AMIR Technical Services LLC
Georgia

Georgian Technical University

Institute of Geography
Kazakhstan

Russian Institute of Petroleum Geology and Geophysics

Abstracts of

The Second Eurasian RISK-2020 Conference and Symposium

Editor

- **Vugar Aliyev**

"Innovations in Minimization of Natural and Technological Risks"

"Minimization of the Most Prevalent Project Risks in the Oil and Gas Industry"

sponsors

AIJR Publisher

12-19 April, 2020
Tbilisi, GEORGIA

RISK-2020

Vugar Aliyev
(Editor)

Abstracts of

The Second Eurasian RISK-2020 Conference and Symposium

RISK-2020 (12th – 19th April 2020)

- *Innovations in Minimization of Natural and Technological Risks*
- *Minimization of the Most Prevalent Project Risks in the Oil and Gas Industry*

Jointly organized by

AMIR Technical Services LLC
Georgia

Georgian Technical University

Institute of Geography
Kazakhstan

Russian Institute of Petroleum Geology and Geophysics

Published by
AIJR Publisher, Dhaurahra, Balrampur, India 271604

Abstracts of The Second Eurasian RISK-2020 Conference and Symposium (RISK-2020)
12th – 19th April 2020

- Innovations in Minimization of Natural and Technological Risks
- Minimization of the Most Prevalent Project Risks in the Oil and Gas Industry

Editor

Prof. Vugar Aliyev
Director of the International Event Organizer Company
AMIR Technical Services LLC

Conference Organizers

- Amir Technical Services LLC, Georgia
- Georgian Technical University
- Institute of Geography, Kazakhstan
- Trofimuk Institute of Petroleum Geology and Geophysics, Russia

Conference Venue

Georgian Technical University, Tbilisi, Georgia

ISBN: 978-81-942709-4-2 (eBook)

DOI: https://doi.org/10.21467/abstracts.93

Type
Abstract Book

Published
12 April 2020

Number of Pages
228

Copyeditor
Dr. Adam A Bahishti

Imprint
AIJR Books

Distribution Channel: eChoice, New Delhi, India

Published by

AIJR Publisher, Dhaurahra, Balrampur, India 271604

Factor Analysis of Environmental Risk Amid Rising Energy Consumption

Vasiliy Nemov[1,2], Irina Filimonova[1,2], Anna Komarova[1,2], Mikhail Mishenin[1,2]

[1]Trofimuk Institute of Petroleum Geology and Geophysics of SB RAS, 630090, Novosibirsk, Russia
[2]Novosibirsk State University, 630090, Novosibirsk, Russia

doi: https://doi.org/10.21467/abstracts.93.21

ABSTRACT

Introduction. Modern researchers pay special attention to the relationship between economic growth and indicators of air pollution at the level of individual sectors of the economy. So, in a study by Marin and Mazzanti (2013), panel data for 1990–2007 are used, confirming the relationship. The development of the service sector, as a rule, is accompanied by a more pronounced decrease in the environmental burden than the growth of the manufacturing industry. A similar example is observed in an article by Darkoh (1996), which examines global trade trends, the relationship between trade, the environment, and economic growth. In York et al. (2003) analysis of panel data covering 86 countries around the world confirmed that the population has the greater impact on CO_2 emissions, the higher the level of urbanization and the smaller the average household size. In numerous studies in this area, researchers cite many factors that affect the dynamics of emissions of pollutants. However, there are different opinions on which factors subject to control by the state or companies may have the most significant effect on reducing the negative impact on the environment.

Methods. In this study, the authors used methods of mathematical modeling, assessed the impact of various economic, technological, resource and demographic factors on the dynamics of environmental indicators. For the calculations, the IPAT model was used, which allows taking into account the impact of structural changes in the economy, modernization of production and environmental investments on environmental pollution indicators. The factors in the model are the population, gross domestic product, industrial production per capita, technological level, as well as the share of industry and agriculture in GDP, the share of exports and imports. The authors' study is based on an analysis of statistics on countries of the world presented at the World Bank. For research purposes, countries are divided into two groups - countries with developed (OECD) and developing economies (not OECD).

From the point of view of system analysis, the development of the economy as a complex dynamic system is largely determined by its political, technological and social structure. Therefore, if the structure remains stable, the growth rate is also maintained. But in the real world, the structure of any system will be dynamic, that is, it changes during evolution, therefore, all the coefficients of the model move along the "development path" and determine the "emission scenarios".

Results. The most intense period of growth in the emission of pollutants into the atmosphere occurred in 1990–2010. Over this period, CO_2 emissions increased by more than 45% or 9.7 billion tons. More than 76% of the increase in emissions came from the Asia-Pacific region and more than 9% from the countries of the Middle East. At the same time, over the same period, CO_2 emissions in European countries decreased by 13.6%. The high growth rate of greenhouse gas emissions during this period was caused by the high growth rate of energy consumption, primarily coal, in developing countries. However, since the 2010s the growth in energy demand is largely offset by a decrease in the energy intensity of the economy and a change in the structure of energy consumed in favor of natural gas and alternative energy sources. As a result, the

DOI: 10.21467/abstracts.93

average annual growth rate of CO_2 emissions in the Asia-Pacific countries decreased from 4.9% in 1990–2010 up to 2.3% in 2010–2018.

As shown in Figure 1, the largest increase in CO_2 emissions came in 2005 and amounted to 3839.6 million tons, and by 2010 the increase was reduced by 12%. The indicator of changes in the energy intensity of the economy (ΔC_{enint}), which measures the change in the rate of energy use depending on technology, the structure of the economy, the level of capacity utilization, and climatic conditions. Since the 2000s changing the structure of energy carriers (ΔC_{emc}) in favor of less polluting species. However, in the post-crisis periods (2009-2010, 2015), the influence of this factor on the reduction of CO_2 emissions is reduced.

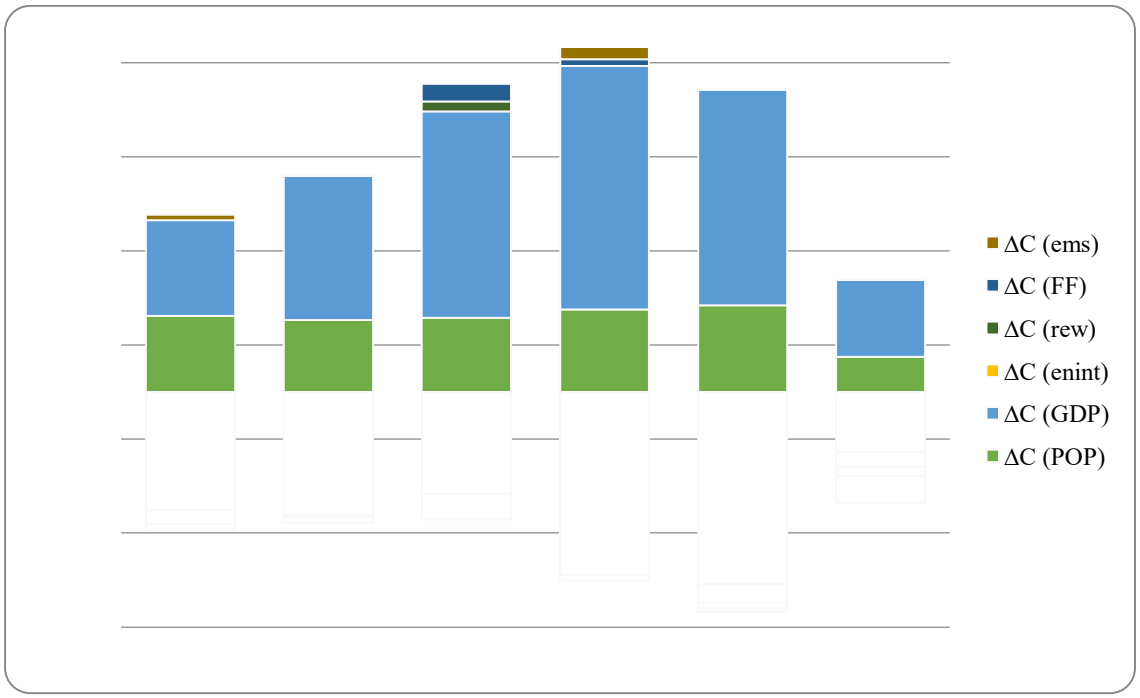

Fig. 1. Change in emissions from all types of fossil fuels in the world, in million tons of oil equivalent.

Economic growth in Russia in 2000-2008 accompanied by a decrease in the energy intensity of the economy. At the same time, among the main factors affecting the reduction in energy intensity was a change in the structure of the economy in favor of less energy-intensive industries. However, in the next decade, the rate of decrease in energy intensity slowed down, and in some years its growth was observed. This is due to the insufficient contribution of the technological factor, the low rate of introduction of modern technologies in industries. Thus, the projected economic growth, while maintaining current trends in the energy intensity of the economy, will significantly increase domestic demand for energy. However, under the current structure of the energy balance and the level of technological equipment, an increase in the consumption of energy resources inevitably leads to an increase in the emission of pollutants.

Acknowledgments. The reported study was funded by RFBR, project number 18-310-20010 and Grant of the President of the Russian Federation to support young scientists № МК-1819.2020.6

DOI: 10.21467/abstracts.93