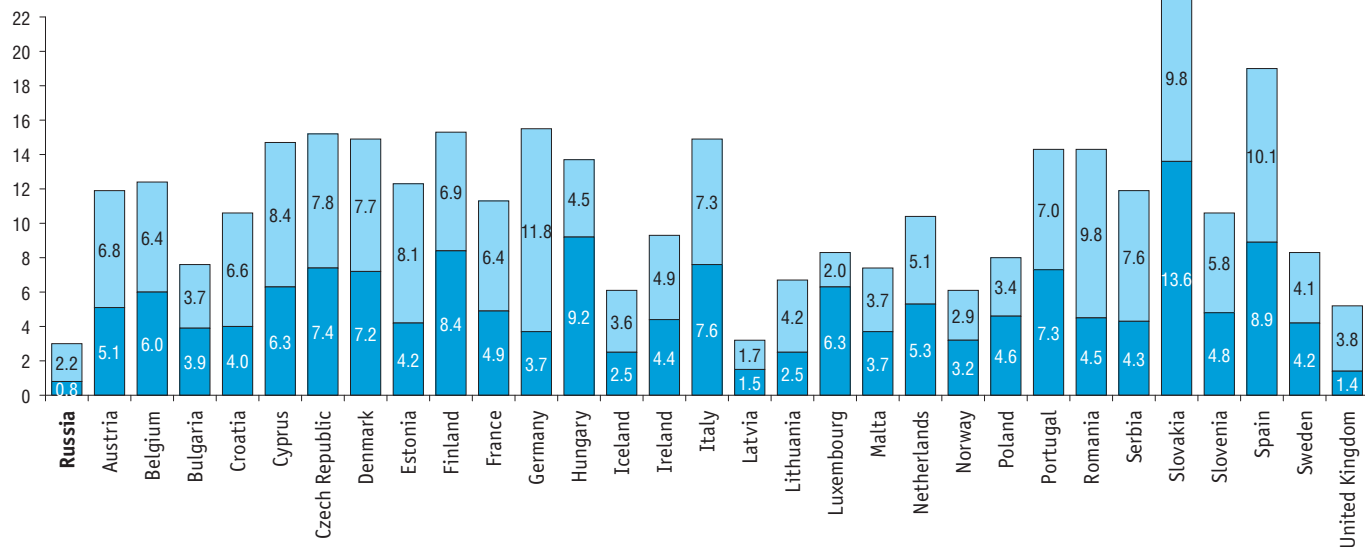
** The data for the EU countries, Norway, Serbia, and Switzerland are based on the European Innovation Survey (2014–2016).

Source: Eurostat.

9.6. NEW OR TECHNOLOGICALLY NEW INNOVATIVE GOODS AND SERVICES

(as a percentage of total sales)

2010**



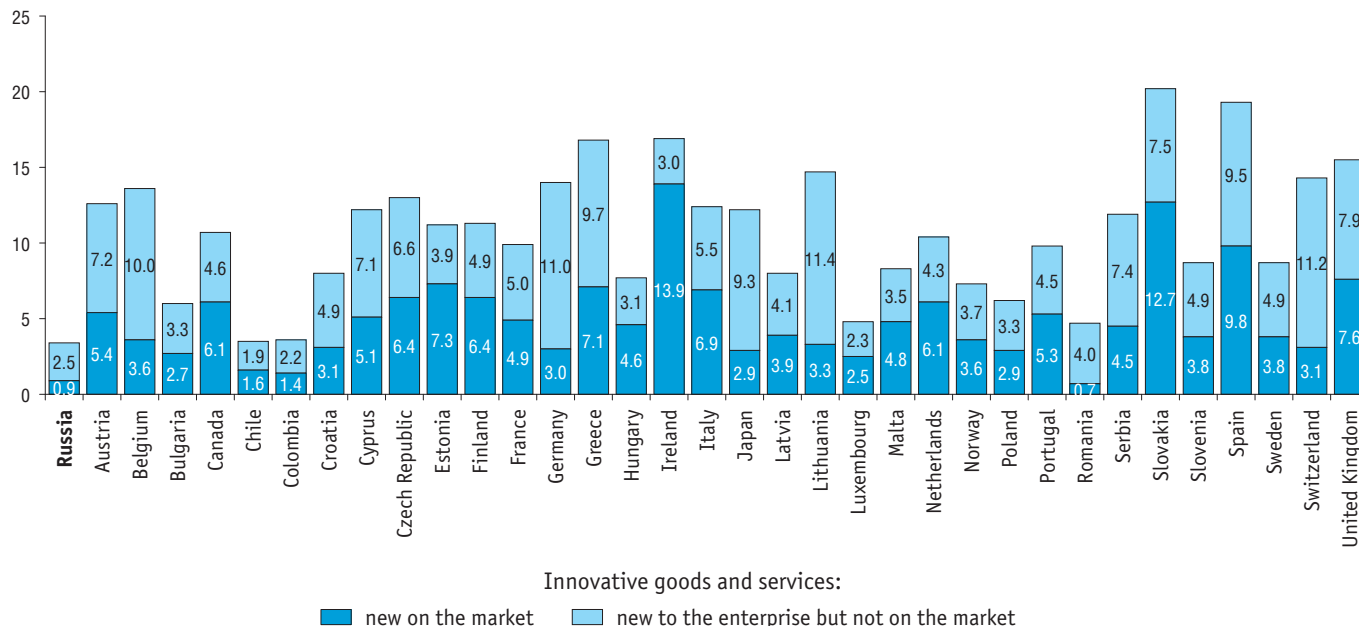
Innovative goods and services:

■ new on the market

■ new to the enterprise but not on the market

(continued)

2019*

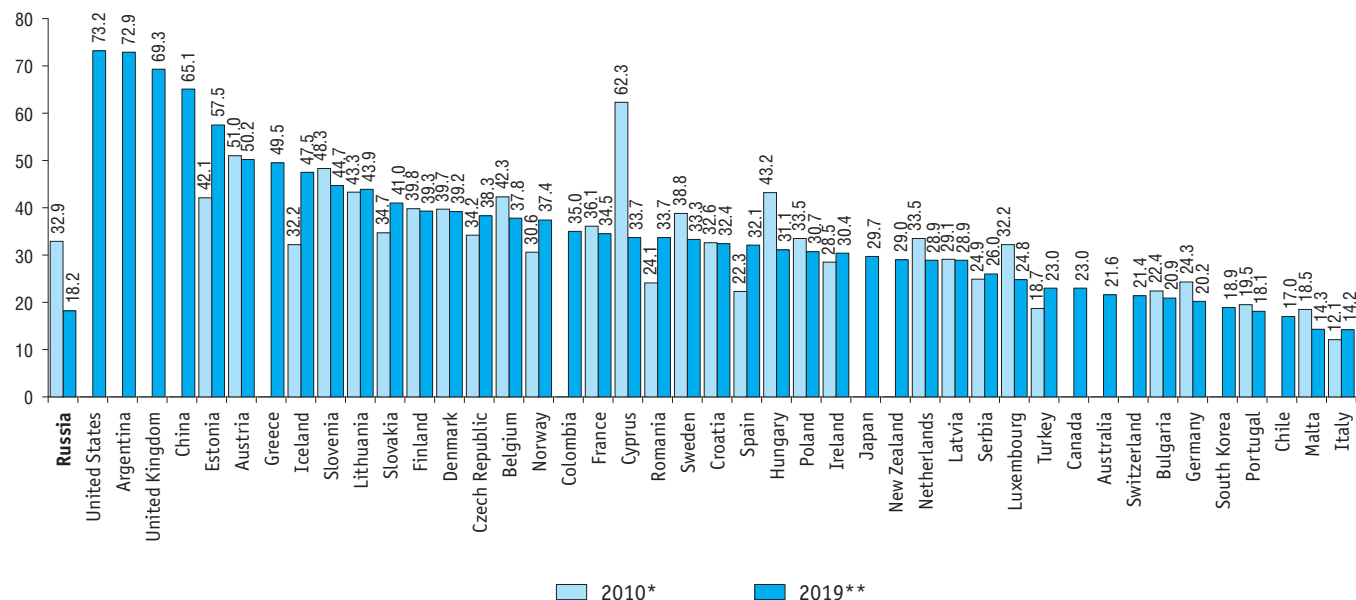


* The data for the EU countries, Iceland, Norway, and Serbia are based on the European Innovation Survey (2008–2010).

** The data for the EU countries, Norway, Serbia, and Switzerland are based on the European Innovation Survey (2014–2016). For other countries, Canada (2015–2017), Colombia (2015–2016, manufacturing), Chile (2015–2016), and Japan (2015–2017).

Sources: Eurostat; materials of national statistical services.

9.7. ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS

(as a percentage of all enterprises that have been engaged in innovative activities)

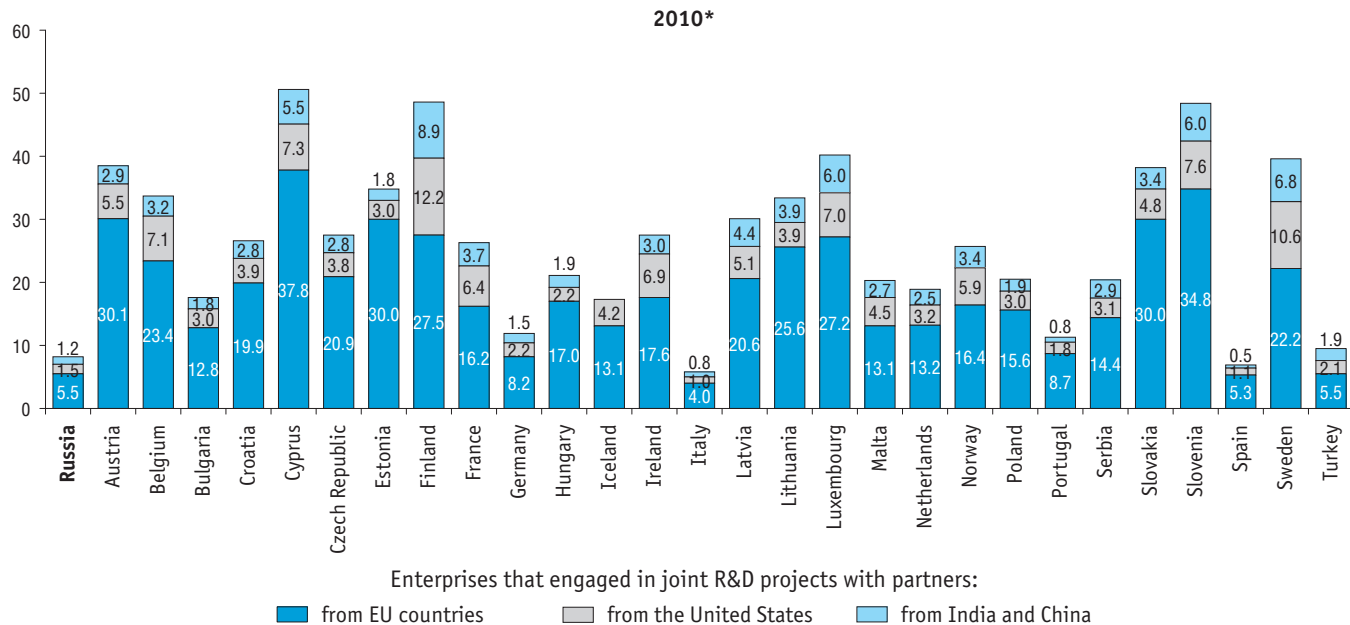
* The data for the EU countries, Iceland, Norway, Serbia, and Turkey are based on the European Innovation Survey (2008–2010).

** The data for the EU countries, Iceland, Norway, Serbia, Turkey and Switzerland are based on the European Innovation Survey (2014–2016). For other countries, Australia (2016–2017), Argentina (2014–2016, manufacturing), Canada (2015–2017), China (2014–2016), Colombia (2015–2016, manufacturing), New Zealand (2015–2017), South Korea (2015–2017), United States (2015–2017), Chile (2015–2016), and Japan (2015–2017).

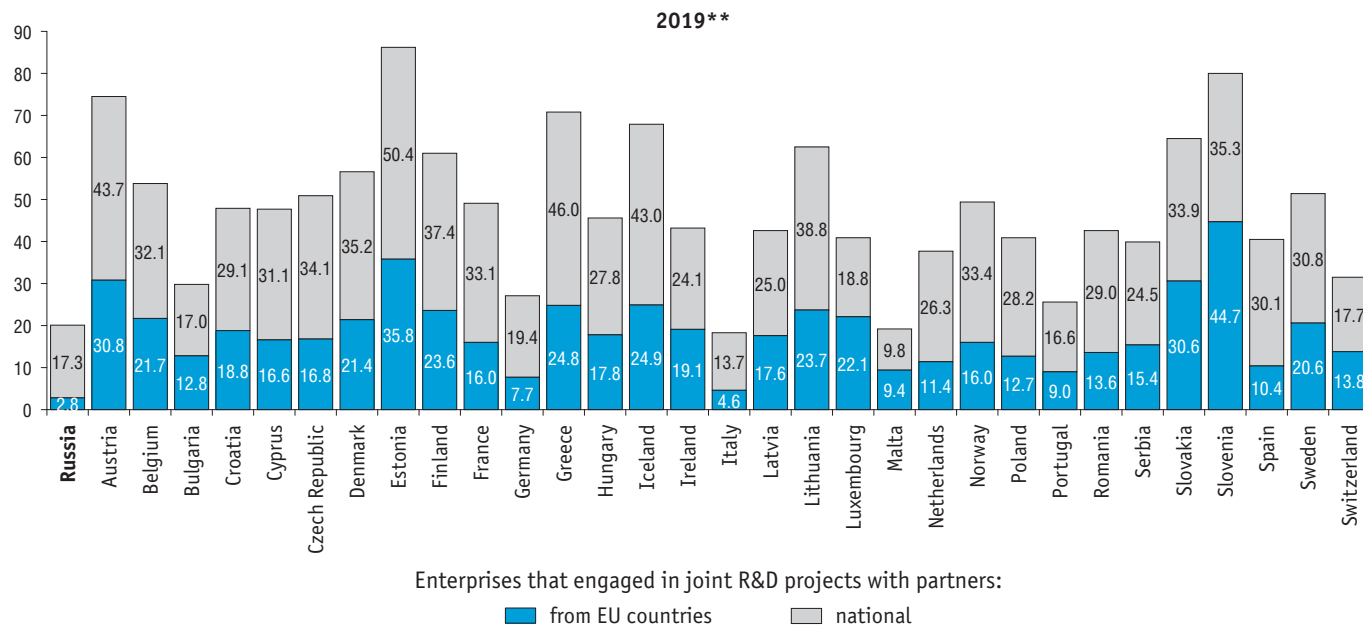
Sources: Eurostat; materials of national statistical services.

9.8. ENTERPRISES THAT ENGAGED IN JOINT R&D PROJECTS BY PARTNER COUNTRY

(as a percentage of all enterprises that have been engaged in innovative activities)



(continued)



* The data for the EU countries, Iceland, Norway, Serbia, and Turkey are based on the European Innovation Survey (2008–2010).

** The data for the EU countries, Iceland, Norway, Serbia, Turkey, and Switzerland are based on the European Innovation Survey (2014–2016).

Source: Eurostat.

9.9. PERCENTAGE DISTRIBUTION OF ENTERPRISES THAT ENGAGED IN INNOVATIVE ACTIVITIES AND JOINT R&D PROJECTS BY PARTNER: 2019*

	Enterprises within a single network	Suppliers of equipment, materials, components, software	Competitors in the industry	Consulting firms, IT services providers	Higher education institutions
Russia	34.3	31.9	8.5	11.5	32
Austria	41.5	58.4	34	30.8	46.2
Belgium	50.2	73.9	14.3	34.1	35.1
Bulgaria	34.9	71.2	27.5	27.6	26
Croatia	30.8	81.6	31.5	32.4	36.8
Cyprus	31.4	87.8	15.7	57	26.2
Czech Republic	37.6	51.5	13.8	28.2	33.5
Denmark	42.3	73.1	24.7	42.6	38.8
Estonia	53.5	89.2	32.8	28.2	21.7
Finland	43.4	73.7	50	47.9	60.4
France	57.7	69.8	36.8	38.5	39.2
Germany	43.4	39.3	29.4	26.4	62.6
Greece	13.7	88.4	46.7	53.6	37
Hungary	51.9	68.9	34.8	36.1	39.3
Iceland	52.5	69	14.5	31.5	26
Ireland	58.6	65.3	19.6	45.9	42.9
Italy	20.7	49.5	36.3	47	41.3
Latvia	55.2	69	43.8	35.7	32.3
Lithuania	35.8	79.7	32.3	31.3	26.9
Luxembourg	77.1	76.6	51.7	48.8	44.9

(continued)

	Enterprises within a single network	Suppliers of equipment, materials, components, software	Competitors in the industry	Consulting firms, IT services providers	Higher education institutions
Malta	51.4	62.9	22.9	34.3	34.3
Netherlands	44	69.9	20.9	26.3	32
Norway	35.1	50.7	16.2	35	22
Poland	40.8	65	22.7	32.1	35.5
Portugal	30.1	63.5	27.4	26.6	46.4
Romania	16.8	52.1	14.7	25.8	50.6
Serbia	78.9	79.8	60.7	60.8	55.9
Slovakia	46.7	75.3	19.4	33.7	27.9
Slovenia	40.4	82.9	59.3	44.1	50.2
Spain	31.8	50.6	20.2	24.8	34.7
Sweden	57.8	77.8	36.8	57.8	47.6
Switzerland	22.3	71.2	19	–	51.5
Turkey	33.9	32.1	26.1	25.8	23.9
United Kingdom	66.5	79.6	46.6	48.3	39.4

* The data for the EU countries, Iceland, Norway, Serbia, Turkey, and Switzerland are based on the European Innovation Survey (2014–2016).

Source: Eurostat.

9.10. ENTERPRISES INDICATING THE FOLLOWING FACTORS HINDERING THEIR INNOVATIVE ACTIVITIES AS MAIN: 2017–2019*

(as a percentage of all enterprises that had completed innovative activities)

	Lack of own funds	Low demand for new goods and services	High cost of introducing innovations	Lack of qualified personnel	Underdeveloped cooperation ties
Russia	16.6	6.5	15.0	4.7	1.9
Austria	20.2	13.0	19.7	25.2	6.4
Belgium	11.6	7.7	14.1	13.3	3.5
Bulgaria	21.1	13.0	27.0	14.7	7.8
Croatia	35.5	19.7	31.1	18.6	11.6
Cyprus	35.2	20.7	36.1	17.9	8.2
Czech Republic	20.0	–	–	14.1	4.8
Estonia	16.5	8.4	19.9	15.9	2.6
Finland	14.3	8.6	12.2	12.0	2.3
France	24.7	13.6	18.1	15.8	5.8
Germany	12.1	7.8	19.9	14.2	4.6
Greece	35.9	22.3	27.6	12.6	8.4
Hungary	20.9	11.2	26.8	22.0	5.3
Italy	18.4	26.7	9.9	21.2	6.0
Latvia	23.8	16.8	30.0	7.7	6.4
Lithuania	15.2	26.4	13.4	26.6	30.9
Luxembourg	12.6	7.5	11.8	12.5	3.3
Malta	14.3	10.1	14.9	16.6	3.9
Norway	16.8	5.6	9.9	8.8	3.4
Poland	19.3	14.8	26.3	10.0	7.0
Portugal	23.8	14.2	30.8	13.7	10.0
Romania	24.8	12.5	28.6	16.2	12.0
Serbia	30.8	16.3	30.9	12.4	11.7
Slovakia	29.0	13.0	25.9	15.0	5.9
Slovenia	40.1	20.3	30.3	33.1	12.2
Switzerland	15.1	12.7	24.1	16.7	–

* The data for the EU countries, Iceland, Norway, Serbia, Turkey, and Switzerland are based on the European Innovation Survey (2014–2016).

Source: Eurostat.

9.11. ENTERPRISES THAT ENGAGED IN ENVIRONMENTAL INNOVATION AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES THAT HAVE HAD COMPLETED INNOVATIVE ACTIVITIES : 2017–2019*

	Improving environmental safety in the production of goods and services					Improving environmental safety as a result of the consumer's use of innovative goods and services		
	Reducing material costs per unit of goods and services output	Reducing carbon dioxide emissions and energy costs for the production of a unit of goods or services	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water or noise pollution)	Recycling waste, water or materials	Reducing energy consumption or loss of energy resources	Reducing environmental pollution (air, soil, water or noise pollution)	Improving the possibilities of recycling goods after use
Russia	5.2	6.9	3.9	8.0	4.5	6.6	6.4	3.1
Austria	27.7	35.8	24.5	27.1	23.9	29.0	19.2	16.6
Bulgaria	10.3	9.3	8.9	10.3	9.4	6.4	7.9	7.1
Croatia	24.4	26.8	20.0	24.1	26.5	21.5	22.6	21.3
Cyprus	13.2	19.5	11.1	14.4	21.8	10.9	8.8	10.2
Czech Republic	20.9	27.9	14.4	19.1	24.9	20.5	14.2	16.0
Denmark	12.2	16.2	7.1	8.3	11.5	13.4	8.5	4.6
Estonia	18.2	24.3	16.4	13.7	16.7	19.3	12.6	10.2
Finland	29.1	37.7	20.6	23.5	25.8	36.9	25.7	23.9
Germany	29.1	51.9	18.7	30.9	28.3	32.8	20.0	18.5
Greece	17.4	24.0	17.3	17.5	21.8	21.6	15.7	23.2
Hungary	15.7	16.8	17.2	14.6	13.9	13.6	11.5	9.3
Iceland	22.2	24.1	20.9	18.4	16.1	24.7	15.0	16.3
Italy	35.8	18.5	23.7	28.0	8.4	22.3	19.4	13.8
Latvia	14.2	20.4	14.9	16.2	13.8	13.0	14.4	10.8
Lithuania	15.0	36.7	13.6	26.8	11.6	19.7	18.9	10.2

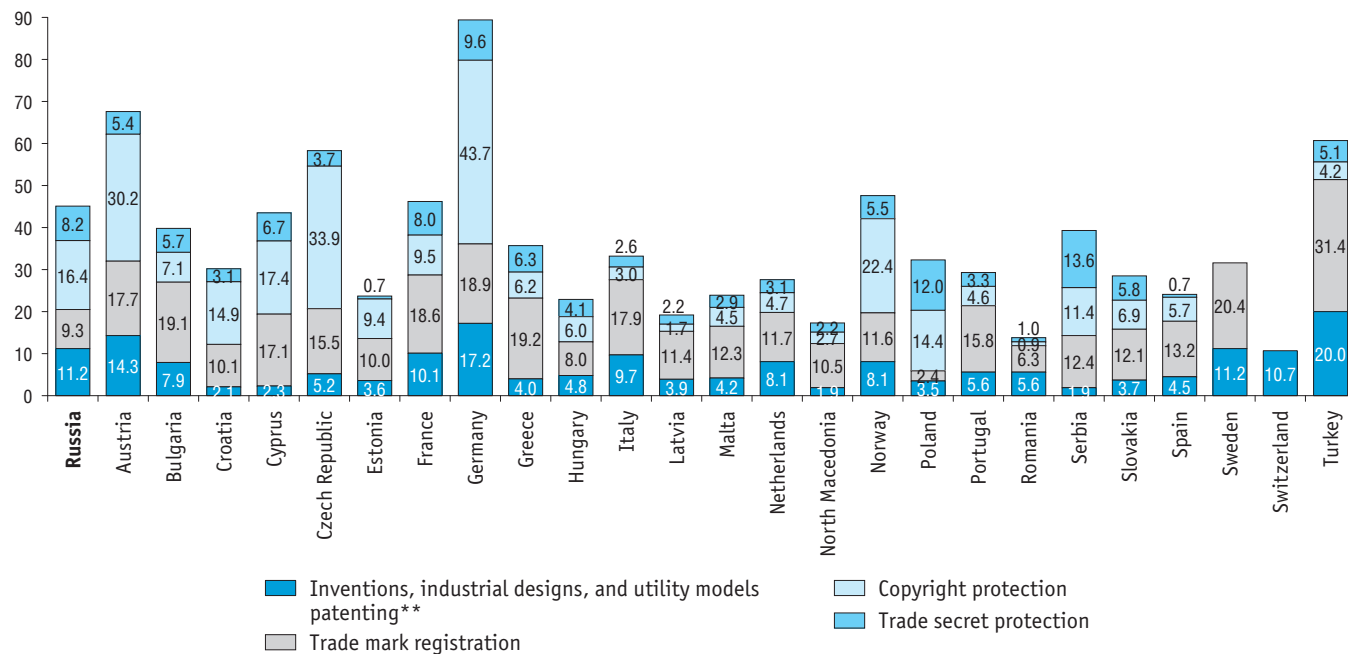
(continued)

	Improving environmental safety in the production of goods and services					Improving environmental safety as a result of the consumer's use of innovative goods and services		
	Reducing material costs per unit of goods and services output	Reducing carbon dioxide emissions and energy costs for the production of a unit of goods or services	Replacing materials with less hazardous or non-hazardous substitutes	Reducing environmental pollution (air, soil, water or noise pollution)	Recycling waste, water or materials	Reducing energy consumption or loss of energy resources	Reducing environmental pollution (air, soil, water or noise pollution)	Improving the possibilities of recycling goods after use
Luxembourg	20.0	26.6	16.3	19.9	24.2	20.6	16.3	19.8
Malta	14.6	17.7	12.9	7.1	17.7	11.7	6.6	14.3
Poland	15.2	17.7	12.3	14.0	15.6	14.5	12.4	9.2
Portugal	25.7	29.4	25.1	27.3	48.5	22.1	19.5	28.7
Romania	9.8	13.4	7.0	14.9	12.5	6.7	9.5	7.5
Serbia	15.0	16.0	14.0	20.0	19.7	15.9	20.5	16.5
Slovakia	19.2	19.6	10.4	18.7	18.2	14.0	12.0	10.7
Slovenia	31.1	36.1	29.8	28.9	24.4	32.5	25.8	17.1
Sweden	18.2	28.6	22.0	22.9	23.0	28.9	23.5	15.7
Turkey	24.0	23.8	31.6	29.9	23.6	25.9	32.9	30.2

* The data for EU the countries, Iceland, Serbia, and Turkey are based on the European Innovation Survey (2012–2014).

Source: Eurostat.

9.12. ENTERPRISES INDICATING THE FOLLOWING INVENTIONS AND R&D RESULTS PROTECTION METHODS AS MAIN: 2017–2019*
(as a percentage of all enterprises that have been engaged in innovative activities)



* The data for the EU countries, Iceland, Norway, Serbia, Turkey, and Switzerland are based on the European Innovation Survey (2014–2016).

** For the EU countries, Iceland, Norway, Serbia, Turkey, and Switzerland, the data refer to the number of enterprises that have been patenting inventions.

Source: Eurostat.

TECHNICAL NOTES

Innovation activity describes the degree of involvement of enterprises (organisations) in general or specific innovative activity during a given period of time. **Innovation activity of enterprises** is calculated as a ratio of the number of innovation-active enterprises to the total number of surveyed enterprises in the reporting year. The methodology for calculating the indicator was approved by Rosstat Order no. 818 of December 27, 2019. Any changes in 2017 data are due to the recalculation indicators according to the specified method.

Innovative activity includes all developmental (R&D), financial or commercial activity related to creation of technologically new or significantly improved goods or services that have been introduced on the market and differ significantly from the previously produced goods and services; or technologically new or significantly improved business processes that differ significantly from the previously used business processes.

The following main **types of innovative activity** are distinguished in statistics:

- research and development of new goods, services, and methods of their production (transfer), new manufacturing processes;
- purchase of machinery, equipment, and other fixed assets related to innovative activities;
- marketing and brand creation (implementation of new or significantly improved marketing methods, methods of maintaining and developing the brand);

- education and training of personnel related to innovative activities;
- design (activity of developing a new or modified shape, appearance, or usability of goods or services);
- engineering, including pre-FEED and FEED, project development and design studies of technological items and solutions at the innovation implementation stage, post-project services during installation, commissioning and start-up work, other engineering (not related to scientific R&D) of new goods, services, and methods of their production (transfer), new manufacturing processes;
- development and purchase of computer programs and databases related to innovative activities;
- acquisition of patent rights (alienation), licenses, industrial designs, utility models, selection achievements, integrated circuit designs, etc.; patenting (registration) of the results of intellectual activity;
- planning, development, and implementation of new business methods, organisation of workplaces and networking.

Product innovation is a new or improved good or service that differs significantly from the previous goods or services and that has been introduced on the market.

Business process innovation is a new or improved business process that differs significantly from the previous business processes and that has been brought into use.

Business process innovations include:

- new or improved methods for producing goods or providing services (including methods for developing goods or services);
- new or improved logistics, delivery, or distribution methods;
- new or improved methods for information processing or communication;
- new or improved methods for accounting or other administrative operations;
- new or improved business practices for organising procedures or external relations;
- new or improved methods of organising work responsibility, decision making or human resource management;
- new or improved marketing methods for promotion, packaging, pricing, product placement, or after sales services.

Innovative goods and services are products (goods and services) that are new or have undergone technological (and/or biological for agricultural enterprises) modification in the last three years. According to the degree of novelty, there are two types of innovative goods, works, and services – those newly introduced (or those that have undergone substantial technological changes) and those significantly improved.

New or technologically new goods and services are goods and services based on new (including fundamentally new) technologies or on a combination of new technologies with existing ones. For this products, the scope of application (use), operational characteristics, features, design, as well as the composition of the materials and components used, have to be new or significantly different in comparison with those in previously manufactured products.

Improved goods and services are based on the introduction of new or significantly improved manufacturing methods, including methods of product transfer involving the use of new production equipment and/or software, new production technologies, new production processes, or their combination.

Classification of innovative goods and services according to the degree of their novelty is also performed from market positions. The following innovative goods and services are distinguished according to the type of novelty for the market: new for the world market, new for the sales market of the enterprise, as well as innovative goods and services, new for the enterprise, but not new for the market.

Innovation expenditure is the actual expenditure in monetary form, connected with the implementation of different or all types of innovative activities (research and development, acquisition of machinery and equipment, engineering, etc.) performed within an organisation. Innovation expenditure includes current expenditure and capital expenditure. At the same time, the stage of the innovation process does not matter, whether at the final stage, when the equipment is already commissioned and mastered in operation, i.e. production is organised and goods (works or services) are produced, or at the initial or intermediate stage, for example, when new equipment is still being installed or only ready for operation, but has not been put into work, has not been tested or used in the production of goods (works or services).

The surveyed **types of economic activity**. Information on innovation activity is provided both in general for the surveyed set of enterprises (legal entities, excluding small enterprises), and for individual types of economic activity:

- industrial production (including mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply (excluding trade of electricity; trade of gas through mains, steam and air conditioning supply (thermal energy)); water supply; sewerage, waste management and remediation activities);
- services sector activities (including transportation and storage; human health and social work activities; publishing activities; telecommunications; computer programming, consultancy and related activities; information technology activities; legal and accounting activities; activities of head offices; management consultancy activities; architectural and engineering activities; technical testing and analysis; scientific research and development; advertising and market research; other professional, scientific and technical activities);
- agriculture (including the growing of non-perennial crops; growing of perennial crops; plant propagation; animal production; mixed farming; support activities to agriculture and post-harvest crop activities);
- construction

The **Oslo Manual** is the main methodological principles for the statistical measurement of innovation activity prepared by the OECD and Eurostat and recognised as an international standard in the field of innovation statistics. The latest, fourth edition of the Oslo Manual (Oslo Manual: Guidelines for collecting, reporting and using data on innovation), published in 2018, is used as a basis for updating the national programme and tools of the federal statistical monitoring of innovation activity of enterprises.

Technological exchange is the number of new technologies or individual technical achievements acquired (transferred) by the enterprise during one year. It covers transactions on the acquisition and transfer of scientific and technical knowledge and expertise for the provision of scientific and technical services, the application of technological processes, the production of goods and services either on a non-contractual basis or on the terms defined by the contract concluded between the parties.

Environmental innovation is a new or significantly improved good, service, or method of their production (transfer), a new or significantly improved business process or a combination of them that improve environmental safety and management or prevent negative impacts on the environment.

Indicators of Innovation in the Russian Federation

Data Book

Translated by *M. Rukhalenko*
Design *G. Podzolkova, A. Stakhnova*
Desk-top publishing *V. Parshina*

National Research University Higher School of Economics
Institute for Statistical Studies and Economics of Knowledge
20 Myasnitskaya st., Moscow, 101000, Russia
Tel.: +7 (495) 621-28-73
<http://issek.hse.ru>, E-mail: issek@hse.ru