



## **Assessment of climate risks and opportunities for JSC “Uzmetkombinat”**

December 2024

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## Part 1. Physical climate risks



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# Physical climate risks

**Physical risks** arising from climate change can be either **event-driven (acute)** or **long-term (chronic)**. These risks can have different financial implications for organizations, such as direct damage caused by **damage caused directly** to company **assets**, or **indirect damage caused** by the **realization of risks** in different parts of the **supply chain**.

## Acute physical risks

Risks due to **single events** (extreme weather conditions)



Abnormal rainfall



Abnormal winds



Thunderstorms



Extreme heat



Abnormal cold



Wildfires

## Transient physical risks

Risks from **climate change in the long term**



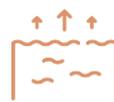
Degradation of permafrost soils



Changing precipitation patterns



Changing the temperature regime



Changes in the level of the world's oceans



### Example

**JSW Steel:** “Negative impact on employee health due to heat stress”

Due to the projected increase in air temperature, employees will be regularly exposed to heat stress, resulting in adverse effects on their health, especially during the summer period. Exposure to excessive heat during work limits the physical ability, performance and productivity of employees.

*JSW Steel Climate Action Report 2024*



### Example 2

**NLMK:** “Temperature changes, water availability, rising ocean levels”

Rising average temperatures, changing precipitation patterns and reduced water availability, as well as rising global sea levels and coastal inundation, entail higher operating costs and capital expenditures (e.g., for asset rehabilitation), higher insurance premiums and potentially reduced availability of insurance for assets in “high risk” areas.

*NLMK Group website, “Climate Risks” section*



## 1.1. Identification of physical risks



## Identification

### Compliance with TCFD guidelines and CDP disclosure requirements

Identification of climate risk factors was carried out **in accordance with the TCFD classification and recommendations. CDP requirements** were also the focus of attention in view of further project phases.

Risk factors and opportunities were identified in the following categories:

- **Physical Risks:**
  - Acute;
  - Chronic.
- **Transient Risks:**
  - Political and legal;
  - Technological;
  - Market;
  - Reputational.
- **Possibilities:**
  - Resource efficiency;
  - Energy Sources;
  - Products and services;
  - Markets;
  - Sustainability.

## Scenario analysis

### IPCC Climate Scenarios

**Models** developed by the **Intergovernmental Panel on Climate Change (IPCC)** were used for scenario analysis of the identified risk factors.

Current indicators of risk factors were compared with the **pre-industrial era (1850-1900)**. **This period** was chosen as the baseline because it is the one listed as most closely reflecting pre-industrial temperatures in the IPCC Fifth Assessment Report.

**Two IPCC scenarios** were used for modeling:

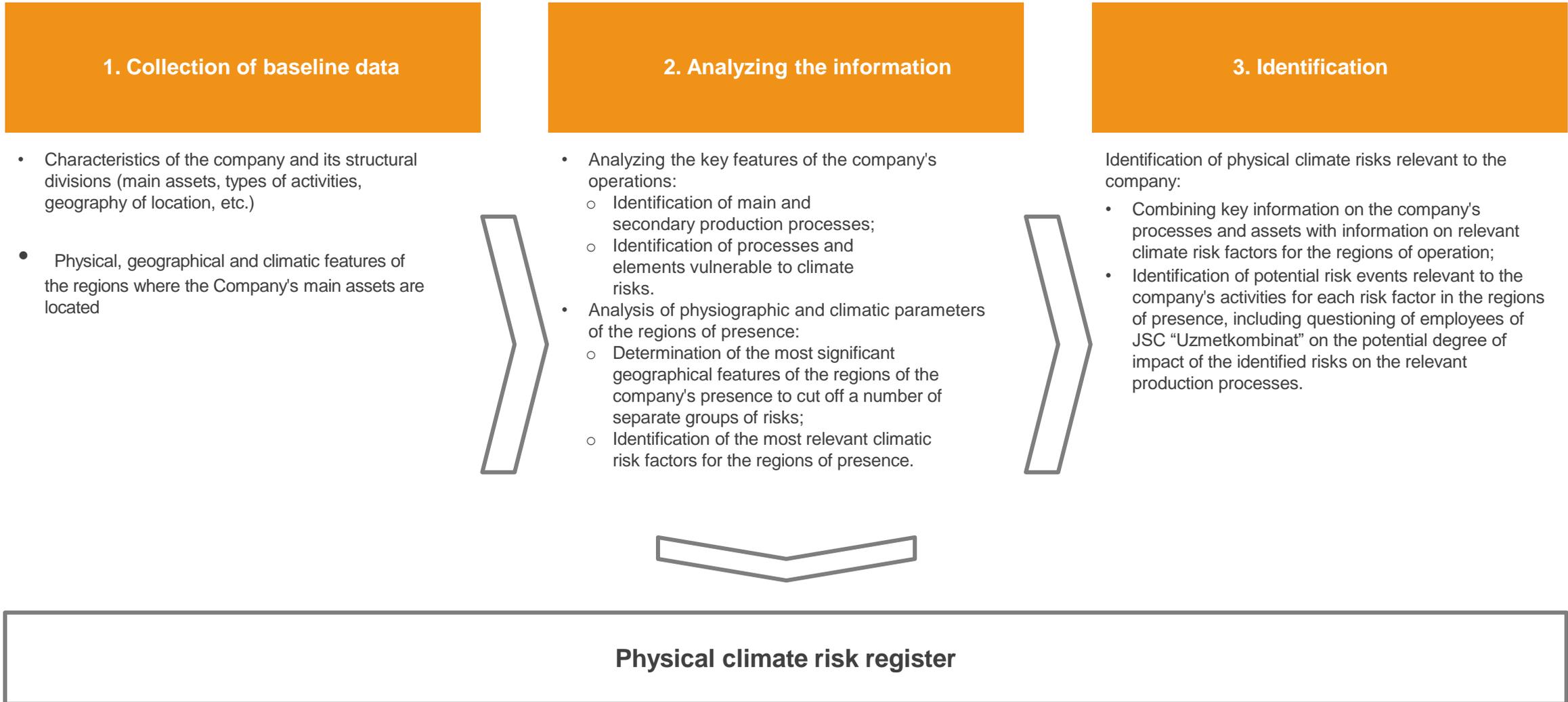
- **SSP 1-2.6** — temperature remains below the warming of 2.0 °C relative to the baseline, net zero in the second half of the century;
- **SSP 2-4.5** — warming higher than 2.0 °C relative to the baseline, net zero is not achieved by 2100.

## Prioritization

### ENVID risk analysis approach

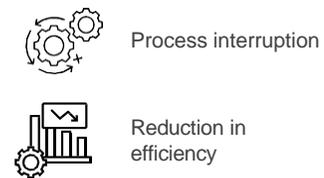
Determining the potential degree of impact of climate risks on the company's key production processes.

Prioritization was carried out by questioning various departments of the company and providing them with a description of the identified risks and potential effects from their implementation.



# Analysis of the impact of physical risks on the Company's assets

Acute physical risk factors	Chronic physical risk factors
1. Number of days with t above 35°C	6. Average annual surface air temperature
2. Number of days with minimum t below 0°C	7. Minimum mean surface air temperature
3. Maximum precipitation for a period of 5 days <sup>1</sup>	8. Maximum average surface air temperature
4. Amount of precipitation in the form of snow*	9. Average precipitation
5. Surface wind speed*	10. Standardized Precipitation Index (SPI-6) <sup>1*</sup>



Key production processes	Risk factors and impact of realization of related risks									
	Acute					Chronic				
	1	2	3	4	5	6	7	8	9	10
Main production processes of ferrous and non-ferrous metallurgy		-		-	-		-	-		-
Energy supply		-		-	-		-	-		-
Water supply		-		-	-				-	-
Supply of raw materials and consumables		-		-	-		-	-		-
Fuel and POL storage		-		-	-	-	-	-		-



<sup>1</sup> The Standardized Precipitation Index (SPI) is the most commonly used index worldwide to detect meteorological droughts.

\* Risk factors with zero or negative dynamics compared to the base period, i.e. the risks associated with these risk factors in the future are less or as likely as now and are not taken into account in this assessment.

## Register of identified physical risks

The result of the identification process is a register of climatic risks containing detailed information on climatic risks relevant for JSC “Uzmetkombinat”.

No	Production process	Risk factor	Risk	Description of risk realization
1	1. Main production processes of ferrous and non-ferrous metallurgy	1. Extreme heat	Decrease in efficiency	Occurrence of hazardous working conditions at work and risks to the health and safety of employees at the workplace, which will cause a decrease in labor productivity or a reduction in the length/number of working days.
2	1. Main production processes of ferrous and non-ferrous metallurgy	1. Extreme heat	Decrease in efficiency	Reduced productivity due to malfunctions of machinery and equipment engines, failure and malfunction of equipment due to overheating.
3	1. Main production processes of ferrous and non-ferrous metallurgy	1. Extreme heat	Restoration costs	Increased operating costs due to equipment failure and malfunctions.
4	1. Main production processes of ferrous and non-ferrous metallurgy	1. Extreme heat	Process interruption	Damage to production infrastructure due to fuel and flammable substances ignition in fuel and POL storage areas when tanks overheat.
5	1. Main production processes of ferrous and non-ferrous metallurgy	1. Extreme heat	Restoration costs	Damage to production infrastructure due to fuel and flammable substances ignition in fuel and POL storage areas when tanks overheat.
6	1. Main production processes of ferrous and non-ferrous metallurgy	3. Abnormal rainfall	Process interruption	Waterlogging or flooding of production sites and buildings as a result of floods, floodwaters or mudflows, erosion of building foundations and flooding of underground utilities, restricted movement of employees within the territory of production facilities.
7	1. Main production processes of ferrous and non-ferrous metallurgy	3. Abnormal rainfall	Restoration costs	Waterlogging or flooding of production sites and buildings as a result of floods, floodwaters or mudflows, erosion of building foundations and flooding of underground utilities, restricted movement of employees within the territory of production facilities.
8	1. Main production processes of ferrous and non-ferrous metallurgy	3. Abnormal rainfall	Decrease in efficiency	Decrease in employee productivity due to compliance with safety protocols at production facilities associated with extreme weather events.
9	1. Main production processes of ferrous and non-ferrous metallurgy	6. Average temperature rise	Decrease in efficiency	Reduction in the number of working days during the summer period due to hazardous working conditions at work and risks to the health and safety of employees at the workplace.
10	1. Main production processes of ferrous and non-ferrous metallurgy	9. Change in average annual precipitation	Restoration costs	Reduction in the number of working days during the year due to undermining of building foundations and flooding of underground utilities due to increased frequency of precipitation.



## 1.2. Qualitative assessment of physical risks



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## Approach to qualitative risk assessment

The degree of significance of the identified risks was determined in accordance with the ENVID methodology. Significance was determined through 2 parameters - the degree of risk impact and the probability of its occurrence.

### Degree of impact

The degree of impact was assessed by expert method in points from 1 to 5. Points were given in the questionnaire by employees of JSC "Uzmetkombinat" depending on how strongly this or that risk can affect the main production processes.

### Probability of occurrence

The probability of occurrence was estimated on the basis of scenario analysis data. It varies depending on time horizons and selected scenarios and is conditionally evaluated in scores from 1 to 5.

### Risk Significance Level = Exposure Rate × Probability of Occurrence

Degree of impact	Probability of risk occurrence				
	1 point Very low level	2 points Low level	3 points Medium level	4 points High level	5 points Very high level
1 point Very low level	1	2	3	4	5
2 points Low level	2	4	6	8	10
3 points Medium level	3	6	9	12	15
4 points High level	4	8	12	16	20
5 points Very high level	5	10	15	20	25

Low risk

Identified risks that do not require additional actions

Medium risk

Identified risks requiring additional monitoring and control

High risk

Identified risks requiring additional monitoring, control and mitigating measures

## Determining the degree of impact

The degree of impact of risks is determined depending on the severity of consequences of the realization of these risks. A questionnaire containing a register of risks and a table with scores of degree of impact was sent to the subdivisions of JSC “Uzmetkombinat”.

Extent of risk impact				
1 point	2 points	3 points	4 points	5 points
Minor damage	Minor damage	Local damage	Serious damage	Massive damage
Minimal impact on the main production process	Suspension of the main process for less than 1 day	Suspension of the main process for a period of 1 day to 1 week	Suspension of the main process for a period of 1 week to 1 month	Suspension of the main process for a period of 1 month to 1 year
No impact on ancillary processes	Stoppage of an auxiliary process for a period of less than 1 hour that does not entail stoppage of the main process	Suspension of the auxiliary process for up to 12 hours, removal possible by in-house specialists	Suspension of the auxiliary process for up to 24 hours, which cannot be eliminated without the involvement of external specialized services	Plant shutdown. Need to replace equipment/production buildings and structures, etc.
No increase in resource intensity	Increase of resource intensity to the upper level of the annual average normative value	Increase in resource intensity above the upper level of the annual average normative value, but without the need to attract additional resources	Utilization of internal reserve resources	Attracting external resources
No decrease in efficiency	Reduction of efficiency of auxiliary equipment less than 50%	Reduction of auxiliary equipment efficiency by more than 50%	Reduction of efficiency of main equipment operation less than 50%	Reduction of efficiency of main equipment more than 50%



# Determining the probability of occurrence

The approach to assessing the probability of risk occurrence was to normalize the results of modeling the dynamics of change in risk factors relative to the baseline - the pre-industrial period (1850-1900).



Region	Enterprise	Near Term		Medium Term		Long Term	
		SSP1-2.6	SSP2-4.5	SSP1-2.6	SSP2-4.5	SSP1-2.6	SSP2-4.5
Tashkent region	<ul style="list-style-type: none"> <li>JSC "Uzmetkombinat"</li> <li>Li Da Metal Technology</li> <li>VCHM Tashkent</li> </ul>	<b>1. Number of days with t above 35°C</b>					
		12,3	11,8	15,6	17,4	15,7	27,2
		12,3	11,8	15,6	17,4	15,7	27,2
		14,7	18,3	14,3	20,8	15,8	26,5
		<b>3. Maximum precipitation for a period of 5 days</b>					
		0,118	0,119	0,118	0,136	0,118	0,201
		0,118	0,119	0,118	0,136	0,118	0,201
		0,141	0,142	0,139	0,131	0,141	0,21
		<b>6. Average annual surface air temperature</b>					
		2,2	2,2	2,6	2,9	2,7	4,0
		2,2	2,2	2,6	2,9	2,7	4,0
		2,2	2,6	2,2	2,9	2,3	3,5
		<b>7. Minimum mean surface air temperature</b>					
		2,3	2,3	2,7	3,1	2,8	4,1
		2,3	2,3	2,7	3,1	2,8	4,1
		2,3	2,7	2,4	3,1	2,5	3,7
		<b>8. Maximum average surface air temperature</b>					
		2,2	2,2	2,7	3,0	2,8	4,1
2,2	2,2	2,7	3,0	2,8	4,1		
2,2	2,7	2,2	2,9	2,3	3,6		
<b>9. Average precipitation</b>							
0,116	0,097	0,113	0,119	0,109	0,159		
0,116	0,097	0,113	0,119	0,109	0,159		
0,14	0,131	0,116	0,129	0,107	0,161		

Region	Enterprise	Near Term		Medium Term		Long Term	
		SSP1-2.6	SSP2-4.5	SSP1-2.6	SSP2-4.5	SSP1-2.6	SSP2-4.5
Tashkent region	<ul style="list-style-type: none"> <li>JSC "Uzmetkombinat"</li> <li>Li Da Metal Technology</li> <li>VCHM Tashkent</li> </ul>	<b>1. Number of days with t above 35°C</b>					
		2,1	2,2	2,4	2,7	2,4	3,7
		<b>3. Maximum precipitation for a period of 5 days</b>					
		2,2	2,2	2,1	2,4	2,2	4,0
		<b>6. Average annual surface air temperature</b>					
		1,2	1,5	1,8	2,7	2,0	4,6
		<b>7. Minimum mean surface air temperature</b>					
		1,0	1,3	1,7	2,8	1,9	4,7
		<b>8. Maximum average surface air temperature</b>					
		1,2	1,5	1,9	2,7	2,1	4,7
		<b>9. Average precipitation</b>					
		3,4	2,8	3,0	3,4	2,8	4,9



### 1.3. Assessment results



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# Scenario and time structure of risk allocation





## Part 2. Transient climate risks



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# Transient climate risks

The transition to a low-carbon economy entails significant **policy, legal, technological and market** changes to mitigate and adapt to climate change. Depending on the nature, speed and direction of these changes, they can be both opportunities and **transient risks** for a company.

## Political and legal risks



International and industry initiatives on decarbonization



Legislative requirements to combat climate change

## Technological risks



Technical re-equipment of production assets



Development of low-carbon production technologies

## Market risks



Changes in demand for the company's products



Implementation of non-market regulatory mechanisms

## Reputational risks



Disclosure of information on GHG emissions



Climate risk disclosure

## Examples



**JSW Steel:** “Cross-Border Carbon Management Mechanism (CBAM)” - political and legal risk

Under the CBAM mechanism implemented in the EU, the European Commission intends to levy a border tax on imports of carbon-intensive products (including iron and steel) from other countries to avoid the risk of carbon leakage. Given that JSW Steel operates in international markets and exports products to Europe, the introduction of CBAM in the EU will result in higher operating costs and lower margins on exported products.

*JSW Steel Climate Action Report 2024*



**NLMK:** “Increased competitiveness of MSP compared to blast furnace and converter production” - technological risk

The development of clean steel production technologies may lead to depreciation of capital investments in the modernization of the blast furnace-converter chain of NLMK Group's production, and, as a result, to a decrease in revenues due to a drop in demand for goods.

*NLMK Group website, “Climate Risks” section*



**POSCO:** “Increased demand for low-GHG steel” – market risk

Reducing carbon intensity will become a key aspect of the materials market in the coming decades due to the development of a low-carbon economy. Businesses will require suppliers to reduce their carbon footprint across the value chain. A delay in reducing GHG emissions could impact the company's ability to meet the growing demand for low carbon steel in national and international markets.

*2020 POSCO Climate Action Report*



## 2.1. Identification of transient risks



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## Types of risks according to TCFD

### Political and legal risks



International and industry initiatives on decarbonization



Legislative requirements to combat climate change

### Technological risks



Technical re-equipment of production assets



Development of low-carbon production technologies

### Market risks



Changes in demand for the company's products



Implementation of non-market regulatory mechanisms

### Reputational risks



Disclosure of information on GHG emissions



Climate risk disclosure

## Identification of transient risks

### 1. Analysis of the regulatory framework

Study of existing and potential future regulations related to climate change and adaptation in the Republic of Uzbekistan and globally.

### 2. Estimation of carbon intensity

Assessment of the carbon intensity of the company's operations and analysis of possible carbon pricing in the regions where the company operates and, in the regions, where the company's products are sold.

### 3. Market trends and consumer preferences

Analysis of market trends and consumer preferences in the regions where products are sold.

### 4. Technological changes

Identify technologies and innovations that may have an impact on the company's operations, especially in the context of renewable energy and energy efficiency.

## Register of identified transient risks

	Risk factor	Risk	Description of risk realization
<b>Political and legal risks</b>	<ul style="list-style-type: none"> <li>• Introduction of a national system of monitoring and reporting on greenhouse gas emissions</li> <li>• Introduction of non-financial reporting in accordance with IFRS international standards</li> <li>• Introduction of GHG emission quotas</li> <li>• Entry into force of the EU Transboundary Carbon Regulation (CBAM)</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in costs</li> <li>• Decrease in revenues</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in costs associated with hiring additional specialists</li> <li>• Increase in costs associated with payment of fines for late submission of reports</li> <li>• Increase in costs associated with the acquisition of additional quota volume</li> <li>• Reduction in revenues due to potential reduction in the price of products for EU customers</li> </ul>
<b>Technological</b>	<ul style="list-style-type: none"> <li>• Need to modernize existing equipment</li> <li>• Low carbon and renewable energy development</li> </ul>	<ul style="list-style-type: none"> <li>• Cost increase</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in costs resulting from capital investments in modernization of existing equipment to reduce energy consumption and greenhouse gas emissions</li> <li>• Increase in costs associated with the growth of the share of renewable energy sources (RES) in the fuel and energy balance of the Republic, which in turn will lead to an increase in electricity prices</li> </ul>
<b>Market</b>	<ul style="list-style-type: none"> <li>• Reduction in demand for the Company's products in the EU as a result of the introduction of CBAM</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease in revenues</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in revenues due to the refusal of EU customers from the Company's products due to their high carbon intensity or the inability to provide information in response to information requests.</li> </ul>



## 2.2. Qualitative assessment of transient risks



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## Risk Significance Level = Exposure Rate × Probability of Occurrence

Degree of impact	Probability of risk occurrence				
	1 point Very low level	2 points Low level	3 points Medium level	4 points High level	5 points Very high level
1 point Very low level	1	2	3	4	5
2 points Low level	2	4	6	8	10
3 points Medium level	3	6	9	12	15
4 points High level	4	8	12	16	20
5 points Very high level	5	10	15	20	25

Probability of risk realization	
Points	Probability
1	< 5%
2	5 - 20%
3	20 - 50%
4	50 - 80%
5	> 80%

Extent of risk exposure	
Points	Expenses, mln USD
1	< 0,01
2	0,01 – 0,1
3	0,1 – 1,0
4	1,0 – 2,5
5	> 2,5



## 2.3. Assessment results



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# Register of assessed transient risks

Risk factor	Risk description	SSP 1-2.6			SSP 2-4.5		
		Near	Medium	Long	Near	Medium	Long
Introduction of a national system of monitoring and reporting on greenhouse gas emissions	Increase in costs associated with hiring specialists required for the establishment and stable operation of the Company's internal system for assessing greenhouse gas emissions, as well as for reporting in accordance with national legislation.	●	●	●	●	●	●
Introduction of a national system of monitoring and reporting on greenhouse gas emissions	Increase in costs associated with the payment of fines in case of late submission of reports or failure to submit them, as well as in case of violations related to their formation.	●	●	●	●	●	●
Entry into force of the EU Transboundary Carbon Regulation (CBAM)	Decrease in revenues due to potential reduction in the price of products for EU customers. The price reduction will be due to the need for importers of the Company's products to purchase special CBAM certificates.	●	●	●	●	●	●
Need to modernize existing equipment	Increase in costs as a result of capital investments in the modernization of existing equipment to reduce energy consumption and greenhouse gas emissions to help achieve the national goal of reducing the carbon intensity of the Republic's GDP by 30% by 2030 relative to 2010 levels, as well as the Company's own corporate climate and energy efficiency goals.	●	●	●	●	●	●
Low-carbon and renewable energy development	Increase in costs associated with the growth of the share of renewable energy sources (RES) in the fuel and energy balance of the Republic, which in turn will lead to an increase in electricity prices.	●	●	●	●	●	●
Reduction in demand for the Company's products in the EU as a result of the introduction of CBAM	Decrease in revenue due to EU customers rejecting the Company's products due to their high carbon intensity or inability to provide information in response to information requests.	●	●	●	●	●	●

● Low significance    ● Average significance    ● High significance



## Part 3. Climatic possibilities



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### 3.1. Identification of climate possibilities



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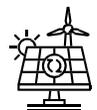
## Types of capabilities according to TCFD

### Efficient use of resources



Implementation of energy efficient solutions

### Energy sources



Introduction of renewable energy sources

### Products and services



Sale of carbon units from the implementation of climate projects

### Markets



Growth of investment attractiveness  
Obtaining green finance

### Sustainability



Reduction of operating costs for heating

## Identification of climate possibilities

### 1. Analysis of the regulatory framework

Study of existing and potential future regulations related to climate change and adaptation in the Republic of Uzbekistan and globally.

### 2. Renewable energy sources

- Assessing the feasibility of generating energy from renewable sources
- Obtaining subsidies or soft loans for RES
- Conclusion of contracts for purchase of green energy

### 3. Market trends and consumer preferences

- Opportunities in new markets or asset types
- Opportunities to diversify the company's operations and prepare for the transition to a low-carbon economy

### 4. Technological changes

Identify technologies and innovations that may have an impact on the company's operations, especially in the context of renewable energy and energy efficiency.

## Efficient use of resources

### Factor:

- Availability of modern energy efficient solutions

### Effect:

- Reduction of costs in terms of energy consumption per unit of output due to increased efficiency of production processes through the introduction of energy-efficient solutions

## Energy sources

### Factor:

- Subsidizing and state support of RES utilization

### Effect:

- Increase in the amount of available capital due to the possibility of using state support and subsidizing loans for the creation of RES generation

## Products and services

### Factor:

- Development of voluntary markets for carbon units

### Effect:

- Increase in revenue from the sale of carbon units generated by climate projects

## Markets

### Factor:

- Development of green finance instruments

### Effect:

- Increase in the volume of available capital due to the possibility of using green finance instruments in the implementation of decarbonization projects (RES, equipment modernization, introduction of energy efficient technologies, etc.)

## Sustainability

### Factor:

- Increase in average surface temperature

### Effect:

- Reduction of heating-related costs due to climate change towards warming



### 3.2. Qualitative assessment of climate possibilities



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## Identification of factors

### Initial data:

- International, national regulations and best available technologies;
- Analysis of market trends and market development of low-carbon products;
- Requirements of financial organizations;
- Technology solutions used by the company.

## Identification of opportunities and description of their realization

### Identification of opportunities for each category



Climate Possibilities Register

## Qualitative assessment of possibilities

### Criteria:

- Availability of information for valuation;
- Possibility of assessment on the horizon up to 2100.

### Approach:

- **Probability** was assessed by expert judgment in scores based on scenarios SSP 1-2.6 and SSP 2-4.5;
- **Impact calculation** involves developing a customized methodological approach to estimate potential revenues for each identified possibility;
- The **significance** of a possibility is estimated as the product of the degree of impact by the probability of occurrence.

## Possibility Significance Level = Degree of Impact × Probability of Occurrence

Degree of impact	Probability of possibility of occurrence				
	1 point Very low level	2 points Low level	3 points Medium level	4 points High level	5 points Very high level
1 point Very low level	1	2	3	4	5
2 points Low level	2	4	6	8	10
3 points Medium level	3	6	9	12	15
4 points High level	4	8	12	16	20
5 points Very high level	5	10	15	20	25

Probability of realization of possibility	
Points	Probability
1	< 5%
2	5 - 20%
3	20 - 50%
4	50 - 80%
5	> 80%

Degree of impact of the possibility	
Points	Revenue, mln USD
1	< 0,01
2	0,01 – 0,1
3	0,1 – 1,0
4	1,0 – 2,5
5	> 2,5



### 3.3. Assessment results



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# Register of assessed climate possibilities

Factor	Possibility Description	SSP 1-2.6			SSP 2-4.5		
		Near	Medium	Long	Near	Medium	Long
Availability of modern energy efficient solutions	Reduction of expenses in terms of energy resources consumed per unit of output due to increased efficiency of production processes through the implementation of energy efficient solutions.	●	●	●	●	●	●
Subsidizing and state support of RES utilization	Increase in the amount of available capital due to the possibility of using state support and subsidized loans for RES generation.	●	●	●	●	●	●
Development of voluntary markets for carbon units	Increased revenue from the sale of carbon units generated by climate projects.	●	●	●	●	●	●
Development of green finance instruments	Increase in the volume of available capital due to the possibility of using green finance instruments in the implementation of decarbonization projects (RES, equipment modernization, introduction of energy efficient technologies, etc.).	●	●	●	●	●	●
Increase in average surface temperature	Reduction in costs associated with heating due to climate change towards warming.	●	●	●	●	●	●

● High significance    
 ● Average significance    
 ● Low significance