The analysis of methodology of the assessment and expected indicators of ecological safety of atmospheric air in the Russian Federation for 2010-2020 years

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Abstract

Programs of environmental protection, as a rule, consist of, both retrospective indicators, and perspective the predicted data which characterize a condition of atmospheric air. In article the analysis of program and real indicators of ecological safety of atmospheric air in the Russian Federation on an interval of 2010-2020 years is given.

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Emissions of pollutants into the atmospheric air by combined heat and power stations make 60% of total amounts of emissions in the Russian Federation. Emissions of the harmful (polluting) substances by production and distribution of the electric power, gas and water make considerable part in structure of emissions from stationary sources.

Emissions by production and distribution of energy and gas in atmospheric air make 51, 88% of total of emissions of nitrogen oxides (NOx), 46, 24% of emissions of solid substances, 28, 05% of emissions of dioxide of sulfur (SO2).

The combined heat and power station treats stationary sources of emissions of the polluting substances in

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atmospheric air. The number of the combined heat and power stations located in the territory of the Russian Federation makes 81% of total of objects of thermal power of the state.

To the harmful (polluting) substances, the objects proceeding from stationary sources power engineering specialists belong emissions: solid substances, carbon oxide (CO), dioxide of sulfur, (SO₂) nitrogen oxides (NOₓ), a benzapiren, methanol [1], [2]. Actual data are taken from official sources [1], [2], [3], [4], [5].

In figures 1 – 7 the planned indicators of the State program of the Russian Federation "Environmental protection" for 2012 - 2020 years in the territory of the Russian Federation and the actual achieved results [2], [3] are presented.

The volume of emissions of the harmful (polluting) substances from stationary sources on unit of gross domestic product during 2012 for 2020 years in the territory of the Russian Federation are planned to lower by 1,38 times from 0,4 to 0,29 tons on GDP unit (see Fig. 1).

Fig. 1. Change of volume of emissions of the harmful (polluting) substances from stationary sources on unit of gross domestic product for the Russian Federation.

The number of the cities with the high and very high level of pollution of atmospheric air for the Russian Federation.

Fig. 2. The number of the cities with the high and very high level of pollution of atmospheric air for the Russian Federation.
The rate of the caught and neutralized substances polluting atmospheric air in total of the polluting substances departing from stationary sources during 2012 for 2020 years in the territory of the Russian Federation is planned to be increased by 1.03 times from 75.5 to 77.4% (see Fig. 3).
The rate of emissions of the harmful (polluting) substances in atmospheric air over standards in a total amount of emissions of substances, during 2012 for 2020 years in the territory of the Russian Federation is planned to be lowered by 5 times with 5 to 1 (see Fig. 4).

![Graph showing changes in emissions](image)

**Fig. 5.** Change of volume of the emissions polluting the atmosphere of the substances departing from fuel and energy complex in relation to 2007.

The volume of the emissions polluting the atmosphere of the substances departing from stationary sources in fuel and energy complex in relation to 2007 year during 2012 for 2020 years in the territory of the Russian Federation are planned to lower by 1,56 times from 93 to 59,5% (see Fig. 5).

![Graph showing changes in emissions](image)

**Fig. 6.** Change of a rate of emissions of the substances, in a total amount of emissions polluting the atmosphere of the substances departing from stationary sources.

The rate of emissions of the substances, in a total amount of emissions polluting the atmosphere of the substances departing from stationary sources during 2012 for 2020 years in the territory of the Russian Federation is planned to be lowered by 1,29 times from 80 to 62% (see Fig. 6).

Emissions of the substances polluting the atmosphere departing from stationary sources in relation to 2007 year, during 2012 for 2020 years in the territory of the Russian Federation are planned to lower by 1,02 times from 92,85 to 91,4% (see Fig. 7).
Now there is no technique or model for an ecological assessment of influence of objects of power with application of the correlation analysis of the data allowing to process data on emissions of the polluting substances and a condition of atmospheric air, the accompanying disease incidence of the population, to reveal the most dangerous polluting substances and to consider their interrelation [6], [7], [8].

Summary:

• The analysis of state programs in the field of environmental protection and ecological safety of power, acting in the territory of the Russian Federation, has shown that the planned indicators of state programs differ from the actual indicators.
• The analysis of a current state of an ecological assessment of quality of territories according to author's research of scientific and technical state programs and techniques of an ecological assessment has shown that there is no technique for an individual assessment of influence of each stationary object of power in the megalopolis in the territory of which the set of power objects works. The existing techniques of an ecological assessment have the generalized character and don't reflect individual influence of emissions of the polluting substances from each stationary source of power (combined heat and power station) on disease incidence of the population living in concrete adjacent territories.

References


Fig. 7. Change of number of emissions of the substances polluting the atmosphere departing from stationary sources in relation to 2007 year.