MANAGING RISKS AND OPPORTUNITIES IN THE FACE OF CLIMATE CHANGE

FULL REPORT

JUNIO 2023

ACEROS AREQUIPA

In compliance with our sustainability strategy and our environmental commitment pillar, Corporacion Aceros Arequipa issues this annual report summarizing our management of risks and opportunities in the face of climate change.

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I EXECUTIVE SUMMARY

Climate change is a problem that occurs worldwide. Due to the different anthropogenic activities, greenhouse gases (GHG) are emitted. The large amounts of GHG produce global warming causing a disorder in the climatic parameters of our planet. These changes cause droughts, floods, new diseases, water depletion, among other affectations that directly impact humanity.

Facing climate change with mitigation measures means developing changes in production processes and progressively reducing the consumption of fossil fuels, replacing it with renewable energy. Simultaneously, we have to adapt to the new climatic conditions and the scarcity of resources that will appear in the coming years. The mitigation and adaptation measures that are implemented will determine the characteristics of development in the 21st century.

This document analyzes the risks and opportunities of the activities of Corporación Aceros Arequipa SA (CAASA) in the face of climate change. We have identified eight transition risks related to a low-carbon economy, six physical risks related to the vulnerability of our activity, and eight opportunities that we can take advantage of as part of improvement.

For the analysis and evaluation of the transition risks, we rely on a scenario analysis and taking into account the Nationally Determined Contributions (NDC) of Peru to contribute to the fact that the temperature of the planet does not increase more than 2°C with respect to pre-industrial conditions and the scenarios proposed by the International Energy Agency (IEA) with a horizon of 2050. Regarding physical risks, we use the scenarios recommended by the IPPC (RCP4.5 and RCP8.5). The main risks were focused on the possibility of damage to CAASA's assets as a result of floods and/or torrential rains. Water stress is also a factor to take into account since the Steel Complex is located in Pisco,

The Climate and Water stress test was carried out, focusing on Carbon Price and Payment for Water Use scenarios, the analysis with respect to the first gave a "High" criticality risk because the Ministry of the Environment (MINAM) proposes a price of US$ 7.17 per ton of CO2e emitted (which is equivalent to S/.27.25), when carrying out this exercise and taking CAASA's carbon footprint as data in the period 2022, it turned out that CAASA would have to pay S/. 6,687,043.54 to the State for the emission of GHG emissions. Regarding the payment for water use, it had a "Considerable" criticality according to CAASA's GIRO Methodology.

Opportunities with potential participation of CAASA with State projects that are focused on transportation and sustainable buildings, and the possibility of strategic alliances with the cement industry due to the use of steel slag were also evaluated.

As a Response Plan, the Adaptation Plan was developed with short, medium and long-term activities in response to physical risks and the Decarbonization Plan in response to transition risks.towards zero emissions, focusing on the national strategy against climate change and the Net-zero standard of the SBTi.

II INTRODUCTION

The increase in temperature on the Earth's surface is considered a serious threat to the political, economic and social stability of nations. For this reason, scientists and technicians have raised the alarm about the terrible effects that climate change is having on the world. Climate changes are becoming more frequent, such as floods, droughts, frosts and more severe and extensive precipitation that threaten our security and the security of the planet. The same happens with the proliferation of diseases such as malaria, dengue, yellow fever and others derived from the heat wave. Everything indicates that these and other signs of climate change will increase in this century.

The challenge of climate change is associated with the presence of unsustainable production and consumption patterns, dependent on the use of fossil fuels with high carbon emissions. Consequently, climate change imposes limits and restrictions and forces a reorientation of the productive paradigm and consumption patterns. The simultaneous challenge of adapting to the new climatic conditions and implementing mitigation processes, while recognizing common but differentiated responsibilities and heterogeneous capacities, is certainly extraordinary and will determine the characteristics of development in the 21st century.

In recent years, Latin America and the Caribbean has shown significant economic growth that has led to an improvement in economic and social conditions. However, this has also had negative side effects, such as increased air pollution in urban areas and significant deterioration of various natural assets, such as non-renewable resources, water and forests. In addition, there are economies and societies with a high vulnerability to any type of adverse impact, such as climatic effects, and with a productive and consumption matrix that is still prone to high levels of carbon emissions. This set of factors reaches the point of eroding the very bases of support of the current economic dynamism.

Peru is responsible for just 0.4% of greenhouse gases (GHG). However, it is the third most vulnerable country to climate risks. In the last 30 years, we have lost 22% of the surface of our glaciers, which are 71% of the world's tropical glaciers. And after the Covid-19 Pandemic we are experiencing a resurgence of diseases with Dengue on the Coast of our territory.

The steel industry contributes a considerable content of GHG emissions and in turn consumes considerable volumes of water for its cooling processes. Corporación Aceros Arequipa SA (CAASA), aware of the implications of its activity regarding climate change, proposes this work in order to carry out an analysis of the risks and opportunities regarding climate change, which has four stages: (1) Identification, (2) Analysis and Evaluation (3) Response Plan and (4) Follow-up; taking as reference the publications made by the TCFD (Task Force Climate – Related Financial Disclosures).

III OBJECTIVES AND SCOPE

III.1 GOALS

- Analyze and disseminate CAASA's strategy regarding the risks and opportunities of climate change.
- Perform a climate and water stress test for CAASA.
- Identify CAASA's internal carbon price distribution for the year 2022.

III.2 SCOPE

The scope of this document is related to the operations of the headquarters:

- Oficinas Administrativas (Av. Antonio Miro quesada 425- Magdalena del Mar).
- Complejo Siderúrgico (Panamericana Sur Km 241 - Pisco).
- Centro de Distribución Callao (Av. Enrique Meiggs 329 – Callao).
- Centro de distribución Arequipa (Km 5.5 de la Variante del Uchumayo, Cerro Colorado – Arequipa).
- Centro de distribución Trujillo (Av. Túpac Amaru N° 1620, Trujillo – La Libertad).
- Centro de distribución de tubos Trapiche (Calle San Ana 102, ex fundo Chacra Cerro, Comas – Lima).
- Patio de Acopio y Procesamiento de Chatarra Oquendo (Calle B con Calle 10 – Ex Fundo Oquendo).
- Patio de Acopio y Procesamiento de Chatarra Huachipa (Av. Chosica, Parcela N°63 - Cajamarquilla).
- Patio de acopio y procesamiento de chatarra Trujillo (Mz. B-1 lotes 6, 7, 8, 9, 10, 11 y 12-B, Urb. Parque Industrial La Esperanza, Trujillo – La Libertad).
- Planta de clavos – Callao (Av. Argentina N° 1123, Callao – Lima).
- Centro de distribución de clavos – Callao (Av. Argentina N° 2051, Callao – Lima).
- Steel Center – Lima (Av. Argentina N° 2051 – Lima).
- Planta de tubos – Cajamarquilla (Parcelación Cajamarquilla Primera etapa, lote 37, Lurigancho – Chosica, Lima).

IV PERU AND CLIMATE CHANGE

Although it is a global environmental problem, climate change has local consequences and therefore has an impact on our economy, our society and our environment. In this way, the global reduction of greenhouse gas (GHG) emissions, which cause climate change, requires the participation of all the countries of the world. It is, then, a global collective action problem in which all nations, without exception, must, sooner or later, reduce or mitigate their GHG emissions, according to their national circumstances, regardless of the fluctuations and cycles politicians. This reality is what led the signatory countries of the United Nations Framework Convention on Climate Change (UNFCCC) to adopt and subsequently ratify the Paris Agreement.

IV.1 THE PARIS AGREEMENT

Actions aimed at reducing GHG emissions must be accompanied by caring for the population and reducing their vulnerability to the adverse impacts of climate change. This is how the objectives of the Paris Agreement are not only related to controlling the increase in global temperature, but also to the adaptation of the population to the effects of climate change. Indeed, on the one hand, it is stated that the increase in global average temperature should not be greater than 2°C and that efforts must be made so that this increase does not exceed 1.5°C; and, on the other hand, that the ability to adapt to the adverse effects of climate change should be increased, as well as foster resilience in the face of climate variability.

The Paris Agreement entered into force on November 4, 2016, when its article 21 was complied with, which establishes that it would enter into force 30 days after at least 55 countries representing 55% of total world emissions of GEI have deposited their instruments of ratification. A few months before its entry into force, on July 22, 2016, the Peruvian State had demonstrated its leadership in the region by becoming the first Spanish-American country to ratify the Paris Agreement, through Supreme Decree No. 058-2016-RE.

Likewise, Peru has to communicate periodically to the UNFCCC about the integral management that it carries out in the face of climate change. In this sense, in 2001, the country sent its First National Communication on Climate Change, which was a fundamental step in fulfilling the country's commitments under the UNFCCC. Through this document, the State informed the international community of its level of GHG emissions (based on the GHG Inventory of 1994), described the activities that influenced climate change in the sectors of Energy, Forests, Transport and Industries, and indicated the issues in which the country was particularly vulnerable. The Second National Communication on Climate Change was presented in 2010, after three years of preparation and institutional strengthening, especially thanks to the creation of MINAM in 2008. In it, the initiatives related to climate change that had been developed by public, private and civil society entities during the 10 years since the First Communication were described. The Third National Communication on Climate Change was presented in April 2016. On this occasion, the progress made in the country between 2010 and 2015 was reported, and the efforts of different actors in the incorporation of strategic objectives and national actions to achieve low carbon and climate resilient development. private organizations and civil society during the 10 years since the First Communication. The Third National Communication on Climate Change was presented in April 2016. On this occasion, the progress made in the country between 2010 and 2015 was reported, and the efforts of different actors in the incorporation of strategic objectives and national actions to achieve low carbon and climate resilient development. private organizations and civil society during the 10 years since the First Communication. The Third National Communication on Climate Change was presented in April 2016. On this occasion, the progress made in the country between 2010 and 2015 was reported, and the efforts of different actors in the incorporation of strategic objectives and national actions to achieve low carbon and climate resilient development.

The report of this Third Communication included the update of the GHG emissions inventories for the year 2010 and the results of the GHG inventories for the years 2005 and 2012. In addition, it presented a general

description of the measures formulated, adopted and implemented by the Peru for the management and planning of the reduction of GHG emissions and for adaptation to climate change, which includes the development of regulatory aspects in the different government sectors.

Currently, the Ministry of the Environment (MINAM) has the General Directorate for Climate Change and Desertification (DGCCD), which is the national authority designated to comply with the commitments that Peru has assumed with the UNFCCC and with the United Nations Convention. Nations to Combat Desertification (CNULD).

IV.2 NATIONALLY DETERMINED CONTRIBUTIONS (NDC)

Within the framework of the agreements reached at COP 20 in Lima, the invitation was reiterated and the deadline defined for each of the Parties to notify the UNFCCC secretariat of their planned and determined contributions at the national level (subsequently known as iNDC, for its acronym in English). In this sense, Peru assumed the commitments acquired and built its iNDCs based on the ongoing processes and the studies on climate change carried out since 2003. During the period of its preparation, the iNDC responded to reality and circumstances. of the country and was aligned with the two pillars under which COP 20 was conducted: a sense of urgency and a high level of ambition.

HeSeptember 12, 2015, Peru formally submitted to the UNFCCC its national proposal for the reduction of GHG emissions through its iNDCs divided into six emission sectorsbased on those used by the IPCC: Agriculture; Land Use, Change in Land Use and Forestry (USCUSS); Energy; Industrial processes; Transportation and Waste. The Transport sector, which the IPCC maintains as part of the Energy sector, was analyzed individually due to the importance of the growth of the automotive fleet, its influence on energy emissions, as well as the implications of territorial management in the construction of scenarios of mitigation.

In this way, 75 mitigation options distributed in the six emission sectors were presented, plus an additional option that represented the sum of the emission reduction potential from all sectors and that had not been specifically considered in any of the 75 options. defined. Thus, the 76 mitigation options considered in the iNDC proposal reached a total mitigation potential of 89.4 MtCO2eq.

Subsequently, as a consequence of the ratification of the Paris Agreement by the Peruvian State, the iNDCs became binding and were renamed Nationally Determined Contributions (NDCs). In this new scenario, Peru is committed to achieving a 20% reduction in GHG emissions in the year 2030, compared to the base year of 2010 and considering a Business as Usual (BaU) scenario of increased emissions. Additionally, the goal should be increased by 10%, which is conditional on international cooperation.

Peru was one of the developing countries that presented not only its contribution in terms of mitigation, but also in adaptation. This decision reflects the importance of reducing vulnerability to the impacts of climate change for Peru. The expected contribution consisted, then, of: i) the prioritization of five thematic areas affected by climate change, namely, Water, Agriculture, Forests, Health and Fisheries and aquaculture; and, ii) the contribution in terms of reducing GHG emissions of 20% in the year 2030, with an additional ambition of 10% conditional on international resources.

IV.2.1 Update of the Nationally Determined Contributions of Peru

The process for updating the NDC of Peru to the year 2030 is characterized by a commitment to increase ambition, both in mitigation and adaptation; by an effort to provide the necessary information for the purposes of clarity, transparency and understanding; by an explicit commitment to ensure methodological consistency; for the regulatory strengthening for the comprehensive management of climate change; for its articulation with the other processes undertaken by the State to achieve the development of the country, even more so in a context characterized by the consequences of the COVID-19 pandemic and economic reactivation; and for having carried out a participatory, multi-level and multi-stakeholder process

with the objective of guaranteeing the success of the process of formulating, updating and implementing the country's national contributions.

The Peruvian State undertakes that its net GHG emissions do not exceed 208.8 MtCO2eq in the year 2030 (unconditional goal). Additionally, the Peruvian State considers that GHG emissions could reach a maximum level of 179.0 MtCO2eq depending on the availability of international external financing and the existence of favorable conditions (conditional goal).

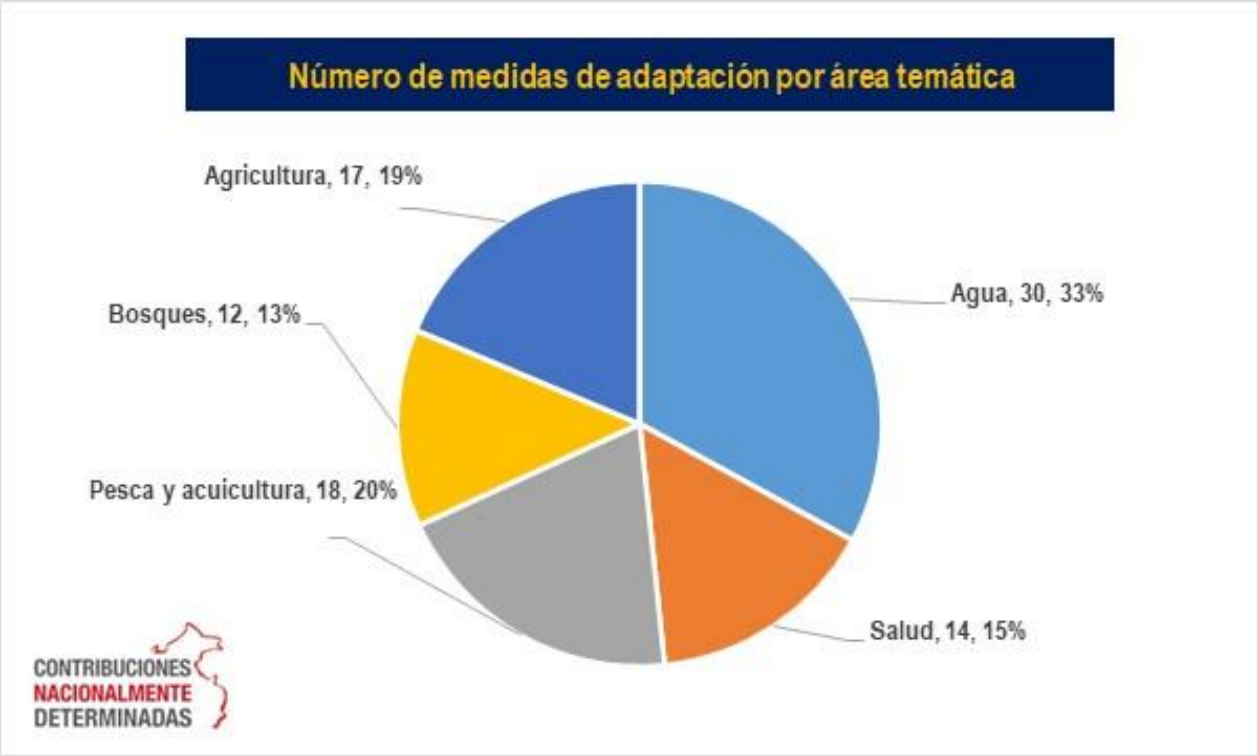
IV.2.2 Adaptation Measures

These are actions that seek to reduce and/or avoid the damage associated with climate change. The adaptation measures that are part of the NDC of the Peruvian State are organized into 5 thematic areas:

- Agriculture
- Forest
- Fishing and aquaculture.
- Health
- Water

Likewise, each thematic area is structured into components which contain the adaptation measures.

Figure 1 Adaptation Measures



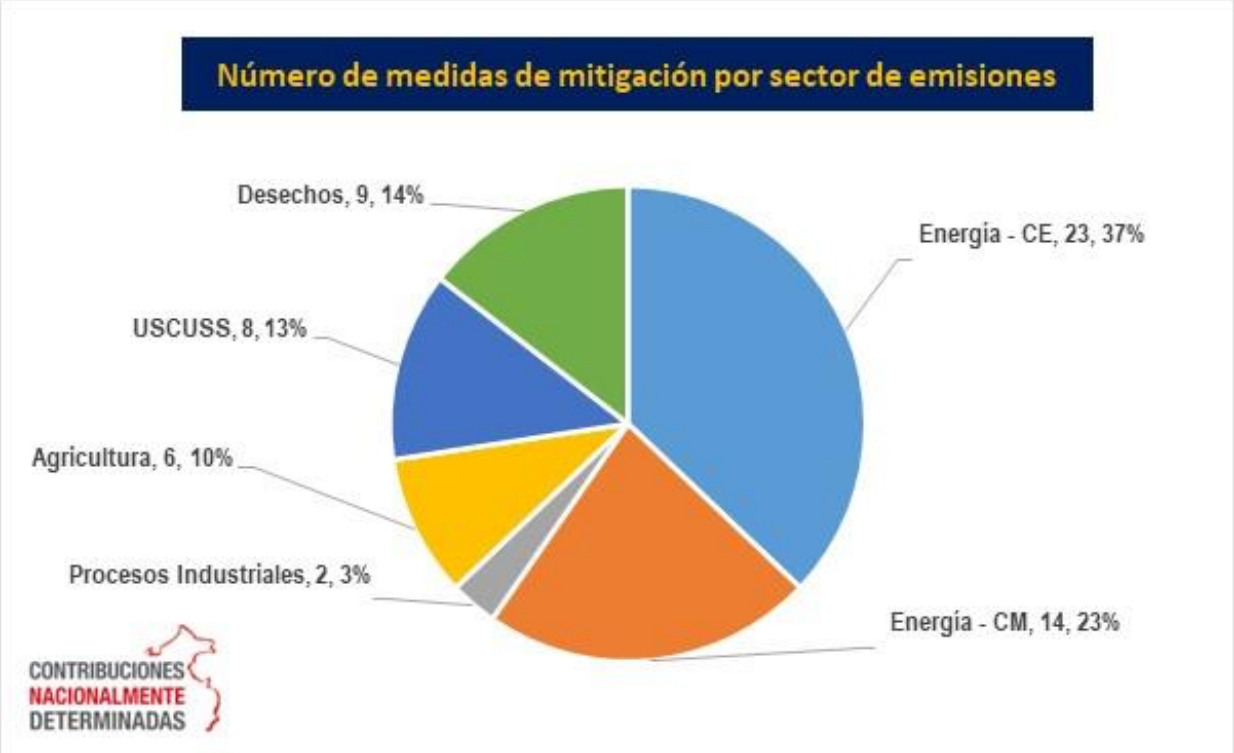
IV.2.3 Mitigation measures

These are actions that reduce emissions and increase GHG removals. The mitigation measures that are part of the NDC of the Peruvian State are organized into 5 sectors:

- Energy - stationary combustion and mobile combustion.
- Industrial processes and product use (PIUP).
- Agriculture.
- Land use, land use change and forestry (USCUSS).
- Waste.

Likewise, each thematic area is structured into components which contain the mitigation measures.

Figure 2 Mitigation measures



V CLIMATE MANAGEMENT AT CAASA

V.1 ABOUT US

We are Corporación Aceros Arequipa SA (CAASA), a leading steel company in Peru and Peruvian capital, dedicated to the manufacture, processing, marketing, distribution and sale of iron, steel, among other metals and their derivatives. We offer quality products and maintain an excellent relationship and communication with our customers for more than 58 years, which is why we position ourselves as the leading company in the Peruvian market.

We have a clear business vision, human capital, good corporate governance, technological innovation, total quality, concern for environmental care and contribution to the community.

At CAASA we generate long-term value for our shareholders and interest groups; and, to achieve this, we ensure our work under solid pillars of good corporate governance, ensuring integral management at all levels, competitive, profitable and transparent. As a company, the constant growth of our operations based on responsible management with resources and society. Our mission and vision are aligned with the context of our organization and where we want to go.

V.1.1 Mission

Offer steel solutions to our clients, through innovation, continuous improvement and human development, contributing to the growth of the country and increasing value for our shareholders and interest groups.

V.1.2 Vision

To be leaders in the Peruvian steel market, located among the most profitable in the region with an active presence in the international market.

V.1.3 Our values

We have strong corporate values that allow us to operate responsibly, achieving our business objectives and having a positive relationship with our collaborators, clients, shareholders, suppliers and other interest groups, under ethical and transparent conduct of operations.

Figure 3 Our Values

V.2 GOVERNANCE

Since 2020, there is a CAASA Sustainability Committee, made up of different leaders of the organization, whose objective is to promote the incorporation of world-class sustainability standards and promote the continuous improvement of company practices to generate value for its customers. shareholders, collaborators, clients, suppliers, environment and populations of our area of influence. This strategic and advisory body is in charge of monitoring compliance with sustainability commitments and plans, one of which is strategic planning for the management of risks and opportunities in the face of climate change. The following figure shows the members of the Sustainability Committee:

Figure 4 Members of the Sustainability Committee

Among the major achievements of the Committee and they find each other:

- Integration of the sustainability strategy by 2030.
- Closing sustainability management gaps 2022.
- Promote the incorporation of Human Rights management practices.
- Improvements in corporate policies.
- Strengthening the culture of sustainability in the company.
- Support in updating the Materiality and Mapping of Actors 2022 process.

The role of the administration in the evaluation and management of the risks and opportunities related to the climate at the entity level belongs to the Sustainability Committee and specifically to each process owner where the risks and opportunities have been identified, supported by the Manager of Strategic Management Control and professionals from the CAASA "Strategic Planning and Risk Management" area and the "Environment" area.

V.3 STRATEGY

Our Sustainability strategy was established and formalized in 2021 and seeks to place us at the forefront of good international practices and the current needs of society, the planet, and the organization. We integrate our relevant topics for the company and material topics, the organization and stakeholders, global industry trends and our contribution to the Sustainable Development Goals (SDG). Based on risk management, we seek to prevent negative impacts and/or enhance positive impacts based on the ESG pillars (environmental, social and governance).

The strategy gathers our ambitions between great axes or pillars: Solid Structure, Environmental Commitment and Shared Value. These, in turn, incorporate specific topics, long-term objectives, targets and indicators.

Figure 5 Sustainability Strategy

Our climate strategy is based on implementing adaptation and mitigation measures against climate change, with the aim of reducing the organizational carbon footprint related to direct and indirect emissions from electricity consumption, achieving carbon neutrality by 2050 in scope 1 and 2. This is how we also promote the reduction of the carbon footprint (upstream and downstream of our operations) with our main suppliers in the supply chain. Since 2020 we have a Corporate Environmental Policy, divided into eight priorities, one of them being the so-called "Actions Against Climate Change", which has the following guidelines:

- ❖ Promote adaptation and mitigation strategies against climate change, with a view to reducing the organizational carbon footprint.
- ❖ Identify, assess and manage risks related to climate change based on the organization's GIRO methodology.

- Avoid or minimize energy consumption and the emission of greenhouse gases generated by its activities.
- Establish goals to reduce greenhouse gas emissions aligned with the latest trends and standards.
- Establish a management mechanism for the use of energy and emissions, which will allow objectively measuring the evolution of performance and decision-making.
- Identify opportunities for the promotion of products and services that respect the environment, adapted to the possible impacts of climate change and that contribute to the transition to a low carbon economy.
- Use adequate and appropriate technologies for adaptation to climate change and mitigation of greenhouse gases and air pollution.

The following figure shows the environmental priorities of the Environmental Policy:

Figure 6 Axes of the Environmental Policy

V.3.1 Lobbying with the Paris Agreement

Our management system includes lobbying activities and trade association memberships. We have a Code of Ethics where the following behavior guidelines are developed:

- **With our customers and suppliers**, we demand knowledge and acceptance of our ethical principles and rigorous compliance with all current legislation and environmental standards, occupational health and safety standards, as well as respect for human rights and socially responsible practices.
- **With the state**, we comply with all laws, rules and regulations in force in the country, respecting the instances of the legal system of Peru and the country where our subsidiaries operate.
- **With society**, we maintain a respectful behavior and an attitude of dialogue, especially with the communities located in the surroundings of our operations, additionally we carry out all our operations within a framework of respect and promotion of human rights recognized by national legislation and global initiatives.

- **With the environment**, in accordance with the nature of the steel business in which CAASA develops, we respect and abide by the norms, laws and provisions on environmental matters that make up the legal system in force in Peru and in each country where we have a presence; the conventions, agreements and treaties that are pertinent and the voluntary commitments that we could contract. We are committed to promoting environmental policies based on sustainable development, reconciling the economic well-being, that of natural resources and that of society.

Specifically related to trade associations, we have our Code of Ethics for Suppliers and Contractors in which the following conducts are developed:

- **Social Conduct,** We expect our suppliers and contractors to build relationships of trust with their stakeholders based on respect and dialogue.
- **Environmental Conduct,** We expect our suppliers and contractors to protect and care for the environment, based on a prevention and management approach to its main environmental risks. They must comply with the environmental legislation that applies to them and have all the permits and licenses required to operate. Their production or service must promote an environmentally responsible culture and have internal policies and procedures that allow them to prevent and **manage its environmental risks, including the risk of climate change.** Like wise, they must stimulate the use of technology and innovation to achieve greater efficiency in the use of resources and have a better environmental performance (water, air, energy, emissions, biodiversity and waste). We also hope that our suppliers and contractors promote the recycling and reuse of waste with a circular economy approach for their main production processes. We seek the commitment to care for biodiversity and not deforestation in their environments of action.

Our "Actions Against Climate Change" that appear in the Environmental Policy are aligned with the Paris Agreement, due to this our reduction and carbon neutrality goals are proposed for the years 2030 and 2050 respectively, in addition to our risk analysis of Transition is focused on compliance with Peru's NDCs and also the opportunities that we may have in the face of State policies. Within the governance framework of our Policy, the roles and responsibilities of the Board of Directors, Sustainability Committee, Strategic Management Control Management and Process Managers and Owners are defined.

We have a membership in the National Society of Industries (SNI) within the Sustainability Committee we participate in meetings and workshops for the general public, one of our greatest achievements with this membership is that we were able to participate in COP 26 on November 2 2021 within the panel "The experience of the Permanent Driving Group of the private sector (GIP) to accelerate climate actions with a focus on Nature-Based Solutions (SBN) in Peru". One of the 5 successful experiences was our Perimetric Live Fence, in the following table we place the link of the publication made by the SNI.

We are also part of the Subcommittee on Greenhouse Gases (GHG) of the National Quality Institute (INACAL), so far we have participated in the review and proposal of the NTP-ISO 14097 Management of greenhouse gases and related activities: framework that includes principles and requirements for evaluating and reporting investments and financial activities related to climate change.

Since 2020 we have participated in the Peru Carbon Footprint program of the Ministry of the Environment, where we report our GHG emissions and our respective verifications.

The following table shows the dissemination actions of our Lobbying regarding the Paris Agreement:

Table 1 Dissemination of CAASA Lobbying regarding the Paris Agreement

Issue	Guy	Description	Evidence
Participation in INFOCARBONO	Report	CAASA reports information to INFOCARBONO for the calculation of the National GHG Inventory within the "Industrial Processes and Product Use" sector.	https://infocarbono.minam.gob.pe/annios-inventarios-nacionales-gei/ingei-2000/
Participation in the Peru Carbon Footprint Program	Report	CAASA participates in the Peru Carbon Footprint Program, reporting its inventories since the 2019 period.	https://huellacarbonoperu.minam.gob.pe/huellaperu/#/listadoInscritos/99 Acknowledgments link:https://acerosarequipa.com/pe/es/gestion-de-medio-ambiente
Participation in the National Society of Industries (SNI)	membership	CAASA participates as a speaker in training sessions open to the general public with the theme "Carbon Footprint: Measurement and Impact"	https://www.linkedin.com/posts/acerosarequipa_acerosarequipa-activity-6978798899125755904-t_D1?utm_source=share&utm_medium=member_desktop
CAASA at COP 26	membership	Our Perimetric Live Fence was exposed by the SNI and considered as a Nature-Based Solution (SBN) at COP 26.	SNI publication:https://www.linkedin.com/posts/sociedad-nacional-de-industrias_soluciones-basadas-en-la-naturaleza-activity-6865283013027213312-_xEx?utm_source=linkedin_share&utm_medium=android_app CAASA Publication: https://www.linkedin.com/posts/acerosarequipa_corporaci%C3%B3n-aceros-arequipa-en-la-cop26-activity-6863846672439611392-H6rY?utm_source=linkedin_share&utm_medium=android_app
Internal training: Conservation of	Training	CAASA has an Environmental Awareness Program for	https://youtu.be/UopQV3Eygog

Biodiversity in CAASA		collaborators which is developed quarterly and covers different topics, on this occasion the following was addressed: Conservation of Biodiversity.	
Internal training: Carbon Footprint at CAASA	Training	CAASA has an Environmental Awareness Program for collaborators which is developed quarterly and covers different topics, on this occasion the following was addressed: Carbon Footprint in CAASA.	https://www.youtube.com/watch?v=GStZg-E74bo
Subcommittee on Greenhouse Gases (GHG) of the National Quality Institute (INACAL)	Representation	CAASA belongs to the INACAL GHG Subcommittee and has participated in the formulation of the proposal for NTP-ISO 14097 Management of greenhouse gases and related activities: framework that includes principles and requirements to evaluate and report investments and financial activities related to the climate change.	https://www.gob.pe/institucion/inacal/institucional

Source: self made.

V.4 RISK AND OPPORTUNITY MANAGEMENT

V.4.1 Identification

At CAASA we identify transition risks and physical risks in the face of climate change. This involves the review or exchange of ideas of the current and future situation of the steel sector and of the CAASA value chain.

V.4.2 Analysis and Evaluation

For transition risks, we carry out an analysis of scenarios related to compliance with the Nationally Determined Contributions (NDC) and what is proposed by the International Energy Agency (IEA); and for physical risks we use the analysis of the Representative Concentration Pathways (RCP) from the fifth report of the IPCC. And to quantify the risks and opportunities we use the GIRO methodology.

V.4.3 Response Plan

After the analysis and evaluation of risks and opportunities, at CAASA we develop and update the Climate Change Adaptation Plan in which we plant short, medium and long-term response actions against the thematic axes of Emergencies and Water. We also developed and updated our Decarbonization Plan with a horizon of 2050.

V.4.4 Follow-up

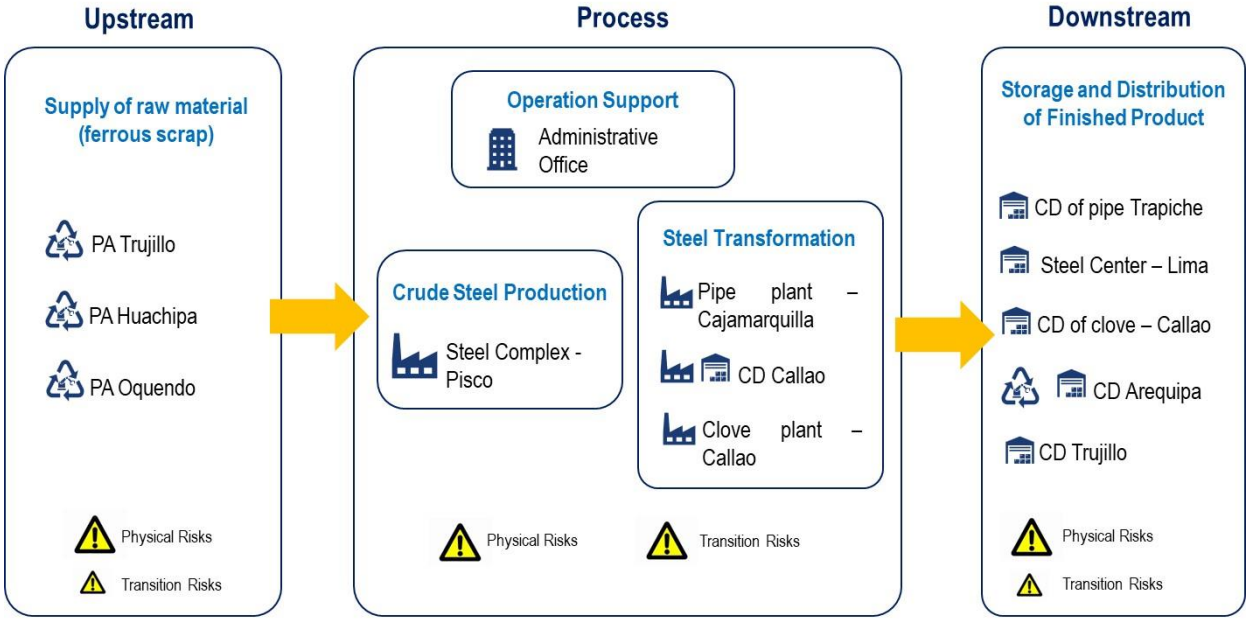
Our general objective is to adequately manage the risks and opportunities in the face of climate change. At this stage, we review compliance with the different initiatives aimed at reducing vulnerability, water

consumption, GHG emissions, energy consumption and the use of Industrial By-products that have a direct impact on the Adaptation Plan and the Decarbonization Plan for CAASA.

In Chapter VI Analysis Methodology and VII Analysis of Risks and Opportunities Faced with Climate Change, each of the four stages of CAASA's Risk and Opportunity Management will be deepened.

The following figure shows the scope of our risk management upstream and downstream of our production processes:

Figure 7 CAASA Climate Risk Management Scope



PA: Scrap Yard.
CD: Center of Distribution.

Source: self made.

V.5 OBJECTIVES AND METRICS

V.5.1 General objective

- Adequately manage the risks and opportunities in the face of climate change.

V.5.2 Specific objectives

- Reduce the vulnerability of our headquarters, implementing response actions in the short, medium and long term.
- Reduce water consumption to 1.30 m3/t of finished product by 2030.
- Reduce corporate greenhouse gas (GHG) emissions by 15% by 2030.
- Reduce electricity consumption to 620 kWh/t of finished product by 2030.
- Reach 60% use of industrial by-products (SPIs) generated by 2030.

V.5.3 Follow-up

The following table shows the results of our main metrics:

Table 2 Metric Tracking

Metrics	Unit	Period				Goal (2030)	Goal (2050)
		2019	2020	2021	2022		
Water consumption per finished product	m3/t finished product	1.41	1.41	1.31	1.47*	1.30	---
GHG emissions per finished product [1]	tCO2e/ t finished product	0.33	0.32	0.31	0.37*	0.23	0.11
GHG emissions from liquid steel	t CO2e/ t liquid steel	0.38	0.38	0.39	0.35	0.26	0.11
GHG emissions from liquid steel (WE)[2]	t CO2e/ t liquid steel	0.68	0.63	0.66	0.47	---	---
Organizational carbon footprint (Scope 1 + Scope 2)	tCO2e	321426.00	240607.00	350480.00	418374.00	85% of baseline	10% of baseline
Carbon footprint (Scope 3)	tCO2e	130152.00	137335.00	281773.00	289979.00	---	20% of baseline
Electricity consumption per finished product	kWh/t	661.34	646.49	630.69	752.00*	620.00	---
Leverage of industrial by-products	%	37.8	52.0	40.0	24.4	60.00	---

[1] **The numerator tons are the sum of scope 1 and scope 2 of all CAASA operations.**
[2] **The calculation is developed with the methodology of Worldsteel Association.**

* In CAASA we have a rolling capacity of 1.1 million tons of billets per year. In the years 2019, 2020 and 2021 we had a liquid steel production of 882,696 t, 629,420 t and 995,916 t respectively, which were complemented with imports of billets to cover rolling capacity (except in 2020 due to the Covid 19 Pandemic) and meet market demand. Today we have matched our rolling capacity with the production of liquid steel. This has had an impact on our indicators because the accounting of the ratios of previous years did not consider the consumption of water and energy, and GHG generation of imported billets. We are currently evaluating the units of these indicators, taking into account that now, having increased our production capacity of liquid steel and consequently the decrease in the dependence on billet imports, allows us to have more representative inventories of direct scope for each one of the indicators.

VI ANALYSIS METHODOLOGY

Our methodology focuses on classifying risks and opportunities in the face of climate change taking into account what is proposed by the Task Force on Climate – Related Financial Disclosures (TCFD), which can be transition risks or physical risks; as a second step we identify possible scenarios, for transition risks we will use the probability of compliance with the Peruvian NDCs and for physical risks the Representative Concentration Pathways (RCP) considered by SENAMHI; and finally we use the GIRO methodology to assess the risks in the different scenarios. Next, we detail the stages of our methodology:

VI.1 IDENTIFICATION

The Task Force on Weather-Related Financial Disclosures (hereinafter TCFD) development guidance for voluntary and consistent weather-related financial disclosures that are helpful to investors, lenders, and insurance underwriters in understanding material risks. TCFD structured its recommendations around four thematic areas that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and objectives.. The four General recommendations are supported by recommended disclosures that build the framework with information that will help investors and others understand how reporting organizations assess climate-related risks and opportunities.

The main objective of the TCFD is to determine the real price of financial assets, adjusting the effect that the consequences of climate change may potentially have on it. Therefore, the desired result is the quantification of the financial impacts on its balance sheet, income statement and cash flows derived from the organization's strategic response to climate risks and opportunities.

At CAASA, for the identification of risks and opportunities, we consider the classification proposed by the TCFD, below, we make a brief description of each of them:

VI.1.1 Weather-Related Risk Classification

Climate-related risks fall into two main categories: (1) risks related to the transition to a low-carbon economy and (2) risks related to the physical impacts of climate change.

VI.1.1.1 Transition Risks

The transition to a low carbon economy may involve major changes in policies, legislation, technology and the market to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed and focus of these changes, transition risks can pose different levels of risk to organizations.

A Political and Legal Risk

Policy actions around climate change continue to evolve, their objectives generally fall into two categories: policy actions that attempt to limit actions that contribute to the adverse effects of climate change, or policy actions that seek to promote adaptation to climate change. Examples include implementing carbon pricing mechanisms to reduce GHG emissions, shifting energy use to lower-emitting sources, adopting energy-efficient solutions, encouraging greater water-efficiency measures, and promoting more sustainable land use practices. The associated risk and financial impact of policy changes depend on the nature and timing of the policy change.

Another major risk is litigation or legal risk. Recent years have seen an increase in climate-related litigation lawsuits being filed in court by property owners, municipalities, insurers, shareholders, and public interest organizations. Reasons for such litigation include organizations' failure to mitigate the impacts of climate change, failure to adapt to climate change, and insufficient information about material financial risks. As the value of loss and damage from climate change increases, the risk of litigation is likely to increase as well.

B Technological Risk

Technological improvements or innovations that support the transition to an economic system with low carbon emissions and energy efficiency can have a significant impact on organizations. For example, the development and use of emerging technologies with renewable energy, battery storage, energy efficiency, and carbon capture and storage will affect the competitiveness of certain organizations, their production and distribution costs, and ultimately, demand. of its end-user products and services.

C Market risk

Although the ways in which markets could be affected by climate change are variable and complex, one of the main ones is through changes in the supply and demand of certain products and services, since the risks and opportunities related to the climate are increasingly taken into account.

D Reputational Risk

Climate change has been identified as a potential source of reputational risk linked to changing customer or community perceptions of an organization's contribution to or detraction from the transition to a low carbon economy.

VI.1.1.2 Physical Risks

Physical risks resulting from climate change can be driven by events (acute) or longer-term (chronic) changes in weather patterns. Physical risks can have financial implications for organizations, such as direct damage to assets and indirect impacts of supply chain disruption. The financial performance of organizations can also be affected by changes in the availability, supply and quality of water, food security; and external temperature changes that affect organizations' facilities, operations, supply chain, transportation needs, and employee safety.

A Acute Risk

Acute physical risks refer to those that are event-driven, including increased severity from external weather events, such as cyclones, hurricanes, or floods.

B Chronic Risk

Chronic physical hazards refer to longer-term changes in weather patterns (for example, sustained higher temperatures) that can cause chronic sea level rise or heat waves.

VI.1.2 Classification of Weather Related Opportunities

Efforts to mitigate and adapt to climate change also create opportunities for organizations, for example through resource efficiency and cost savings, adoption of low-emission energy sources, development of new products and services. , access to new markets and building resilience throughout the supply chain.

VI.1.2.1 Resource Efficiency

There is growing evidence and examples of organizations that have managed to reduce operating costs by improving efficiency in their production and distribution processes, buildings, machinery/appliances and transport/mobility, particularly in relation to energy efficiency, but also including more spacious, water and waste management. Innovation in technology is helping this transition. Such innovation includes developing efficient heating solutions and circular economy solutions, advancing LED lighting technology and industrial motor technology, retrofitting buildings, using geothermal energy, offering water use and treatment solutions, and developing electric vehicles.

VI.1.2.2 Power source

According to the International Energy Agency (IEA), to meet global emissions reduction targets, countries should make a major transition of their power generation to low-emission alternatives such as wind, solar, tidal, hydroelectric, geothermal, nuclear , biofuels and carbon capture and storage. The trend toward decentralized clean energy sources, rapidly decreasing costs, improved storage capacities, and the subsequent global adoption of these technologies are significant.

VI.1.2.3 Products and services

Organizations that innovate and develop new low-emission products and services can improve their competitive position and capitalize on changing consumer and producer preferences. Some examples include consumer goods and services that place greater emphasis on a product's carbon footprint in their marketing and labeling (for example, travel, food, beverage and consumer staples, mobility, print, fashion, and recycling services). and producer goods that emphasize emission reduction (for example, adoption of energy efficiency measures throughout the supply chain).

VI.1.2.4 Markets

Organizations that proactively seek opportunities in new markets or asset types can diversify their activities and better position themselves for the transition to a low carbon economy. In particular, there are opportunities for organizations to access new markets by collaborating with government, development banks, local small-scale entrepreneurs and community groups in developed and developing countries as they work to shift to a low carbon economy.

VI.1.2.5 Resilience

The concept of climate resilience implies that organizations build adaptive capacity to respond to climate change to better manage associated risks and take advantage of opportunities, including the ability to respond to transition risks and physical risks. Resilience-related opportunities may be especially relevant for organizations with long-lived fixed assets or extensive supply or distribution networks; those that are critically dependent on public service networks and infrastructure or on natural resources in their value chain; and those that may require longer-term financing and investment.

In the following table we present examples of the classification of risks and their potential financial impacts:

Table 3 Examples of Weather-Related Risks and Potential Financial Impacts

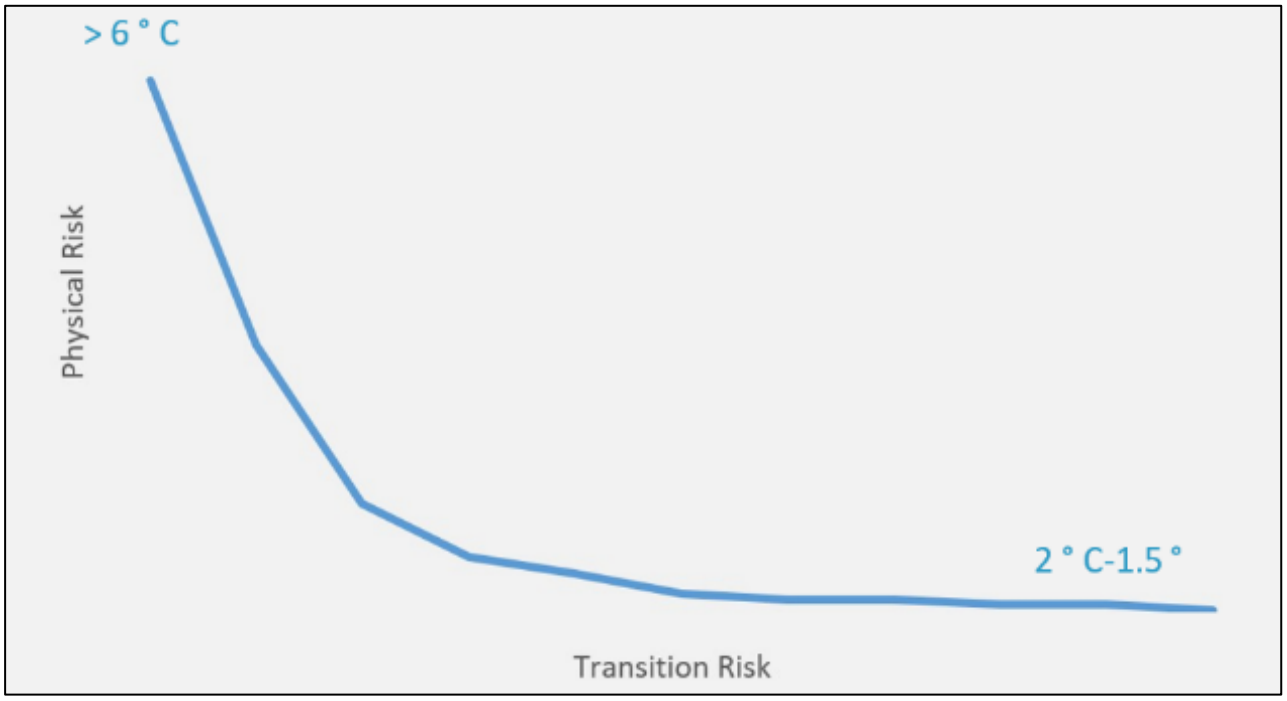
Risk Type		Potential Financial Impacts
Transition Risks		
Political and Legal (PL) 	⚠ Higher price of GHG emissions. ⚠ Obligations to report improvements in GHG emissions. ⚠ Mandates and regulation of existing products and services. ⚠ Exposure to litigation	Increased operating costs (for example, higher compliance costs, higher insurance premiums). Write-offs, impairment of assets, and early retirement of existing assets due to policy changes. Increased costs and/or reduced demand for products and services as a result of fines and lawsuits.
Technology (Tea) 	⚠ Substitution of existing products and services with lower emission options. ⚠ Failed investment in new technologies. ⚠ Costs of transition to low emission technology.	Cancellations and early retirement of existing assets Reduced demand for products and services. Research and development (R&D) expenses on new and alternative technologies. Capital investments in technological development. Costs to adopt/implement new practices and processes.

Market (I)	⚠ Change on customer behavior. ⚠ Uncertainty in market signals. ⚠ Increased cost of raw materials.	Reduced demand for goods and services due to changing consumer preferences. Increased production costs due to changes in input prices (eg energy, water) and production requirements (eg waste treatment). Abrupt and unexpected changes in energy costs. Change in revenue mix and sources, resulting in decreased revenue. Asset price change (eg, fossil fuel reserves, land valuations, stock valuations).
Reputation (Re)	⚠ Changes in consumer preferences. ⚠ Stigmatization of the sector. ⚠ Increased concern from stakeholders or negative feedback from stakeholders.	Reduction in income due to decreased demand for goods / services. Reduced revenue from negative impacts on workforce management and planning (for example, employee attraction and retention). Reduced availability of capital
Physical risks		
Sharp (TO)	⚠ Increased severity of extreme weather events such as cyclones and floods.	Reduced revenue from decreased production capacity (eg, transportation difficulties, supply chain disruptions). Reduced revenue and higher costs from negative workforce impacts (eg, health, safety, absenteeism). Write-offs and early retirement of existing assets (for example, property damage and assets in "high risk" locations). Increased operating costs (for example, inadequate supply of water for hydroelectric plants or to cool nuclear and fossil fuel plants). Increased capital costs (eg, damage to facilities). Reduction in income due to lower sales / production. Increased insurance premiums and potential for reduced availability of insurance on assets in "high risk" locations.
Chronic (C)	⚠ Changes in precipitation patterns and extreme variability in weather patterns. ⚠ Increase in average temperatures. ⚠ Rising sea levels.	

Source: TCFD (Task Force on Climate – Related Financial Disclosures).

As described above, it is likely that lower transition risk will result in higher levels of physical risk from climate change. The following figure shows the behavior of the two types of risks with respect to their impact directly related to the increase in temperature.

Figure 8 Behavior of Transition and Physical Risks



Source: TCFD (Task Force on Climate – Related Financial Disclosures).

VI.2 ANALYSIS AND EVALUATION

VI.2.1 Scenario Analysis

To identify the possible external events that may impact the achievement of our objectives, we carry out an analysis of the environment where we operate. For transition risks, we have considered compliance with the Peruvian NDCs, the APS and NZE 2050 of the International Energy Agency (IEA) as scenarios equal to or less than 2 °C; and for a scenario above 2°C we are considering the STEPS of the IEA.

For physical risks, the RCP scenarios of IPCC AR5 have been taken into account, considering only scenarios above 2°C, which are: RCP 4.5 and RCP 8.5.

Below, we describe the exposure scenarios of transition and physical risks considered:

VI.2.1.1 Exposure to Transition Risks

A key type of transition risk scenario is the so-called 2°C scenario, which sets out an emissions path and trajectory consistent with keeping the increase in global mean temperature to 2°C above pre-industrial levels. A 2°C scenario provides a common reference point that is generally aligned with the goals of the Paris Agreement and will support investors' assessment of the potential magnitude and timing of transition-related implications for individual organizations; in different organizations.

A Formulation of Scenarios for Transition Risks Considering the NDC

At CAASA, one of the analyzes we are using is qualitative, related to compliance with Peru's Nationally Determined Contributions (NDC), since it is based on national policy considerations regarding what constitutes a practical and solid path towards a low carbon economy. in light of energy security requirements. We have proposed four scenarios, Transformation, Coordination, Fragmentation (Lower Damages) and Fragmentation (Higher Damages) that collectively represent a reasonable range of potential results against compliance with the Peruvian NDCs. In the following tables we describe each scenario:

Table 4 Transformation Scenario

Description:100% compliance with proposed NDCs by 2030. Ambitious and stringent climate change policies and mitigation action put the world on the path of limiting global warming to 1.5°C above pre-industrial temperatures by the end of 2030.
Climate Outlook
The most ambitious of the four scenarios considered in this study in terms of climate policy. This scenario is the critical benchmark: from a scientific perspective, it increases the chances of avoiding dangerous climate change, with an international climate policy that supports the transformation to a low-carbon economy. However, some believe this scenario is already "off the table" as policy makers have not reacted fast enough to date, and many promises to reduce emissions are not being followed up on enough. For transformation to occur, time is undoubtedly of the essence and the results of the Paris Agreement negotiations have certainly increased its likelihood.
Investor Perspective
When change is rapid, short-term and significant, investors who have not considered the risks and opportunities posed by action on climate change may be caught off guard. A transformation scenario could cause significant market volatility in the short term. Investors who have considered the risks and opportunities posed by climate change should be well positioned relative to those who have not considered those risks and are expected to benefit from first-mover advantage relative to their peers.

Source: self made.

Table 5 Coordination Scenario

Description: Compliance with NDCs between 50% and below 100% by 2030. Climate change policy and mitigation actions are aligned and coherent, keeping warming to 2.0°C above pre-industrial temperatures by the end of 2030.
Climate Outlook
While not as ambitious as the transformation, this scenario assumes a well-defined and coordinated policy response to reduce emissions by 2030.
Investor Perspective
When change is more measured and anticipated, investors have more time to react and position their portfolios accordingly. Early movers would be expected to benefit in the shorter term as the policy response becomes increasingly apparent to the broader market. However, investors should be careful that policy transparency is not confused with adequacy in terms of the scale of ambition, as this could cause investors to underestimate the economic damages associated with the long-term impacts of change. climate.

Source: self made.

Table 6 Fragmentation Scenario (Lower Damage)

Description: Compliance with NDCs between 30% and 50% by 2030. Limited climate action and lack of coordination cause warming to exceed 2°C from pre-industrial temperatures by the end of 2030.
Climate Outlook
This scenario assumes a fragmented policy response (both by region and by ambition) with limited further action from the policy arrangements currently in place.

Investor Perspective
If the policy response is different in terms of commitment and timing, it creates a higher level of uncertainty for investors. In the short term, a lack of political action could mislead investors into a false sense of security that it is business as usual, from a longer-term perspective, investors cannot afford to become complacent about structural economic change. and the politics of emerging markets. Investors who have a better understanding of potentially divergent responses are likely to be better able to tailor their investment strategy by anticipating regional differences and positioning their portfolios accordingly.

Source: self made.

Table 7 Fragmentation Scenario (High Damage)

Description: Compliance with NDCs below 30%. Limited climate action and a lack of coordination cause warming to increase to 4°C or more from pre-industrial temperatures by 2030. The physical impacts of this warming are being felt most severely.
Climate Outlook
In this scenario, CO2 continues to be emitted without any control and the political response such as fragmentation (higher damage) increases the possible physical impacts of climate change.
Investor Perspective
In addition to the considerations highlighted for the Fragmentation (Lower Damages) scenario, investors with exposure to investments that are expected to be more sensitive to the physical impacts of climate change should carefully monitor the risks posed by climate change (particularly when investments are not liquid).

Source: self made.

CAASA-related NDCs are shown in the following table:

Table 8 CAASA Related NDCs

CAASA Related NDCs
Adaptation NDC
Water **A1:** Modernization of the granting of water use rights in vulnerable basins incorporating climate scenarios.
Mitigation NDC
Energy – Stationary Combustion **E1:** Renewable energy mix. **E2:** Cogeneration. **E3:** Energy efficiency in the industrial sector. **E4:** Use of fuels derived from residues as a substitute for fossil fuels in clinker production kilns (This measure was considered since CAASA has rotary kilns in which it can also do co-processing, manufacturing alternative fuel with shredder residues). **E5:** Energy efficiency through comprehensive interventions in the industrial manufacturing sector.

- **E6:** Promotion of sustainable construction in new buildings (This average was considered since within the construction materials of sustainable buildings the construction bar that qualifies in the credits of materials and resources of the LEED criteria is also used).

Energy – Mobile Combustion

- **E7:** Implementation of the Complementary Corridors of the Integrated Transport System of Lima.
- **E8:** Implementation of Lines 1 and 2 of the Lima and Callao Metro.
- **E9:** Promotion of the use of cleaner fuels
- **E10:** Promotion of electric vehicles nationwide (This measure was considered because CAASA outsources the transportation service for employees of the Pisco headquarters).
- **E11:** Efficient driving training for professional drivers.
- **E12:** National Program for Vehicle Scrap and Renovation.
- **E13:** Project "Construction of the Trans-Andean Tunnel".
- **E14**: Improvement of the railway transport service in the Tacna – Arica section.
- **E15:** Comprehensive rehabilitation of the Huancayo – Huancavelica railway.

Industrial Processes and Product Use

- **M1:** Substitution of clinker to reduce the clinker/cement ratio by producing added cements (This measure was taken into account because CAASA generates steel slag, which is one of the materials proposed to replace clinker).
- **M2:** Replacement of refrigerants with alternatives with lower global warming potential.

Source: self made.

B Formulation of Scenarios for Transition Risks Considering IEA Publications

Since 1993, the IEA has provided medium- and long-term energy projections using an ever-evolving set of world-leading and detailed modeling tools. First, the World Energy Model (WEM) was developed, a large-scale simulation model designed to reproduce the functioning of energy markets. A decade later, the Energy Technology Perspectives (ETP) model, a technology-rich bottom-up model, was developed for use in parallel with the WEM. In 2021, the IEA first adopted a new hybrid modeling approach that builds on the strengths of both models to develop the world's first comprehensive study on how to transition to a net zero CO2 emissions power system for the 2050.

Since then, the IEA has worked to develop a new integrated modeling framework: the IEA Global Energy and Climate (GEC) Model. As of 2022, this model is the main tool used to generate detailed sector-by-sector and region-by-region long-term scenarios in IEA publications.

WEO-2022 and ETP-2023, basedin the GEC integrated modeling cycle, explore three scenarios, which areton Fully updated to include the latest energy market and cost data. The 2050 Net Zero Emissions (NZE) Scenario is normative in that it is designed to achieve specific outcomes: an emissions trajectory consistent with keeping temperature rise below 1.5°C by 2100 (with 50% probability) , universal access to modern energy services and significant improvements in air quality, and shows a way to achieve it. The Announced Commitment Scenario (APS) and Stated Policy Scenario (STEPS) are exploratory, in the sense that they define a set of initial conditions, such as policies and goals, and then see where they lead based on model representations of energy systems, including market dynamics and technological progress.

Table 9 IEA Scenarios

Net Zero Emissions Scenario by 2050 (NZE)	Announced Commitment Scenario (APS)	Stated Policy Scenario (STEPS)
Description: It is a scenario that sets a path for the global energy sector to reach net zero CO2 emissions by 2050. It does not depend on emission reductions outside the energy sector to achieve its targets. Universal access to electricity and clean cooking are achieved by 2030.	**Description:** It is a scenario that assumes that all climate commitments made by governments around the world, including nationally determined contributions. (NDC) and longer-term net zero emissions targets, as well as targets for access to electricity and clean cooking, will be met in full and on time.	**Description:** A scenario that reflects the current policy configuration on a sector-by-sector and country-by-country basis, with assessment of the specific policies that are in place, as well as those that have been announced by governments around the world.
Aim: Show what is needed in major sectors by various actors, and by when, for the world to achieve net zero carbon-related CO2 emissions industrial process and energy by 2050, while other sustainable energy-related requirements, such as the sustainable development goals (SDGs) associated with universal access to energy.	**Aim:** To show how close current pledges come to the goal of limiting global warming to 1.5°C, it highlights the "ambition gap" that must be closed to achieve the targets agreed in Paris in 2015. It also shows the gap between targets and achieve universal access to energy.	**Aim:** Provide a reference point to assess potential achievement (and limitations) of the latest energy and climate policies.

Source: IEA, Global Energy and Climate Model.

In the following tables and figures we show the important points of the IEA scenarios, which could have a direct impact on CAASA:

Table 10 Carbon Price of Electricity, Industry and Energy Production in Selected Regions by Scenario

Price (US$/t CO2)	2030	2040	2050
STEPS scenario			
Canada	54	62	77
Chile, Colombia	13	twenty-one	29
China	28	43	53
European Union	90	98	113

Korea	42	68	89
PHC scenario			
Advanced economies with net zero emission pledges.	135	175	200
Emerging market and developing economies with net zero emissions pledges	40	110	160
Other emerging market and developing economies	---	17	47
NZE 2050 scenario			
Advanced economies with net zero emission pledges.	140	205	250
Emerging market and developing economies with net zero emissions pledges	90	160	200
Other emerging market and developing economies	25	85	180

Source: Adapted from IEA, Global Energy and Climate Model.

The Carbon Price criterion is a transition measure that has not yet taken place in Peru, but for our analysis we will be taking into account the experience of Chile and Colombia. Regarding the APS and NZE scenarios, we assume that we are in an emerging and developing market economy with promises of net zero emissions, taking into account the latest commitments that the Peruvian State has assumed in 2021.

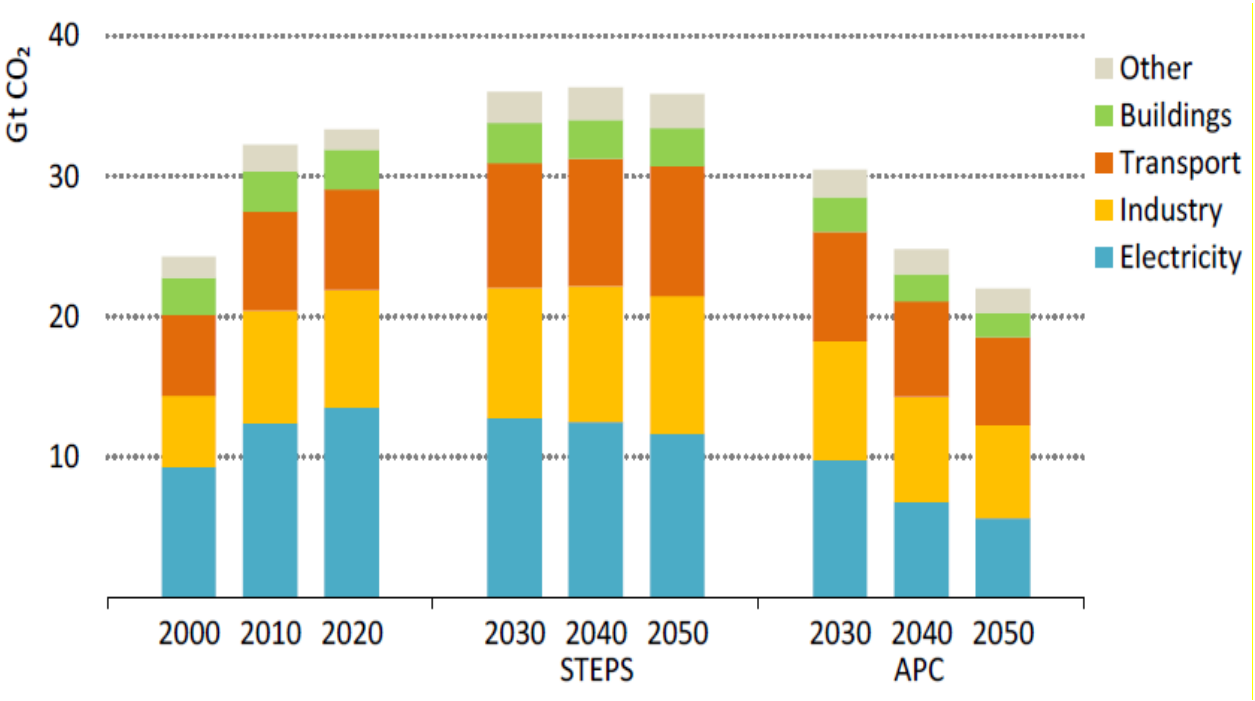
Table 11 Capital Costs for Selected Technologies by Scenario

	2021	STEPS scenario		APS scenarios		NZE 2050 scenario	
		2030	2050	2030	2050	2030	2050
Primary steel production (US$/ ton per year)							
Conventional	640	650	660	650	670	650	680
Innovative	n/a	1400	1050	1330	980	1020	910

Source: Adapted from IEA, Global Energy and Climate Model.

Note: This statement is referential because the IEA considers the integrated blast furnace technology as primary steel production, and the electric arc considers it as secondary production. This classification is due to its participation in world steel production.

Figure 9 Global CO2 Emissions by Sector in STEPS and APS Scenarios



Source: Adapted from IEA, Net Zero by 2050.

Figure 10 Total Energy Supply by Source in STEPS and APS Scenarios

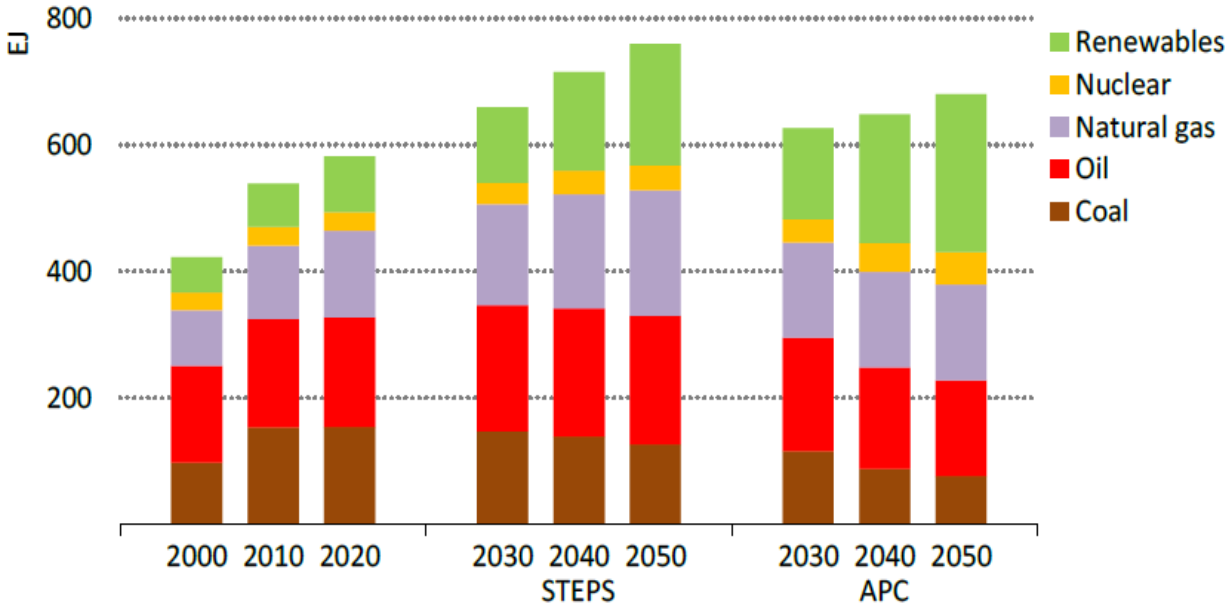
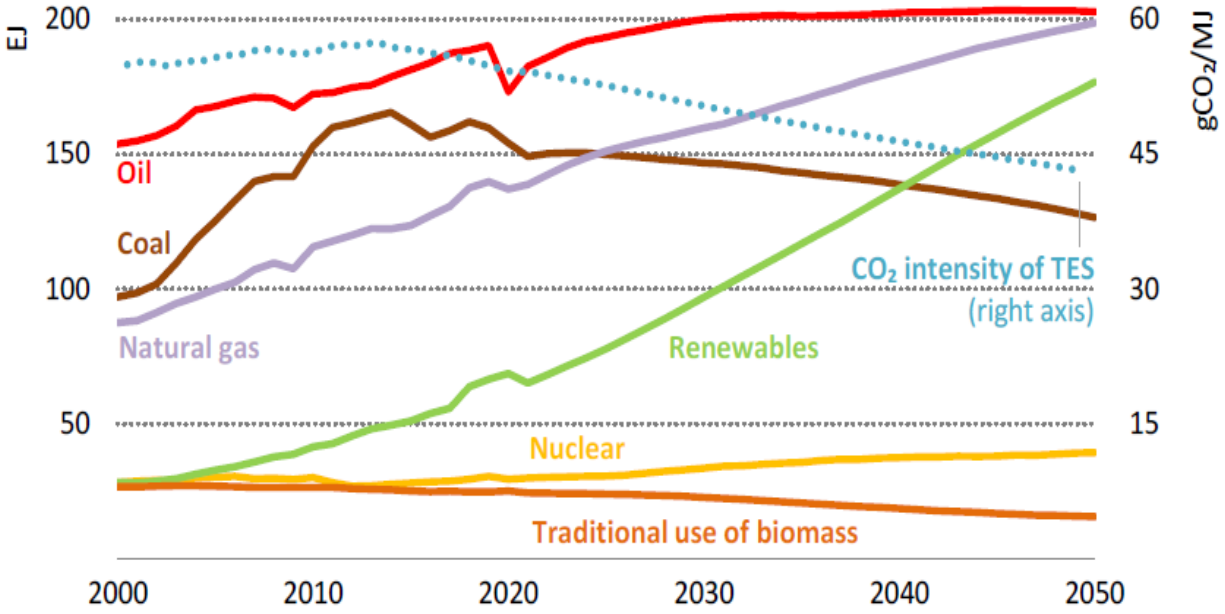
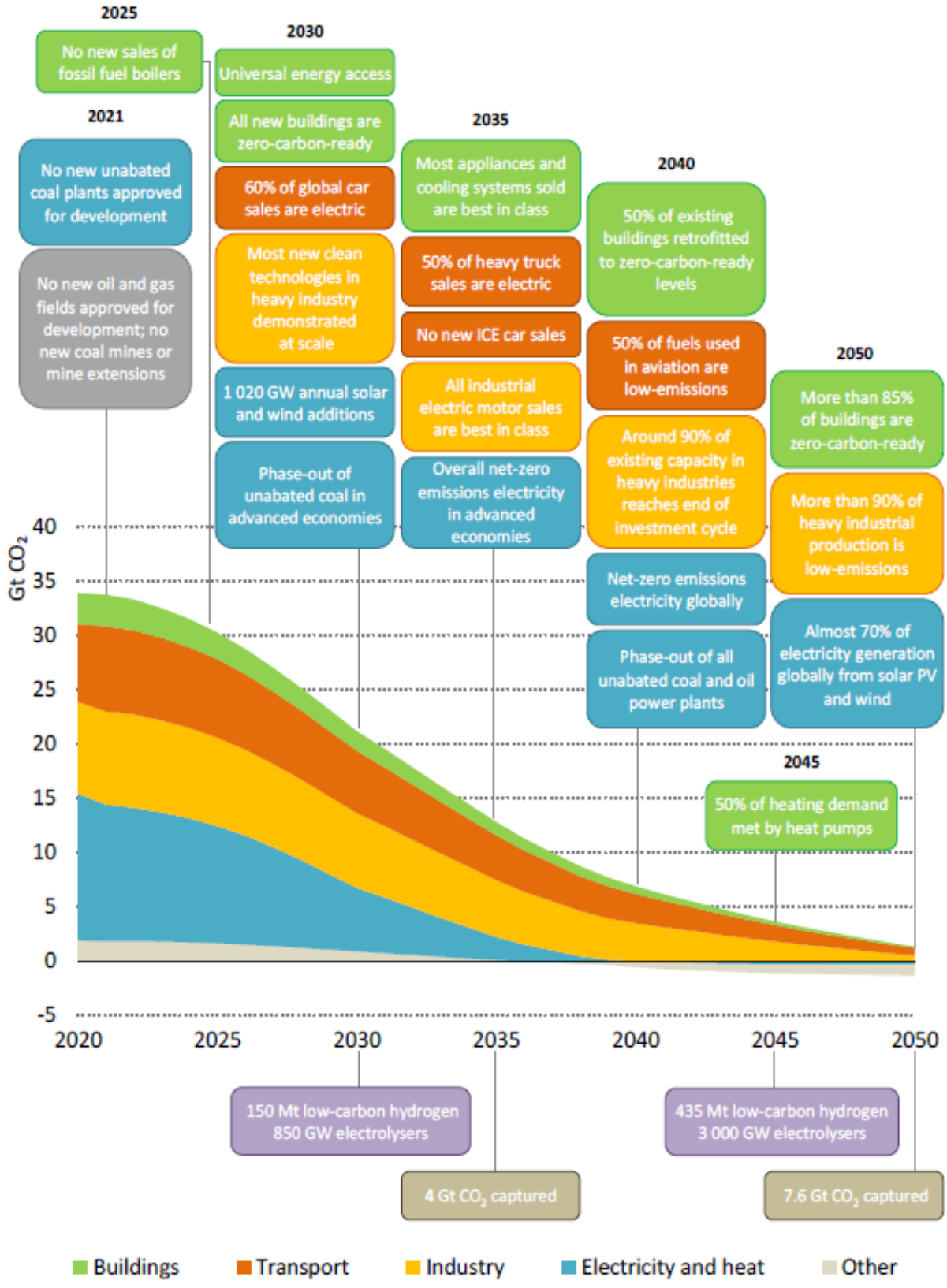


Figure 11 Total Energy Supply and CO2 Emissions Intensity in the STEPS Scenario



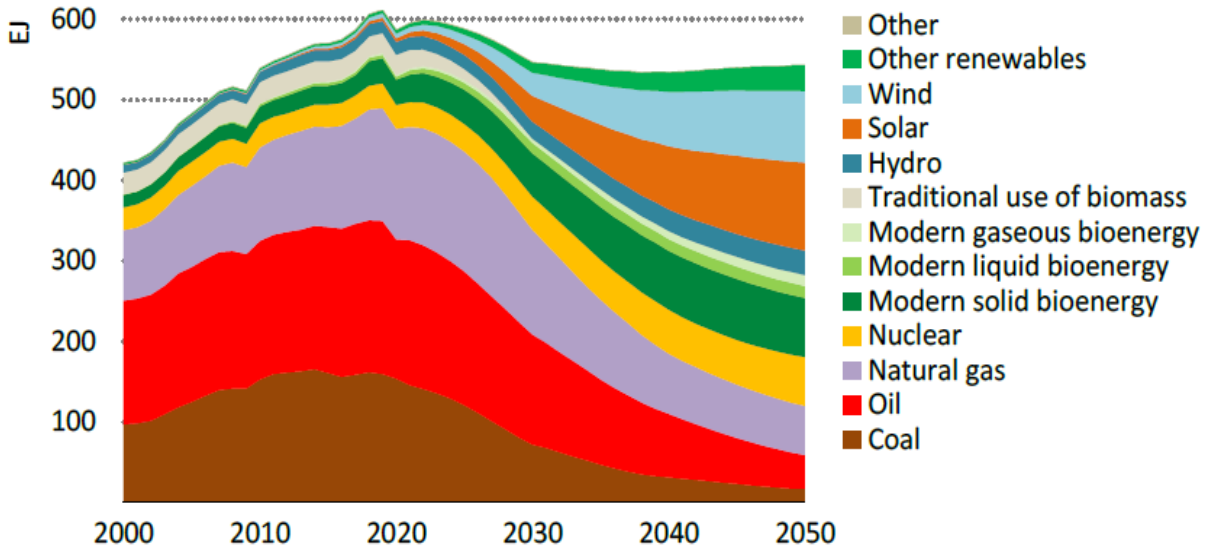
Source: Adapted from IEA, Net Zero by 2050.

Figure 12 Key Milestones Toward Net Zero



Source: Adapted from IEA, Net Zero by 2050.

Figure 13 Total power supply in the NZE Scenario



Source: Adapted from IEA, Net Zero by 2050.

Table 12 Key Global Milestones for the Electrification of the NZE 2050 Scenario

Sector	2020	2030	2050
Industry: Proportion of steel production using electric arc furnace	24%	37%	53%

Source: Adapted from IEA, Net Zero by 2050.

VI.2.1.2 Exposure to Physical Risks

Physical climate-related scenarios are particularly relevant for organizations exposed to acute or chronic climate change, such as those with: long-lived fixed assets; locations or operations in climate-sensitive regions (for example, coastal and flood zones); dependence on water availability; and value chains exposed to the above.

At CAASA, the analysis we are using takes as a reference the RCP scenarios, which are the latest generation of scenarios that provide information to the climate models that support the fifth IPCC report (AR5). These scenarios describe the climate impacts of a range of possible future GHG emissions and the consequent trajectories of atmospheric GHG concentrations. RCP scenarios fix the amount of GHG concentration in the atmosphere and analyze the resulting changes in global temperatures (and other variables such as precipitation) at various points in the future (i.e., through 2035, mid-century from 2046 to 2065, and at turn of the century from 2081 to 2100) relative to pre-industrial levels.

A Formulation of Scenarios for Physical Risks

Radiative forcing is the change in the net flux of radiative energy to the Earth's surface measured at the upper edge of the troposphere (about 12,000 m above sea level) as a result of internal changes in the composition of the atmosphere. , or changes in the external contribution of solar energy.

Positive radiative forcing means that the Earth receives more energy from sunlight than it radiates into space. This net energy gain will cause warming.

The AR5 RCP scenarios are characterized by their approximate calculation of the total radiative forcing for the year 2100 relative to 1750. The four RCP scenarios include a GHG emissions mitigation scenario leading to a very low level of forcing (RCP2,6); two stabilization scenarios (RCP4.5 and RCP6.0), and a scenario with a very high GHG level (RCP8.5).

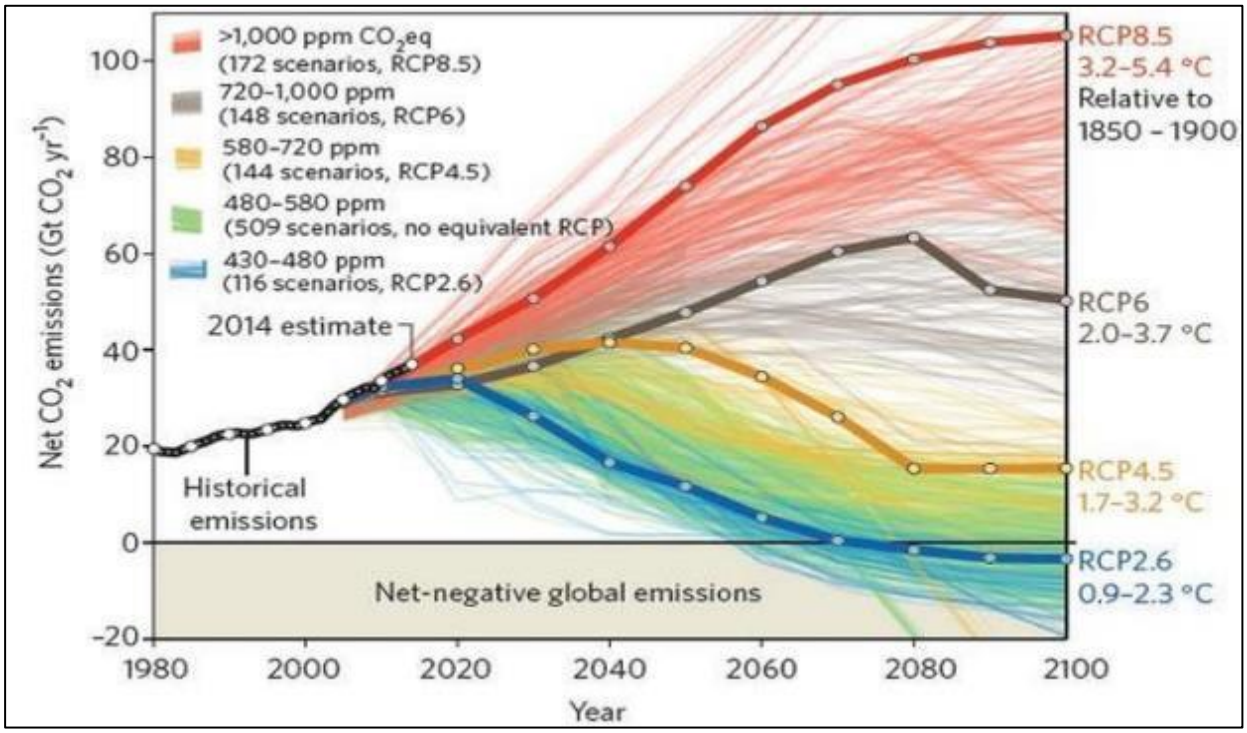
Each RCP presents different values of radiative forcing that are indicative, according to the Coupled Model Intercomparison Project 5 (CMIP5) of the World Climate Research Program, the climate forcing resulting from all drivers of climate change (natural and anthropogenic substances and processes that alter the Earth's energy balance) varies between different climate models.The following table describes the main characteristics of the emission scenarios.

Table 13 IPCC Representative Concentration Pathway (RCP) Scenarios

CPR	Description
CPR 8.5	It is the high emissions scenario, consistent with a future with no changes in policies to reduce emissions and characterized by increasing GHG emissions leading to high atmospheric GHG concentrations. It is broadly aligned with current policies or business as usual scenario.
CPR 6.0	It is a high to intermediate emissions scenario where GHG emissions peak around 2060 and then decline for the remainder of the century.
CPR 4.5	It is an intermediate emissions scenario, consistent with a future with relatively ambitious emission reductions and a slight increase in GHG emissions before starting to decline around 2040. Despite these relatively ambitious emission reduction actions, RCP4.5 falls short of the 2°C/1.5°C target agreed in the Paris Agreement. It is broadly aligned with the GHG emissions profile that would result from the implementation of the 2015 NDCs (through 2030), quickly followed by the peak and then reduction of global emissions by 50% by 2080.
RCP 2.6	it is the only IPCC scenario in line with the established 2°C/1.5°C limit of the Paris Agreement. This RCP is consistent with the ambitious reduction of GHG emissions, which would peak around 2020, then decline on a linear path and turn negative before 2100.

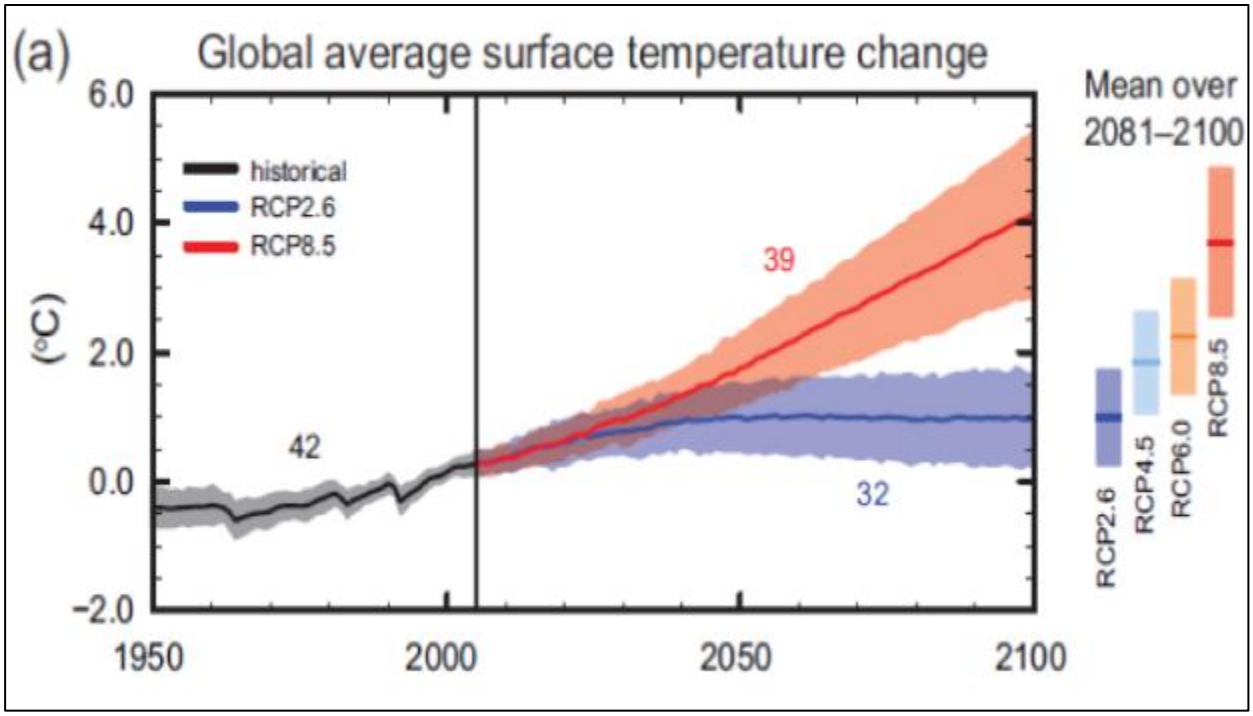
Source: TCFD (Task Force on Climate – Related Financial Disclosures).

Figure 14 Emissions Projections in the RCP Scenarios



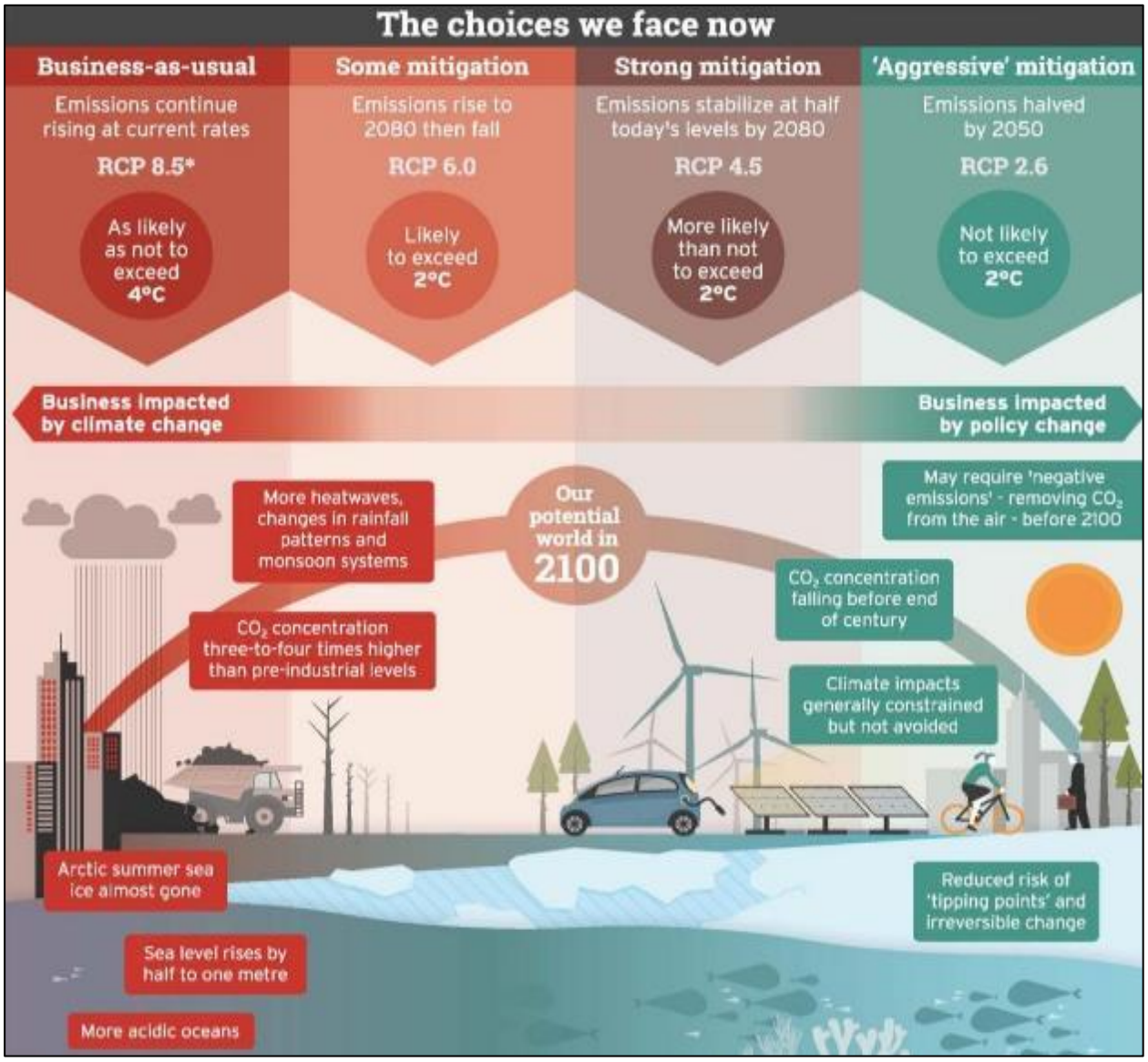
Source: TCFD (Task Force on Climate – Related Financial Disclosures).

Figure 15 Temperature Projections in RCP Scenarios



Source IPCC-2013

Figure 16 IPCC Representative Concentration Scenarios (RCP)



Source: TCFD (Task Force on Climate – Related Financial Disclosures).

B Impacts of the RCP 4.5 and RCP 8.5 Emission Scenarios in Peru

For the analysis of scenarios in CAASA we have taken as a reference the report "Update of Water Availability Scenarios in Peru in the Context of Climate Change" issued in 2015 by the National Meteorology and Hydrology Service of Peru (SENAMHI). To characterize the current climate and water availability, SENAMHI has used historical information from meteorological and hydrological stations from which the climatology of the variables is constructed: Precipitation, Maximum Temperature, Minimum Temperature, Evapotranspiration and Runoff. For this purpose, two reference periods of 30 years were selected; a first period that corresponds to 1970-1999 and the second period to 1980-2009. The objective of this analysis was to compare the behavior of the hydrological variables at a monthly and annual level for these two reference periods in each hydrological region into which the Peruvian territory has been divided. This hydrological division has been taken from the study by Halcrow who prepared the Atlas of National Hydroelectric Potential in 2011 at the request of the Ministry of Energy and Mines. See the following figure:

Figure 17 Map of Hydrological Regions of Peru

Source: Halcrow, 2012.

Estimates of the potential changes that would be expected in the variables precipitation, temperature, evapotranspiration and surface runoff have been quantified based on the projections of 2 CMIP5 climate models and 2 RCP 4.5 and RCP 8.5 Emission Scenarios. The horizon of the Scenarios is the period 2035-2065 centered on the year 2050. Analogous to the procedure carried out to characterize the climate and the

availability of present water, the analysis of the climatic variables and the surface water availability is carried out at the of Hydrological Region.

The analysis of the climate and the availability of water projected to 2050, has been developed taking into account the variables described above. For this case, we are going to present only the results of the "Pacific 3" Hydrological Region specifically, since it is the area where our Steel Complex is located and in general for all of Peru. The simulations carried out with two climate models and two Emission scenarios indicate that the changes that would occur by the year 2050 in the annual average of the evaluated variables will show different nuances in each hydrographic region of Peru; In the following table we show the main comments of the analyzed variables:

Table 14 Main Comments on the Meteorological Variables Evaluated in the Pacific Hydrographic Region

Expected Changes in Maximum Temperature for the year 2050
In the Pacific 1 hydrological region, it would experience the greatest changes in maximum temperature, with an increase in the annual average of 2.7ºC and 2.8ºC, considering the average of the 2 climate models for the RCP 4.5 and RCP 8.5 scenarios, respectively. The least warming thermal projection would occur in the Pacific 6 region, with an average increase in the maximum annual temperature of 1.5ºC and 1.6ºC for the RCP 4.5 and RCP 8.5 scenarios, respectively.
Expected Changes in Minimum Temperature for the year 2050
The Pacific 1 hydrological region would experience the greatest changes in minimum temperature, with an increase in the annual average of 2.9 ºC and 2.8 ºC, considering the average of the 2 climate models for the RCP 4.5 and RCP 8.5 scenarios, respectively. The least warming would occur in the Pacific 5 region, with an average increase in the annual minimum temperature of 1.5 ºC and 2 ºC for the RCP 4.5 and RCP 8.5 scenarios, respectively.
Expected Changes (%) in Precipitation for the Year 2050
For the RCP 4.5 scenario in the Pacific 1 and Pacific 6 regions, increases of 0.2% and 9.8% are projected, respectively. In the Pacific 2, Pacific 3, Pacific 4 and Pacific 5 regions, a decrease in annual precipitation of -1.3%, -5.5%, -3.4%, -1.3%, respectively, is projected. For the RCP 8.5 Scenario, increases in precipitation of 2.4%, 0.4%, 5.3%, 6.8%, and 24.2%, respectively, are projected in the Pacific 2, Pacific 3, Pacific 4, and Pacific 5 regions; in the Pacific 1 region, a decrease in annual precipitation of -4.8% is projected.
Expected Changes (%) in Evapotranspiration for the Year 2050
In this region, the projected changes for annual evapotranspiration indicate increases ranging from 1.9% to 8.0%, in the Pacific 6 and Pacific 1 regions, respectively, according to the RCP 4.5 Emission Scenario. In the RCP 8.5 Scenario, the increases are of greater magnitude in a range that goes from 3.9% to 11% as an annual average, for these same regions.
Lower water availability is expected in the region for the year 2050, except in hydrological region 6, where there will be a greater supply of water availability. The most critical conditions of water deficiency would be expected in the Pacífico 1 and Pacífico 3 hydrological regions, where annual water availability would be reduced by 48% and 42%, respectively, impacting the Tambo, Moquegua, Sama, Locumba and Caplina for the first case and the basins of Topará, San Juan, Pisco, Ica, Acarí and Yauca in the second case. On the other hand, in the basins of the Pacific 6 region, such as Tumbes, Chira, Piura and Cascajal, the availability of water would increase by up to 59% for the most critical condition.

Source: Update of Water Availability Scenarios in Peru in the Context of Climate Change (SENAMHI).

Additionally, the document "Guidelines for Climate Analysis and Determination of Hazards Associated with Climate Change published by SENAMHI through Technical Note No. 001-2019-/SENAMHI/DMA, which considers the following consequences regarding climate variability, was taken into account. :

Table 15 Impacts Associated with Climate Change

Changes Due to Weather Averages	Changes Due to Climate Variability
❖ Flood occurrence ❖ Coastal erosion ❖ Coastal flood ❖ Decrease in groundwater due to increased evapotranspiration ❖ Changes in flow. ❖ Changes in the water table.	❖ Presence of pests and vectors ❖ Summers and droughts ❖ Greater Occurrence of avalanches ❖ flood occurrence ❖ Increase in flows ❖ Soil and groundwater salinization

Source: Technical Note No. 001-2019-/SENAMHI/DMA

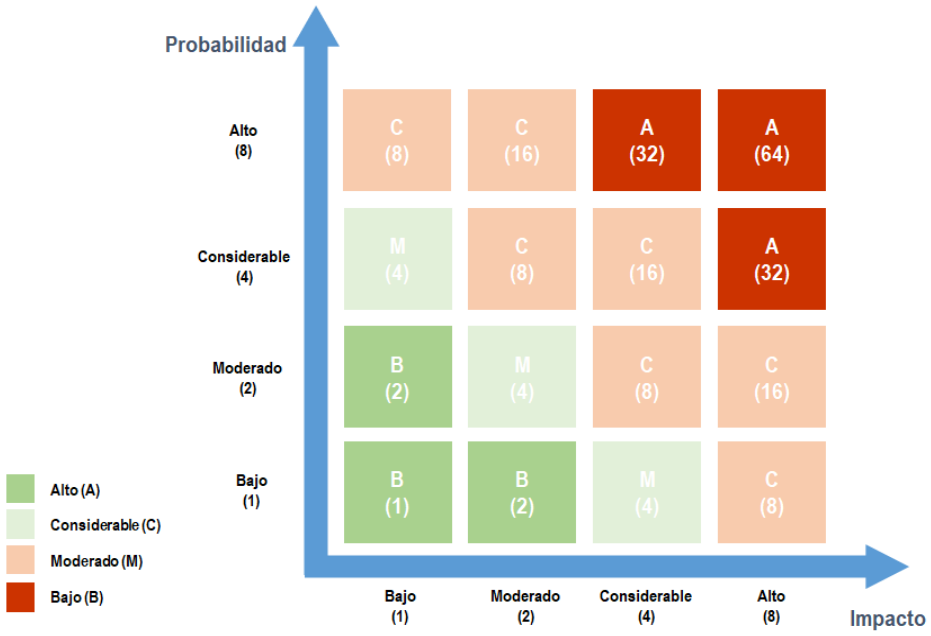
VI.2.2 Risk and Opportunity Assessment

In an increasingly complex environment, with greater changes and more intense competition, organizations need to make quick and correct decisions to achieve their objectives. CAASA's Comprehensive Risk and Opportunity Management (GIRO) methodology allows us to analyze threats in the environment and in our processes, in order to define response strategies to deal with them.

VI.2.2.1 Risk criticality

The criticality level is defined based on the Impact Level and the Probability. The interaction of the different levels of the two factors gives us the criticality of each risk, as shown in the following figure:

Figure 18 Risk Criticality



Source: Methodology for Internal Control and Risk Management of CAASA.

A Assessment of the level of impact

Evaluates the degree of change or effect that a risk may have in the face of a proposed scenario, which is focused on taking into account the following criteria:

- Economic.
- Continuity of operations and systems
- Security of the information.
- Reputation and image.
- Regulatory compliance.
- ethical management
- Environment.
- Occupational health and safety.

For the analysis that we are developing, we have used "Economic" as the main impact criterion, which is aligned with what is recommended by the TCFD and that could have an impact on the financial statements in the form of income from the demand for products and services or as expenditures in response to adaptation to climate change. Additionally, within a balance sheet, climate-related assets and liabilities can be identified, and finally, capital and financing that could change the profile of an organization's debt and capital structure in the face of identified risks and opportunities.

B Probability Level Assessment

It refers to the number of times the risk could materialize taking into account the following criteria:

- Occurrence estimate.
- Exposure.
- Historical frequency.

In Annex No. 01 and 02 are the evaluation criteria of the levels of impact and probability.

VI.2.2.2 Opportunities

Throughout the stages of the Comprehensive Risk and Opportunity Management process, opportunities for improvement are identified, which should serve as elements in the definition of objectives, strategy and initiatives.

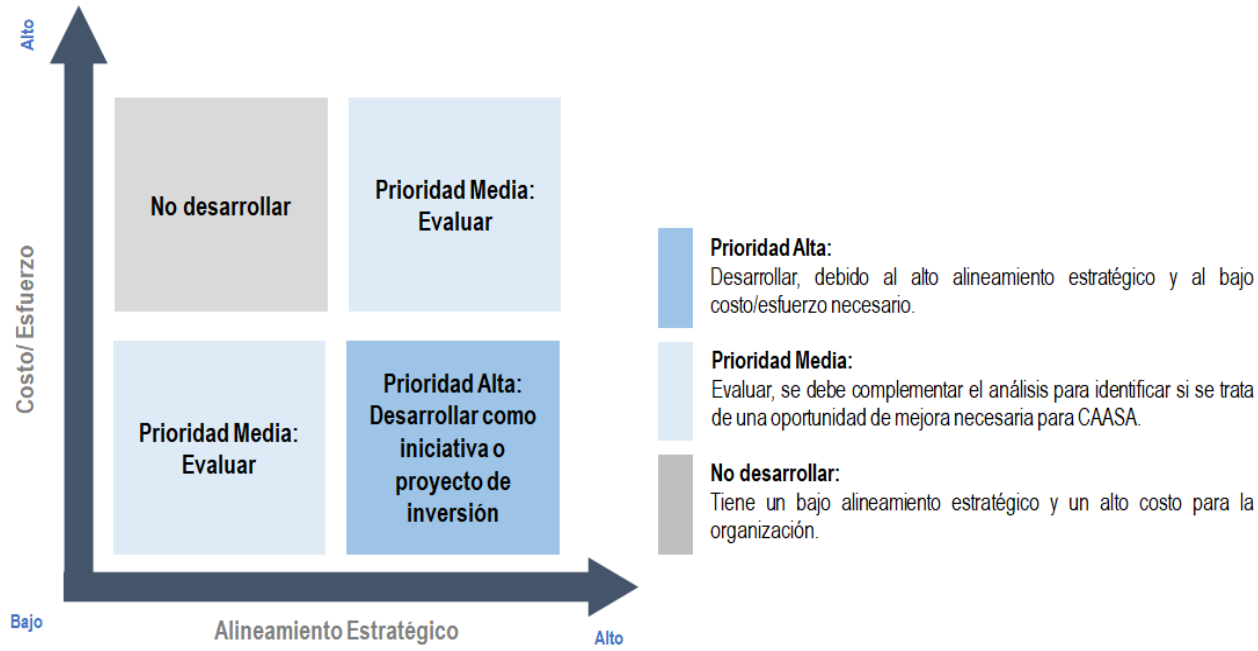
Opportunities are related to the following criteria:

- Improvement of the organization and processes (includes the environmental component).
- Automation and improvement of information systems.
- Simplification of activities
- Strengthening of internal control.

For the development of opportunities, a cost/benefit evaluation should be considered, this will allow us to prioritize and allocate resources.

The following figure shows the responses to the opportunity analysis.

Figure 19 Response to Analysis of Opportunities



Source: Methodology for Internal Control and Risk Management of CAASA.

VI.3 Response Plan

After the risk assessment in the proposed scenarios, the response strategy is formulated taking into account the current controls and the Climate Change Adaptation Plan is designed for physical risks and the Decarbonization Plan for transition risks.

The controls in each of the plans can be (according to their nature) preventive or detective and can cover manual, semi-automatic and automatic activities.

VI.4 Follow-up

Monitoring is part of our Internal Control and Comprehensive Risk Management Business Policy. For us, continuous evaluations (ISO audits, Legal Requirements Compliance Audits, product quality controls, budget control, occupational health and safety supervision, environmental inspections, etc.), independent evaluations (internal and external audits) or a combination of both, are used to determine whether each of the components of internal control and the controls to comply with the principles of each component are present and functioning properly.

The principles of this component are:

- We select, develop and carry out continuous and/or independent evaluations to determine if the components of the internal control system are present and functioning.
- The results of the evaluations are communicated to us in a timely manner to apply corrective measures.

Additionally, our risk management has 3 lines of defense: **the first line** It is made up of the managers, process owners and collaborators, who design and execute the controls of each process, in the second line are the areas of Strategic Management Control (Quality, MA and SSO), financial controls and others, and in the third line is the Internal Audit area focused on objective and independent supervision with a report to the Board of Directors and the Audit and Risk Committee (CAR). Periodically the defense is reviewed by external audits and supervision of regulatory entities.

VII ANALYSIS OF RISKS AND OPPORTUNITIES FACING CLIMATE CHANGE

VII.1 IDENTIFICATION

The following table shows the list of risk classification and identified opportunities:

Table 16 Identification of Risks and Opportunities

Transition Risks
⚠ **TR1:** Increase in production costs due to the use of alternative water sources, due to the reduction of the volumetric flow in the extraction licenses for the use of groundwater.
⚠ **TR2:** That the operating costs increase, due to the increase in the rate for the consumption of electrical energy from a non-renewable source.
⚠ **TR3:** Logistics costs of transporting raw materials and finished products increase due to the increase in the price of fossil fuels due to a higher tax rate.
⚠ **TR4:** That the costs of transferring personnel increase, due to the increase in the price of fossil fuels due to a higher tax rate.
⚠ **TR5:** That the operating costs increase, due to the change of refrigerants with a lower GHG emission factor in the air conditioning systems.
⚠ **TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.
⚠ **TR7:** That the operating costs increase, due to the abrupt increase in the rate for the use of groundwater as a result of the water stress in the area of influence.
⚠ **TR8:** Increase in the costs of ferrous scrap due to greater future dependence as a source of raw material for the steel industry, due to the increasing technological migration from BOF to EAF in steel mills worldwide, encouraged by global initiatives to achieve neutrality in carbon by 2050.
Physical Risks
⚠ **RF1:** That costs increase due to damage to infrastructure, equipment and products, due to increased rainfall in the areas where the different headquarters are located.
⚠ **RF2:** That cost overruns are generated due to the interruption of electrical power to the Steel Complex, due to damage to the transmission line due to the overflow of the Pisco river.
⚠ **RF3:** Costs for the use of alternative resources for cooling in the production process increase, due to the low availability of groundwater in the area where the Steel Complex is located.
⚠ **RF4:** That transport logistics operations are interrupted due to the blocking of access roads due to social conflicts generated by damage to the infrastructure and scarcity of resources due to climatic vulnerability in the company's areas of influence.
⚠ **RF5:** Lost sales are generated due to the interruption of access roads and highways due to mudslides and floods.
⚠ **RF6:** That an increase in the cost of production is generated due to the acquisition of a greater amount of imported scrap, generated by the delay in the supply of local suppliers as a result of the interruption of access roads and highways due to mudslides and floods.

Opportunities
OP1: Carry out a natural gas cogeneration project at the Pisco plant.
OP2: Implement and certify an energy management system based on ISO 50001.
OP3: Co-processing in the steel complex.
OP4: Invest in technology with energy efficiency and participate in the State's Cleaner Production projects.
OP5: Participate in State projects providing CAASA services and/or products.
OP6: Reduce unnecessary fuel consumption in delivery and replenishment units.
OP7: Capture a greater amount of scrap of national origin.
OP8: Being able to market the steel slag to cement companies and being able to meet the goal with respect to the NDC.

Source: self made.

VII.2 ANALYSIS AND EVALUATION

VII.2.1 Transition Risk Analysis

VII.2.1.1 Scenario Formulation

A Scenarios in Function to the NDC

To carry out the analysis of transition risk scenarios, we have selected the NDCs that may be related to CAASA's activities. In the following table we relate the NDCs with the identified transition risks:

Table 17 Relationship of NDCs to CAASA Transition Risks

Nationally Determined Contributions (NDC)	Transition Risks				
	Description	Guy			
		PL	Tea	I	Re
A1: Modernization of the granting of water use rights in vulnerable basins incorporating climate scenarios.	⚠ **TR1:** Increase in production costs due to the use of alternative water sources, due to the reduction of the volumetric flow in the extraction licenses for the use of groundwater.	⚖	📱	---	---

E1: Renewable energy mix	⚠ **TR2:** That the operating costs increase, due to the increase in the rate for the consumption of electrical energy from a non-renewable source.			---	---
E9: Promotion of the use of cleaner fuels	⚠ **TR3:** Logistics costs of transporting raw materials and finished products increase due to the increase in the price of fossil fuels due to a higher tax rate.		---	---	---
E10: Promotion of electric vehicles nationwide	⚠ **TR4:** That the costs of transferring personnel increase, due to the increase in the price of fossil fuels due to a higher tax rate.			---	---
M2: Replacement of refrigerants with alternatives with lower global warming potential	⚠ **TR5:** That the operating costs increase, due to the change of refrigerants with a lower GHG emission factor in the air conditioning systems.		---	---	---
***L1:** Carbon price	⚠ **TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.		---	---	---
***L2:** Water Price	⚠ **TR7:** That the operating costs increase, due to the abrupt increase in the rate for the use of groundwater as a result of the water stress in the area of influence.		---	---	---
***T1:** Technology migration from BOF to EAF	⚠ **TR8:** Increase in the costs of ferrous scrap due to greater future dependence as a source of raw material for the steel industry, due to the increasing technological migration from BOF to EAF in steel mills worldwide, encouraged by global initiatives to achieve neutrality in carbon by 2050.	---		---	---

Source: self made.
*** They are sources for transition risks, but they are not part of the NDC, but in a stress scenario. Its legend is: L – Legislation and T – Technology.**
Note 1: The classification topics used for the NDCs have the following legend: A - Water, E - Energy and M - Industrial Processes.
Note 2: The legend for the types of transition risks is as follows: PL – Political and legal, Te – Technology, Me – Market and Re – Reputation.

We have also identified opportunities regarding the implementation of the NDCs, which we show below:

Table 18 Relationship of NDCs to CAASA Opportunities

Nationally Determined Contributions (NDC)	Opportunities					
	Description	Guy				
		ER	FE	PyS	M	R
E2: Cogeneration	**OP1:** Carry out a natural gas cogeneration project at the Pisco plant	---		---	---	---
E3: Energy efficiency in the industrial sector	**OP2:** Implement and certify an energy management system based on ISO 50001.	---		---	---	---
E4: Use of waste-derived fuels as a substitute for fossil fuels in clinker production kilns.	**OP3:** Co-processing in the steel complex.			---	---	---
E5: Energy efficiency through comprehensive interventions in the industrial manufacturing sector.	**OP4:** Invest in technology with energy efficiency and participate in the State's Cleaner Production projects.				---	---
E6: Promotion of sustainable construction in new buildings.	**OP5:** Participate in the Project with the services and/or products of CAASA	---	---		---	---
E7: Implementation of the Complementary Corridors of the Integrated Transport System of Lima.	**OP5:** Participate in the Project with the services and/or products of CAASA	---	---		---	---
E8: Implementation of Lines 1 and 2 of the Lima and Callao Metro.	**OP5:** Participate in the Project with the services and/or products of CAASA	---	---		---	---
E11: Efficient driving training for professional drivers	**OP6:** Reduce unnecessary fuel consumption in delivery and replenishment units.			---	---	---
E12: National Program for Vehicle Scrap and Renovation	**OP7:** Capture the largest amount of national scrap		---	---	---	---
E13: Project "Construction of the Trans-Andean Tunnel"	**OP5:** Participate in the Project with the services and/or products of CAASA	---	---		---	---

E14: Improvement of the rail transport service in the Tacna - Arica section	**OP5:** Participate in the Project with the services and/or products of CAASA	---	---		---	---
E15: Comprehensive rehabilitation of the Huancayo – Huancavelica railway.	**OP5:** Participate in the Project with the services and/or products of CAASA	---	---		---	---
M1: Clinker substitution to reduce the clinker/cement ratio producing "added cements".	**OP8:** Being able to market the steel slag to cement companies and being able to meet the goal with respect to the NDC		---	---		---

Source: self made.
Note 1: The classification topics used for the NDCs have the following legend: E – Energy and M – Industrial Processes.
Note 2: The legend for the types of opportunities is as follows: ER - Resource Efficiency, FE - Source of Energy, P&S - Products and Services, M - Markets and R - Resilience.

B Scenarios Based on the IEA

The following table presents the risks associated with the IEA scenarios:

Table 19 Relationship of IEA Scenarios with CAASA Transition Risks

IEA Scenarios			Transition Risks
Zero Net Emissions by 2050 (NZE)	**Announced Commitments (APS)**	**Stated Policies (STPES)**	**Description**
It is a scenario that sets a path for the global energy sector to reach net zero CO2 emissions by 2050.	It is a scenario that assumes that all climate commitments made by governments around the world, including nationally determined contributions (NDCs) and longer-term net-zero emissions targets are met.	A scenario that reflects the current policy configuration on a sector-by-sector and country-by-country basis, with assessment of the specific policies that are in place, as well as those that have been announced by	⚠ **TR2:** That the operating costs increase, due to the increase in the rate for the consumption of electrical energy from a non-renewable source.
			⚠ **TR3:** Logistics costs of transporting raw materials and finished products increase due to the increase in the price of fossil fuels due to a higher tax rate.
			⚠ **TR4:** That the costs of transferring personnel increase, due to the increase in the price of fossil fuels due to a higher tax rate.
			⚠ **TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.

		governments around the world.	⚠ **TR8:** Increase in the costs of ferrous scrap due to greater future dependence as a source of raw material for the steel industry, due to the increasing technological migration from BOF to EAF in steel mills worldwide, encouraged by global initiatives to achieve neutrality in carbon by 2050.

Source: self made

VII.2.1.2 Risk and Opportunity Assessment

The following table shows the assessment of transition risks in each of the scenarios:

Table 20 Transition Risk Assessment with NDC Scenario

NDC	Risk		Scenarios											
	Guy	Description	Transformation (Tr) 100% NDC compliance			Coordination (Coor) NDC compliance between <100% - 50%]			Fragmentation (FD-) NDC compliance between <50% - 30%]			Fragmentation (FD+) NDC compliance <30%		
			Imp.	Prob.	Level	Imp.	Prob.	Level	Imp.	Prob.	Level	Imp.	Prob.	Level
A1	**PL/ Te**	**TR1:** Increase in production costs due to the use of alternative water sources, due to the reduction of the volumetric flow in the extraction licenses for the use of groundwater.	Consid. (4)	High (8)	**High (32)**	Consid. (4)	Consid. (4)	**Consid. (16)**	Consid. (4)	Mod. (2)	**Consid. (8)**	Consid. (4)	Low (1)	**Mod. (4)**
E1	**PL/ Te**	**TR2:** That the operating costs increase, due to the increase in the rate for the consumption of electrical energy from a non-renewable source.	Consid. (4)	High (8)	**High (32)**	Consid. (4)	Consid. (4)	**Consid. (16)**	Consid. (4)	Mod. (2)	**Consid. (8)**	Consid. (4)	Low (1)	**Mod. (4)**
E9	**PL/ Te**	**TR3:** Logistics costs of transporting raw materials and finished products increase due to the increase	High (8)	High (8)	**High (64)**	High (8)	Consid. (4)	**High (32)**	High (8)	Mod. (2)	**Consid. (16)**	High (8)	Low (1)	**Consid. (8)**

		in the price of fossil fuels due to a higher tax rate.												
E10	**PL/ Te**	**TR4:** That the costs of transferring personnel increase, due to the increase in the price of fossil fuels due to a higher tax rate.	Consid. (4)	Mod. (2)	**Consid. (8)**	Consid. (4)	Mod. (2)	**Consid. (8)**	Consid. (4)	Low (1)	**Mod. (4)**	Consid. (4)	Low (1)	**Mod. (4)**
m2	**PL/ Te**	**TR5:** That the operating costs increase, due to the change of refrigerants with a lower GHG emission factor in the air conditioning systems.	Mod. (2)	High (8)	**Consid. (16)**	Mod. (2)	Consid. (4)	**Consid. (8)**	Mod. (2)	Mod. (2)	**Mod. (4)**	Mod. (2)	Low (1)	**Low (2)**
L1*	**PL**	**TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.	High (8)	High (8)	**High (64)**	High (8)	Consid. (4)	**High (32)**	High (8)	Mod. (2)	**Consid. (16)**	High (8)	Low (1)	**Consid. (8)**
L2*	**PL**	**TR7:** That the operating costs increase, due to the abrupt increase in the rate for the use of groundwater as a result of the water stress in the area of influence.	Low (1)	High (8)	**Consid. (8)**	Low (1)	Consid. (4)	**Mod. (4)**	Low (1)	Mod. (2)	**Low (2)**	Low (1)	Low (1)	**Low (1)**
T1*	**Te**	**TR8:** Increase in the costs of ferrous scrap due to greater future dependence as a source of raw material for the steel industry, due to the increasing technological migration from BOF to EAF in steel mills worldwide, encouraged by global initiatives to achieve neutrality in carbon by 2050.	High (8)	High (8)	**High (64)**	High (8)	Consid. (4)	**High (32)**	High (8)	Mod. (2)	**Consid. (16)**	High (8)	Low (1)	**Consid. (8)**

Source: self made.

*** They are sources for transition risks, but they are not part of the NDC, but in a stress scenario. Its legend is: L – Legislation and T – Technology.**

Note 1: The classification topics used for the NDCs have the following legend: A - Water, E - Energy and M - Industrial Processes.
Note 2: The legend for the types of transition risks is as follows: PL – Political and legal, Te – Technology, Me – Market and Re – Reputation.
Note 3: The legend related to the variables related to risk are: Imp. – impact, Prob. – Probability, Consid. – Considerable, Mod. - Moderate.

Table 21 Transition Risk Assessment with IEA Scenarios

Risk		scenarios								
Guy	Description	Zero Net Emissions by 2050 (NZE)			Announced Commitments (APS)			Stated Policies (STEPS)		
		Imp.	Prob.	Level	Imp.	Prob.	Level	Imp.	Prob.	Level
PL/ Tea	**TR2:** That the operating costs increase, due to the increase in the rate for the consumption of electrical energy from a non-renewable source.	Consid. (4)	High (8)	**High (32)**	Consid. (4)	High (8)	**High (32)**	Consid. (4)	Consid. (4)	**Consid. (16)**
PL/ Tea	**TR3:** Logistics costs of transporting raw materials and finished products increase due to the increase in the price of fossil fuels due to a higher tax rate.	High (8)	High (8)	**High (64)**	High (8)	High (8)	**High (64)**	High (8)	Consid. (4)	**High (32)**
PL/ Te	**TR4:** That the costs of transferring personnel increase, due to the increase in the price of fossil fuels due to a higher tax rate.	Consid. (4)	Mod. (2)	**Consid. (8)**	Consid. (4)	Low. (1)	**Mod. (4)**	Consid. (4)	Low. (1)	**Mod. (4)**
PL	**TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.	High (8)	High (8)	**High (64)**	High (8)	High (8)	**High (64)**	High (8)	Consid. (4)	**High (32)**
Te	**TR8:** Increase in the costs of ferrous scrap due to greater future dependence as a source of raw material for the steel industry, due to the increasing technological migration from BOF to EAF in steel mills worldwide, encouraged by global initiatives to achieve neutrality in carbon by 2050.	High (8)	High (8)	**High (64)**	High (8)	High (8)	**High (64)**	High (8)	Consid. (4)	**High (32)**

Source: self made.

Note 1: The legend for the types of transition risks is as follows: PL – Political and legal, Te – Technology, Me – Market and Re – Reputation.
Note 2: The legend related to the variables related to risk are: Imp. – impact, Prob. – Probability, Consid. – Considerable, Mod. - Moderate.

Table 22 Opportunity Assessment

NDC	Chance		scenarios											
	Guy	Description	transformation (tr) 100% NDC compliance			Coordination (color) NDC compliance between <100% - 50%]			Fragmentation (FD-) NDC compliance between <50% - 30%]			Fragmentation (FD+) NDC compliance <30%		
			Cost/ Effort	Align. Estrateg.	Level	Cost/ Effort	Align. Estrateg.	Level	Cost/ Effort	Align. Estrateg.	Level	Cost/ Effort	Align. Estrateg.	Level
E2	FE	**OP1:** Carry out a natural gas cogeneration project at the Pisco plant	High	High	Priority Half	High	High	Priority Half	High	Low	No Development	High	Low	No Development
E3	FE	**OP2:** Implement and certify an energy management system based on ISO 50001.	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half	Low	Low	Priority Half
E4	ER/ FE	**OP3:** Co-processing in the steel complex.	High	High	Priority high	High	High	Priority high	High	High	Priority high	High	Low	Priority Half
E5	ER/ FE/ PyS	**OP4:** Invest in technology with energy efficiency and participate in the State's Cleaner Production projects.	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half	Low	Low	Priority Half
E6	PyS	**OP5-A:** Participate in the Project with CAASA services and/or products, supporting our clients so that they	Low	High	Priority high	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half

		can receive bonuses related to sustainable construction.												
E7	**PyS**	**OP5-B:** Participate in the Project "Complementary Corridors of the Integrated Transport System of Lima", with the services and/or products of CAASA.	Low	High	Priority high	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half
E8	**PyS**	**OP5-C:** Participate in the Project "Lines 1 and 2 of the Lima and Callao Metro" with the services and/or products of CAASA.	Low	High	Priority high	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half
E11	**ER/ FE**	**OP6:** Reduce unnecessary fuel consumption in delivery and replenishment units.	High	Low	Priority Half	High	Low	Priority Half	High	Low	Priority Half	High	Low	Priority Half
E12	**ER**	**OP7:** Capture a greater amount of national scrap.	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half	Low	Low	Priority Half
E13	**PyS**	**OP5-D:** Participate in the "Trans-Andean Tunnel" Project, with the services and/or products of CAASA.	Low	High	Priority high	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half
E14	**PyS**	**OP5-E:** Participate in the Project	Low	High	Priority high	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half

		"Improvement of the Railway Transport Service in the Tacna - Arica section", with the services and/or products of CAASA												
E15	**PyS**	**OP5-F:** Participate in the Project "Integral Rehabilitation of the Huancayo - Huancavelica railway", with the services and/or products of CAASA.	Low	High	Priority high	Low	High	Priority high	Low	High	Priority high	Low	Low	Priority Half
M1	**ER/ M**	**OP8:** Being able to market the steel slag to cement companies and being able to meet the goal with respect to the NDC	High	High	Priority Half	High	High	Priority Half	Low	Low	Priority Half	Low	Low	Priority Half

Source: self made.
Note 1: The classification topics used for the NDCs have the following legend: A - Water, E - Energy and M - Industrial Processes.
Note 2: The legend for the types of opportunities is as follows: ER - Resource Efficiency, FE - Source of Energy, P&S - Products and Services, M - Markets and R - Resilience.
Note 3: The legend related to the variables related to the Opportunity arePriority: Priority/ Align. Strategy: Strategic alignment / Development: Develop.

The steel industry is intensive in CO_2 emissions because a large part of world production is carried out under BOF technology (70% of world production) that consumes large amounts of coal (coke) as an energy source for the manufacture of steel. steel. However, EAF technology presents much less CO_2 emissions, since its main source is electrical energy. Aceros Arequipa uses EAF technology for production and deploys various initiatives to reduce CO_2 emissions, which is why we managed to position ourselves well below the industry average in terms of CO_2 emissions per ton of liquid steel.

These results give us a competitive advantage in the face of changes in consumer preferences towards products that generate less environmental impact.

VII.2.1.3 Controls

After identifying and assessing the risks and opportunities in the different scenarios regarding compliance with the NDCs, we have chosen to take the Transformation (Tr) scenario as a reference to propose the response strategy since it is the scenario that opens up the most possibilities for propose better strategies that can contribute to compliance with the NDC from our activities. In the following tables we describe our current and proposed controls:

Table 23 Controls Against Transition Risks

Risk		NDC scenario (Tr)	IEA scenario (NZE)	Controls
Guy	Description			
PL/ Te	**TR1:** Increase in production costs due to the use of alternative water sources, due to the reduction of the volumetric flow in the extraction licenses for the use of groundwater.	High	NA	**Current Controls:** - All our underground wells have a license for water use and we promptly pay the competent authority for their consumption. - We have an industrial water treatment plant that allows us to recirculate process water and thus optimize its use. - Since the fourth quarter of 2021 we have two domestic wastewater treatment plants in the Steel Complex, which has allowed us to expand the scope of treatment and a better use for the irrigation of green areas. - We have guidelines for relations with the population, led by the Social Responsibility area. - Since 2021 we have air coolers, which replace cooling towers and thus achieve adequate cooling without mass transfer losses. - Since 2022 we have a connection to an underground well that, due to the height difference with the Pisco river, facilitates natural filtration, allowing the use of water that has been lost in the sea for years. **Proposed Controls:** - Implement projects that repower the water treatment system to increase the number of process water cycles. - Analyze the possibility of purchasing desalinated seawater to replace groundwater extraction.
PL	**TR7:** That the operating costs increase, due to the abrupt increase in the rate for the use of groundwater as a result of the water stress in the area of influence.	Consid.	NA	

PL/ Te	**TR2:** That the operating costs increase, due to the increase in the rate for the consumption of electrical energy from a non-renewable source.	High	High	**Current Controls:** - Currently the supply of electricity is given by the National Interconnected Electric Service (SEIN). - We have new machinery that consumes electrical energy efficiently. - Our processes have Natural Gas as the main energy matrix, which is a fossil fuel with a lower greenhouse gas emission factor. - Massive passenger transport compared to private transport is a more efficient measure of GHG emissions. At CAASA we have bus contracts for the transfer of our staff. - Since 2020 we have acquired 4 electric cranes that replace those that consume diesel, for the scrap collection yards. This implementation has allowed us to reduce approximately 150 t CO2e/year for each piece of equipment. - Since 2021, the new steel mill has started operating, which has a lower ratio of electricity consumption. We have gone from 415kWh/t to 375kWh/t of liquid steel. - Together with the new steel mill we have also implemented electric cranes for the supply of scrap. It is worth mentioning that previously oil-consuming cranes were used. - In 2023 we have trained 31 ISO 50001 internal auditors in order to implement an Energy Management system in the Steel Complex. - In 2023 we have acquired a fleet of 32 natural gas trucks for the supply chain. **Proposed Controls:** - Analyze the electric power contract, in order to ensure the supply of a renewable source with renewable certification. - Implement ISO 50001 and certify it. - Identify service contracts for machinery and personnel transport that have cleaner fuels than current ones and, in the best of cases, electricity. - Implement projects that are efficient in the consumption of electrical energy. - Renovate air conditioning systems taking into account refrigerant with less carbon footprint than the current ones or those proposed by the State. - Implement the new vertical lime kiln project that will allow us to have a better natural gas consumption ratio in the process, we will go from 2500 kcal/kg to 900 kcal/kg of lime.
PL	**TR3:** Logistics costs of transporting raw materials and finished products increase due to the increase in the price of fossil fuels due to a higher tax rate.	High	High	
PL/Te	**TR4:** That the costs of transferring personnel increase, due to the increase in the price of fossil fuels due to a higher tax rate.	Consid.	High	
PL	**TR5:** That the operating costs increase, due to the change of refrigerants with a lower GHG emission factor in the air conditioning systems.	Consid.	NA	
PL	**TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.	High	High	
Te	**TR8:** Increase in the costs of ferrous scrap due to greater future dependence as a source of raw material for the steel industry, due to the increasing technological migration from BOF to EAF in steel mills worldwide, encouraged by global initiatives to achieve neutrality in carbon by 2050.	High	High	

				- Implement scrap cleaning machine to reduce electric power consumption in electric furnace. - Implement new annealing furnaces to improve the efficiency in the use of natural gas in the drawing process.

Source: self made.
Note 1: The legend for the types of transition risks is as follows: PL – Political and legal, Te – Technology, Me – Market and Re – Reputation.
Note 2: The legend related to the variables related to risk are: Imp. – impact, Prob. – Probability, Consid. – Considerable, Mod. - Moderate.

Table 24 Response to Opportunities

NDC	Opportunity		Scenery tr	Answer
	Guy	Description		
E2	**FE**	**OP1:** Carry out a natural gas cogeneration project in the steel complex.	Medium priority	- Evaluate the possibility of carrying out co-processing in the steel complex and adapt them to the new Maximum Permissible Limits (LMP) for atmospheric emissions. - Participate in all State projects with the services offered by CAASA. - Participate in State training so that drivers of transport units consume fuel efficiently and thus reduce transport costs. - Actively participate in the State Scrap Project and ensure that our Scrap Collection Yards comply with the technical specifications proposed by the Ministry of Transport and Communications.
E3	**FE**	**OP2:** Implement and certify an energy management system based on ISO 50001.	High priority	
E4	**ER/ FE**	**OP3:** Co-processing in the steel complex.	High priority	
E5	**ER/ FE/ PyS**	**OP4:** Invest in technology with energy efficiency and participate in the State's Cleaner Production projects.	High priority	
E6	**PyS**	**OP5-A:** Participate in the Project with CAASA services and/or products, supporting our clients so that they can receive bonuses related to sustainable construction.	High priority	
E7	**PyS**	**OP5-B:** Participate in the Project "Complementary Corridors of the Integrated Transport System of Lima", with the services and/or products of CAASA	High priority	
E8	**PyS**	**OP5-C:** Participate in the Project "Lines 1 and 2 of the Lima and Callao Metro" with the services and/or products of CAASA.	High priority	

E11	**ER/ FE**	**OP6:** Reduce unnecessary fuel consumption in delivery and replenishment units.	Medium priority	- Evaluate the possibility of signing agreements with cement companies and being able to supply the steel slag. - Develop projects related to circular economy: o Implementation of the Eddy Current process that will allow us to recover non-ferrous metals and be able to reinsert them into the recycling value chain. o Expansion of the zinc oxide recovery project from steel dust. o Development of bricks and paving stones based on steel slag.
E12	**ER**	**OP7:** Capture a greater amount of national scrap.	High priority	
E13	**PyS**	**OP5-D:** Participate in the "Trans-Andean Tunnel" Project, with the services and/or products of CAASA.	High priority	
E14	**PyS**	**OP5-E:** Participate in the Project "Improvement of the Railway Transport Service in the Tacna - Arica section", with the services and/or products of CAASA	High priority	
E15	**PyS**	**OP5-F:** Participate in the Project "Integral Rehabilitation of the Huancayo - Huancavelica railway", with the services and/or products of CAASA.	High priority	
M1	**ER/ M**	**OP8:** Being able to market the steel slag to cement companies and being able to meet the goal with respect to the NDC	Medium priority	

Source: self made.
Note 1: The classification topics used for the NDCs have the following legend: A - Water, E - Energy and M - Industrial Processes.
Note 2: The legend for the types of opportunities is as follows: ER - Resource Efficiency, FE - Source of Energy, P&S - Products and Services, M - Markets and R - Resilience.
Note 3: Scenario Tr: Transformation (100% compliance with the NDCs).

VII.2.2 Analysis of Physical Risks

VII.2.2.1 Scenario Formulation

The scenarios considered for physical risks are those of RCP 4.5 and RCP 8.5 with information developed by SENHAMI as described in Chapter VII Analysis Methodology.

The following table describes the physical risks identified according to the area in which CAASA is located and its interrelation with its supply chain.

Table 25 CAASA Physical Hazard Classification

CPR 4.5	CPR 8.5	Physical risks		
		Description	Guy	
			Sharp (A)	Chronic (C)
It is an intermediate emissions scenario, consistent with a future with relatively ambitious emission reductions and a slight increase in GHG emissions before starting to decline around 2040. Despite these relatively ambitious emission reduction actions, RCP4.5 falls short of the 2°C/1.5°C target agreed in the Paris Agreement.	It is the high emissions scenario, consistent with a future with no changes in policies to reduce emissions and characterized by increasing GHG emissions leading to high atmospheric GHG concentrations. It is broadly aligned with current policies or business as usual scenario.	⚠ **RF1:** That costs increase due to damage to infrastructure, equipment and products, due to increased rainfall in the areas where the different headquarters are located.	---	
		⚠ **RF2:** That cost overruns are generated due to the interruption of electrical power to the Steel Complex, due to damage to the transmission line due to the overflow of the Pisco river.		---
		⚠ **RF3:** Costs for the use of alternative resources for cooling in the production process increase, due to the low availability of groundwater in the area where the Steel Complex is located.	---	
		⚠ **RF4:** That transport logistics operations are interrupted due to the blocking of access roads due to social conflicts generated by damage to the infrastructure and scarcity of resources due to climatic vulnerability in the company's areas of influence.	---	
		⚠ **RF5:** Lost sales are generated due to the interruption of access roads and highways due to mudslides and floods.		---
		⚠ **RF6:** That an increase in the cost of production is generated due to the acquisition of a greater amount of imported scrap, generated by the delay in the supply of local suppliers as a result of the interruption of access roads and highways due to mudslides and floods.		---

Source: self made.

VII.2.2.2 Risk assessment

Table 26 Physical Risk Assessment

Risk		Scenery					
Description	Guy	CPR 4.5			CPR 8.5		
		Impact	Probability	Level	Impact	Probability	Level
RF1: That costs increase due to damage to infrastructure, equipment and products, due to increased rainfall in the areas where the different headquarters are located.	C.	High (8)	moderate (2)	Considerable (16)	High (8)	High (8)	High (64)
RF2: That cost overruns are generated due to the interruption of electrical power to the Steel Complex, due to damage to the transmission line due to the overflow of the Pisco river.	A	High (8)	moderate (2)	Considerable (16)	High (8)	High (8)	High (64)
RF3: Costs for the use of alternative resources for cooling in the production process increase, due to the low availability of groundwater in the area where the Steel Complex is located.	C.	High (8)	moderate (2)	Considerable (16)	High (8)	High (8)	High (64)
RF4: That transport logistics operations are interrupted due to the blocking of access roads due to social conflicts generated by damage to the infrastructure and scarcity of resources due to climatic vulnerability in the company's areas of influence.	C.	Considerable (4)	Low (1)	Moderate (4)	Considerable (4)	Moderate (2)	Considerable (8)
RF5: Lost sales are generated due to the interruption of access roads and highways due to mudslides and floods.	A	Moderate (2)	Moderate (2)	Moderate (4)	Considerable (4)	High (8)	High (32)
RF6: That an increase in the cost of production is generated due to the acquisition of a greater amount of imported scrap, generated by the delay in the supply of local suppliers as a result of the interruption of access roads and highways due to mudslides and floods.	A	High (8)	Moderate (2)	Considerable (16)	High (8)	High (8)	High (64)

Source: self made.

Note 1: The legend for the types of physical risks is as follows: C – Chronic and A – Acute.

In the case related to physical risks, we have not identified opportunities separately, but rather as part of the response strategy oriented as adaptation measures.

VII.2.2.3 Controls

Table 27 Controls Against Physical Risks

Risk		Scenery		controls
Description	Guy	CPR 4.5	CPR 8.5	
RF1: That costs increase due to damage to infrastructure, equipment and products, due to increased rainfall in the areas where the different headquarters are located.	C.	Considerable	High	**Current Controls:** - The plant is made of noble material, the equipment is on paved floors and under a roof with a waterfall. - There is an Infrastructure Maintenance Program led by the SMTU area. - The ground where the plant is located is level and there is no component that is under a slope. - The main operating units, the Steelworks and the Rolling Mill, are indoors. In the case of the Steelworks, this is inside a hermetically designed hangar due to its smoke treatment system. **Proposed Controls:** - Interconnect with the State early warning system.
RF2: That cost overruns are generated due to the interruption of electrical power to the Steel Complex, due to damage to the transmission line due to the overflow of the Pisco river.	A	Considerable	High	**Current Controls:** - We have a protocol to supervise the rise in the level of the Pisco river, and we carry out cleaning activities with heavy machinery. **Proposed Controls:** - Interconnect with the State early warning system.
RF3: Costs for the use of alternative resources for cooling in the production process increase, due to the low availability of groundwater in the area where the Steel Complex is located.	C.	Considerable	High	**Current Controls:** - All of our underground wells have a license for water use, we promptly make the payment for water consumption to the competent authority. - We have a water treatment plant that allows us to recirculate the process water. - Since the fourth quarter of 2021 we have two domestic wastewater treatment plants in the Steel Complex,which has allowed us to expand the scope of treatment and a better use for the irrigation of green areas. - - Since 2022 we have a connection to an underground well that, due to the height difference with the Pisco river, facilitates natural filtration, allowing the use of water that has been lost in the sea for years.

				Proposed Controls: - Implement projects that repower the water treatment system to increase the number of process water cycles. - Analyze the possibility of purchasing desalinated seawater to replace groundwater extraction.
RF4: That transport logistics operations are interrupted due to the blocking of access roads due to social conflicts generated by damage to the infrastructure and scarcity of resources due to climatic vulnerability in the company's areas of influence.	C.	Moderate	Considerable	**Current Controls:** - We have guidelines for relations with the population, led by the Social Responsibility area. **Proposed Controls:** - Implement projects that repower the water treatment system to increase the number of process water cycles. - Analyze the possibility of purchasing desalinated seawater to replace groundwater extraction.
RF5: Lost sales are generated due to the interruption of access roads and highways due to mudslides and floods.	A	Moderate	High	**Current Controls:** - When we know that there will be interruptions on the highway due to the El Niño phenomenon or scheduled strikes, the increase in the inventory of the distribution centers is programmed to be able to withstand temporary interruptions. - We have finished product warehouses distributed in strategic areas of the country. **Proposed Controls:** - Interconnect with the State early warning system.
RF6: That an increase in the cost of production is generated due to the acquisition of a greater amount of imported scrap, generated by the delay in the supply of local suppliers as a result of the interruption of access roads and highways due to mudslides and floods.	A	Considerable	High	**Current Controls:** - During the El Niño Phenomenon season, there are changes of seasons, the Transportation area verifies with the supplier the delivery dates, the possibilities of delays and rescheduling of the service. However, if the requirement of the raw material and input is urgent, the change of supplier will be managed for a timely delivery. - We have scrap yards distributed in strategic areas of the country, with the purpose of capturing and storing scrap from the different provinces of the country. **Proposed Controls:** - Interconnect with the State early warning system.

Source: self made.

Note 1: The legend for the types of physical risks is as follows: C – Chronic and A – Acute.

VII.2.3 Climate and Water Stress Test

Stress tests are a measure of risk exposure, either historically or hypothetically. In this sense, they constitute an instrument for evaluating the financial risk profile, which is used to quantify the potential impact on the system of a specific event or of simultaneous changes in macroeconomic and/or financial variables. They are a useful tool to determine the additional capital requirement necessary to maintain the stability of the system in the face of a severe shock, whether of a macro or micro prudential nature. For the stress test, 2 variables have been identified: "the price of carbon" and the "payment for water use".

VII.2.3.1 Carbon Price

It is the way in which countries and markets set a monetary value to CO2 emissions. It consists of making emitters pay for the impact of the GHG they emit. This encourages decisions and investments that are good for the environment and helps build sustainable economic growth. The carbon price contributes, in a flexible manner and with low costs for society, to the cost-effective reduction of GHG emissions.According to MINAM, Peru has a social price for carbon that allows the incorporation into economic evaluations of the benefits or social costs of reducing or increasing GHG emissions. The assigned value is US$7.17 per ton of CO2eq (which is equivalent to S/ 27.25) at the exchange rate that closed in 2022 according to the Central Reserve Bank of Peru.

Figure 20 Carbon Prices in the Region

Source: MINAM 2019

VII.2.3.2 Payment for Water Use

The Peruvian State promotes and controls the sustainable use and conservation of water resources, preventing the affectation of their environmental quality and the natural conditions of their surroundings, as part of the ecosystem where they are found. The sustainable use and management of water implies the balanced integration of sociocultural, environmental and economic aspects in national development, as well as the satisfaction of the needs of current and future generations.

The primary use of water must be carried out in such a way that it does not alter the quality and quantity of the water or its associated goods and without using equipment or carrying out works that divert them from their channels. It is worth mentioning that in Peru the order of preference for the granting of water for productive uses, in case of concurrence of requests, is the following: a) Agricultural, aquaculture and fishing. b) Energetic, industrial, medicinal and mining. c) Recreational, tourist and transportation. d) Other uses.

Water for human consumption is a priority over any other class or type of use. In situations of scarcity, the State ensures the preferential use of water for purposes of supplying population needs. When a closed or emergency zone of water resources is declared, the National Water Authority (ANA) is in charge of issuing the necessary measures to satisfy the demands for primary and population use. The ANA developed the method to determine the values of economic compensation for the right to use water and for the discharge of wastewater into natural water sources. The economic compensation for the use of water is the payment that all water users must pay the State as consideration for the use of the resource, regardless of its origin. It is set per cubic meter of water used regardless of the form of right of use granted and is established by ANA based on social, environmental and economic criteria. The following table shows the economic remuneration (rates) of recent years:

Table 28 Economic Retributions for the Use of Groundwater Applicable to CAASA

Year	(sols./m3)	Normative
2018	0.0766	Supreme Decree No. 017-2017-MINAGRI
2019	0.0776	Supreme Decree No. 014-2018-MINAGRI
2020	0.0792	Supreme Decree No. 011-2019-MINAGRI
2021	0.0792	Supreme Decree No. 013-2020-MIDAGRI
2022	0.0831	Supreme Decree No. 025-2021-MIDAGRI

Source: self made.
Note: The selected rates are from the Pisco aquifer (which appears as an "underexploited" state) and applicable to industrial use.

In the following table we show the relationship between the stress variables and the risks identified in the previous subchapters:

Table 29 Variables and Risks Associated with the Stress Test

Variable	Associated Risk
Carbon price	⚠ **TR6:** That the operating costs increase, due to the implementation of the carbon price in the country.
Payment for water use	⚠ **TR7:** That the operating costs increase, due to the abrupt increase in the rate for the use of groundwater as a result of the water stress in the area of influence.

Source: self made.

VII.2.3.3 Definition of Scenarios

In order to analyze the impact of the identified variables, different scenarios (baseline and hypothetical) are constructed, which are shown in the following table:

Table 30 Base and Stress Scenarios

Variable	Risk Code	Base scenario	stress scenario
Carbon price	RT6	Currently there is no carbon price established in Peru (S/. 0.00/t CO2e)	It is proposed that by 2026 the carbon price be applied taking as a reference the MINAM proposal at the 2022 exchange rate (S/. 27.25/t CO2e)
Payment for Water Use	RT7	Currently the rate for groundwater consumption is S/. 0.0831/m3	A scenario is proposed where the Pisco aquifer goes from an "under-exploited" state to "Over-exploited" by 2026 and that the rate for groundwater consumption is S/. 0.2493/m3

Note: The magnitudes of the variables, in the proposed scenarios, are shown for a period of 2022-2026.
In the case of the scenario of payment for water use, a second degree polynomial regression has been carried out taking into account the rates of the last five years, the stress value is the projection for the year 2026 and considering that the state of the Pisco aquifer go from "Under exploited" to "Over exploited".

VII.2.3.4 Risk analysis

To calculate the criticality of the risk against the deviation (Base - Stress), the CAASA GIRO methodology will be used, for this we will calculate the impact in the following table:

Table 31 Impact of Stress on Carbon Price

Year	Carbon footprint (tCO2e)(1)	Price (S/./t CO2e)	Amount (Healthy)
Foundation (2022)	245 432.13	0.00	0.00
Stress (2026)	245 432.13	27.25	6 687 043.54
Deviation (Base – Stress)			**6 687 043.54**

(1)Only direct emissions (category 1) corresponding to the 2022 period are being considered.

Taking into account the criterion of "Economic loss (Quantitative)" of the GIRO Methodology, the Impact with respect to the RT6 risk is "High (8)" because it is > 5 million soles and taking into account that the probability is "High (8)" in view of the stress scenario occurring, the risk has a criticality of "High".Due to the installed capacity of the CAASA production plant and the type of industry, its carbon footprint is high, even taking into account that its main energy matrix is natural gas, for this reason we consider that the scenario in which the Price is applied to Carbon has a "high sensitivity" for the organization.

Table 32 Impact of Stress from Water Use

Year	Volume of water (m3/year)	Price (S/./m3/year)	Amount (Healthy)
Foundation (2022)	1 671 989.00	0.0831	138 942.29
Stress (2026)	1 671 989.00	0.2493	416 826.86
Deviation (Base – Stress)			**277 884.57**

Source: self made.

Taking into account the criterion of "Economic loss (Quantitative)" of the GIRO Methodology, the Impact with respect to the RT7 risk is "Low (1)" because it is < 1.25 million soles and taking into account that the probability is "High (8)" in the face of the stress scenario, the risk has a criticality of "Considerable". Due to the fact that CAASA's production plant is located in an area classified as having "hydric stress" by the State and that there are other activities in the region that are classified as having a higher priority, we consider that the scenario of an abrupt increase in for Payment for Water Use has a "Considerable Sensitivity" for the organization.

In the following table we present the risk assessment:

Table 33 Risk Assessment in Stress Scenarios

Variable	Risk Code	Probability	Impact	Risk Criticality	Risk Response
Carbon price	RT6	high (8)	high (8)	High (64)	Avoid
Payment for Water Use	RT7	high (8)	Low (1)	Considerable (8)	To mitigate

Source: self made.

VII.2.3.5 Response Strategy

- Implement the internal carbon price, so that each one of the owners of the CAASA processes becomes aware of the decarbonization of their process. Once the Internal Carbon Price has been implemented, analyze the possibility that this is not just a shadow price but an internal tariff in order to have funds.
- Implement adaptation and mitigation measures against climate change and carry out a more exhaustive analysis of the possibility of the Carbon Price materializing in Peru and its repercussions on the cost of the product.
- Search for new source water alternatives such as the use of desalinated sea water.
- Implement efficient technologies in water consumption, as well as water treatment plants that allow reuse cycles to be greater.

VII.3 RESPONSE PLAN

VII.3.1 Climate Change Adaptation Plan

VII.3.1.1 Goals

A General objective

- Adequately manage the identified physical risks, by reducing the vulnerability and/or adapting our operations to climate change.

B Specific objectives

- Reduce the vulnerability of our headquarters, implementing response actions in the short, medium and long term.
- Reduce water consumption to 1.30 m3/t of finished product by 2030.

VII.3.1.2 Specific Analysis of Physical Risks

To make a more specific analysis of the physical risks to which the organization is exposed, we have distributed our headquarters, according to their location, in three areas of the Peruvian territory as shown in the following figure:

Figure 21 Geographic Distribution of CAASA Headquarters

Physical Risks

RF1: That costs increase due to damage to infrastructure, equipment and products, due to increased rainfall in the areas where the different headquarters are located.

RF2: That cost overruns are generated due to the interruption of electrical power to the Steel Complex, due to damage to the transmission line due to the overflow of the Pisco river.

RF3: Costs for the use of alternative resources for cooling in the production process increase, due to the low availability of groundwater in the area where the Steel Complex is located.

RF4: That transport logistics operations are interrupted due to the blocking of access roads due to social conflicts generated by damage to the infrastructure and scarcity of resources due to climatic vulnerability in the company's areas of influence.

RF5: Lost sales are generated due to the interruption of access roads and highways due to mudslides and floods.

RF6: That an increase in the cost of production is generated due to the acquisition of a greater amount of imported scrap, generated by the delay in the supply of local suppliers as a result of the interruption of access roads and highways due to mudslides and floods.

Of the physical risks identified corporately and using the GIRO methodology, we present the following risk analysis tables, grouping each headquarters according to the zone that corresponds to it and assuming an "RCP8.5" scenario:

Table 34 Risk Analysis in the North Zone

Risk Code	Campus		Impact/ explanation
	CD Trujillo	PA Trujillo	
RF1	Considerable	Considerable	This risk occurs because we have finished product and equipment in CD Trujillo and in Patio Trujillo we have our electric handling crane, which can reach losses of more than S/0.6 million per year.
RF2	Considerable	Does not apply	The risk is inherent to the Pisco Steel Complex, but it can mainly affect the distribution centers, even being able to evaluate, in the worst case, the operation of the Trujillo Distribution Center. This would mean that CD Trujillo could be left without supplies and lose customers in the north of the country. In the case of the Trujillo storage yard, it does not apply since its operations are upstream of the headquarters where the risk would materialize.
RF3	High	Does not apply	The risk is inherent to the Pisco Steel Complex, but it can mainly affect the distribution centers, even being able to evaluate, in the worst case, the operation of the Trujillo Distribution Center. In the case of the Trujillo storage yard, it does not apply since its operations are upstream of the headquarters where the risk would materialize.
RF4	High	High	This risk can occur due to social demonstrations and not necessarily as a result of CAASA's activities, but also due to outside activities and the discontent that the population may have regarding the measures that the Government may be taking regarding climate change and its consequences. , this could shorten supplies to CD Trujillo and interrupt the supply of scrap from the Trujillo collection yard to the Pisco Steel Complex, causing losses in sales and supply of strategic raw material for the organization.
RF5	High	Does not apply	This risk can occur due to landslides, landslides, bridge collapse, which will cause a shortage in the north of the country, generating sales losses for the organization.
RF6	High	High	The collapse of the land communication routes could stop supplying the Pisco Steel Complex with scrap, leaving the Trujillo Stockyard isolated without being able to supply scrap, additionally the Steel Complex would have to use virgin and/or foreign raw materials that would increase the cost of production and thus have an impact on the supply price for CD Trujillo.

Source: self made.

Table 35 Risk Analysis in the Central Zone (Lima)

Risk Code	Campus					Impact/ explanation
	Admin offices	Tubes CD - Trapiche	Steel Center - Lima	Pipe plant - Cajamarquilla	PA Huachipa	
RF1	Moderate	Considerable	Considerable	High	High	This risk occurs because we have a finished product, and in the Patio Huachipa we have our electric handling crane, which can reach losses of between S/0.6 million to S/2.5 million per year. In the case of administrative offices, the impacts are minimal because we do not have our own equipment or infrastructure. Additionally, the offices located in Cajamarquilla - Huachipa are more vulnerable to floods and mudslides because its relief is considered a ravine and the overflow of the Huaycoloro River.
RF2	Does not apply	Considerable*	Does not apply	Does not apply	Does not apply	* This risk is applicable to the damages that the Trapiche tube CD may have and power interruption due to its proximity to the Chillón river (0.92 km).
RF3	Does not apply	Does not apply	Does not apply	Does not apply	Does not apply	Does not apply
RF4	Does not apply	High	High	High	High	This risk can occur due to social manifestations and not necessarily as a result of CAASA's activities, but also due to outside activities; and the discontent that the population may have regarding the measures that the Government may be taking with respect to climate change and its consequences, this could lead to a shortage of raw material and finished product to the headquarters and interrupt the supply of scrap metal from the Huachipa collection yard to the Pisco Steel Complex, causing losses in sales and supply of strategic raw materials for the organization.
RF5	Does not apply	High	High	High	Does not apply	This risk can occur due to landslides, landslides, bridge collapse, which will cause a shortage of raw material and finished product between these locations, generating sales losses for the organization.
RF6	Does not apply	Does not apply	Does not apply	Does not apply	High	The collapse of the land communication routes could stop supplying the Pisco Steel Complex with scrap, leaving the Huachipa Stockyard isolated without being able to supply scrap. This risk does not apply to the other locations because the Steel Complex currently does not supply them with materials.

Source: self made.

Table 36 Risk Analysis in the Central Zone (Callao)

Risk Code	Campus				Impact/ explanation
	CD - Callao	CD of nails - Callao	Clove plant - Callao	PA - Oquendo	
RF1	High	High	High	High	This risk occurs because we have a finished product, and in Patio Oquendo we have our electric handling crane, which can reach losses of up to S/2.5 million per year. Additionally, the storage yard is the most vulnerable location in the downtown area due to its proximity to the sea (0.7km).
RF2	High	High	High	Does not apply	The risk is inherent to the Pisco Steel Complex, but it will mainly affect the distribution centers. In the case of CD Callao, it would be due to the supply of finished product, in the Callao nail plant due to an increase in the cost of raw material (wire rod) and for the CD of nails - Callao also a shortage of finished product with a higher cost.
RF3	High	High	High	Does not apply	The risk is inherent to the Pisco Steel Complex, but it can mainly affect the distribution centers. In the case of the Oquendo storage yard, it does not apply since its operations are upstream of the headquarters where the risk would materialize.
RF4	High	High	High	High	This risk can occur due to social demonstrations and not necessarily as a result of CAASA's activities, but also due to outside activities and the discontent that the population may have regarding the measures that the Government may be taking regarding climate change and its consequences. .
RF5	High	High	High	Does not apply	This risk can occur due to landslides, landslides, bridge collapse, which will cause a shortage in the north of the country, generating sales losses for the organization.
RF6	High	High	High	High	The collapse of the land communication routes could stop supplying the Pisco Steel Complex with scrap, leaving the Oquendo Stockyard isolated without being able to supply scrap, additionally the Steel Complex would have to use virgin and/or foreign raw materials that would increase the cost of production and thus have an impact on the supply price for the other 3 locations in the downtown area.

Source: self made.

Table 37 Risk Analysis in the South Zone

Risk Code	Campus		Impact/ explanation
	Steel Complex - Pisco	CD Arequipa	
RF1	High	High	In the province of Pisco, rain is unlikely, but if it occurs frequently, it could damage a large part of the infrastructure, equipment, and products that are not indoors. In the CD there is also a risk, this because they are in a very rainy area.
RF2	High	High	The Steel Complex is supplied with electricity through the Independencia transmission line. This line is located near the Pisco River, which increases its flow in the summer months (January-March) due to the rains from the Sierra, which may affect to the closest towers of the line and leaving the steel complex without power supply for more than 2 days. This risk mainly affects distribution centers such as CD Arequipa.
RF3	High	High	Due to the water stress area where the Steel Complex is located, it is necessary to identify other water sources or other projects for saving and efficient use of water, this would involve additional costs in production and that will be transferred to the sale price to the distribution centers such as CD Arequipa.
RF4	Considerable	High	This risk can occur due to social demonstrations and not necessarily as a result of CAASA's activities, but also due to outside activities and the discontent that the population may have regarding the measures that the Government may be taking regarding climate change and its consequences. This could lead to a shortage of raw materials for the organization and interrupt the supply of finished products to our distribution centers.
RF5	High	High	This risk can occur due to landslides, landslides, bridge collapse, which will cause a shortage in the south of the country, generating sales losses for the organization.
RF6	High	High	The collapse of the land communication routes could stop supplying the Pisco Steel Complex with scrap, additionally virgin and/or foreign raw materials would have to be used, which would increase the cost of production and thus have an impact on the supply price for CD Arequipa.

Source: self made.

VII.3.1.3 Adaptation Response to Climate Risks

The following table shows the different response actions (in the short, medium and long term) against the risks identified by climate change, distributed in the following thematic axes: "emergencies" and "water".

Table 38 Main Actions in Response to the Identified Risks

Risk		Response Action	Key Actors
Code	criticality		
Thematic axis: Emergencies			
RF1	High	**Short term**	
		- Implementation of the Emergency Response Plan (Floods) in all CAASA headquarters, evaluating vulnerability according to their zoning and identifying the most important material assets. - Develop the Infrastructure Maintenance Program in each of the organization's headquarters. - Before each change of season, review and disseminate the meteorological forecast of the National Meteorology and Hydrology Service of Peru (SENAMHI) focused on the areas where the headquarters are located.	- Central Production Manager. - Supply Chain Manager. - CEG Manager.
		Medium term	
		- Interconnection to the early warning system of the State in order to be able to forecast events that may harm the activities of the company.	- CEG Manager.
		Long term	
		- Each time a new headquarters for the organization is identified, the vulnerability of the area to climate change (huaicos, landslides, road obstruction, etc.) must be taken into account.	- Central Production Manager. - Supply Chain Manager
RF2	High	**Short term**	
		- Include in the Emergency Response Plan of the headquarters, the works of prevention that the company has been carrying out in the Pisco river. - Develop the Infrastructure Maintenance Program on the Independencia transmission line, especially in towers 7 and 8 as they are the closest to the Murga Bridge.	- Central Production Manager. - CEG Manager.

		- Before each change of season, review and disseminate the meteorological forecast of the National Meteorology and Hydrology Service of Peru (SENAMHI) focused on the Pisco river basin, influenced by its source.	
		Medium term	
		- Coordinate integrated works with the Municipality of Pisco focused on cleaning the banks of the Pisco River before reaching the rainy season in the Sierra. - Interconnection to the early warning system of the State in order to be able to forecast events that may harm the activities of the company.	- Project Manager, Mining and Social Responsibility. - CEG Manager.
		Long term	
		- Each time a new headquarters for the organization is identified, the vulnerability of the area to climate change (huaicos, landslides, road obstruction, etc.) must be taken into account.	- Central Production Manager. - Supply Chain Manager.
RF5	High	**Short term**	
		- Check the latest news and other media, making sure that there are no blockages on the dispatch route (if there is a blockage, the dispatch is rescheduled until the route is released), if the blockage occurs during the route, the driver looks for a safe area until the route is released. - When we know that there will be interruptions on the highway due to the El Niño phenomenon or scheduled strikes, the increase in the inventory of the distribution centers is programmed to be able to withstand temporary interruptions.	- Supply Chain Manager.
		Medium term	
		- Interconnection to the early warning system of the State in order to be able to forecast events that may harm the activities of the company. - Before each change of season, review and disseminate the meteorological forecast of the National Meteorology and Hydrology Service of Peru (SENAMHI) focused on the main transport routes of the organization.	- CEG Manager.
		Long term	

		- Evaluate the need to open new distribution centers in the interior of the country, in order not to short-supply our customers.	- Supply Chain Manager.
RF6	High	**Short term**	
		- Check the latest news and other media, making sure that there are no blockages on the dispatch route (if there is a blockage, the dispatch is rescheduled until the route is released), if the blockage occurs during the route, the driver looks for a safe area until the route is released.	- Supply Chain Manager.
		Medium term	
		- Interconnection to the early warning system of the State in order to be able to forecast events that may harm the activities of the company. - Before each change of season, review and disseminate the meteorological forecast of the National Meteorology and Hydrology Service of Peru (SENAMHI) focused on the main transport routes of the organization.	- CEG Manager.
		Long term	
		- Develop activities to increase the uptake of scrap at a national level, evaluating the possibility of opening new offices in the interior of the country.	- Strategic Purchasing Manager.
Thematic Axis: Water			
RF3	High	**Short term**	
		- Implementation of water treatment systems that allow increasing the recirculation of the water used in the steel complex. - Optimize the use of wastewater within the plant, either in other operations or in the live fence.	- Central Production Manager.
		Medium term	
		- Evaluate source water replacement alternatives such as seawater desalination. - Calculate the organizational Water Footprint.	- Project Manager, Mining and Social Responsibility. - Central Production Manager. - CEG Manager.
		Long term	

		- Continue acquiring technologies that can replace the use of water for forced-air cooling.	- Project Manager, Mining and Social Responsibility. - Central Production Manager.
RF4	Considerable	**Short term**	
		- Continue participating in the meetings of the Committee of Non-Agricultural Groundwater Users, to continue maintaining good relations with the main actors. - Continue to participate actively in the Municipal Environmental Commission of Pisco, to continue maintaining good relations with the main actors. - Communicate and disseminate the implementation of water treatment systems that allow increasing the recirculation of the water used in the steel complex. - Communicate and disseminate the treatment and reuse of wastewater that the organization has been carrying out.	- Project Manager, Mining and Social Responsibility. - CEG Manager.
		Medium term	
		- Evaluate source water replacement alternatives such as seawater desalination. - Calculate the organizational Water Footprint in accordance with ISO 14046.	- Project Manager, Mining and Social Responsibility. - CEG Manager.
		Long term	
		- Continue acquiring technologies that can replace the use of water for forced-air cooling.	- Project Manager, Mining and Social Responsibility. - Central Production Manager.

Source: self made.
Note: Risk Criticality is related to the RCP 8.5 scenario.

VII.3.2 CAASA Decarbonization Plan

Peru, through MINAM, is in the process of updating its National Strategy for Climate Change (ENCC), which will include the goal of achieving carbon neutrality for the country by 2050.

In the document "Costs and benefits of carbon-neutrality in Peru" from the IDB, an analysis of the costs and benefits of achieving carbon-neutrality in Peru by mid-century is described. This document seeks to support MINAM in updating the ENCC, especially with regard to the mitigation component.

The study carried out by the IDB and other institutions shows that achieving zero net GHG emissions in Peru is technically possible with interventions in each of the sectors of the economy and under the considerations made. The transformative process not only allows decarbonizing the economy, but also brings benefits for the country that far exceed the additional costs of the transformative process and provide a net socioeconomic benefit between 2021 and 2050. The analysis serves as technical support for the Technical Study for Carbon-Neutrality prepared by MINAM with a view to updating the ENCC and has provided relevant technical inputs for updating the 2020 NDCs, which represent Peru's initial commitment under the Paris Agreement.

At CAASA, consistent with the need to reduce our GHG emissions, we have aligned ourselves with The Science Based Targets Initiative (SBTi), which is a global organization that allows companies to establish ambitious emission reduction targets in line with climate science more recent. It focuses on accelerating companies around the world to halve emissions by 2030 and achieve net zero emissions by 2050.

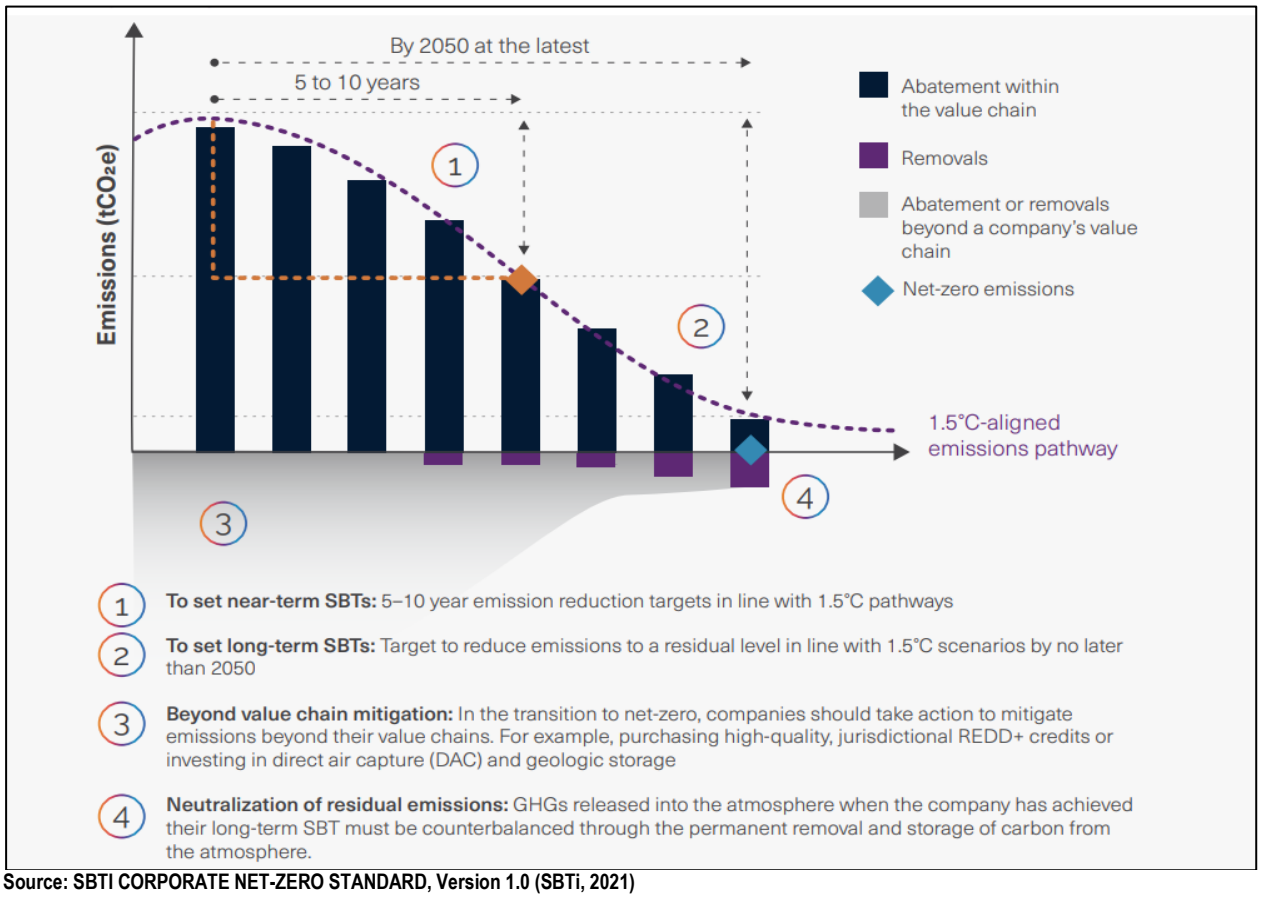
The SBTi Corporate Net Zero Standard (also known as the Net Zero Standard) provides guidance, criteria, and recommendations to help companies establish net zero targets through SBTi.

The primary goal of this standard is to provide a robust, standardized approach for companies to set net-zero emissions targets that are aligned with climate science. To contribute to the social goals of net zero emissions, companies must deeply reduce emissions and offset the impact of remaining emissions. The SBTi Net-Zero standard defines corporate net-zero as:

- Reduce Scope 1, 2 and 3 emissions to zero or a residual level that is consistent with achieving net zero emissions globally or sectorally on eligible roads aligned with 1.5°C
- Neutralize any residual emissions in the net-zero target year and any GHG emissions released to the atmosphere thereafter.

The Net-Zero Standard establishes four key elements that make up a net-zero corporate goal as shown in the figure below. The first of these elements is a science-based short-term objective, the second is a science-based long-term objective, the third is mitigation beyond the value chain, and the final element is neutralization of residual emissions.

Figure 22 Key Elements of the Net-Zero Standard



Source: SBTI CORPORATE NET-ZERO STANDARD, Version 1.0 (SBTi, 2021)

Firms can take a variety of approaches to develop objectives based onin science in the short and long term; however, the SBTi recommends following the five steps outlined in the following figure:

Figure 23 SBTi 5-Step Approach

Source: SBTI CORPORATE NET-ZERO STANDARD, Version 1.0 (SBTi, 2021)

VII.3.2.1 Base Year Selection

CAASA has established 2019 as the base or reference year, due to the availability of auditable data (first calculated period) and due to the organization's commitment to progressively establish Actions Against Climate Change.

A Changes in the base year or other historical data

For the issuance of this report on the GHG inventory for the year 2022 we have recalculated our base year due to the following:

- For the 2021 inventory there was a structural change due to the purchase of two subsidiaries (COMASA and COMFER) having as new emission sources: (1) Nail plant - Callao, (2) Nail distribution center - Callao, (3) Cajamarquilla tube plant and (4) Steel Center. It should be described that COMFER's activities have a significant source of emissions due to its annealing furnaces.
- For the 2021 inventory, we adapted to the ISO 14064-1: 2018 methodology, reporting categories of indirect emissions according to significance analysis.
- For the 2021 and 2022 inventory, we have identified new emission factors specifically related to our steelmaking process, having as new sources of GHG the consumption of electrodes, pig iron, ferroalloys and anthracite.

To perform the recalculation of the base year, we have considered what is described in the Instruction for the Review and Recalculation of the Base Year (MAPG01-I003), with the result being 461,578.74 t CO2e.

The following table shows the distribution of GHG emissions by headquarters and categories of the recalculation of the base year:

Table 39 Base Year Recalculation for 2022 Inventory

Campus	GHG emissions (t CO2e)					Stake (%)
	Category 1	Category 2	Category 3	Category 4	Total	
Magdalena Administrative Offices	6.09	31.04	348.59	-	385.72	0.08%
steel complex	214,052.30	110,285.99	91,348.83	-	214,052.30	90.06%
CD - Callao	212.31	352.22	31,346.51	0.58	31,911.62	1.25%
CD – Trapiche	18.53	-	11.89	-	30.42	0.01%
CD - Arequipa	66.75	36.43	4,744.98	-	4,848.16	1.05%
CD – Trujillo	-	0.85	2.27	-	3.12	0.00%
PA – Oquendo	185.20	41.38	4.16	-	230.74	0.05%
PA – Cajamarquilla	281.71	-	5.69	-	287.40	0.06%
PA – Trujillo*	-	-	-	-	-	0.00%
Steel center – Lima**	3.96	103.64	180.60	207.00	495.20	0.11%
Pipe Plant – Cajamarquilla**	36.62	321.88	243.17	103.92	705.59	0.06%
CD of Nails – Callao***	70.61	22.05	1,152.87	1.06	1,246.59	0.27%
Clove Plant – Callao***	4,554.86	741.79	448.47	1.94	5,747.06	1.25%
Total	**219,488.94**	**111,937.27**	**129,838.03**	**314.50**	**461,578.74**	**100.00%**

Source: Own elaboration, CAASA 2023
*** Starts operations in 2021.**
**** New headquarters of the subsidiary Comercial del Acero S.A. (Considered for the GHG inventory after 2019).**
***** New headquarters of subsidiary COMFER S.A. (Considered for the GHG inventory after 2019).**

Due to the adaptation of our inventory to the ISO 14064-1:2018 standard, we use the category approach, with the equivalences being those shown in the following table:

Table 40 Equivalences between the Scope Approach and Categories

ISO 14064-1:2012 approach and the Greenhouse Gas Protocol	ISO 14064-1: 2018 approach
Scope 1: Direct GHG emissions	Category 1: Direct GHG emissions and removals.
Scope 2: Indirect GHG emissions associated with electricity	Category 2: Indirect GHG emissions from imported energy.
Scope 3: Other indirect GHG emissions	Category 3: Indirect GHG emissions from transport.
	Category 4: Indirect GHG emissions from products used by the organization.
	Category 5: Indirect GHG emissions associated with the use of the organization's products.
	Category 6: Indirect GHG emissions from other sources.

Source: self made.

CAASA applies and documents a process to determine which are the indirect emissions to be included in its GHG inventory, in accordance with the document MAPG01-I005 Instruction for the determination of the significance of indirect GHG emissions, which has as criteria for assessment: magnitude, level of influence, risk or opportunity, industry-specific guidance, outsourcing, employee engagement, and information availability. In CAASA it has been possible to determine activities with significant indirect emissions related to categories 2, 3 and 4.

VII.3.2.2 Calculation of GHG Emissions

A Organizational Limit

The CAASA organizational boundary for the 2022 inventory is as follows:

Table 41 CAASA Organizational Boundary

Facility	Classification	Location	Address
Administrative offices – Magdalena	Administrative office	Lime	Floor 16 and 17 of Av. Antonio Miró Quesada 425, Magdalena del Mar - Lima.
Steel Complex – Pisco	steel complex	pisco	Km 241 of the Panamericana Sur, Paracas - Ica.
CD – Callao	Finished product warehouse.	callao	Av. Enrique Meiggs 329, Callao.
CD – Arequipa	Finished product warehouse.	Arequipa	Km 5.5 of the Uchumayo Bypass, Cerro Colorado – Arequipa.
CD – Trujillo	Finished product warehouse.	Trujillo	Av. Tupac Amaru No. 1620, Trujillo – La Libertad
CD – Trapiche	finished product warehouse	Lime	Calle Santa Ana 102 (Former Fundo Chacra Cerro), Comas – Lima.
PA – Oquendo	Scrap yard	callao	B Street with 10th Street (Ex Fundo Oquendo), Callao – Lima.
PA – Cajamarquilla	Scrap yard	Lime	Av. Chosica Plot No. 63, Lurigancho Chosica – Lima.

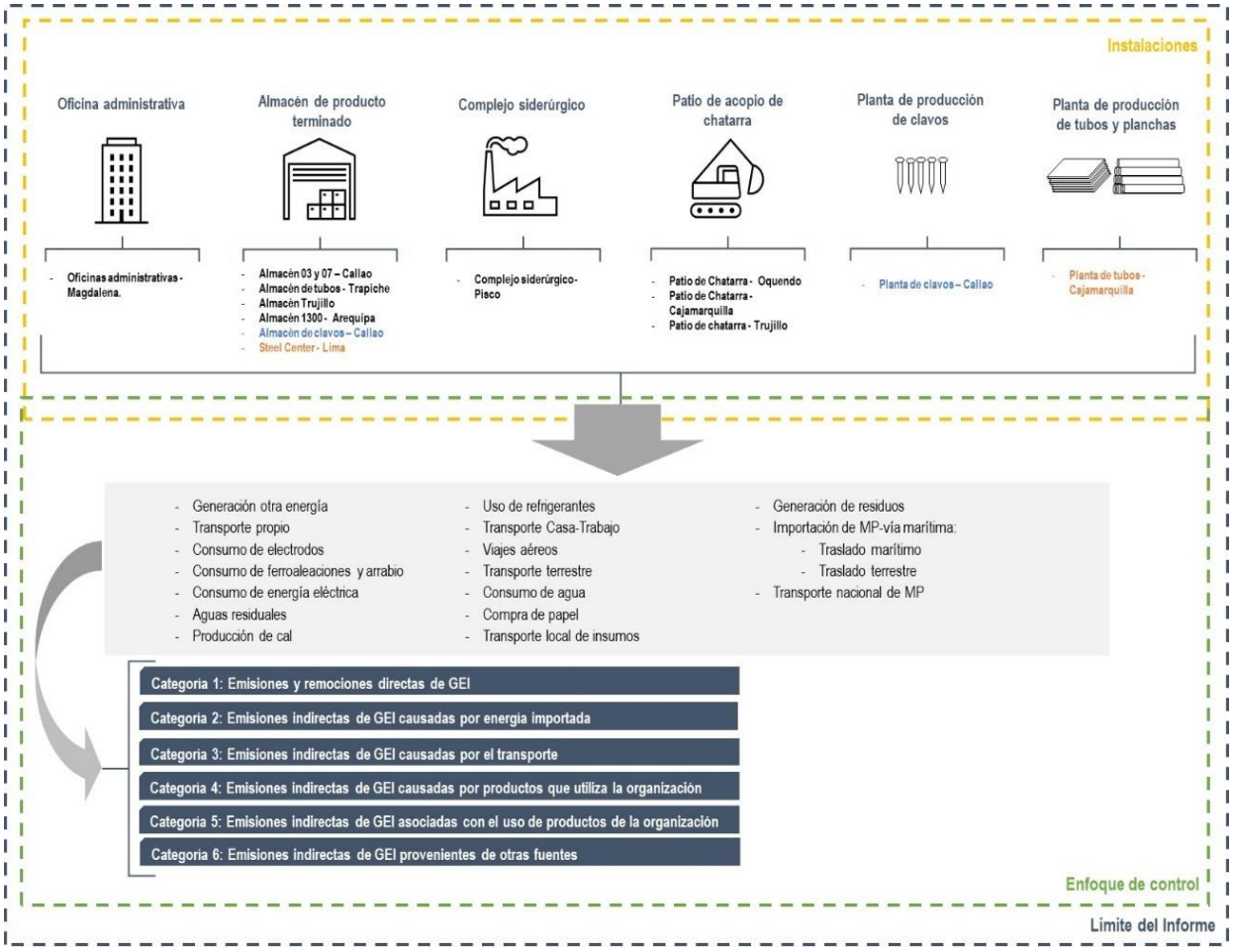
PA - Trujillo	Scrap yard	Trujillo	Mz. B-1 Lots 6, 7, 8, 9, 10, 11 and 12 – B, Urb. Parque Industrial, La Esperanza, Trujillo - La Libertad.
Clove plant – Callao	nail production plant	callao	Av. Argentina No. 1123, Callao – Lima.
Nail store – Callao	finished product warehouse	callao	Av. Argentina No. 1646 – 1650, Callao – Lima.
Steel center – Lima	finished product warehouse	Lime	Av. Argentina No. 2051, Lima.
Pipe Plant – Cajamarquilla**	Tube and sheet production plant	Lime	Parcelación Cajamarquilla First Stage, lot 37, district Lurigancho - Chosica, Lima.

Source: Own elaboration, CAASA 2022

B Report Limits (Operational)

The consolidation of GHG emissions in the operation of CAASA and subsidiaries is approached from the operational control approach; These emissions have been categorized as proposed by Standard ISO 14064-1 version 2018; In addition, in accordance with the methodology used based on their categories and identified emission sources. CAASA's GHG emissions have been classified as direct or indirect emissions On the basis described above, the operational limits are determined, through the classification of GHG emission sources with their respective categories.

Figure 24 Limits of the GHG Inventory 2022



Source: 2022 GHG Inventory Report, CAASA.

In CAASA's Carbon Footprint Calculation, emissions have been quantified in categories 1, 2, 3 and 4, so that the evaluation of the significance of indirect emissions from facilities and activities controlled by the company and its subsidiaries.

Other considerations, regarding the established limits:

- Emissions from biomass burning, referring to the burning of organic matter of plant origin, are reported separately as carbon dioxide (CO2) emissions and are not part of CAASA's carbon footprint.
- The emissions, of methane and nitrous oxide, from the burning of biomass do form part of CAASA's carbon footprint.
- GHG emissions, not covered by the Kyoto Protocol, such as HCFCs, are not included in category 1. These have been reported separately together with CO2 emissions.

C Results of the Organizational Carbon Footprint

CAASA's Organizational Carbon Footprint for the year 2022 is (rounded off 708,353.34 tons of CO2e): 708,354.00 t CO2e (Seven hundred eight thousand, three hundred fifty-four tons of carbon dioxide equivalent).

The total greenhouse gas (GHG) emissions for the year 2022 are shown in the following table and graph. 34.65% of the total GHG emissions are generated in Category 1 (direct GHG emissions); and 65.35% are generated in Categories 2, 3 and 4 (indirect GHG emissions).

Table 42 GHG Emissions by Category Type – HC 2022

Scope	GHG emissions [tCO2e/year]	overall participation [%]
Category 1	245 432	34.65
Category 2	172 942	24.41
Category 3	289 506	40.87
Category 4	473	0.07
Total	**708 353**	**100.00**

Source: Own elaboration, CAASA 2023

Table 43 Carbon Footprint 2022 by Emission Source

Categorías	Dioxido de carbono [tCO2]	Metano [tCH4]	Óxido Nitroso [tN2O]	Hexafluoruro de azufre [tSF6]	Hidrofluorocarbonos [tHFC]	Perfluorocarbonos [tPFC]	Trifluoruro de nitrógeno [tNF3]	Emisiones GEI [tCO2e]	Participación general [%]
Categoría 1: Emisiones directas de GEI								**245,432.13**	**34.65%**
Combustión estacionaria	114,557.58	2.11	0.22					114,678.18	16.19%
Planta de Cal (carbón mineral bituminoso)	*915.71*	*0.10*	*0.01*					***922.46***	*0.13%*
Gas Natural	*111280.08*	*1.98*	*0.20*					***111,392.10***	*15.73%*
Gas Licuado de Petróleo (GLP)	*2048.95*	*0.03*	*0.00*					***2,050.78***	*0.29%*
Fuentes fijas biogénicas									
Quema de polvo baghouse	*312.84*							***312.84***	*0.04%*
Combustión móvil	5,153.97	0.2887	0.2710					5,234.44	0.74%
Fuentes móviles biogénicas		0.0067	0.0013					0.5500	0.00%
Procesos industriales	125,452.84							125,452.84	17.71%
Producción de cal	*25535.99*							***25,535.99***	*3.60%*
Electrodos	*6557.39*							***6,557.39***	*0.93%*
Ferroaleaciones	*321.86*							***321.86***	*0.05%*
Arrabio	*7063.46*							***7,063.46***	*1.00%*
Antracita	*85974.13*							***85,974.13***	*12.14%*
Uso de Refrigerantes					0.02			25.29	0.00%
Uso de Fertilizantes			0.1476					39.11	0.01%
Recarga de extintores	1.70							1.71	0.0002%
Categoría 2: Emisiones indirectas de GEI provenientes de energía importada								**172,942.22**	**24.41%**
Consumo de electricidad SEIN	172,384.53	8.8393	1.10					172,942.22	24.41%
Categoría 3: Emisiones indirectas de GEI provenientes del transporte								**289,506.46**	**40.87%**
Transporte de insumo								0.01	0.00%
Transporte de materia prima e insumo	192,931.74	55.46	2,651.10					195,638.29	27.62%
Traslado marítimo	*168627.21*	*52.96*	*2309.09*					***170,989.27***	*24.14%*
Traslado terrestre	*24304.53*	*2.50*	*342.01*					***24,649.03***	*3.48%*
Trasporte de producto terminado	89,440.81	16.14	1,246.13					90,703.09	12.80%
Traslado marítimo	*32915.16*	*10.34*	*450.72*					***33,376.22***	*4.71%*
Traslado terrestre	*56525.65*	*5.81*	*795.41*					***57,326.87***	*8.09%*
Transporte casa-trabajo	3,131.44	0.2371	0.1001					3,165.07	0.45%
Categoría 4: Emisiones indirectas de GEI provenientes de productos que utiliza la organización								**472.53**	**0.07%**
Consumo de agua								11.32	0.00%
Servicios (terceria ILM)	454.18	0.0239	0.0238					461.21	0.07%
TOTAL HUELLA DE CARBONO	**703,508.79**	**83.11**	**3,899.09**	**-**	**0.02**	**-**	**-**	**708,353.34**	**100%**
								708,354.00	

Source: 2022 GHG Inventory Report, CAASA.

Table 44 2022 GHG Emissions by Locations

Headquarters	GHG emissions (t CO2e)					Stake(%)
	Category 1	Category 2	Category 3	Category4	Total	
Magdalena Administrative Office	45.38	30.30	303.04	0.00	378.72	0.05%
steel complex	240,944.16	170,855.90	211,724.78	0.00	623,524.84	88.04%
CD - Callao	0.11	450.65	43,975.68	196.41	44,622.86	6.30%
CD - Trapiche	0.00	17.28	3.22	6.35	26.85	0.00%
CD - Arequipa	0.46	77.47	4,893.72	1.94	4,973.59	0.70%
CD - Trujillo	6.23	2.46	1,550.61	0.04	1,559.35	0.22%
PA - Oquendo	0.01	107.08	10.76	0.00	117.85	0.02%
PA - Cajamarquilla	0.03	86.02	14.56	0.05	100.66	0.01%
PA - Trujillo	5.99	41.64	12.78	0.40	60.81	0.01%
Steel center – Lima*	2.04	106.13	13,070.71	130.59	13,309.46	1.88%
Pipe plant – Cajamarquilla*	32.72	258.71	12,792.37	133.32	13,217.11	1.87%
CD of nails – Callao**	0.00	16.77	142.67	0.85	160.30	0.02%
Clove plant – Callao**	4,394.99	891.81	1,011.55	2.58	6,300.94	0.89%
Total	**245,432.13**	**172,942.22**	**289,506.46**	**472.53**	**708,353.34**	**100.00%**

Source: Own elaboration, CAASA 2023
*** Headquarters of subsidiary Comercial del Acero SA (In liquidation)**
**** COMFER SA subsidiary headquarters (In liquidation).**

In the ISO 14064-1 standard, only the seven greenhouse gases contemplated in the Kyoto Protocol are considered, in an additional and complementary manner, CAASA has calculated the "No Kyoto" GHG emissions and CO2 emissions from biomass burning, biofuels and hydrochlorofluorocarbons (HCFCs). These are reported as informative emissions and are not part of CAASA's 2022 Carbon Footprint.

Gasohol and diesel contain 7.8% and 5% biofuel and ethanol respectively. CO2 emissions are not part of the Carbon Footprint, because CO2 emissions from biomass (combustion or decomposition) must be treated separately as an informative element. By the year 2022, 157.20 t CO2 have been generated, due to the burning of biofuel and ethanol. These are not part of CAASA's 2022 carbon footprint and are reported in the following table:

Table 45 CO2 Emissions from Biomass Burning

Fountain	Carbon dioxide (tCO2)	overall participation (%)
Biofuel 100%	154.65	98.38%
Ethanol	2.55	1.62%
TOTAL	**157.20**	**100%**

Source: Own elaboration, CAASA 2023.

Hydrochlorofluorocarbons are not reported as part of the Carbon Footprint, as they are non-Kyoto greenhouse gases; since, they are considered as precursor gases. Therefore, their emissions are reported in an informative manner, as detailed:

Table 46 GHG Emissions from Hydrofluorocarbons

gas type	hydrochlorofluorocarbons (t HCFC/year)	equivalent carbon dioxide (t CO2e/year)
hydrochlorofluorocarbons	0.11	163.29

Source: Own elaboration, CAASA 2023.

VII.3.2.3 Science-Based Target Limits

The coverage of the short and long-term objectives takes into account the large percentage of participation of the GHG emissions of the headquarters, the main one being that of the Pisco Steel Complex.

This calculation has been developed based on what the emission source that attacks the directed actions of the headquarters represents, giving priority to those with the greatest participation such as the Pisco Steel Complex, Nail Plant – Callao and Warehouse No. 03 and 07 – Shut up.

Table 47 Short and Long Term Target Coverage (Scope 1 and 2)

Campus	action oriented	Unit coverage of sources	Full Source Coverage
Pisco Steel Complex	**Category 1** - Progressive change from synthetic fertilizers to organic fertilizers. - Use of electric machinery and vehicles to replace those that consume diesel oil. - Implementation of the hot load in the NTL to reach a unitary consumption of natural gas of 20 m3/t product. - Implementation of the Vertical Lime Kiln to reach a consumption of 900 kcal/kg product. - Implementation of the scrap cleaning machine to reduce the consumption of electrical energy in the electric furnace. - - Implement new annealing furnaces to improve the efficiency in the use of natural gas in the drawing process. **Category 2** - Electricity supply with certified renewable source. - Implementation of an energy management management system based on ISO 50001.	80%	80.5%
Clove plant – Callao	**Category 2** - Electricity supply with certified renewable source.	0.3%	
Warehouse No. 03 and 07 - Callao	**Category 2** - Implementation of solar panels.	0.2%	

Source: self made.

Table 48 Short Term Target Coverage (Scope 3)

Campus	action oriented	Unit coverage of sources	Full Source Coverage
Pisco Steel Complex	**Category 3** - Progressive change of the Transportes Barcino fleet (from diesel to natural gas).	5.2%	8.6%
Warehouse No. 03 and 07 - Callao	**Category 3** - Progressive change of the Transportes Barcino fleet (from diesel to natural gas). **Category 4** - Decarbonization of the outsourcing service.	3.4%	

Source: self made.

Table 49 Long Term Target Coverage (Scope 3)

Campus	action oriented	Unit coverage of sources	Full Source Coverage
Pisco Steel Complex	**Category 3** - Total change of the Transportes Barcino fleet (from diesel to natural gas). - Total change of the third fleet that transports the raw material and delivery. - Preferences in imports/exports with a lower carbon footprint.	61.5%	99.1%
Warehouse No. 03 and 07 - Callao	**Category 3** - Total change of the Transportes Barcino fleet (from diesel to natural). - Total change of the third fleet that transports the raw material and delivery. - Preferences in exports with a lower carbon footprint. **Category 4** - Decarbonization of the outsourcing service.	37.6%	

Source: self made.

VII.3.2.4 Choice of Target Year

The short-term target year is 2030 and the long-term target year is 2050.

VII.3.2.5 Calculation of the Objectives

The following table shows the short and long-term objectives taking into account the execution of targeted actions in each of the categories:

Table 50 Short and Long Term Objectives

Guy	Temporality	Aim
Relative	Short term	Generate 0.23 t CO2e (scope 1 + scope 2) / t of finished product (laminated) by 2030.
	Long term	Generate 0.11 t CO2e (scope 1 + scope 2) / t of finished product (laminated) by 2050.
	Short term	Generate 0.26 t CO2e (scope 1 + scope 2) / t of liquid steel by 2030.
	Long term	Generate 0.11 t CO2e (scope 1 + scope 2) / t of liquid steel by 2050.
Absolute	Short term	Consume more than 98% electrical energy from renewable sources by 2030.
	Long term	Consume more than 99% electrical energy from renewable sources by 2050.
Absolute	Short term	Reduce 15% of GHG emissions (scope 1 + scope 2) from the baseline (2019) to 2030.
	Long term	Reduce 90% of GHG emissions (scope 1 + scope 2) from the baseline (2019) to 2050.
Absolute	Long term	Reduce 80% of GHG emissions (scope 3) from the baseline (2019) to 2050.

Source: self made.

Figure 25 Objectives to reach Carbon Neutrality

VII.3.2.6 CAASA Internal Carbon Price Analysis

The approach is defined as one that contributes to a journey to align a company's business strategy with the transition to a low carbon economy.

A Goals

Implementing the internal carbon price allows us to:

- **Change internal behavior**, to raise awareness about climate change and influence decision makers to incorporate a climate change perspective into their daily thinking.
- **Promote energy efficiency,** implementing projects that involve energy efficiency, consumption of renewable energy and reduction of GHG emissions.
- **Satisfy shareholder expectations,** in order to identify the position of the organization in the value chain which will allow and make appropriate business decisions.
- **Identify and seize low carbon opportunities,** to lead us to a low-carbon economy, with an improved competitive position for low-carbon products, increased demand for products that reduce GHG emissions.
- **Promote investments with low carbon emissions,** using technologies that reduce the carbon footprint.

B Approach

The internal carbon price approach attributes a hypothetical cost of carbon emissions to better understand how GHG emission pricing affects the organization's business case. This includes mapping potential financial risks related to climate change or estimating the potential impact of a carbon price on the prices of products under development.

The price used by Corporación Aceros Arequipa (CAASA) is a “uniform price” that is used throughout the company regardless of geography, subsidiary by type of decision.

There are two types of prices that can be used: shadow price and internal rate price. The price currently used by CAASA is "shadow price" which will allow us to:

- Have approval criteria in business decisions.
- Integrate it into overhead cost calculations as a financial indicator
- Include it qualitatively in the decision-making process.
- Track compliance prices without directly affecting business decisions.

There are 4 approaches to adjust prices, which are:

- **Based on external resources**, such as price projections from climate-related regulation such as “the Price on Carbon”.
- **Based on a benchmark against peers**, by looking at carbon prices set by other companies within their own sector.
- **Based on internal consultation**, to arrive at a price that is material enough to change business decisions and behavior.
- **Based on technical analysis**, of the measures required to achieve the objectives of reducing its carbon footprint and the necessary associated investments.

In the case of CAASA, the process to set the price was "based on external resources" taking into account the proposal of the Ministry of the Environment (MINAM) in 2019, of US$ 7.17 per ton of CO2e(which is

equivalent to S/ 27,246 at the exchange rate at the end of 2022 according to the Central Reserve Bank of Peru).

C Distribution of the Internal Carbon Price for the 2022 Period

CAASA's 2022 carbon footprint includes, as an organizational limit, the headquarters described in Chapter III Objective and Scope of this report. The following table shows the distribution of the CAASA Internal Carbon Price for 2022:

Table 51 Domestic Carbon Price Distribution for 2022

Headquarters	Domestic Carbon Price 2022			Stake
	scope 1	scope 2	Total	(%)
	S/.	S/.	S/.	
Magdalena Administrative Office	1,236.42	825.55	2,061.98	0.02
Pisco Steel Complex	6,564,764.58	4,655,139.85	11,219,904.43	98.43
Warehouse No. 03 and 07 - Callao	3.00	12,278.41	12,281.41	0.11
Finished product warehouse - Trapiche	-	470.81	470.81	0.00
Warehouse 1300 - Arequipa	12.53	2,110.75	2,123.28	0.02
Finished product warehouse - Trujillo	169.74	67.03	236.77	0.00
Scrap Collection Yard - Oquendo	0.27	2,917.50	2,917.77	0.03
Scrap Collection Yard - Cajamarquilla	0.82	2,343.70	2,344.52	0.02
Scrap Collection Yard - Trujillo	163.20	1,134.52	1,297.73	0.01
Steel center – Lima	55.58	2,891.62	2,947.20	0.03
Pipe plant – Cajamarquilla	891.49	7,048.81	7,940.30	0.07
CD of nails – Callao	-	456.92	456.92	0.00
Clove plant – Callao	119,745.90	24,298.26	144,044.15	1.26
Total	**6,687,043.54**	**4,711,983.73**	**11,399,027.27**	**100.00**

Source: self made.

The steel complex has the highest internal carbon price, since that is where the CAASA production plant is located, it is at this headquarters where improvements related to the reduction of GHG emissions are being implemented, analyzing possibilities of reducing use of fossil fuels for the machinery, improvements in the lime production process and the implementation of hot charge in the rolling process.

VII.3.2.7 Response Strategy

The following table shows the different response actions (in the short, medium and long term) against the risks identified by climate change, distributed in the following thematic axes: energy and carbon footprint.

Table 52 Main Response Actions Against Identified Transition Risks

Risk		Response Action	Key Actors
Code	criticality		
Thematic Axis: Water			
RT1	High	**Short term**	
		- Implement projects that repower the water treatment system to increase the number of process water cycles.	- Central Production Manager.
		Medium term	
		- Analyze the possibility of purchasing desalinated seawater to replace groundwater extraction. - Calculate the organizational Water Footprint.	- Project Manager, Mining and Social Responsibility. - Central Production Manager. - CEG Manager.
		Long term	
		Continue acquiring technologies that can replace the use of water for forced-air cooling.	- Project Manager, Mining and Social Responsibility. - Central Production Manager.
RT7	Considerable	**Short term**	
		- Implementation of water treatment systems that allow increasing the recirculation of the water used in the steel complex. - Treat and reuse wastewater within the plant, either in other operations or in the live fence.	- Central Production Manager.
		Medium term	
		- Evaluate source water replacement alternatives such as seawater desalination.	- Project Manager, Mining and Social Responsibility.
		Long term	

		- Continue acquiring technologies that can replace the use of water for forced-air cooling.	- Project Manager, Mining and Social Responsibility
Thematic Axis: Energy			
RT2	High	**Short term**	
		- Maintain electricity supply contracts with operators of renewable sources. - Maintain the criteria for acquiring technology based on energy efficiency. - Maintain the efficient lighting criteria in each of the CAASA headquarters. - Implementation of the energy management system based on the ISO 50001 standard.	- Project Manager, Mining and Social Responsibility. - Supply Chain Manager. - Central Production Manager. - CEG Manager
		Medium term	
		- Evaluate the possibility of implementing improvements in the New Steel Mill which will allow us to make the most of electrical energy. - Evaluate the possibility of acquiring energy accumulation or storage technology that allows reducing network consumption at peak times. - Renewal of the electricity supply contract with generators that issue renewable energy certificates (CER).	- Project Manager, Mining and Social Responsibility
		Long term	
		- Evaluate the possibility of carrying out self-generation projects based on renewable energy.	- Project Manager, Mining and Social Responsibility
RT3	High	**Short term**	
		- Maintain the natural gas energy matrix in the steel complex. - Optimize the feeding of the hot load in the reheating furnaces and thus reduce the consumption of natural gas. - Continue to progressively replace equipment that consumes oil with electrical equipment at all the organization's headquarters.	- Central Production Manager. - Project Manager, Mining and Social Responsibility. - Supply Chain Manager.
		Medium term	
		- Expand the natural gas network to replace certain equipment that only works with diesel oil. - Evaluate the possibility of feeding the hot load in the reheating furnaces and thus reduce the consumption of natural gas.	- Central Production Manager. - Project Manager, Mining and Social Responsibility. - Supply Chain Manager.

		- Evaluate the arrangement in each of the locations taking into account the decrease in the use of forklifts due to handling and long routes. - Purchase efficient energy consumption technology or if it is necessary to use a fossil fuel opt for natural gas whenever possible. - Phasing in the Transportes Barcino fleet by units that consume GNV.	
		Long term	
		- Progressively replace equipment that consumes fossil fuels with more efficient technologies that are electric whenever possible.	- Central Production Manager. - Project Manager, Mining and Social Responsibility. - Supply Chain Manager.
RT4	Considerable	**Short term**	
		- Optimize the routes of the CAASA personnel transport buses.	- Human Management Manager.
		Medium term	
		- Evaluate the possibility of having a personnel transportation service contract with natural gas buses. - Implement a program that encourages the use of bicycles or other means of non-motorized transportation for CAASA personnel.	- Human Management Manager. - Supply Chain Manager. - CEG Manager.
		Long term	
		- Evaluate the possibility of having a personnel transport service contract with electric buses.	- Human Management Manager. - Supply Chain Manager.
Thematic Axis: Carbon Footprint			
RT5	Considerable	**Short term**	
		- Evaluate the possibility of using refrigerants with a lower global warming coefficient in the organization's air conditioning system. - Continue with the preventive maintenance of the air conditioning system, to avoid refrigerant leaks. - Replacement of artificial fertilizers with organic ones.	- Central Production Manager. - CEG Manager.
		Medium term	
		- Progressively replace old air conditioning systems with new technologies that have a lower global warming coefficient in their operation.	- Central Production Manager. - CEG Manager. - Supply Chain Manager.

			- Project Manager, Mining and Social Responsibility.
		Long term	
		- Evaluate the possibility of acquiring technology that does not use refrigerants that deplete the ozone layer and that has the lowest global warming coefficient on the market whenever possible.	- Project Manager, Mining and Social Responsibility.
RT6	High	**Short term**	
		- Calculate and verify the organizational carbon footprint of CAASA under the ISO 14064 standard. - Implement initiatives or directed actions related to energy and water that allow us to reduce the organizational carbon footprint. - Consolidate the Internal Carbon Price (shadow price) in the organization.	- CEG Manager. - Supply Chain Manager. - Central Production Manager. - Administration and Finance Manager.
		Medium term	
		- Evaluate the possibility that the Internal Carbon Price adapts to the "internal rate price" methodology in the organization. - Strengthen the Financial Impact Analysis, in the organization, due to Climate Change. - Implement the Recognition System related to the reduction of the carbon footprint at the level of senior officials in the organization. - Strengthen the Analysis of Risks and Opportunities against Climate Change, in the Strategic Planning Cycle of the organization. - Implementation of the hot load in the NTL to reach a unitary consumption of natural gas of 20 m3/t product. - Implementation of the Vertical Lime Kiln to reach a consumption of 900 kcal/kg product. - Use of artificial intelligence to reduce the consumption of materials that increase the carbon footprint due to their emission factor	- General manager - CEG Manager. - Supply Chain Manager. - Central Production Manager. - Project Manager, Mining and Social Responsibility. - Administration and Finance Manager. - Human Management Manager. - IT Manager
		Long term	
		- Evaluate the possibility of participating in projects that have carbon credits accredited by the State.	- General manager. - CEG Manager. - Administration and Finance Manager.
RT8		**Short term**	
		- Continue with electric oven technology vs. built-in. - Implementation of services that can ensure direct supply with scrap generators.	- Central Production Manager.

			- Project Manager, Mining and Social Responsibility. - Strategic Purchasing Manager.
		Medium term	
		- Implementation of initiatives that allow us to be more circular in our raw materials and industrial by-products generated towards the "zero residue" certification. - Implementation of new scrap collection yards.	- CEG Manager. - Supply Chain Manager. - Strategic Purchasing Manager.
		Long term	
		- Consolidate the collection of imported scrap	- Supply Chain Manager. - Strategic Purchasing Manager.

Source: self made.
Note: Risk Criticality is related to the Tr scenario.

Table 53 Main Response Actions Faced with Identified Opportunities

Chance	criticality	Response Action	Key Actors
Carry out a natural gas cogeneration project in the steel complex	Medium priority	- Evaluate the cost - benefit of cogeneration in the steel complex.	- Central Production Manager. - Project Manager, Mining and Social Responsibility. - CEG Manager.
Implement and certify an energy management system based on ISO 50001.	High priority	- Implement an energy management system based on the ISO 50001 standard.	- CEG Manager. - Central Production Manager.
Carry out co-processing in the Steel Complex	High priority	- Evaluate the possibility of carrying out co-processing in rotary kilns and/or in the new steel mill, and that compliance with the new Maximum Permissible Limits (LMP) for atmospheric emissions.	- Central Production Manager. - Project Manager, Mining and Social Responsibility. - CEG Manager.
Invest in technology with energy efficiency and participate in the State's Cleaner Production projects.	High priority	- Maintain the criteria for acquiring technology based on energy efficiency. - Evaluate the possibility of acquiring energy accumulation or storage technology that allows reducing network consumption at peak times.	- Project Manager, Mining and Social Responsibility. - CEG Manager.
Participation in the Scrap Program and vehicle renovation promoted by the State and thus increase the uptake of national scrap.	High priority	- Evaluate the possibility that scrap yards can be considered as infrastructures where vehicles can be scrapped.	- Strategic Purchasing Manager. - CEG Manager.
Promote the use of steel slag to replace clinker to reduce the clinker/cement ratio in the production of “added cements”.	Medium priority	- Evaluate the possibility of signing agreements with cement companies and being able to supply our steel slag.	- CEG Manager. - Project Manager, Mining and Social Responsibility. - Central Production Manager.

Source: self made.
Note: Risk Criticality is related to the Tr scenario.

VII.4 FOLLOW-UP

- Regarding the transition risk analysis, it is identical that CAASA's activities are related to 18 NDCs, in 5 of them risks were identified and, in the rest, opportunities were identified. Regarding the scenario, we have oriented our plan considering the "Tr (100% compliance with the NDC)" scenario, proposing short, medium and long-term measures.

- Most of the identified opportunities have a "High Priority" rating and are related to the participation of CAASA providing its services for each of the works proposed in the NDC, which are easily aligned with the company's strategy, of the five Identified projects are still in the bidding stage. Additionally, in 2022 our product had a participation of more than two thousand tons of steel for sustainable constructions with LEED certification, additionally we had a participation of close to 4 thousand tons of steel for reconstruction works (hospitals, schools, and others).

- Also within the NDC opportunities we have identified forming strategic alliances with cement companies so that they can use steel slag as a percentage replacement for clinker. In 2021 and 2022 we have held meetings with two cement companies located in Pisco in order to offer our ecogravilla, we have also sent ecogravilla samples to two companies dedicated to ceramic glue. We are comprehensively developing a pilot called "Industrial By-Products Bag" that will be on our website and will have several technical sheets of each of our SPIs. In Annex 6 we attach images of the pilot and the first file prepared.

- Regarding the analysis of physical risks, 6 have been identified (between acute and chronic), the scenarios taken into account were from RCP4.5 and RCP8.5. The risks that had criticality between "High" and "Considerable" are those related to flooding and water stress in the area, which can generate an increase in costs, for this we have a special area for plant maintenance, as well as with monitoring of the level of the Pisco River in which we schedule cleaning with machinery. Regarding water management, we are renewing our technology, since 2021 we have air coolers which allow us to reduce cooling losses,

- Regarding the Climate and Water Stress test, the Carbon Price proposed by MINAM in 2019 and the Payment for Water Use in extreme conditions were taken into account. It was identified that the Carbon Price Payment represents a high risk for the company, the calculated amount amounts to S/. 6,687,043.54 per year. Regarding the stress risk for payment of Water Use, this had a "Considerable" criticality that involves an increase of S/ 277,884.57 per year in the payment of this supply.

- With respect to the internal carbon price, it was proposed that this be considered a shadow price, for the moment, but that it serve to carry out an analysis of how much CAASA would have to pay to the State or allocate that fund to acquire Carbon Credits that can offset its carbon footprint. Being the Pisco headquarters the one that has more than 98.43% participation of this internal carbon price.

- The GHG inventory corresponding to the year 2022 is higher than that of our recalculated baseline (2019). For this inventory we have made a more robust calculation, identifying more indirect sources upstream of our operations. Additionally, we have calculated our relative emissions, seeing that we have a slight decrease compared to our baseline, attributing it to the operation of the new steel mill, which has more efficient consumption ratios. As part of our transparency, our inventories are subject to verification, and these are in the public domain. In Annex 7 we attach the links to the GHG inventory verification statement.

- For this year we have trained 17 internal carbon footprint auditors based on the ISO 14064 standard and 31 internal energy management auditors based on ISO 50001 in order to implement an energy management system and thus reduce our carbon footprint. (category 2) and generate savings in the organization.

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IX ANNEXES

ANNEX 1 IMPACT LEVELS

Criterion	Low (1)	Moderate (2)	Substantial (4)	high (8)
Economic	Loss or impact of less than S/0.6 M soles in a year	Loss or impact between S/0.6 M and S/1.25M soles in a year	Loss or impact between S/1.25 M and S/2.5M in one year	Loss or impact greater than S/2.5 M in one year
Continuity of Operations and Systems	Interruption of operation < 1 hour	Interruption of operation > 1 and < 8 hours	Interruption of operation > 8 and < 24 hrs	Interruption of operation > 24 hours
Security of the information	Does not impact integrity or timeliness of information	Impacts integrity and/or timeliness of information	Loss of own non-critical information or that of third parties	Loss of own critical information or that of third parties
Reputation and Image	Minimal public knowledge or perception of responsibility of the company	Limited public knowledge or perception of company responsibility	Broad media impact or tangible perception of company responsibility	Massive public knowledge, political interest or strong perception of responsibility of the company
Regulatory compliance	Does not cause regulatory non-compliance	Possible non-compliance with light penalties	Non-compliance with regulations with penalties	Severe regulatory breach with penalties
Ethical Management	-	-	Ethical faults in the execution of a process, does not incur a crime.	Ethical faults in a systemic way in the execution of a process and/or that a crime is incurred.
Environment	- Scope of the impact at the activity level and/or - Impact on pavement infrastructure.	- Scope of the impact at the level of an entire process and/or - Impact on 1 environmental factor (air, soil, water, flora and fauna).	- Scope of impact on other processes and/or - Impact on 2 or more environmental factors (air, soil, water, flora and fauna).	- Scope of the impact exceeds company limits and/or - Affectation of the sensitive natural environment or population.

Occupational Health and Safety (SSO)	Minor injuries may cause discomfort or discomfort.	Moderate injuries, may require minor medical attention.	Temporary disability and/or reversible damage to health	Permanent total or partial disability and/or irreversible/mortal damage

Source: Methodology for Internal Control and Comprehensive Risk Management of CAASA.

ANNEX 2 LEVELS OF PROBABILITY

Criterion	Low (1)	Moderate (2)	Substantial (4)	high (8)
Occurrence estimate (qualitative)	Low occurrence estimate.	Estimate of moderate occurrence.	Considerable occurrence estimate.	High occurrence estimate.
Occurrence estimate (qualitative)	Low occurrence estimate.	Estimate of moderate occurrence.	Considerable occurrence estimate.	High occurrence estimate.
Historical Frequency(quantitative)	- It has never happened.- It happened in less than 0.5% of the cases / total transactions.	- During the last year the event has not occurred, but it has occurred before.- It occurred between 0.5% and 1% of the total cases / transactions.	- During the last year it has happened once.- It happened between 1% and 5% of the total cases / transactions.	- During the last year the event has occurred more than once.- It occurred in more than 5% of the total cases / transactions.

Source: Methodology for Internal Control and Comprehensive Risk Management of CAASA.

ANNEX 3 ADAPTATION AND MITIGATION MEASURES CONSIDERED

Adaptation Measures of the Water Thematic Area

Adaptation Measure	Description
Implementation of Early Warning Systems for floods, droughts, landslides and hazards of glacial origin in basins vulnerable to climate change.	In order to reduce the impacts and risks of future disasters that may be associated with scenarios of greater irregularity in the climate and water regime due to increased rainfall (North Coast between +10% and +20%), as well as the intensification and greater risk of droughts due to reduced rainfall (Coast and Sierra Sur between -10% to -20% but also in the High and Low Jungle at -10%); and on the other hand, to face the dangers and risks of glacial origin due to the progressive increase in temperature by 2030 (the Andean region has already been experiencing the accelerated melting of glaciers), early warning systems will be implemented in basins vulnerable to climate change. . In this context, the prioritized alert systems are: 1) SAT for floods caused by heavy rains, 2) SAT for droughts and 3) SAT for floods and hazards of glacial origin. In accordance with the INDECI guidelines, the Early Warning Systems are made up of the following components: a) Knowledge and permanent and real-time surveillance of threats; b) Monitoring and alert service; c) Dissemination and communication; and d) Response capacity. Considering these components, the design of the measure is established in three phases: Each system will offer information services that allow anticipating actions and improving the communication of danger and risk, but also generating the modeling of future risk scenarios that guide planning and territorial ordering. Technological development and innovation is relevant to have modern and safe systems for monitoring and surveillance of danger and risk in complex geographical conditions.
Implementation of a Hydrometric Network for the collection and distribution of water in major and minor hydraulic infrastructure in basins vulnerable to climate change.	It is about improving and expanding the hydrometric network of water demand in common hydraulic systems that include the measurement of the volume of surface and underground water with the aim of making a better distribution with emphasis on areas with water stress and deficits in water supply associated with the climate change. The measure includes the establishment of a set of water measurement points, strategically located in the hydraulic systems in such a way that they constitute a network that allows interrelation, the information obtained and forms part of the hydrometric system, which is a set of activities and procedures that allow knowing the volumes of water to schedule and distribute them appropriately.
Modernization of the granting of water use rights in vulnerable basins incorporating climate scenarios.	Except for the direct use of water sources - which is carried out without infrastructure or equipment, also called primary use - to use water, any natural or legal person, public or private, requires a right to use water granted by ANA. The rights of use of water recognized by the Law are: Permit, Authorization and License. Currently, the ANA has regulated within the procedures for the granting of a water use license, the allocation of surface water in the procedure to prove water availability for consumptive use is granted at 75% persistence, the measure consists of incorporating the Consideration of how climate change will affect water resources in the basin in the procedure for granting water use rights. In this way it will be achieved that the rights granted are given with a more precise knowledge about how the availability of water may vary in the future. Among the necessary conditions for the implementation of the measure are the determination of comprehensive assessment methodology (identification of surface and underground sources, monitoring and study of the offer in quality,

	quantity and opportunity) optimizing its use in climate change scenarios; implement a periodic evaluation system in critical areas in vulnerable basins to determine the effects of Climate Change; and encourage and monitor progress in the formalization of water use rights, all of which are the responsibility of ANA.

Energy Sector Mitigation Measures – Stationary Combustion

Adaptation Measure	Description
Renewable energy mix	This mitigation measure, proposed by the Ministry of Energy and Mines, proposes to increase the participation of Energy Resources from Renewable sources (RER) in the national energy matrix by 6.8% in the year 2030, Currently, 40% of the matrix National energy comes from thermal generation based on natural, residual, diesel and coal gas as indicated in the 2017 Operations Statistics published by the Committee for Economic Operation of the National Interconnected System (COES 2017). This measure requires specific conditions that allow it to be implemented. For example, new promotion mechanisms for renewable energies should be implemented, as an alternative to auctions, such as generation quotas and special rates, that allows the maintenance of the electricity rate to the end user and considers parameters of technical efficiency. Likewise, the mitigation of access barriers to the deployment of RERs through the allocation of firm power for wind and solar technologies have also been proposed.
cogeneration	This mitigation measure, proposed by the Ministry of Energy and Mines, proposes the promotion and development of a technology that improves energy efficiency and reduces fuel consumption through the combined production of electricity and useful heat, that is, cogeneration plants. , reducing GHG emissions due to the use of less fuel. This measure is implemented in accordance with the provisions of the Cogeneration Regulation via Supreme Decree No. 064-2005-EM and its amendments Supreme Decree No. 037-2006-EM and Supreme Decree No. 082-2007-EM. Among the identified benefits of this measure, the following have been identified: i) the reduction of local pollutant emissions, improving the quality of life of the population; ii) job creation; iii) promotion of business competitiveness; iv) the generation of economic savings in electricity billing; and, v) the improvement of energy efficiency in the country. This mitigation measure proposes the implementation of qualified cogeneration plants that operate connected to electrical distribution or transmission systems regulated by Supreme Decree No. 037-2006-EM that approves the replacement of the cogeneration regulation. The procedure for the qualification of the cogeneration plants is through a qualification request under format B of the COES and it is submitted to the General Directorate of Electricity (DGE) of the Ministry of Energy and Mines (MINEM). In 2010, the period of implementation of the measure began. The operation phase starts from the year 2010 and extends until the year 2030,
Energy efficiency in the industrial sector	This mitigation measure, proposed by the Ministry of Energy and Mines, proposes the implementation of energy efficiency measures in companies in the industrial sector, promoting the competitiveness of the national economy and reducing the negative environmental impact of the use and consumption of energy such as the reduction of GHG emissions. This measure is part of the Law for the Promotion of Efficient Use of Energy, Law No. 27345, and its Regulations approved by Supreme Decree No. 053-2007-EM. Thus, it is expected to consider the replacement of engines and boilers, once the Energy Efficiency Financing Fund (FOFEE) becomes viable. Among the identified benefits of this measure, the following have been identified: i) the reduction of local polluting emissions, ii) the generation of jobs, and iii) the generation of economic savings. This mitigation measure proposes promoting the following actions: i) energy audits in the private sector, ii) energy

	management systems - ISO 50001, iii) a pilot implementation of the Energy Management System - ISO 50001, iv) the preparation of guides for the application of the NTP ISO 50001 Standard, Energy Management, and v) the replacement of Engines and Boilers. In the year 2020, the implementation period begins with the creation of the Financing Fund for Energy Efficiency. The operation phase begins in 2021 and runs until 2030, the period in which reductions in greenhouse gas (GHG) emissions are generated. Private companies that have implemented ISO 50001,
Use of waste-derived fuels as a substitute for fossil fuels in clinker production kilns	This measure, proposed by the Ministry of Production, is part of the cement NAMA and consists of the co-processing of waste-derived fuels for use in clinker production kilns nationwide. Co-processing is the conversion of waste into energy in the cement kiln for its final disposal, in such a way that new waste, ash or emissions are not generated. It is so called because it is developed simultaneously with the production of clinker. This measure, in addition to mitigating climate change, has the great attribute of contributing to the recovery of solid waste, giving an adequate and permanent final destination to problematic waste such as tires, solvents, oils, etc.
Energy efficiency through comprehensive interventions in the industrial manufacturing sector	The mitigation measure, proposed by the Ministry of Production, consists of the development of two initiatives promoted by the Ministry of Production: the Sustainable Industrial Zones (ZIS) project and the green MYPES program. Among the actions to improve energy efficiency in the aforementioned initiatives, to date, there are a variety of alternative actions referring to both operational controls and technological changes. Among the co-benefits generated by the mitigation measure, the improvement of occupational health and safety conditions in the work environment stands out. That is to say,
Promotion of sustainable construction in new buildings	This measure proposed by the Ministry of Housing, Construction and Sanitation seeks the implementation of actions that reduce the impact of construction activity at the national level, specifically, it seeks to account for the benefits of the implementation of the Sustainable Construction Technical Code (CTCS) in the construction of new buildings. Said constructions can be carried out by public or private entities, or through the strengthening or promotion of financial tools such as those constituted by the Mi Vivienda Fund (FMV) and others that can be hosted by the financial sector. The current CTCS (Supreme Decree No. 015-2015-VIVIENDA, of August 28, 2015) is the norm that establishes technical design and construction guidelines to develop sustainable buildings and cities.

Energy Sector Mitigation Measures – Mobile Combustion

Adaptation Measure	Description
Implementation of the Complementary Corridors of the Integrated Transport System of Lima	The mitigation measure, proposed by the MML as a contribution to the transport sector, consists of the implementation of high-capacity trunk-feeder route systems for public transport so that they can circulate on segregated or mixed roads within the city. of Metropolitan Lima and the Province of Callao. Likewise, the measure contemplates the renewal of the public transport units in a period not exceeding 5 years and the execution of an Obsolete Vehicle Scrap Plan in the first five years of the operation of each bidding package mainly with the resources of the awarded public transport companies (Operators).

Implementation of Lines 1 and 2 of the Lima and Callao Metro	The mitigation measure, proposed by the Autonomous Authority of the Mass Transportation Electric System of Lima and Callao (AATE) of the MTC, consists of the implementation of Line 1 that runs mostly through the metropolitan area on an elevated viaduct with an extension of 35 km and 26 stations, through which approximately 320,000 passengers are transported per day (data updated to May 2018), which exceeded the estimated demand projection.
Promotion of the use of cleaner fuels	The mitigation measure, proposed by the Ministry of Energy and Mines, proposes reducing the levels of sulfur contained in fuels (diesel, gasoline and high-octane gasoholes), thus improving the quality of life of the population and safeguarding air quality. and public health, in addition to improving the efficiency of the combustion engine and reducing fuel consumption, which translates into the reduction of greenhouse gas (GHG) emissions. Euro IV technology, for example, improves post-treatment and optimizes the combustion process, thus managing to reduce emissions by almost 50% compared to Euro III. Likewise, the sustainability of this measure will be carried out by establishing future standards with an impact that generates more demanding and greater environmental benefits such as Euro V and Euro VI technologies. This measure proposes, for the execution of this measure, the establishment of two (02) mechanisms of action in the regulation of the sulfur content in diesel, gasoline and high octane gasoholes: i) the prohibition of the commercialization and use of B5 diesel with a sulfur content greater than 50 ppm and ii) establish the regulation on the sulfur content not greater than 50 ppm in gasolines and gasoholes of 95, 97 and 98. In 2010 the implementation of the measure began . The operation phase begins in 2010 and extends until 2030, the period in which reductions in greenhouse gas (GHG) emissions are generated. i) the prohibition of the commercialization and use of B5 diesel with a sulfur content higher than 50 ppm and ii) establish the regulation on the sulfur content not higher than 50 ppm in gasolines and gasoholes of 95, 97 and 98. In 2010 the implementation of the measure began. The operation phase begins in 2010 and extends until 2030, the period in which reductions in greenhouse gas (GHG) emissions are generated. i) the prohibition of the commercialization and use of B5 diesel with a sulfur content higher than 50 ppm and ii) establish the regulation on the sulfur content not higher than 50 ppm in gasolines and gasoholes of 95, 97 and 98. In 2010 the implementation of the measure began. The operation phase begins in 2010 and extends until 2030, the period in which reductions in greenhouse gas (GHG) emissions are generated.
Promotion of electric vehicles nationwide	This mitigation measure, proposed by the Ministry of Energy and Mines, proposes to replace the energy matrix used in transportation, which predominantly uses fossil fuels (gasoline, diesel, liquefied petroleum gas, and vehicular natural gas), through a greater participation of electric vehicles in the vehicle fleet, contributing to compliance with the 2014-2025 National Energy Plan and reducing greenhouse gas (GHG) emissions thanks to the replacement or displacement of vehicles that consume gasoline or diesel with new electric vehicles. The goal set for this mitigation measure in a first stage is given under 2 actions: i) the introduction of electric buses and ii) introduction of light electric vehicles.
Efficient driving training for professional drivers	This measure, proposed by the MTC, aims to strengthen and develop the technical capabilities of licensed drivers by providing information on safe and efficient driving techniques, as well as providing information on technical tools to logistics companies, that allows them to technologically improve the fleet management of their units. In this way, the reduction of GHG emissions will occur thanks to fuel savings due to the greater efficiency in the performance of the fuel used by the vehicle. As a consequence of the implementation of the measure, benefits have been identified such as i) the improvement of the population's health due to the reduction of local contaminants, ii) the awareness of the population about the effects of contamination,
National Program for Vehicle Scrap and Renovation	The mitigation measure, proposed by the MTC, consists of the implementation of a National Program for the Scrapping and Renovation of the Old Vehicle Park with the objective of achieving the exit from the market (circulation) of this type of units. For this purpose, incentives have been provided that may be considered economic in exchange for the owners of these vehicles voluntarily accepting the total disintegration of their units, eliminating their operability and the possibility of their use in other economic activities, among other types. of incentives. The implementation of the program will take place via: the withdrawal of vehicles, which

	due to conditions stipulated in the respective norm, cannot continue circulating; vehicle renewal, through which obsolete vehicles are removed and new units with more modern technologies and minimum energy efficiency standards are incorporated; and additionally, the program also considers the substitution that can be given to the cases of public transport services that would also contribute to improving fleet management tools for cities. It is expected that the scope of the measure is national and will be implemented on the one hand through the local governments represented by the authorities of the cities that are in charge of the authorization of the fleet of passenger and merchandise transport services; and on the other hand, by the MTC, which generates the national authorizations for the interprovincial transport of passengers and the movement of cargo and merchandise at the national level.
Project "Construction of the Trans-Andean Tunnel"	This mitigation measure, proposed by the MTC, proposes to facilitate the mass transport of passengers and merchandise between the cities of Lima and Huancayo/La Oroya, achieving "Adequate Road Conditions for Land Transport" so that, thus, improves competitiveness between the various modes of transport. With the measure, the traditional vehicle fleet projected on the highway (cargo trucks and passenger buses) will be reduced and the time used for the projected transportation of cargo and passengers will be saved, generating savings in diesel fuel consumption, thus reducing GHG emissions. Among the identified benefits of this measure, the following have been identified: i) decongest traffic on the Central Highway; ii) reduce traffic accidents; iii) reduce travel times; and, iv) achieve a lower emission of polluting gases. This mitigation measure proposes the optimization of cargo and passenger transport, current and projected, on the railway line known as the Central Railway of Peru, by reducing the length of the route in the Lima-La Oroya section, through the construction of the Trasandino Tunnel, approximately 25 km long, and complementary tunnels, reducing a total length of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. This mitigation measure proposes the optimization of cargo and passenger transport, current and projected, on the railway line known as the Central Railway of Peru, by reducing the length of the route in the Lima-La Oroya section, through the construction of the Trasandino Tunnel, approximately 25 km long, and complementary tunnels, reducing a total length of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. This mitigation measure proposes the optimization of cargo and passenger transport, current and projected, on the railway line known as the Central Railway of Peru, by reducing the length of the route in the Lima-La Oroya section, through the construction of the Trasandino Tunnel, approximately 25 km long, and complementary tunnels, reducing a total length of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. current and projected, on the railway line known as the Central Railway of Peru, by reducing the length of the route in the Lima-La Oroya section, through the construction of the Trasandino Tunnel, approximately 25 km long, and tunnels complementary, reducing a total route of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. current and projected, on the railway line known as the Central Railway of Peru, by reducing the length of the route in the Lima-La Oroya section, through the construction of the Trasandino Tunnel, approximately 25 km long, and tunnels complementary, reducing a total route of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. through the construction of the Trasandino Tunnel, approximately 25 km long, and complementary tunnels, reducing a total length of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. through the construction of the Trasandino

	Tunnel, approximately 25 km long, and complementary tunnels, reducing a total length of 40,785 meters. Likewise, the measure provides for the purchase of rolling stock, construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies. construction of intermodal stations and complementary services for the transfer of cargo and passengers from road to rail. It is estimated that the implementation of the measure would begin in 2018, mainly with the first investments in feasibility studies.
Improvement of the rail transport service in the Tacna - Arica section	This mitigation measure, proposed by the MTC, aims to increase the operation of the Tacna-Arica Railway, administered by the Tacna Regional Government, in all its magnitude and through the improvement of its infrastructure and the implementation of an adequate commercial projection, operational and administrative. The measure will reduce GHG emissions, since the modernization of the railway would absorb a significant number of passengers who currently use other types of transportation, such as buses, collective taxis, and private vehicles, which would reduce the number of vehicles in circulation by road, thus reducing fuel consumption. Among the identified benefits of this measure, the following have been identified: i) the reduction of general travel costs in the rail mode, ii) the reduction of negative externalities of land transport, iii) the reduction of pollution due to lower emissions of carbon monoxide, particulate matter and nitrogen oxides; consequently, a reduction in health problems, iv) the increase in the level of employment in the area of influence, and v) the increase in the exchange of people and goods between the two cities Peru-Tacna and Chile-Arica, thus raising the socioeconomic level and cultural exchange of users. This mitigation measure proposes carrying out the necessary works to improve the track that will be carried out on the current route of the Tacna-Arica Railroad. These include the complete removal of the superstructure in 59 km, the improvement of the substructure in an important part of the layout, as well as the infrastructures (such as the five existing bridges) and the maintenance of the railcar service during them. During 2018, the implementation period of the measure would begin with the start of the investment phase for infrastructure works, to continue with the investment phase in 2019.
Comprehensive rehabilitation of the Huancayo - Huancavelica railway	This mitigation measure, proposed by the MTC, proposes renewing the existing track of the Huancayo-Huancavelica public railway line, which is managed by the same sector through the DGCF, as well as the reconditioning of the stations and bus stops, the acquisition of rolling stock and establish the operating model; in order to provide a safe, efficient and comfortable rail transport service for users, reducing GHG emissions due to the reduction in the number of vehicles on the road, both for cargo and passenger transport, thus reducing consumption made out of fuel. Among the identified benefits of this measure, the following have been identified: i) savings in travel time for train passengers and those captured by road, ii) savings in cargo transport time, iii) savings from road infrastructure maintenance due to reduced traffic, iv) economic benefits generated by tourists, and v) savings from preventing losses caused by natural phenomena. This mitigation measure proposes having a supply of new rolling stock, which must be in accordance with the characteristics of the road, such as: operating altitude, radii, gradients and tunnel gauges. The measure will begin its implementation during the year 2018 with the preparation of the corresponding technical studies and their approval by the year 2020. The scope of the mitigation measure is regional in scope corresponding to the departments of Junín and Huancavelica, covering 128.7 km of the central highlands of Peru. iii) savings from road infrastructure maintenance due to traffic reduction, iv) economic benefits generated by tourists, and v) savings from preventing losses caused by natural phenomena. This mitigation measure proposes having a supply of new rolling stock, which must be in accordance with the characteristics of the road, such as: operating altitude, radii, gradients and tunnel gauges. The measure will begin its implementation during the year 2018 with the preparation of the corresponding technical studies and their approval by the year 2020. The scope of the mitigation measure is regional in scope corresponding to the departments of Junín and Huancavelica, covering 128.7 km of the central highlands of Peru. iii) savings from road infrastructure maintenance due to traffic reduction, iv) economic benefits generated by tourists, and v) savings from preventing losses caused by natural phenomena. This mitigation measure proposes having a supply of new rolling stock, which must be in accordance with the characteristics of the road, such as: operating altitude, radii, gradients and tunnel gauges.

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Mitigation Measures for the Industrial Processes and Product Use Sector

Adaptation Measure	Description
Clinker substitution to reduce the clinker/cement ratio by producing added cements	The mitigation measure, proposed by PRODUCE, related to cement production includes the partial replacement of clinker by substitute materials with similar properties such as natural pozzolans, steel slag, and others to produce the so-called added cements. Currently, the factor The average national clinker is 81% and the measure proposes reducing this factor to 71% by the year 2030. According to statistics from the Cement Sustainability Initiative (CSI) of the World Business Council for Sustainable Development (WBCSD, in English), the world average of the clinker factor was 65% in 2014, so reaching the goal proposed in the measure is plausible. On the other hand, Among the potential environmental co-benefits, a) the reduction of air pollution linked to the reduction of emissions of particulate matter and combustion gases (due to the decrease in the calcination activity of limestone), b) the reduction of the impacts environmental conditions in soil and water (associated with the extraction and use of calcite), among others. It should be noted that this measure could only be applied to those plants that have a clinker factor greater than 65% (international average clinker factor reported in 2014 by the Cement Sustainability Initiative). In this sense, of the 7 existing plants nationwide, 6 have been identified as meeting these conditions: Pacasmayo, Rioja, Piura, Lurigancho, Condorcocha and Atocongo.

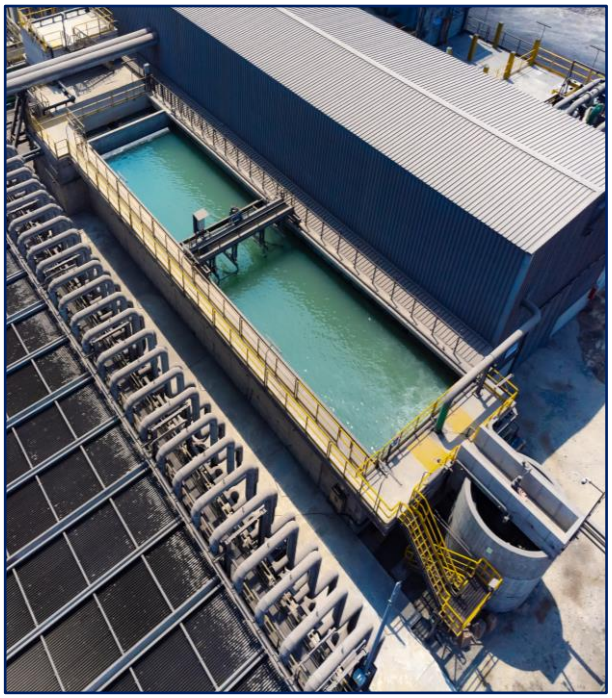
Replacement of refrigerants with alternatives with lower global warming potential	This measure, proposed by PRODUCE, consists of the implementation of the Kigali Amendment to the Montreal Protocol, which constitutes an international agreement that seeks to reduce the consumption and production of hydrofluorocarbons (HFCs), used predominantly as refrigerants and as an alternative to the use of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), in order to prevent depletion of the ozone layer. However, while HFCs have no ozone depletion potential, they do have considerable global warming potential (GWP). Without regulating the production and consumption of HFCs, the resulting emissions would contribute substantially to global GHG emissions. The reduction of GHG emissions derived from this measure considers those that are directly avoided by reducing the consumption of HFCs and those that would be produced by reducing the consumption of HCFC gases. HCFCs are also considered because it is assumed that, in the absence of the Kigali Amendment, they would be replaced by HFCs. Instead, due to the Amendment a fraction of these would be replaced by alternative refrigerants.

ANNEX 4 BASIN MAP OF THE PACIFIC REGION 3

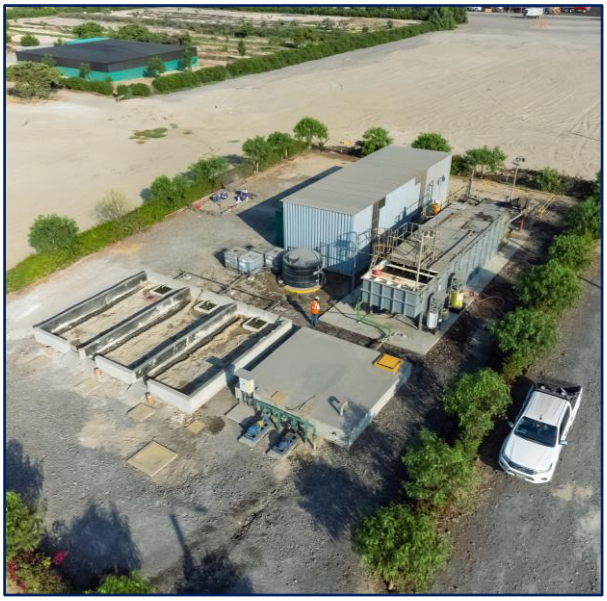
ANNEX 5 PHOTOGRAPHIC GALLERY OF THE IMPLEMENTED CONTROLS

Controls Related to Physical Hazards

Pisco River Level Supervision Protocol and Transmission Line Maintenance



Industrial Water Treatment System and Air Coolers



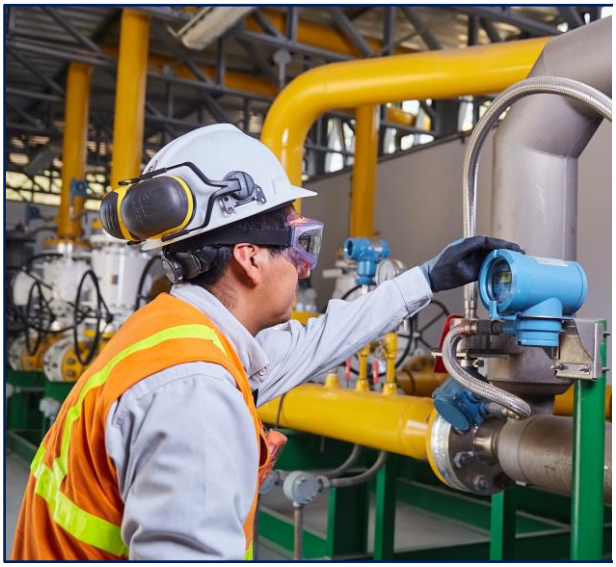
Domestic Wastewater Treatment System

Program with the Local Water Authority and Local Government of Lima

Support to Communities

Controls Related to Transition Risks

Acquisition of a fleet of 32 natural gas trucks for the supply chain

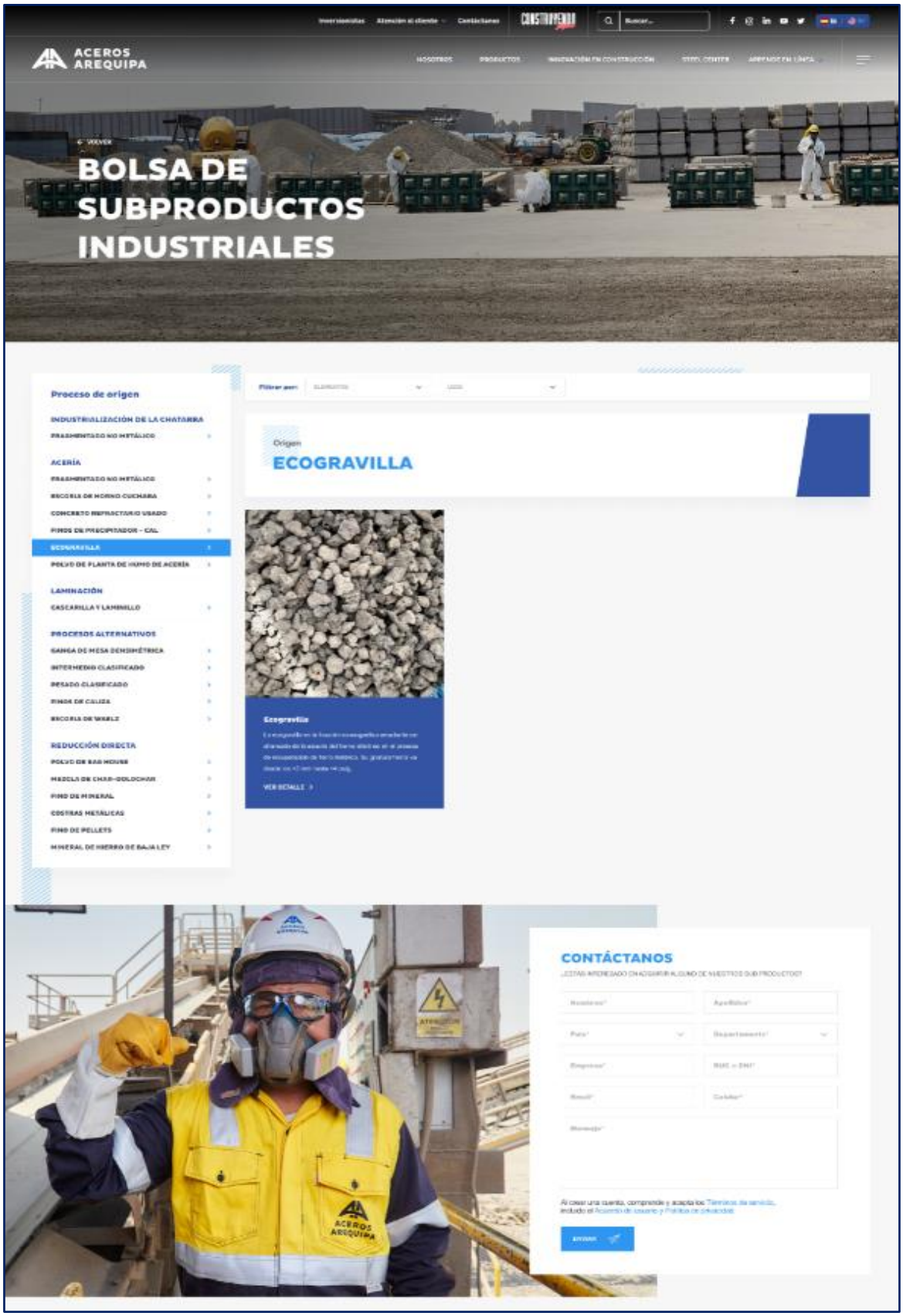


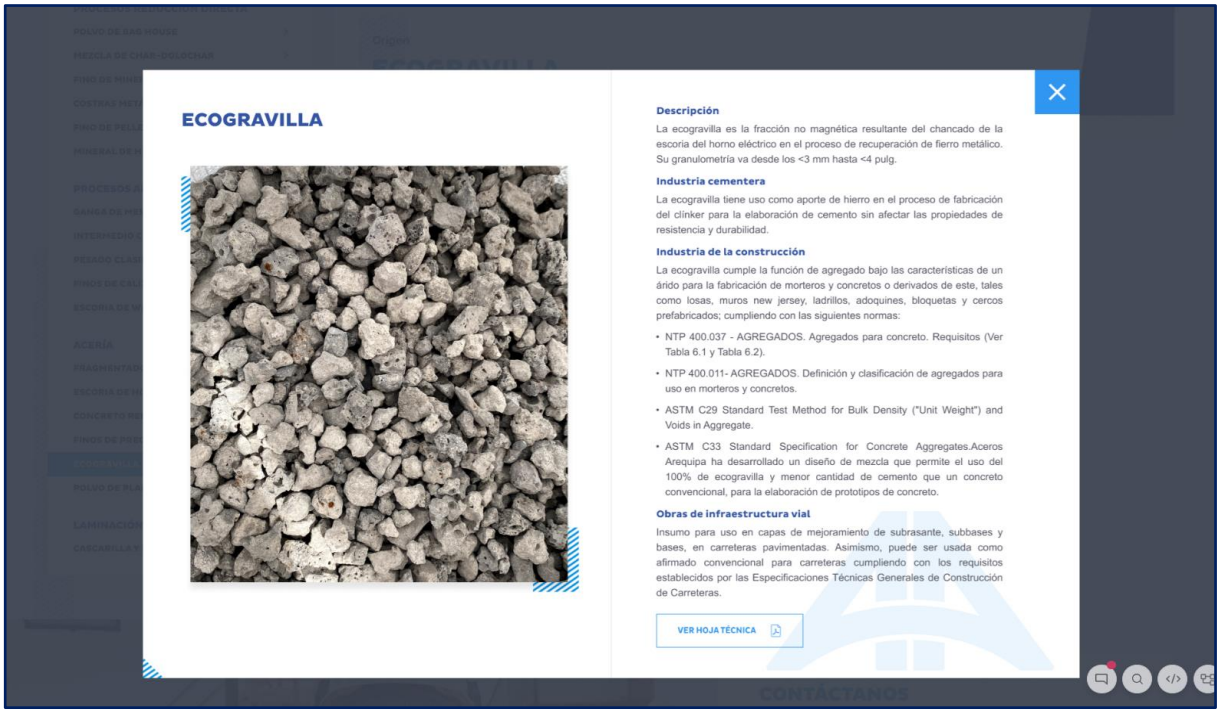
Maintenance of the Natural Gas Substation

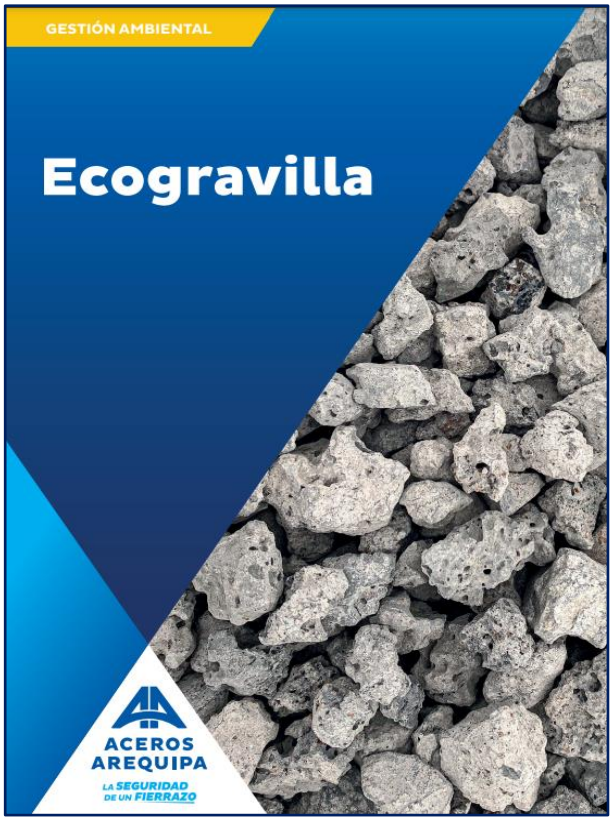
Energy Saving Technology

Training of Internal Auditors Carbon Footprint and Energy Management

ANNEX 6 IMAGES OF THE PROGRESS OF THE BAGS OF CAASA SPIs




ECOGRAVILLA
Descripción
La ecogravilla es la fracción no magnética resultante del chancado de la escoria del horno eléctrico en el proceso de recuperación de fierro metálico. Su granulometría va desde los <3 mm hasta <4 pulg.
Industria cementera
La ecogravilla tiene uso como aporte de hierro en el proceso de fabricación del clínker para la elaboración de cemento sin afectar las propiedades de resistencia y durabilidad.
Industria de la construcción
La ecogravilla cumple la función de agregado bajo las características de un árido para la fabricación de morteros y concretos o derivados de este, tales como losas, muros new jersey, ladrillos, adoquines, bloquetas y cercos prefabricados; cumpliendo con las siguientes normas:
• NTP 400.037 - AGREGADOS. Agregados para concreto. Requisitos (Ver Tabla 6.1 y Tabla 6.2).
• NTP 400.011- AGREGADOS. Definición y clasificación de agregados para uso en morteros y concretos.
• ASTM C29 Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.
• ASTM C33 Standard Specification for Concrete Aggregates.Aceros Arequipa ha desarrollado un diseño de mezcla que permite el uso del 100% de ecogravilla y menor cantidad de cemento que un concreto convencional, para la elaboración de prototipos de concreto.
Obras de infraestructura vial
Insumo para uso en capas de mejoramiento de subrasante, subbases y bases, en carreteras pavimentadas. Asimismo, puede ser usada como afirmado convencional para carreteras cumpliendo con los requisitos establecidos por las Especificaciones Técnicas Generales de Construcción de Carreteras.
VER HOJA TÉCNICA


GESTIÓN AMBIENTAL
Ecogravilla
ACEROS AREQUIPA
LA SEGURIDAD DE UN FIERRAZO


Ecogravilla
DENOMINACIÓN:
DESCRIPCIÓN:
UNIDAD DE MANEJO:
ORIGEN:
CARACTERÍSTICAS:
COMPOSICIÓN MINERALÓGICA:
ANÁLISIS DE PELIGROSIDAD:
COMPOSICIÓN QUÍMICA:
PRESENTACIÓN:
PERÚ
COLOMBIA
BOLIVIA
CHILE
ACEROS AREQUIPA

ANNEX 7 LIST OF LINKS TO GHG INVENTORY VERIFICATION STATEMENTS

- 2019 inventory : https://acerosarequipa.com//sites/default/files/gestion/ambiente/assurance-statement-2019-caasa.pdf
- 2020 inventory : https://acerosarequipa.com//sites/default/files/gestion/ambiente/assurance-statement-2020-caasa.pdf
- 2021 inventory : https://acerosarequipa.com//sites/default/files/gestion/ambiente/ISO14064-1DecAcerosArequipaRev2(Eng).pdf
- 2022 inventory : https://acerosarequipa.com//sites/default/files/gestion/ambiente/AssuranceStatementCAASACY2022Ingles.pdf