Contribution of Russian Oil and Gas Companies to the Implementation of the Sustainable Development Goal of Combating Climate Change

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Abstract. The paper representing the author's study of the role of Russian oil and gas companies in combating climate change considers the issue of ensuring sustainable development, which is currently becoming more and more relevant. Using the analysis and synthesis techniques and the analytical and statistical study results, the authors have concluded that the climate change issue is a huge threat to humanity and requires an immediate solution. Oil and gas companies being one of the largest environmental pollution sources should first and foremost take appropriate measures to combat climate change. A systematic approach as the main one has been chosen to study this issue, due to which such diverse elements as sustainable development, the state, and oil and gas companies that have previously been studied separately are considered from a holistic perspective. The paper has proven that the largest Russian oil and gas companies such as Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC recognize the importance of actions to combat climate change and not only include sustainable development goals in their policies and strategies but also implement specific responses to climate change, thereby making a significant contribution to achieving the goal of combating climate change. The paper materials are of practical value for state authorities in terms of improving policies implemented in the field of sustainable development and drawing up regulatory documents and programs. Also, the research results may be considered by oil and gas other industry companies that have not yet passed to more sustainable business development models.

1. Introduction
The study subject relevance is determined by the fact that the UN Sustainable Development Goals (SDGs) focused on improving the economic, social, and environmental conditions of the public life have currently become the most discussed issue in the world economy. They are based on the principle of interdependence of the state, business, society, and the environment and involve the formation of
partnerships, the search for innovative solutions, and the use of global approaches and complex solutions to the tasks assigned.

Given that in the implementation of the SDGs, the state interests are associated with ensuring the economic, environmental, energy, and social security and development of the country, while the business interests comprise making a profit and effectively adapting to the changing environmental conditions, the question arises whether companies are integrating the SDGs into their business strategies.

Most business leaders recognize the goal of Combating Climate Change (SDG 13) as a paramount one. Oil and gas companies being one of the largest sources of environmental and social issues have been among the first to include this goal in their priorities.

The reliability of our research results will be confirmed by using the analysis, generalization, and synthesis techniques, as well as a systematic approach, which will allow comprehensively considering several diverse elements that have previously been studied separately.

2. Relevance and scientific significance of the research

The sustainable development concept, sustainable development goals, and adaptation of these Goals for Russia are quite widely represented in the studies of such Russian experts as S.N. Bobylev, R.A. Perelet, P.A. Kiryushin, O.V. Kudryavtseva (Bobylev and Perelet, 2013; Bobylev, 2017; Bobylev, Kiryushin, and Kudryavtseva, 2019); L.S. Revenko (Revenko, 2017); V.I. Danilov-Danilyan and N.A. Piskulova (Danilov-Danilyan and Piskulova, 2018); B.S. Bataeva, O.V. Kožhevina (Bataeva and Kožhevina, 2017); E.B. Zavyalova, N.V. Studenikin, E.A. Starikova (Zavyalova, Studenikin, and Starikova, 2018).

The implementation of sustainable development goals at the corporate level has been considered by E.B. Zavyalova, E.A. Starikova (Zavyalova and Starikova, 2018; Starikova, 2017); K.Yu. Belousov (Belousov, 2013).

Far less attention has been paid to the integration of sustainable development goals into the business strategies of oil and gas companies. However, in recent years, experts such as O.V. Lenkova and I.V. Osinovskaya (Lenkova and Osinovskaya, 2013), E.G. Matyugina, O.V. Pozharinskaya, L.S. Grinkevich, D.S. Belozerova, and A.V. Strelnikova (Matyugina, Pozharinskaya, Grinkevich, Belozerova, and Strelnikova, 2016), S.G. Tyaglov, A.V. Sheveleva, M.V. Chernev, T.B. Guseva (Sheveleva and Chernev, 2018; Tyaglov and Sheveleva, 2015; Tyaglov, Sheveleva, and Guseva, 2019) have shown scientific interest in this issue.

The issue of studying the contribution of Russian oil and gas companies to the implementation of sustainable development goals, particularly, the goal of Combating Climate Change remains virtually unexplored.

3. Integration of sustainable development goals into the strategies of oil and gas companies

In 2015, the UN adopted the 2030 Agenda for Sustainable Development. The program comprises 17 goals aimed at eradicating poverty, preserving the planet's resources, and ensuring prosperity. Each goal is characterized by a set of indicators to be achieved over 15 years. Achieving them requires joint efforts of governments, civil society, and business.

According to the results of the study ‘SDG Reporting Challenge 2018’ performed by PricewaterhouseCoopers Audit, 72 % of 729 companies of 21 countries and 6 industries (13 % of the fuel and energy and the mining industry companies) include SDGs in their corporate reporting (for comparison, in 2017, this the rate was 62 %), 50 % of them have identified priority SDGs, and 54 % of those who prioritized the Goals have included them in their business strategies. These figures indicate an increasing relevance of SDGs for business.

The fuel and energy and the mining industry companies, particularly, oil and gas ones most often include SDGs in their reporting (Fig. 1) [1].
Figure 1. Sectoral Structure of Companies Including SDGs in their Reporting, % of the total number of companies surveyed.

Half of the companies surveyed have noted SDGs having the highest priority for their business. 31% of them were concerned about climate change and environmental damage. For the fuel and energy and mining industry companies, particularly, oil and gas ones, Goal 13 Combating Climate Change was ranked first (Fig. 2) [1].

Figure 2. The SDG Priority by Sectors.

This breakdown is determined by the requirements set by both international and regional agencies regulating greenhouse gas emissions, which oil and gas companies have to comply with. However, it should be noted that the Goal of Combating Climate Change is aimed at not only reducing emissions but also mobilizing financial resources, implementing the best available technologies, improving the quality of education, and developing effective planning and management mechanisms in the field of climate change, and all this applies primarily to the least developed countries.
4. Significance of the goal of combating climate change for Russian oil and gas companies

The climate change issue is widely discussed both in the world and Russia. Scholars argue that global warming and the catastrophic consequences of this process are proceeding faster than expected. This indicates the low efficiency of the measures taken.

The German NewClimate Institute and Germanwatch jointly with the international Climate Action Network perform the annual researches, based on the results of which a rating is drawn up indicating the efficiency level of the climate change combating measures taken by different countries.

Each country is rated considering the greenhouse gas emissions, the renewable energy development level, the electric power consumption level, total primary energy reserves, and the general foreign and domestic state policy in the field of combating climate change. Thus, this report shows the efficiency of each country’s actions in solving the global warming issue.

In the ranking of the world countries by climate change combating efficiency at the beginning of 2020, Russia took 52nd place among 61 possible ones (Table 1) [2].

| Countries     | 2020 | 2019 | CO₂ Reduction | RES | Consump tion | Policy |
|---------------|------|------|---------------|-----|--------------|--------|
| Sweden        | 4    | 4    | high          | high| low          | low    |
| Denmark       | 5    | 15   | high          | high| low          | low    |
| Morocco       | 6    | 5    | high          | high| low          | low    |
| Great Britain | 7    | 8    | high          | high| low          | low    |
| India         | 9    | 11   | high          | high| low          | low    |
| Brazil        | 21   | 22   | high          | high| low          | low    |
| EU countries  | 22   | 16   | high          | high| low          | low    |
| Germany       | 23   | 27   | high          | high| low          | low    |
| Italy         | 26   | 23   | high          | high| low          | low    |
| China         | 30   | 33   | high          | high| low          | low    |
| Mexico        | 32   | 25   | high          | high| low          | low    |
| Indonesia     | 39   | 38   | high          | high| low          | low    |
| Argentina     | 42   | 56   | high          | high| low          | low    |
| Poland        | 50   | 41   | high          | high| low          | low    |
| Russia        | 52   | 52   | high          | high| low          | low    |
| Malaysia      | 53   | 51   | high          | high| low          | low    |
| Australia     | 56   | 36   | low           | low | high         | medium |
| Saudi Arabia  | 60   | 60   | low           | low | high         | medium |
| United States | 61   | 59   | low           | low | high         | medium |

In the rating, the first three places turned out to be vacant since none of the countries has yet done enough for global environmental changes. Sweden, Denmark, and Morocco rank fourth, fifth, and sixth in the rating, respectively. Also, Great Britain, Lithuania, India, and Finland are in the top ten. At the same time, the United States ranks 61st; the country has not joined the Paris Agreement, and its President D. Trump is skeptical about global warming.

The countries’ actions were estimated by 14 parameters in four main categories: Greenhouse Gas Emissions, Renewable Energy, Energy Consumption, and Climate Policy. In all four categories, Russia’s indicators were rated as low or extremely low.

Also, among the G20 countries, Russia showed the worst results in renewable energy development. Currently, the country does not virtually have in-house renewable energy sources and any plans for their future development - Russia is going to increase them to only 2.5 % by 2024 and up to 4 % by 2035 [3].
The experts have noted that Russia still does not have a strategy for implementing technologies with low greenhouse gas emissions until 2050, but it is currently under development. Russia is not also taking any steps to set a carbon price and phase out fossil fuel subsidies. Instead, new coal terminals are being built and funds constantly invested in the development of new oil and gas fields in the country.

Herewith, climate change in Russia is becoming more and more noticeable; over the past 10 years, the average annual temperature has increased by 0.42 degrees, while in the world, by 0.17 degrees only.

According to Russian and foreign Arctic background monitoring stations, the carbon dioxide concentration is currently growing at a rate of about 2 ppm per year. Among the largest greenhouse gas emission sources are the Russian oil and gas companies Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC.

Thus, we may conclude that the Goal of Combating Climate Change is of great importance for Russian oil and gas companies; they are primarily responsible for achieving it.

5. Research proposals and results. Achieving the goal of combating climate change by Russian oil and gas companies

The largest Russian oil and gas companies Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC recognize the importance of actions to combat climate change and intend to contribute to achieving SDG 13 Combating Climate Change.

They include measures of response to climate change into their policies, strategies, and plans.

To preserve the climate, Gazprom PJSC is taking the below measures:
- accounting of greenhouse gas emissions,
- preventing the natural gas blowing when repairing main gas pipelines and reducing methane emissions when performing process operations,
- reducing the APG flaring,
- energy-saving and energy efficiency measures, including the use of alternative energy sources,
- developing the NGV market [4].

Control over the APG emissions is part of the Gazprom PJSC corporate strategy, which contributes to achieving the national goal of ensuring a reduction in the associated gas emissions to a maximum of 75% of their 1990 volume by 2020.

In 2018, methane emissions were one of the significant environmental aspects. The gas compression is responsible for 70% of the gross methane emissions, as well as specific emissions of nitrogen oxides.

The target indicators for reducing these emissions have been set at the level of 2014 and are 62.7% and 4.32 t/MCM, respectively. In 2018, the goal was achieved.

According to the Gazprom PJSC's Innovative Development Program, the main goal in improving the environmental friendliness of the production process is the KPI4 key efficiency indicator of reducing specific APG emissions in CO₂ equivalent. By 2020, the target KPI4 value is 6.6% of the baseline 2014 level, the target KPI4 value for 2021–2025 is maintaining the level achieved. The Company also plans to implement the system for accounting the associated gas emissions along the supply chain.

In 2018, the Gazprom Group of companies developed a Roadmap for the greenhouse gas emission control system for the period up to 2020 and further up to 2030, considering the multivariate development scenarios and environmental priorities.

The document sets targets for the forecasted indicators of specific APG emissions by 2020, 2025, and 2030, as well as measures to achieve them.

Gazprom is purposefully reducing the APG flaring having implemented the investment projects for utilizing it in the fields. The Group's goal is to achieve at least a 95% APG utilization degree according to the requirements of Resolution No. 1148 of the Government of the Russian Federation dated November 8, 2012.
In 2018, the indicator of the APG beneficial use at the fields of the Gazprom PJSC’s gas-producing subsidiaries (including Tomskgazprom OJSC), Gazprom Neft Group, and Sakhalin Energy amounted to 97.7, 78.3, and 97.4 %, respectively.

The Gazprom Group supports the use of alternative energy sources in economically and technically justified situations, particularly, in remote or technologically isolated areas. The Company uses renewable energy sources (RES) and secondary energy resources (SER) to generate energy for in-house needs and sell it to third-party consumers. Solar and wind generators and converters for converting the gas flow thermal energy into electric power are used at production facilities, main gas pipelines, and gas distribution networks to supply power for telemetry systems, cathodic protection of main pipelines, and lighting. The Gazprom Group has generated 12.84 billion kWh of electric power through hydrogeneration.

In 2018, the Gazprom Group used 2,154 RES- and SER-based energy units such as turboexpanders, thermoelectric generators, solar modules and batteries, and wind generators, other than hydroelectric sets. The total volume of power generated by these energy units amounted to 582.66 thousand kWh. In 2015–2018, investments in RES at Gazprom PJSC’s facilities amounted to more than RUB 43 million.

LUKOIL PJSC also plans and implements measures aimed at combating climate change [5].

As of the end of 2018, due to an essential increase in the beneficial use of APG, the Russian oil and gas companies significantly reduced greenhouse gas emissions as compared to 2017 (by 773 thousand tons of CO₂E, which amounted to 9 %). Over the 2016–2018, the APG flaring volume decreased almost three times, thereat in 2018, by 57 % as compared to 2017.

The Russian companies of LUKOIL Group have implemented an energy management system meeting the requirements of the international standard ISO 50001:2012.

The LUKOIL Group’s Energy Saving Program for 2018 and further up to 2019–2020 and roadmaps for improving operational efficiency until 2020 are in force in Russian companies. The Center for the Development of New Activities has been created to coordinate projects in the field of innovative technologies in the power industry and develop new energy infrastructure. For Russian companies of the LUKOIL Group, the targets of the Energy Saving Program until 2020 include cumulative energy savings for three years (2018–2020) in the amount of about 280 million kWh of electric power, 330 thousand Gcal of thermal energy, and 360 thousand TCE of the boiler and furnace fuel.

LUKOIL has also joined the Greenpeace Green Office project. Fulfillment of voluntary commitments aimed at improving the ecology of office premises allowed reducing the costs of maintaining the Company's offices and contribute to reducing power consumption.

At the filling stations, the company is installing electric charging stations for the prospect of wider use of electric vehicles.

A strategic approach to resolving issues related to RES is implemented: the Company manages a fleet of four hydroelectric power plants in the South of Russia with a total capacity of about 300 MW, as well as solar and wind energy facilities in Russia, Romania, and Bulgaria with a total capacity of about 100 MW.

It was the first Russian oil company to join the World Bank's Zero Routine APG Flaring by 2030 initiative, which was introduced in 2015 to bring together the efforts of governments, oil companies, and public organizations to increase the beneficial use of APG. As part of the initiative, LUKOIL is implementing two projects, under which the expected reduction in greenhouse gas emissions is about 105 thousand tons of CO₂E.

Rosneft PJSC has identified five priority SDGs, one of which is Combating Climate Change [6].

The Rosneft-2022 Strategy provides for the reduction in greenhouse gas emissions to less than 5 % of the target set by the Government of the Russian Federation. Since 2016, the company has already achieved some progress in this field. As a result of implementing the gas investment and the energy-saving programs, as well as creating the infrastructure for the collection, use, and supply of gas to
consumers or re-injection of gas into reservoirs, specific greenhouse gas emissions have reduced by 8%. By 2022, the Company plans to prevent 8 million tons of CO₂ emissions.

To preserve the climate, Rosneft OC PJSC is taking the below measures to reduce greenhouse emissions:

- increases the natural gas production volume,
- implements projects for retrofitting refineries,
- improves the efficiency of operating production facilities,
- creates and manufactures new types of products.

In 2018, the company completed the construction of 19 facilities intended to use associated petroleum gas. For the whole of Rosneft OC PJSC, in 2018, the APG utilization volume amounted to 35.3 BCM, which is 1.9 BCM less as compared to 2017.

Since 2013, the Commission for Energy Efficiency has permanently operated, which ensures the implementation of advanced techniques and approaches to power management. The Rosneft OC PJSC’s Energy Saving Program for 2019–2023 has been developed; the planned saving of fuel and energy resources over five years is 4.35 mln. TOE.

Also, the Company implements innovative projects and patents technologies for the use of renewable energy sources.

The results of the measures taken by the largest Russian oil and gas companies Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC to combat climate change are given in Table 2 [7].

**Table 2. Contribution of Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC to Achieving SDG 13 Combating Climate Change.**

| Indicators                      | Gazprom PJSC | LUKOIL PJSC | Rosneft OC PJSC | National Goals |
|--------------------------------|--------------|-------------|-----------------|----------------|
| Greenhouse gas emissions       | 6.6 % of the 2014 baseline reduction by 2020 | 9 % reduction in 2017-2018 | Prevention of greenhouse gas emissions in the amount of 8 mln. t of CO₂E by 2022 | Maximum 75 % of the emissions specified in 1990 |
| APG utilization                | 97.7%        | 97.4%       | 84.4%           | at least 95 %  |
| Saving energy and energy efficiency | Preparation for certification for compliance with the requirements of the international standard ISO 50001 | The energy management system complying with the requirements of the international standard ISO 50001: 2012 has been implemented | 34 companies of the Group have been certified for the compliance with the international standard ISO 50001 | Compliance with the requirements of the international standard ISO 50001 Energy Management System |
| Plan for 2019-2021 - economy of fuel and energy resources not less than 7.43 mln. TCE. | Savings targets have been achieved for each type of energy resources | Reduction in the consumption of energy resources by 2022 – 4.4 mln. TCE | Saving fuel and energy resources |
Oil refining assets modernization program

Replacing and retrofitting the process equipment are underway

In 2018, 8 technical audits of the power equipment operation arrangement quality were performed with the development of corrective measures

Implementing energy-efficient equipment

Developing RES

Solar and wind generators to produce energy for in-house needs and sale to third-party consumers

Three SPPs at refineries in Bulgaria, Romania, and Russia with a total capacity of 20.25 MW, and a WPP of 84 MW in Romania

Installing wind and solar generators at the remote Company’s facilities

Increasing the RES share in the energy balance.

Increasing RES-based power production and consumption volume to 4.5 % by 2024

In 2015-2018, investments in RES amounted to more than RUB 43 mln.

In 2016-2018, investments in the RES development increased 10 times and amounted to RUB 2.58 billion

No data

Increasing investments in the RES development

The tabular data indicate that measures taken by the largest Russian oil and gas companies Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC to combat climate change are generally in line with the national goals, and in some fields, particularly, the APG utilization degree, Gazprom PJSC and LUKOIL PJSC even exceed the targets set.

6. Conclusions

The climate change issue is one of the most pressing problems of our time and an essential prerequisite of sustainable development. All countries, including Russia, realize the environmental, economic, and social consequences of this issue and develop appropriate national plans and programs to address it. Implementing these programs supposes close interaction of the state and business, which implies switching companies to more sustainable business development models and implementing the best available technologies. This primarily concerns oil and gas companies, which are among the largest environmental pollution sources.

Based on the analysis of measures taken by the largest Russian oil and gas companies Gazprom PJSC, LUKOIL PJSC, and Rosneft OC PJSC to combat climate change, it can be concluded that having integrated actions to respond to climate change into their policies, strategies, and plans and already achieved some success in reducing greenhouse gas emissions, utilizing APG, ensuring energy saving, improving energy efficiency, and developing renewable energy sources, these companies make a significant contribution to achieving SDG 13 Combating Climate Change.
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