BORÇELİK

Task Force on Climate-Related Financial Disclosures Report

Borçelik's Approach to Climate Change

Content

About this Report > Introduction

Of all the challenges facing the world, none is greater than climate change. The latest report of the Intergovernmental Panel on Climate Change (IPCC) and the Paris Agreement have highlighted the need to keep global warming within a 1.5°C temperature rise. Otherwise, there will be very limited sources to sustain life in the world by the end of the current century.

According to the Energy Technology Perspectives 2020 Report of the International Energy Agency (IEA), the steel sector's direct CO_2 emissions amounted to 2.6 Gt in 2019 globally, making up 7% of total energy sector emissions and 28% of industrial emissions. When energy-indirect emissions are included in the estimation, total emissions amounted to around 3.6 Gt.

Through this TCFD Report, we aim to provide transparent and comprehensive information to all our stakeholders about Borçelik's Sustainability Policy and the actions we have been implementing in this regard.

About this Report > About Borçelik

Borçelik Çelik Sanayii Ticaret A.Ş. (Borçelik), established in 1990 as a joint venture between ArcelorMittal and Borusan Holding, is Türkiye's biggest producer of high-quality galvanized steel. Many milestones have been achieved in the course of our existence.

1994 marks the year we first started coil production. We made critical investment decisions in 2001 in order to increase the capacity of cold rolling production and build a new galvanizing line. Innovation and growth-investing continued throughout our history.

In 2017, Borçelik merged with Kerim Çelik Mamulleri ve İmalat A.Ş. and we continued our operations under the legally recognized entity of Borçelik Çelik Sanayii Ticaret A.Ş. Today, we continue our operations with a shared vision, keeping the environmental sustainability at the forefront of corporate operations to address global climate change.

We continue to improve our governance mechanism regarding climate change-related fiscal risks, develop strategies for climate change adaptation, identify and assess climate-related risks and opportunities in both short and long-term plans, and adhere to these strategies and observations before deciding on any operational action plan. Correspondingly, we have adopted a set of well-designed and well-discussed policies that will facilitate the ResponsibleSteel™ Principles.

About this Report > About Borçelik

Figure 1.1 below shows our main production line.

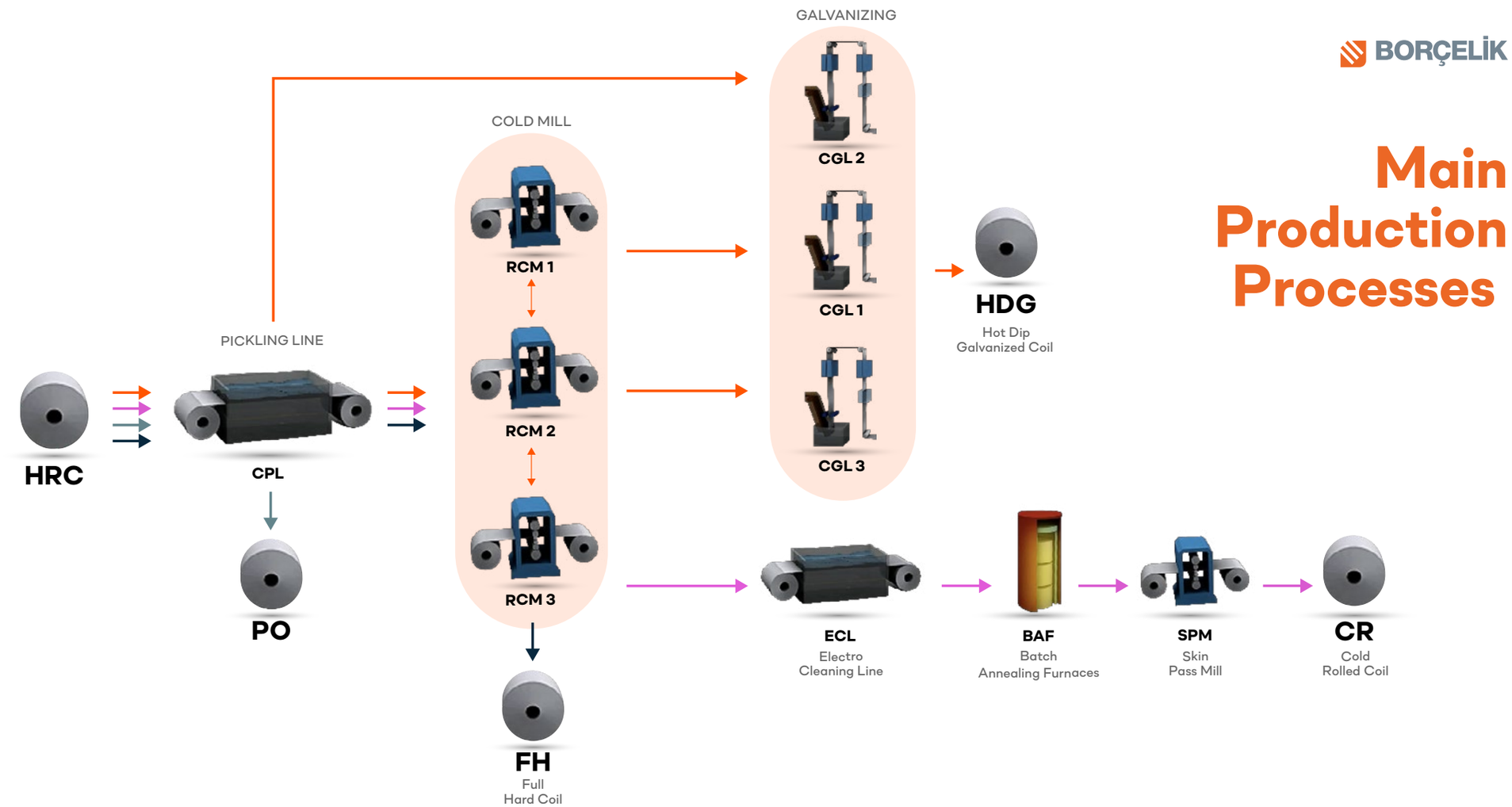


Figure 1.1: Borçelik Production Processes

We manufacture *cold rolled sheet (CR)* and *galvanized coil sheet (HDG)* made from *hot rolled coil HRC*. These value-added final products serve to the needs of our strategic customers operating in the automotive, household appliances, radiator and building industries.

About this Report > Borçelik Timeline

1990
Borçelik founded

1994
Commencement of Cold Rolled Mill production

2003
Commissioning of the first Galvanizing line

2004
Commissioning of the new Cold Rolled Mill investment

2006
- Commissioning of the Hydrogen based annealing lines
- Modernization of the second Galvanizing line
- Commissioning of the third Galvanizing line
- Borusan Holding signed UN Global Compact

2008
Commissioning of the third Cold Rolled Mill line

2009
Borusan Holding published its first Sustainability Report

2010
Borusan Holding joined the ***"World Sustainable Development Business Council"*** as the second member from Türkiye

2011
Establishment of Borusan Holding's new Sustainable Strategy

2015
Declaration of production emissions, calculated according to the MRV protocol, to the Ministry of Environment and Urbanism

2017
Merger of Borçelik and Kerim Çelik

2020
- Establishment of Sustainability Committee in Borusan Holding and Borçelik
- Borçelik's Roadmap to Sustainability

2021
Creation of Thematic Working groups

2022
- Borçelik becomes a member of **Responsible Steel** and **GlobalCompact**
- Publishing of Integrated Annual Report
- Setting near term sustainability targets for 2022 - 2030
- First CDP supply chain report was completed on the request of our customers
- Product CO_2 intensities measured and verified by third party in general alignment with the WRI/WBCSD GHG Protocol for Product Lifecycle Accounting and Reporting.

Letter from the Management

Vice-chairman of the Board

As one of the pioneering companies in the steel industry, we consider sustainability to be our core principle. We conduct our business operations through a well-designed structure that uses technology for the welfare of society and the climate. Borçelik implements sustainability practices throughout its operations by integrating innovative technologies and solutions while keeping the climate in mind.

Borçelik has worked diligently towards publishing its first TCFD report, fulfilling disclosure requirements and commitments to demonstrate transparency and accountability. Borçelik's TCFD report will serve as guidance for our company in identifying potential challenges and developing long-term solutions. In this journey, alongside our goals, we aim to prove our commitment to achieving a pioneering and leading position within the industry.

Jean-Martin Van der Hoeven,
Member Responsible for Sustainability and Climate Change at Borçelik

Letter from the Management

Borçelik General Manager

At Borçelik, we view the notion of sustainability as being at the very cornerstone of our business, and conduct all our activities with a holistic point of view. Borçelik has carried out various, focused work on the topics of "**climate**", "**people**", and "**innovation**", and we continue to focus on these themes as crucial strategic issues.

In order to transform our understanding of sustainability into a vision that can have a wide-scale and uninterrupted impact on our company's business processes, we are creating a roadmap that includes our strategy and targets until 2030, aided by the valuable feedback from our stakeholders.

Regarding this framework, we are publishing the first Borçelik TCFD report and sharing our Global Climate Crisis-focused strategy with all of our stakeholders. However, we are aware that we have a long way to go in term of facing more challenging problems.

Borçelik is committed to producing effective and long-term solutions to this crisis that all humanity is facing. In this context, we can say that our company, which does not accept to evaluate sustainability as a general and one-sided concept, has chosen to do its part in all aspects of sustainability.

Kerem Çakır

10-17

GOVERNANCE

Governance > The Climate Change Overview at Borçelik

As a direct result of our holistic understanding of sustainability, we have consolidated our economic, environmental, and social sustainability efforts, and have implemented relevant inter-connected policies accordingly. When climate change issues are integrated into the business strategy, the concept of sustainability is not seen as the operational responsibility of a single department or a small number of managers. Borçelik's sustainability-related operations include all organizational units.

All organizational units are included in Borçelik's sustainability-related operations.

This strengthens the scientific and organizational basis of our operations on the path to low-carbon transformation. Briefly, the company-wide risks and opportunities are defined more effectively, and rapid reaction in a short period of time can be ensured.

Borçelik's shareholders consider sustainable development, and the risks and opportunities related to climate, to be vital strategic issues. Likewise, ArcelorMittal is extensively focusing on competitive technologies that will decarbonize the steelmaking process. Specifically, ArcelorMittal is investing in innovative DRI and smart carbon technologies.

The Board of Directors (BOD) member responsible for sustainability and climate change is also an ArcelorMittal representative, and this member is chosen based on their professional background in climate change and sustainability. This creates a strong governance bridge between Borçelik and ArcelorMittal. Thus, Borçelik's efforts on climate strategy are reinforced by the company at the highest level.

BORUSAN ArcelorMittal

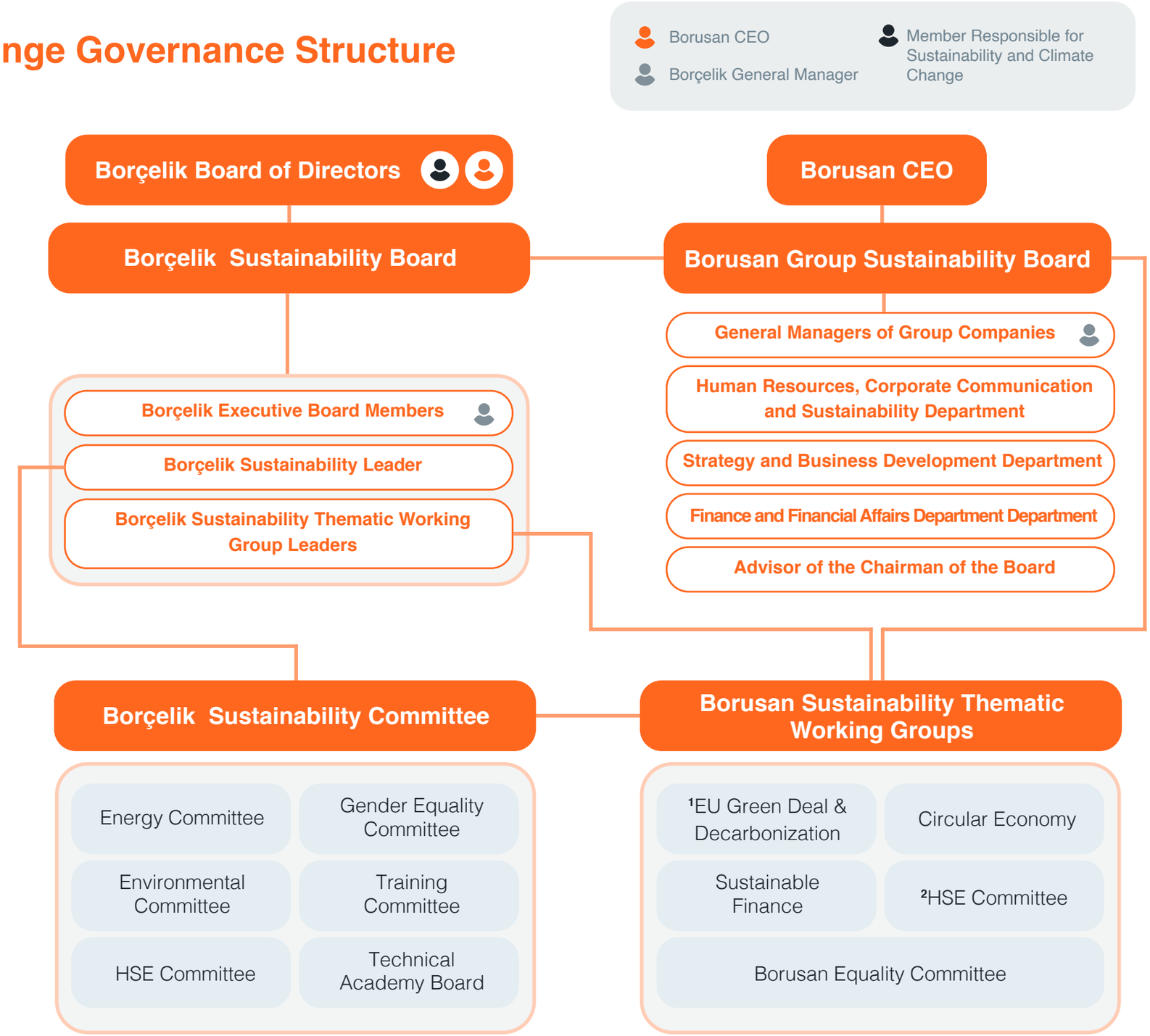
In addition, Borusan Holding also contributes to our sustainability activities by using the "**I³ Approach**", that is 'İklim, İnsan, İnovasyon' in Turkish, meaning '**Climate, People and Innovation**', and participating in the governance structure. Borusan Holding's extensive investments in sustainable energy can be cited as current examples and reflections of this approach.

Governance > Climate Change Governance Structure

The organizational units convey any issues, prospective risks, opportunities, and new developments associated with our sustainability framework to the Borçelik Sustainability Committee and then the Borçelik Sustainability Board through the relevant sub-committees.

The Borçelik Sustainability Board engages with the Borusan Group Sustainability Board via its members, and the Borçelik General Manager sits on the Group Sustainability Board. The Borçelik Sustainability Board also reports to the Borçelik BOD. Ultimately, sustainability and climate change governance is ensured and superintended by the Borçelik BOD, which is the final decision-maker. The Borçelik BOD holds ordinary meetings at least four times a year and is also convened if any extraordinary meeting is needed.

The Sustainability and Climate Change Governance Mechanism is given in Figure 1.2 and further details are provided in the following sections.



¹EU: European Union
²HSE Committee: Health, Safety and Environmental Committee

Figure 1.2: Borçelik Climate Change Governance

Governance > Borçelik Board of Directors

The Borçelik BOD consists of eight members. Four members are appointed by Borusan Holding, and ArcelorMittal appoints the remaining four. The board convenes at least four times a year and is the highest decision-making body responsible and accountable for sustainable development and climate-related strategies.

Climate change risks and opportunities, along with the decarbonisation roadmap, are key topics discussed by the BOD. The BOD also approves capital allocation for climate-related initiatives as part of the financial indicators of a sustainable development strategy.

While the BOD approves the climate-related budget requirements once a year, any relevant significant expenditures are approved by the Board when necessary.

All decisions taken at the board meetings are fully documented in addition to the minutes of the meeting. These documents are followed up regularly after the sessions. The climate change-focused targets are also approved by the BOD and checked periodically.

For some years, the board has placed increasing importance on developing a business strategy aligned with the global transition to a low-carbon economy. Decisions and action plans the board has approved include reducing greenhouse gas emissions in line with the goals of the Paris Agreement.

Governance > Borçelik Sustainability Board

Members of the Sustainability Board convey issues and information related to sustainability and climate change to the BOD. Results related to the target performance criteria, the risks and opportunities identified, and the decisions expected to be taken by the BOD are presented to the Board members by the Sustainability Board at the BOD meetings.

In addition to the regular quarterly BOD meetings, interim meetings are held as necessary with the members of the BOD and information is conveyed about any further developments.

The Borçelik Sustainability Board consists of the Executive Board members, the Borçelik Sustainability Leader, and the Sustainability Thematic Working Group Leaders.

In the Sustainability Board, the Borçelik Executive Board Members are responsible for examining and evaluating requests and reports from the Sustainability Committee and redirecting them to the Borçelik BOD.

As a member of the Executive Board, the Borçelik General Manager participates in the Borçelik Sustainability Board and reports directly to the Borçelik BOD.

The Borçelik Sustainability Leader, on the other hand, leads the Borçelik Sustainability Committee and ensures communication between the Sustainability Committee and the Sustainability Board.

The Borusan Sustainability Thematic Working Group Leaders from Borçelik are also members of the Borçelik Sustainability Board. This supports the alignment of all the Borusan Group Companies' actions.

Governance > Borçelik Executive Board

Borçelik Executive Board members:

Human Resources and Corporate Communication:
Responsible for employee training, activities regarding climate-change awareness and conducting internal and external communication with all stakeholders.

Sales/Marketing/Innovation/Customer Technical Services:
Responsible for the design, development, marketing and sales of new, sustainable products, alongside customer adaptation, creating business strategies integrated with sustainability, and monitoring and reporting local and global developments regarding climate change.

Financial Affairs and Foreign Trade Operations:
Responsible for investment financing, green credits and financial reporting on climate change.

Supply Chain Management:
Responsible for ensuring efficiency in the company's supply chain management and supporting the decarbonization of logistics processes.

Production and Investments:
Responsible for the planning and management of investments and process improvement tasks for the decarbonization of manufacturing processes, the direction of the energy and environment committees and the realization of the annual activity plans agreed on by these committees.

R&D/Information Technologies/Smart Production Systems/Management Systems:
Responsible for the implementation of process improvements to enhance the effectiveness of production processes, the development of new low-carbon products, the establishment and execution of management systems related to sustainability and climate change, and the management of calculation, verification and reporting of greenhouse gas emissions.

Sales of Kerim Çelik/Raw Material and Non-Raw Material Purchasing:
Responsible for the development and implementation of the company's responsible purchasing policy and the development and implementation of strategies for purchasing low-carbon and carbon-neutral raw materials.

Governance > Borçelik Sustainability Committee

The Management Systems Director is the leader of the Borçelik Sustainability Committee, known as the Borçelik Sustainability Leader. The members of the committee consist of middle-level managers in the Production, Human Resources, Corporate Communications, Financial Affairs, Strategy and Marketing, Management Systems, Health and Safety, Research and Development and Purchasing departments.

The Sustainability Committee manages the creation, execution and follow-up of the near- and long-term Climate Change Roadmap and communication with the stakeholders about this.

The Sustainability Committee coordinates with the Environment, Energy, Gender Equality, Training, HSE Committees and the Borçelik Technical Academy Board.

Climate-related training is organized to increase the knowledge of internal stakeholders about the global climate crisis and its impacts. Potential climate-related risks and opportunities are also evaluated, and all these evaluations are incorporated into the company's risk management procedures by the Sustainability Committee. Sustainability-oriented governance is thus always considered a part of integrated risk-management and relevant actions are taken within this framework.

Governance > Borçelik Sustainability Committee

The positions of the executives who are a part of the climate management at Borçelik are as follows, regardless of their role in the Sustainability Committee.

- The Management Systems Director, Quality Management Systems Manager, Borçelik Technical Academy Manager and the Quality Systems Authorized Specialist conduct sustainability management. As the Leader of the Borçelik Sustainability Committee, Management Systems Director reports to the Executive Board regularly.

- The Borçelik R&D Director and Innovation and Export Director stipulate the management of R&D and innovation studies related to climate change issues.

- The Raw Material Purchasing Director and Non-Raw Material Purchasing Manager ensure responsible and green purchasing processes are planned under Borçelik's Climate Change Strategy.

- The Finance and Foreign Trade Operations Manager is responsible for investment, financing and green loans and plans the financing processes of Borçelik in a climate-compatible strategy.

- The Strategy Development Manager, Marketing Unit Manager and Marketing Specialist oversee the business plan and strategic management with a sustainability standpoint.

- The Electricity, Automation and OH&S Manager, Technical Services Manager, and Production Directors carry out production, investment, environment, energy management within the context of a climate change-focused strategy and manage OH&S (occupational health and safety) in Borçelik.

- The Human Resources and Corporate Communications Manager and the Corporate Communications Unit Manager are responsible for corporate communications and stakeholder relations focused on climate change and sustainability. The Internal Control Unit Manager is responsible for how processes following Borçelik's strategy regarding climate change progress in terms of Corporate Governance.

The managers of the Borçelik Sustainability Committee and other relevant departments are responsible for identifying and assessing climate-related risks at the strategic and operational levels. The Budget and Financial Control Unit Manager and Finance Authorized Specialist are responsible for evaluating the financial impacts of the identified risks. The managers in the abovementioned positions report to the Deputy General Managers and General Managers within their professional areas of responsibility.

Governance > Borusan Group Sustainability Board

The Borusan Group Sustainability Board is directly responsible to the Borusan Group CEO and the Executive Board Member of the Borçelik BOD, and ensures the coordination of sustainability and climate change-related activities within Borusan Holding group companies. The Board consists of General Managers, and Managers in the Human Resources, Corporate Communication and Sustainability and Strategy and Business Development Departments, as well as in Finance and Financial Affairs, and the Advisor to the Chairman of the Board.

The Borusan Sustainability Board has Thematic Working Groups which are affiliated with the board. Group Companies participate in these working groups and contribute to tackling climate change issues.

Borçelik also participates in these Thematic Working Groups as a Sponsor or through Member Representatives.

In this way, Borçelik benefits from the synergy created in the Borusan Group, increases its knowledge and experience and takes part in joint studies with Group Companies.

The Borusan Sustainability Thematic Working Groups are managed by a Group Company in the relevant sector. The General Manager of the group company in question also acts as the Sponsor of the Working Group. The EU Green Deal and Decarbonization Working Group, which sits under the Borusan Sustainability Board, is sponsored by Borçelik General Manager.

The Borusan Group Sustainability Board and Borçelik Sustainability Board regularly hold follow-up and steering meetings. The Borçelik Sustainability Board, Borçelik Executive Board, and Borusan Group Sustainability Board have regular interim meetings at least twice a year.

19-71

Strategy

Strategy > Policy Landscape

Steel is a carbon-intensive product that is critical to the world economy. About 2 billion tons of steel is produced and accounts for about 8% of global CO_2 emissions each year. Therefore, the steel industry is at the centre of every climate change issue.

The Paris Agreement was adopted in 2015 and entered into force in 2016. Its goal is to limit global warming to well below 2 – and preferably to 1.5 degrees – Celsius, compared to pre-industrial levels. To realize the 1.5°C target, based on various modelling and scenarios, it was agreed that global emissions need to be reduced by 45% by 2030 and reach net zero by 2050.

The EU Green Deal, which was proposed by the European Commission in 2020 and which guides the countries of the European Union toward carbon neutrality, includes several plans and policies to reduce emissions by 55% by 2030 (compared to 1990) and to reach carbon neutrality by 2050. It creates a road map of a “net zero transition” with regard to climate targets through specific Climate Laws and more efficient carbon pricing, the promotion of clean and accessible energy, and a “circular economy” action plan.

The European Commission has adopted a package of “Fit for 55” legislative proposals as part of the European Green Deal, which aims to strengthen the EU’s position as a global climate leader. The package aims to modernize existing legislation in line with the EU’s 2030 climate target and introduce new policy measures to help bring about the transformative changes needed in the economy, society, and industry. This is in order to achieve and support an at least 55% reduction by 2030, and climate neutrality by 2050.

The core element of the Fit for 55 package is the Carbon Border Adjustment Mechanism (CBAM), designed to prevent carbon leakage from the Emissions Trading System (ETS), especially in carbon-intensive industries. The CBAM initially included iron and steel, cement, aluminium, fertilizers, electric energy production, hydrogen, and will be extended to organic chemicals, plastics, and ammonia.

Strategy > Policy Landscape

In the transitional period between 2023 and 2025, direct and indirect emissions from the production of imported raw materials by EU importers will be reported with the methodologies to be determined by the EU Commission. These emissions need to be verified by accredited bodies. This means that for emissions for which the importer into the EU is responsible, it prefers to work with producers with lower carbon emissions.

Türkiye signed the Paris Agreement in 2021 and set a Climate Change Adaptation Strategy and Action Plan within the scope of the 2030 and 2053 medium-term and long-term targets, and Nationally Determined Contributions in line with the 2053 targets.

Preparations continue to create a National Emission Trade System (NETS) and enact a Climate Law in Türkiye, in order to avoid the international financial risks that arise through the CBAM. The above-mentioned developments enable sustainable growth during the transition to low-carbon in the Turkish economy and increase competitiveness. Türkiye's Action Plan includes these regulations as well as the green and circular economy, green finance, a clean energy supply, and the fight against climate change.

Strategy

As a company that adopts continuous growth as a critical business principle, we place sustainability at the center of our business. We also aim to raise awareness about decarbonization in our country, and to raise awareness in public, private sector and non-governmental organizations about the possible risks and opportunities.

We are conducting lobbying activities to achieve this. In this direction, we participated in the government's studies on NETS and listed our suggestions: Türkiye should establish its own ETS and this should be compatible with the EU. National carbon prices should be at the same level as the EU. Thus, additional payments can be avoided at the border. The principle that the polluter pays as they pollute should be adopted, and carbon payments should be paid by the polluter at source. It should be ensured that the financial fund created by the carbon payment is transferred to the sustainable transformation projects being pursued within the industry. Incentives should be developed by facilitating renewable unlicensed energy investments.

The steel industry is undergoing a transformation as a result of the force of the above-mentioned regulations, which were enacted to minimize the effects of climate change. Various climate-related risks and opportunities occur within the framework of this transformation.

Although there is no consensus on terminology or a common standard on a global scale, customers are increasingly demanding "Green Steel", which refers to steel produced with low carbon emission green technologies and/or has been certified as such. Likewise, our customers, in addition to their basic expectations such as price, quality, on-time delivery, product diversity and reliable partnership, have begun to demand products from responsible suppliers utilizing low-carbon and clean production technologies and processes, and which comply with ESG principles.

Although our products are mainly sold to the domestic market, approximately 20-30% of our sales are exported directly to international end users and/or intermediaries. However, since our domestic customers are also exporters, up to 75% of the total products are used directly or indirectly abroad. For this reason, we evaluate all climate-related risks and opportunities at the same time as defining our strategy within the scope of our roadmap. We do this in order to create a sectoral framework that meets the sustainable production expectations of our customers while being minimally affected by carbon-based payments.

Strategy > Climate Related Risks And Opportunities

Borçelik defines 0-5 years as the short-term, 6-15 years as the medium-term, and 16-35 years as the long-term within its strategy. This is based on the time intervals determined by the Responsible Steel Standard. 2030 is thus accepted to be near--term and 2050 to be long-term.

	Short-Term	Medium-Term	Long-Term
Time(years)	0-5	6-15	16-35
Target years for Near-term & Long-term		2030	2050

Risks and opportunities with critical strategic impact are assessed in terms of where they occur in the value chain, the type, time period and probability of occurrence, the scale of impact, and the financial impact. These assessments are conducted using qualitative and quantitative analyses based on various scenarios providing long-term projections.

Borçelik determines the critical strategic impact of climate strategies on the basis of **revenue loss**. Since loss of revenue is not equal to profitability, revenue loss does not represent the net profit effect of climate-related risks and opportunities on Borçelik.
In deciding this effect, the following method is applied: an inventory is made of all climate-related risks and opportunities in our strategy, and the revenue effect of each for the short-, medium-, and long-term is calculated alongside various assumptions based on current climate scenarios. The minimum and maximum price ranges for all three periods are then assessed. Finally, the average threshold values that will affect our strategy are determined. As a result of this evaluation, revenue losses, which are $**5M+ for the short-term, $10M+ for the mid-term, and $40M+ for the long-term**, are accepted to have a **substantial strategic impact.**

Strategy > Physical Risk Assessment

Acute physical risks from climate change, such as extreme weather events, drought, sea-level rise, and water stress are expected to critically affect Türkiye. According to the report of the Parliamentary Climate Research Commission, both the frequency and severity of drought will increase, and the precipitation regime will change and decrease significantly until 2040.

In the steel industry, for an integrated producer water withdrawal is about 28 m^3 per tonne of steel produced. Nearly 90% of this water is discharged and only 10% is consumed during production. For Borçelik, although this consumption is much less than compared to an integrated steel producer, at about 0.5 m^3/tonne of steel, it is still much higher than for many industrial producers. According to the World Steel Association's Water Management Policy paper, most of the water lost is due to evaporation. The types of water used in steel production may be fresh water, salt water, rainwater, or recycled water. Considering the global water stress and water scarcity, it is expected that steel producers will replace freshwater consumption with recycled and rainwater in the near future.

We reviewed the expected changes in the temperature and water stress based on the 2030 and 2050 projections of the **RCP 4.5** and **RCP 8.5** of *IPCC Representative Concentration Pathway* scenarios and future projections of *WRI Aqueduct.* Based on the RCP 4.5 and RCP 8.5 scenarios, the average temperature increase is likely to be 2.4°C and 4.3°C in 2100, the atmospheric CO_2 concentration is expected to reach 538 ppm and 936 ppm, and sea levels are projected to rise 0.47 meters and 0.63 meters repectively. In line with these projections, the physical risks and their potential financial impacts determined in our 2021 physical risk assessment are indicated in Table 2.1.

Since Borçelik's production activities are located on the South Coast of the Black Sea Basin according to the WRI Aqueduct Tool, Borçelik is more susceptible to the effects of climate disasters caused by climate change, and extreme weather events thus have the potential to directly affect operations. In addition to the fact that the probability of these risks being realized is at a medium level, their subsequent effects carry a high risk.

Although the main water use in the steel production processes takes part in the upstream supply chain in terms of Borçelik's activities, water availability and quality are a matter of concern regardless of its place in the supply chain. Accordingly, it is important for Borçelik that its suppliers have access to the right type and quality of water.

For this reason, water availability and water-related risks are always evaluated in risk assessment meetings and alternative efficiency practices are studied, including optimizing water use in our facilities through efficiency practices.

Strategy > Physical Risk Assessment

Risks and their potential financial impacts determined in our 2021 physical risk assessment are indicated in Table 2.1.

● Long Term ● Medium Term ● Short Term

	Risk No.	Risks Of Organization's Value Chain	Risk Types	Risk Factor	Risk Timeframe	Risk Definition	Financial Impact	Revenue Effect ($)	Financial Disclosure
PHYSICAL RISKS	1	Upstream & Direct operations	Acute Physical	Increased severity of extreme weather events	Short, Medium, Long	In 2021, the cost of climate crisis-related disasters in the world amounted to USD$ 145 billion. In addition, according to the Türkiye 2021 Climate Assessment Report prepared by the General Directorate of Meteorology, 2021 was recorded as the year with the most extraordinary weather events with 1024 events in total. These extreme weather events, including flood, storm, tornado, etc. may affect Borçelik's production units, and cause damage and break-downs.	Diminished revenues due to reduced production capacity Increased indirect costs	26.5M - 106.1M	Borçelik's three-year average gross sales are approximately $1,365,000,000. Considering that production continues for 360 days, daily gross sales correspond to $3,791,667. In scenarios where production stops for 7, 14 and 28 days due to related risks, the loss of revenue is calculated as a minimum of $26,541,667 and a maximum of $106,166,667.
	2	Upstream & Direct operations	Acute Physical	Increased severity of extreme weather events	Short, Medium, Long	Possible extreme weather conditions (flood, storm, tornado, etc.) may damage the operations of raw material suppliers of Borçelik and cause production interruptions. Since 97% of our raw material supply is shipped by sea and 3% by land, similar weather events may cause disruptions in the supply chain, especially during maritime transport. These situations can have financial impacts.			
	3	Upstream & Direct operations	Chronic Physical	Changes in precipitation values and extreme variability in weather patterns Increased average temperatures	Medium, Long	According to the WRI Aqueduct Tool, there is a high risk of water stress in the region where we operate in 2030 and an extremely high risk in 2040. Moreover, groundwater levels are expected to decrease in the coming years. Borçelik uses ground water for its operations. 0.5 tons of water is used for approximately 1 ton of steel. Therefore, all possible water-related risks will lead to production interruptions in our process and disruptions in product supply and cause financial losses.			

Table 2.1: Key climate-related physical risks of Borçelik

Strategy > Physical Risk Assessment

Climate-related physical risks cause social as well as economic problems. Acknowledging the central position of humans in our climate-related efforts, we strive to create the best social benefits possible by designing work models for the future, and making our shareholders, throughout the value-chain, a part of the decision process within our sustainability strategy.

In this context, we use the **IPCC's Shared Socioeconomic Pathways (SSPs)** in our physical risk assessment as a form qualitative analysis allowing the adaptation to climate change and the minimization of its impact on society. SSP scenarios, in parallel with RCP scenarios, provide projections regarding emissions reduction levels and social changes by modelling population, education, economic growth, and technological advancement.

At Borçelik, we consider the **SSP2** scenario, compatible with the **RCP 4.5**, in our risk assessment and strategy. Based on this SSP scenario, there will be significant developments in energy distribution, fossil fuel-based economies, education, and healthcare throughout the 21st century.

However, throughout these developments, mid-level difficulties, such as gender equality problems will emerge with regards to the reduction and adaptation of impact. To clarify, according to the UNFCCC, women often suffer increased risks and costs from the effects of climate change and poverty, and women make up the vast majority of the world's poor.

The unequal participation of women in decision-making processes and labor markets exacerbates inequalities and frequently prevents women from fully participating in climate-related planning, policymaking, and implementation. In this transitional period, we aim to support the development of gender equality through comprehensive vocational trainings by making gender equality an integral part of the company culture.

We embrace this approach to gender equality in our operations and aim to increase ratio of female workers in our factories by 10% by 2030: the percentage is currently 3%. In addition, as an institution that acts with the awareness that a bright future is only possible through education, we see vocational training as a responsibility, and we provide vocational high-school students with training in various fields within the framework of the development program.

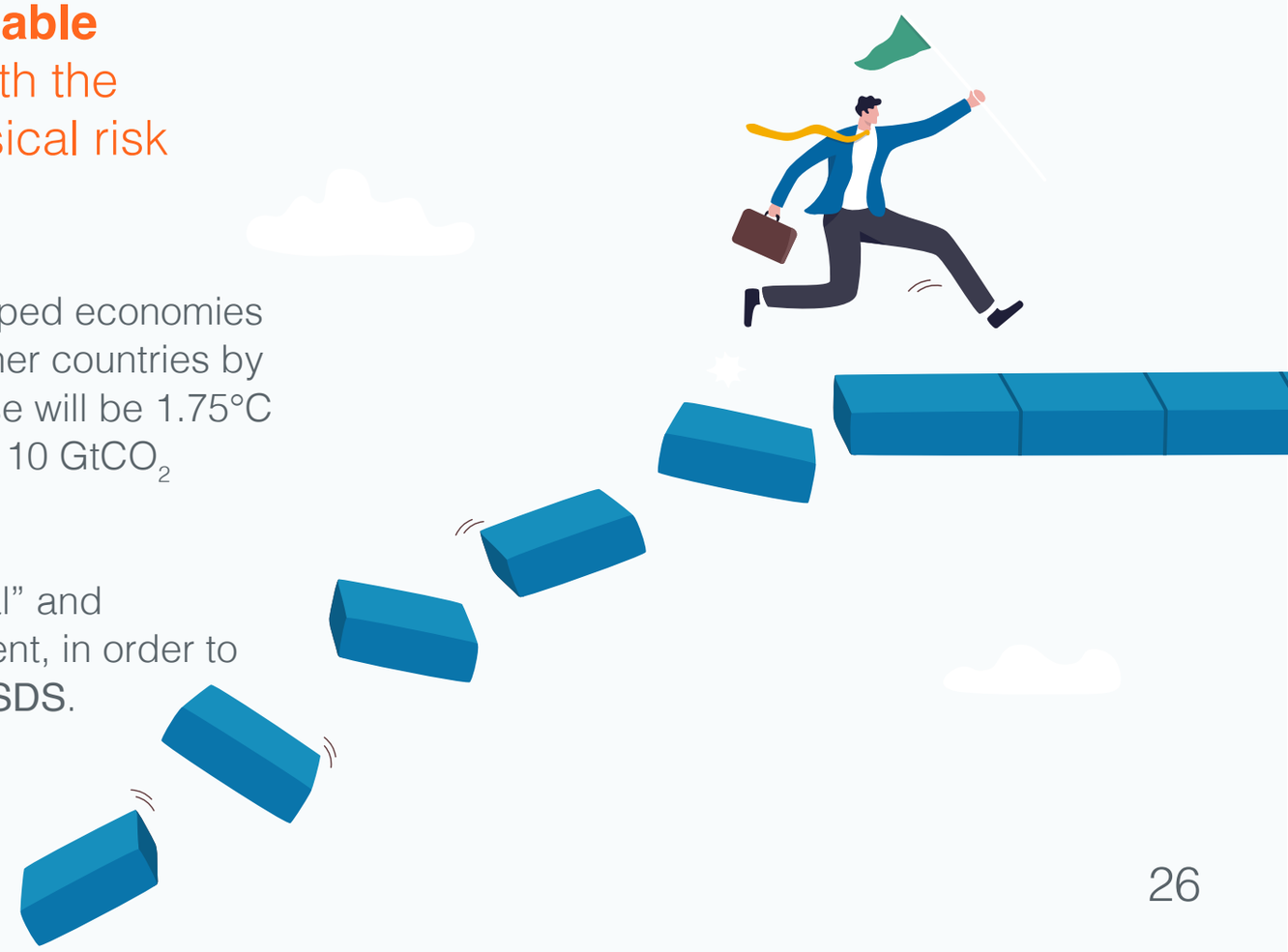
Strategy > Transition Risk Assessment

Following the increase in the number of climate change policies being implemented worldwide, the expectations of customers have started to change, and the technological developments required for the low-carbon transition have attracted focus. As the transition risks, encompassing policy, legal, market, and technological risks, particularly affect the steel industry, such risks are always part of our risk assessment. In this process, we take the global climate change scenarios of the IEA, published in its 2021 World Energy Outlook, into account.

Our risk assessment is based on the **IEA Sustainable Development Scenario (SDS)**, in accordance with the **RCP 4.5 scenario**, which is also used in our physical risk assessment, and the Paris Agreement.

If the commitments based on the IEA SDS are fulfilled, developed economies will reach net zero emissions by 2050, China by 2060, and other countries by 2070 at the latest. Moreover, the average temperature increase will be 1.75°C and the atmospheric CO_2 concentration will be approximately 10 $GtCO_2$ (gigatonnes of carbon dioxide).

In addition, we have used the output of the “business-as-usual” and “pessimistic” scenarios from the IEA 2DS in our risk assessment, in order to strengthen the resilience of our strategy in relation to the IEA SDS.



Strategy > Transition Risk Assessment

In the assessment, particularly in the financial impact calculations, we have analyzed the mid-term and long-term projections for every scenario regarding carbon pricing, energy distribution, availability of raw material, and advancement of technologies such as CCUS.

We have calculated the financial impact based on “optimistic”, “business-as-usual”, and “pessimistic” scenarios. The outcome of our 2021 transition risk assessment is given in Table 2.2.

As seen in the table, our most important transition risks are the financial liabilities brought by the developing policies, as well as the disruptions and technological inadequacies that may be experienced in the supply of raw materials due to changes in customer preferences during the “green transformation” process.

Evaluating these risks and their financial impacts on our climate strategy means that alternative activities for Borçelik to engage in are discussed at our risk assessment meetings.

Long Term Medium Term Short Term

Risk Number: 4

Risks Of Organization's Value Chain	Risk Types	Risk Factor	Risk Timeframe	Risk Definition	Financial Impact	Revenue Effect($)	Financial Disclosure
Upstream	Policy and Legal	Carbon Border Adjustment Mechanism	Short Term Medium Term Long Term	Borçelik as a re-roller, operates in the steel industry, one of the industries with the highest intensity of emissions on the global scale and one that is directly impacted by current and emerging climate regulations. CBAM, a climate measure which is designed to keep track of the carbon emissions of imported carbon-intensive goods and products from non-EU countries can be viewed as a legal and political risk. It will initially cover a number of specific products including iron and steel. Indirect emissions from electricity consumption would also be included in the regulation. It is also designed to sell certificates corresponding to the embedded emissions in the products, which is expected to urge importers to seek suppliers with low emissions to avoid paying for extra costs. CBAM may increase our operational and indirect expenses. Additionally, there would be an increase on requests for the measurement, verification and submission of our products' emissions which would bring additional costs and improvements particularly in our ERP systems to calculate our carbon footprint.	Increasing direct cost Diminishing revenues through demand reduction on product and services Expenditure related to R&D of new and alternative technologies	8M - 22.5M	Two scenarios can be used to calculate the financial cost of CBAM and national ETS. In the first, only CBAM is considered when no national ETS exists. In such a scenario, 90% of the sales to the EU will be lost due to the high costs to occur, while 10% of the total EU sales for the Romania-based automotive OEM will remain. In this case, the capacity allocated to EU customers must be sold to non-EU customers (excluding US and Canadian customers). Switching from customers in the EU to customers outside the EU will result in loss of revenue as sales to these customers may be possible at prices below EU prices. On the other hand, CBAM payments will be incurred for the 10% portion that will continue to be sold to the EU. In calculating this cost, it is assumed that the price of carbon credits will be $81 per ton for 2021, and $100 or $160 per ton for 2030 and 2050 according to IEA-SDS scenarios. 379,830 tCO_2, which is the total CO_2e (scope 1-2-3) of the 3-year average sales to the EU, is used in the calculation of the revenue effect. According to this first scenario, the total effect on revenue is between 19,560,000-22,560,000 USD depending on the carbon price. For the second scenario, it is assumed that the national ETS is in full compliance with the EU ETS where the carbon prices in Türkiye and EU ETS are equivalent. In such a scenario, sales to the EU will not be lost and no additional CBAM payment will be made. Payments to the national ETS are based on the same carbon pricing defined in the first scenario and no free allowances are assumed in the national ETS system. In this national ETS system to be established, all producers will be responsible for emissions (Scope 1) arising from their own activities. The revenue effect for this scenario is between 8,044,000 and 15,889,000 based on carbon price. Payments for the national ETS are expected to be returned to the industry as financing for use in green transformation activities. If this happens, the aforementioned cost will be recovered.

Table 2.2: Key climate-related transition risks of Borçelik

Risk Number: 5

Long Term | Medium Term | Short Term

Risks Of Organization's Value Chain	Risk Types	Risk Factor	Risk Timeframe	Risk Definition	Financial Impact	Revenue Effect($)	Financial Disclosure
Downstream	Market	Change in customer expectations	Medium Term Long Term	According to the PWC Consumer Intelligence Series 2021 Survey, 80% of consumers are more likely to buy from a company that advocates for the environment, and 83% of consumers think companies should actively shape ESG best practices. This growing consumer behavior forces thus companies to become green. On the other hand, developing and extending climate policies and regulations such as CBAM, especially those involving the steel industry, will cause an increase in demand of products that are produced with fewer emissions/green steel. This will force producers who are producing for sectors in the scope of CBAM, such as Borçelik, to improve and develop their processes to reduce their carbon footprint. One of the main improvements in Borçelik should be strengthening its ERP and other IT-based infrastructure to calculate and share the embedded carbon content of its products. Although expenditures on new applications and technologies for decarbonization may increase, failure to take these measures may put Borçelik's market position at risk, especially in customer segments that are more sensitive to climate change, such as automotive and white goods. By following and adopting global applications before our competitors, this risk can be turned into an opportunity.	Diminishing revenues through demand reduction on product and services Expenditure related to R&D of new and alternative technologies Expenditure related to new applications and processes	6,142,500 - 61,425,000	It is assumed that 45% of Borçelik customers are more sensitive to environmentally friendly and low-carbon green steel products, based on the average three-year turnover. These green-focused customers are also more profitable for Borçelik as they demand advanced products with more added value. Any loss of sales to these customers will result in switching to other customers who are less environmental friendly. In such a case, a 10% loss of revenue per tonne of steel since these customers are expected to have lower prices. Three scenarios are examined in case Borçelik does not act in the green transformation and continues its business as usual. In the first scenario, sales cannot be made to this green-oriented customer segment, 50% in the second scenario and 10% in the third scenario. According to these assumptions, it is calculated that for these scenarios, a revenue loss of $61,425,000 if the products are not sold 100%, $30,712,500 if the products are not sold 50%, and $6,142,500 if they are not sold 10%.

Table 2.2: Key climate-related transition risks of Borçelik

Risk Number: 6

● Long Term ● Medium Term ● Short Term

Risks Of Organization's Value Chain	Risk Types	Risk Factor	Risk Timeframe	Risk Definition	Financial Impact	Revenue Effect($)	Financial Disclosure
Downstream & Direct operations	Technology	Replacement of existing products and services with lower emission options Cost of transitioning to low-emission technologies	●	Significant advancements in new green technology support decarbonization in steel production processes. Upstream steel production has undergone revolutionary changes, such as the Direct Reduced Iron Production (DRI)-EAF steel production process based on the usage of green hydrogen. Steel producers invest in this issue with large budgets. Technologies for reducing the energy inputs of operations and boosting energy efficiency, process control software, and intelligent automation systems are evolving in the rolling and surface treatment (galvanization) sector, in which Borçelik is involved. While there is a growing need for raw materials generated using new decarbonization technology, production processes also require investments in new technology. The transformation experienced on the customer's side – especially the demand for green steel and the need for lightened-strength steels – also increases the need for technological transformation in Borçelik's processes. If this does not occur, there is a chance that our revenues will fall due to a decline in consumer demand for goods and services.	Diminishing revenues through demand reduction on product and services Expenditure related to R&D of new and alternative technologies Expenditure related to new applications and processes	6,142,500 - 61,425,000	It is assumed that 45% of Borçelik customers are more sensitive to environmentally friendly and low-carbon green steel products, based on the average three-year turnover. These green-focused customers are also more profitable for Borçelik as they demand advanced products with more added value. Any loss of sales to these customers will result in switching to other customers who are less environmental friendly. In such a case, a 10% loss of revenue per tonne of steel since these customers are expected to have lower prices. Three scenarios are examined in case Borçelik does not act in the green transformation and continues its business as usual. In the first scenario, sales cannot be made to this green-oriented customer segment, 50% in the second scenario and 10% in the third scenario. According to these assumptions, it is calculated that for these scenarios, a revenue loss of $61,425,000 if the products are not sold 100%, $30,712,500 if the products are not sold 50%, and $6,142,500 if they are not sold 10%.

Table 2.2: Key climate-related transition risks of Borçelik

Risk Number: 7 & 8

Long Term | Medium Term | Short Term

Risks Of Organization's Value Chain	Risk Types	Risk Factor	Risk Timeframe	Risk Definition	Financial Impact	Revenue Effect($)	Financial Disclosure
Upstream	Market	Supply Chain Breakdown Risks	Medium Term, Long Term	Borcelik's primary raw materials, zinc and HRC, are carbon-intensive products. HRC is available from both BOF and EAF sources. Considering the green transformation, EAF-based HRC will be in greater demand due to its low carbon content. On the other hand, EAF-based HRC production requires scrap. Today, Borcelik's main EAF sources are based on local producers and Türkiye is the world's largest scrap importer. Increasing demand for EAF-based low-emission HRC and therefore new EAF investments will put more pressure on scrap supply. Any missing raw material delivery to Borçelik may cause an interruption in its processes and therefore sales income may drop. This creates a financial risk due to climate change.	Diminishing revenues due to production capacity reduction Increasing indirect costs	26.5M - 106.2M	The three-year average gross sales for Borçelik are approximately $1,365,000,000. Considering a 360-day production cycle, the daily gross sales amount to $3,791,667. The potential loss of income is evaluated as a minimum of $26,541,667 and a maximum of $106,166,667 in the scenarios where production is halted for 7, 14, and 28 days due to the associated risks.
Upstream	Market	Energy Supply Risks	Medium Term, Long Term	In order to reduce the effects of the climate crisis, strict energy policies are implemented within the framework of the 2050 net-zero targets determined by the Paris Agreement and the EU and other countries. As the transition to clean energy becomes more commonplace globally, many countries have proposed strategies to phase out fossil fuels, primarily coal. This situation leads to an increase in energy prices and also causes a contraction in the energy supply. Global political problems between countries also strengthen this effect. Interruptions to energy supply will also affect business continuity and reduce our revenue.	Sudden and unexpected changes in energy costs Diminishing revenues due to production capacity reduction Increasing indirect costs		

Table 2.2: Key climate-related transition risks of Borçelik

Long Term Medium Term Short Term

Risk Number: 9

Risks Of Organization's Value Chain	Risk Types	Risk Factor	Risk Timeframe	Risk Definition	Financial Impact	Revenue Effect($)	Financial Disclosure
Direct operations	Market	Accessibility to sustainable financial investments	Short Term, Medium Term, Long Term	Access to sustainable financial investments is critical in taking the necessary steps to tackle the climate crisis. In the EU for example, it is intended to prioritize sustainable investments and adopt sustainable business models, particularly within business ecosystems, corresponding to the framework of the 2050 targets. Various policies and classification models have been devised for this specific objective. EU Taxonomy is a sustainability goals-oriented classification model extensively utilized to achieve this goal. It is expected that in terms of the medium- and long-term assessments of the sustainability risks to institutions, specifically in terms of the sustainability criteria of banking institutions, they will provide financing to the relevant sectors by taking EU Taxonomy into account. These circumstances will pose an additional financial risk to Borçelik if low-carbon production does not start in a comprehensive manner.	Increasing credit risks	2,250,000	The cost of the associated risk is estimated to be $2,250,000 given the magnitude of the loans and the expected pricing advantage of sustainable finance.

Table 2.2: Key climate-related transition risks of Borçelik

Strategy > Transition Risk Assessment

The probability of the occurrence and impact of the climate-related risks elaborated in Table 2.1 and Table 2.2, when graded from “very low” to “very high”, lead to the outcomes illustrated in the risk heat map in Figure 2.1. Warm colors are used when the impact and probability of occurrence are very high, red when risks are at the highest level, and cold colors when the impact and probability of occurrence are very low.

Based on the results, the impact and probability of occurrence of risk 5 and 7 are very high, the probability of occurrence of risk 4, 6, and 8 is probable, but the impact is very high, and the probability of occurrence and impact of risk 1, 2, 3 and 9 are probable.

As Borçelik, we use the risks identified with strategic impact in our short-term, mid-term and long-term climate-related risk assessments in order to set emission reduction targets and develop strategies.
Our mitigation strategy in the face of these risks is elaborated in the “*Borçelik’s Mitigation and Realization Strategy*” section.

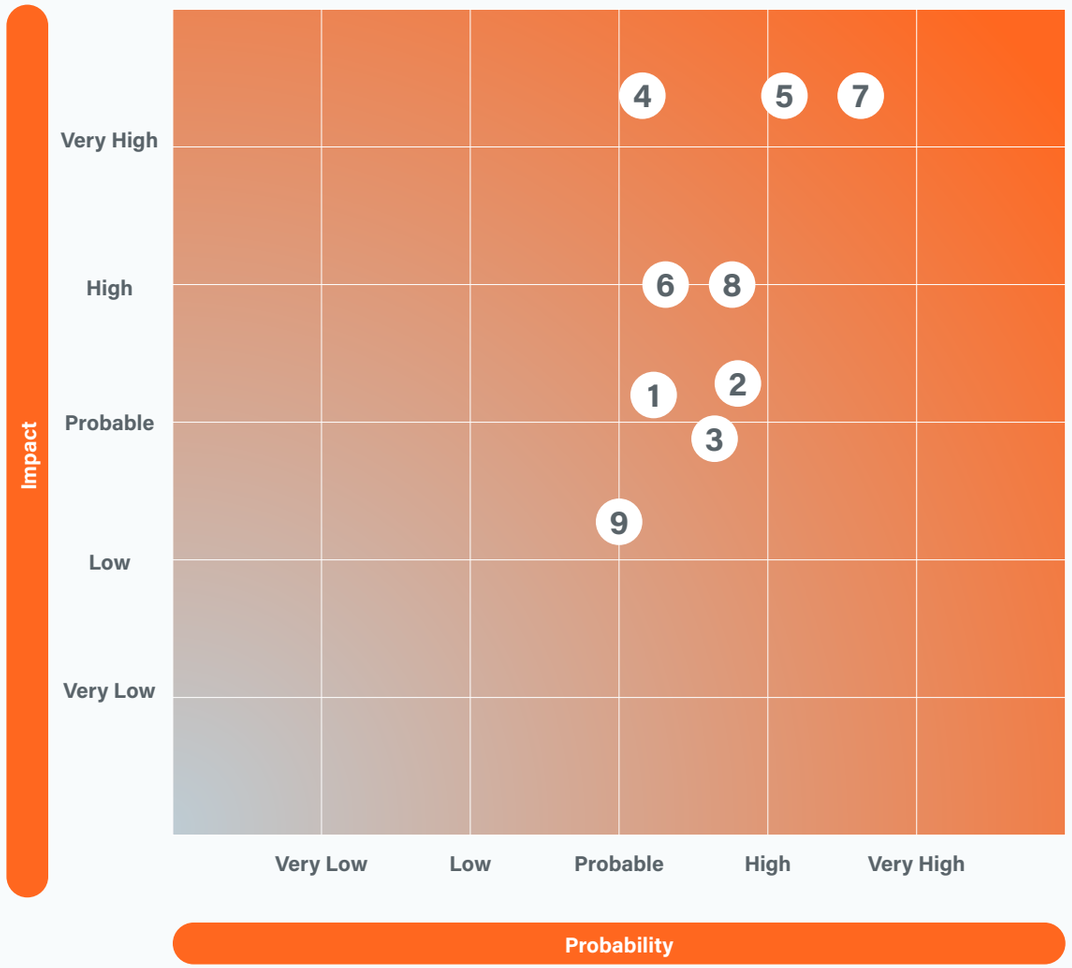


Figure 2.1: The heat map of climate risks

1 2 3 Increased severity of extreme weather events
4 Carbon Border Adjustment Mechanism
5 Change in customer expectations
6 Transitioning to low-emission technologies
7 Supply Chain Breakdown Risks
8 Energy Supply Risks
9 Accessibility to sustainable financial investments

Strategy > Key Climate-Related Opportunities

Borçelik's short-term, mid-term, and long-term climate-related opportunities are investments in low-carbon technologies for product-based emission reduction, energy efficiency, new products, services, markets, assets, and flexibility, all in the context of the transition to a low-carbon economy accelerated by climate change. The opportunities considered in our strategy, as well as the risk assessment, are given in Table 2.3.

As seen in the table, there are significant climate-related opportunities listed. These include being less affected by the changes in carbon costs, increasing revenue through the demand for lower-emission products and services, and reacquiring positive competitive revenue through the adaptation to changing consumer preferences.

Borçelik closely monitors customer demands and developments in the market and incorporates these opportunities into its corporate strategy.

Therefore, we are in an advantageous position in terms of our ability to utilize these opportunities by taking faster actions than our competitors, and especially by following current developments in research and development. Our realization strategy for climate-related opportunities is elaborated in the section on "*Borçelik's Mitigation and Realization Strategy*".

Long Term | Medium Term | Short Term

Type of Opportunity	Time Period of the Opportunity	Description of the Opportunity	Substantive Financial Impact
Products and services	Short Term, Medium Term, Long Term	A number of new and radical technologies, such as the use of hydrogen from renewable energy in steel production and carbon capture and storage systems, are developing in the upstream rapidly. However, these applications are still in the research and prototype stage. Considered as the previous phase to these technologies, the transition from coal (blast furnace) to natural gas (in a DRI facility) has accelerated, and the use of electric arc furnaces (EAF) producing from scrap has increased. Borcelik's potential to reduce its operational direct emissions as production starts from the semi-finished product phase comparatively limited. Nevertheless, Borçelik embraces a sustainable approach to production, closely monitors new technologies to reduce operational emissions, and continues its investments and process improvement projects. Borçelik could benefit more from the carbon reduction it would gain from its operations from using low-carbon raw materials, as most of its emissions from its products result from emissions embedded in the raw material. Since Borçelik is an independent rolling mill, it does not experience inheritance problems like integrated steel producers. Borçelik is able to reach these low-carbon raw materials better than its competitors by using its cooperation with low-emission producers, including its shareholder ArcelorMittal.	• Increased revenue through demand for lower-emission products and services • Positive competitive revenue through the adaptation to changing consumer preferences
Market Increase in green financing	Short Term, Medium Term, Long Term	The most efficient solution to tackle climate change and to maintain sustainable development is the implementation and widespread use of low-carbon economy models. The financial sector plays a critical role in the green transformation of the industry. As a pioneer that embraces sustainability as a core value and fulfills its obligations in this regard, Borçelik can achieve its decarbonization targets in production with lower credit costs thanks to green financing.	• Increasing diversification of financial assets (green bonds and infrastructure)
Market Participation in the carbon market	Short Term, Medium Term	With CBAM, China, Russia, India and Vietnam, which are natural exporters to the EU, are expected to be more worried than Türkiye in terms of commercial competition due to the higher emission intensity in their production processes in the steel industry. Türkiye will be preferable to these EU importers due to its relatively low carbon production processes resulting from EAF technology. In addition, the Turkish steel industry, including Borçelik, can benefit from the national ETS system, which is compatible with EU ETS, expected to be established in Türkiye.	• Increasing capital availability (as more investors choose low-emission producers) • Positive effect of increasing demand for the product on reputation

Table 2.3: Key climate-related opportunities of Borçelik

Long Term | Medium Term | Short Term

Type of Opportunity	Time Period of the Opportunity	Description of the Opportunity	Substantive Financial Impact
Market Participation in the carbon market	Medium Term Long Term	The EU Commission has stated that manufacturers paying a carbon tax equivalent to EU standards in their own country will be exempt from paying the cost of CBAM. In order to avoid tax evasion to the EU, Türkiye is expected to upgrade the existing MRV system to the national ETS and expand its application. Since the carbon payment with the national ETS will be made in Türkiye, no additional payment will be made for CBAM if an equivalent system is established with the EU ETS. In addition, the new national ETS is expected to require that each company be responsible for the emissions from its own operations. Since Borçelik is a re-rolling mill and has far fewer emissions than a production-oriented producer, it is expected to pay much less compared to upstream steel-making companies. Furthermore, reallocating the funds from national ETS to the relevant sector will enhance the green transformation of the Turkish Steel Industry.	• Reduced operating costs
Market Changes in customer preferences	Short Term Medium Term Long Term	Due to increasing consumer awareness and regulatory pressure, our customers are focusing more on being environmentally friendly and reducing their carbon footprints. To achieve this, they demand that the steel products they use be reduced in weight, improved corrosion resistance to extend product life, and lowered the carbon content. The development of these features is becoming an important driving force for steel manufacturers, especially serving the automotive and white goods industries. For example, in the automotive industry, it is expected that more steel from the Advanced High-Strength Steel (AHSS) families will be needed to address prominent product safety issues and reduce the weight of the body-in-white. Apart from AHSS, demand for metallic and non-metallic coatings with high corrosion resistance, prolonging the life cycle of products and conserving natural resources is expected to increase in the market. It is desired to reduce the carbon content of our products through the use of low-carbon raw materials, energy efficiency projects and investments. Borçelik is a rolling mill and has strong collaborations with raw material suppliers, including its shareholder ArcelorMittal. Borçelik can also reduce its carbon footprint by using low-carbon raw materials. Adaptation of these technologies and green transformation of processes may provide Borçelik with financial advantages in meeting such changes in customer preferences.	• Increasing capital availability (as more investors choose low-emission producers) • Positive effect of increasing demand for the product on reputation

Table 2.3: Key climate-related opportunities of Borçelik

Long Term | Medium Term | Short Term

Type of Opportunity	Time Period of the Opportunity	Description of the Opportunity	Substantive Financial Impact
Resource efficiency Reduction in water use	Medium Term Long Term	According to the RCP 4.5 scenario, one of the physical scenarios published by the IPCC, the temperature is set to increase by 2.4°C on average by 2100, and one of the significant effects of this increase will be difficulty accessing water resources. Water plays a vital role in Borçelik's production. Therefore, we consider the water resource outputs of the RCP 4.5 and WRI Aqueduct Tool in determining our strategy, and optimize water use in our facilities through efficiency practices. Thus, we both reduce the effects of the related risk, and reduce our operational costs, turning the water issue into a climate and water-related opportunity.	• Reduced operating costs
Resource efficiency • Circular economy • Zero waste	Short Term Medium Term Long Term	The "buy/use/throw-away" approach of the linear economy system is the main reason for resource issues today. At Borçelik, we are aware of this issue in our decarbonization process and thus embrace circular economy models and carry out recycling activities to reduce resource use in all our facilities. Thanks to our resource efficiency practices, our environmental performance has improved. In addition, our economic performance improves through the decrease in our operating costs.	• Reduced operating costs
Resource efficiency • Energy efficiency • Process improvement	Short Term Medium Term Long Term	Energy costs in Borçelik represent the most significant portion of operating costs after raw material (HRC and zinc) costs. Therefore, investments, projects, and other respective efforts by Borçelik on emission reduction directly contribute to improving Borçelik's energy efficiency and thus reducing operating costs. For this reason, all actions to be carried out in this regard are directly related to Borçelik's profitability and competitiveness in the market.	• Reduced operating costs
Energy source Use of low-emission energy sources	Short Term Medium Term	Following Türkiye's ratification of the Paris Agreement in October 2021 and commitment to achieving the net-zero target by 2053, new institutional regulations are currently being introduced to address climate change issues, including the updating of the National Climate Action Change Plan. Within this framework, various incentive mechanisms have been applied, particularly for energy efficiency applications and for the widespread use of electricity generation from renewable energy sources. Within Borçelik's emission reduction targets we aim to reach net zero in our Scope 2 emissions by taking advantage of the incentives in the transition to a low-carbon economy and supplying all our electricity from renewable energy sources. Therefore, we project that we will be less affected by fossil-fuel price increases and carbon costs in the future and will leave a positive impression on our stakeholders.	• Less exposure to future fossil fuel price increases • Being less affected by the changes in carbon costs • Return on investment in low-emission technology

Table 2.3: Key climate-related opportunities of Borçelik

Strategy > Borçelik's Mitigation and Realization Strategy

Borçelik, a galvanized steel producer of the highest quality with the largest production capacity in Türkiye, aims to work in close collaboration with its key customers and ensure its solutions have a sustainable approach. We thus conduct our sustainability practices within the themes of the "climate", "people", and "innovation" and take actions in accordance with our "**Inspiring the Future, Inspired by the Earth**" approach.

Our climate-related risks and opportunities strategy is connected to at least three of our six strategy initiatives:

- **Innovation and R&D**
- **Profit Optimization**
- **Growth**

Borçelik's climate-related strategy includes the adaptation of procurement policy for the purchase of raw materials, the management of operations for energy and resource efficiency, innovation and R&D practices for the development of low-emission products and processes, investment programs for emissions reductions, IT system infrastructure for emissions calculations and monitoring, the management approach, corporate risk management, human resources for raising employee awareness about climate, sales and marketing strategy including education and corporate communications, and financial affairs for green finance.
All the above-mentioned operations are integrated into Borçelik's corporate strategy.

Strategy > Borçelik's Mitigation and Realization Strategy

We have identified critical questions focusing on energy demand and availability, the pricing of commodities and raw materials, changes in carbon pricing, policies, customer expectations, and technological developments within our climate strategy.

We have assessed the outcome of climate scenarios through sectoral analysis and answered the focal questions accordingly.

Subsequently, we have determined the cost of risks and opportunities, as well as actions to be taken for those with strategic impact and have continued our research and development in this area.

Strategy > Focal Questions and Outcomes

Distribution Of Energy Resources

Focal Questions

· Which energy sources were mainly used in 2021?
· Which energy sources are predicted to be trending in the future?
· What are the future projections for renewable energy power plants?

Outcomes

In 2021, electricity production in Türkiye from different energy sources was distributed as follows: 30.9% coal powered, 33.2% from natural gas, 33.5% from renewable sources (16.7% from hydraulic energy, 9.4% from wind, 4.2% from the sun, 3.2% from geothermal energy) and 2.4% from other sources. Globally, electricity generation from clean energy sources had a share of 38% in 2021, while wind and sun accounted for 10.3% of global electricity production, accounting for the first time for more than one-tenth of global electricity production.

With the Paris Agreement and developing regulations, it is predicted that electricity generation from renewable energy sources will increase rapidly, increasing the probability of reaching global climate targets. Forecasts of total capacity distribution in global electricity generation for the years 2030, 2040 and 2050 of the IEA SDS scenario are given in Table 2.4. The fact that Türkiye has a wide range of renewable energy resources and is among the countries that are suitable for the use of wind energy creates an opportunity for Borçelik to reach its Scope 2 targets. With Türkiye's advantageous location, wind and solar energy are among the leading renewable energy sources, enabling Borçelik to direct its investment strategy to SPP and WPP for electricity generation purposes.

	2030	2040	2050
Renewables	63%	74%	78%
Nuclear	4%	3%	3%
Fossil fuels with CCUS	-	1%	1%
Unabated fossil fuels	30%	14%	8%
Hydrogen and ammonia	-	2%	2%
Battery storage	3%	6%	8%

Table 2.4: Distribution of total capacity in global electricity generation according to SDS scenario (%)

(Source: IEA World Energy Outlook 2021)

Strategy > Focal Questions and Outcomes

Raw Material Availability And Pricing

Focal Questions

- How does the future look in terms of raw materials?

Outcomes

It is estimated that hot rolled HRC prices will start to increase in the near-term due to rising energy costs and production constraints, and then stabilize. Since the investments in HRC production will continue in the domestic market, it is expected there will be more availability as capacity would increase by around 40% in the next three years.

Continuous Galvanizing Grade (CGG) alloy zinc, which plays a crucial role in HDG, is expected to face a serious supply shortage, especially in Europe, due to rising energy prices. According to the LME, zinc stocks in European warehouses have been zeroed out for some time and it is thought that the supply shortage will worsen due to possible power outages in Europe in the coming periods. Although companies are struggling to keep their current production costs, no shortage is expected in raw materials.

At Borçelik, we regularly monitor our stocks and our access to raw materials is relatively easier than the other producers, thanks to our business partners.
We are also working on energy efficiency practices and energy investments, taking into account possible price increases.

Strategy > Focal Questions and Outcomes

Policies

Focal Questions

· How are current regulations expected to evolve over time?
· What kind of sanctions are expected in the steel industry with the Carbon Border Adjustment Mechanism (CBAM)?
· How will this mechanism affect Borçelik's processes?
· How will energy efficiency laws such as the incentive mechanism affect Borçelik and what opportunities will they create?

Outcomes

The steps required under the European Green Deal and the Carbon Border Adjustment Mechanism (CBAM) mandate the de-carbonization of all production processes, especially in the iron and steel, cement, aluminum, electricity and fertilizer sectors, and require a multi-dimensional effort involving auditing, reporting and financing of products. Türkiye has committed to reducing its greenhouse gas emissions by 41% by 2030 based on the annual growth rate.

In order to achieve this target, the country has announced plans and policies in many areas, including energy, transportation, agriculture, waste, etc. In recent years, the country has made significant progress, especially in the fields of renewable energy, energy efficiency and waste management and has been increasing the share of renewable energy in the installed energy generation capacity, especially through incentive mechanisms.

At Borçelik, when we compared our total emissions from our own operations, we determined that our most important emission source was the raw materials we use. When CBAM and the Turkish Emissions Trading System (ETS) are established, it is critical that we reduce our indirect emissions by supplying low-carbon raw materials in order to minimize our commercial impact. At this point, in order to increase the use of low-emission raw materials, especially in the use of EAF-sourced raw materials, we are focusing on R&D activities such as advancing the existing steel technologies with our suppliers and copper electrolysis to eliminate the negative effects in the processes.

Strategy > Focal Questions and Outcomes

Carbon Pricing

Focal Questions

· How will carbon prices change over time?
· What will be the impact of price changes in the sector?
· Are common carbon pricing or differentiated prices expected to be applied?

Outcomes

One of the tools used to reduce greenhouse gas emissions globally is the implementation of an effective carbon pricing mechanism. In line with the targets committed to combat climate change, an increasing number of countries are implementing national carbon pricing mechanisms. Carbon pricing helps to promote green technologies and increase incentives for efficiency practices by placing an economic value on emissions. Table 2.5 shows the change in carbon pricing projected by the IEA SDS scenarios over the years. The steel industry is a carbon-intensive sector. Yet it continues to receive 80% of the free allowances in the ETS system.

Year	2030	2040	2050
$/tCO$_2$	100	140	160

Table 2.5: Yearly change in carbon pricing according to the IEA SDS scenario

(Source: IEA World Energy Outlook 2021)

With the CBAM, which will enter into force in 2026, designed by the EU Commission in order to reduce free allowances and prevent carbon leakages, it is expected that free allowances will be gradually reduced and a pricing system applied globally will be implemented.
Although there is not yet an ETS in Türkiye, in the case that an expanded ETS is established, Borçelik will be required to make financial payments to the country where it is located for the production emissions it causes on an annual basis. Although it is known that carbon prices will increase every year, Borçelik has set emission reduction targets for its 2030 and 2050 strategy and begun to take actions in this context.

Strategy > Focal Questions and Outcomes

Customer Expectations and Changes in Production

Focal Questions

· What will be the changes in steel demand and production globally and in Türkiye?
· What are the projections for EAF-BOF production in 2050 according to climate scenarios?

Outcomes

According to the latest monthly report of the World Steel Association, world steel production declined by 4.3% to 1.405 Mt during the first nine months of 2022 compared to the same period in the previous year. World steel production mounted to 1.953 Mt in 2021, a volume that is expected to decline annually due to economic headwinds in 2022. Global steel production scaled at 1.953 Mt in 2021, a volume expected to decline due to economic stagnation in 2022. Furthermore, Türkiye is anticipated to suffer a contraction of 1.4 Mt in 2022 from 2021 levels of 33.4 Mt steel demand due to the negative impact of depreciating currency and high inflation on domestic construction. Türkiye's steel demand is foreseen to recover to 2021 levels 2023 by reaching 33.3 Mt.

According to the IEA's Iron and Steel Technology Roadmap, the total share of electric furnaces, as shown in the Figure 2.2, is significantly higher in the Sustainable Development Scenario, reaching 57% by 2050, compared to 47% in the Stated Policies Scenario in 2050 and 29% in 2019. The increase above the Stated Policies Scenario is primarily due to increased use of the DRI-EAF route (including DRI with CCUS and hydrogen-based direct reduced iron [H_2 DRI]).

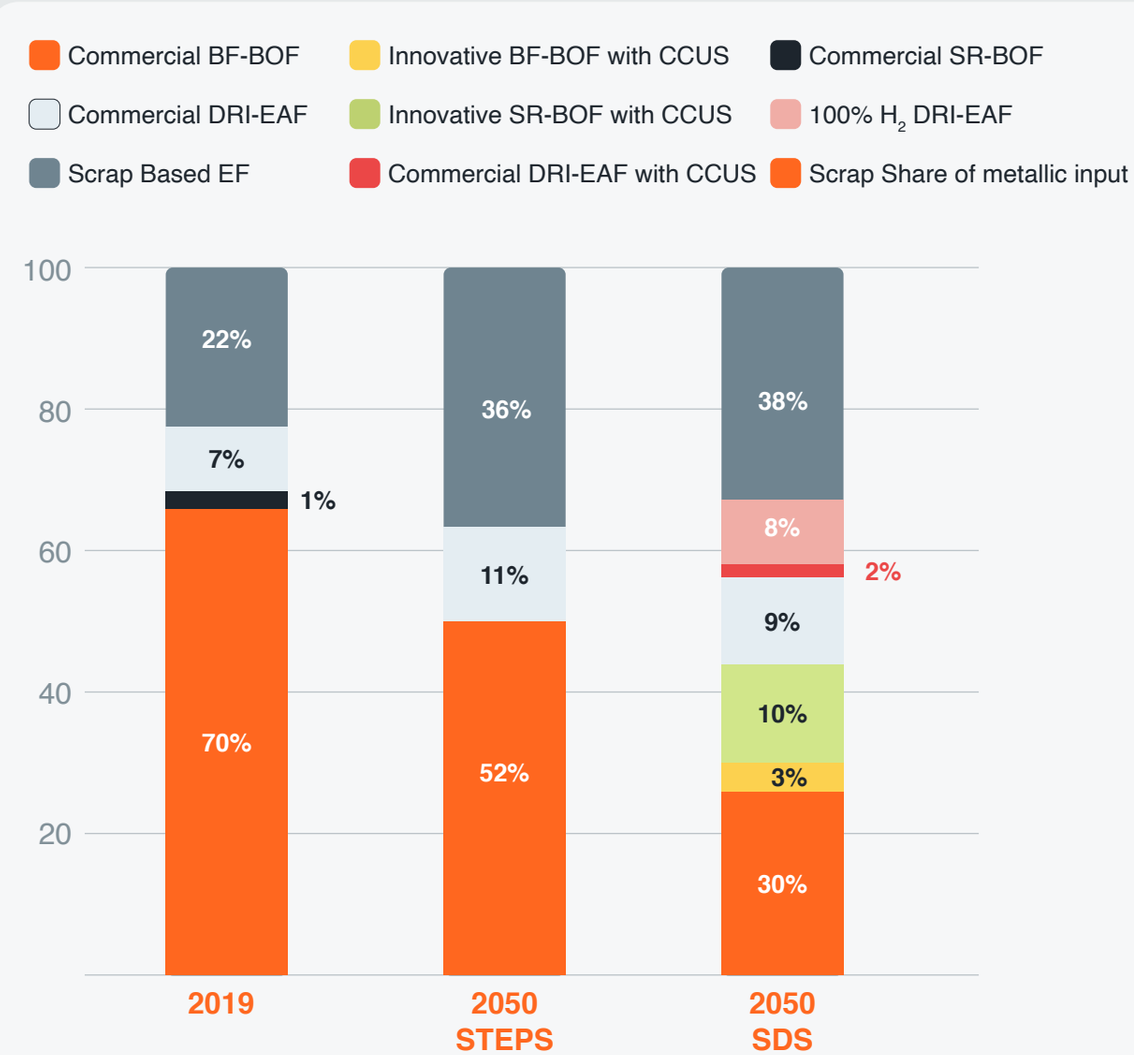


Figure 2.2: Share of global steel production methods,
(Source: IEA Iron and Steel Technology Roadmap)

Strategy > Focal Questions and Outcomes

Customer Expectations and Changes in Production

Focal Questions

· How will customers' expectations change during the green transformation process in the steel industry?
· What actions will Borçelik take to meet customer demands?

Outcomes

Global steel demand is expected to contract Global steel demand is expected to contract by 2.3% in 2022 to reach 1.796 Mt, as a result of the repercussions of major macroeconomic disruptions around the globe: Inflation, energy shortages, and monetary tightening. Although steel demand is expected to recover in 2023 by 1% to 1.814 Mt through the advancement of emerging markets, the global demand will still remain below the 2021 levels of 1.838 Mt. While the global steel demand -aside from China- will surpass 2021 levels with growth expectations in 2023, according to relevant projections, the economic slowdown in China will cause a downturn of the global steel demand below 2021 levels in 2022 and 2023. In addition, long-term steel demand forecasts are inherently unpredictable since they depend on assumptions about how steel will be utilized in the future. According to the IEA's STEPS forecast, global steel demand in 2050 will be over 2.5 billion tonnes, a 30% increase from today. On the other hand, IEA SDS anticipates a little over 2.0 billion tonnes of demand while accounting for increasing economies of use.

The common feature of the automotive, household appliances, radiator, construction and other sectors we serve is that they are industrial customers and are generally in the manufacturing sector. In this sense, Borçelik operates as Business-to-Business (B2B). In terms of tonnage, approximately 20-25% of our total sales is to the foreign market and 75-80% is to the domestic market. In terms of sales value, 42% of our products are sold directly to the domestic market and consumed, 18-20% are sold directly abroad, and 40-43% are used in automotive, white goods, radiator production in Türkiye and sold abroad despite being sold to the domestic market.
Our customers are the leading companies in their respective sectors. Providing services to primary and , secondary industries and their sub-categories, our customers are also active players in strategic industries inof Türkiye. For the automoative sector, we provide services to companies such as Ford Otosan, Tofaş, Renault, Toyota, Mercedes, MAN; for the household appliances industry industry, we work with Arçelik, Vestel, and BSH. The main expectations of our customers are price, quality, on-time delivery, product diversity and being a reliable business partner. However, with the transition occurring in the sector, we expect that customers, especially those operating in the automotive and white goods sectors, will increasingly demand "green steel". Currently, customers have started to ask about the emissions from Borçelik's operations. In addition, in recent years, the idea of purchasing from a responsible supplier, especially one with low carbon content that usesand produced with clean production technologies and processes are also included topart of customers'these questions and concerns. It is foreseen that this trend will increase even more in the coming years due to regulations such as CBAM and ETS, both in terms of our customers and in end-user demand. As a customer-oriented organization, Borçelik carries out its activities to fulfill these expectations today.

Strategy > GHG Emission Reduction Targets

To meet the climate targets set by the Paris Agreement, all sectors need to reduce their share of greenhouse gas emissions globally.

According to the World Steel Association, the steel industry, one of the most carbon-intensive industries, was also responsible for around 7% of global anthropogenic greenhouse gases in 2020.

At Borçelik, we will reduce Scope 1 and 2 absolute greenhouse gas emissions by 47% from the base year of 2021 by 2030 and reach net zero across all scopes by 2050.
The roadmap to net zero is provided in Figure 2.3, Figure 2.4 and Figure 2.5

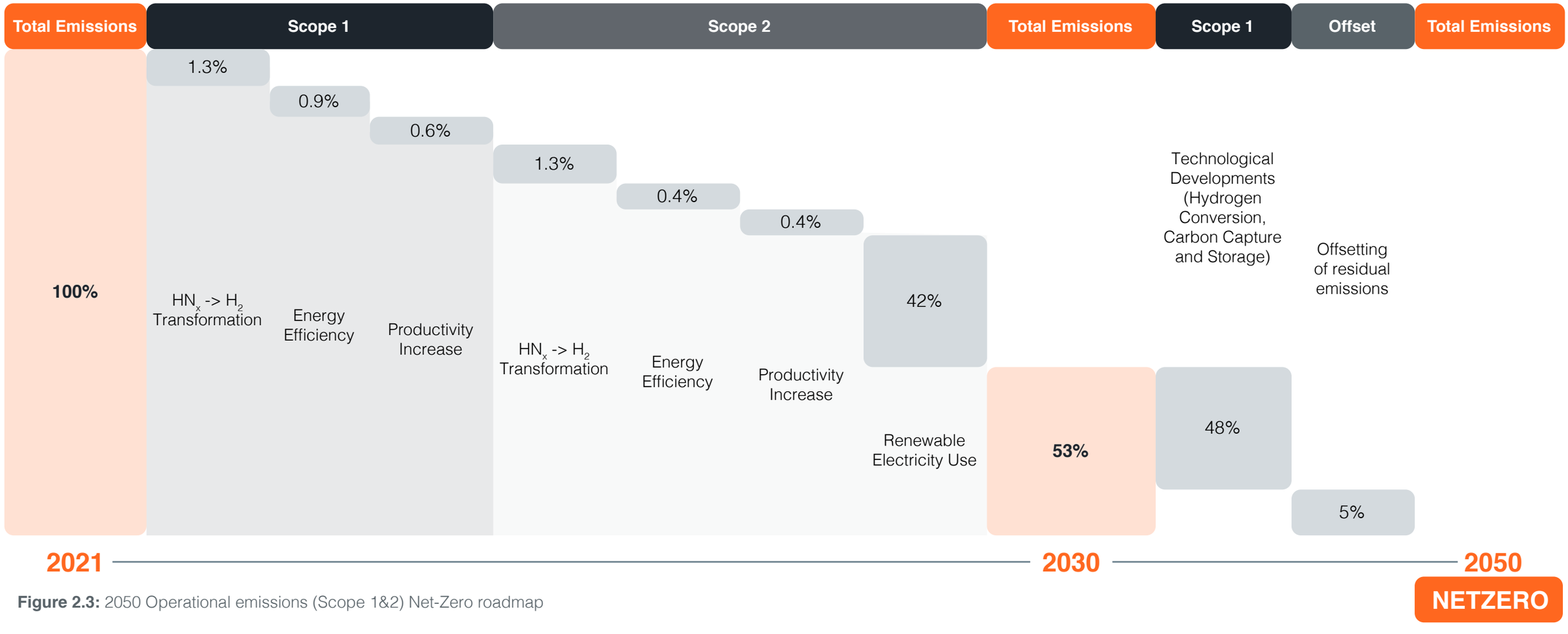


Figure 2.3: 2050 Operational emissions (Scope 1&2) Net-Zero roadmap

Strategy > GHG Emission Reduction Targets

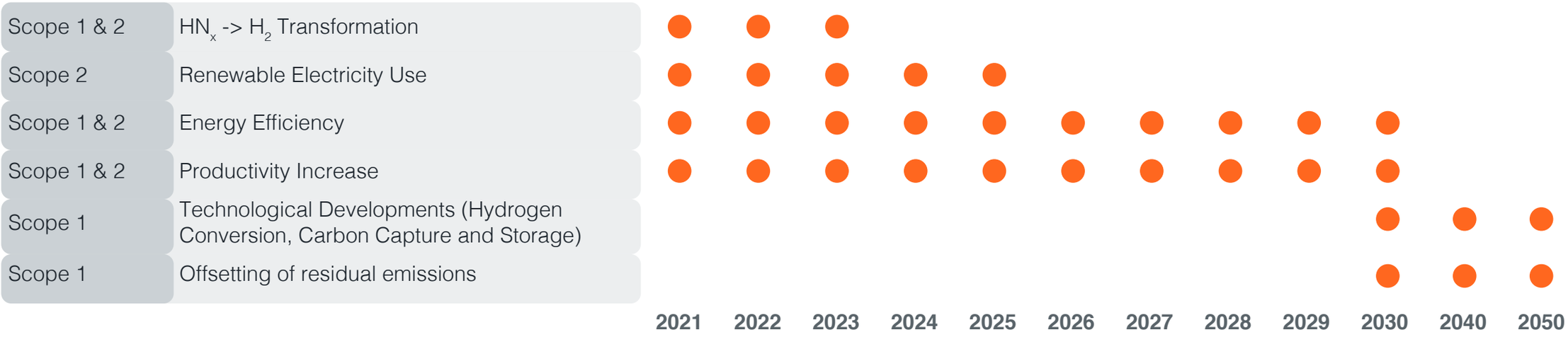


Figure 2.4: 2050 Net-zero roadmap, emission reduction initiatives

Activites and initiatives planned to achieve emission reduction targets

- Reducing electricity and natural gas consumption
- Purchasing low-carbon equipment and goods
- Loss and leakage prevention throughout the processes
- LED lighting conversion
- Actualizing projects to increase line productivity
- Transformation to more efficient engine technologies
- Modernization of production lines (revamp)
- Heat recovery
- Replacing ICE vehicles with electric alternatives

In order to implement these developments and increase our EAF usage rates, we are continuing with our R&D and technology studies in order remove technical barriers. The Borçelik patented electrolysis line, which we developed for the copper problem in the use of EAF, is one of these improvements.

Strategy > GHG Emission Reduction Targets

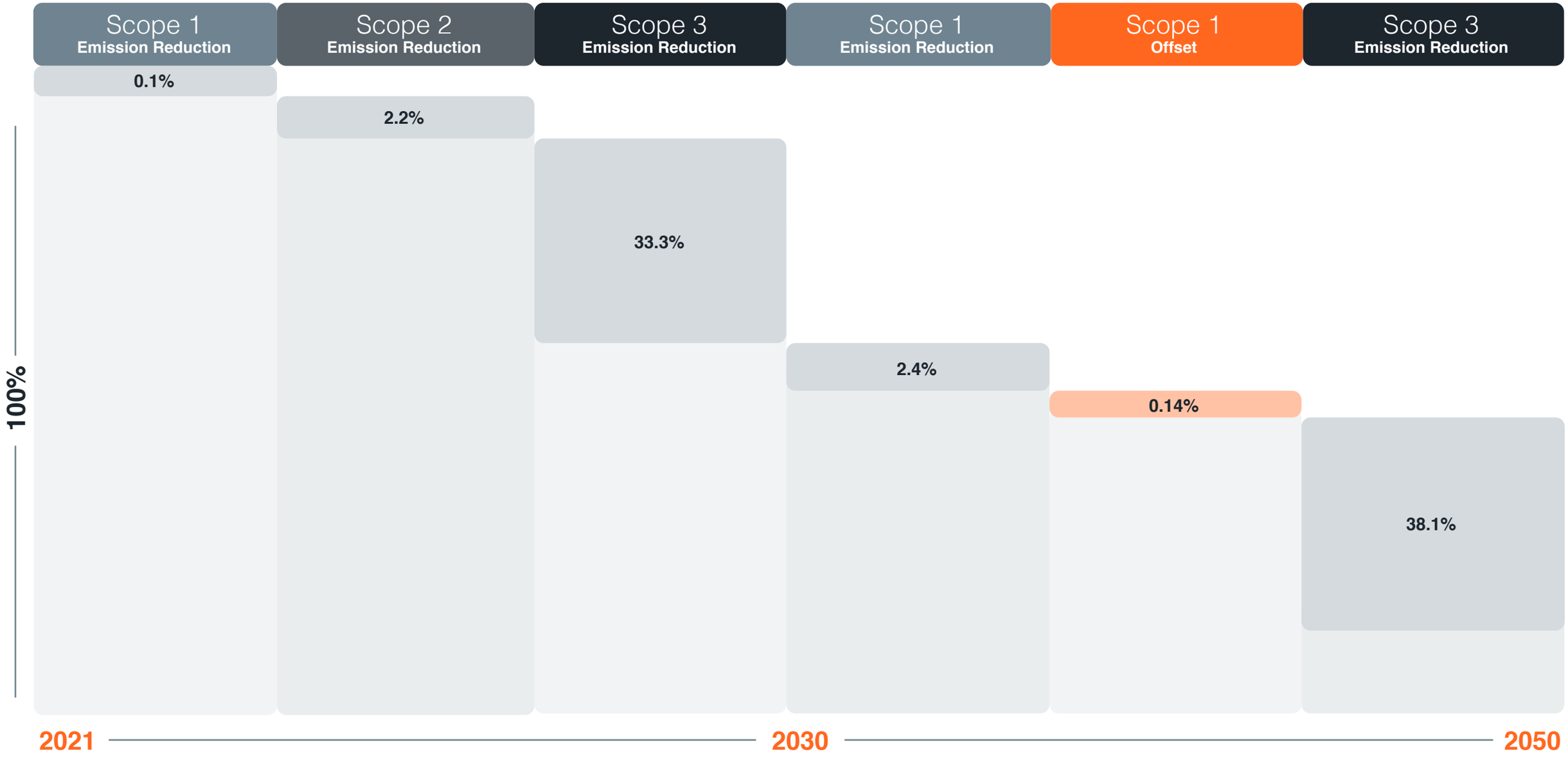


Figure 2.5: 2050 Borçelik total emissions (Scope 1&2&3) reduction roadmap

Strategy > GHG Emission Reduction Targets

In accordance with the targets of reducing global emissions of steel production, we have set out our actions to achieve net-zero in Scope 3.

More than 95% of the total Scope 3 emissions are from purchased steel. After analyzing the greenhouse gas emission reduction targets of our suppliers, we have set a target to reduce our raw material-based emissions by 35% by 2030 and by 75% by 2050. For suppliers who do not yet have emission reduction targets, assumptions have been made in line with the targets of the countries in which they are located. These assumptions are provided in Table 2.6.

	Target Year	
	2030	2050
HRC BOF	20%	45%
HRC EAF	15%	20%

Table 2.6: Assumptions for suppliers' 2030 and 2050 emission reductions

In the transition to lower emission raw materials, it is planned to change the ratios of EAF and BOF used in production. By 2050, the amount of EAF used in production will be 80% more than today's levels. With this increase, 36% of the total production will be produced with EAF by 2050. The remaining BOF will be procured from suppliers who are producing with lower emissions than at present.

In the process of supply-chain transformation, we have adopted Responsible Steel's responsible sourcing mechanism. On this basis, a Responsible Supplier Policy with environmental and social content has been prepared. As of 2022, all of our existing and new suppliers are subject to this policy.

We have also adopted Responsible Steel's Chain of Custody mechanism and defined Chain of Custody requirements for monitoring and recording input material quantities moving through supply chains. An entire Chain of Custody provides reassurance that the input materials are indeed from responsible suppliers and is, therefore, a vital credibility mechanism.

In choosing our raw material suppliers, we pay attention to whether they are located near to our production facility. By 2030, we will increase our domestic supplier rate in terms of raw material purchases to 36%.

Customer demand for green steel and the commitment of governments to the industry must continue in order to achieve the goals and achieve the transition to a low-carbon economy. In addition, it will be possible to achieve net-zero targets through technological developments and the availability and accessibility of scrap for the EAF in terms of raw materials.

Strategy > Innovation and R&D

Borçelik established an R&D Center, approved by the Ministry of Industry and Technology, in 2017 with the aim of increasing its contribution to Türkiye's economy and exporter sectors. We are not limited to products and materials within the R&D Center, and aim to expand our scope to developing processes, technologies, and products together.

Thus, we maintain R&D in three main areas, **Materials Development, Technology Development,** and **Process Development**, with a focus on producing materials of high-added value through R&D and digitalization

First, considering the differentiation of materials, we are working on alternatives to enhance and shape corrosion resistance by using different types of coating, such as corrosion-resistant metallic and non-metallic coatings.

We also focus on developing common solutions together with customers and providing technical support on the use of items in the design process. We aim to accelerate and simplify production and supply chain processes via optimization algorithms and smart decision-support systems within the digital transformation to increase productivity.

We provide efficiency by creating twin digital processes in process development and implementing Industry 4.0 applications in the field of technology, which also supports energy efficiency and decarbonization.

Borçelik's main target is to accomplish emissions reduction within a strategy based on the assessments on the focal points. We closely monitor sectoral developments and customer demand. Our customers' demand for low-carbon products with the low-carbon transition in the steel industry acts as a driving force for us to continue our R&D.

Strategy > Innovation and R&D

Various studies based on different modelling and scenarios have been carried with regard to the decarbonization of steel production. While each study varies regionally, there is one common element that plays a critical role in reducing greenhouse gas emissions, and that is the role of technology.

During this period, the development of low-carbon technologies in steel production and investments in new technologies will accelerate the steel industry's transition to low-carbon. While there is no one-size-fits-all solution for CO_2-free steelmaking, several up-to-date solutions developed for steel industry stand out and are discussed as follows:

1 Facilities with Hydrogen-based Direct-reduced Iron Technology

Currently, the iron used in the steel production process is produced by the use of fossil resources such as natural gas and coal. However, thanks to technology, it is also possible to reduce iron ore by using hydrogen rather than carbon. The required hydrogen for hydrogen-powered technologies can be obtained from fuels that contain hydrogen, such as natural gas and biogas, and/or by electrolysis of water. Hydrogen has different classifications based on its production process. Hydrogen obtained through renewable energy-powered water electrolysis is classified as "**green hydrogen**", through fossil fuel-powered processes that are complemented with CCS technology as "**blue hydrogen**", and through fossil fuel-powered processes without any emission reduction applications as "**grey hydrogen**".

Natural gas is the primary source of approximately three-quarters of the current 70 million tons of annual hydrogen production, accounting for about 6% of global natural gas use. However, under the IEA's SDS scenario, electrolytic hydrogen as the primary reducing agent will reach 12 Mt by 2050; the largest demand for electrolytic hydrogen is predicted to be in India and China due to the high production volume and access to large quantities of low-cost renewable electricity. In addition, according to the SDS, global hydrogen demand will increase to 258 million tons by 2050, which represents an increase of over 400% compared to 2020, indicating a significant growth in demand that should be supported by the growth of supply. Although it is currently an expensive venture to produce green hydrogen, the IEA concluded in its analysis that the cost of producing hydrogen from renewable electricity will decrease by 30% as of 2030 as a result of falling renewable energy costs and increasing hydrogen production.

In accordance with these predicted improvements, ArcelorMittal's Sestao plant in Spain plans to achieve zero carbon emissions by harnessing green hydrogen and renewable energy.

Strategy > Innovation and R&D

2 Scrap Based EAF

EAF steel production creates fewer CO_2 emissions than BF/BOF steel production. In this regard, Türkiye is one of the few environmentally-friendly steelmaker countries in the world, with 72% EAF route production compared to the global average of 29%. Moreover, almost half of European steel is produced from scrap. In many markets around the world, the recycling rate of steel is over 90%.

According to IEA's SDS projection, demand for BOF-based steel is expected to decrease by 20% compared to STEPS' projections. In other words, the demand for steel produced from recycled materials will increase through practices designed around resource efficiency becoming widespread. However, due to the increasing demand for steel, the current scrap can only meet 25% of the global steel demand.

Therefore, considering the current scrap amount, difficulties might be seen in meeting the scrap demands in coming years.

Strategy > Innovation and R&D

3 Carbon Capture, Utilization and Storage (CCUS)

It is critical for companies with net-zero or carbon-neutral commitments to use Carbon Capture, Utilization and Storage (CCUS) technology to begin mitigating the impact of carbon. The steel industry is an ideal industry for the application of this technology as most of the emissions can be captured directly from process gas and exit-gas. Captured carbon can be reused or sold back to the market in a circular carbon economy approach, allowing manufacturers to keep costs low or engage in safe long-term storage while making significant progress towards global net-zero targets. However, besides the advantages of CCUS in green transformation, difficulties such as higher initial production costs and therefore higher price demand are also observed. Despite this, governments around the world are increasingly encouraging the industry to adopt technologies like CCUS. As an example, in 2020, the European Development Fund launched a €1 billion CCUS financing programme. In addition, the total CAPEX of BF-BOF, which has the CCUS technology necessary to make the transition to green production in the steel industry and meet the 2030 climate targets, is estimated to be 31 billion Euros.

The IEA expects innovative technologies to cost 10-50% more than traditional production methods, emphasizing that the cost increase significantly exceeds the profit margins. As an emerging technology, CCUS is still in development. However, within the scope of the IEA's SDS, it is predicted that approximately 75% of all global CO_2 from iron and steel will be captured by 2070. In order for this projection to be realized, an average of 14 steel plants working with CCUS must be built each year from 2030 to 2070. This corresponds to 15 $GtCO_2$ captured cumulatively by 2070. At Borçelik, we continue to follow the latest developments in CCUS technology and its applicability in Türkiye within the scope of our strategy.

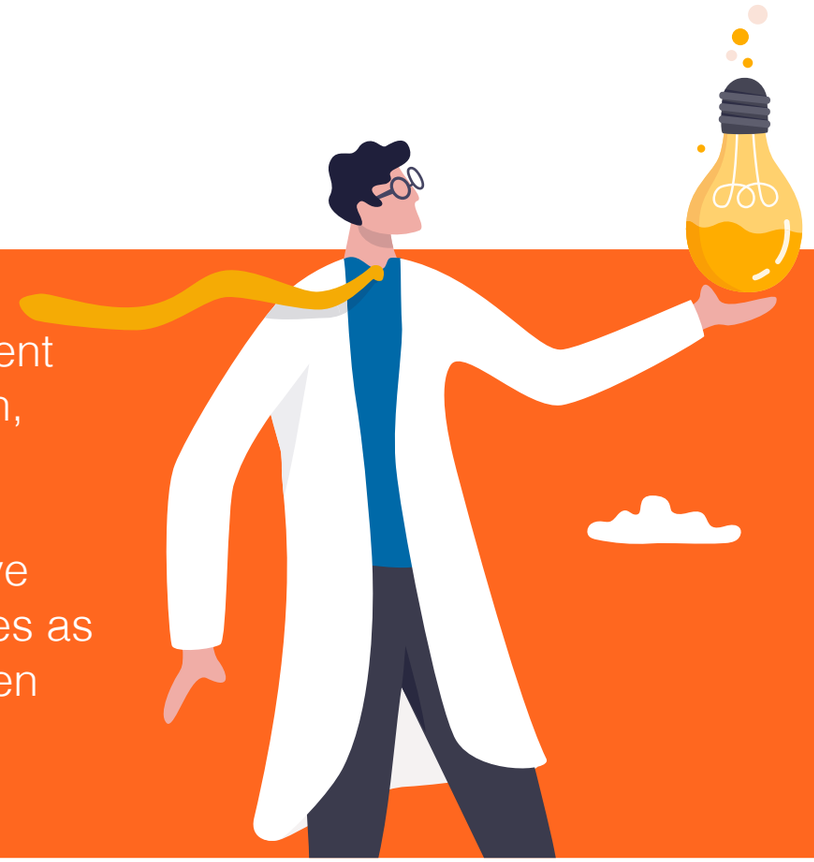
Strategy > Innovation and R&D

We would like to state that the low-carbon transition, which brings climate-related risks and opportunities, is possible if customer demand for green steel and government commitments to the sector continue, the expected developments in all of the technologies mentioned above are completed, and scrap is available and accessible. If there is a step back, the acceleration in this transformation will decrease.

Considering that the most important source of embedded emissions from the outputs produced by Borçelik is from the raw materials it uses, our access to appropriate green raw materials during production is extremely important for our decarbonization process. With new green technologies in particular, the low-emission raw materials produced from scrap or DRI are critical in this regard.

Strategy > Innovation and R&D

However, the use of scrap steel from various sources causes different metallic impurities in the content of the final product. For this reason, there are situations where HRCs produced by the EAF method with existing technologies cannot meet the surface-quality expectations of Borçelik's customers, especially those operating in the automotive sector. Therefore, taking mitigating actions in other emission sources as well as raw material supply is very important in our transition to green production.



Because Borçelik has developed strong business relations with the companies it supplies raw materials to around the world, and because it is JV of a large producer such as ArcelorMittal, Borçelik is in a very advantageous position compared to its competitors in terms of access to these raw materials. In addition, we are conducting R&D and feasibility studies to overcome the obstacles in our processes in order to use EAF-based raw materials, increase efficiency practices, improve our supplier evaluation process and offer new high-quality products. The results of our studies, the actions needed to be taken for climate-related mitigation and our realization strategy, and their impacts are given in Table 2.7.

Strategy > Innovation and R&D

	Action	Cost of Action ($)	Outcomes of the Action
Energy Source	**Solar Power Plant Practices** The transition to renewable energy is the most important factor in reducing the emissions by approximately 47% by 2030. In this context, it was decided to install a pilot SPP with 180 MWh capacity on an area of 1,120 m² on the roof. After observing the effect of industrial pollution on energy production in the Gemlik Factory SPP panels, it is planned to expand the GES installation to an area of approximately 80,000 m² on the factory roof, in the case that this study yields a positive result. This SPP is expected to produce 12 GWh of energy, corresponding to 6.5% of the total electricity demand. In addition, SPP installation with a capacity of 1,600 MWh continues in an area of 9,856 m² on the roof of the Manisa Steel Service Center. This is targeted to enter into force in 2023.	75,900,000	It is expected that around $75M will be spent for renewable energy investments with an expected yield (return on investment) of $13.5 M annualy. Through feasibility studies, it is expected that 77,524 tCO_2e GHG emission will be reduced annually in Scope 2 with the use of renewable resources.
Energy Source	**Wind Power Plant Practices** Following the “Regulation Amending the Regulation on Unlicensed Electricity Production in the Electricity Market”, which is about establishing generation facilities up to twice the total consumption of consumers without a generator license, without an upper limit of installed power, it was decided to establish a WPP to meet all Borçelik’s electricity needs. Together with EnBW, it continues its investment preparations for 55 MW of installed power. Land acquisition activities for the WPP, which is planned to be commissioned gradually as of 2025, continue. Within the scope of this project, since the WPP will be some distance from the Borçelik production facility, it cannot be used directly in the manufacturing processes. Instead the generated electricity will be sold to the national grid and I-REC per MWh will be generated. I-RECs will then be associated with Borçelik’s annual electricity consumption.		

Table 2.7: Actions to be taken for climate-related mitigation and realization strategy and their impact

Strategy > Innovation and R&D

	Action	Cost of Action ($)	Outcomes of the Action
Resource Efficiency	**Natural Gas Efficiency Practices** According to Borçelik's emission reduction targets for its operations, natural gas emissions are expected to decrease by 5% by 2030. This reduction will be largely achieved by the HN_x>H_2 conversion of the BAF line. These reductions are planned to be realized by the end of 2023. It is planned to invest in a new H_2 facility and commission 14 H_2 furnaces instead of 34 HN_x furnaces. The first phase of the HN_x>H_2 investment includes the commissioning of six furnaces by the end of the first quarter of 2023. In the second phase, eight new H_2 furnaces will be commissioned by the end of Q2 2023.	10,000,000	Within the scope of the targets we have set in our roadmap, 10 million dollars of green financing was provided for the decarbonization investments at Borçelik in order to meet the sustainability expectations of our customers and to be minimally affected by carbon-based payments. A significant portion of this loan is spent on the BAF investment, where H_2 gas will be used instead of HN_X gas in the annealing process. This investment is expected to be completed in 2023. With this investment, the annual production capacity will not increase; however, the return on this investment through cost savings from energy efficiency is expected to be a minimum of $1,220,000 with an additional 5,230 tCO_2e emission reduction.
Resource Efficiency	**Energy Efficiency Practices** The electrification of mobile transportation vehicles such as forklifts in the factory and the conversion to LED lighting systems have been completed. The transition to efficient engine technologies was carried out with the Efficiency Improvement Project (VAP) with the support of the Ministry of Energy and Natural Resources of the Republic of Türkiye. As a result of regular energy efficiency audits, projects are carried out in improvement areas. In this context, efforts to recover waste heat, increase efficiency in processes and prevent heat loss/leakage are continuing. The automation system of the factory, which started production in 1994, is being updated within the framework of the planned program.	200,000	Projects that provide efficiency, speed increase and raw material efficiency (waste reduction) in Borçelik also indirectly support energy efficiency. Significant gains were achieved through process improvement, digital transformation and R&D projects. In particular, in digital twin studies, by creating a mathematical model of the processes, 1-2% increase in efficiency was achieved in the CPL, RCM and BAF lines. In addition, $200,000 was spent on the measures taken. With these applications, a profit of $65,000 and a reduction of approximately 3,117 tCO_2e were achieved.

Table 2.7: Actions to be taken for climate-related mitigation and realization strategy and their impact

Strategy > Innovation and R&D

	Action	Cost of Action ($)	Outcomes of the Action
Resource Efficiency	**Water Use Efficiency Practices** Since the water we use in the process in Borçelik is extracted from underground water wells, we conduct new technologies and various feasibility studies. For example, Borçelik Reverse Osmosis Facility aims to prevent 100,000 m^3 of water extraction by treating wastewater, and to provide a 15% reduction in total water use in the Demineralization Facility. In addition, when the rainwater collection system is completed, this system will provide a further 5% reduction. Borçelik plans to reuse industrial and domestic wastewater for industrial and irrigation purposes. Borcelik also plans to reduce the evaporation of the brackish groundwater source and the cooling tower with a closed heat exchanger system. Thus, our water system will prevent the related evaporation losses and reduce the annual groundwater withdrawals of Borçelik by up to 15% annually.	615,000	Borcelik's decarbonization roadmap aims to reduce the amount of water withdrawn from underground clean water sources by 50% by 2050 by increasing the amount of water recovered within the scope of the circular economy. It is predicted that with the actions taken, water consumption will decrease by 50% and a total of $262,500.00 gain will be achieved, assuming the current water cost is 0.75 $/t. Moreover, in the near future, if sea water usage applications are commissioned, although the cost of the water obtained from this source is $1.5/t , the source transition will not cause any economic loss due to less water usage through efficiency improvements.
Resource Efficiency	**Water Discharge Efficiency Practices** Thanks to the Waste Reverse Osmosis Plant and the Demineralization Plant projects, Borçelik will reduce water discharges to the deep sea as the use of recycled water increases. This circumstance will lead to a 28% decline in total discharges to the sea. In addition, Borçelik aims to downsize the amount of sea discharge annually by 14% by using the discharge water instead of fresh water to produce sand filters and lime in the wastewater treatment plant. Using domestic wastewater for industrial and irrigation purposes after the advanced wastewater treatment process will also reduce water discharges by up to 8% annually.		

Table 2.7: Actions to be taken for climate-related mitigation and realization strategy and their impact

Strategy > Innovation and R&D

	Action	Cost of Action ($)	Outcomes of the Action
Resource Efficiency	**Waste Recycling Practices** We develop and implement projects that will reduce the amount of waste and emissions throughout our operations. We work on creating a roadmap for waste prevention, reduction, reuse, and recovery with process input, output, and analyses to achieve zero waste. End-of-life rollers used in Borçelik's production processes are compiled with the metal wastes to be recycled and reused. These are called IMR Rolls (Intermediate Rolls). IMRs are end-of-life products that cannot be used in the production processes at Borçelik. Scrap IMRs are converted into RCM work rolls to be used for a similar purpose in different production processes requiring fewer diameters. The aim is to manufacture RCM work rolls (WR) from scrap IMR rolls using the opportunities provided by Borçelik and the domestic market. Their service life is regularly monitored, and 40 additional scrap IMR rolls are stored for recycling. In addition, the facility for this process, the cryogenic furnace, has been invested in. After the implementation, the cycle performance of the roller passing through the cryogenic furnace in the IMR-WR conversion will further increase. So far, 13 IMRs have been converted into WR and have begun to be used.	230,000	Before this project and investment, IMR rolls that had completed their life cycle were sold to licensed companies for scrap prices. With this project, scrapped IMR rollers were converted into WR (work roll) rollers. The roll cycle potential is 50 IMR to WR conversion per year. In return, an annual cost advantage of $480,000 is provided. Together with the invested cryogenic furnace, the used WRs will be cycled and provide longer and higher quality service. In addition, by evaluating all the roll needs of Borçelik throughout the factory, different areas of use have also been discovered. For example, CGL3 scrap WRs have been put into use by converting them as embossing rollers on the slitting lines with the approach in this project. Similarly, two deflector rolls were manufactured from scrapped WRs to the CPL line. The financial income obtained from using all the rollers that have been converted from the beginning of the project to the present is about $127,000.
Resource Efficiency	**Waste Recycling Practices** The use of scrap steel collected from various sources leads to metallic impurities in the substance of the final product. The metallic impurities present in the final product make it unsuitable for quality classes. Among them, one factor that negatively affects our processes is the high copper (Cu) ratio. Metallic impurities, such as Cr, Ni, and Ti, cause a problem particularly for mild steel grades that will be exposed to forming processes. It is challenging to reduce their ratios to the required levels. Cu as a substance in hot rolled coils (HRC), which is Borçelik's raw material, dissolves from the surface of the coil and accumulates in the acid as free ions during surface cleaning with acid in the Continuous Pickling Line (CPL). As a result of the increase in the concentration of free Cu ions accumulated in the acid, the surfaces of the coils are coated with Cu undesirably during the pickling operation. Coils sticking to the surface of Cu may cause different surface defects or poor quality in the subsequent processes. At Borçelik, we have invested in a Copper Removal Facility to reduce the negative effects of Cu pollution throughout the processes, ensuring the capture of Cu ions that accumulate in the acid and therefore increase the use of EAF-sourced steel.	400,000	Considering the actions taken, 1,850 tons of hydrochloric acid was prevented from being waste and reused annually.

Table 2.7: Actions to be taken for climate-related mitigation and realization strategy and their impact

Strategy > Innovation and R&D

	Action	Cost of Action ($)	Outcomes of the Action
Products and Services	**Product Development Practices** Carrying out product development studies (AHSS steel development, metallic/non-metallic coatings, etc.) and reducing the weight of the bodies of vehicles is one of the prominent issues in the transformation of the automotive sector, due to both the increasing need for driving safety and the effect of environmental factors. For weight reduction, the thickness of the sheets used in automotives will gradually decrease, while the strength of the sheets will increase due to safety requirements. Therefore, it is expected that the automotive industry will further increase its demands for steel rolls made from Advance High Strength Steel (AHSS) steel families. New ones are being added to R&D studies carried out in flat steel grades with a strength of up to 1000 MPa in different product families developed at Borçelik, and with improved forming properties. With the R&D studies, the orientation towards the import of AHSS steels is prevented, and on-site production and consumption are supported. Low commercial grades are usually procured from plants with high emissions and carbon footprints due to the imperatives of price competition. With the transition to AHSS, this situation is prevented, carbon emissions embedded in products are reduced, and natural resource efficiency is ensured. In addition, the high added value provided by AHSS steels provides a financial advantage for Borçelik compared to other commercial grades. Apart from AHSS, it is anticipated that the demand for metallic and non-metallic coatings with high corrosion resistance, which will extend the life cycle of products and protect natural resources, will increase in the market. Among the applications in this regard are the special coatings developed for using galvanized (HDG) products produced by Borçelik, instead of steels with higher carbon footprints such as stainless steel. The new-generation coatings can be used to produce more environmentally friendly and aesthetically pleasing steels that can replace stainless steel and expand in the market.	2,210,330	In calculating the expected profit from the product development applications, several assumptions are taken into account. In scenarios used for the projection assumptions, 55% of our current portfolio customers are assumed to have a demand for brown steel demand and 5%, 10% and 15% of these have a potential to prefer green steel. Assuming 10% revenue difference between the brown and green steel, 5% demand on green steel will correspond to financial gain of $3,592,105, 10% to $7,184,211, and 15% to $10,776,316.

Table 2.7: Actions to be taken for climate-related mitigation and realization strategy and their impact

Strategy > Innovation and R&D

Borçelik conducts nearly 30 R&D and innovation projects annually, aiming to become a global player in the steel industry by producing materials of high-added value and quality. Borçelik's R&D expenditures between 2018-2021 are given in Figure 2.6. 84% of the expenditure in 2021 was made for climate-related R&D studies.

In addition to R&D expenditures, we have included CAPEX and OPEX expenditures arising from climate-related risks and opportunities in our strategic plans as well as in our annual budget studies. The budgets prepared are reviewed by the Borçelik Executive Board and approved by the Borçelik Board of Directors. We carry out feasibility studies for CAPEX expenditures included in the budget and evaluate them annually. It is an undeniable fact that accessibility to sustainable financial investments is critical in taking the necessary steps to tackle the climate crisis. Thankfully, the green bond market continues to grow rapidly, reaching a total volume of €1.8 trillion at the end of 2021.

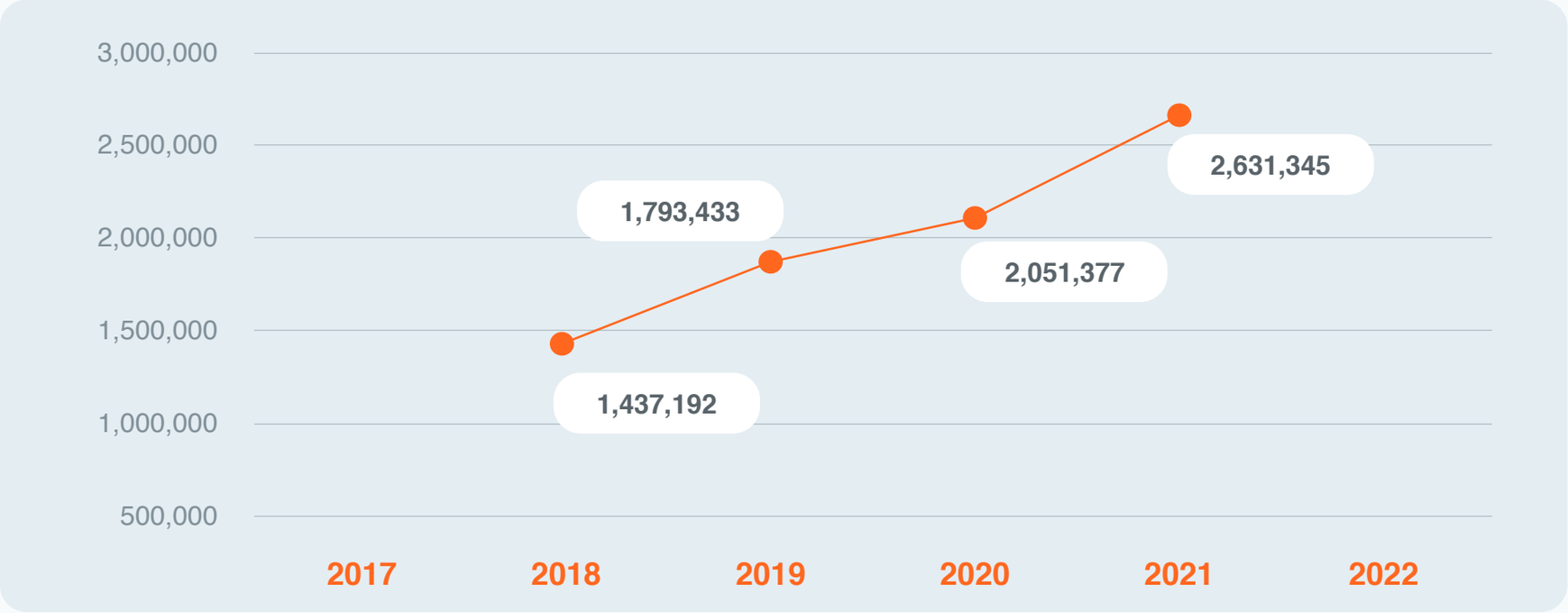


Figure 2.6: USD Expenditure on research and development between 2018-2021
**The average exchange rate value for the year 2021 (8.8425 $/TL) is used in the TL/USD conversion.*

Strategy > Innovation and R&D

Borçelik, which is sensitive about the definition of "green steel" in its sector, avoids misleading its customers and the public. We foresee a growing demand from our customers for green products and green product certificates (low emission/zero emission). In particular, products manufactured through low-emission production processes using renewable energy and recycled steel (scrap) are in demand. Certificates in which the reduced emission amounts of these products are calculated and verified by independent organizations are found in the market under different trade names.

For example, ArcelorMittal's XCarb™ certification is designed to bring together ArcelorMittal's reduced, low and zero carbon products and steelmaking activities, as well as greener innovation projects, into a single effort focused on making demonstrable progress towards carbon-neutral steel. In this context, the infrastructure for certification has been prepared for raw materials produced from renewable energy and recycled (scrap) materials from Borçelik suppliers. Through this process, it will be possible both to reach the 2050 targets and to obtain certificates from voluntary markets for "green steel" business models.

Borçelik is taking important steps in the field of green steel, both in terms of turning its products green by concretely reducing its emissions and, when necessary, sharing this with its customers through verified certificates, as well as creating a revenue model from this.

Responsible™ Steel | standards & certification

Moreover, aiming to become an indispensable player in the global arena by producing high value-added materials in line with sustainability goals,

Borçelik has been accepted as a member of ResponsibleSteel™, the world's first organization founded on the principle of environmentally and socially responsible steel production, one that also aims at standardization that is specific to the steel industry.

Strategy > Innovation and R&D

As a non-profit organization, ResponsibleSteel™ is the steel industry's first global multi-stakeholder standards and certification initiative. Within the aims of the organization, which counts the world's leading steel producers and steel associations as members, Borçelik is committed to establishing and continuing to work in line with ResponsibleSteel™ standards, which cover socio-economic and environmental sustainability issues and are audited by an independent audit firm. The company aims to obtain the prestigious ResponsibleSteel™ Certified Site designation by reviewing and adapting its operations according to these standards in 2022.

In this context, we at Borçelik, upon acceptance of our ResponsibleSteel™ membership, have committed to comply with the principles listed below:

Principle 1
Corporate Leadership

Principle 2
Social, Environmental and Governance Management Systems

Principle 3
Responsible Sourcing of Input Materials

Principle 4
Decommissioning and Closure

Principle 5
Occupational Health and Safety

Principle 6
Labor Rights

Principle 7
Human Rights

Principle 8
Stakeholder Engagement and Communication

Principle 9
Local Communities

Principle 10
Climate Change and GHG Emissions

Principle 11
Noise, Emissions, Effluents and Waste

Principle 12
Water Stewardship

Principle 13
Biodiversity

Strategy > Innovation and R&D

Global steel producers have announced their targets in line with the commitments to emission reduction in their respective economic regions following the Paris Climate Agreement. In this context, ArcelorMittal, Borçelik's partner and the world's second largest steel producer, has announced that it aims to achieve a 30% reduction in emissions by 2030 and net zero emission by 2050.

At Borçelik we are aware of our responsibility to combat the climate crisis, which we see as one of the most important threats to our planet. Taking into account the decarbonization targets of both our partners and Türkiye as a whole, **we are committed to reducing our CO_2 equivalent emissions from stationary combustion and process-induced carbon dioxide emissions, and electricity purchased by 47% in our operations by 2030 and to achieve net zero by 2050** for a world where the global average temperature increase is limited to 1.5 °C in accordance with the IPCC. Our targeted transition plan in this direction is as follows:

For our Scope 1 emissions, only 5% improvement will be possible due to the limitations arising from the current cold sheet rolling and galvanizing processes. It is aimed to achieve 3% of this improvement through the HN_X>H_2 conversion in the annealing (BAF) line, which is ongoing and planned to be commissioned by the end of 2023, and 2% through studies to reduce natural gas consumption in the processes.

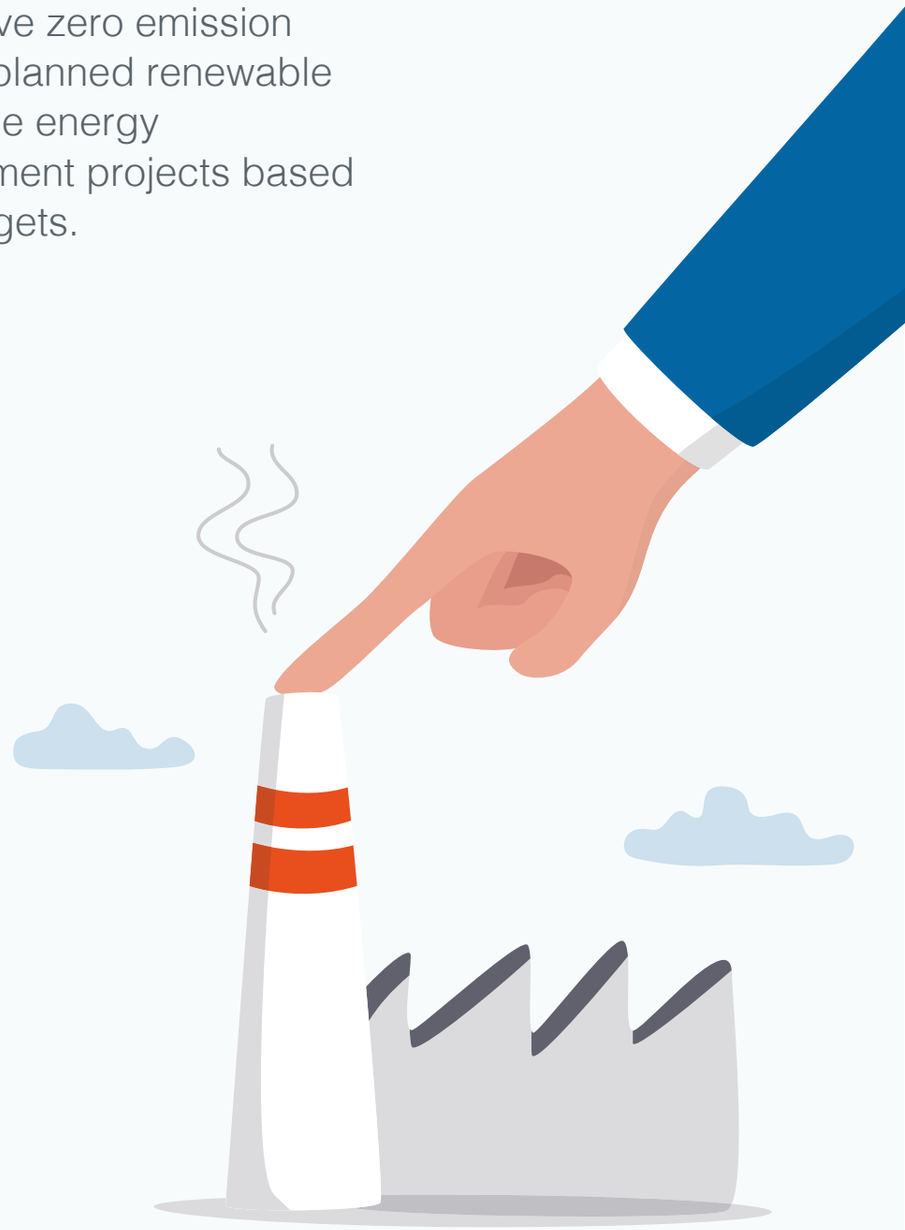
Strategy > Innovation and R&D

In our Scope 2 emissions, emissions from the use of electricity are targeted to achieve zero emission by 2030. Among the most important steps in achieving this goal are the ongoing and planned renewable energy investments which are mentioned in Table 2.7 in detail. In addition to renewable energy investments, the implementation of energy efficiency studies and continuous improvement projects based on energy audits will also make a significant contribution to achieving our Scope 2 targets.

After 2030, new technologies and new investments will have an effect on the process of reaching our 2050 target. In particular, we are closely following developments in green hydrogen technology and carbon capture and storage. Additionally, we are participating in EU projects in this field within the scope of our R&D activities.

Furthermore, in order to reduce the Scope 3 emissions from our raw materials, we are working to eliminate technical barriers for the use of EAF-based raw materials and to develop relationships with new suppliers. With these efforts and as a result of the green transformation in our suppliers, we expect significant improvements in our raw material emissions by 2050.

The off-setting option will then be evaluated for the remaining emission amounts after the efforts at reduction in order to meet our neutralization target.



Strategy > Resilience of Borçelik's Strategy

Climate change scenarios are projections of greenhouse gas (GHG) emissions used by analysts to assess future prospects for climate change. Focusing on many forward-looking variables and pathways rather than historical data, these scenarios not only recognize potential climate-related risks, but also guide companies in their strategic planning by providing insight into energy efficiency, changes in energy sources and technologies, and new markets.

Scenarios do not predict the future with certainty, but describe alternative situations that are likely to occur, focusing on key factors. For example, the most significant impacts of climate change are likely to occur in the medium- to long-term, but their exact timing and magnitude are uncertain.

We have evaluated alternative pathways against this uncertainty by using multiple climate-related scenarios while determining our short-, medium- and long-term strategy and have created a transition plan in accordance with the IPCC, where the global average temperature increase is limited to 1.5 °C. Thus, we can observe how climate-related risks and opportunities may evolve under different scenarios and how they may affect potential business outcomes.

Strategy > Resilience of Borçelik's Strategy

In terms of the transition scenarios, according to the World Energy Outlook published by the IEA in 2021, there are four main scenarios particularly based on energy trends:

1.Stated Policies Scenario (STEPS):

A scenario based on a sectoral assessment of the specific policies currently in place and announced by countries around the world. However, this scenario recognizes that governments will not be able to achieve all targets and explores where the energy system will end up following existing policies without further action.

2.Announced Pledges Scenario (APS):

This assumes full and timely fulfilment of climate-related commitments made by governments, including Nationally Determined Contributions (NDCs) and longer-term net zero targets.

3.Net Zero Emissions by 2050 (NZE):

This assumes that the global energy sector achieves net zero CO_2 emissions by 2050. In order to achieve these targets, it charts a path where the energy sector as well as non-energy sector emissions will be reduced at the same rate.

4.Sustainable Development Scenario (SDS):

This represents a "*well below 2°C*" projection to achieve the outcomes targeted by the Paris Agreement. In this scenario, assuming all energy-related SDGs are met and existing net zero commitments are fulfilled, developed economies would reach net zero emissions by 2050, China by 2060 and other countries by 2070 at the latest.

Strategy > Resilience of Borçelik's Strategy

When the estimates of these scenarios for CO_2 emissions and average temperature increase are compared according to the modelling used, it can be seen in Figure 2.7 that the APS is not sufficient in reducing emissions until 2030, the SDS shows a faster reduction in accordance with the Paris Agreement, and the NZE provides net zero emissions by 2050.

When the average temperature increase is evaluated, as seen in Figure 2.8, there will be an increase of 2.6 °C in the STEPS and 2.1 °C in the APS by 2100, and this increase will continue; according to the SDS, there will be a temperature increase of 1.7 °C around 2050, while this increase is 1.5 °C in the NZE, followed by a decrease in average temperatures as targeted in the Paris Agreement.

As can be seen from these graphs, the current policies and the NDCs committed to are insufficient to reach the 1.5 °C target.

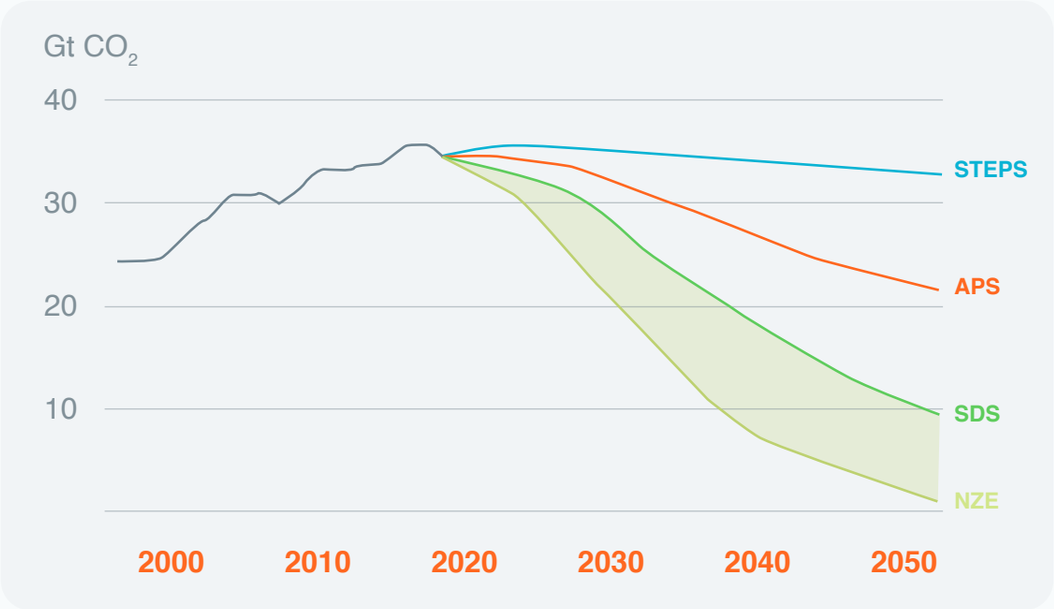


Figure 2.7: Graph of CO_2 emission change over time according to WEO-2021 scenarios (Source: IEA- WEO 2021)

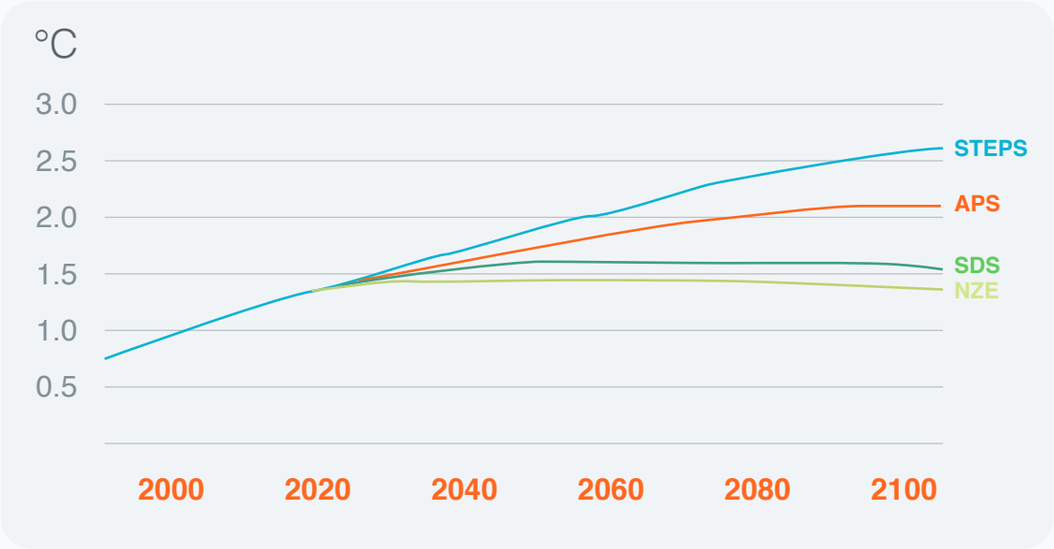


Figure 2.8: Graph of change in average temperature rise over time according to WEO-2021 scenarios
(Source: IEA- WEO 2021)

Strategy > Resilience of Borçelik's Strategy

The IEA 450, IEA B2DS and IEA 2DS scenarios are the IAE's most frequently emphasized transition scenarios. IEA 450 is a scenario that predominantly evaluates the energy sectors. It states that there is a 50% chance of limiting the increase to 2 °C by 2100. The IEA B2DS is the below 2 °C scenario, which assumes that the energy sector reaches carbon neutrality by 2060 in order to limit future temperature increases to 1.75 °C by 2100.

The IEA 2DS is part of the annual publication "*Energy Technology Perspectives*" (ETP), which provides analyses of scenarios based on the development of low carbon technology and its application in various sectors. ETP examines how far clean energy technologies can advance the energy sector towards greater climate change targets if technological innovation is pushed to its maximum practical limits.

According to this scenario, CO_2 emissions decrease by almost 60% by 2050 and decline after 2050 until carbon neutrality is achieved. While this scenario emphasizes the importance of the transformation of the energy sector, it also emphasizes that it is not enough alone to ensure a secure and affordable energy system in the long term.

Strategy > Resilience of Borçelik's Strategy

As a company operating in the steel sector, we have worked on two transition scenarios in order to ensure the flexibility of its short-, medium- and long-term strategy, which has been determined by taking into account the change in carbon pricing over time, the distribution of future energy resources, technological developments such as efficiency and CCS applications, and developing regulations.

The First Scenario

The first of these scenarios is the IEA SDS scenario, which is in line with both the targets committed to globally committed and the targets announced by Türkiye.

The Second Scenario

The second is the IEA 2DS scenario, which is in line with the 2 °C target, which takes into account the challenges facing green transformation in the steel sector and worst-case scenarios such as possible energy cuts and slow technological developments.

The scenarios have allowed a variety of studies and pathways to be modelled, especially for carbon-intensive sectors. Each of these pathways is based on different assumptions and can vary regionally.

However, despite their differences, they provide a useful indication of the potential to reduce GHG emissions and the role of low-carbon technologies. CCUS technologies can only be applied on a small scale under current conditions, making the green transformation of steelmaking processes more costly..

However, if nothing is done, it is foreseen that the sector will be exposed to investment risk. Although there are some current limitations to this technology, mostly in terms of scale, cost and efficiency, the scenarios studied show that the cost of innovative approaches will decrease in the medium- and long-term compared to today. Moreover, according to the IEA 2DS scenario, CCUS technologies will capture around 3.5 $GtCO_2$ (gigatonnes of CO_2) worldwide in 2050, accounting for 12% of cumulative emission reductions.

Strategy > Resilience of Borçelik's Strategy

Another parameter that the scenarios evaluate, taking into account a series of energy policies and emission reduction incentives, is the global increase in carbon pricing. Carbon pricing is a practice that improves competition in green technologies while also encouraging efficiency gains.

The year-over-year change predicted by the IEA SDS and IEA 2DS scenarios for carbon pricing is given in Table 2.8.

Carbon Pricing

USD/tCO_2	2030	2040	2040
SDS	100	140	160
2DS	93	152	210

Table 2.8: Change in carbon pricing across the years in the SDS and 2DS scenarios *(Source: IEA WEO-2021)*

These scenarios take into account the effects of CO_2 pricing as well as other policy measures such as coal phase-out plans, efficiency standards and renewable targets. The CBAM, which will come into effect in 2026, is expected to reduce the risks of carbon leakage by gradually reducing free allowances and implementing a globally applied pricing system.

At Borçelik, we develop our sustainability strategy in line with our values and vision, and in line with the expectations of all our stakeholders, by adopting a dynamic business model based on possible scenarios for today and the future, one that is integrated with the United Nations Sustainable Development Goals and Responsible Steel principles.

Taking the results of these scenarios into account as listed in our sustainability strategy, we identify potential climate-related risks and opportunities, systematically monitor them, evaluate their financial impact, and take the necessary actions by integrating these risks and their strategic financial impact into our short-, medium-, and long-term strategy through our risk management process.

73-83

RISK MANAGEMENT

3.1. Relevance of Risk Types
3.2. Identification, Assessment and Response to Climate-Related Risks and Opportunities
3.3 Management of Risks

Risk Management

We evaluate **high-priority** climate risks through the Borçelik Board of Directors, the Borçelik Sustainability Board, the Borusan Sustainability Board, and the Borçelik Sustainability Committee.

We prioritize **climate-related risk-opportunity studies** as they are significant for the business strategy and sustainability of the organization.

Understanding climate-related risks is essential to our ability to seize climate-related opportunities in various scenarios.

We conduct our risk studies according to the TCFD categories.

In the TCFD Recommendations, climate-related risks are evaluated by categorizing them as Transition Risks and Physical Risks.

Climate Related Transition Risks	Climate Related Physical Risks
Policy and Legal	Acute Physical
Technology	Chronic Physical
Market	
Reputation	

According to TCFD, opportunities are considered in the following categories:

Climate Related Opportunities

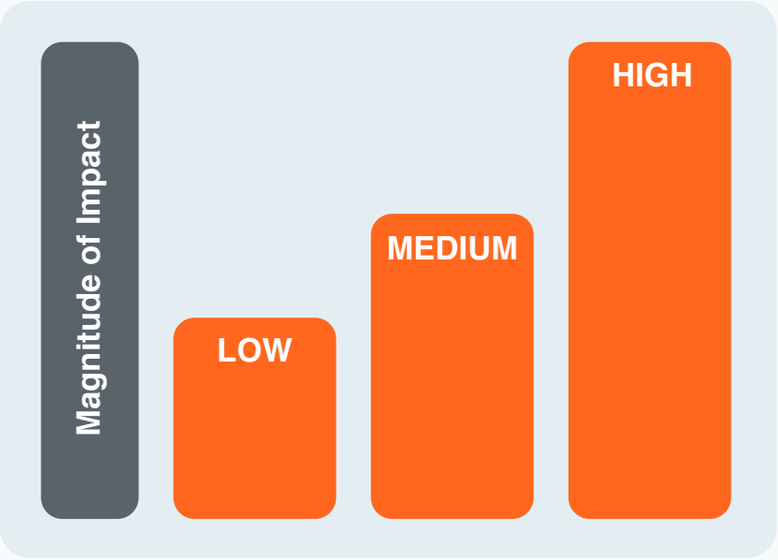
- **Resource Efficiency**
- **Markets**
- **Energy Source**
- **Resillience**
- **Product / Services**

Risk Management > Relevance of Risk Types

We determine the critical strategic impact in climate strategies based on revenue loss. Revenue losses which are $5M+ for the short-term, $10M+ for the mid-term, and $40M+ for the long-term are accepted as having a **substantial strategic impact** to our organization. These tresholds are used to assess the impact of climate-related risks.

The main reason we chose revenue is that all losses will result in lost sales, and choosing a common unit makes comparison easy. The operational costs of the risks are relatively insignificant compared to the revenue losses. On the other hand, the costs of the actions to eliminate the risks are also stated in the report.

Risks and opportunities with “low” and “moderate” impact sizes are reviewed respectively **in terms of their importance.**



Any risk and opportunity relevant to us and our operations that could have a substantive financial effect is quickly assessed. The rate at which risks and opportunities create a potentially substantive impact may vary according to their occurrence at different time intervals and depending on the type of risk.

Therefore, whether these risk types are relevant to our organization or not is determined by the “company description” developed specifically for our organization. We work on all types of risk determined by the TCFD, according to the **risk relevance** and **company-specific description**. These company descriptions are given in the table 3.1.

Risk Management > Relevance of Risk Types

Risk Type (Transition Risks)	Relevance	Company Specific Description
Policy and Legal	Relevant	The steel industry in which we operate is an emission intensive sector. Accordingly, it is among the first industries to be affected by existing and emerging regulations. It is important for us to be able to eliminate possible risks and to carry out precautionary activities. In this regard, policy and legal risks are related to our foundation, including risk exercises. For instance, CBAM is a part of the Green Deal approved by the European Commission and creates political and regulatory risks for use in terms of climate change. Moreover, because CBAM is a common risk for carbon intensity, it is likely to contain risks for Türkiye specifically. Concerning CBAM, initiating emission trade in Türkiye may incur additional calculation and reporting expenses for us. Corresponding to the potential ETS system, in terms of selling our carbon rights, this situation might create financial opportunities.
Technology	Relevant	Technologies for reducing the energy inputs of operations and boosting energy efficiency, process control software, and intelligent automation systems are evolving in the milling and surface treatment (galvanization) sector in which we are involved. Therefore, technology risks are regularly monitored by our R&D department, and alternative applications for our organization are discussed at our risk assessment meetings.
Market	Relevant	Risks that may materialize in the market have the potential to directly affect us due to its value chain The fact that the steel sector is an energy and emission intensive sector may affect us in terms of suppliers, customers and investor relations, and demands may develop based on these points. If we are late in integrating activities to reduce the carbon footprint of the product, our revenues may decrease due to a decrease in demand for our products. To prevent this risk, the emissions occurring in the production process can be reduced by low-carbon investments, and market risk can be avoided.
Reputation	Relevant	We take precautions and works against all risks that may arise by maintaining our reputation at the highest level. All the risks mentioned and evaluated constitute a reputational risk for us if they cannot be eliminated or if we cannot respond to the demands they make. In this context, reputational risk related to us and is always included in risk studies.

Table 3.1: Relevance of risk types

Risk Management > Relevance of Risk Types

Risk Type (Physical Risks)	Relevance	Company Specific Description
Acute Physical	Relevant	Sudden weather events that may occur at locations where our manufacturing facilities are based may have a significant impact on us and pose a risk. Since 97 % of our raw material supply is shipped by sea and 3% by land, extreme weather events will cause disruptions in raw material supply in the long term and cause financial impacts. Therefore, acute physical risks are always taken into consideration in risk assessment meetings.
Chronic Physical	Relevant	Long-term changes related to the climate of the region that may occur in our production locations can have a significant impact on the organization and pose a risk. We use ground water for our operations. 0.5 tons of water is used for approximately 1 ton of steel. If the water used in the processes does not meet the adequate requirements, product quality may decrease and/or production may be disrupted. Water availability and water-related chronic risks are always evaluated in risk assessment meetings and alternative efficiency practices are studied.

Table 3.1: Relevance of risk types

Risk Management > Identification, Assessment and Response to Climate-related Risks and Opportunities

Risk studies are divided into stages within our organization and the persons/departments involved in each stage are clearly set out. Every member contributes to risk studies with a sense of responsibility.

Responsibility of Climate Related Risks

- **Identification**
  - External: Environmental Consultant
  - Borusan Sustainability Thematic Working Groups
  - Borçelik Sustainability Committtee
  - Borçelik Environmental Committee
  - Borçelik Strategy and Marketing Department
- **Assessment**
  - Borçelik Budget and Financial Control Department
  - Borçelik Board of Directors & Sustainability Board
- **Response**
  - All Related Departments
- **Process Management in the Company**
  - Borçelik Management Systems Department
  - Borçelik Internal Control Departmant

Risk Management > Identification, Assessment and Response to Climate-Related Risks and Opportunities

Developing information about the working stages related to climate risk shown in the table above are important so that everyone acts with a shared sense of responsibility.

Our teams working on climate risks

1) Identification: Identifying and Prioritizing Climate Risks

- **Borusan Sustainability Thematic Working Groups**
- **Borçelik Sustainability Committee**
- **Borçelik Environmental Committee**
- **Borçelik Strategy and Marketing Department**
- **Borçelik Environmental Consultant**

The Sustainability Committee, Borusan Sustainability Thematic Working Groups, Environmental Committee, Environmental Consultant, and Strategy and Marketing Department follow climate change and sustainability agendas and identify and define the potential risks to our operational activities and the effects of these risks to our organization.

Every contingency that the organization may encounter in terms of different types of risk and issues is taken into consideration. At this point, important risks and opportunities are prioritized and discussed accordingly.

2) Assessment: Assessing the Financial Effects of Risks

- **Borçelik Budget and Financial Control Department**
- **Borçelik Board of Directors and Sustainability Board**

In evaluating risks, the size of the effect and the possible losses are studied in terms of the financial costs.

Assessing the financial effects of climate risks while creating an action plan and making investment decisions based on these risks enable a broader perspective, which allows our organization to make the right decisions. Financial evaluations are carried out with regard to each location, operation, business unit, and item which could be affected by the risks in question.

Afterwards, financial evaluations are prioritized accordingly, and an action plan is developed to handle the risks.

Risk Management > Identification, Assessment and Response to Climate-Related Risks and Opportunities

Our teams working on climate risks

3) Response and Management of Climate Actions Determined on:

•All relevant departments

An action plan is developed following the identification, prioritization, and evaluation processes. The individuals and departments in charge complete their tasks within the framework of the action plan and ensure that relevant risks are addressed on behalf of our organization.

4) Management and Governance of Risk Management

•Borçelik Management Systems Department
•Borçelik Internal Control Department

The Management Systems Department and the Internal Control Department collaborate to make sure that the entire process runs smoothly within our organization. The departments in question also ensure that all phases of the study of climate risk are integrated into our other risk assessments and maintained accordingly.

Risk Management > Organizational Structure and Planning

All climate risk studies are **integrated into the organization's risk management program** and work in line with the existing system. Work on the development of the integrated risk management structure is continued through the contribution of the Internal Control Department.

	Short-Term	Medium-Term	Long-Term
Time(years)	0-5	6-15	16-35
Target years for Near-term & Long-term		2030	2050

In conducting **risk analysis**, a plan is drawn up considering **the size of the effect** and the **probability of its occurrence**; and the necessary action plans are prepared by evaluating the risks within specific time intervals. At our organization, short-term corresponds to 0-5 years, medium-term to 6-15 years, and the long-term is 16-35 years. The time intervals determined by the Responsible Steel Standard are taken as the basis. Within this definition, we define year 2030 to be the milestone for the near-term and year 2050 as the milestone for the long-term.

With the support of the Borusan Sustainability Board, our Sustainability Committee is responsible for climate risk governance, identifying new climate risks, prioritizing risks, creating emergency plans, and monitoring and controlling these risks. In this regard, we collaborate with the Sustainability Committee, the Environment Committee, the Emergency Committee, and the Strategy and Marketing Department. Committees also benefit from external consultancy when necessary.

Risk Management > Organizational Structure and Planning

In prioritizing risks, we evaluate their impact and probability of occurrence. The risk score is calculated by multiplying these two values. Risks with a high **RPN score (Risk Priority Number)** are a priority, and an action plan and precautionary measures are prepared. The costs of risks are assessed by the financial departments.

Potential risks are addressed with a control method, for example, "**accept**", "**share/ transfer**", "**reduce/control**" and, as a last resort, "**avoid**".

Two important issues for us:

Fast Action | **Right Action**

Action plans are executed by the relevant departments. In cases requiring investment, we carry out feasibility studies with the support of the financial affairs department, in addition to the other relevant departments.

Depending on the size of the risk in question, decisions regarding the governance of those risks are made by our BOD and Sustainability Board, as well as the management of the relevant departments, with the awareness of the Borçelik Sustainability Committee and the Borusan Sustainability Board.

Project-management methodologies are often used during the implementation of the decisions taken. Waterfall or Lean 6 Sigma methodologies are widely used. The Borçelik Project Management Office coordinates the management of these. Projects are sponsored by members of the Sustainability Board or department directors.

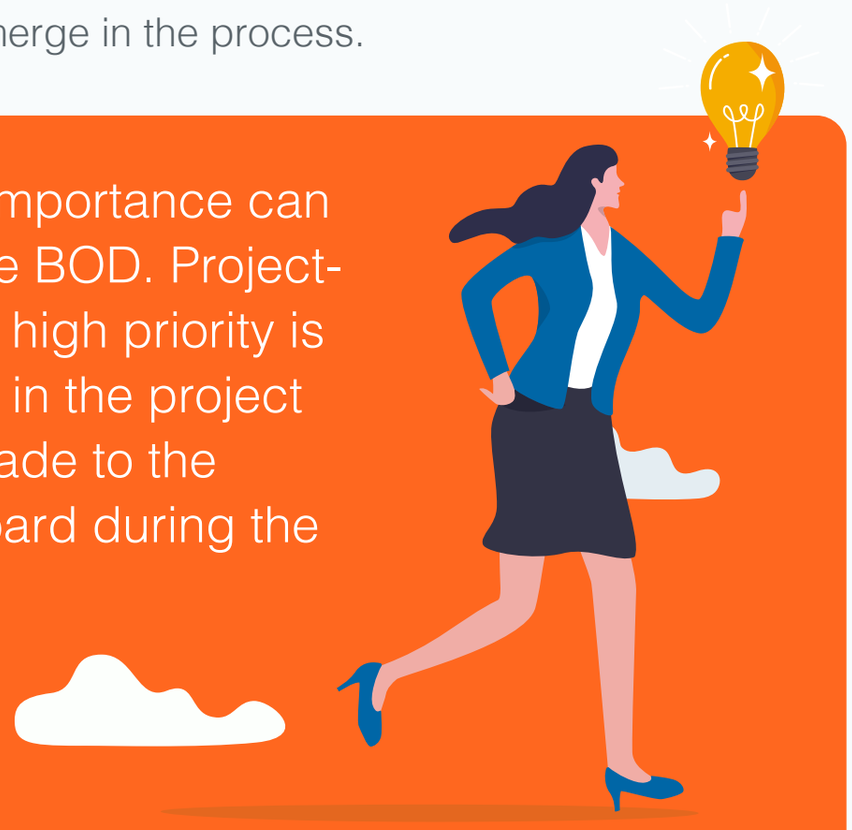
Related work is carried out in multifunctional teams managed by project managers certified on the subject. Issues that were not projected, but are followed only based on action, are recorded in the Integrated Management System of our organization.

Risk Management > Organizational Structure and Planning

Issues determined on a project or action basis, form the annual sustainability business plan. The business plan is submitted to the Sustainability Board and the Borusan Sustainability Board **at the beginning of each year.**

In the middle of the year, we follow up the business plan with interim review meetings. However, necessary action can be taken with the assistance of the structures mentioned above for any new risks that emerge in the process.

Matters of high importance can be brought to the BOD. Project-based work with high priority is also followed up in the project presentations made to the Sustainability Board during the year.



Department managers/directors are responsible for the activities of their departments at all stages of risk studies. All related studies and risks are reported to the Borçelik Sustainability Board. The Borçelik Sustainability Board is responsible to Borçelik BOD with regard to critical risks. Action plans and risk studies requiring high investment decisions **must be approved** by the BOD. However, our Committee and Managers may also give their approval in respect to minor decisions.

Highly important risks are also **reported** to our Sustainability Board, and, if necessary, to the BOD. The Sustainability Board and/or BOD **approve** the action plans and take decisions accordingly to **address** risks and **eliminate** the potential effects thereof.

We **share** the results of the studies on sustainability with our employees on "*Borçelik Project Day*" or through the "*Your Project, Your Stage*" program.

Risk Management > Investment Decisions Regarding Climate Risks

Within the scope of the European Green Deal and the Carbon Border Adjustment Mechanism (CBAM), which is of high importance to us, we have agreed to **invest in renewable energy** resources to eliminate potential risks. This decision also supports our **carbon reduction target of 47% by 2030**, and the targeted reduction of electrical energy usage costs.

•We decided to establish a pilot **Solar Power Plant (SPP)** facility with a capacity of ~180 MWh, on an area of 1,120 m², on the roof of the Gemlik Factory. After observing the effects of industrial pollution in the region on productivity, the expansion of the pilot application to the entire factory roof was postponed for further evaluation in the coming years.

•Work on the establishment of a 1,600 Mwh SPP on a 9,856 m² area on the roof of the Steel Service Center in Manisa is currently ongoing, with the aim of it being ready for use in 2023.

•In addition, we decided to establish a **Wind Power Plant (WPP)** to meet our electricity needs, in accordance with the “5.1.h” regulation in Türkiye. The regulation in question pertains to the establishment of generation facilities with a power of up to two times the total consumption contract power of consumers without a producer license, and without an upper limit for installed power.

As a result of joint work with Borusan EnBW, preparations are proceeding with regard to investment for 55 MW installed power. Land acquisition studies for the WPP continue. All renewable energy investments are carried out with the knowledge and approval of our BOD. Our General Manager and the Sustainability Board are **actively involved** in the process.

85-89

METRICS AND TARGETS

Metrics & Targets > Energy Use

Our production facilities operate mainly on natural gas and electricity. The average energy consumption values of the last four years show that natural gas supply accounted for 75% of our energy use, followed by the power grid at 25%. As of 2022, all our operational electricity needs are supplied by the national power grid.
Figure 4.1 provides annual energy use in TJ for years 2018-2021 and Figure 4.2 shows the ratio of average energy types used.

Energy Consumptions

	2021	2020	2019
Natural Gas (sm³)	50,485,343	47,814,898	49,223,901
Diesel (L)	12,268	166,432	211,132
Petrol (L)	121,009	18,492	23,460
Electricity (MWh)	181,681	173,244	176,644

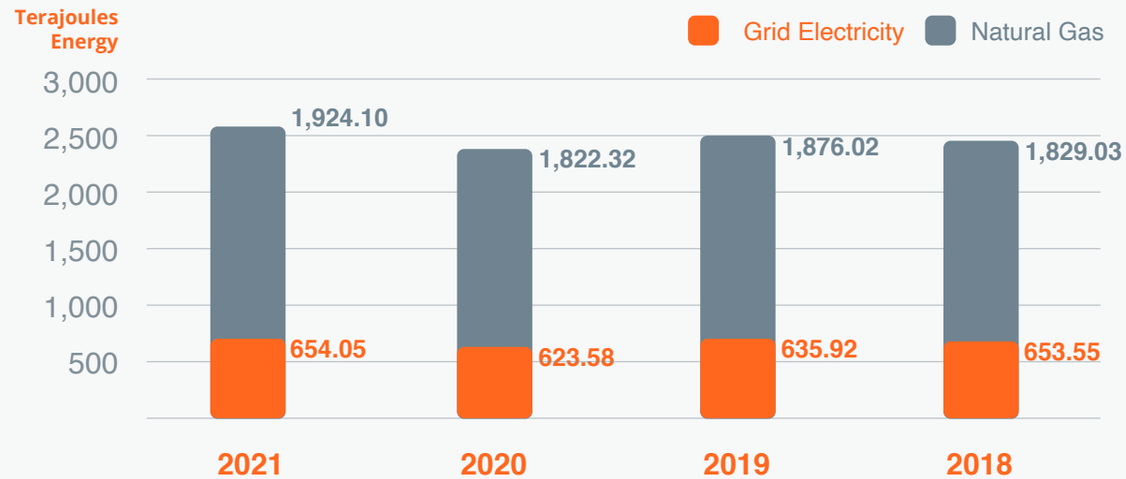


Figure 4.1: Annuel energy uses, TJ

TJ Energy Use

Figure 4.2: Average ratio of energy types used in production

The Strategy section of this TCFD report details initiatives to reduce energy use. These initiatives, covering a wide range of topics, mainly focus on energy efficiency audits and process improvement projects related to the transformation of efficient engine technologies and increasing the use of renewable electricity sources.

Metrics & Targets > GHG Emissions

Essential climate variables to monitor climate change include measuring and monitoring the CO_2, methane, and other long-lived greenhouse gases that are emitted. Among the seven GHGs in total, CO_2 is the GHG with the highest emissions in the steel industry.

The amount of CO_2 that we emit due to our production processes is calculated and validated by third parties according to *WRI/WBCSD GHG Protocol for Product Lifecycle Accounting and Reporting*. CO_2 emissions from mobile combustion, such as company cars, are not included in the verified CO_2 emissions. The verification report can be accessed in Annex I.

As illustrated in the Table 4.1 and Figure 4.3, Scope 1 and 2 GHG emissions are given in tons of CO_2 equivalent for 2019, 2020, and 2021 according to the GHG Protocol Corporate Standard.

tCO_2e GHG Emissions

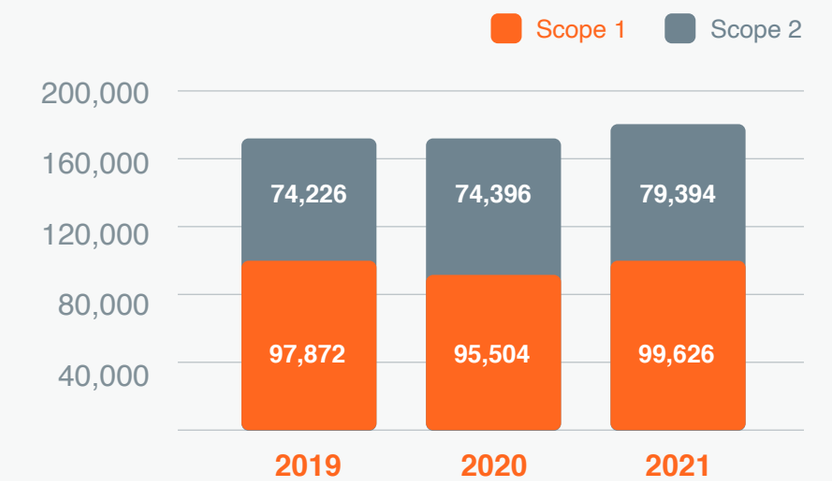


Figure 4.3: Annual GHG Emissions in tCO_2e, in line with GHG Protocol

tCO_2e GHG Emissions	2019	2020	2021
Scope 1	97,872	95,504	99,626
Scope 2	74,226	74,396	79,394
Scope 3, Category 1	3,286,329	3,053,474	3,444,844
Scope 3, Category 4	45,529	47,183	43,239

Table 4.1: Annual GHG Emissions in tCO_2e, in line with GHG Protocol

The CO_2 emission values for natural gas and diesel fuel in stationary combustion that are included in Scope 1 have been verified. The total Scope 1 GHG emissions include natural gas and diesel combustion for production processes and company cars, in addition to the verified CO_2 emissions in production.

Scope 2 GHG emissions include electricity purchased from the national electricity grid of Türkiye.

Metrics & Targets > GHG Emissions

In addition, the change in emissions intensity per USD revenue is driven by annual revenue changes, as given in Table 4.2. With the implementation of emission reduction incentives, absolute emissions are expected to decrease in line with the targets. Therefore, the intensity value of Scope 1 and 2 emissions per revenue is expected to decrease.

As a company in the galvanized steel industry that uses raw steel as an input in its production processes, the Scope 3, Category 1: Purchased Goods and Services GHG emissions are much higher than Scopes 1 and 2 combined. This includes the total steel purchased per year. GHG emissions from the transportation of purchased raw materials (Scope 3, Category 4) also account for 1.5% of the entire Scope 3 GHG emissions

tCO_2e/ Million USD	2019	2020	2021	2022 (Expected)
Revenue, Million USD	1,167	1,087	1,842	1,421
tCO_2e per Million USD Revenue	147	156	97	126

Table 4.2: Emission intensities, tCO_2e per Million USD Revenue

Metrics & Targets > GHG Emissions

A more detailed breakdown of emissions for our purchased steel and end products is provided in Figure 4.4.

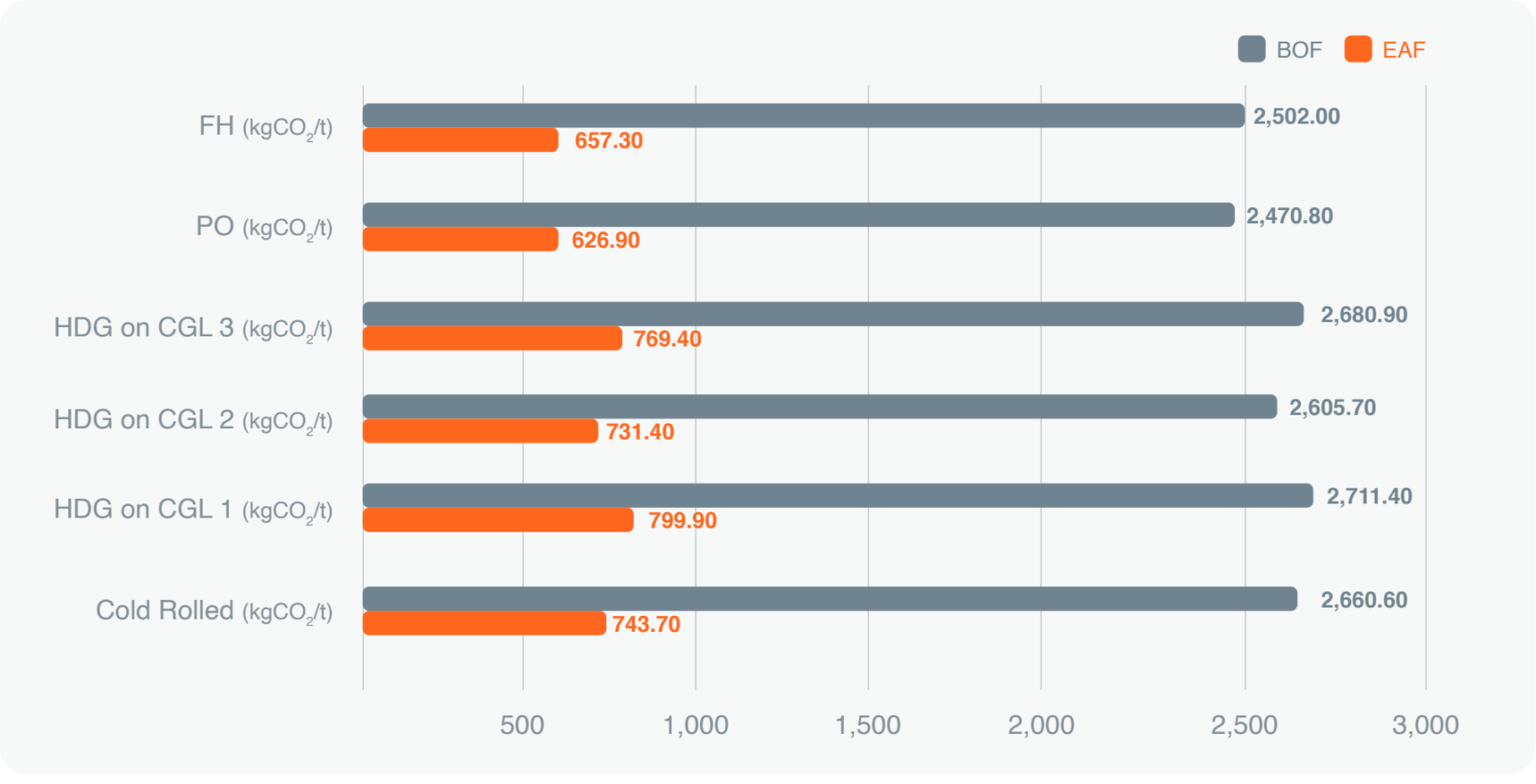


Figure 4.4: Raw material and Borçelik process emissions for each type of products

By using EAF instead of BOF in production, the carbon emission of the end product is 3.6 times lower on average. As of the end of 2022, the raw material distribution used in our production is 23.8% and 76.2% for EAF and BOF, respectively.

Metrics & Targets > Other Metrics

> Water

The primary water consumption in Borçelik is for cooling, which makes up half of the total water withdrawals per year.

Figure 4.5 indicates the total water withdrawals, water consumption and discharges in previous years.

The source of water withdrawals is 100% underground freshwater on the south coast of the Black Sea Basin[1] as of 2022. We set targets and accordingly identified action points to minimize risks related to water availability and water quality throughout the value chain.

We will reduce water consumption by 50% and increase water recovery by 50% by 2030.

Water risks and necessary actions are given in detail in the Strategy section of the report.

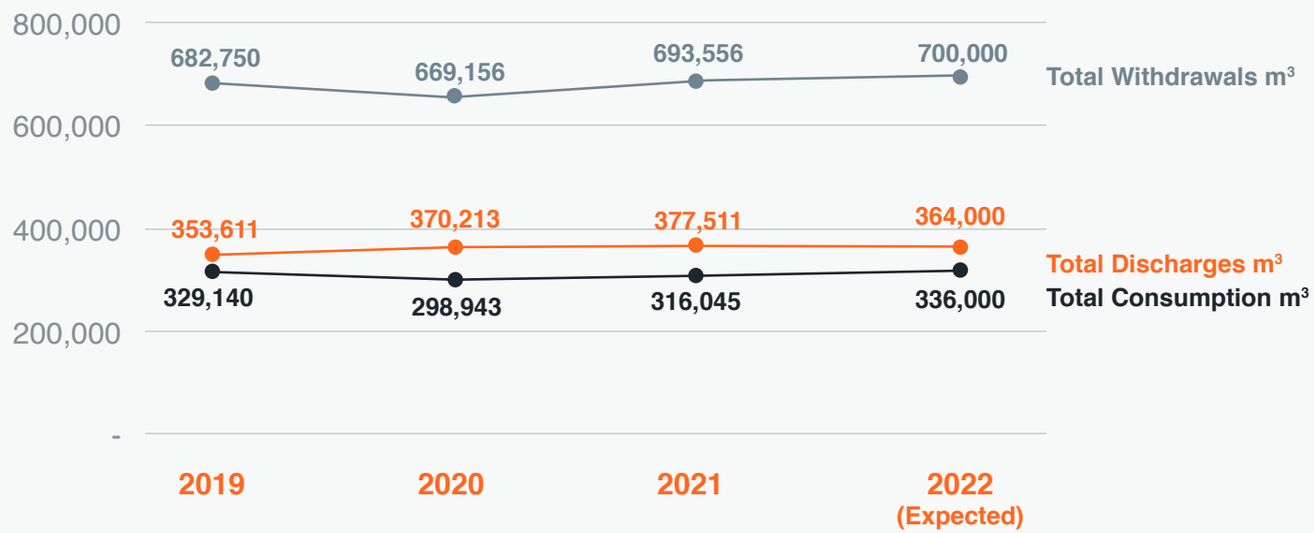


Figure 4.5: Water withdrawals, consumption and discharge values

> Waste

As a company in the steel galvanizing sector, the majority of our waste consists of metals. All metal wastes are recyclable and are transported to recycling facilities. Recycled materials can be used as raw materials in the production processes in other sectors. Remaining waste other than metal is transferred for energy recovery and to landfills for disposal. Non-metal wastes were calculated to be 2,079 tons in 2021.

We aim to reduce this amount by 50% by 2030.

[1]According to the WRI Aqueduct Water Risk Atlas

Conclusion

Determining targets and creating a decarbonization roadmap is the most important part of the transition to a low-carbon economy. However, prior to target-setting and the achievement of these goals, it is necessary to define climate-related risks and climate strategy along with their financial implications under the Corporate Climate Governance Scheme.

We continue to develop our sustainability strategy with regard to our sustainability values and vision, and alongside the expectations of all stakeholders, through a dynamic business model that corresponds fully with the United Nations Sustainable Development Goals and Responsible Steel Principles.

We identify potential climate-related risks and opportunities in our climate strategy, monitor them, assess their financial consequences, and take the necessary actions by integrating risk management with our short-, medium-, and long-term business strategies.

The medium and long-term targets were set in line with this approach.

We will be tracking our GHG emissions and targets annually with as our system and methodologies continue to improve. Achieving our aforementioned targets will be linked to the global developments that occur alongside our specific corporate efforts, as is the case for all companies.

For example, scrap needs to be accessible in the value chain for the targeted EAF-BOF conversion in production. Technological developments that are brought to completion, and the establishment of new climate-related regulations in the transition to a low-carbon economy are important factors in the steel industry achieving its emission reduction targets by no later than 2050.

For more information about climate change and sustainability studies at Borçelik, please contact:

infobrc@borcelik.com

Glossary

APS **Announced Pledges Scenario:**
This scenario assumes that all climate-related commitments made by governments, including longer-term net-zero targets and Nationally Determined Contributions (NDCs), will be fully met in time.

BOD **Board of Directors:**
The governing body of Borçelik, which is constituted from a select group of people, and which sets strategy and manages the company.

Carbon Neutrality The approach, defined as essential in the Paris Agreement and promoted by the European Green Deal, which aims to limit global warming 1.5 °C by balancing emitted carbon and absorbed carbon from the atmosphere.

This refers to balancing the total amount of carbon emissions, while net-zero emission means that no carbon was emitted from the start, and that no carbon thus needs to be captured or offset.

CCUS **Carbon Capture, Utilization and Storage:**
The technology, which is predicted to provide 12% of cumulative carbon emission reduction worldwide in 2050 based on the IEA 2DS scenario, is one that Borçelik is considering adapting on a small scale, despite its limitations.

EAF **Electric Arc Furnace:**
A furnace is used to heat and melt steel scraps, reducing iron from iron ore by means of an electric arc.

Green Bond A particular type of fixed-income instrument designed to raise funds for green projects that are sustainable and socially responsible with regard to issues such as renewable energy, clean transportation etc., that are related to the environment and the climate.

BF-BOF **Blast Furnace-Basic Oxygen Furnace:**
A vessel, usually connected with a blast furnace, therefore called a BF-BOF, that works as a converter of pig iron to scraps by utilizing the heap generated by chemical reactions.

CAPEX **Capital Expenditures:**
Payments that Borçelik has made for acquiring or maintaining fixed assets and, to reduce costs of the company

CBAM **Carbon Border Adjustment Mechanism:**
A regulation expected to come into force starting from 2026 that Borçelik intends to follow, with the aim of accomplising a softer transition for the adaptation of mitigation and leakage prevention policies.

CPL **Continuous Pickling Line:**
A line which has an annual production capacity 1.6 megatons in order to process strip thicknesses from 1.20 to 6.00 mm and strip widths of up to 1,568 mm.

CoC **Chain of Custody:**
A process for transferring, monitoring, and controlling inputs, outputs, and related data as they pass through each stage of the supply chain (adopted from ISO 22095:2020(E) Chain of custody – General terminology and models).

ETS **Emission Trading System:**
The EU's policy to address climate change and the main tool for lowering GHGs in an efficient manner. It was the first significant carbon market in the world and continues to be the largest.

Green Economy The economic model that targets the reduction environmental risks and ecological scarcities, aims for sustainable development without degrading the environment, and prioritizes human well-being and social equity.

Glossary

HRC **Hot Rolled Coil:**
Steel that has undergone the continuous rolling process at a high temperature (over 1,000 °F).

IPCC **International Panel on Climate Change:**
The body established to enhance the knowledge about climate change caused by human activities, its effects, and its potential hazards by analyzing ecosystems at both the regional and global levels and offering periodical scientific evaluations.

Net-zero **Net-zero Emission:**
The approach that aims to achieve absolute net-zero emissions by no later than 2050. No carbon is emitted from the start, and hence no carbon needs to be captured or offset.

RCP **Representative Concentration Pathway:**
The portion of the concentration increase extending up to 2100, guiding the building of model future scenarios regarding climate change and its impacts such as sea level rise and extreme temperature and weather conditions.

SSP **Shared Socioeconomic Pathways:**
This scenario refers to the projected socioeconomic changes due to impacts of climate change on a global level up to 2100.

WRI **World Resource Institute:**
An international and non-profit research organization that collaborates with governments, corporations, and civil society organizations to create workable solutions that enhance the lives of people and protect the environment.

IEA **International Energy Agency:**
An independent organization, established in 1974, that works with countries around the world to build energy policies for a sustainable future.

NDC **Nationally Determined Contributions:**
National goals to be submitted by each country every five years to the UNFCCC to reduce national emissions and achieve the long-term goals of the Paris Agreement.

OPEX **Operating Expenses:**
The costs that Borçelik incurs through its usual business operations.

SDS **Sustainable Development Scenario:**
This scenario indicates a “well below 2°C” projection in terms of the desired outcomes the Paris Agreement.

STEPS **Stated Policies Scenario:**
This scenario targets sectoral analysis regarding specific policies announced and put in place by countries around the world.

Sustainable Finance Investment decisions made in the financial sector with environmental, social, and governance (ESG) factors in mind, which result in longer-term investments in sustainable economic activities and projects.

TCFD **The Task Force on Climate-related Financial Disclosures:**
The body established in 2015 by the Financial Stability Board to help companies, banks, and investors develop a framework to disclose climate-related risks and opportunities through specific reporting processes.

Document Versions

Version	Date	Description of Update
1.0	14.02.2023	Release of the first version

Annex I

DNV

WHEN TRUST MATTERS

Independent Limited Assurance Report

to the Management of Borcelik Celik Sanayii Ticaret A.S.

Borcelik Celik Sanayii Ticaret A.S. ("Borcelik") commissioned DNV Business Assurance Germany GmbH ("DNV", "us" or "we") to provide limited assurance over Selected Information used by Borcelik as the basis for issuing product carbon intensity certificates.

Our Conclusion: Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the Selected Information is not fairly stated and has not been prepared, in all material respects, in accordance with the Criteria. In our opinion the methodology for calculating product CO_2eq intensities has been prepared in general alignment with the WRI/WBCSD GHG Protocol for Product Lifecycle Accounting and Reporting. Borcelik's customers that receive these certificates can utilise these product CO2eq intensities in their Scope 3 emissions reporting in accordance with the GHG Protocol Corporate Accounting and Reporting Standard. This conclusion relates only to the Selected Information and is to be read in the context of this Assurance Report, in particular the inherent limitations explained overleaf.

Selected Information

The scope and boundary of our work is restricted to the **data** and **methodology** described below (the "Selected Information"):

- **Product CO_2eq intensities:** The amount of CO_2eq per tonne of products covered by the **methodology** relating to products (specified below) produced by Borcelik's at the company's site in Gemlik, Turkey (the "Entity");
- **The methodology:** the detailed description developed by Borcelik of the processes and data sources used to calculate product carbon intensities;
- **Product carbon footprint tool:** the inventory spreadsheets containing 2021, 2020 and 2019 year data from Borcelik's Gemlik site and calculations to determine product carbon footprints in accordance with the methodology.
- The Borcelik **product groups** covered by the product carbon footprint tool are:
  - Cold Rolled (CR)
  - Hot Dip Galvanized (HDG) produced on Continuous Galvanizing Line CGL 1
  - Hot Dip Galvanized (HDG) produced on Continuous Galvanizing Line CGL 2
  - Hot Dip Galvanized (HDG) produced on Continuous Galvanizing Line CGL 3
  - Pickled and Oiled (PO)
  - Full Hard (FH)
- For details of the GHG emissions data and product CO_2eq intensities covered by this assurance engagement, see Appendix below.

Criteria

We assessed Borcelik's methodology and data for calculating product CO_2eq intensities against the following **Criteria** (the "Criteria"):

- The publicly available Greenhouse Gas Protocol for Product Life Cycle Accounting and Reporting Standard, as issued by WRI/WBCSD;
- Borcelik's internal procedure for issuing certificates and tracking customer transactions; and
- Borcelik's methodology document [summary available on request from Borcelik] on the product CO_2eq intensities, including their following definitions and programme rules:
  - **product CO_2eq intensities:** The amount in metric tonnes of CO_2eq associated with each tonne of product. The CO_2eq intensities calculation is conducted in alignment with the Greenhouse Gas Protocol for Product Life Cycle Accounting and Reporting Standard.
  - **Reporting period:** The CO_2eq intensities have been calculated based on data over the time period January 2021 to December 2021, and for the same periods in 2020 and 2019.

DNV have reviewed the reference values (sourced from CRU data) used by Borcelik for the upstream GHG emissions associated with hot rolled coil (HRC) production for the Electric Arc Furnace (EAF) and Basic Oxygen Furnace (BOF) routes. Borcelik will provide CO_2eq intensity data for its products to customers based on HRC references values, unless HRC supplier specific values are available. Where HRC supplier specific values are used, DNV will review these calculations as part of this assurance engagement.

DNV will conduct periodic reviews of the certificates issued and use of the product carbon footprint tool after an initial six month period, at which point DNV will also assure data relating to calendar year 2022.

DNV

WHEN TRUST MATTERS

Standard and level of assurance

We performed a **limited** assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 revised – 'Assurance Engagements other than Audits and Reviews of Historical Financial Information' (revised), issued by the International Auditing and Assurance Standards Board. This standard requires that we comply with ethical requirements and plan and perform the assurance engagement to obtain limited assurance.

DNV applies its own management standards and compliance policies for quality control, in accordance with ISO/IEC 17021:2011 – Conformity Assessment Requirements for bodies providing audit and certification of management systems, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement; and the level of assurance obtained is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. We planned and performed our work to obtain the evidence we considered sufficient to provide a basis for our opinion, so that the risk of this conclusion being in error is reduced but not reduced to very low.

Basis of our conclusion

We are required to plan and perform our work in order to consider the risk of material misstatement of the Selected Information; our work included, but was not restricted to:

- Assessing the appropriateness of the Criteria for the Selected Information;
- Conducting interviews with Borcelik's technical teams and other key personnel to obtain an understanding of the key processes, systems and controls in place to generate, aggregate and report the Selected Information;
- Site visit to Gemlik, Turkey to review evidence to support specific site level data. We were free to request interviews, data and information to support the process;
- Performing limited substantive testing on a selective basis of the Selected Information to check that data had been appropriately measured, recorded, collated and reported; and
- Reviewing that the evidence, measurements and their scope provided to us by Borcelik for the Selected Information is prepared in line with the Criteria.

DNV Business Assurance Germany GmbH

Essen, Germany

8th September 2022

DNV

DNV Business Assurance Germany GmbH is part of DNV – Business Assurance, a global provider of certification, verification, assessment and training services, helping customers to build sustainable business performance. www.dnv.com

Our competence, independence and quality control

DNV established policies and procedures are designed to ensure that DNV, its personnel and, where applicable, others are subject to independence requirements (including personnel of other entities of DNV) and maintain independence where required by relevant ethical requirements. This engagement work was carried out by an independent team of sustainability assurance professionals. Our multi- disciplinary team consisted of professionals with a combination of environmental and sustainability assurance experience.

Inherent limitations

All assurance engagements are subject to inherent limitations as selective testing (sampling) may not detect errors, fraud or other irregularities. Non-financial data may be subject to greater inherent uncertainty than financial data, given the nature and methods used for calculating, estimating and determining such data. The selection of different, but acceptable, measurement techniques may result in different quantifications between different entities. Our assurance relies on the premise that the data and information provided to us by Borcelik have been provided in good faith. DNV expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Independent Limited Assurance Report.

Responsibilities of the Management of Borcelik and DNV

The Management of Borcelik have sole responsibility for:

- Preparing and presenting the Selected information in accordance with the Criteria;
- Designing, implementing and maintaining effective internal controls over the information and data, resulting in the preparation of the Selected Information that is free from material misstatements;
- Measuring and reporting the Selected Information based on their established Criteria; and
- Contents and statements contained within product carbon intensity certificates

Our responsibility is to plan and perform our work to obtain limited assurance about whether the Selected Information has been prepared in accordance with the Criteria and to report to Borcelik in the form of an independent limited assurance conclusion, based on the work performed and the evidence obtained. We have not been responsible for the preparation of the certificates. We have not reviewed whether or how Borcelik customers have used the reported CO_2e q savings in their Scope 3 reporting.

Annex I

WHEN TRUST MATTERS

Appendix: GHG emissions data and product CO_2eq intensities covered by this assurance engagement

Total GHG emissions for Borcelik's Gemlik site, based on Borcelik's methodology document

Scope 1	Tonnes CO2eq	Scope 2	Tonnes CO2eq	Scope 3	Tonnes CO2eq
2019	97,246	2019	74,226	2019	3,331,858
2020	95,010	2020	74,396	2020	3,100,658
2021	99,310	2021	79,394	2021	3,488,083

CO_2eq intensities for product groups produced by Borcelik

Cold Rolled (kgCO2/t)								
	Scope 1		Scope 2		Scope 3		Total	
	EAF	BOF	EAF	BOF	EAF	BOF	EAF	BOF
2021	51.8	51.8	52.9	52.9	639.0	2555.9	743.7	2660.6
2020	51.3	51.3	53.2	53.2	637.6	2550.5	742.2	2655.0
2019	51.3	51.3	51.9	51.9	636.7	2546.8	739.9	2650.0

HDG on CGL 1 (kgCO2/t)								
	Scope 1		Scope 2		Scope 3		Total	
	EAF	BOF	EAF	BOF	EAF	BOF	EAF	BOF
2021	99.5	99.5	63.3	63.3	637.2	2548.6	799.9	2711.4
2020	106.6	106.6	64.8	64.8	635.9	2543.5	807.2	2714.8
2019	97.7	97.7	62.2	62.2	638.0	2551.9	797.9	2711.9

HDG on CGL 2 (kgCO2/t)								
	Scope 1		Scope 2		Scope 3		Total	
	EAF	BOF	EAF	BOF	EAF	BOF	EAF	BOF
2021	16.7	16.7	89.9	89.9	624.8	2499.1	731.4	2605.7
2020	18.0	18.0	90.7	90.7	626.9	2507.8	735.6	2616.4
2019	20.0	20.0	89.0	89.0	627.6	2510.3	736.6	2619.3

HDG on CGL 3 (kgCO2/t)								
	Scope 1		Scope 2		Scope 3		Total	
	EAF	BOF	EAF	BOF	EAF	BOF	EAF	BOF
2021	80.4	80.4	51.9	51.9	637.2	2548.6	769.4	2680.9
2020	85.8	85.8	53.9	53.9	635.9	2543.5	775.6	2683.3
2019	87.7	87.7	50.9	50.9	638.0	2551.9	776.7	2690.6

WHEN TRUST MATTERS

Appendix: GHG emissions data and product CO_2eq intensities covered by this assurance engagement

Total GHG emissions for Borcelik's Gemlik site, based on Borcelik's methodology document (contd.)

PO (kgCO2/t)								
	Scope 1		Scope 2		Scope 3		Total	
	EAF	BOF	EAF	BOF	EAF	BOF	EAF	BOF
2021	7.8	7.8	4.4	4.4	614.6	2458.6	626.9	2470.8
2020	8.5	8.5	4.2	4.2	614.8	2459.3	627.5	2472.0
2019	8.8	8.8	4.0	4.0	614.3	2457.2	627.1	2470.0

FH (kgCO2/t)								
	Scope 1		Scope 2		Scope 3		Total	
	EAF	BOF	EAF	BOF	EAF	BOF	EAF	BOF
2021	8.8	8.8	33.7	33.7	614.9	2459.5	657.3	2502.0
2020	9.4	9.4	34.1	34.1	615.1	2460.5	658.5	2503.9
2019	9.7	9.7	33.0	33.0	614.6	2458.3	657.3	2501.0

BORÇELİK

Borçelik Çelik Sanayii Ticaret A.Ş.

Ata Mh. 125 No'lu Sokak No:1 16601 Gemlik – BURSA

+90 224 280 40 00 +90 224 519 01 30 - 31 infobrc@borcelik.com

TCFD Consultancy
Semtrio Sustainability

SEMTRIO

+90 216 807 02 48
iletisim@semtrio.com