对俄罗斯燃料和能源行业公司气候风险的定性评估

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简介
本文总结了评估燃料和能源综合体企业与气候变化相关风险的现有方法建议。本文根据最权威的气候风险评估方法建议--TCFD 气候相关财务披露工作组的建议，对气候风险进行了分类。 介绍了有形风险和瞬时风险，以及与风险发生相关的可能后果。对燃料和能源行业的三家俄罗斯公司的气候风险进行了研究。 每家公司都说明了已确定的气候变化风险，既包括有形风险--飓风、洪水等急性风险，也包括可能导致海平面上升或干旱的长期气候条件变化所带来的慢性风险，还包括与向低碳经济过渡有关的过渡性风险。 介绍了各公司制定的缓解和适应措施。得出的结论是，有必要评估气候风险，并在实施温室气体排放管理的业务流程时将其考虑在内，以降低未来因气候变化而产生的成本。
关键词: 气候风险、气候变化、可持续发展、燃料和能源公司。

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Introduction

Climate change and environmental degradation are serious challenges facing the global community. At the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28) in Dubai in 2023, Parties recognised the need to reduce greenhouse gas emissions, taking into account different national circumstances, pathways and approaches. The final joint statement includes measures to reduce greenhouse gas emissions: tripling the capacity of renewable energy sources (hereafter referred to as RES) by 2030, gradually reducing the share of coal-fired power generation without carbon capture, gradually phasing out fossil fuels in energy systems 'in a fair, orderly and equitable manner', accelerating measures to achieve carbon neutrality by 2050 in accordance with scientific data, etc.[1] The National Action Plan for the Second Stage of Adaptation to Climate Change for the period up to 2025 shows that the average annual surface air temperature on the territory of the Russian Federation is currently increasing on average 2.8 times faster than the average global air temperature[2].

IIn order to reduce the risks caused by climate change, Russia has adopted the Climate Doctrine[3], which is based on background and applied scientific knowledge in the field of climate and related areas, including a retrospective current analysis of the climate system, the influence of various factors on the climate, the forecast of climate change and its consequences for all sectors of the country's economy, as well as an assessment of the possibility of mitigating the impact on the climate.

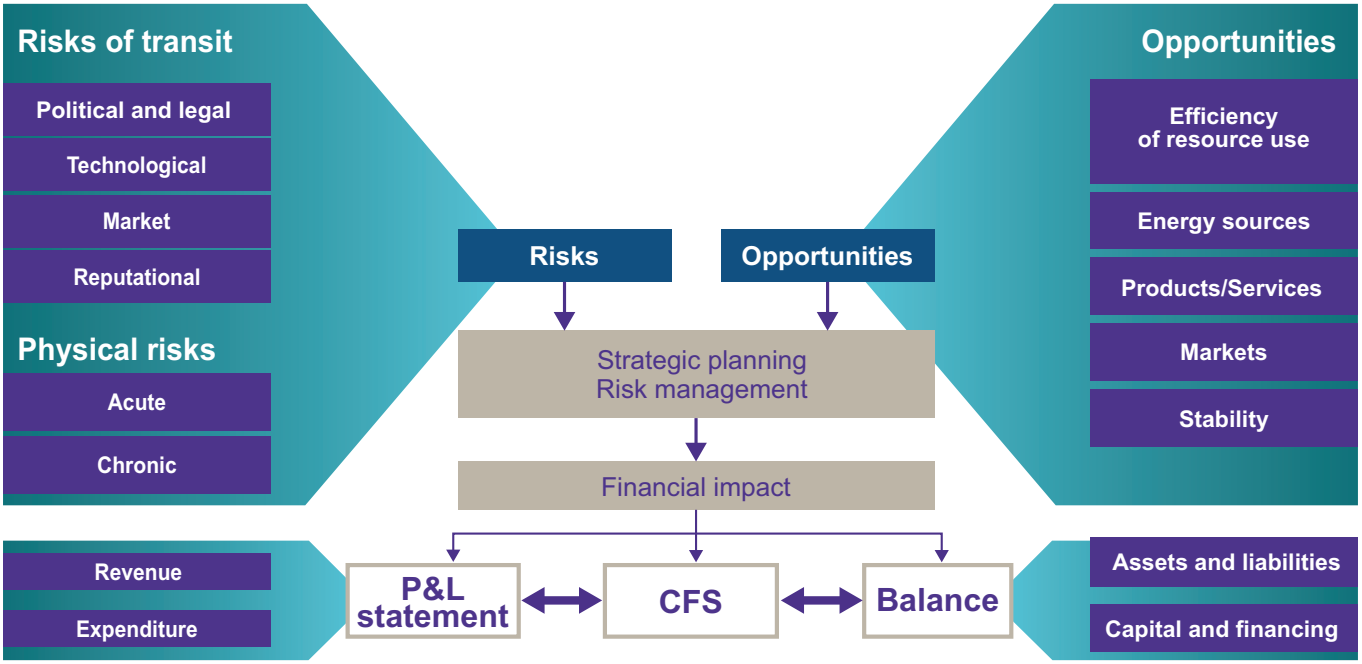
Russia's Fuel and Energy Complex (FEC) is the basic sector of the country's economy, ensuring energy independence and the progressive development of the country's entire industry. Fuel and energy companies, especially those involved in the extraction and combustion of hydrocarbons, are major sources of greenhouse gas emissions, as the technological processes of hydrocarbon and coal extraction are inextricably linked to greenhouse gas emissions (carbon dioxide, methane and nitrogen dioxide). Reducing these emissions is therefore an increasingly urgent task for fuel and energy companies.

1. Climate risk assessment methods

There are several approaches to assessing climate risks. The most authoritative are the recommendations of the Task Force on Climate-Related Financial Disclosure (TCFD), established by the Financial Stability Board (FSB) in 2015 to develop approaches to climate-related disclosure to inform

[1] First global stocktake. Conference of the Parties serving as the meeting of the Parties to the Paris Agreement Fifth session United Arab Emirates. 2023. https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf.
[2] National Action Plan for the Second Stage of Adaptation to Climate Change for the Period to 2025. Decree of the Government of the Russian Federation of 11.03.2023 No. 559-r. 2023. http://publication.pravo.gov.ru/Document/View/0001202303130019.
[3] Decree of the President of the Russian Federation dated 26.10.2023 N 812 'On Approval of the Climate Doctrine of the Russian Federation'. 2023. http://publication.pravo.gov.ru/document/0001202310260009.

Fig. Risks, opportunities, and financial implications of climate change



Source: Climate risks in the reporting of insurance companies. Report and Letter of the Bank of Russia dated 12.01.2021 No. IN-015-53/1 'On Accounting for Climate Risks'. FBK Grant Thornton. https://www.fbk.ru/upload/press-center/Климатические%20риски%20для%20СК_final.pdf.

investment, credit and insurance policies, understand the concentration of carbon-related financial assets, and assess the exposure of the financial system to climate-related risks. The TCFD recommendations apply to the following aspects: corporate governance, corporate development strategy, risk management system, corporate objectives and metrics[4]. The TCFD methodology divides climate risks into two categories: physical risks associated with the impacts of climate change, and transition risks associated with the transition to a low-carbon economy.

Physical risks represent a significant financial cost to organisations.

Physical risks include:

– acute risks: hurricanes, floods;
– chronic risks: driven by long-term changes in climate conditions that can cause sea level rise or drought.

Transition risks associated with the transition to a low-carbon economy include:

– political and legal risks: organisational mechanisms for reducing greenhouse gas emissions (emissions trading schemes, carbon tax) [Nagaytsev, 2022];
– technological risks: the transition to a low-carbon economy has a significant impact on the existing global energy balance in favour of less carbon-intensive production and renewable energy sources;
– market risks: changes in demand for goods and services in favour of less carbon-intensive ones create risks and opportunities;
– reputational risks: companies' activities will be judged by society according to their contribution to the climate agenda.

In addition to the risks, there are a number of opportunities associated with climate change, as highlighted by the TCFD:

– efficient use of resources;
– transition to low-carbon and renewable energy sources;
– products and services with a low carbon footprint;
– access to new sales markets;
– sustainability.

The figure shows the climate-related risks, opportunities and financial implications of the TCFD.

The financial impact of climate-related risks on an organisation is determined by specific consequences. To reduce the likelihood of climate-related risks occurring, organisations need to manage these risks by implementing appropriate management and technology business processes.

In Russia, methodological recommendations and indicators on climate change adaptation issues have been developed and adopted for assessing climate risks[5]. The methodological recommendations introduce the concept of climate risk: 'a common characteristic of the probability

[4] Recommendations of the task force on climate-related financial disclosures. 2017. https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf.
[5] Order of the Ministry of Economic Development of Russia of 13.05.2021 No. 267 'On Approval of Methodological Recommendations and Indicators of Adaptation to Climate Change'. https://www.economy.gov.ru/material/file/b3cc582c24e7367170b5605f1199c6a9/267_13052021.pdf.

of dangerous manifestations of a climatic factor and its impact on the object of this impact, which is expressed in the amount of damage characteristic of the repeatability of the specified values of a dangerous climatic factor'. The recommendations include:

- general approaches to climate risk assessment;
- assessment of climate risks to territories;
- assessment of climate risks of economic and other activities;
- climate risk assessment of economic sectors;
- recommended information sources for climate risk assessment;
- examples of climate factors and their relationship to climate risks and vulnerability;
- other applications intended for assessment of climate risks, ranking of adaptation measures, preparation of plans for adaptation to climate change at the level of sectors, regions, enterprises;
- Indicators of achievement of climate change adaptation objectives.

Corporate governance disclosure under the TCFD involves communicating the extent to which management is engaged in managing the risks and opportunities associated with global climate change. The TCFD recommends communicating to senior management the actions taken to manage climate-related changes in production processes, including their monitoring and prompt response. In order to comply with the climate risk assessment recommendations, companies need to implement management business processes for managing risks associated with climate change.

The company's climate risk management business processes include the following management functions:

- determining the planning horizon over which climate-related risks and opportunities are analysed and identified [Sitnik, 2022];
- analysing the company's activities and identify processes that are vulnerable to the effects of climate change;
- identifying assets that are vulnerable to the effects of climate change;
- identifying climate-related risk factors and ways to prevent them.

The outcome of these functions is to determine the impact of climate-related risks and opportunities on the business plan, strategy and financial indicators. Based on the results obtained, a scenario and an action plan are developed for the company to ensure its sustainable operation under different conditions of global climate change development and related climate agenda trends.

Table 1
Transitional and physical risks of Lukoil

Types of risks	Description	Activities
Transitional risks		
Political and legal risks	Transitional risks associated with the tightening of greenhouse gas regulations in the countries in which the company operates.	Transitional risks associated with the tightening of greenhouse gas regulations in the countries in which the company operates.
Technological risks	Risks associated with the development and diffusion of low-carbon technologies	Monitoring and developing our own solutions to reduce greenhouse gas emissions
Market risks	Risks associated with consumer switching to less carbon-intensive products	Using a scenario approach to forecast economic indicators based on different climate scenarios
Reputational risks	Risks associated with the perception of the company's climate activities by key stakeholders	Disclosure of information related to the company's actions in the area of climate impact
Physical risks		
Acute risks, chronic risks	Risks associated with climate change affecting the company's operations, including natural disasters and melting permafrost	Assessing climate change in the design of investment projects in the most vulnerable areas. Monitoring climate change

Source: Annual report of PJSC Lukoil for 2022. https://lukoil.ru/FileSystem/9/621041.pdf.

Table 2
Transitional and physical risks of Novatek

Types of risks	Description	Activities
Transitional risks		
Political and legal риски	Increased costs associated with the introduction of carbon regulation	The company analyses global and Russian practices in the field of climate regulation.
Technological risks	Increased costs of adapting production processes to the effects of climate change	The company develops and implements decarbonisation technologies.
Market risks	Decline in demand for the company's products	Monitoring and transformation of products taking into account market demand
Reputational risks	Reducing the company's investment attractiveness as climate policy evolves	Considering the market situation and developing scenarios and plans in the light of climate policy developments
Physical risks		
Acute risks, chronic risks	Climate change, extreme weather events causing damage	Implementation of various measures to mitigate and adapt to climate risks

Source: Annual report of PJSC Novatek. 2022. https://www.novatek.ru/common/upload/doc/RUS_NOVATEK_AR22.pdf.

Table 3
Transitional and physical risks of Evraz

Types of risks	Description	Activities
Transitional risks		
Political and legal risks	Carbon pricing, other regulatory risks: More jurisdictions likely to introduce carbon pricing mechanisms. The World Bank predicts that by 2025, about half of all greenhouse gas emissions will be controlled through government and intergovernmental regulation. The forms of regulation are direct taxes on emissions, trading schemes, and an increase in the average global price of carbon in the context of rising current prices in the ETS. In 2018, only 15% of global emissions were covered to any degree by these forms of regulation. In addition, the changes are justified by new requirements to disclose information on activities that may have an impact on climate change.	Assessment of potential new regulations related to carbon regulation, etc.
Technological risks and market risks	Transition to a less carbon-intensive global economy. Failure to respond to these trends creates risks for companies that do not develop and implement clean technologies. However, there is no guarantee that investment in R&D to develop low-carbon projects will be successful.	Monitoring the spread of new low-carbon technologies.
Reputational risks	Climate change is a major challenge for the steel industry. As more financial institutions and regulators adopt ESG criteria, industrial companies are being asked to take a more responsible approach to sustainability issues, including following the recommendations of the TCFD.	Public disclosure of climate-related risks and opportunities in line with TCFD recommendations.
Physical risks		
Acute risks, chronic risks	Climate change, extreme weather events causing damage	The company constantly monitors changes in weather conditions and implements various measures to mitigate and adapt to climate risks, including the use of a closed water supply cycle in the plants, monitoring the condition of equipment, etc.

Source: Our approach to climate change. Evraz. 2020. https://www.evraz.com/upload/iblock/5b4/5b4632992a737d9dc83693b375ce3f16.pdf.

2. Results of climate risk assessment by fuel and energy companies

Some Russian energy companies have already conducted climate change risk assessments based on the TCFD recommendations, identifying key physical and transition risks and developing adaptation and mitigation measures.

Below are the climate risks of three Russian fuel and energy companies representing the oil, gas and coal industries: Lukoil, Novatek and Evraz (including the coal segment).

Lukoil. The company's business model includes oil and gas exploration, production, gas and oil refining, petrochemicals, product sales and power generation, including renewable energy. The company pays great attention to monitoring and preventing climate risks and implements a wide range of measures to manage them and identify opportunities[6] (Table 1).

From the information provided, it can be concluded that the company has identified key risks to itself and developed mitigation and adaptation measures, and has also identified climate-related opportunities: energy conservation, natural gas, renewables, CO_2 capture and storage, and advanced biofuels.

Novatek. The majority of the company's assets are located in the Yamalo-Nenets Autonomous Okrug with total proven reserves of 17.6 billion barrels of oil equivalent (as of the end of 2022). The Company analyses and considers the impact of climate risks and opportunities on its activities in accordance with the recommendations of the TCFD[7].

Climate risks at Novatek are taken into account in the development and implementation of strategic and financial plans. The risk criticality indicator is used to assess the impact of the risk, taking into account the probability of the risk occurring and a quantitative assessment of the consequence[8]. The transition and physical risks identified by Novatek are presented in Table 2.

Analysing the data in the table, we can conclude that the company has assessed the potential impact of each risk on its activities and has developed measures that contribute to mitigating and adapting to the risks described above.

Evraz. In 2020, the company published a climate change report to provide stakeholders with additional information on the principles that guide its approach to climate change and an understanding of the potential long-term risks associated with climate change[9]. The report has been prepared in accordance with the recommendations of the TCFD. The company's structure includes the Coal Division, which supplies coal raw materials not only to the Group's steel mills in Russia, but also to other major domestic coke and steel producers, and exports its products abroad. The company's transition and physical risks are shown in Table 3.

Climate change challenges the company to adapt to new demands and conditions, and dynamic action will lead to new opportunities. Evraz has identified the following opportunities related to climate change:

– resource efficiency: increasing the use of scrap metal, improving the efficiency of water resource management (closed water systems), increasing the use of coke oven gas produced by the company's own operations, reducing natural gas consumption;

Table 4
Typical transition and physical risks for Russian fuel and energy companies

Types of risks	Description	Activities
Transitional risks		
Political and legal risks	Risks of tightening carbon regulation around the world, risks of introducing carbon regulation in Russia	Monitoring global carbon regulation and climate policy implementation in Russia
Technological risks	Accelerated development and deployment of low-carbon technologies. Transition to a less carbon-intensive global economy	Development and implementation of technologies to reduce carbon footprint, investment in R&D, research, development and production, and use of alternative energy sources
Market risks	Risks associated with changing consumer preferences towards less carbon intensive products	Monitoring market preferences and taking into account consumer demands, increasing the company's competitiveness by implementing technological solutions to reduce the carbon footprint, using alternative energy sources

[6] Lukoil Group Sustainable Development Report 2022. file:///C:/Users/79609/Downloads/Отчет%20об%20устойчивом%20развитии%20Группы%20«ЛУКОЙЛ»%202022%20(1).pdf.
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Table 4 – *remainder*

Types of risks	Description	Activities
Reputational risks	Risks arising from stakeholders' desire to buy products that have a minimal carbon footprint during production	Disclosure of climate-related information, including: greenhouse gas emissions, climate risk assessment, application of internal carbon price, etc.
Physical risks		
Acute risks, chronic risks	Single events (hurricanes, floods, cyclones) and chronic risks (long-term changes in climate conditions) that can affect the operational efficiency of the business and the supply chain.	Implementing systems to monitor the impact of climatic conditions on the company's production activities, as well as considering likely climatic changes in the design of the company's facilities

Source: compiled by the authors.

– energy resources: gradual transition to less carbon-intensive and more efficient energy resources, gradual increase in the share of renewable energy sources in the energy balance;
– markets and products: identifying opportunities in new markets and new products related to the transition to a low-carbon economy and climate change adaptation and mitigation[10].

3. Discussion

The above assessment of physical and transition risks gives an idea of the most prominent climate risks faced by Russian fuel and energy companies. Table 4 shows the typical climate risks of Russian fuel and energy companies.

Analysing the data in Table 4, we can conclude that the activities of Russian fuel and energy companies are subject to the influence of climate risks. The possibility of occurrence of one or another risk may affect the investment and operational efficiency of the company or its customers. For stable and effective work, it is necessary to take into account the possible consequences of climate change when developing and implementing long-term strategies.

Conclusion

Fuel and energy companies involved in the extraction, processing and transportation of energy resources face a number of climate risks. These include extreme weather events such as hurricanes, floods, droughts and wildfires, which can lead to production disruptions, losses and even fatalities. The risk classification is based on the TCFD guidelines for climate risk assessment and is based on the division of risks into two categories: risks arising from the consequences of climate change (physical risks) and risks arising from the transition to a low greenhouse gas economy (transition risks).

To reduce the pressure of climate risks on the efficiency of fuel and energy companies' operations, it is necessary to develop appropriate projects. In the process of developing mitigation or adaptation measures, Russian fuel and energy companies need to introduce new technological processes, as well as expand the sphere of influence on the production technology of existing or emerging business processes for managing greenhouse gas emissions for a comprehensive approach to issues related to carbon regulation and climate policy in general. These include improving infrastructure, developing adaptive technologies, introducing weather monitoring and forecasting systems, and training personnel. It is therefore necessary to implement individual measures and large-scale projects to reduce the impact of the fuel and energy complex on the climate.

At the same time, large companies have the opportunity to implement adaptation projects and even offset the impact of climate change on the performance of activities that are reduced due to climate change and the need to adapt. Despite the complexity of the task, there are positive examples of fuel and energy companies successfully adapting to climate change. Many companies are actively implementing energy-efficient technologies and developing and implementing projects to reduce greenhouse gas emissions, thereby contributing to a reduction in the rate of climate change.

In conclusion, climate risks pose a serious threat to fuel and energy companies, but with the right approach and implementation of the necessary projects, it is possible to reduce and minimise the negative impact of fuel and energy companies on climate change.

[10] Id.

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