**Oil tank farm emission trends of Russian refineries**

Vladimir Pavlovich Klepikov

National Research University Higher School of Economics

Email: vklepikov@hse.ru

Muhammad Shahbaz

Beijing Institute of Technology

Email: muhdshahbaz77@gmail.com‎

**Abstract**

Russia is a leader in the primary processing of crude oil in Europe. However, most of the country's oil refineries have outdated production capacities of tank farms for storing oil, and the issue of emissions from Russian refineries is a research gap in this area. The aim of this study was to identify the dynamics of changes in the amounts of emissions from tank farms for oil storage at Russian refineries. A study period from 2008 to 2018 was considered. The contributions of this paper include the development of methods for estimating emissions for the regions. In Russia, a unified methodology is in place for determining emissions of pollutants into the atmosphere from tanks. However, the use of this technique presents significant difficulties for conducting research on a regional scale, because in this case it is necessary to have detailed information about the technological features of each refinery. In this study, an approach was developed that, based on the existing expressions of the unified methodology, allows us to estimate the emissions of tank farms at a regional scale.

The results showed that the greatest emissions occurred in the Volga Federal District. The volume of emissions from that region exceeded the total emissions of the next three districts: the Central, Siberian, and Northwestern Federal Districts of Russia. The largest growth rate of emissions was demonstrated by the refineries of the Southern Federal District, exceeding those of the Central, Siberian, and Northwestern Federal Districts during the study period. In the Far Eastern and Ural federal districts of the country, annual emissions were much lower. During the study period, the total accumulated emissions exceeded 2.5 million tons; therefore, the country needs to carry out work to modernize the tank farms of oil refineries in accordance with the proposed direction.

Keywords: Oil; Refinery; Emissions; Tank farms; Federal District