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## The Development of the Human Resource Capacity of the Federal Target Program 'Research and Development in the Top Priority Areas of Russia's Scientific and Technological Complex, 2007-2013'

*Analysis of the quantitative and qualitative composition of the personnel directly or indirectly engaged in R&D carried out within the framework of the Program indicates that, since 2009, their numbers have begun to grow. This trend was also apparent in 2011. Among the factors behind this trend was also the fact that not only the state sector and universities, but also the private sector of the economy began to be increasingly interested in the Program. Over the course of five years since the launch of the Program, the average age of R&D personnel engaged in R&D within the framework of the Program has dropped by more than 3% on 2007.*

The Federal Target Program 'Research and Development in the Top Priority Areas of Russia's Scientific and Technological Complex. 2007-2013' (hereinafter to be referred to as the Program) is an instrument of the State's support for science and technology development in Russia.

One of the major tasks of the Program's implementation consists in the preservation and maintenance of the proper level of qualification of the Russian scientists engaged in R&D. Its second major task is to stimulate the inflow of young specialists into this sphere. The implementation of the Program promotes the development of talent pools as the most important component of the resource base of Russia's R&D sector, and greatly improves the quality of this component.

Shown below are the results of an analysis of the quantitative and qualitative composition of the personal engaged in the implementation of the Program-related state contracts over the course of 5 years of the Program's implementation (2007-2011). The initial data for the analysis were taken from the reports submitted by the contractors for the work under the aforesaid state contracts.

Since 2009, there has been a rise in the numbers of personnel engaged in R&D carried out within the framework of the Program. This trend was also apparent in 2011. Among the factors behind this trend was the fact that not only the state sector and universities but also the private sector of the economy began to be increasingly interested in the Program (it has accounted for approximately 20% of the contracts concluded since the launch of the Program).

In 2011, 1,477 contracts were being implemented within the framework of the Program.

The total number of personnel engaged in the execution of work under the Program amounted to 54,767. Of this amount, 45,122 persons were directly engaged in R&D (82% of the total amount of persons engaged in the execution of work under the Program in 2011), while 9,645 persons performed other types of work.

The qualitative (professional) composition of persons directly engaged in R&D in 2011 was as follows:

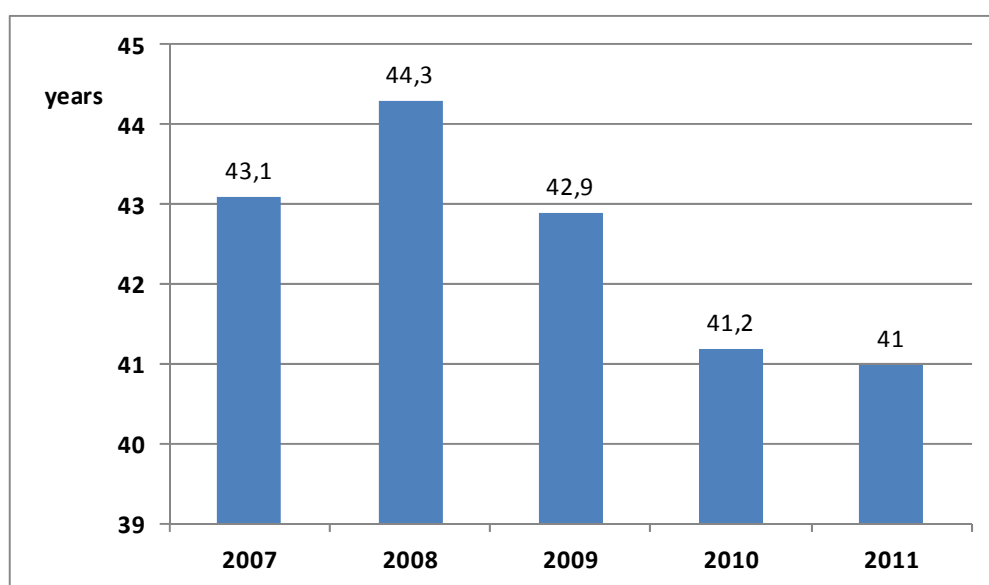
- ▣ researchers and science educators – 33,469, including researchers and science educator aged up to 35 years inclusive – 9,010;
- ▣ engineers and technicians – 11,653.

The number of R&D personnel holding doctoral degrees amounted to 7,725, 236 of whom were young (aged up to 35 years inclusive).

The number of R&D personnel holding candidate of sciences degrees amounted to 15,213, 6,203 of whom were young (aged up to 35 years inclusive).

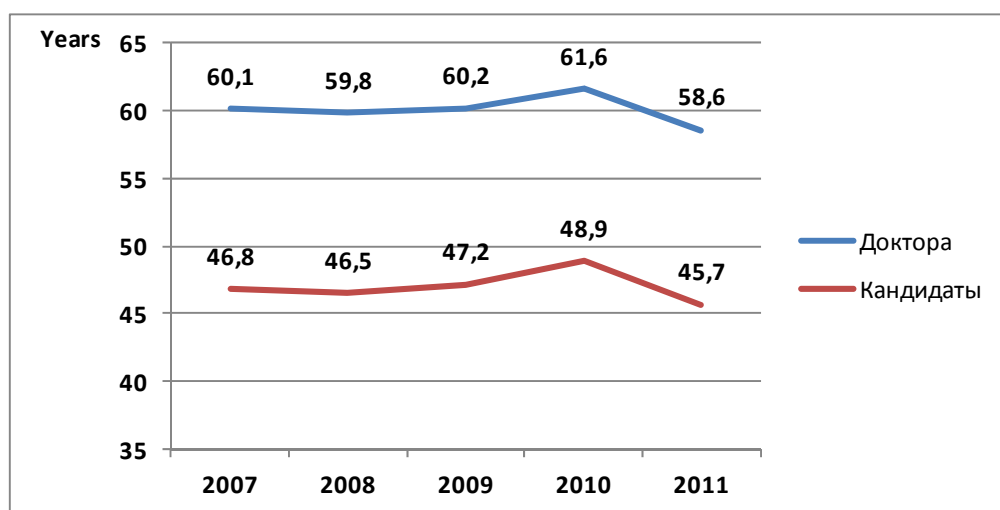
The number of postgraduate students among R&D personnel amounted to 4,461; the number of higher education students amounted to 4,830.

Over the course of five years since the launch of the Program - that is, by the end of 2011 - the average age of R&D personnel engaged in R&D within the framework of the Program has dropped by more than 3% on 2007. In 2011, the average age of this personnel amounted to 41 years (*Fig. 1*).



**Fig. 1. The Average Age of R&D Personnel**

The analysis has shown a rise in the share of researchers holding doctoral and candidate of sciences degrees. In 2011, the average age of doctoral degree holders was 58.6 years, while that of candidate of sciences degree holders was 45.7 years. The reduction, in 2009 and 2010, in the number of contracts concluded under the Program, caused by cuts in financing, resulted in a drop in the number of R&D personnel (including young specialists). As a result, in 2010, the average age of specialists of top qualification notably increased (*Fig. 2*).



Note. Candidates of Sciences; Doctors

**Fig. 2. Changes in the Average Age of R&D Personnel Holding Doctoral and Candidate of Sciences Degrees**

Table 1 illustrates changes in the numbers and the qualitative composition of personnel engaged in the execution of projects (calculated per contract).

Table 1

**Number of R&D Personnel Per Contract, in 2007-2011**

Calculated Per Contract	2007	2008	2009	2010	2011
Total	31.07	29.80	34.83	36.90	40.36
including R&D personnel	25.02	24.48	28.11	29.57	32.26
Researchers	16.28	17.13	18.20	19.15	21.76
including aged up to 35 years inclusive	4.92	5.16	5.22	5.75	5.77
Engineers & Technicians	8.74	7.35	9.91	10.42	10.50
Other executors of work	6.05	5.32	6.72	7.33	8.10
Holders of doctoral degrees	3.37	3.74	4.51	5.21	5.22
including aged up to 39 years inclusive	0.13	0.13	0.14	0.15	0.15
Holders of candidate of sciences degrees	7.75	7.75	9.5	9.8	9.90
including aged up to 35 years inclusive	2.65	2.95	3.48	3.91	3.93
Postgraduate students	2.41	2.37	2.52	2.63	2.64
Higher education students	2.24	2.48	2.48	3.21	3.21
Number of contracts being implemented	1297	1363	996	496	1477

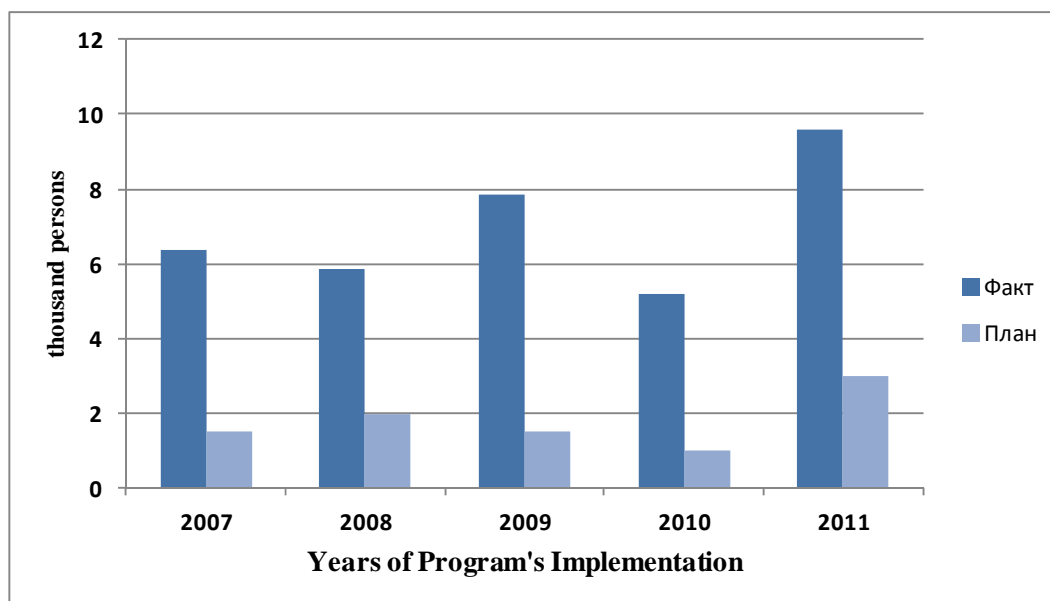
The data presented in Table 1 show a trend toward a reduction in the age of personnel engaged in the projects: the share of young researchers is steadily on the rise, and the same is true for the shares of higher education students and postgraduate students.

One of the major aims of the Program is to boost the inflow of young specialists into the field of R&D. This inflow is seen as one of the principal factors of increasing the ranks of Russia's scientific community.

Under the conditions stipulated in the Program, the category of young specialists should include workers aged no more than 35 years inclusive, who have acquired a higher professional education or secondary vocational training, or final-year students of professional-education establishments, including those without work experience, just starting their careers. The duration of young specialists' participation in research should be no less than two uninterrupted weeks. In

order to rule out the possibility of double counting, a young specialist should have the right to be registered as a participant in only one project being implemented by one or other contractor within the framework of the Program.

In each of the five years (2007–2011) since the Program’s inception, the ‘Number of Young Specialists’ indicator has exceeded two to three times the benchmarks set in the Program. Over the course of that period, 33.84 thousand persons were directly engaged in R&D, while the plan envisaged that only 20 to 23.5 thousand R&D specialists would participate in the Program in 2007-2013. On the average, in each year since the Program’s inception, approximately 7 thousand young specialists were engaged in R&D within the framework of the Program (*Fig. 3*).



Note. Actual; Planned

**Fig. 3. Number of Young Specialists Engaged in R&D**

In 2011, the ‘Number of Young Specialists Engaged in R&D’ indicator amounted to 9.59 thousand, with the target set at between 3 and 3.5 thousand. In 2011, there were 6.5 young specialists per contract; they accounted for 46% of persons engaged in work under the Program-related contracts.

The age distribution of persons participating in work under the aforesaid contracts was as follows (*Table 2*):

*Table 2*

**The Age Distribution of the Persons Participating in Work under the Program-related Contracts, by Year of the Program’s Implementation, %**

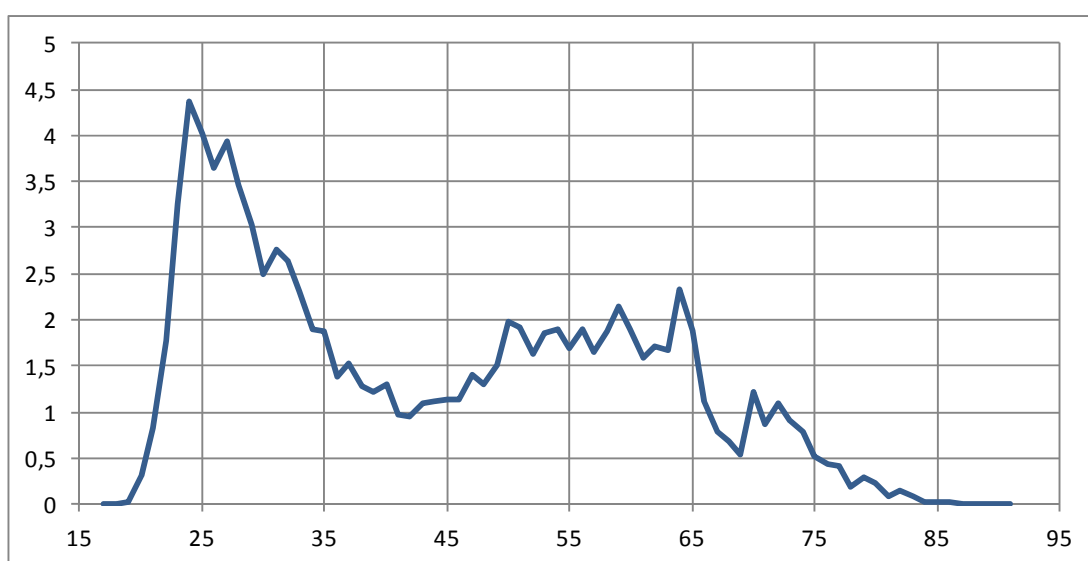
Age in Years	2007	2008	2009	2010	2011
16–20	2.29	1.21	1.33	0.35	1.63
21–25	16.60	11.92	16.62	14.26	16.78
26–30	13.16	12.47	14.70	16.56	15.58
31–35	8.02	9.24	9.33	11.48	11.78
36–40	6.01	6.04	6.45	6.72	6.12
41–45	7.11	6.61	6.35	5.28	5.41
46–50	8.89	9.64	8.05	7.30	6.04
51–55	10.57	11.05	9.81	8.99	8.39
56–60	11.08	11.28	9.68	9.45	8.26

61–70	12.74	15.14	13.16	13.50	10.08
Over 70	3.52	5.31	4.76	6.10	7.27

Table 2 shows that

- ▣ the share of such workers, aged 26 to 35 years, increased on 2007 (by more than 2.5%);
- ▣ the share of such workers, aged 51 to 60 years, decreased on 2007 (by approximately 2 to 3%);
- ▣ the share of such workers, aged 36 to 50 years, remained relatively unchanged (at about 20% of the total amount of workers under those contracts).

The age distribution of the persons participating in the work under the Program-related contracts is shown in *Fig. 4*. It can be seen that the share of young specialists significantly exceeds the share of specialists belonging to other age categories.



**Fig. 4. Age Distribution of the Persons Participating in Work Under the Program-related Contracts in 2011**