5.3. Climate-related risks and opportunities

The methodology of identification and assessment of enterprise risks in the ENEA Group is not focused directly on assessing the company's climate impact or the impact of climate on the company's business. Climate-related risks are selected from the pool of enterprise risks that are identified, prioritized and periodically assessed by their owners within the framework of the enterprise risk management process, in compliance with the assumptions of the *ENEA Group Enterprise Risk Management Policy* and the *ENEA Group Enterprise Risk Management Methodology*. These risks, like other types of enterprise risks, are subject to ongoing and cyclical monitoring and reporting for the benefit of both the parent company and the ENEA Group as a whole. Mitigating measures are taken for all risk categories.

As at the publication date of this Statement, the ENEA Group has not defined any goals for the purpose of managing climate-related risks and opportunities. Such opportunities and risks will be comprehensively identified and a management plan will be prepared in the course of the current works on the Group's climate policy.

Under the non-financial reporting process for 2022, the Group updated the initial list of risks and opportunities arising from climate change that might bring about major changes in its operations, revenues or costs, prepared for the purposes of the reporting of 2021. The reviews covered the short term (until the end of 2024), the medium term (until the end of 2027) and the long term (until the end of 2036).

For the purpose of this Statement, climate-related risks were assigned to the categories applied in the *ESG Reporting Guidelines*, a guide published by the Warsaw Stock Exchange, which have identified the following types of risk:

Transition risk: Resulting from the transition towards a low-carbon economy, including: legal and regulatory risk (resulting from current or upcoming regulations), technological risk (the need to invest in innovative technologies), market risk (resulting from changing consumer behaviors, increasing prices of raw materials, etc.), reputational risk.

Physical risk: Resulting from the changing climate, including acute risk (from extreme weather phenomena such as droughts, floods and fires) and chronic risk (from long-term processes such as changes in temperature and rising ocean levels).

It should be pointed out that the risk management model described in the Statement identifies risk categories other than those specified in the said guidelines.

As at the publication of the Statement, works were in progress on the *ENEA Group Climate Policy*, for the purpose of which a comprehensive analysis of risks and opportunities arising from climate change will be performed. The works are expected to be finished in 2023.

Business area of the ENEA Group	Climate related risk	Description of the risk factor	How the risk affects the ENEA Group	Methods applied in risk management
DISTRIBUTION	Risk of catastrophic damage to elements of infrastructure as a result of extreme weather phenomena that cause an increase in costs of operations Risk category: physical Perspective: long term.	Increased frequency of extreme weather phenomena	Physical damage to elements of grid infrastructure as a result of extreme weather phenomena	1. Visual inspections, check-ups and operational procedures in compliance with the due dates specified in the annual Maintenance Procedure Plans. 2. Ongoing removal of the effects of failures and damage to power lines and devices. 3. Capital expenditure endeavors related to the restoration of grid assets in compliance with the Capital Expenditure Plan.
GENERATION	Risk of the consolidation of a strong upward trend on the EUA market, with simultaneous disproportionate increases in electricity prices Risk category: transition Perspective: short, medium and long term	High prices of CO_2 emission allowances may result in a low or negative value of the clean dark spread (CDS)	Decline in or loss of profitability in electricity generation	1. Substitution of coal with low-carbon fuels, including a greater share of biomass co-firing. 2. Project of incorporation of combined cycle power units in ENEA Wytwarzanie to replace the currently operating 8x200 MW units by ENEA ELKOGAZ.
	Risks related to extreme weather phenomena Risk category: physical Perspective: short, medium and long term	An increased frequency of extreme weather phenomena (droughts, floods affecting the water level on the Vistula River, heavy snowfalls, frosts, icing, hurricanes) may disrupt energy generation	Interruption of business continuity, loss of revenue and significant additional costs	1. Vistula River water level monitoring system. 2. Annual assessment of the technical condition of power plant facilities. 3. Continuous supervision of staff over the operation of the power plant. 4. Flood protection system in the event of an increase in the water level on the Vistula River (stoplogs). 5. Ongoing supervision of devices and optimal overhaul management. 6. Monitoring of and supervision over water level in rivers by hydro power plants (close control in order not to exceed the parameters specified in the water permits). 7. Wind farm weather conditions monitoring system adapting the generation parameters to current conditions.
	Risk of construction disasters in hydro power plants Risk category: physical Perspective: medium to long term	Factors such as torrential rains may increase the adverse impact of water on hydrotechnical facilities	Partial or complete damage to hydrotechnical equipment	1. Inspections of the technical condition and safety of buildings in accordance with legal requirements. 2. Execution of the required renovation and capital expenditure tasks to ensure that hydrotechnical equipment is kept in at least good technical condition.

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	Risk of construction disasters on wind farms Risk category: physical Perspective: medium to long term	Extreme weather phenomena, such as strong winds, hurricanes and tornadoes, may pose a threat to selected elements of farm infrastructure	Partial or complete damage to generation facilities	1. Inspections of the technical condition and safety of buildings in accordance with legal requirements.
	Risk of construction disasters in cogeneration plants Risk category: physical Perspective: medium to long term	Changing weather conditions throughout the year necessitate the transport of fuel on belt conveyors in cogeneration plants in 'covered' technological facilities (tunnels, galleries, etc.), thereby increasing the risk of an explosion of coal dust or biomass	Partial or complete damage to generation facilities	1. Inspections of the technical condition and safety of buildings in accordance with legal requirements – maintaining a positive evaluation of the technical condition. 2. Execution of required maintenance, repairs and capital expenditure tasks to ensure that facilities are kept in at least good technical condition. 3. Ongoing supervision over fuel unloading, storage and feed facilities, in particular in areas with coal or biomass explosion hazard.
	Risk related to uncertainty of the legislative environment, including risk of limitation of electricity generation from bituminous coal due the radical tightening of the regulations concerning atmospheric emissions of pollution planned by the European Commission Risk category: transition Perspective: medium to long term	Amendments to EU or national regulations, for example resulting from the non-recognition of biomass as a zero-emission energy source.	Loss of revenue or increased costs related to changing the company's business context	1. Monitoring of and participation in legislative work. 2. Lobbying in the European Commission for changing/mitigating the current climate policy, removing or postponing the adopted deadlines of abandonment of fossil fuels through domestic industry organizations. 3. Incorporation of combined cycle power units in ENEA Wytwarzanie to replace the currently operating 8x200 MW units by ENEA ELKOGAZ. 4. Developing and implementing a CO_2 emissions reduction concept by incorporating CCS (Carbon Capture Storage) and/or CCU (Carbon Capture and Utlilisation) installations.
	Risk of a decrease in revenues from sales of heat Risk category: physical Perspective: short, medium and long term	The trend of an increase in average temperatures during the heating season may lead to a significant decline in demand for heat	Lower revenue from sales of heat	1. Diversification of revenue sources through the development of cogeneration.

Business area of the ENEA Group	Climate related risk	Description of the risk factor	How the risk affects the ENEA Group	Methods applied in risk management
	Risk of an increase in environmental fees, in particular, in the cost of CO_2 emission allowances Risk category: transition Perspective: short term	Due to ongoing climate change, environmental regulations are tightened, resulting in increased fees and penalties	Increase in environmental fees resulting in higher costs of generation processes	1. Ongoing monitoring of regulations. 2. Ongoing monitoring of the validity of decisions held, thereby enabling an early preparation of requests for changes. 3. Ongoing supervision over the manner of implementation and compliance with the conditions specified in the decisions held.
	Risk of suspension of electricity/heat generation as a result of technological misalignment with the requirements of environmental protection regulations Risk category: transition Perspective: short term	Need to adapt generation units to the applicable legal requirements, including the IED	Suspension of electricity/heat generation as a result of technological misalignment	1. Regular upgrades of and investments in: – units for generation of energy from renewable sources, – heat accumulation systems, – flue gas heat recovery units, – flue gas desulfurization units, – boilers. 2. Upgrade of transmission infrastructure and heating nodes, gradual extension of the extent of application of telemetric systems. 3. Use of proper cooling systems in electricity and heat generation. 4. Taking care of the proper technical condition of equipment using fluorinated gases.
	Risk of non-continuity of fuel supplies Risk category: transition Perspective: short, medium and long term	1. Natural disasters such as hurricanes, floods, droughts or freezing conditions may result in a limited availability or lack of biomass 2. Natural disasters in the mining sector or in the supply process may cause a limited availability or lack of coal	Interruption or curtailment of the continuity of fuel supplies and the related loss of revenue.	1. Optimization of fuel supplies. 2. Diversification of the fuel portfolio. 3. Emergency fuel purchases. 4. Gradual shift of all or part of the fuel shipment process to the supplier. 5. Performance monitoring with deviation analysis and update of plans for the performance of contracts for the supply of generation fuels and logistics services.
	Risk of an increase in biogas production expenses Risk category: physical Perspective: medium term	Hydrological drought might affect the availability and prices of corn silage, which is the key input substrate in biogas production	Deterioration of the economic profitability of biogas production from plant-based substrates	1. Adoption of and early preparation for a comprehensive substrate procurement action. 2. Ongoing monitoring of the substrate market.

Business area of the ENEA Group	Climate related risk	Description of the risk factor	How the risk affects the ENEA Group	Methods applied in risk management
	Risk of an increase in the cost of raising capital and/or property insurance Risk category: transition Perspective: short, medium and long term	Global climate crisis making it increasingly difficult for fossil fuel-based businesses to access finance, insurance undertakings treating the coal-fired energy sector as a high-risk industry	Increase in operating costs associated with higher cost of raising capital and/or property insurance	1. Use of the Group's transformation strategy in consultations with the reinsurance market. 2. Search for new methods of securing assets. 3. Spin-off of coal-fired generation assets from the ENEA Group's structures
	Risks associated with the activities of environmental organizations Risk category: transition Perspective: short, medium and long term	Activities of environmental organizations conducting aggressive campaigns against power plants by: − appealing against and demanding the cancellation of integrated permits or environmental decisions held by them, – referring to the public interest and joining proceedings aimed at amending integrated permits, thereby delaying or preventing the issue of favorable decisions	Reducing or ceasing the operation of power plants due to difficulties in obtaining or maintaining valid environmental decisions and permits.	1. Cooperation with leading law firms. 2. Cooperation with environmental organizations.
	Risk of losses in capacity caused by hydrologic conditions Risk category: physical Perspective: short, medium and long term	The country's unfavorable hydrological or meteorological translates into a deterioration in the hydrological conditions for the operation of power plants	Low surface levels and high water temperatures of the Vistula River may cause power losses due to problems with the provision of the necessary amount of cooling water (resulting from the need to maintain its uninterrupted flow) or abiding by the permissible temperature of the discharged cooling water	1. A concept of dismantling of the temporary check dam and reconstruction of the Vistula River bottom was prepared in order to ensure an appropriate water level during a low-water period. The project was initially approved by the State Water Holding Polish Waters. Furthermore, hydraulic structures redirecting the majority of the river stream towards the power plant bank were altered.
TRADING	Risk of adopting outdated assumptions for long-term financial projections Risk category: transition Perspective: medium to long term	The progressing climate change affecting the climate policy of various countries and organizations may potentially shape the operating principles of the system and the price of CO_2 emission allowances	Occurrence of unexpected costs caused by wrong assumptions for long-term financial projections Losses or higher financial performance related to underestimation/overestimation of the assumptions of price paths.	1. Periodic updates of price paths.

Business area of the ENEA Group	Climate related risk	Description of the risk factor	How the risk affects the ENEA Group	Methods applied in risk management
	Risk of additional costs or losses resulting from commodity price volatility on the futures market Risk category: transition Perspective: short, medium and long term	If the actual temperatures in the summer and winter seasons are different from the forecasts, this may cause deviations in electricity and gas prices on the Polish Power Exchange compared to the prices contracted in the previous months	Additional costs and/or lower revenue as a result of the volatility in commodity prices on the forward market Losses or higher financial performance related to underestimation/overestimation of the trade assumptions.	1. Maintaining and developing risk management competences in the ENEA Group. 2. Internal risk optimization procedures. 3. Monitoring and analysis of factors affecting prices on the Polish Power Exchange. 4. Adjustment of orders placed, both in terms of price and volumes, to the current market situation.
	Risk of commodity price volatility on the SPOT market Risk category: transition Perspective: short, medium and long term	Meteorological conditions: – in the winter season (December-February), monthly average temperatures above the long-term norm, – in the summer season (June–August), monthly average temperatures above the long-term norm, may generate financial losses on open positions	Additional costs and/or lower revenue as a result of the volatility in commodity prices on the SPOT market Losses or higher financial performance related to underestimation/overestimation of the trade assumptions.	1. Maintaining and developing competence within the company to manage this risk. 2. Internal procedures governing optimization on the SPOT market. 3. Ongoing analysis of factors affecting prices. 4. Monitoring and forecasting of factors affecting prices. 5. Adjustment of orders placed, both in terms of price and volumes, to the current market situation.
	Risk of disturbances/failures in energy generation Risk category: physical Perspective: short, medium and long term	Climate change may cause: a) in the winter season: – lower wind generation due to lower wind speeds, – very low photovoltaic generation due to heavy clouds, – lower generation in hydro power plants due to low water levels; b) in the summer season: – lower wind generation due to lower wind speeds, – low levels of surface/ground waters resulting in the inability to use them for technological purposes in power plants, – extreme weather phenomena (violent storms, gusty winds, flash floods), resulting in limited access to energy over a large area	Additional costs associated with disturbance/failure management Generation of financial losses related to the financial expenditure on repairs of infrastructure, upgrade of grid (to achieve more resistance to considerably higher temperatures)	1. Maintaining and developing competence within the company to manage this risk. 2. Internal procedures governing optimization on the SPOT market. 3. Ongoing analysis of factors affecting prices. 4. Monitoring and forecasting of factors affecting prices. 5. Adjustment of orders placed, both in terms of price and volumes, to the current market situation.

Business area of the ENEA Group	Climate related risk	Description of the risk factor	How the risk affects the ENEA Group	Methods applied in risk management
MINING	Risks related to the need to change the company's operations are run, which would entail additional capital expenditures Risk category: transition Perspective: medium to long term	Climate change causing an increasingly restrictive EU climate policy, directly and indirectly translating into a number of more stringent environmental standards imposed on mines	Additional costs associated with increasing environmental standards	1. Ongoing supervision over compliance with environmental standards. 2. Continuous monitoring of changes in the EU's climate policy and the resulting amendments to national regulations. 3. Active participation in consultations on new regulations. 4. Continuous search for technical and organizational solutions minimizing the company's impact on the climate, e.g. by energy efficiency improvements.
	Risk of a decline in demand for steam coal in Poland and globally Risk category: transition Perspective: medium to long term	Changes in the country's energy mix, including the ENEA Group's energy mix, and from a decrease in demand for electricity generated from coal (e.g. as a result of measures favoring energy efficiency, elimination of retail customers from the portfolio, more frequent switching to own sources of energy and heat generation, higher average atmospheric temperatures in winter) is likely to cause a gradual decrease in demand for the products offered to date	Restricting the possibility to sell mined coal	1. Seeking new coal consumers in Poland. 2. Seeking new, foreign coal outlet markets. 3. Implementation of a new business strategy, including through diversification of revenues towards the extraction of coking coal, which is a strategic commodity in the EU. 4. Taking into account the forecasts of climate models in determining the scope of contracts with customers.
	Risk of an increase in operating costs due to the need to pay greater compensations for losses in grasslands and agricultural land caused by the need to repair of mining damage to the environment Risk category: physical Perspective: short, medium and long term	The conduct of mining activities is associated with the occurrence of mining damage and may lead to the formation of subsidence basins and disruption of local water relations, thus causing occasional local flooding	Increase in operating costs due to the need to pay greater compensations for losses in grasslands and land caused by the need to repair of mining damage to the environment	1. Effective mining damage management policy. Ongoing dialog with local communities. 2. Continuous monitoring of rock mass movements using of modern measurement methods. 3. Monitoring of environmental aspects through the Integrated Quality, Environment and Safety Management System. 4. Ongoing reclamation of areas adversely affected by mining activities.
	Risk of an increase in the cost of raising capital and/or property insurance Risk category: transition Perspective: short, medium and long term	Global climate crisis making it increasingly difficult for fossil fuel-based businesses to access finance, insurance undertakings treating the mining sector as a high-risk industry	Increase in operating costs associated with higher cost of raising capital and/or property insurance	1. Use of the Group's transformation strategy in consultations with the reinsurance market. 2. Search for new methods of securing assets - the attitude of banks to providing financing to the company is monitored on an ongoing basis.

Businessarea of the ENEA Group	Climate related risks	Description of the risk factor	How the risk affects the ENEA Group	Methods applied in risk management
	Risks associated with the activities of non-governmental environmental organizations Risk category: transition Perspective: medium to long term	The activities of environmental organizations, including potential protests related to investment and development activities, may affect the social acceptance of the company	Obstruction in the progress of various administrative procedures conducted with the participation of environmental organizations	1. Execution of project activities in partnership with environmental organizations. 2. Ongoing communication of activities aimed at improving environmental safety. 3. Increasing the company's environmental efficiency, e.g. through investments. 4. Respecting state-imposed forms of nature protection (e.g. no mining and no future mining plans under the Polesie National Park).
	Reputation risk related to the conduct of business in the fossil fuel industry Risk category: transition Perspective: medium to long term	Due to the climate crisis, the EU's policy and the activities of environmental organizations, the mining industry may be perceived as the perpetrator of climate change	Damage to the image	1. Participation in business initiatives. 2. Involvement in local socio-economic development initiatives. 3. Intensive communication activities, focusing chiefly on demonstrating the role played by the company in the Lublin region along with its environmental efficiency and openness to change.

Business area of the ENEA Group	Sphere of activity	Source of development opportunity	How the opportunity affects the ENEA Group
TRADING	Wholesale and retail energy trading Opportunity category: market/technology Perspective: short, medium and long term	Implementation by the ENEA Group and its environment, of modern technological solutions supporting the fight against climate change	Possibility to trade in "green energy" including in foreign markets. Increased liquidity in the market, with a wide range of generators, prosumers, and virtual asset management players, allowing for optimization of own assets, better hedging of the product portfolio, and generation of more stable and better financial results. Possibility to prepare advanced, low-carbon products and services, including multi-product and customized offers for business or individual customers (e.g. electricity, CO_2, fuels, portfolio management). Possibility to build competitive edge and/or customer loyalty by creating an offer of participation in pro-environmental investments carried out by them, e.g. modernization of industrial CHP plants and expansion and modernization of connections or plant networks. Multidimensional benefits of installing and managing energy storage facilities, e.g. price arbitrage, time-shifting of peaks and valleys of demand, load balancing, balancing market services, contingency power supply and offtake, support and stabilization of a system saturated with RES and prosumers, system reserves, emergency power supply, compensation for losses in power plants and CHP plants, balancing of island grids and energy clusters, support for the use of industrial waste energy. The need to recycle used and damaged photovoltaic panels and used traction batteries from electric cars. The possibility of utilizing the blades of used windmills in new projects, in line with the circular economy concept. They can find application, among others, as parts of power line poles and emergency housing roofs, in the production of polymer fibers and low-cost housing from materials containing polymer granules, and in co-processing cement and making pellets or boards. Developing cooperation with local communities and building modern, comprehensive solutions, e.g. in connection with the implementation of the concept of energy clusters (energy cooperatives, self-sufficient energy communities).

Business area of the ENEA Group	Sphere of activity	Source of development opportunity	How the opportunity affects the ENEA Group
DISTRIBUTION	Distribution of electricity Opportunity category: market/technology Perspective: medium to long term	Implementation, by the ENEA Group and its environment, of modern technological solutions supporting the fight against climate change	Gradual transformation of the passive (unidirectional) network into a more flexible active (bidirectional) one, in order to increase its flexibility to allow for the development of distributed energy and the popularization of prosumer energy and the installation of charging points and energy storage. Implementation of smart grid solutions, including smart meters, control and automatic reconfiguration elements, network operation diagnostic and analysis devices, electricity quality monitoring and management. Development of cooperation between DSOs and TSOs in order to ensure security and reliability of the Polish Power System taking into account distributed generation from RES. Development of cooperation between DSOs and local governments to ensure that the correlation of the expansion and modernization of the power grid with the environmental needs and plans of the townships. Development of energy storage facilities for frequency control, voltage control, reactive power compensation, backup power supply, and grid planning support – deferring distribution grid investments, supporting smart grids.
GENERATION	Production of electricity and heat Opportunity category: market/technology Perspective: short, medium and long term	Investments in own renewable energy sources	Reduction of energy production costs and ensuring business continuity while reducing greenhouse gas emissions. Adaptation of conventional energy sources to blend coal with zero- or low-carbon fuels. Replacement of coal-fired energy sources with gas-fired, alternative fuel and biomass sources. Development of offshore wind energy. Reduction of raw material (e.g. water) consumption, greenhouse gas emissions and waste production. Securing access to land and infrastructure so that the ENEA Group can build gas-steam units or other generation assets not based on coal in place of coal-fired units. The possibility of using waste to produce heat and electricity. Possibility of using combustion by-products (fly ash, FGD gypsum, slag, ash-slag mixture) for road construction and production of construction materials.
MINING	Coal mining Opportunity category: market/technology Perspective: short, medium and long term	Investments in own renewable energy sources	Securing post-mining sites for future RES development.
GENERATION, TRADING, DISTRIBUTION	R&D&I Opportunity category: technology Perspective: short, medium and long term	Implementation, by the ENEA Group and its environment, of modern technological solutions supporting the fight against climate change	Development of energy technologies and R&D investments, including energy storage technologies, smart metering and energy management systems, electromobility, alternative fuels, hydrogen technologies, participation in the development and operation of energy islands.