MINISTRY OF SCIENCE
AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION

FEDERAL STATE
STATISTICS SERVICE

HSE
UNIVERSITY

SCIENCE. TECHNOLOGY. INNOVATION

POCKET DATA BOOK

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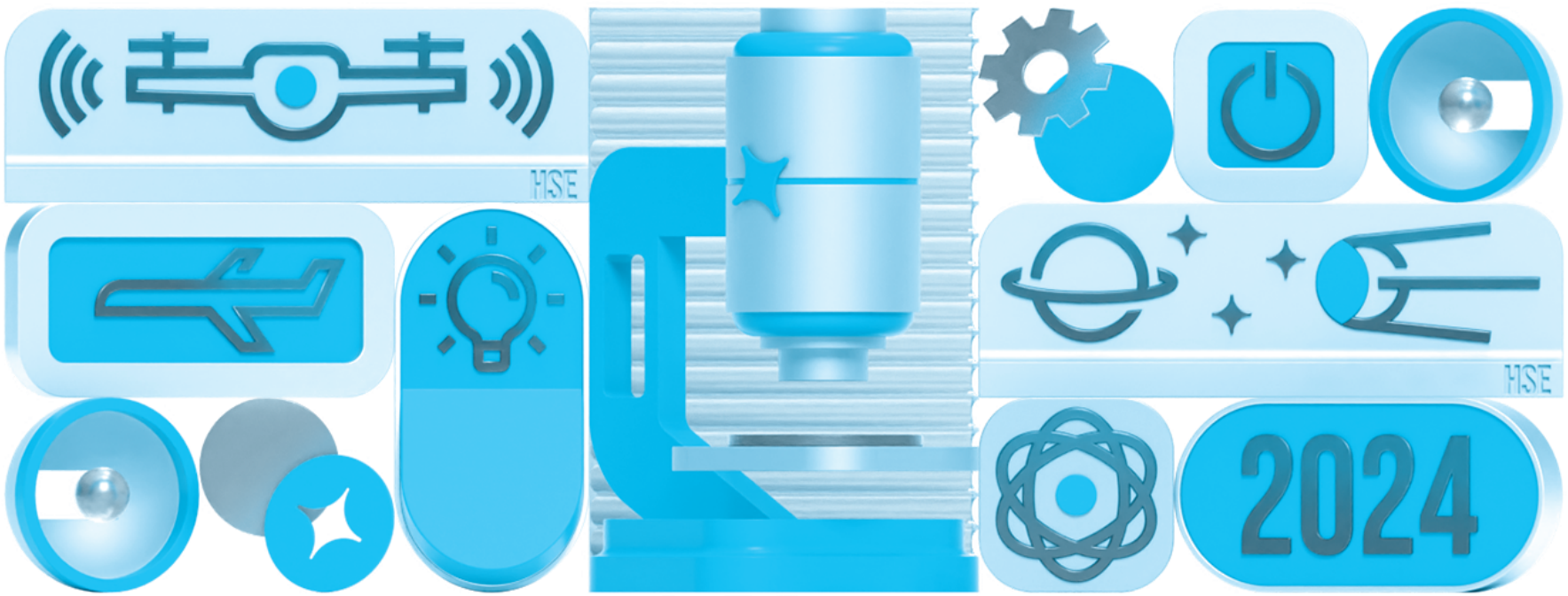

SCIENCE. TECHNOLOGY. INNOVATION

POCKET DATA BOOK

MOSCOW 2024

УДК 001(083.41)(470+571)
ББК 72(2Рос)я27
S40

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This pocket data book contains main S&T and innovation indicators for the Russian Federation. The publication includes the most recent statistical data on R&D input and output, as well as international comparisons. The data book includes information of the Russian Federal State Statistics Service (Rosstat), Ministry of Science and Higher Education of the Russian Federation, Russian Federal Service for Intellectual Property (Rospatent), Organisation for Economic Co-operation and Development (OECD), European Statistical Office (Eurostat), UNESCO, World Intellectual Property Organisation (WIPO), national statistical offices of other countries, and results of methodological and analytical studies of the HSE Institute for Statistical Studies and Economics of Knowledge. In some cases, 2022 data are preliminary.

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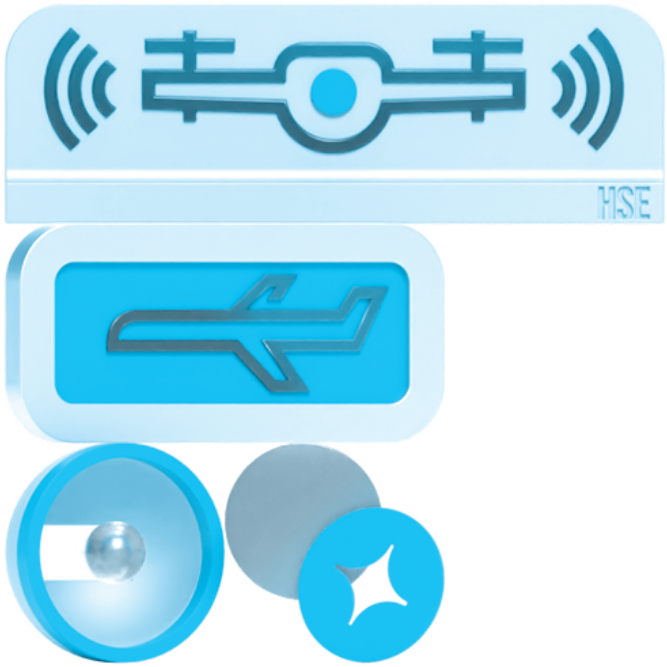
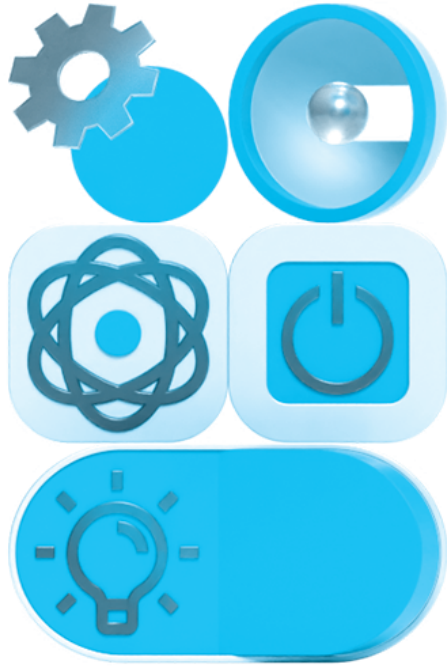
Content

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.





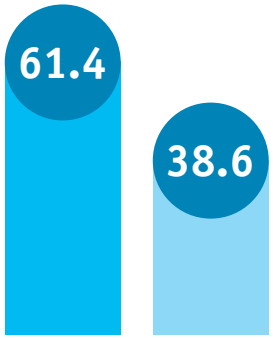
INFOGRAPHICS

R&D personnel: 2022

669.9 thousand persons — R&D personnel

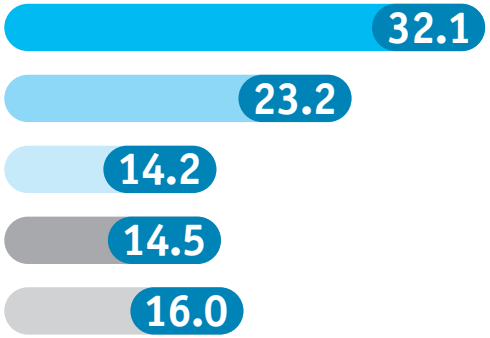
340.7 thousand persons — Researchers

Gender, %



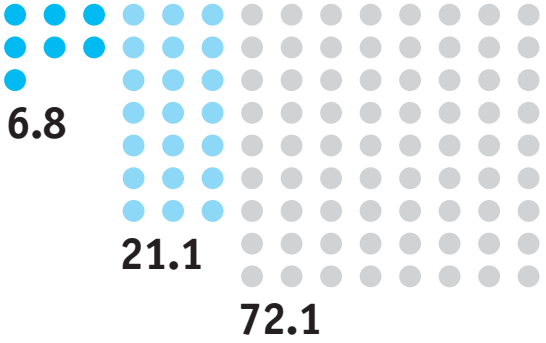
- Males
- Females

Age, %



- Under 35
- 36–44
- 45–54
- 55–64
- 65 and over

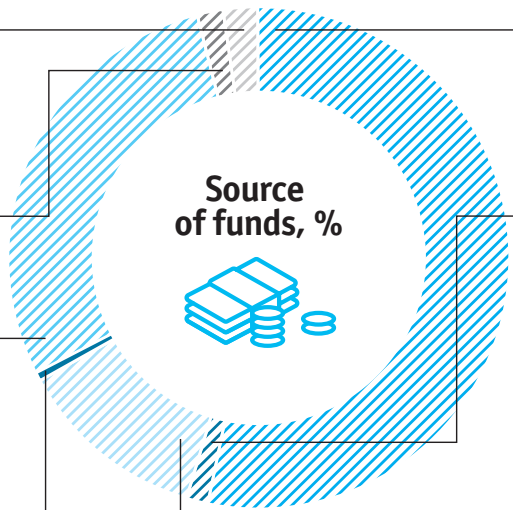
Scientific degree, %



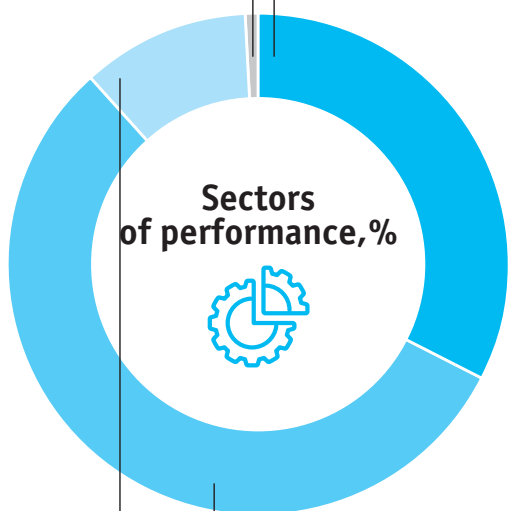
- Doctors of Sciences
- Candidates of Sciences
- Without scientific degrees

R&D funding: 2022

Gross domestic expenditure on R&D | **1,435.9** billion roubles

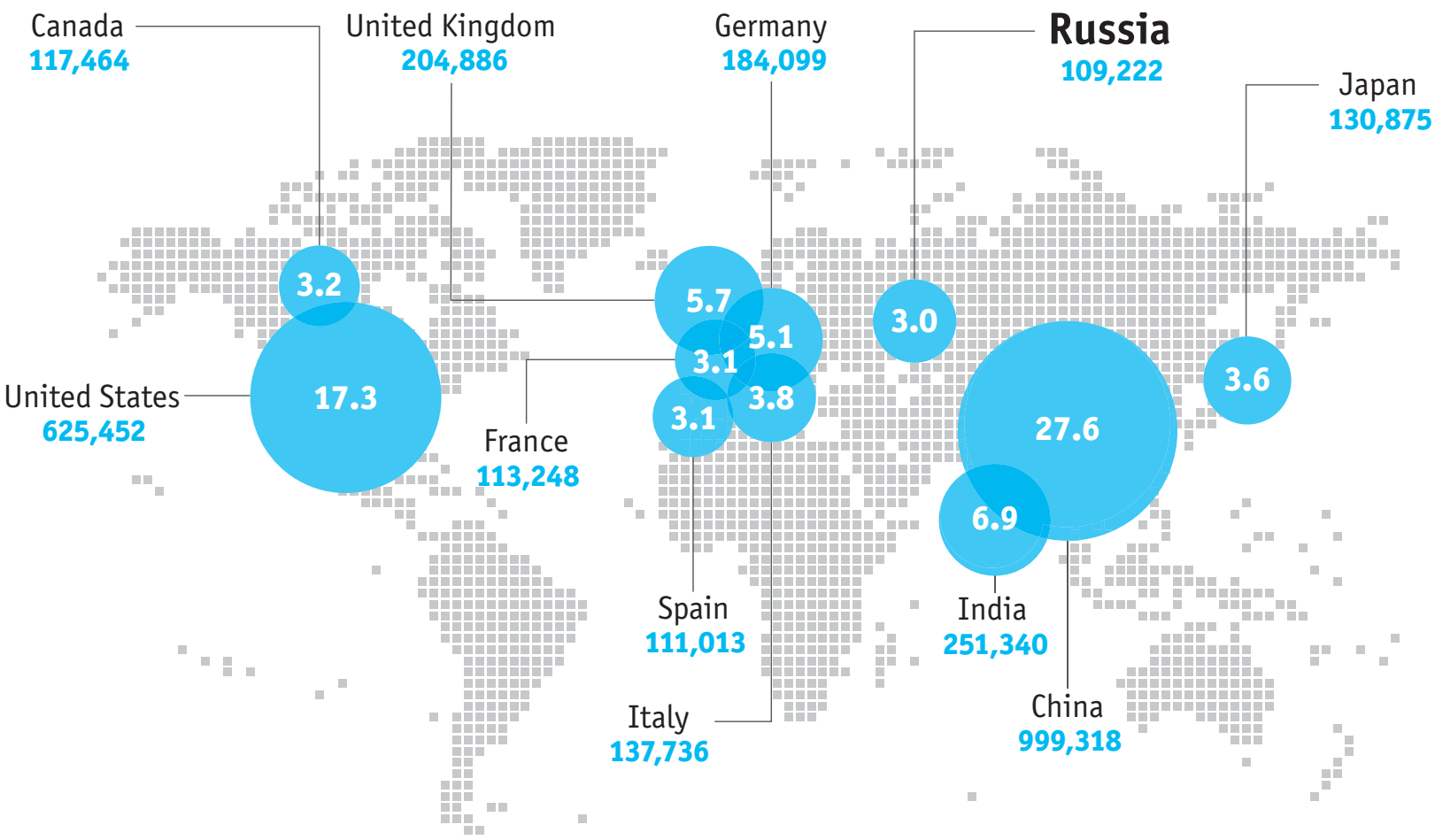


- **2.1** Funds from abroad
- **53.6** Federal budget
- **1.7** Other national sources
- **1.3** Regional and local budgets of the Russian Federation
- **28.9** Business enterprise sector
- **12.3** Government sector institutions' funds (including own funds)
- **0.1** General university funds



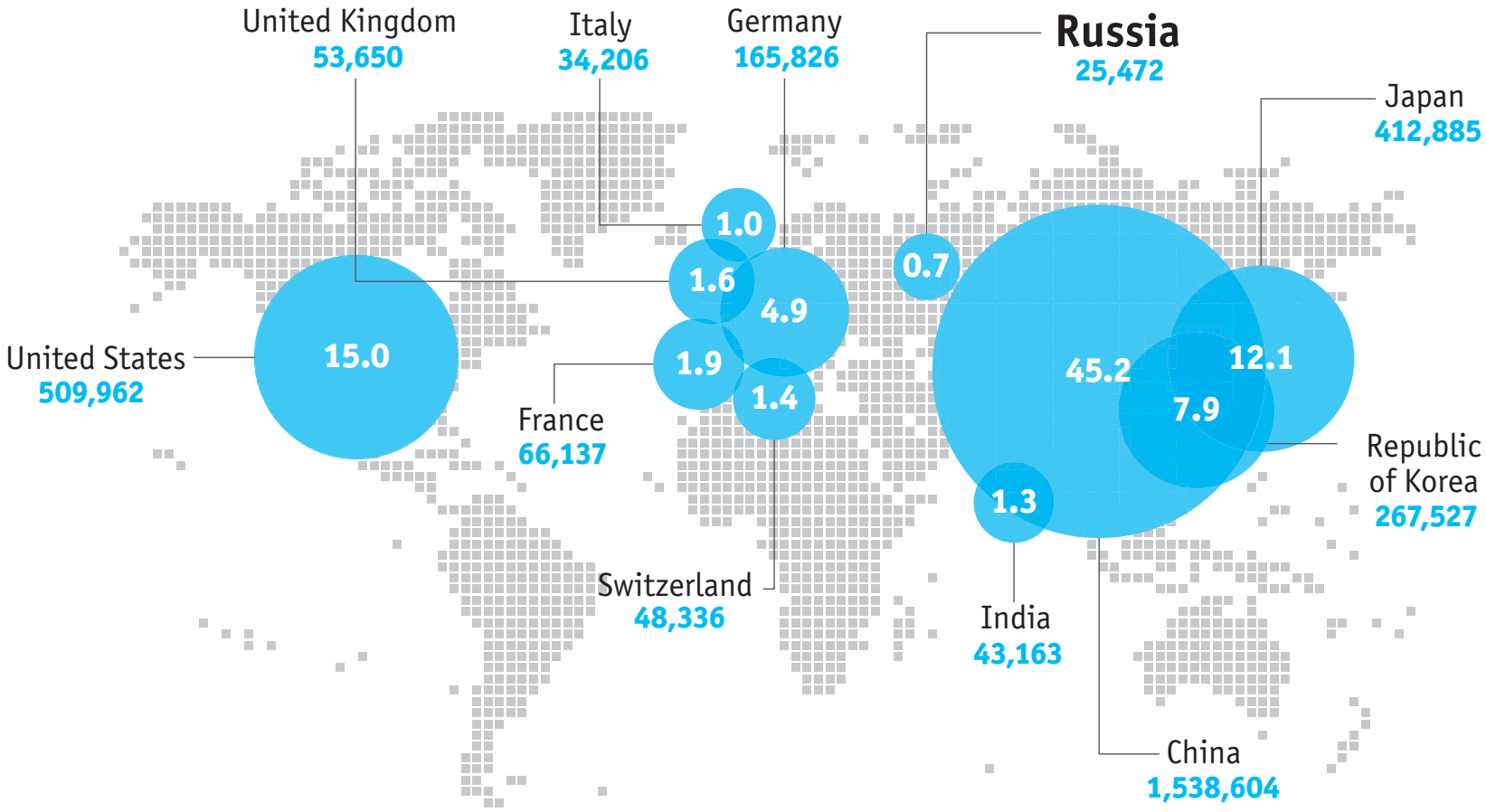
- **0.7** Private non-profit
- **32.7** Government
- **10.8** Higher education
- **55.9** Business enterprise

Publication activity by country: 2022*



* The data cover top 10 countries and Russia. *Source:* estimates based on international scientific databases as of September 06, 2023.

Patent activity by country: 2021*



3,401,100 world total of patent applications

XX Number of patent applications

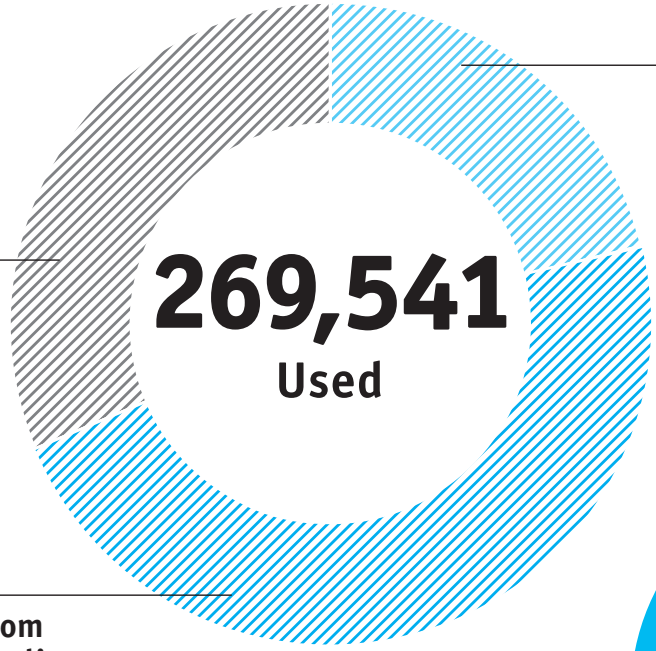
Country's share in the world total of patent applications, %

* The data cover top 10 countries and Russia. Patent applications filed by residents in the country and abroad.
Source: WIPO database, September 2023.

Development and use of advanced manufacturing technologies: 2022

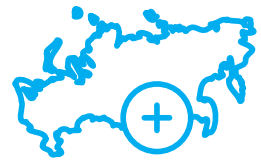
Technologies

127,863
acquired from other Russian organisations

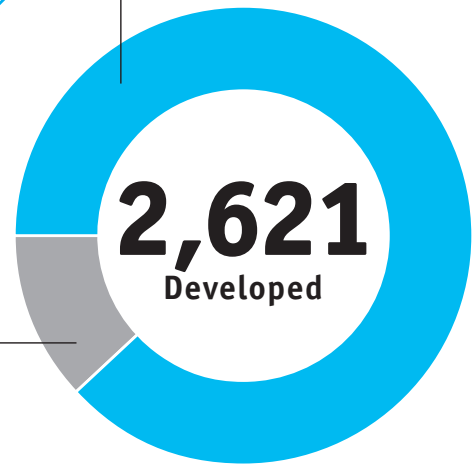


57,357
developed by organisations using their own resources

2,314
new to Russia



84,321
acquired from foreign suppliers



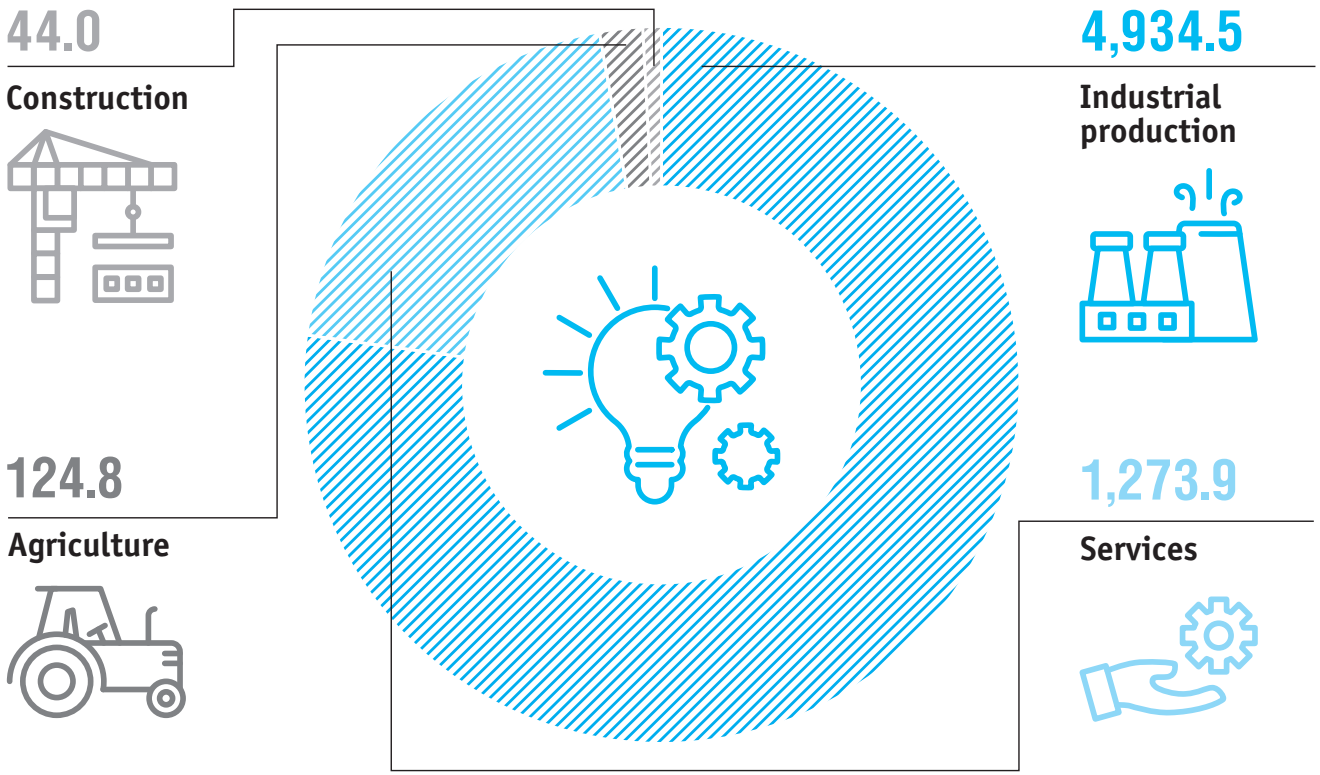
307
radically new

Innovation activity: 2022

Sales of innovative goods and services

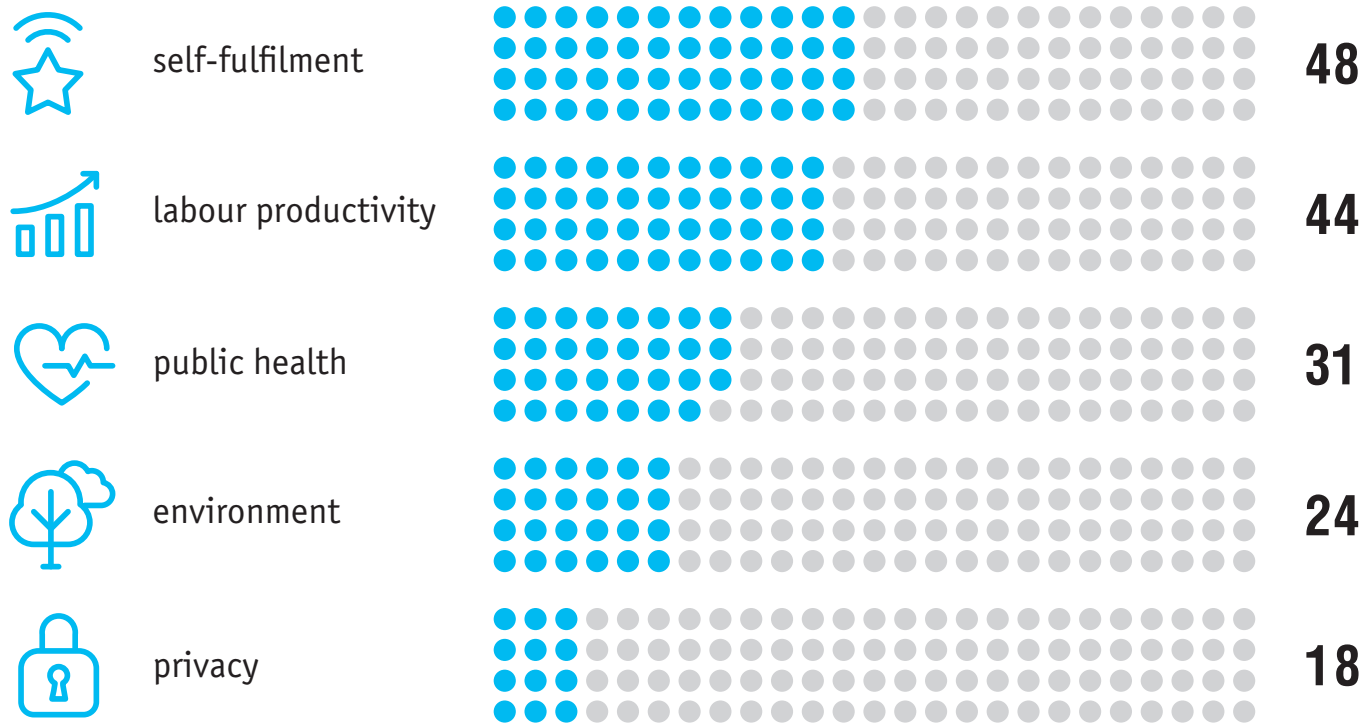
Total

6,377.2

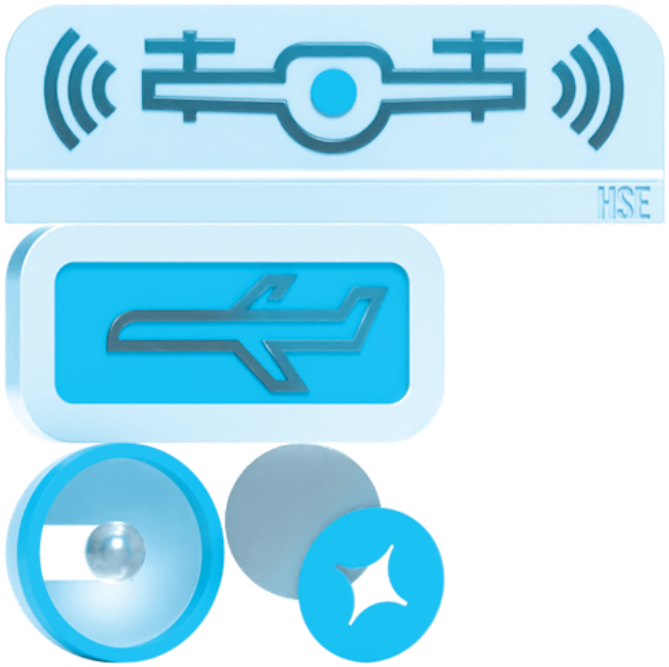


Public attitudes towards digital technologies: 2022

Digital technologies and devices have a positive effect on, %: *



* Respondents who evaluated the effect as ‘mostly positive’ and ‘rather positive’.
Source: representative survey of the Russian population aged 14 and over, HSE ISSEK (2022).



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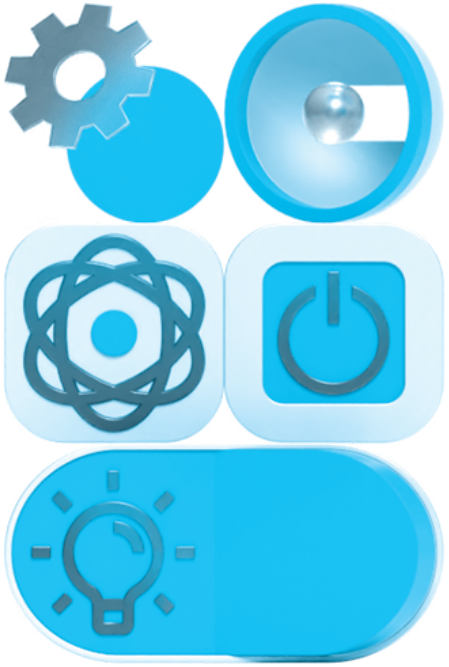


INSTITUTIONS

1.1. R&D institutions by type

	2000	2010	2019	2020	2021	2022
Total	**4099**	**3492**	**4051**	**4175**	**4175**	**4195**
Research institutes	2686	1840	1618	1633	1627	1584
Design organisations	318	362	255	239	233	249
Construction project and exploration organisations	85	36	11	12	13	13
Pilot plants	33	47	44	35	33	30
Higher education institutions	390	517	951*	969	990	991
Industrial enterprises	284	238	450	441	446	494
Others	303	452	722	846	833	834

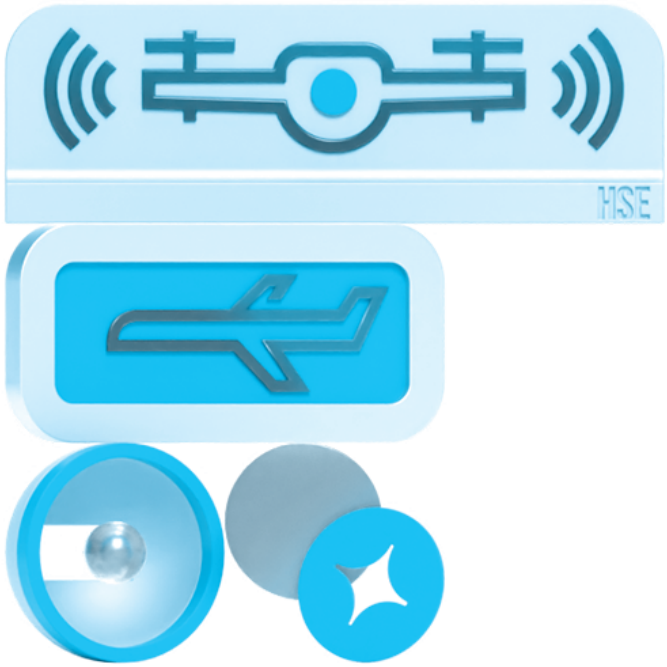
* Since 2015, the number of R&D institutions includes branches of higher education institutions.

1.2. R&D institutions by sector of performance

	2000	2010	2019	2020	2021	2022
Total	**4099**	**3492**	**4051**	**4175**	**4175**	**4195**
Sectors of performance:						
government	1247	1400	1479	1501	1462	1522
business enterprise	2278	1405	1374	1426	1437	1394
higher education	526	617	1057	1080	1096	1088
private non-profit	48	70	141	168	180	191

1.3. R&D institutions by ownership

	2000	2010	2019	2020	2021	2022
Total	**4099**	**3492**	**4051**	**4175**	**4175**	**4195**
Ownership:						
public	2938	2610	2555	2591	2580	2536
private	388	470	920	999	1014	1087
mixed	635	304	310	304	301	288
by state corporations	…	6	121	121	134	146
foreign and joint (with both Russian and foreign participation)	64	56	96	104	93	85
others	74	46	49	56	53	53



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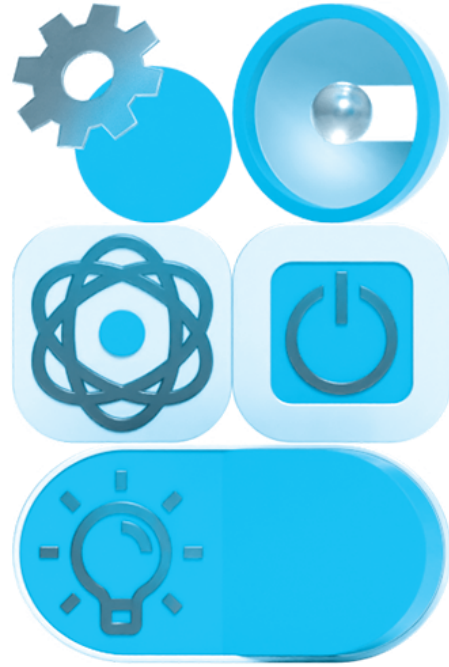


PERSONNEL

2.1. R&D personnel

(headcount)

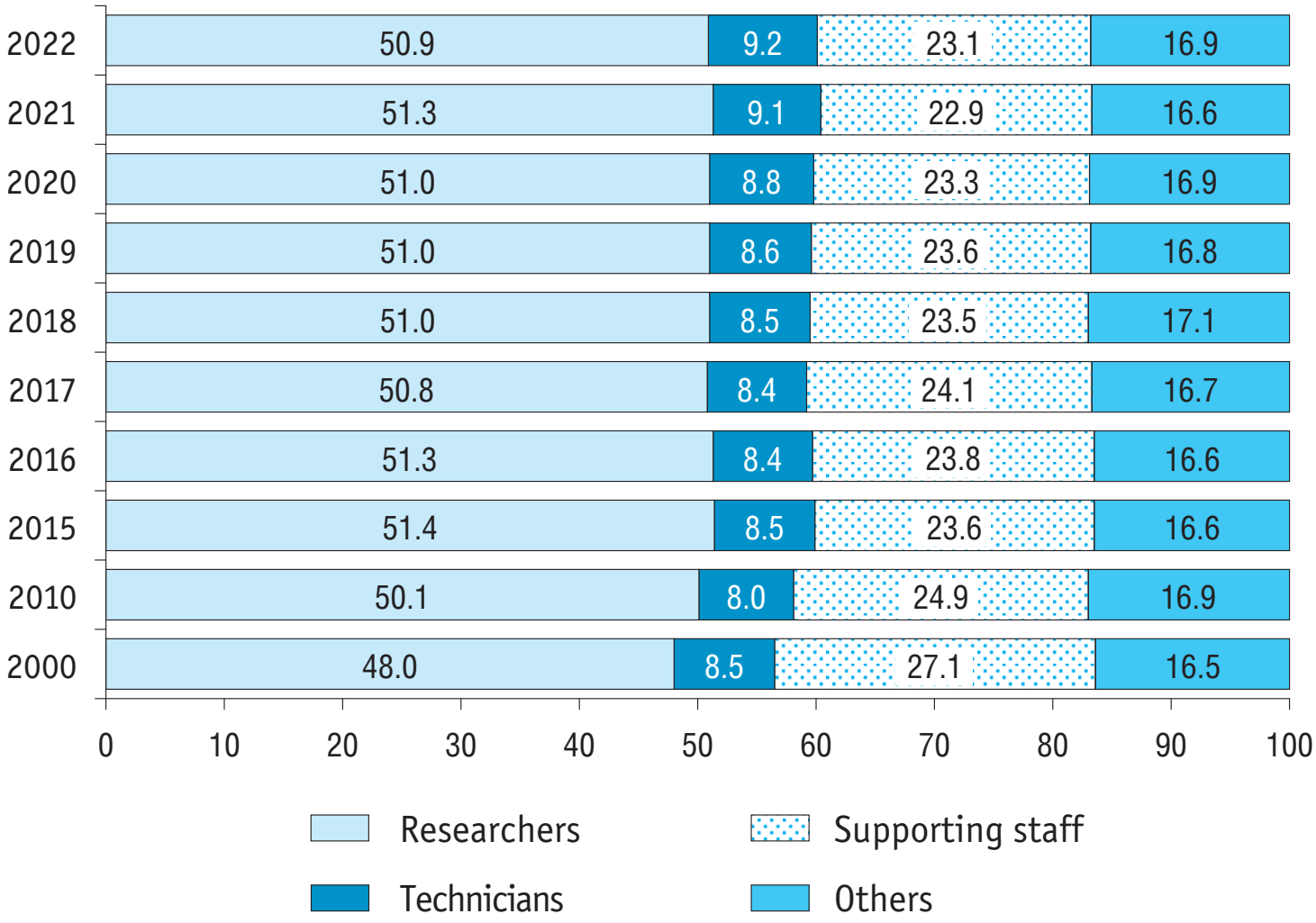
	2000	2010	2019	2020	2021	2022
Total	**887729**	**736540**	**682464**	**679333**	**662702**	**669870**
Research institutes	718434	435304	401771	388757	366041	366610
Design organisations	56488	157146	112684	103346	109185	103679
Construction project and exploration organisations	6811	6324	508	1955	2161	1762
Pilot plants	6145	1558	3284	2897	7477	6722
Higher education institutions	31110	46776	59280	61436	63990	66666
Industrial enterprises	54721	51807	57974	63189	64489	75312
Others	14020	37625	46963	57753	49359	49119

2.2. R&D personnel by occupation

(headcount)

	2000	2010	2019	2020	2021	2022
Total	**887729**	**736540**	**682464**	**679333**	**662702**	**669870**
Researchers	425954	368915	348221	346497	340142	340666
Technicians	75184	59276	58681	59557	60474	61369
Supporting staff	240506	183713	160864	158298	152066	154750
Others	146085	124636	114698	114981	110020	113085

2.3. Percentage distribution of R&D personnel by occupation



2.4. R&D personnel by sector of performance

	2000	2010	2019	2020	2021	2022
			Headcount			
Total	**887729**	**736540**	**682464**	**679333**	**662702**	**669870**
Sectors of performance:						
government	255850	259007	227480	248680	234973	248355
business enterprise	590646	423112	379442	359280	352581	345473
higher education	40787	53290	74215	68860	72353	73714
private non-profit	446	1131	1327	2513	2795	2328
			Percentage			
Total	**100**	**100**	**100**	**100**	**100**	**100**
Sectors of performance:						
government	28.8	35.2	33.3	36.6	35.5	37.1
business enterprise	66.5	57.4	55.6	52.9	53.2	51.6
higher education	4.6	7.2	10.9	10.1	10.9	11.0
private non-profit	0.1	0.2	0.2	0.4	0.4	0.3

2.5. R&D personnel turnover

(headcount)

	Inflow – total	Of whom		Outflow – total	Of whom	
		higher education graduates	other research institutes' graduates		resigned	were made redundant
2001	132757	14122	21549	137932	93587	3542
2005	109973	13495	15618	122773	81623	6598
2009	93526	13235	13529	97071	58295	5776
2011	94939	13725	11881	100849	62848	2973
2013	94550	11075	13210	93112	59214	2015
2015	100290	11662	14026	98643	58285	4238
2017	92300	9985	12539	98797	57974	4327
2019	89311	11165	11263	89842	54687	2689
2020	85544	14015	15750	91079	...	2796
2021	92653	17005	13430	98258	...	2105
2022	108932	15430	14292	101398	...	1263

2.6. R&D personnel by country

(thousand person-years; in full-time equivalent)

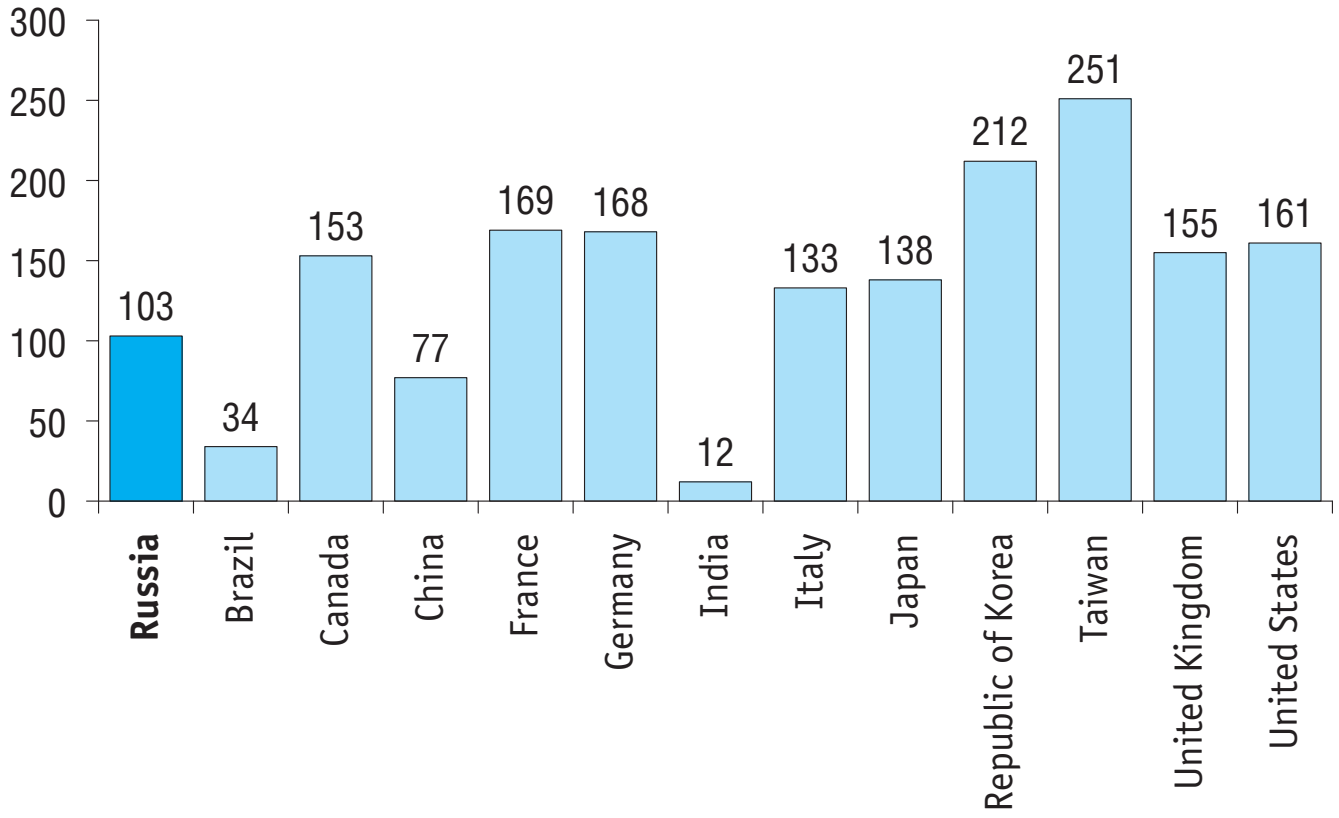
	2000	2010	2022*	Rank**
Russia	**1007.3**	**840.0**	**736.7**	**5**
Brazil	105.2	243.6	316.5	11
Canada	167.9	233.1	267.5	13
China	922.1	2553.8	5716.3	1
France	327.5	397.8	496.3	8
Germany	484.7	548.7	753.9	4
India	318.4	441.1	553.0	7
Italy	150.1	225.6	333.1	10
Japan	896.8	877.9	942.0	3
Republic of Korea	138.1	335.2	577.1	6
Taiwan	104.6	211.2	287.4	12
United Kingdom	288.6	350.8	486.1	9
United States***	977.0	1099.9	2415.1	2

* Or nearest years for which data are available.

** In global ranking.

*** In 2000 and 2010, the number of researchers is provided in full-time equivalent.

2.7. R&D personnel per 10,000 employment by country: 2022*



* Or nearest years for which data are available. Calculated by employment in full-time equivalent.

2.8. Researchers by sector of performance

	2000	2010	2019	2020	2021	2022
			Headcount			
Total	**425954**	**368915**	**348221**	**346497**	**340142**	**340666**
Sectors of performance:						
government	129725	131734	113555	120649	115208	120260
business enterprise	267640	197785	185358	178481	175178	171228
higher education	28325	38640	48429	45837	48087	47880
private non-profit	264	756	879	1530	1669	1298
			Percentage			
Total	**100**	**100**	**100**	**100**	**100**	**100**
Sectors of performance:						
government	30.5	35.7	32.6	34.8	33.9	35.3
business enterprise	62.8	53.6	53.2	51.5	51.5	50.3
higher education	6.6	10.5	13.9	13.2	14.1	14.1
private non-profit	0.1	0.2	0.3	0.4	0.5	0.4

2.9. Researchers with scientific degrees

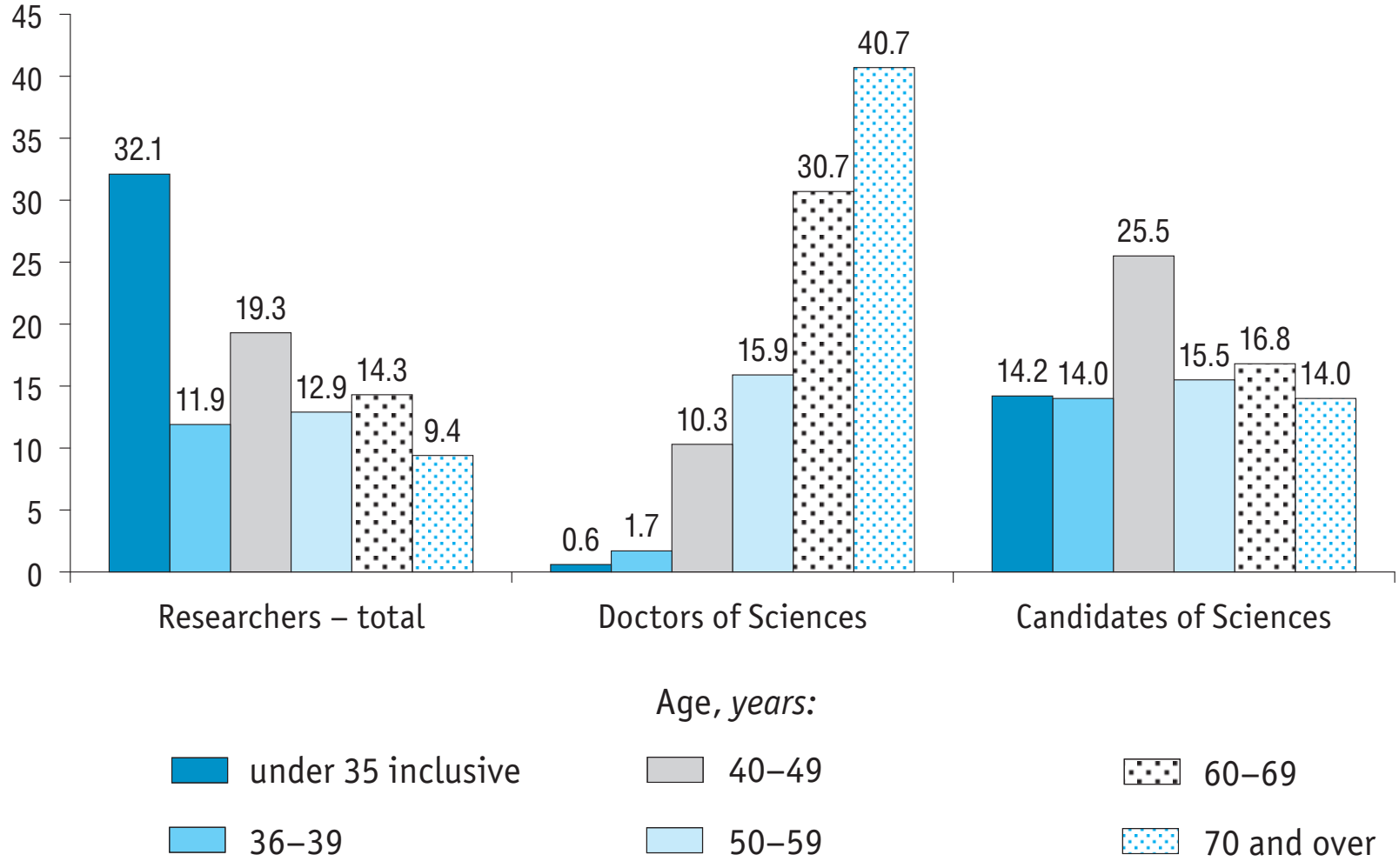
	2000	2010	2019	2020	2021	2022
Headcount						
Researchers with scientific degrees	**105911**	**105114**	**99912**	**99122**	**97537**	**95204**
Doctors of Sciences	21949	26789	24844	24473	24074	23306
Candidates of Sciences	83962	78325	75068	74649	73463	71898
As a percentage of the total number of researchers						
Researchers with scientific degrees	**24.9**	**28.5**	**28.7**	**28.6**	**28.7**	**27.9**
Doctors of Sciences	5.2	7.3	7.1	7.1	7.1	6.8
Candidates of Sciences	19.7	21.2	21.6	21.5	21.6	21.1

2.10. Researchers by field of science and technology: 2022

(headcount)

	Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences
Total	**340666**	**23306**	**71898**
Natural sciences	84461	10074	30096
Engineering and technology	201513	3780	17587
Medical sciences	14190	3181	5607
Agricultural sciences	9315	1109	3689
Social sciences	18665	2746	8911
Humanities	12522	2416	6008

2.11. Percentage distribution of researchers by age: 2022



2.12. Researchers by country

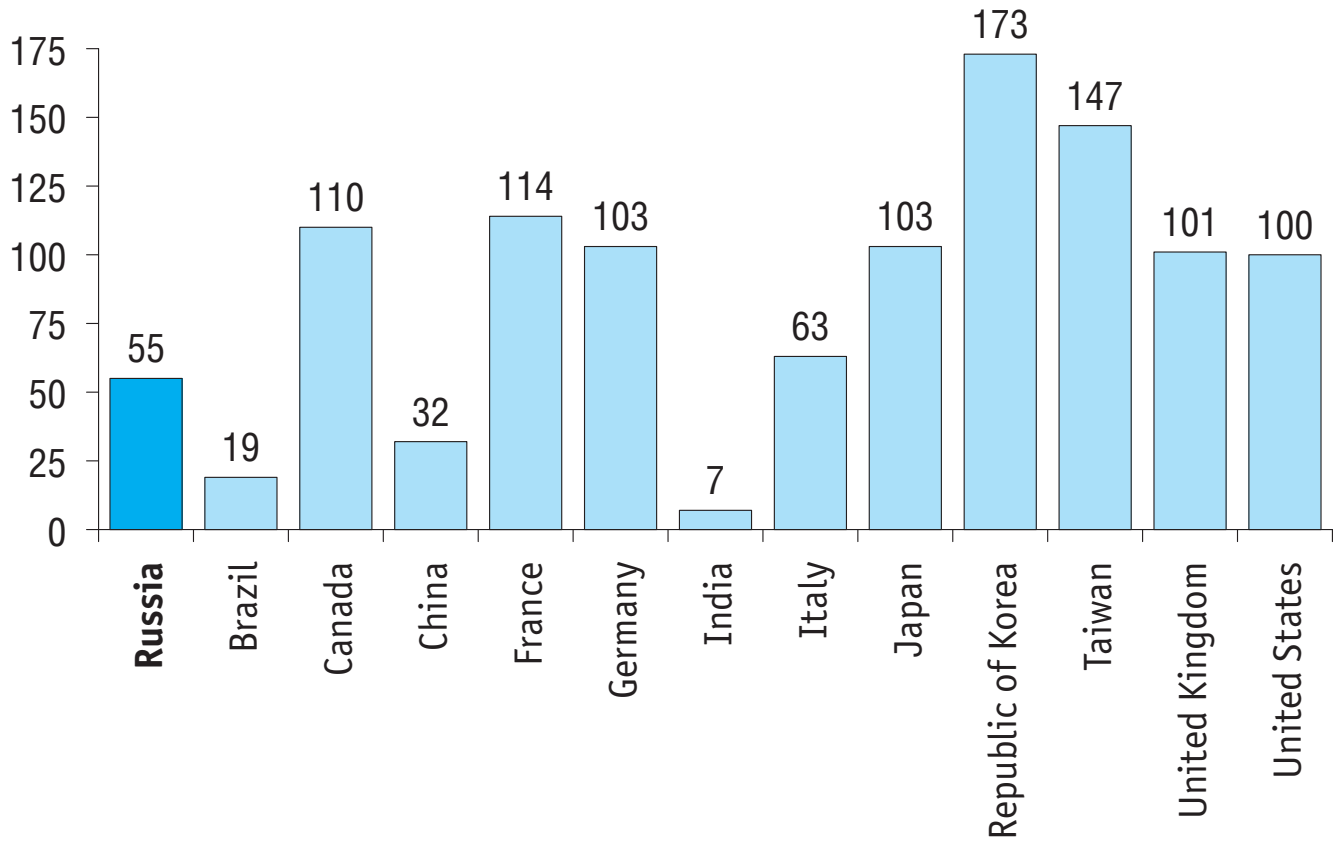
(thousand person-years; in full-time equivalent)

	2000	2010	2022*	Rank**
Russia	**506.4**	**442.1**	**390.5**	**6**
Brazil	51.6	134.3	180.0	11
Canada	107.9	158.7	191.7	10
China	695.1	1210.8	2405.5	1
France	172.1	243.5	333.8	8
Germany	257.9	328.0	461.6	5
India	115.9	192.8	341.8	7
Italy	66.1	103.4	159.0	14
Japan	647.6	656.0	704.5	3
Republic of Korea	108.4	264.1	470.7	4
Taiwan	55.5	128.1	167.8	13
United Kingdom	170.6	256.6	317.5	9
United States	977.0	1099.9	1493.1	2

* Or nearest years for which data are available.

** In global ranking.

2.13. Researchers per 10,000 employment by country: 2022*



* Or nearest years for which data are available. Calculated by employment in full-time equivalent.

Training of R&D personnel

2.14. Main indicators of postgraduate studies

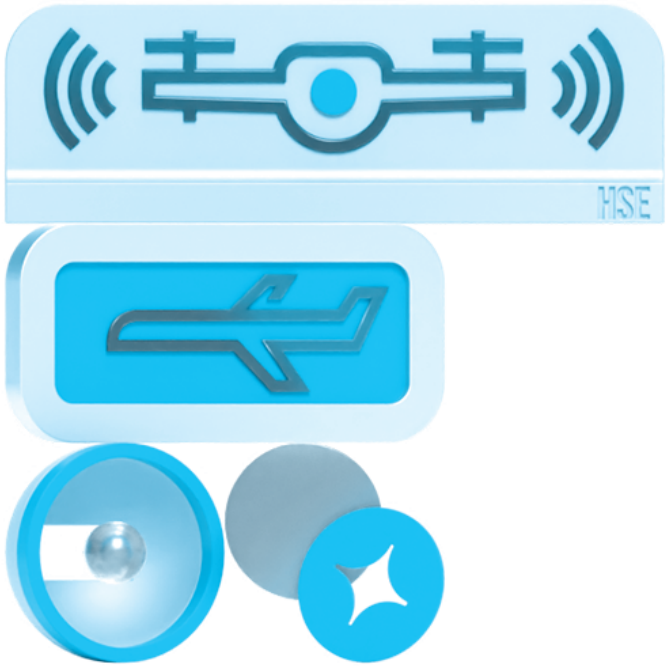
	Number of institutions *(at the end of the year)*	Enrolment *(at the end of the year; persons)*	Entrants, *persons*	Graduates, *persons*	Of whom defended their thesis, *persons**
2000	1362	117714	43100	24828	7503
2005	1473	142899	46896	33561	10650
2010	1568	157437	54558	33763	9611
2015	1446	109936	31647	25826	4651
2016	1359	98352	26421	25992	3730
2017	1284	93523	26081	18069	2320
2018	1223	90823	27008	17729	2198
2019	1187	84265	24912	15453	1629
2020	1189	87751	27710	13957	1245
2021	1174	90156	27992	14326	1500
2022	1152	109705	45075	13865	1791

* Number of individuals who defended their thesis during postgraduate studies (i.e., during the period of time specified in the order of admission).

2.15. Main indicators of postdoctoral studies

	Number of institutions (*at the end of the year*)	Enrolment (*at the end of the year; persons*)	Entrants, *persons*	Graduates, *persons*	Of whom defended their thesis, *persons**
2000	492	4213	1637	1251	486
2005	535	4282	1457	1417	516
2010	602	4418	1650	1259	336
2015	437	2007	419	1386	181
2016	385	921	397	1346	151
2017	223	1059	439	253	65
2018	213	1048	393	330	82
2019	195	955	386	356	82
2020	183	979	351	339	63
2021	182	932	210	354	87
2022	168	888	340	316	77

* Number of individuals who defended the thesis during postdoctoral studies (i.e., during the period of time specified in the order of admission).



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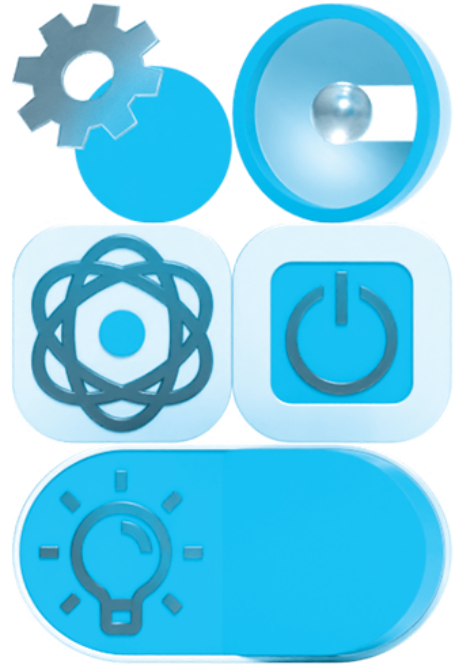


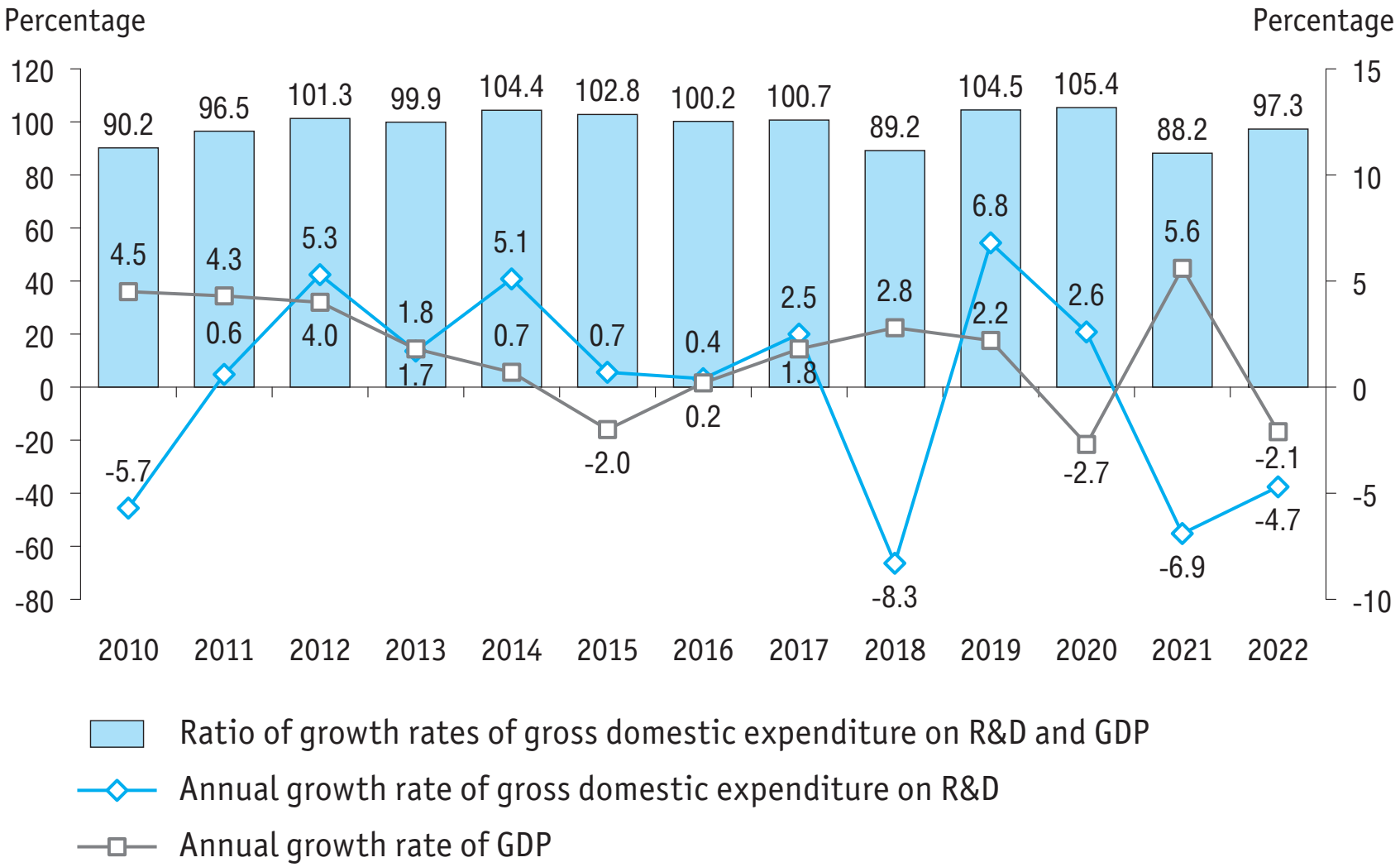
R&D FUNDING

3.1. Gross domestic expenditure on R&D

	2010	2018	2019	2020	2021	2022
Gross domestic expenditure on R&D, *million roubles:*						
at current prices	523377.2	1028247.6	1134786.7	1174534.3	1301490.9	1435914.3
at constant 2010 prices*	523377.2	563763.2	602296.4	617818.3	575295.5	548121.6
Gross domestic expenditure on R&D as a percentage of GDP	1.13	0.99	1.04	1.09	0.96	0.94

* The data are calculated using GDP deflator as of April 7, 2023.

3.2. Growth rates of gross domestic expenditure on R&D and GDP



3.3. Gross domestic expenditure on R&D by country

(million current USD PPPs)

	2000	2010	2022*	Rank**
Russia	**10504.4**	**33080.9**	**49851.1**	**10**
Brazil	16571.0	32465.4	35905.9	13
Canada	16744.9	24889.1	35280.4	14
China	32899.1	212161.6	667638.6	2
France	33276.7	50860.0	77224.8	7
Germany	53895.7	86965.4	153724.2	4
India	16742.4	41237.1	59117.8	8
Italy	15474.7	25382.5	40138.6	11
Japan	98935.2	140511.5	177427.5	3
Republic of Korea	18520.6	52146.6	119582.8	5
Taiwan	9147.9	25044.6	55560.7	9
United Kingdom	25150.6	37537.8	97792.6	6
United States	268558.0	408496.0	806013.0	1

* Or nearest years for which data are available.

** In global ranking.

3.4. Gross domestic expenditure on R&D as a percentage of GDP by country

	2000	2010	2022*
Russia	**1.05**	**1.13**	**0.94**
Brazil	1.05	1.16	1.17
Canada	1.86	1.83	1.55
China	0.89	1.71	2.43
France	2.09	2.18	2.22
Germany	2.41	2.73	3.13
India	0.76	0.79	0.66
Italy	1.00	1.22	1.45
Japan	2.86	3.10	3.30
Republic of Korea	2.13	3.32	4.93
Taiwan	1.91	2.82	3.77
United Kingdom	1.61	1.63	2.91
United States	2.62	2.71	3.46

* Or nearest years for which data are available.

3.5. Federal budget appropriations on civil S&T

	2010*	2020*	2021*	2022*	2023**
Federal budget appropriations on civil S&T, *million roubles*	**237644.0**	**549602.1**	**626574.3**	**631701.6**	**705910.8**
Basic research	82172.0	203246.8	225152.7	247286.9	252950.4
Applied research	155472.0	346355.4	401421.6	384414.8	452960.4
As a percentage of:					
GDP	0.51	0.51	0.46	0.41	…
total federal budget appropriations	2.35	2.41	2.53	2.51	3.11

* In 2010, 2020, and 2021, in accordance with annual reports on the implementation of the consolidated budget of the Russian Federation and budgets of state non-budgetary funds; in 2022, in accordance with the annual report on the implementation of the federal budget (budget.gov.ru) (the data are provided by the Federal Treasury).

** In accordance with Federal Law no. 466-FL of December 5, 2022 'On the 2023 Federal Budget and the 2024–2025 Budget Plan'.

3.6. Government budget appropriations on R&D by country

(million current USD PPPs)

	2000	2010	2022*
Russia**	**4685.4**	**26074.9**	**22984.8**
Brazil***	8576.9	16593.0	19243.7
Canada	4589.4	8475.9	10174.1
China***	10990.8	50957.2	126563.9
France	14880.9	19142.2	25534.6
Germany	17234.9	28587.9	59157.8
India***	…	…	34855.6
Italy	9509.0	12349.2	20233.6
Japan	21231.4	32128.0	96297.6
Republic of Korea	5014.5	16291.9	35792.2
Taiwan	2955.7	7038.9	9597.2
United Kingdom	9492.7	13316.2	20730.3
United States	72681.0	119382.0	169938.0

* Or nearest years for which data are available.

** Federal budget appropriations on science and technology.

*** Gross domestic expenditure on R&D financed by the government.

3.7. Gross domestic expenditure on R&D by source of funds

(million roubles)

	2000	2010	2019	2020	2021	2022
Gross domestic expenditure on R&D	**76697.1**	**523377.2**	**1134786.7**	**1174534.3**	**1301490.9**	**1435914.3**
Government*	42035.7	368191.8	752261.0	796369.9	878778.6	966397.5
Of which federal budget appropriations	29639.3	287057.5	602743.8	618170.4	688707.9	769654.3
Business enterprise sector	25208.4	133499.0	342833.0	343278.0	378026.0	415285.7
Higher education sector	213.0	2436.6	9010.7	10876.3	15733.1	18612.4
Private non-profit sector institutions	67.6	682.4	3462.8	3327.1	3829.3	5292.4
Funds from abroad	9172.4	18567.5	27219.2	20683.1	25124.0	30326.2

* Including budget funds, general university funds, and government sector institutions' funds (including own funds).

3.8. Percentage distribution of gross domestic expenditure on R&D by source of funds and country: 2022*

	Gross domestic expenditure on R&D	Government	Business enterprise sector	Other national sources	Funds from abroad
Russia	**100**	**67.3****	**28.9**	**1.7**	**2.1**
Brazil	100	53.6	43.5	2.9	...
Canada	100	30.9	44.1	14.9	10.1
China	100	19.0	78.0	...	0.2
France	100	32.5	55.4	4.4	7.7
Germany	100	30.0	62.8	0.3	6.9
India	100	63.2	36.8	...	...
Italy	100	35.1	53.9	2.1	8.8
Japan	100	15.5	78.1	5.9	0.6
Republic of Korea	100	22.8	76.1	0.8	0.3
Taiwan	100	15.1	84.2	0.6	0.1
United Kingdom	100	19.4	58.5	11.4	10.6
United States	100	19.9	67.9	5.5	6.7

* Or nearest years for which data are available.

** Including budget funds, general university funds, and government sector institutions' funds (including own funds).

3.9. Gross domestic expenditure on R&D by sector of performance

	2000	2010	2019	2020	2021	2022
			Million roubles			
Total	**76697.1**	**523377.2**	**1134786.7**	**1174534.3**	**1301490.9**	**1435914.3**
Sectors of performance:						
government	18748.6	161988.4	320991.5	385550.7	408458.1	468930.2
business enterprise	54288.8	316701.7	688349.5	664773.1	752056.9	803091.3
higher education	3489.3	43714.0	120583.8	115667.8	132125.5	154549.7
private non-profit	170.4	973.1	4861.8	8542.7	8850.5	9343.1
			Percentage			
Total	**100**	**100**	**100**	**100**	**100**	**100**
Sectors of performance:						
government	24.4	31.0	28.3	32.8	31.4	32.7
business enterprise	70.8	60.5	60.7	56.6	57.8	55.9
higher education	4.5	8.4	10.6	9.8	10.2	10.8
private non-profit	0.2	0.2	0.4	0.7	0.7	0.7

3.10. Percentage distribution of gross domestic expenditure on R&D by sector of performance and country: 2022*

(percentage)

	Gross domestic expenditure on R&D	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Russia	**100**	**32.7**	**55.9**	**10.8**	**0.7**
Canada	100	7.0	55.1	37.5	0.4
China	100	15.3	76.9	7.8	...
France	100	11.7	65.7	20.5	2.1
Germany	100	14.8	66.9	18.3	...
India	100	56.1	36.8	7.1	...
Italy	100	14.0	60.2	24.0	1.9
Japan	100	8.4	78.6	11.9	1.2
Republic of Korea	100	9.8	79.1	9.1	2.0
Taiwan	100	8.8	84.3	6.9	0.1
United Kingdom	100	5.1	70.9	22.5	1.5
United States	100	8.3	77.6	10.4	3.7

* Or nearest years for which data are available.

3.11. Subsidies, grants, and other types of competitive R&D funding: 2022

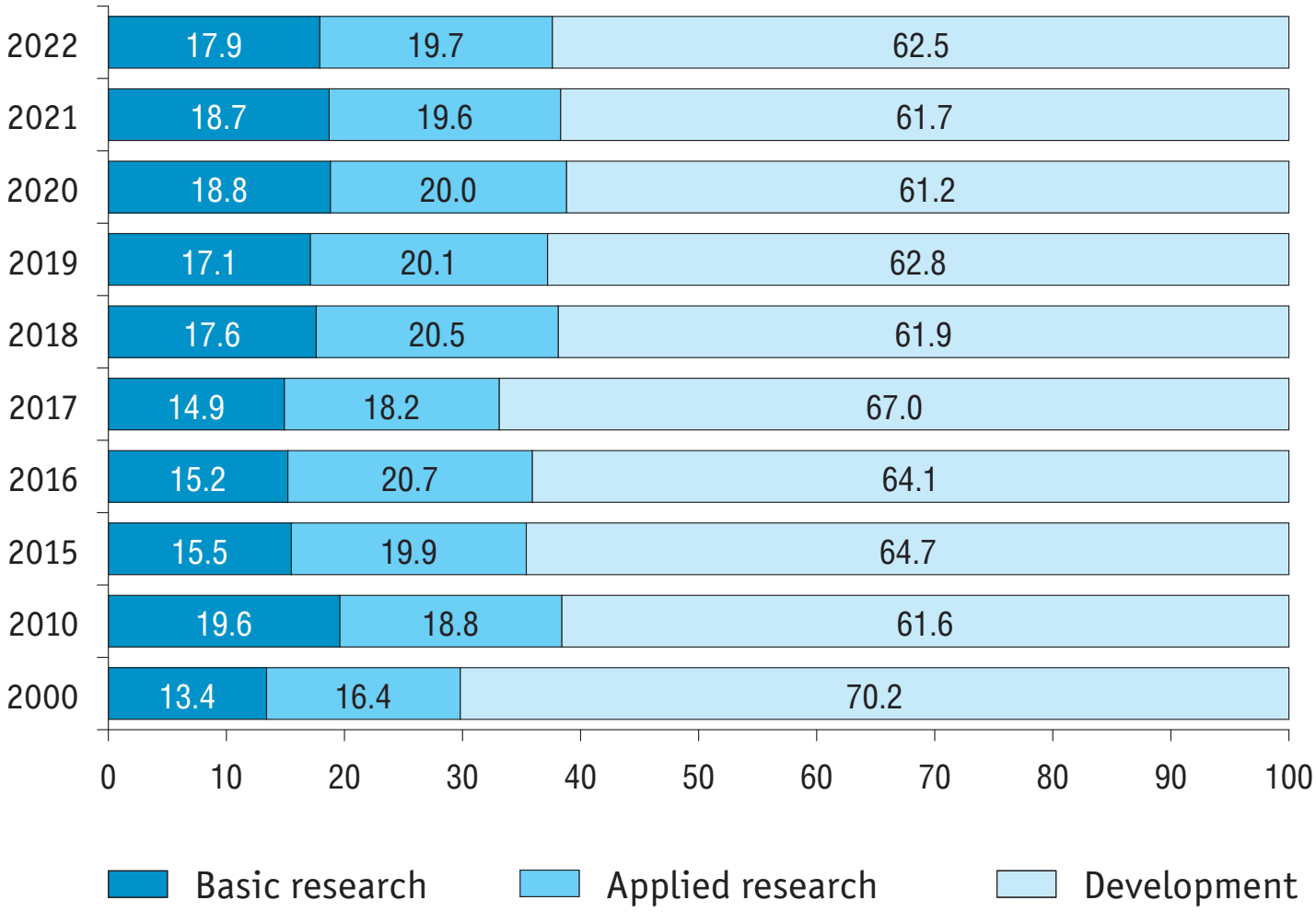
	Total, *million roubles*	As a percentage of total
Gross domestic expenditure on R&D – total	**1435914.3**	**100**
Of which:		
budget subsidies for institutional R&D funding	228448.7	15.9
budget subsidies for performing R&D	85683.4	6.0
grants from foundations for S&T and innovation	47124.4	3.3
other types of competitive financing	82464.3	5.7

3.12. Current expenditure on R&D by type of R&D activity

(million roubles)

	2000	2010	2019	2020	2021	2022
Current expenditure on R&D	**73873.3**	**489450.8**	**1060589.7**	**1091333.5**	**1193578.5**	**1322563.9**
Basic research	9875.7	95881.4	181371.9	205227.9	223093.6	236266.1
Applied research	12117.5	92010.7	213363.3	218491.5	233457.7	259974.6
Development	51880.2	301558.8	665854.6	667614.1	737027.2	826323.2

3.13. Percentage distribution of current expenditure on R&D by type of R&D activity



3.14. Current expenditure on R&D for the creation of new and improved products and business processes

	2018	2019	2020	2021	2022
Current expenditure on R&D for the creation of new and improved products and business processes, *million roubles*	**359926.9**	**346383.8**	**361866.4**	**395729.8**	**396348.0**
Of which carried out according to orders of enterprises engaged in mining and quarrying; manufacturing; electricity, gas, steam and air-conditioning supply; water supply; sewerage, waste management, and remediation activities	25743.9	22755.6	25401.4	26146.2	32134.0
R&D for the creation of new and improved products and business processes as a percentage of the total current expenditure on R&D	**37.5**	**32.7**	**33.2**	**33.2**	**30.0**

3.15. Average monthly salary of R&D personnel

	2000	2010	2019	2020	2021	2022
Average monthly salary, *roubles*	**2322.9**	**25043.5**	**57012.6**	**60247.3**	**67685.0**	**75841.3**
As a percentage of the salary:						
in the national economy (=100%)	104.5	119.5	119.1	117.3	118.2	116.1
in manufacturing (=100%)	98.2	131.3	130.0	129.5	129.1	125.5
in construction (=100%)	88.0	118.3	133.7	134.7	130.3	124.6

3.16. Tax incentives established by Russian law for institutional R&D support

(million roubles)

	2017	2018	2019	2020	2021	2022
Tax expenditure on R&D – total	**144519.8**	**146835.9**	**179949.6**	**189035.6**	**203806.2**	**211456.6**
VAT exemption	128925.2	128188.3	161831.2	169735.4	178401.5	185894.5
R&D funded from budget and special foundations on the basis of commercial contracts	95200.5	86585.6	104606.8	96736.9	112260.6	112793.1
R&D aimed at development/ improvement of new technologies and products (for selected types of economic activity)	5956.9	6951.4	6855.1	7142.4	11752.4	11788.8
Sales of exclusive rights on R&D results	27767.7	34651.3	50369.4	65856.1	54388.6	61312.6

(continued)

	2017	2018	2019	2020	2021	2022
of which:						
on computer software and databases	–	–	–	–	51560.4	58256.8
on inventions, utility models, industrial designs, integrated circuit designs, production secrets (know-how), as well as rights to use mentioned results of intellectual activity	–	–	–	–	2828.2	3055.8
Income tax – total	13290.7	15952.5	15956.7	17529.9	23543.0	23177.7
Income tax reduction	13167.5	15882.7	15821.4	17320.2	23305.9	22683.9
In the amount of income as contributions from state foundations for R&D and innovation support	1083.6	1483.4	1745.8	1710.2	3167.6	3436.3
In the amount of income as contributions for the formation of state foundations for R&D and innovation support	63.4	223.5	235.3	79.0	156.4	159.3

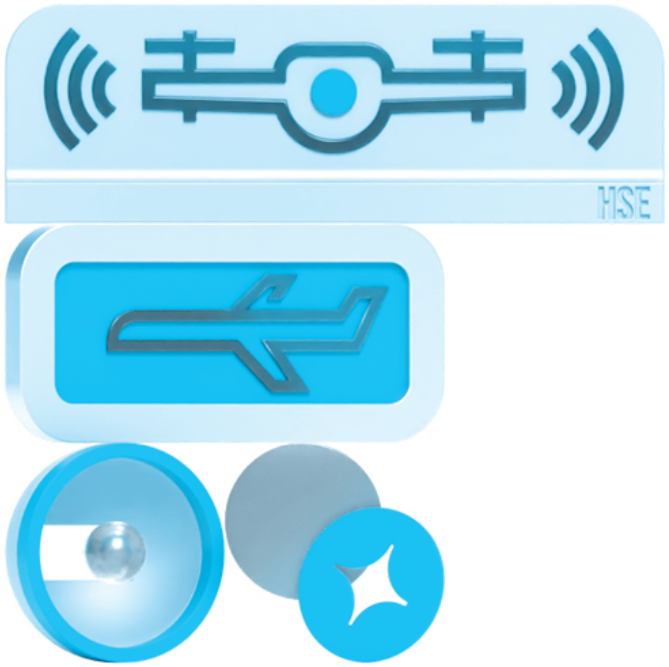
(continued)

	2017	2018	2019	2020	2021	2022
From special purpose funds for the formation of state foundations for R&D and innovation support	51.9	52.4	847.7	461.4	289.2	468.0
In the amount of R&D expenditure	11968.5	14123.4	12992.6	15069.6	19692.8	18620.2
Of which, according to the list established by the Government of the Russian Federation	1962.9	2701.9	2502.1	2407.4	5866.6	4561.0
Accelerated depreciation of fixed assets for S&T activity	24.4	23.6	23.5	21.8	21.8	24.6
Reduced corporate income tax rate for enterprises that received the Skolkovo Project Participant status and enterprises participating in innovative S&T centres	98.8	46.2	111.8	187.9	215.3	469.2

(continued)

	2017	2018	2019	2020	2021	2022
Property tax exemption	2303.9	2695.1	2161.6	1770.4	1861.6	2384.4
State research centres	2202.9	2579.3	2024.3	1641.8	1818.5	1620.1
Enterprises that received the Skolkovo Project Participant status	101.0	115.8	96.4	27.9	32.0	764.3
Enterprises participating in innovative S&T centres	–	–	40.9	100.7	11.1	–

Sources: national statistical surveys on the structure of VAT calculation, on the tax base and the structure of income tax calculation for organisations, on the tax base and the structure of property tax calculation for organisations.



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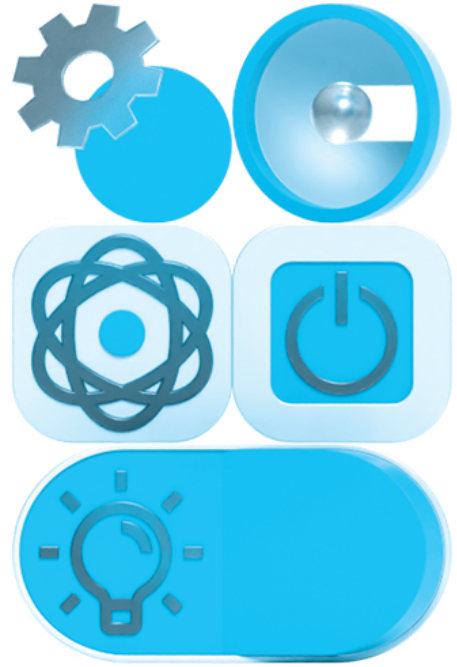


R&D OUTPUT

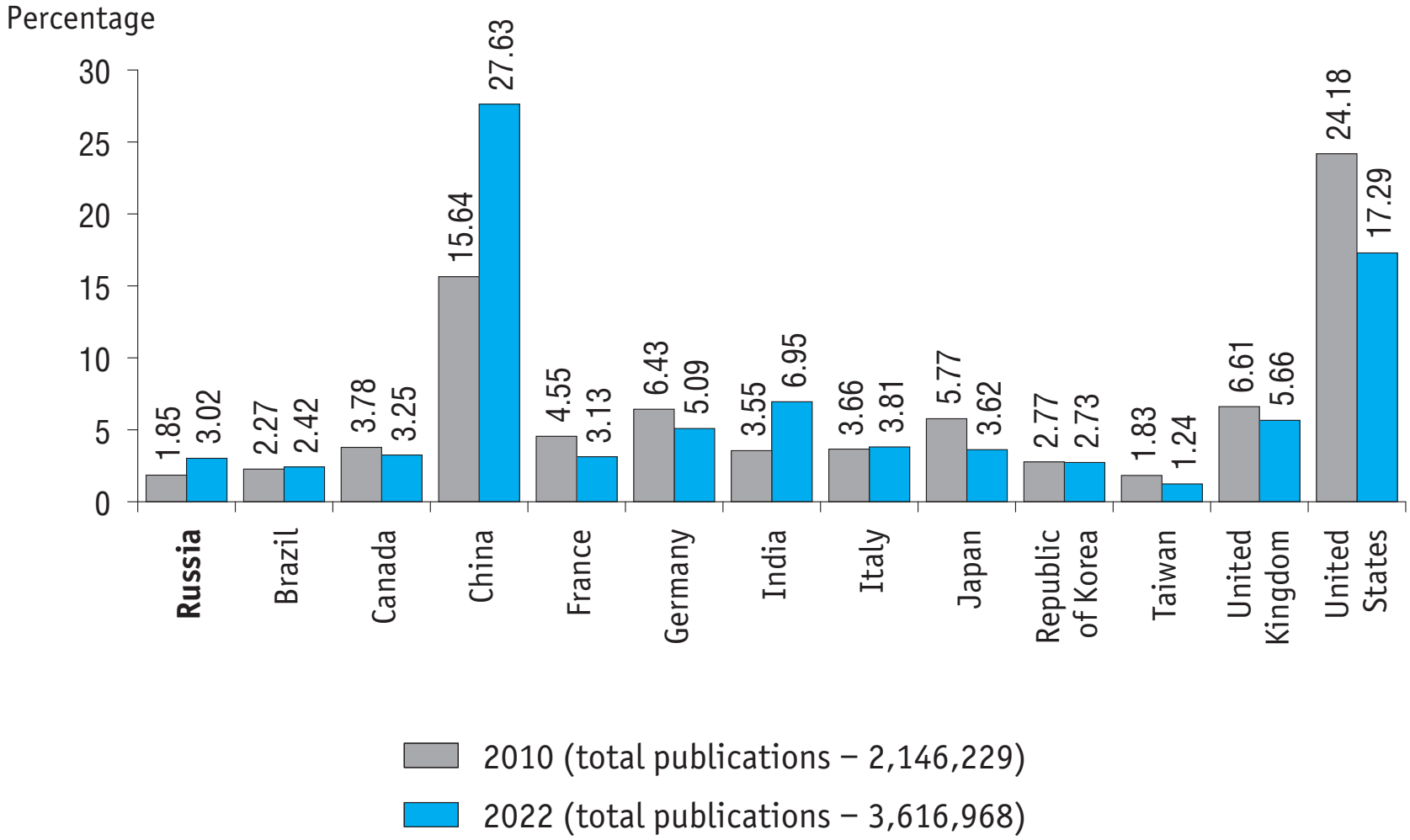
4.1. Publications in scientific journals indexed in Scopus by country*

	Number of publications				Rank**			
	2010	2015	2020	2022	2010	2015	2020	2022
Russia	**39659**	**67591**	**127924**	**109222**	**15**	**13**	**8**	**12**
Brazil	48777	67082	90737	87567	13	14	14	14
Canada	81224	93668	109862	117464	7	9	10	8
China	335588	454870	762595	999318	2	2	1	1
France	97735	111047	113986	113248	6	7	9	9
Germany	137981	160369	177320	184099	4	4	5	5
India	76197	133711	194676	251340	9	5	4	3
Italy	78562	101061	130329	137736	8	8	6	6
Japan	123817	120267	129686	130875	5	6	7	7
Republic of Korea	59427	79714	92523	98750	12	12	13	13
Taiwan	39382	37261	39311	44942	16	20	22	22
United Kingdom	141909	169128	196576	204886	3	3	3	4
United States	518995	576310	630121	625452	1	1	2	2

* HSE ISSEK estimates as of September 6, 2023.

** In global ranking.

4.2. Countries' shares in the world total number of publications in scientific journals indexed in Scopus: 2010 and 2022*



* HSE ISSEK estimates as of September 6, 2023.

4.3. Main quality indicators of publications by Russian authors in scientific journals indexed in Scopus*

Indicator	2010	2015	2020	2022
Ratio of average citation level of publications by Russian authors to the world citation average	0.52	0.53	0.50	0.58
Citations of publications by Russian authors as a percentage in the world citation total	0.94	1.40	1.94	1.74
Publications in Q1 journals as a percentage of the total number of publications by Russian authors	21.1	21.4	18.6	24.0
Publications in Q1 journals as a percentage of the world total number of publications	44.8	44.7	46.3	50.9

* HSE ISSEK estimates as of August 20, 2023.

4.4. Publications by Russian authors in scientific journals indexed in Scopus by field of science and technology: 2010 and 2022*

	Number of publications by Russian authors		Russia's share in the world total number of publications		Russia's rank**	
	2010	2022	2010	2022	2010	2022
Natural sciences						
Physical sciences	15409	27744	4.75	5.43	7	5
Earth and related environmental sciences	5722	17437	2.59	3.27	12	11
Chemical sciences	8556	16687	3.49	3.64	10	7
Biological sciences	5462	14606	1.61	2.42	17	14
Computer and information science	2489	14111	0.80	2.41	30	11
Mathematics	4847	11962	2.96	3.61	11	8

* HSE ISSEK estimates as of September 6, 2023.

** In global ranking.

(continued)

	Number of publications by Russian authors		Russia's share in the world total number of publications		Russia's rank**	
	2010	2022	2010	2022	2010	2022
Engineering and technology						
Materials engineering	7522	16626	3.26	3.92	9	7
Chemical engineering	2779	8865	2.71	3.47	11	6
Mechanical engineering	2019	6778	1.48	2.80	16	9
Electrical engineering, electronic engineering, and information technology	2532	6169	1.49	2.18	15	11
Construction and architecture	115	1758	0.33	1.74	46	17
Energy sector and rational use of natural resources	155	1752	0.62	1.33	29	22
Medical technologies	147	1013	0.44	1.84	36	17
Nanotechnology	438	488	3.05	2.49	11	8
Environmental biotechnology	204	268	1.16	1.07	23	24
Industrial biotechnology	36	66	0.61	0.81	33	25

(continued)

	Number of publications by Russian authors		Russia's share in the world total number of publications		Russia's rank**	
	2010	2022	2010	2022	2010	2022
Medical sciences						
Clinical medicine	2154	17622	0.43	2.10	37	17
Basic medicine	2041	6775	0.99	1.90	23	16
Health sciences	237	3849	0.24	1.62	44	18
Medical biotechnologies	130	731	0.47	1.59	34	18
Agricultural sciences						
Agriculture, forestry and fisheries	993	2837	1.35	2.34	19	14
Animal and dairy farming	273	1474	0.61	1.47	41	21
Veterinary science	31	220	0.15	0.74	61-62	36
Agricultural biotechnologies	3	10	0.47	0.72	31-35	31-32
Social sciences						
Sociology	424	4873	0.83	4.74	22	3
Economics and business	249	3043	0.32	2.18	39	15
Educational sciences	181	2512	0.49	3.04	34	9

(continued)

	Number of publications by Russian authors		Russia's share in the world total number of publications		Russia's rank**	
	2010	2022	2010	2022	2010	2022
Psychology	179	1908	0.33	1.74	38	15
Political sciences	78	1780	0.50	6.14	30	3
Social and economic geography	175	1484	0.83	2.14	27	16
Law	87	757	0.57	2.65	20	11
Media and communications	56	312	0.51	1.67	32-33	16
Humanities						
History and archaeology	237	4065	1.14	9.34	13	2
Languages and literature	110	2940	0.41	5.40	35	5
Philosophy, ethics, religion	149	1602	1.00	4.95	14	4
Art (arts, history of arts, etc.)	9	783	0.10	4.25	44	4

4.5. Patent applications and patent grants in Russia

	2000	2010	2018	2019	2020	2021	2022
Patent applications filed in the Russian Federation	28688	42500	37957	35511	34984	30977	26924
By Russian residents	23377	28722	24926	23337	23759	19569	18970
By non-residents	5311	13778	13031	12174	11225	11408	7954
Patent grants received in the Russian Federation	17592	30322	35774	34008	28788	23662	23315
By Russian residents	14444	21627	20526	20113	17181	15012	15307
By non-residents	3148	8695	15248	13895	11607	8650	8008
Patents in force in the Russian Federation	144325	181904	256419	263688	266189	264587	259020

4.6. Patent applications filed in Russia by section of the International Patent Classification: 2022

IPC section	Patent applications filed – total	Of which	
		By Russian residents	By non-residents
A – Human necessities	7266	4849	2447
B – Performing operations; transporting	3742	2663	1079
C – Chemistry; metallurgy	4608	3691	1917
D – Textiles; paper	151	67	84
E – Fixed construction	1526	1294	232
F – Mechanical engineering; lighting; heating; weapons; blasting	2193	1853	340
G – Physics	3945	3244	701
H – Electricity	2244	1390	854
Not classified	1249	949	300

4.7. Patent applications by country of origin*

	2000	2010	2020	2021	Rank**
Russia	**24159**	**32547**	**29830**	**25472**	**14**
Brazil	3799	5743	7271	6909	26
Canada	14360	24249	23855	26525	13
China	26489	308345	1441086	1538604	1
France	47119	65805	64287	66137	6
Germany	136484	173826	168092	165826	5
India	2886	14888	37895	43163	9
Italy	20511	27992	32551	34206	10
Japan	493936	468510	423264	412885	3
Republic of Korea	86151	178679	260614	267527	4
United Kingdom	47995	50926	53095	53650	7
United States	293616	433462	496123	509962	2

* Patent applications filed by residents in the country and abroad.

** In global ranking.

Source: Rospatent Annual Reports; WIPO Statistics Database, September 2023.

4.8. Patent applications by country of origin and patent office: 2021

	Patent applications filed by residents		
	total	of which	
		to the national patent office	abroad
Russia	**25472**	**19569**	**5903**
Brazil	6909	4666	2243
Canada	26525	4710	21815
China	1538604	1426644	111960
France	66137	24036	42101
Germany	165826	65757	100069
India	43163	26267	16896
Italy	34206	15205	19001
Japan	412885	222452	190433
Republic of Korea	267527	186245	81282
United Kingdom	53650	17215	36435
United States	509962	262244	247718

Source: Rospatent Annual Reports; WIPO Statistics Database, September 2023.

4.9. Development of advanced manufacturing technologies by type and degree of novelty: 2022

	Total	Of which technologies	
		new to the country	radically new
Advanced manufacturing technologies	**2621**	**2314**	**307**
Of which:			
design and engineering	483	437	46
fabrication, processing, and assembling	772	665	107
automated inspection and/or testing equipment	160	132	28
communications, management, and geomatics	237	215	22
production management information system and automation of production processes	333	300	33
industrial computing and big data technologies	318	284	34
green technology*	129	107	22
advanced production engineering and management methods	189	174	15

* Here and below in table 4.10, as of 2021, energy efficient technologies are also included in this type of advanced manufacturing technologies.

4.10. Use of advanced manufacturing technologies by type and duration: 2022

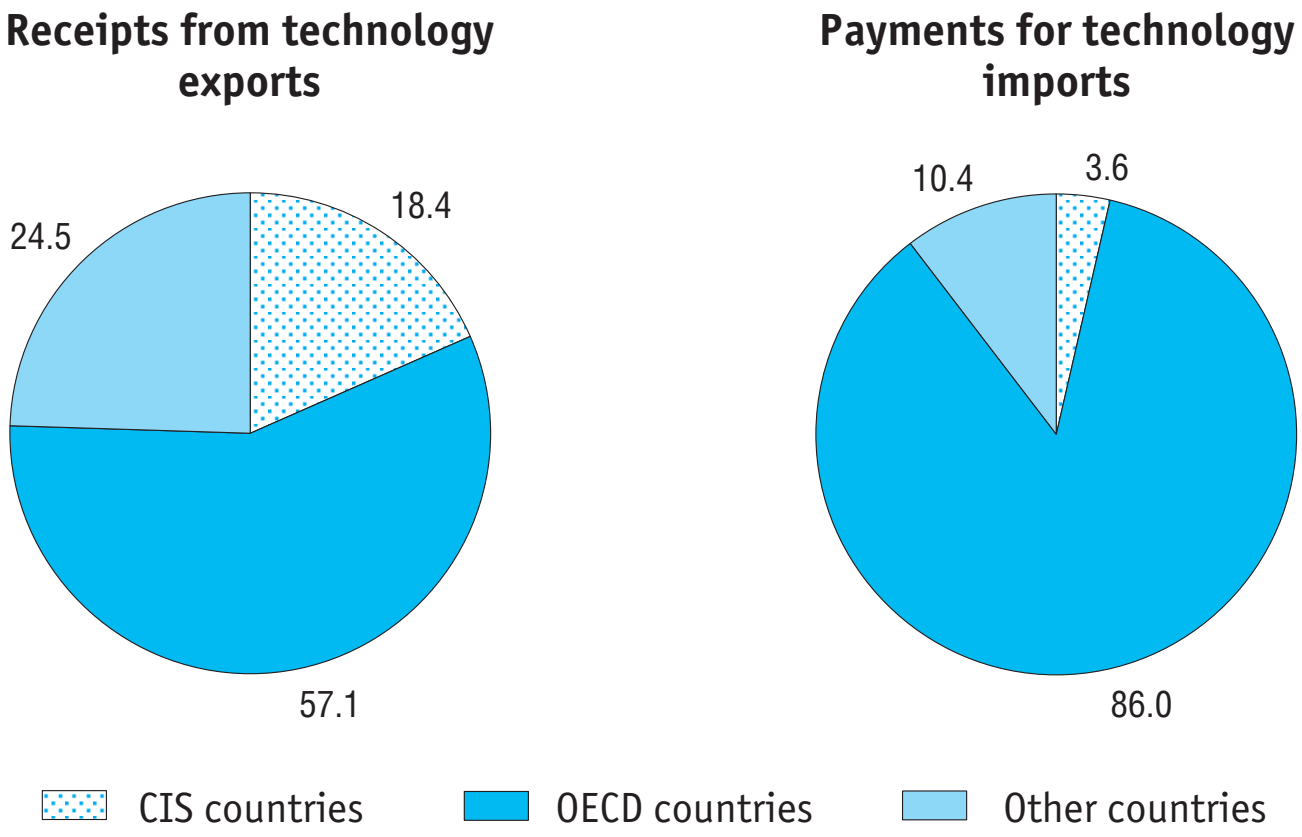
	Total	Of which technologies used during the period of			
		less than 1 year	1–3 years	4–5 years	6 years and over
Advanced manufacturing technologies	269541	20766	60080	41095	147600
Of which:					
design and engineering	39953	2830	7796	6110	23217
fabrication, processing, and assembling	89732	6782	17287	12887	52776
automated inspection and/or testing equipment	22350	1446	6101	3155	11648
communications, management, and geomatics	56072	4464	13859	9373	28376
production management information system and automation of production processes	29721	2130	6340	4975	16276
industrial computing and big data technologies	10364	1497	3809	1724	3334
green technology	4356	323	882	567	2584
advanced production engineering and management methods	16993	1294	4006	2304	9389

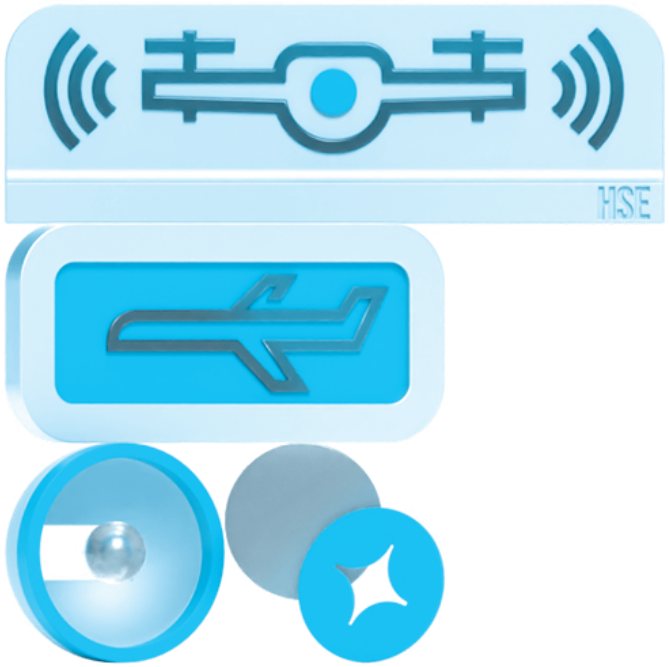
4.11. Technology balance of payments by category of contracts: 2021

(million USD)

	Receipts from technology exports	Payments for technology imports	Technology balance of payments
Total	**4662.7**	**5044.3**	**-381.5**
Patents	1.5	52.7	-51.2
Unpatented inventions	30.0	1.3	28.7
Patent licences	33.3	409.3	-376.0
Selection achievements	1.9	5.0	-3.1
Utility models	0.3	3.4	-3.0
Know-how	443.8	462.3	-18.5
Trademarks	108.3	1273.1	-1164.8
Industrial designs	0.1	1.9	-1.9
Engineering services	1862.9	1569.5	293.4
Scientific research and development	967.7	250.2	717.5
Others	1212.9	1015.6	197.3

4.12. Percentage distribution of technology exports and imports in Russia by country group: 2021





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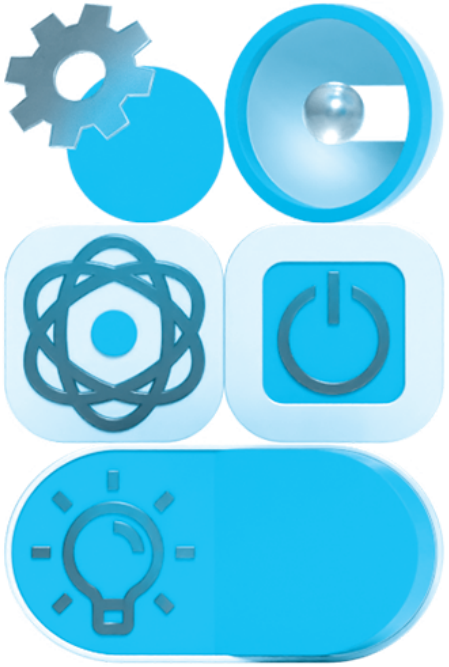
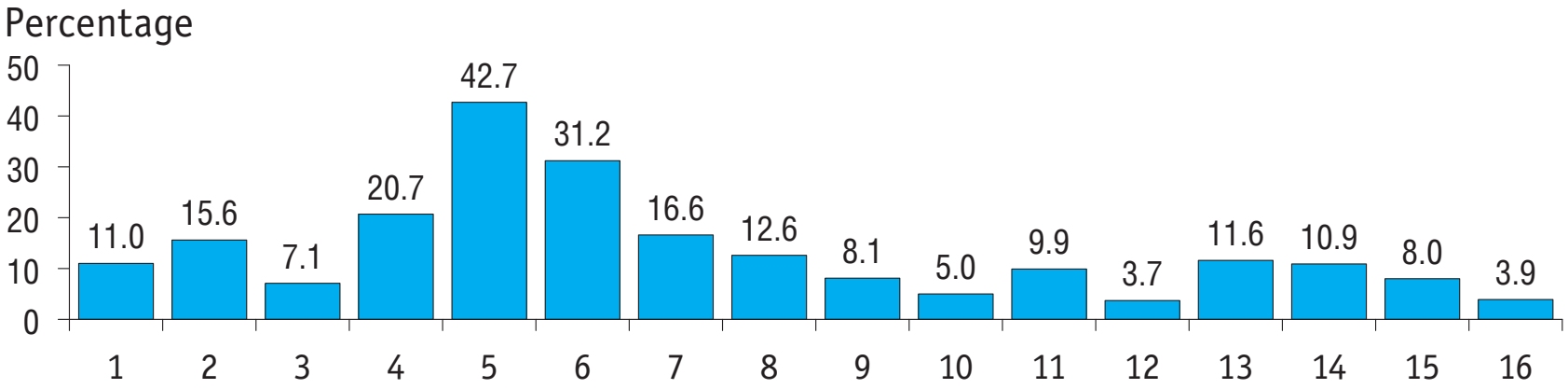


INNOVATION

5.1. Main indicators of enterprises' innovative activity

	2010	2015	2018	2019	2020	2021	2022
Innovation activity of enterprises, *percentage*	9.5	9.3	12.8	9.1	10.8	11.9	11.0
Innovation expenditure, *million roubles*	411008.8	1211294.4	1484901.1	1954133.3	2134038.4	2379709.9	2662571.1
At constant 2010 prices	411008.8	790817.0	814135.2	1037170.7	1122528.2	1051898.5	1016364.9
As a percentage of total sales	1.6	2.7	2.2	2.1	2.3	2.0	2.1
Sales of innovative goods and services, *million roubles*	1243712.5	3843428.7	4516276.4	4863381.9	5189046.2	6003342.0	6377248.5
At constant 2010 prices	1243712.5	2509256.8	2476164.5	2581275.9	2729496.7	2653645.4	2434343.1
As a percentage of total sales	4.8	8.4	6.5	5.3	5.7	5.0	5.1

5.2. Innovation activity of enterprises: 2022



1 – total
2 – industrial production
3 – mining and quarrying
4 – manufacturing
5 – high tech
6 – medium high tech
7 – medium low tech
8 – low tech
9 – electricity, gas, steam and air conditioning supply*
10 – water supply; sewerage, waste management and remediation activities**
11 – services
12 – transportation and storage
13 – telecommunications and IT industry***
14 – human health and social work activities
15 – agriculture
16 – construction

* Here and below in this section, aggregate data on enterprises by type of economic activity with OKVED2 Section D codes.

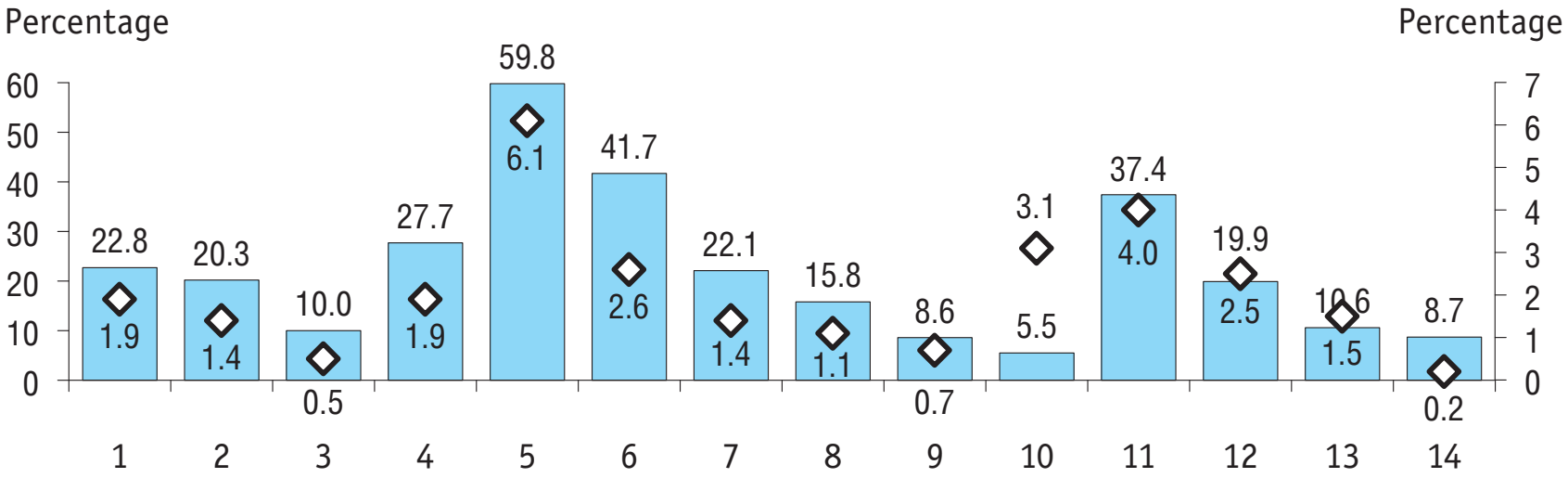
** Here and below in this section, aggregate data on enterprises by type of economic activity with OKVED2 Section E codes.

*** Here and below in this section, aggregate data on enterprises by type of economic activity with OKVED2 codes 61, 62, 63.

5.3. Enterprises that engaged in product and business process innovation: 2020–2022

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

5.4. Technological innovation: 2022



1 – total
2 – industrial production
3 – mining and quarrying
4 – manufacturing
5 – high tech
6 – medium high tech
7 – medium low tech
8 – low tech
9 – electricity, gas, steam and air conditioning supply
10 – water supply; sewerage, waste management and remediation activities
11 – services
12 – telecommunications and IT industry
13 – agriculture
14 – construction

Enterprises that engaged in technological innovation as a percentage of the total*

Expenditure on technological innovation as a percentage of total sales

* According to a Indicator Calculation Methodology approved by Rosstat order no. 788 of December 20, 2019, with amendments no. 813 of December 18, 2020.

5.5. Innovation expenditure: 2022

	Total, *million roubles*	Of which, *percentage*			
		research and development	purchase of machinery and equipment, or other fixed assets	development and purchase of software and databases	acquisition of rights to the results of intellectual activity*
Total	**2662571.1**	**41.2**	**37.5**	**5.3**	**1.5**
Industrial production	1432680.6	33.9	42.6	3.9	2.3
Mining and quarrying	180730.4	13.8	53.8	22.4	0.2
Manufacturing	1156538.2	37.8	39.1	1.1	2.8
High tech	251742.0	68.1	13.3	1.5	10.9
Medium high tech	277470.1	22.6	56.0	0.7	0.6
Medium low tech	493369.8	39.3	30.9	1.1	0.4
Low tech	133956.4	6.9	82.7	0.9	0.7

(continued)

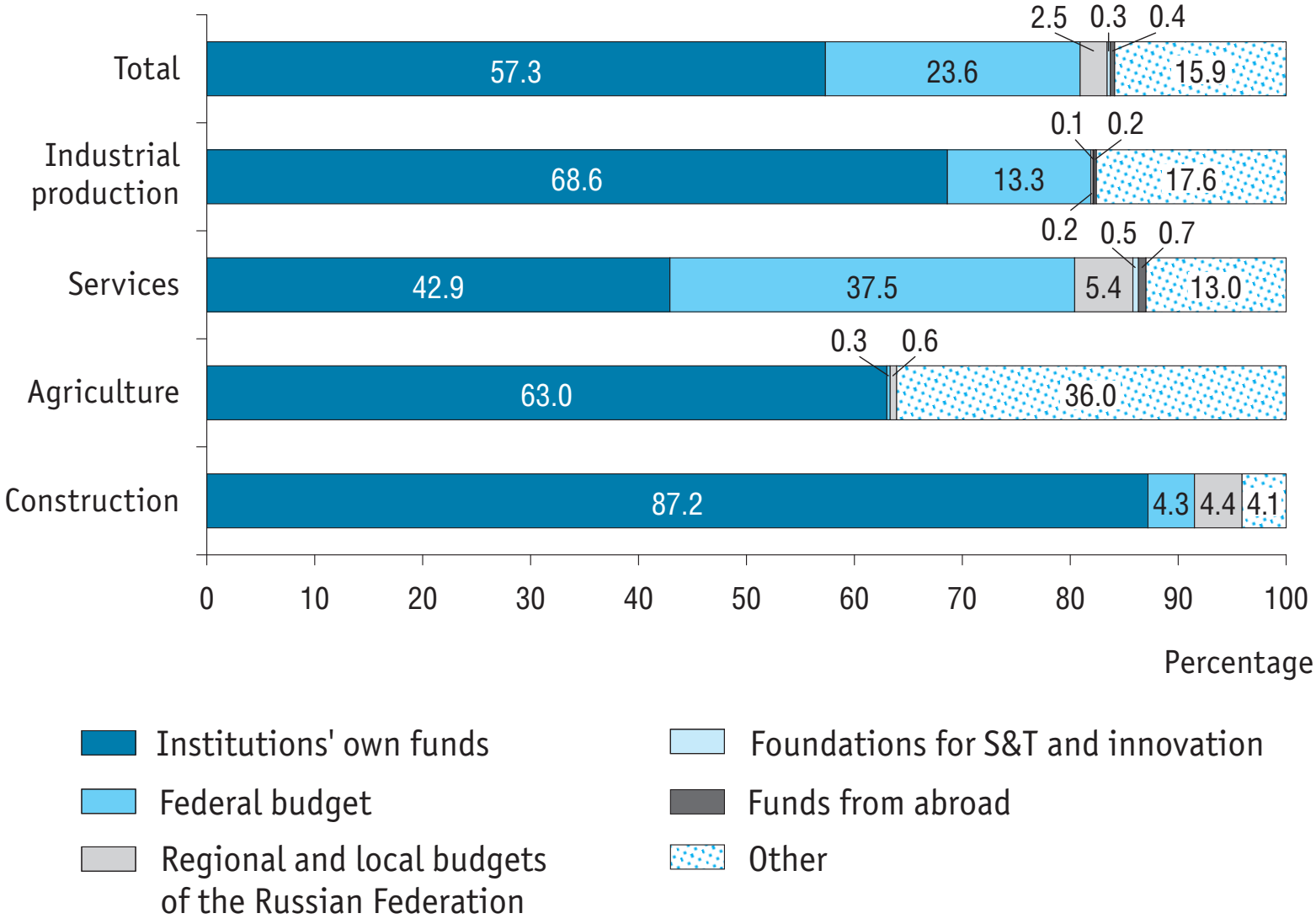
	Total, *million roubles*	Of which, *percentage*			
		research and development	purchase of machinery and equipment, or other fixed assets	development and purchase of software and databases	acquisition of rights to the results of intellectual activity*
Electricity, gas, steam and air conditioning supply	53719.0	36.3	45.2	3.8	0.1
Water supply; sewerage, waste management and remediation activities	41692.9	9.6	87.4	0.6	0.0
Services	1165612.5	51.8	28.9	7.4	0.6
Transportation and storage	184748.0	4.6	87.5	2.2	0.7
Telecommunications and IT industry	198300.9	11.6	25.3	30.0	1.5
Human health and social work activities	31257.0	10.1	71.7	1.1	0.2

(continued)

	Total, *million roubles*	Of which, *percentage*			
		research and development	purchase of machinery and equipment, or other fixed assets	development and purchase of software and databases	acquisition of rights to the results of intellectual activity*
Agriculture	49022.4	3.1	90.8	0.4	0.02
Construction	15255.6	31.7	42.6	1.3	0.1

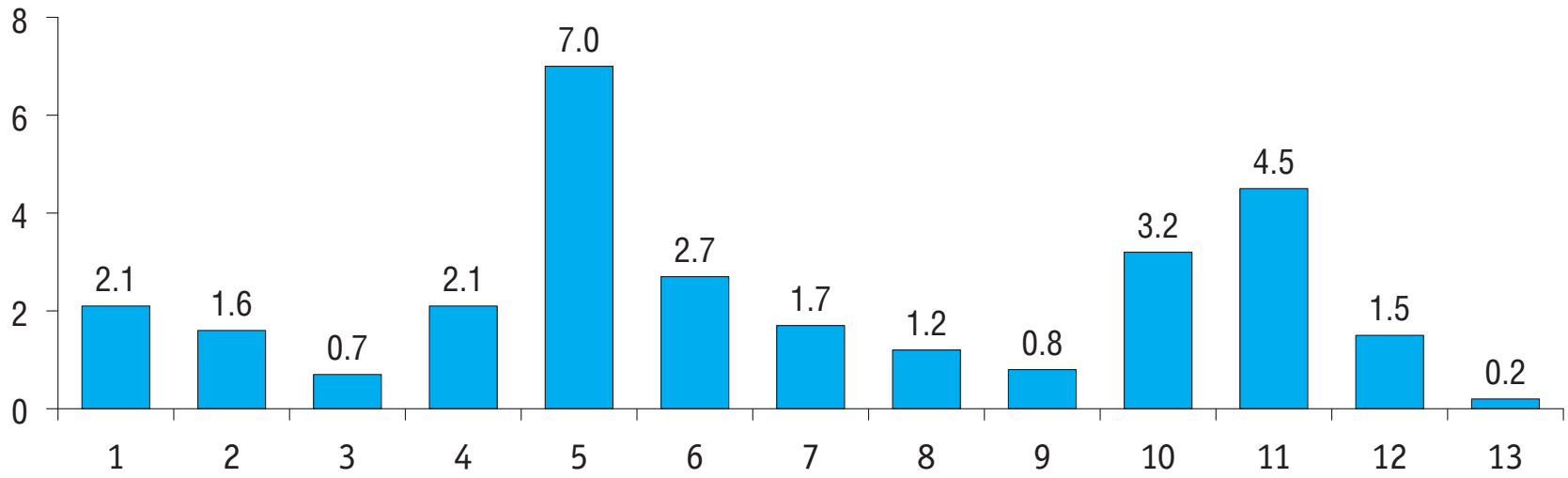
* Acquisition of patent rights (alienation), licenses, industrial designs, utility models, selection achievements, integrated circuit designs, etc.; patenting (registration) of the results of intellectual activity.

5.6. Innovation expenditure by source of funds: 2022



5.7. Intensity of innovation expenditure: 2022

(innovation expenditure as a percentage of total sales)



1 – total
2 – industrial production
3 – mining and quarrying
4 – manufacturing
5 – high tech
6 – medium high tech
7 – medium low tech
8 – low tech
9 – electricity, gas, steam and air conditioning supply
10 – water supply; sewerage, waste management and remediation activities
11 – services
12 – agriculture
13 – construction

5.8. Sales of innovative goods and services: 2022

	Million roubles	As a percentage of total sales
Total	**6377248.5**	**5.1**
Industrial production	4934479.5	5.5
Mining and quarrying	870008.3	3.2
Manufacturing	3802530.2	7.0
High tech	677495.7	18.9
Medium high tech	884455.6	8.7
Medium low tech	1729759.0	6.0
Low tech	510819.9	4.4
Electricity, gas, steam and air conditioning supply	230912.7	3.4
Water supply; sewerage, waste management and remediation activities	31028.3	2.4
Services	1273911.5	5.0
Transportation and storage	124690.6	1.0
Telecommunications and IT industry	371472.5	8.3
Human health and social work activities	19572.8	0.7
Agriculture	124823.1	3.8
Construction	44034.4	0.6

5.9. Sales of innovative goods and services created using results of intellectual activity that have Russian copyright holders: 2022

	Million roubles	As a percentage of total sales of innovative goods and services
Total	**1922196.8**	**30.1**
Industrial production	1548913.6	31.4
Mining and quarrying	574075.5	66.0
Manufacturing	762741.2	20.1
High tech	143263.3	21.1
Medium high tech	79989.7	9.0
Medium low tech	512167.1	29.6
Low tech	27321.1	5.3
Electricity, gas, steam and air conditioning supply	203849.6	88.3
Water supply; sewerage, waste management and remediation activities	8247.3	26.6

(continued)

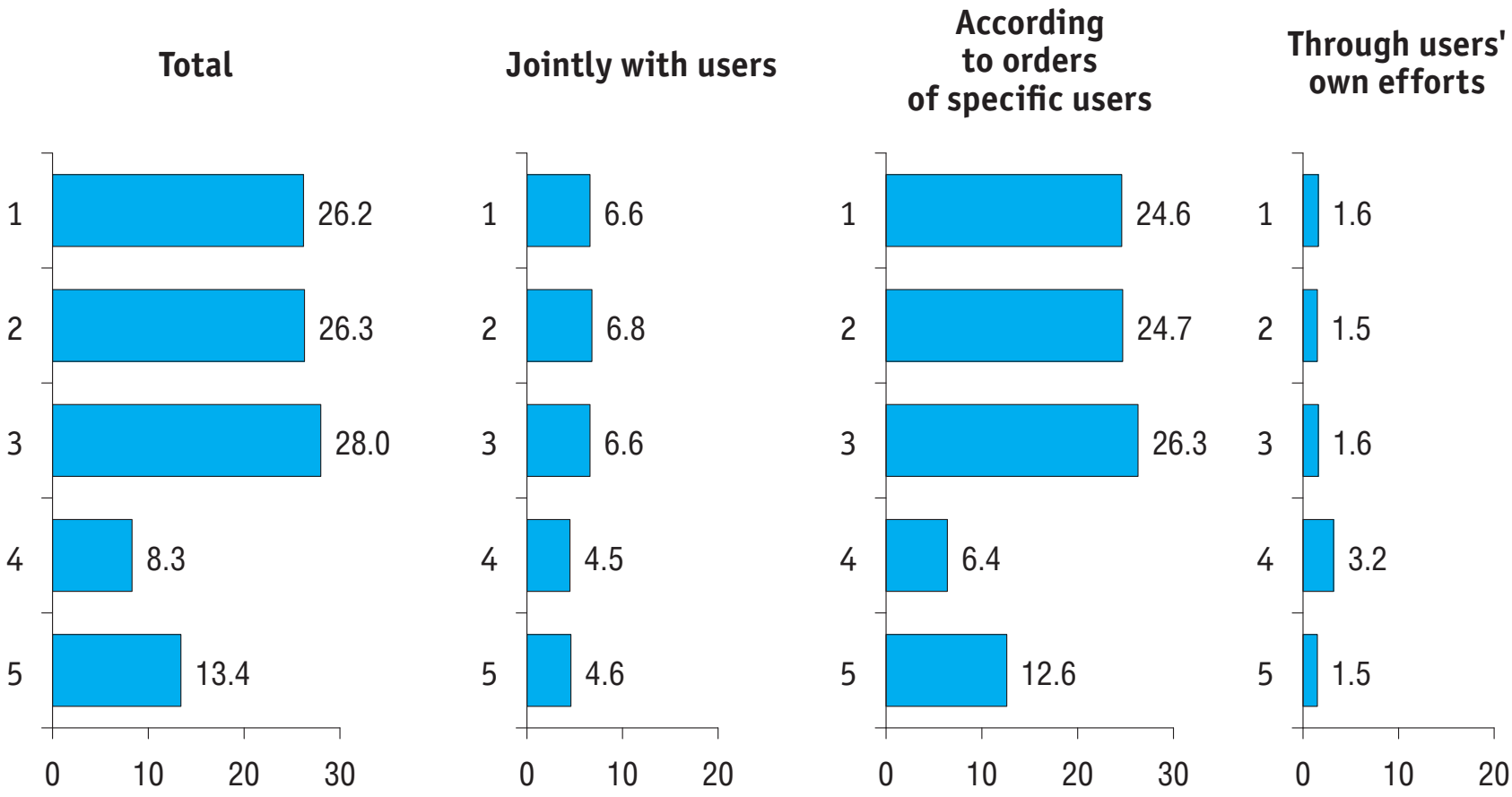
	Million roubles	As a percentage of total sales of innovative goods and services
Services	372435.8	29.2
Transportation and storage	60137.7	48.2
Telecommunications and IT industry	71787.4	19.3
Human health and social work activities	5059.1	25.8
Agriculture	833.5	0.7
Construction	13.9	0.03

5.10. Enterprises that indicated high effects of intellectual activity on production development: 2020–2022

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

5.11. Enterprises that sold customised innovative goods and services: 2020–2022

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



1 – total
2 – industrial production
3 – services
4 – agriculture
5 – construction

5.12. Enterprises that had cooperation ties in innovation by type of partners: 2022

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

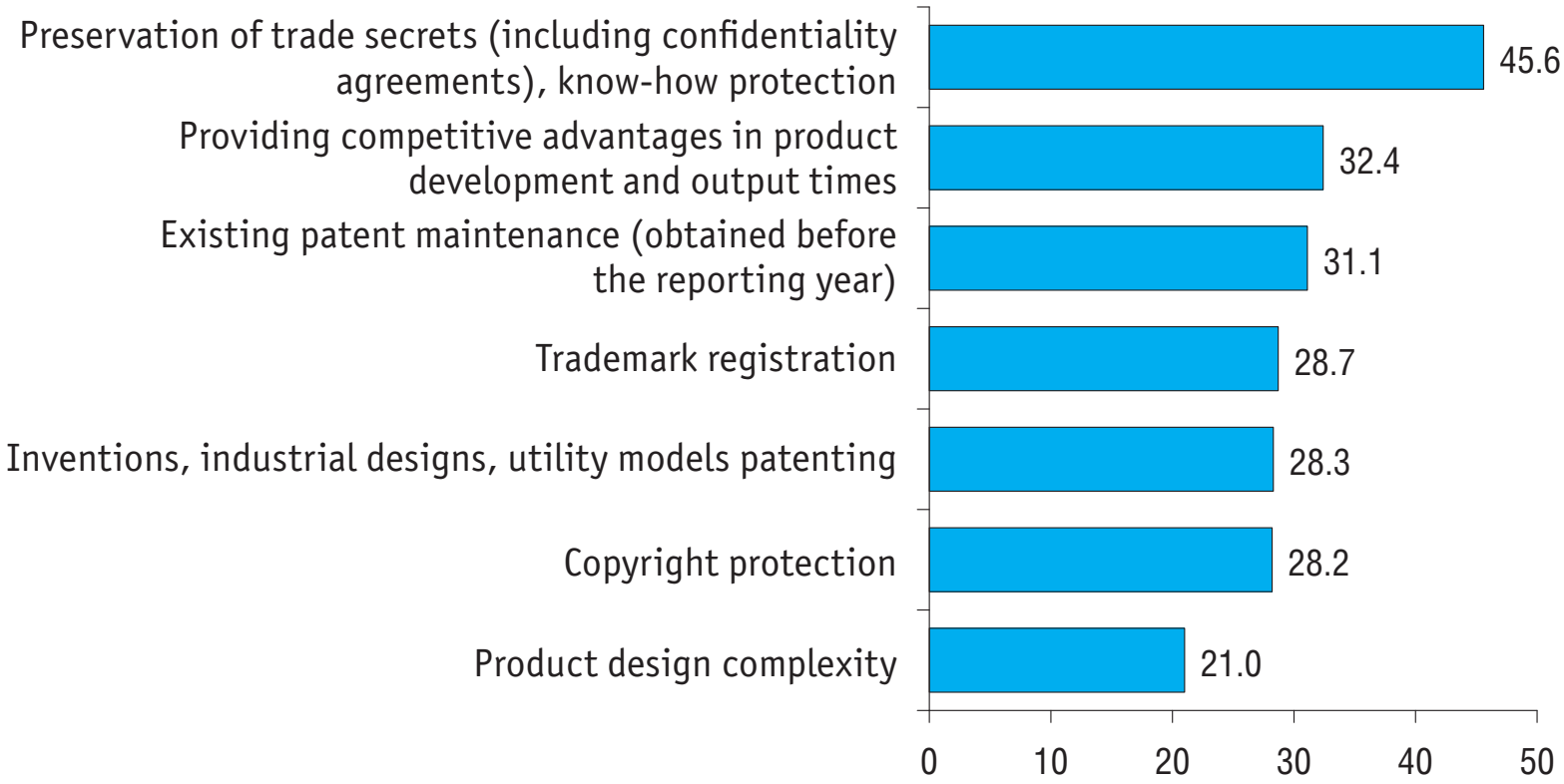
	Enterprises within a single network	Research institutes	Consumers of goods and services	Higher education institutions
Total	**9.8**	**8.3**	**7.1**	**6.8**
Industrial production	10.9	8.5	6.3	6.2
Mining and quarrying	17.4	9.3	1.7	6.4
Manufacturing	11.0	8.7	7.2	6.4
High tech	19.8	17.2	15.0	14.0
Medium high tech	9.3	7.0	6.7	4.9
Medium low tech	13.5	10.5	7.3	7.2
Low tech	2.7	1.6	1.2	1.2
Electricity, gas, steam and air conditioning supply	9.7	8.6	1.7	5.8
Water supply; sewerage, waste management and remediation activities	3.5	3.5	1.2	2.4

(continued)

	Enterprises within a single network	Research institutes	Consumers of goods and services	Higher education institutions
Services	9.8	9.1	8.5	8.1
Transportation and storage	9.6	5.0	2.8	5.4
Telecommunications and IT industry	10.0	2.6	10.2	3.7
Human health and social work activities	2.2	2.3	2.3	3.2
Agriculture	3.8	1.7	2.6	1.7
Construction	3.0	0.8	2.2	1.6

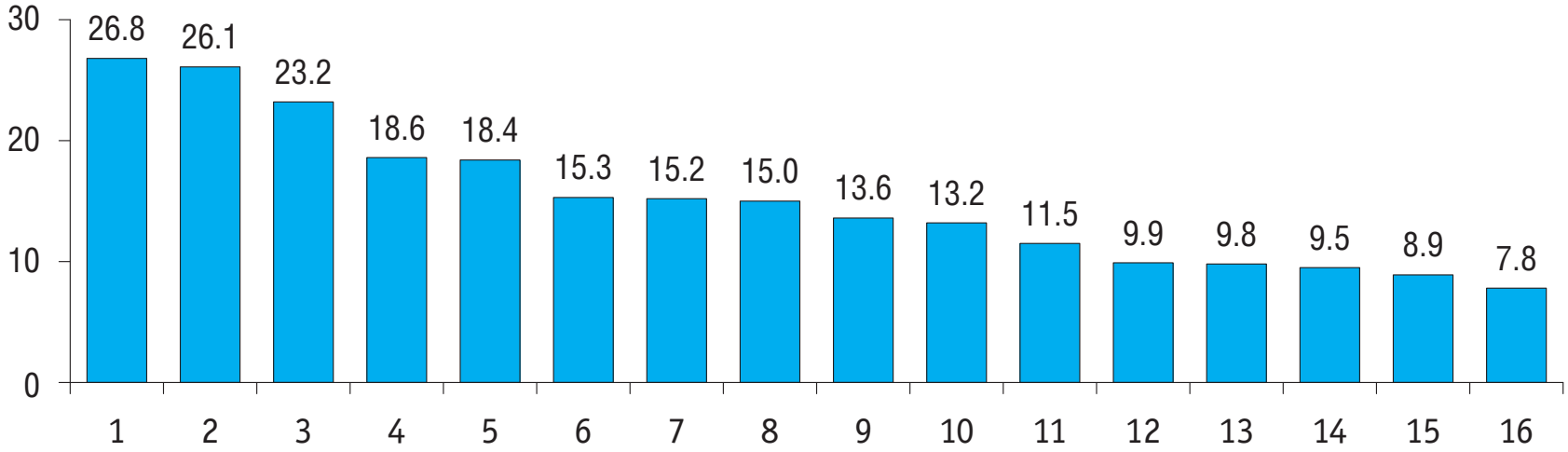
5.13. Enterprises that indicated main and most significant protection methods of R&D results: 2020–2022

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



5.14. Enterprises that identified main and most significant factors hindering innovation: 2020–2022

(as a percentage of all enterprises)

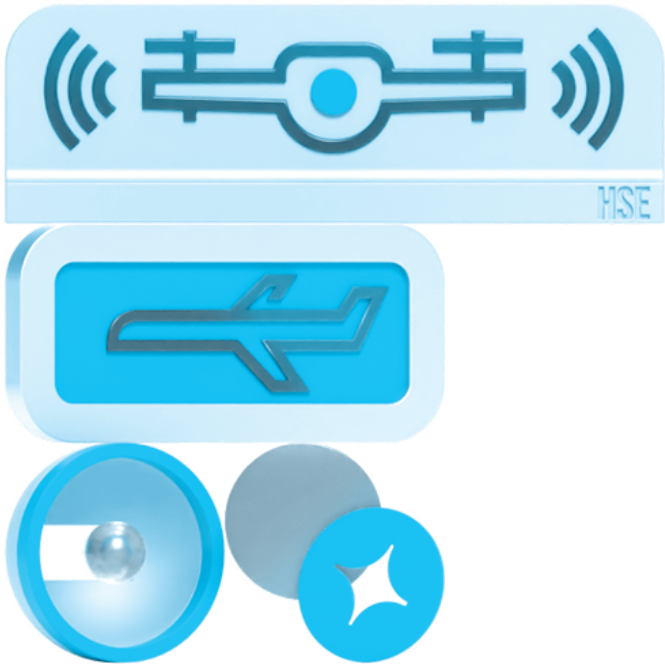


1 – high cost of introducing innovations
2 – lack of own funds
3 – high economic risk
4 – lack of financial support from the government
5 – high competition in the market
6 – lack of qualified personnel
7 – low innovation potential of the organization
8 – uncertain market demand
9 – lack of loans or direct investment
10 – unclear economic benefits from the use of intellectual property
11 – inconsistency with the priorities of the organization
12 – lack of legislative documents regulating and stimulating innovation activity, imperfect existing technical regulations, rules, standards when it comes to advanced manufacturing technologies
13 – underdeveloped innovation infrastructure (intermediary, information, legal, banking, and other services)
14 – lack of information about new technologies
15 – lack of information about sales markets
16 – underdeveloped cooperation links

5.15. Main indicators of enterprises' innovation activity by country: 2022*

	Expenditure on technological innovation as a percentage of total sales	Innovative goods and services as a percentage of total sales
Russia	**2.1**	**5.1**
Austria	2.3	13.0
Belgium	2.8	15.1
Denmark	2.5	15.0
Finland	2.5	19.3
France	2.4	6.2
Germany	3.4	14.0
Italy	1.6	13.5
Norway	1.9	6.0
Poland	1.2	7.5
Romania	0.5	5.2
Spain	1.4	21.7
Sweden	3.5	12.7

* For countries other than Russia, data on the results of the European Innovation Survey for 2018–2020. (Eurostat).



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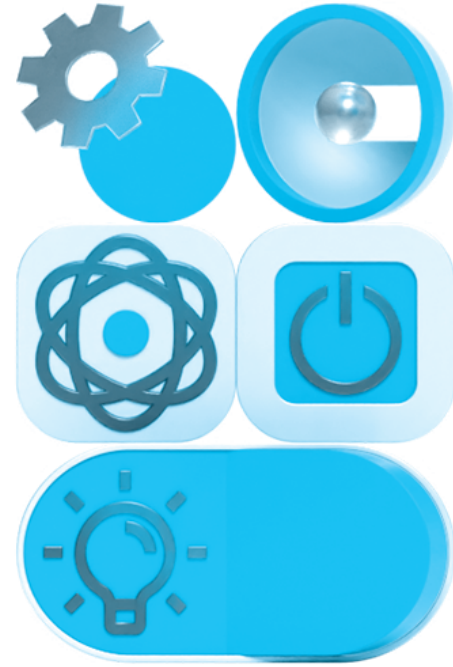
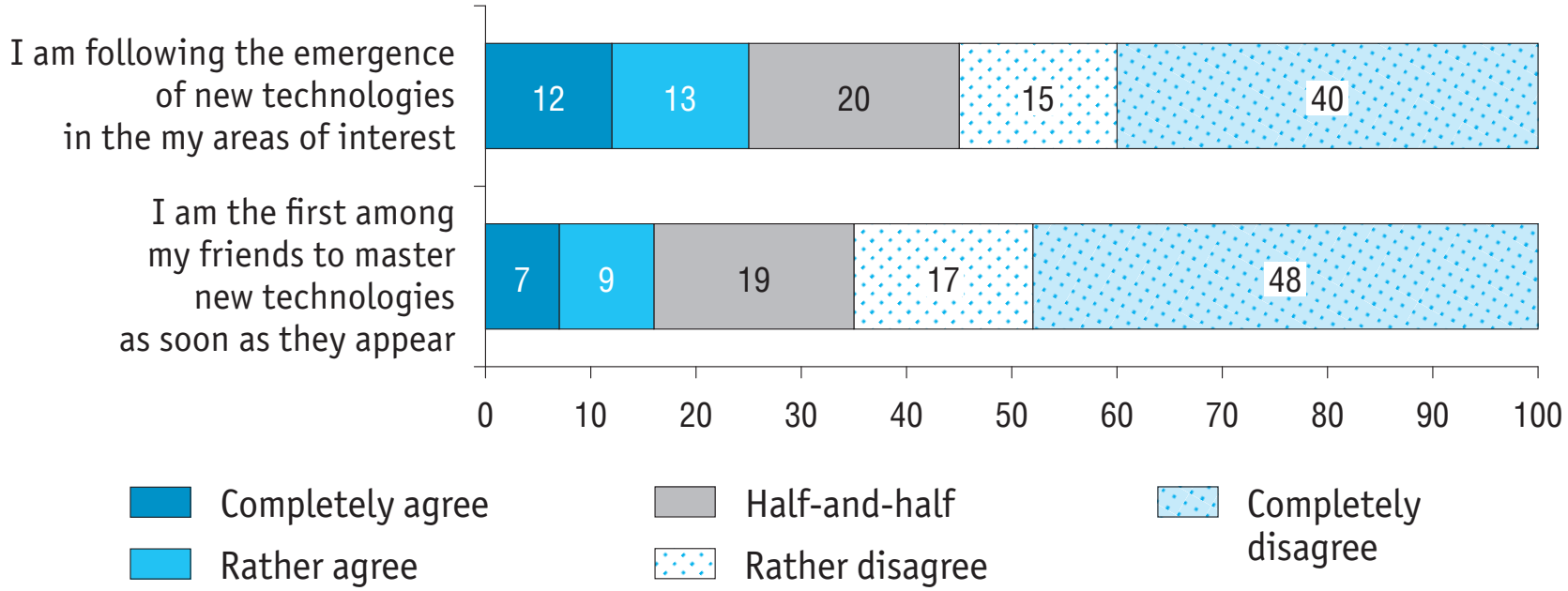


PUBLIC ATTITUDES TOWARDS SCIENCE, TECHNOLOGY, AND INNOVATION

6.1. Public interest in new technologies: 2022

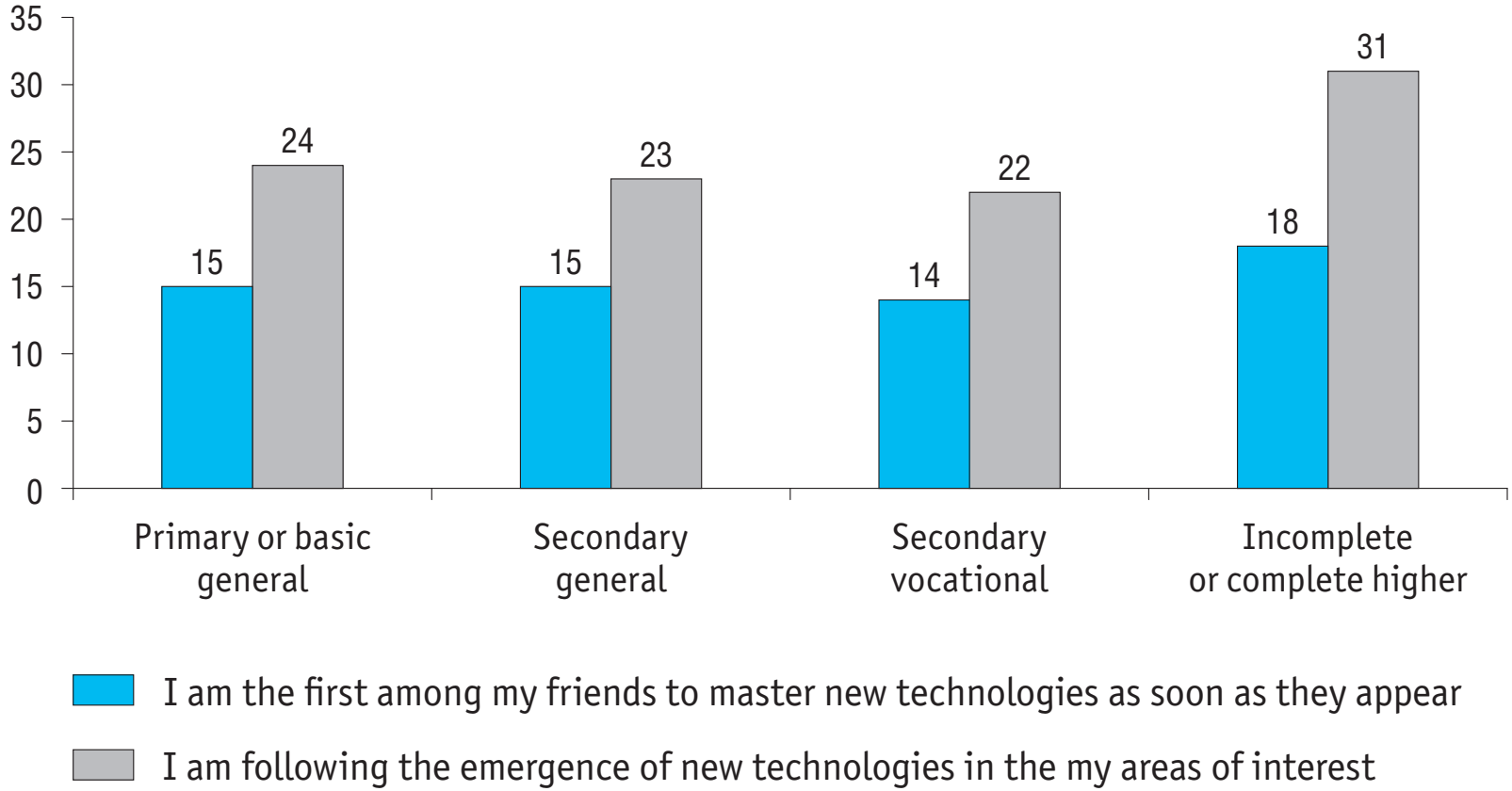
(as a percentage of all respondents)



Source in figures 6.1 and 6.2: the results of a representative survey of the adult Russian population aged 14 years and over conducted by HSE ISSEK within Digital Transformation Monitoring of the Economy and Society (carried out in August 4 — September 7, 2022 with of 10,021 participants).

6.2. Public interest in new technologies by level of education: 2022

(as a percentage of all respondents) *

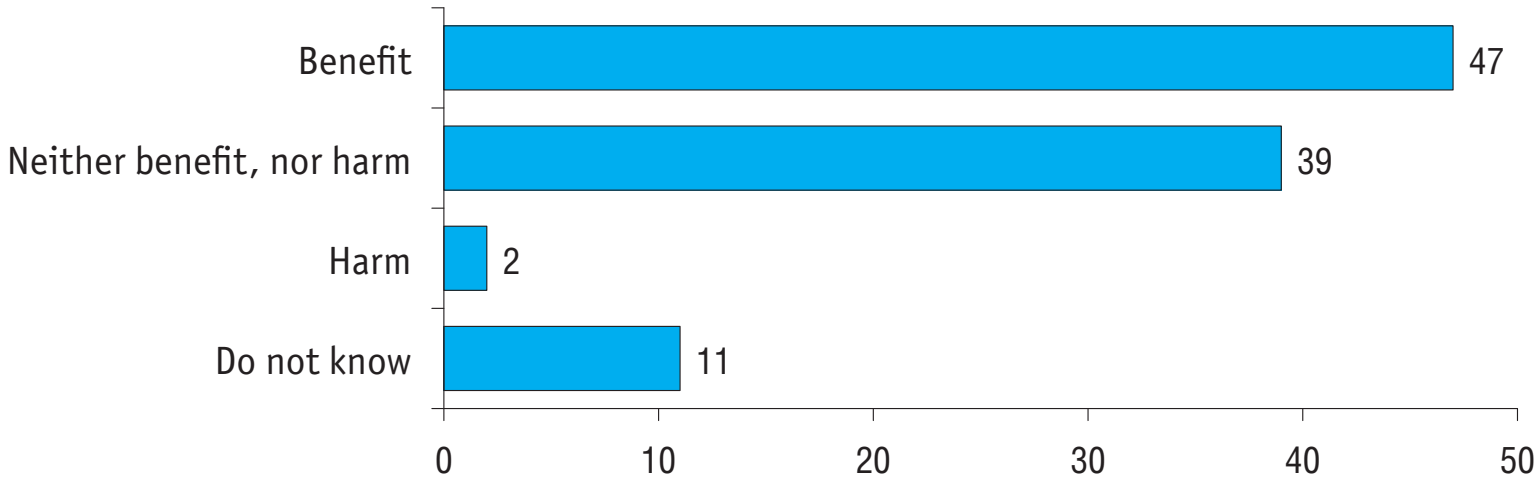


* The share of respondents who gave the answers 'completely agree' and 'mostly agree.'

6.3. Public perception of the work of Russian scientists: 2020–2021

(as a percentage of all respondents)

Does the work of Russian scientists benefit or harm you personally?

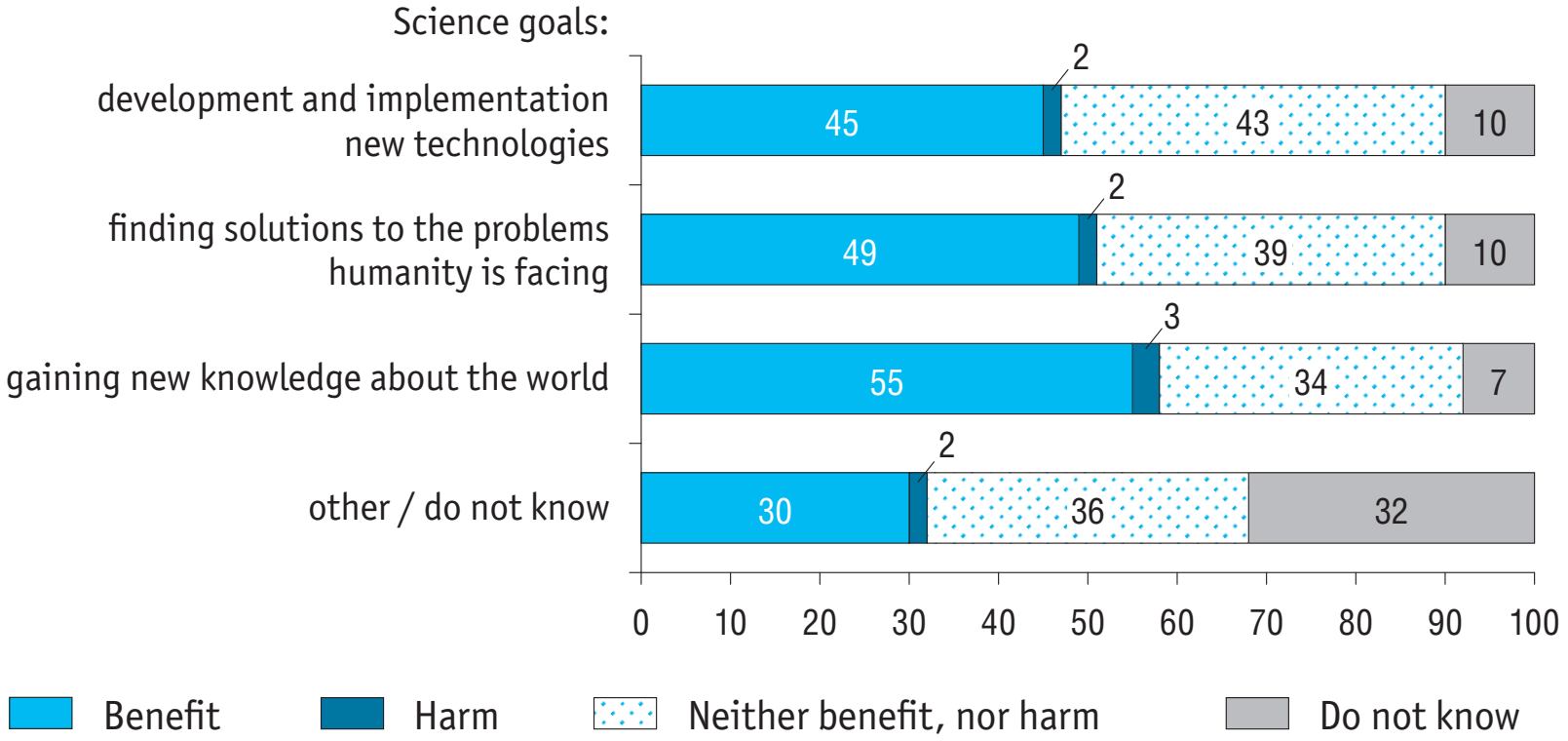


Source in figures 6.3 – 6.5: results of a representative survey of the Russian population aged 18–65 organised by the Russia Longitudinal Monitoring Survey – Higher School of Economics within the framework of the HSE Basic Research Programme (conducted in September 2020 – January 2021, with 7,467 participants).

6.4. Public perception of the work of Russian scientists depending on public's understanding of science goals: 2020–2021

(as a percentage of all respondents)

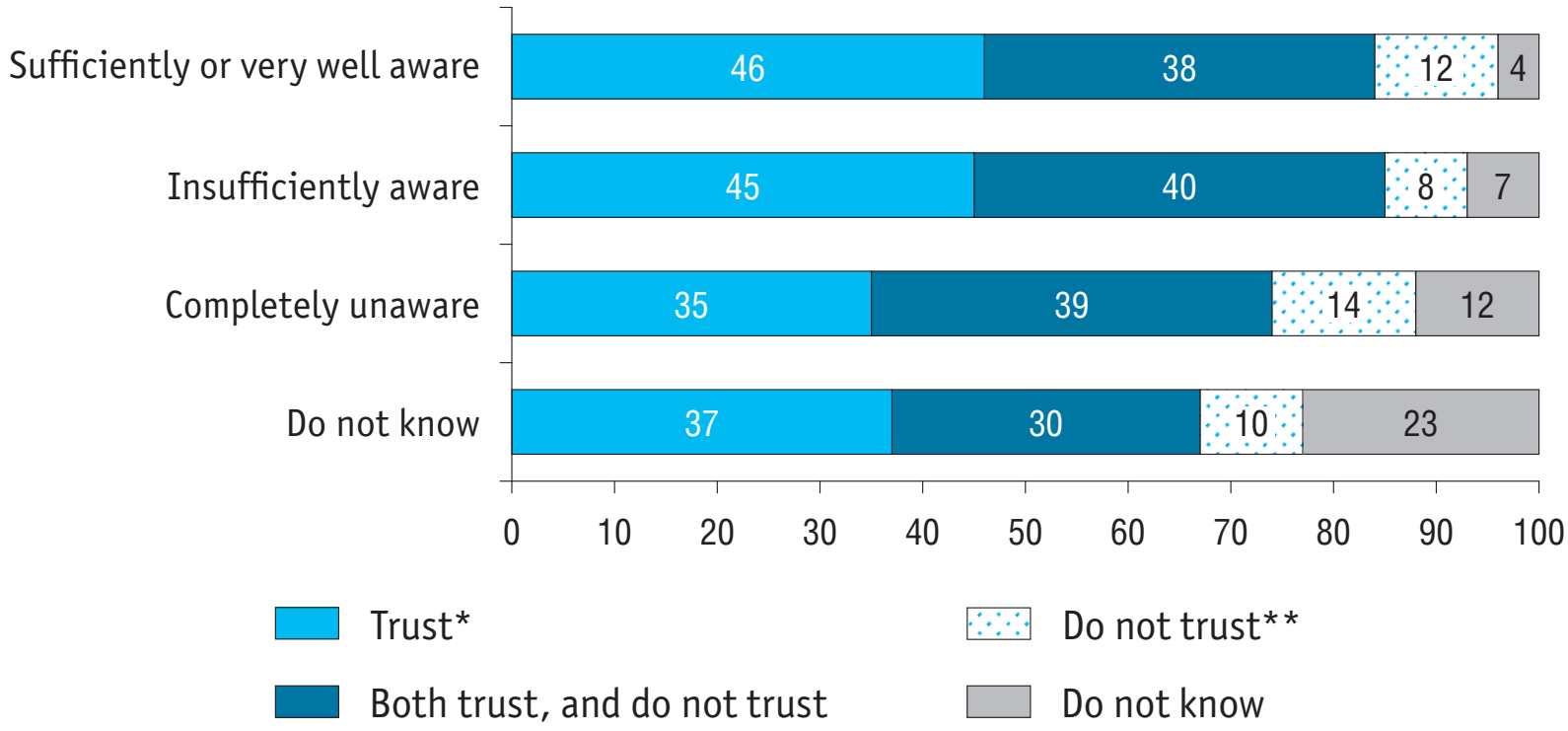
Does the work of Russian scientists benefit or harm you personally?



6.5. Trust towards research institutes depending on awareness of S&T achievements: 2020–2021

(as a percentage of all respondents)

To what extent do you trust research institutes?

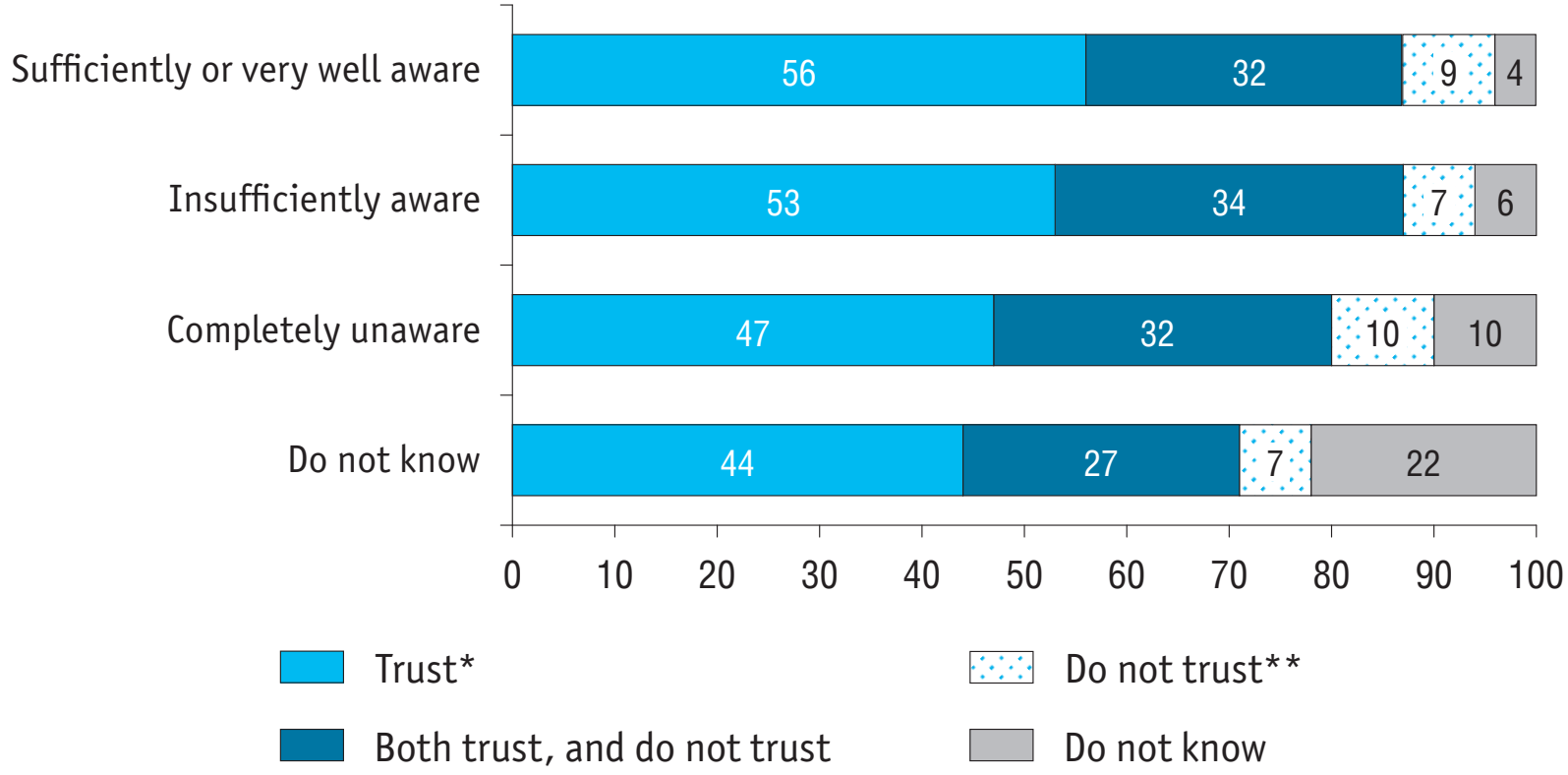


* The share of respondents who gave the answers 'completely agree' and 'mostly agree.'

** The total share of respondents who answered 'completely do not trust' or 'rather do not trust' is presented.

(continued)

To what extent do you trust universities?



* The share of respondents who gave the answers 'completely agree' and 'mostly agree.'

** The total share of respondents who answered 'completely do not trust' or 'rather do not trust' is presented.

Technical notes

Federal budget appropriations on civil S&T are the federal budget funds allocated for basic and applied research to be applied in civil S&T.

Technology balance of payments is the total sum of the money transfers on intangible transactions connected with technology imports and exports.

Gross domestic expenditure on R&D is actual expenditure on research and development performed by organisations, expressed in a monetary form.

Grants are cash and other assets provided irrevocably and free of charge by persons and legal entities, including foreign citizens and foreign legal entities and international organisations which have the right to provide grants to the Russian Federation in accordance with the procedures laid down by the Government of the Russian Federation, to realise specific S&T programmes and projects, innovation projects, to conduct specific research under the conditions attached by grantmakers.

Innovation expenditure is the actual expenditure connected with the implementation of one, several, or all types of innovative activities performed within an organisation, expressed in monetary form. Innovation expenditure includes current expenditure and capital expenditure.

Invention is a technical and/or engineering solution pertaining to a product (a device, a material, a germ strain, plant or animal cell culture) or to a method

(a process of manipulating material objects through material means), including to the use of the product or a method for a specific purpose. Patent is a title of protection granted for an invention that certifies inventor's priority, inventorship, and the right of exclusive use of this invention during patent's term of validity.

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.

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 (including the reporting period).

Researchers are professionals engaged in R&D and direct creators of new knowledge, products, processes, methods, and systems, as well as managers of these activities. Generally, researches have diplomas of higher education.

Competitive R&D funding means funds received by the organisation, which came first according to the decision of a competition commission after summarising the results of a competition for scientific, technical programmes, innovation and other R&D-related projects, based on the best R&D project implementation conditions presented by this organisation in comparison to other participants.

Tax incentives, according to Article 56 of the Tax Code of the Russian Federation, are recognized as benefits provided to certain categories of taxpayers and payers of fees provided by the legislation on taxes and fees in comparison with other taxpayers or payers of fees, including the ability not to pay taxes or fees or to pay them in a smaller amount.

R&D personnel are professionals whose creative activities, performed systematically, are aimed at the advancement of scientific knowledge or search for new areas of its application, as well as direct services related to the performance of R&D.

Publication activity indicators is calculated based on Scopus database. An article belongs to a country if it is listed in the affiliated address of an author or one of the co-authors.

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.

Construction includes aggregated data on enterprises by types of economic activities: for 2015–2018, OKVED2 codes 43.91, 43.99; from 2019, Section F.

Services includes consolidated data on enterprises by types of economic activities according OKVED2 Section H codes 58, 61, 62, 63, 69, 70, 71, 72, 73, 74, 86.

Technological innovation is a technologically new or improved good or service introduced on a market, a technologically new or improved process or technique of service production (transfer) used in real life.

Innovation activity of enterprises is determined as the ratio of the number of innovation-active enterprises to the total number of enterprises surveyed in the reporting year. The methodology for calculating this indicator was approved by Rosstat Order no. 818 of December 27, 2019. Any changes in 2017 data are due to the recalculation of the indicator according to the specified method.

Number of personnel in full-time equivalent is an indicator which reflects the sum of time shares actually spent by R&D personnel on R&D activities and is measured in person-years.

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