

CLIMATE CHANGE AND SUSTAINABILITY

RESEARCH:

OUTLOOK ON BIST 30 COMPANIES



This report was prepared by 350
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İklim İin 350, It takes its name from the fact that the safe upper limit of carbon dioxide in the atmosphere should be 350 parts per million (ppm). It advocates that the use of fossil fuels, especially coal, which threaten public health, nature and the climate, should be terminated as soon as possible for a livable earth. In this framework, the organization advocates a fair transition from fossil fuels to renewable energy sources and carries out various activities in this direction. For more information: iklimicin350.org

Sustainable Economy and Finance Research Association (SEFiA)

SEFiA is a research-oriented non-governmental organization established to conduct independent studies in the fields of sustainable economy and financing sustainability, with a particular focus on Turkey's transition to a low-carbon economy and the fight against climate change. SEFiA aims to develop data, knowledge and researcher capacity through national and international collaborations and aims to contribute to low carbon economy policies. For more information: sefia.org



CLIMATE CHANGE AND SUSTAINABILITY RESEARCH: OUT-LOOK ON BIST 30 COMPANIES

INTRODUCTION

After the Paris Agreement was approved by the Turkish Grand National Assembly on October 6, 2021, Turkey became a party to a key step in the global fight against climate change, albeit somewhat late. It also announced its goal of becoming net-zero emissions by 2053. According to the most recent data announced by TURKSTAT, Turkey's total greenhouse gas emissions increased by 3% in 2020 compared to the previous year and reached¹ 524 million tons (Mt) carbon dioxide equivalent (CO₂e). It is quite clear that Turkey needs to reduce its emissions rapidly to achieve its 2053 net-zero target. Non-governmental organizations and think-tanks working on climate in Turkey state that it should achieve an absolute reduction of emissions of at least 35% to 340 MtCO₂e by 2030 compared to 2020 to reach its net-zero target, emphasizing that this remains realistic.² Shifting global trends in climate change policies and the mainstreaming of the low-carbon economy approach as a new growth model has also affected Turkey's climate policies. A key development that has accelerated the agenda in Turkey is the "European Green Deal", which the European Union made public in December 2019. Within the framework of the agreement, EU countries aim to reduce their carbon emissions by 55% by 2030 com-

pared to 1990, aiming to be the first carbon neutral continent by 2050. One of the initiatives within the scope of this target is the Carbon Border Adjustment Mechanism (CBAM). The mechanism focuses³ on carbon leakage and aims to reduce greenhouse gas emissions both in the EU and in the EU's trading partners by pricing the carbon into the products imported by the EU, thus contributing to the fight against climate change.⁴

Within the scope of CBAM, five sectors with high carbon emissions, namely iron and steel, cement, aluminum, fertilizer, and electricity, are the priorities. The aim is to implement CBAM across these sectors by 2026 through carbon costing, following a 3-year transition period, which will start with data/information collection on trade and carbon content in 2023, during which time there will be no financial obligations. This has the potential to be a significant competition restriction for Turkey, as about half of its exports are to EU countries. In addition, members of the European Parliament have called for a wider and faster implementation of the CBAM by including the organic chemicals, plastics, hydrogen, and ammonia sectors, in order to achieve the global climate target quicker. For this reason, many companies are likely to come into the direct sphere of influence of the CBAM in the moderate-long term because of its expanding scope. At this point, a focus on BIST 30

companies is important. The BIST 30 Index includes the 30 companies with the highest trading volume and market value on Borsa Istanbul. These companies have high financing capabilities and can make a significant contribution to economic development by creating employment and added value. However, in terms of sustainability, it is important to examine the current situation of BIST 30 companies closely, as their situation may also affect their ability to generate finance. In this context, 25 non-banking companies in the BIST 30 have been evaluated based on their approaches to the following five vital climate and biodiversity-related themes:

- Level of interaction with fossil fuel assets/investments
- Target date for “Net Zero”
- Carbon footprint and target date for “Carbon Neutrality”
- Clean energy investments
- ESG (Environmental, Social, Governance) and similar ratings

This study evaluates the banks' annual reports, sustainability reports, Carbon Disclosure Project (CDP) Climate Change 2021 scores and Sustainalytics ESG scores.



OUTLOOK ON BIST 30 COMPANIES

Arçelik A.Ş.

Founded in Istanbul in 1955, Arçelik has more than 40,000 employees. It operates in 49 countries globally with 12 brands, including Arçelik, Beko, Grundig, Blomberg, ElektraBregenz, Arctic, Leisure, Flavel, Defy, Altus, Dowlance, and Voltas Beko. It has 30 production facilities across 9 countries. The company's consolidated revenues reached 6.5 billion Euros in 2021.

Arçelik has been publishing sustainability reports since 2007.

As part of a green financing initiative, Arçelik is the first real sector company to issue green bonds in international markets. The bond is worth 350 million Euros and has a maturity of 5 years.

In 2021, Arçelik also signed an eight-year green loan agreement for 150 million Euros with the European Bank for Reconstruction and Development (EBRD).

Level of interaction with fossil fuel assets/investments

The Monoblock heat pump product range, the most environmentally friendly category in air conditioning, was introduced to the Turkish market by Arçelik. Its primary feature is a reduced use of fossil fuels.

Target date for “Net Zero”

Arçelik is committed to achieving net zero emissions in its value chain by 2050.⁵

Carbon footprint and target date for “Carbon Neutrality”

Arçelik is a signatory to the Science Based Targets Initiative (SBTI), a joint initiative by the Carbon Disclosure Project (CDP), the United Nations Global Compact (UNGC), the World Natural Resources Institute (WRI) and the World Wildlife Fund (WWF). To this end, it is committed to being carbon-neutral by 2050. In addition, a 30% reduction rate in 2030 has been approved by the SBTI, ensuring the continuity of Scope 1 and 2 emission reductions, which were 20% in 2021 compared to 2018. Furthermore, another emissions reduction target of 50.4% for the same year is at the SBTI approval stage.

Arçelik was the first white goods manufacturer in Turkey to produce refrigerators without chlorofluorocarbon (CFC) (which is harmful to the ozone layer), and its products have been in accordance with the requirements of the energy label regulation since 1995.

Since 2020, Arçelik has applied the Shadow Carbon Price Model, which supports investment decisions for low carbon emission technology.

Clean energy investments

In 2021, Arçelik met 69% of its global electricity needs from renewable green electricity sources. In addition, by 2030, Arçelik aims to

purchase 100% green electricity in all its production facilities.

It also aims to increase its renewable energy systems capacity, which was 3.26 MW in 2021, to 50 MW by 2030.

In PV panel sales, which reached 9 MW between April and December 2021, the interim target for 2022 is 51 MW, and the final target is 450 MW annual sales for 2025.

A total of 228 energy efficiency projects were implemented in 2021 at Arçelik's production facilities. 51.6% of its turnover consists of energy efficient products, and as a result of these projects, approximately 63,000 GJ of energy was saved. Thanks to this increase in efficiency, a reduction of 5,514 tons of CO₂e emissions and a financial saving of 773,932 Euros was achieved.

Its 2021 Sustainability Report data also underlined that all renewable energy and energy efficiency investments totaled 3,773,672 USD in 2021, and a minimum of 50 million USD will be reached by 2030.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Arçelik received a "12.8 - Low ESG Risk" rating from Sustainalytics.⁶

Arçelik became the first Turkish industrial company to make the Global A List published by the Carbon Disclosure Project (CDP) for a second time.⁷

As a signatory of the CEO Climate Alliance of the World Economic Forum (WEF), Arçelik also achieved the highest score in the Durable Home Appliances Category for the third time in the Dow Jones Sustainability Index, which evaluates the sustainability performance of corporations (2021 S&P Global Corporate Sustainability Assessment - 86/100 points).⁸

Arçelik was among the top 10 companies in the field of "Environmental and Corporate Sustainability" at the European Business Awards 2016/2017, and also received an honorable mention.⁹

Arçelik has also been awarded the "Terra Carta Seal", presented by the Prince of Wales of the United Kingdom to companies that are committed to combating climate change with concrete objectives within the scope of the Sustainable Markets Initiative.



Aselsan Elektronik Sanayi ve Ticaret A.Ş.

ASELSAN, a joint stock company affiliated to the Turkish Armed Forces Foundation (TSK-GV), was established in 1975 to meet the communication needs of the Turkish Armed Forces. Currently, 74.20% of its shares are owned by TAFF and the remaining 25.8% are traded on Borsa Istanbul (BIST).

ASELSAN is a defense electronics company, with a product portfolio spanning communication and information technologies; radar and electronic warfare; electro-optics; avionics; unmanned systems; land, sea and weapon systems; air defense and missile systems; command and control systems, as well as transportation, security, traffic, automation and medical systems.

With over 9,000 employees, ASELSAN allocates 7% of its annual income to self-financing Research and Development (R&D) activities.

Level of interaction with fossil fuel assets/ investments

ASELSAN reduced its total energy consumption from non-renewable fuels (natural gas and diesel) by more than 15% in 2021 compared to the previous year.

Target date for “Net Zero”

ASELSAN has publicly announced a net zero emission target for 2050.

Carbon footprint and target date for “Carbon Neutrality”

Carbon emissions have been measured at the Aselsan Macunköy Campus since 2009. Sco-

pe-1 and Scope-2 aims to reduce emission by 64.12% based on unit turnover compared to the reference year by 2022.

Clean energy investments

Developed in cooperation with ASELSAN and TEMSA, the first 100% domestically produced electric bus, the Avenue EV Project, was completed on July 16, 2021. In addition, an Ultra Fast Charging Bus and Charging Infrastructure System Project agreement has been signed between Samsun Metropolitan Municipality and ASELSAN.¹⁰

ESG (Environmental, Social, Governance) and similar ratings

In 2022, ASELSAN received a "23.8 - Moderate ESG Risk" rating from Sustainalytics.¹¹

ASELSAN became one of the 15 companies included in the BIST Sustainability Index when it was launched in 2014 and was included in the index for the 9th time in 2022.

ASELSAN also took part in the Carbon Disclosure Project (CDP) in 2012, and received an rating of A- in 2019 in carbon emissions.¹²

ASELSAN also participated in CDP Water Reporting for the first time and received a rating of A-, and received a rating of A- in CDP Climate Change Supply Chain Management. ASELSAN was also one of 8 companies in the "CDP Turkey Climate Change Leaders" classification in 2021.¹³

ASELSAN has been publishing its Corporate Governance Principles Compliance Report every year since 2004 and had a corporate rating of 9.35 in 2021.

Bim Birleşik Mağazalar A.Ş.

With the greatest market share in the organized retail sector in Turkey, BİM Birleşik Mağazalar A.Ş. started its activities in 1995 with 21 stores. By the end of 2021, with the opening of 1,081 new stores (plus 37 FILE stores), the total number of BİM stores in Turkey reached 9,451 (9,611, including FILE stores). BİM operates not only in Turkey, but also abroad, particularly in Morocco and Egypt. The total number of stores, including the stores in these two countries, reached 10,489 by the end of 2021. BİM applies the fixed discount model and has approximately 850 products in its product portfolio, and it has over 70 thousand employees.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

The majority of BİM's energy consumption is accounted for by the electricity consumption in its stores. Store design was revamped in 2020, and as a result of improvements in energy saving and thermal insulation, an average of 25% heat and 10% electricity savings have been achieved per store. By 2030, BİM aims to roll out a new “energy efficient and

modern-looking” design across all stores.

Within the scope of its sustainability targets, it aims to reduce greenhouse gas emissions (kgCO₂e/m²) by 20% by 2026 compared to 2019.

Clean energy investments

BİM has started a project to install solar power plants (SPP) on the roofs of its regional warehouses and invested 10 million TL in the project in 2021. While the amount of energy obtained from SPPs was 1,643 MWh, the decrease in energy use per square meter was 5%. In BİM's Turkey operations, greenhouse gas emission per square meter has decreased by approximately 11% since 2019, reaching 118 kg CO₂e.

The total amount of environmental investments and expenditures realized in 2021 was 18 million TL.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, BİM received a "30.3 - High ESG Risk" rating from Sustainalytics.¹⁴

BİM is included in the Borsa Istanbul (BIST) Sustainability Index.

Emlak Konut Gayrimenkül Yatırım Ortaklığı A.Ş.

Established in the construction sector in 1953, Emlak Konut became a real estate investment partnership in 2002. It has tendered for and completed a total of 181 projects of various sizes since 2003. With the first and second public offerings in 2010 and 2013, Emlak Konut reached a paid-in capital of TL 3.8 billion and an asset total of TL 35.5 billion as of March 31, 2022.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

The main objectives within the framework of Energy Management are to increase energy savings; to use products with EPD (Environmental Product Declaration) Certification; to increase the proportion of renewable energy use; and to build greener buildings which account for lower amounts of greenhouse gases. To this end, it has constructed buildings which exceed legislation and regulation requirements by 20% by using Energy Efficient Ele-

ctrical and Mechanical systems (Condensing Boilers, Frequency-controlled pumps, LED Lighting Fixtures, Automation Systems, etc.) and Roof SPP Systems.

Within the scope of this project, 60,000 independent sections have been constructed and 300 m³ of natural gas is saved per year per independent section.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Emlak Konut received a "23.6 - Moderate ESG Risk" rating from Sustainalytics.¹⁵



Ereğli Demir ve Çelik Fabrikaları T.A.Ş.

Erdemir became the parent company of OYAK Maden Metalürji Grubu after its privatization in 2006. It was established in 1960 through special decree to become the first domestic flat steel producer for Turkish industry. Erdemir produces plate, hot and cold rolled, tin, chrome and zinc coated flat steel. It supplies the automotive, white goods, pipes and tubes, rolling, manufacturing, electrical-electronics, mechanical engineering, energy, heating equipment, shipbuilding, defense and packaging industries. Erdemir has a production capacity of 4 million tons of crude steel and 5 million tons of finished products.

Level of interaction with fossil fuel assets/ investments

Fossil fuel is used in the current blast furnace production circuit. Due to a reduction in the use of fossil fuels, the steel industry's need for scrap is increasing globally. Erdemir also used 1.6 million tons of scrap together with İsdemir, another company in the OYAK Group.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

After starting its Climate Risks and Opportunities Assessment Project (IRF Project) based on the TCFD (Task Force on Climate-Related Financial Disclosures) approach, Erdemir has kept up to date with low-emission steel production technologies and has carried out feasibility studies. It states that it reduces its emissions by conducting work to improve existing production processes in terms of resource and energy efficiency.

Erdemir commissioned the Kızılcapınar Hydroelectric Power Plant to meet the group's energy needs.

By optimizing the firing furnace at its Sinter Factory, coke gas savings have also been achieved. The project has achieved a decrease of 5,600 tons in annual CO2 emissions.

As a result of energy efficiency projects, 42% energy savings have been achieved at Erdemir since the year it was founded. By 2021, it had saved 283,746,414 kWh and reduced emissions by 157,479 tons of CO2 through its energy efficiency projects.

In order to increase resource efficiency, maintain competitiveness and reduce emissions, Erdemir also participated in the World Steel Association's Step Up Program¹⁶ in 2021.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Erdemir received a "38.8 - High ESG Risk" rating from Sustainalytics.¹⁷

Erdemir is included in the BIST Sustainability Index.¹⁸

Ford Otomotiv Sanayi A.Ş.

Ford Otosan (Ford Otomotiv Sanayi A.Ş.) is a publicly traded company in which Ford Motor Company and Koç Holding A.Ş. have equal shareholding of 41% each. It operates in three main centers, namely Kocaeli, Eskişehir and Istanbul, employing approximately 11,000 people.

Founded in 1959, Ford Otosan is Ford's largest commercial vehicle production center in Europe, with a production capacity of 455,000 commercial vehicles, 70,000 engines and 140,000 powertrains as of the end of 2019.

Level of interaction with fossil fuel assets/ investments

The British government said in a statement that six major automakers, including Ford Motor, will commit to phasing out production of fossil fuel vehicles worldwide by 2040, as part of global efforts to reduce carbon emissions.¹⁹ Ford Otosan's first fully electric commercial vehicle, the E-Transit, and a Ford classic Mustang Mach-E come with a fully electric engine. Zero-emission engines provide benefits to the environment as they do not emit harmful gases, and to the economy due to reduced fuel consumption.²⁰

Target date for “Net Zero”

Ford Automotive is committed to reducing carbon emissions per vehicle by 55% by 2030, and to zero emissions in trucks by 2040, as part of its Moderate-term goals.

Carbon footprint and target date for “Carbon Neutrality”

With the development of low-emission smart transportation models, Ford Otosan predicts that there will be zero-emission models in its entire commercial vehicle portfolio by 2024.

Ford Otosan has also signed the European Automobile Manufacturers Association's (EAMA) Heavy Vehicle Roadmap Joint Statement, and has set a target to reduce emissions from heavy commercial fleet vehicles to zero by 2040.

Ford Otosan has also set targets for Scope 1 and Scope 2 emissions in its operations within the scope of the European Union Green Agreement (EUGA). These goals are as follows:

- Reducing carbon emissions per vehicle by 18% by 2023 and by 50-55% by 2030 compared to 2017,
- To be a carbon neutral factory by 2050.
- In addition, Ford Otosan was among the global companies that supported the Climate-Related Financial Statements Task Force in 2021.

Clean energy investments

Ford Automotive carries out projects to reduce energy consumption in its operations and to supply renewable electricity. Within the scope of energy efficiency activities carried out in 2021, financial savings of 11,923,443 TL were achieved through a total of 22 projects. Led lighting conversion, digital compressed air management, pump line driver conversion, and the economizer application are just some of the projects implemented.

Ford Automotive directly supplies renewable energy to help achieve its targets for reducing greenhouse gas emissions. It prevented 113,847.26 tons of CO₂e greenhouse gas emissions with the purchase of 946,317.59 GJ of renewable electricity in 2021. At the same time, Ford Automotive focuses on direct production at all its campuses with wind energy, Solarwall and solar power plants, and has documented that all of the energy used in these campuses is supplied from 100% renewable resources with internationally valid I-REC certificates.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Ford Otosan received a "22.2 - Moderate ESG Risk" rating from Sustainalytics.²¹

Evaluated by the Carbon Disclosure Project (CDP) Climate Change and Water Programs, Ford Otosan's 2021 achieved a grade of "B" in both programs. Ford Otosan is also in the "A-" band within the scope of the CDP Supplier Evaluation.²²



Gübre Fabrikaları T.A.Ş.

GÜBRETAS (Gübre Fabrikaları T.A.Ş.) was established in 1952 to provide fertilizer to the Turkish agricultural industry. GÜBRETAS has a market share of 31% and delivers its products to the market through 2,800 sales points.

The GÜBRETAS product range includes solid, water-soluble and organic fertilizers, plant growth regulators and soil conditioners, and it owns a subsidiary in the plant protection segment, which is key for agricultural production. With a fertilizer production complex in Iran, GÜBRETAS produces ammonia, urea and phosphoric acid across its facilities.

GÜBRETAS continues its operational activities in its production facilities and warehouses located in Kocaeli, Iskenderun, Izmir, Samsun and Tekirdag, which are all important trade centers and ports in Turkey.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

Information not available.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, GÜBRETAS received a "55.1 - Serious ESG Risk" rating from Sustainalytics.²³



Hacı Ömer Sabancı Holding A.Ş.

Headquartered in Istanbul, Sabancı Holding is a holding company engaged in various commercial activities through its subsidiaries and affiliates, primarily in the banking, financial services, energy, industry, construction materials and retail sectors.

Operating in 13 countries as of the end of 2021, Sabancı Group companies announced a combined income of 152 billion TL and a consolidated net profit of 12 billion TL for the same year.

49.11% of Sabancı Holding shares have been publicly traded on Borsa Istanbul since 1997.

Level of interaction with fossil fuel assets/ investments

Established in 1996, EnerjiSA is owned by Sabancı Holding and E.ON, which sells and distributes electricity. EnerjiSA started trading on Borsa Istanbul as of February 8, 2018, offering 20% of its shares to the public. Subsequently, in 2019, EnerjiSA shares were included in both the BIST Sustainability Index and the BIST Corporate Governance Index.

Currently, EnerjiSA has a total of 22 power plants, including 4 wind power, 12 hydroelectric, 2 solar, 3 natural gas and 1 domestic lignite, and boasts a total installed power of 3,672 MW. 56% of its electricity production is provided from domestic and renewable energy.²⁴

Target date for “Net Zero”

Sabancı Group has set a Net Zero Emission and Zero Waste target across all operations by 2050 at the latest.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

While the energy use of the Sabancı Group was 0.38 tCO₂e/million TL in 2020, Scope 1 and 2 emissions in proportion to combined net sales revenues was 0.21 tCO₂e/million TL. In addition, 12.5 thousand MWh of energy was saved through efficiency projects. Furthermore, greenhouse gas emissions close to 21 thousand tons of CO₂ equivalent have been prevented through emission reduction projects.

Sabancı Holding obtains nearly 165,000 MWh of its electricity from renewable energy, and while the proportion of renewable energy generation in the portfolio is 45%, renewable energy will account for all energy in its new investment plan for 565 MW.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Sabancı Holding received “13,9 – Low ESG Risk” rating from Sustainalytics.²⁵

Hektaş Ticaret T.A.Ş.

Hektaş was established in Adana in 1956 to manufacture and sell pesticides. Hektaş established its first production facility in Istanbul in 1962 and started production and marketing of agricultural chemicals in the pesticides sector. OYAK joined Hektaş in 1963 and became the majority shareholder in 1981 with a 53.8% stake. Following this, Hektaş shares were offered to the public in 1981 and were listed on Borsa Istanbul in 1986.

Today, Hektaş has a portfolio of more than 250 plant protection products, 50 plant nutrition products and more than 40 animal health products.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

Information not available.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Hektaş received a “32.2 – High ESG Risk” rating from Sustainalytics.²⁶



Karabük Demir Çelik Sanayi ve Ticaret A.Ş.

The foundations of Kardemir, Turkey's first integrated iron and steel factory, were laid in 1939. Kardemir has an annual steel production capacity of 3.5 million tons and was added to the BIST 30 index after its privatization in 1995. All of its shares are publicly traded.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Kardemir has announced its goal of becoming a sustainable and carbon-neutral company by 2039, which coincides with the 100th anniversary since its establishment.²⁷

Clean energy investments

Six million tons of CO2 greenhouse gas was released through Kardemir's operations in 2021. The amount of greenhouse gas emissions per unit of crude steel produced is 2.32.

In line with the increasing levels of production in 2021, total energy consumption increased by 2% compared to 2020 and energy use per product produced increased by 1%.

On the other hand, the total energy savings achieved through facility investments and energy efficiency projects increased by 8% compared to 2020 and amounted to 1,035 TJ in 2021.

Again in 2021, 139,699 tons of emission savings were achieved by Kardemir through energy efficiency work. As a result, it reports that total greenhouse gas emission savings achieved since 2017 through efficiency work amount to 720 thousand tons.

In addition, since 2017, the total amount of energy saved thanks to efficiency projects has reached 5,117 TJ.

Energy Efficiency Projects implemented in 2021:

- 30 MW Turbo Generator Investment,
- Continuous Rolling Mill Annealing Furnace Recuperator Replacement,
- Coke Extinguishing Tower Construction,
- Review of Coil Refractory Structures ½ and ¾.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Kardemir received a “33.8 – High ESG Risk” rating from Sustainalytics.²⁸

Kardemir is also included in the BIST sustainability index.

Koç Holding A.Ş.

Established in 1926, Koç Group established Turkey's first joint stock company, formed the first industrial enterprise and first international partnership of the Republic, and was the country's first public offering. While Koç Group's total sales correspond to approximately 8% of Turkey's GDP, its share in Turkey's total exports and R&D expenditures is approximately 7%. Exporting to more than 150 countries with more than 94 thousand employees, Koç Holding has more than 60 overseas marketing and production facilities. Koç Holding is the only Turkish company to be included in the Fortune Global 500, and enjoys a competitive advantage in the energy, automotive, consumer durables and finance sectors.

Level of interaction with fossil fuel assets/ investments

Its activities in the energy sector are ongoing with a total of 11 group companies. Koç Holding's most important stakeholders in the energy group are TÜPRAŞ, Aygaz, OPET and Entek.²⁹

TÜPRAŞ, which was established in 1983 with the merger of İPRAŞ and three other refineries, produces fuel products and petroleum derivatives such as bitumen, fuel oil, jet fuel, kerosene, LPG and motor oil. TÜPRAŞ is the 7th largest refinery company in Europe.³⁰

Established in 1961, Aygaz is an integrated LPG

company involved in the supply, storage, and filling of LPG, and the production and sale of LPG devices. Operating in the LPG sector with over 4,000 dealers and stations today, Aygaz is the first publicly traded company.³¹

Established in 1992, OPET Petrolcülük A.Ş. operates in retail sales, commercial and industrial fuels, mineral oils, storage and international trade. OPET, of which Koç Holding Energy Group became a shareholder of 50% at the end of 2002, is a sector leader with its market share in both white and black products.³²

Entek Elektrik Üretimi A.Ş., which started actual production in December 1998 after its establishment in 1995, has a total installed power of 443 MW. In terms of how this installed power is distributed, Entek has 1 natural gas power plant with 112 MW, 1 wind power plant with 66 MW and 8 hydroelectric power plants with 265 MW of installed power.³³

Target date for “Net Zero”

Koç Holding is committed to being net zero by 2050.

Carbon footprint and target date for “Carbon Neutrality”

Koç Group states that it currently closely monitors Scope 1, Scope 2 and Scope 3 emissions in order to facilitate its commitment to 2050, and it sets group-level targets.

Clean energy investments

While Koç Group doubled its renewable energy purchases in 2020 compared to the previous year, it also reduced its energy use and carbon emissions.

In 2020, CO2 greenhouse gas emissions were reduced by 54 thousand tons, while 1.04 million GJ of energy was saved.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Koç Holding received a “44.9 – Serious ESG Risk” rating from Sustainalytics.³⁴

Koza Altın İşletmeleri A.Ş.

KOZA ALTIN İŞLETMELERİ A.Ş. was established to explore and operate Turkey’s gold mines. Ovacık Gold Mine, located in Bergama, İzmir, owned by the company, was the first operational gold mine in the Republic of Turkey.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

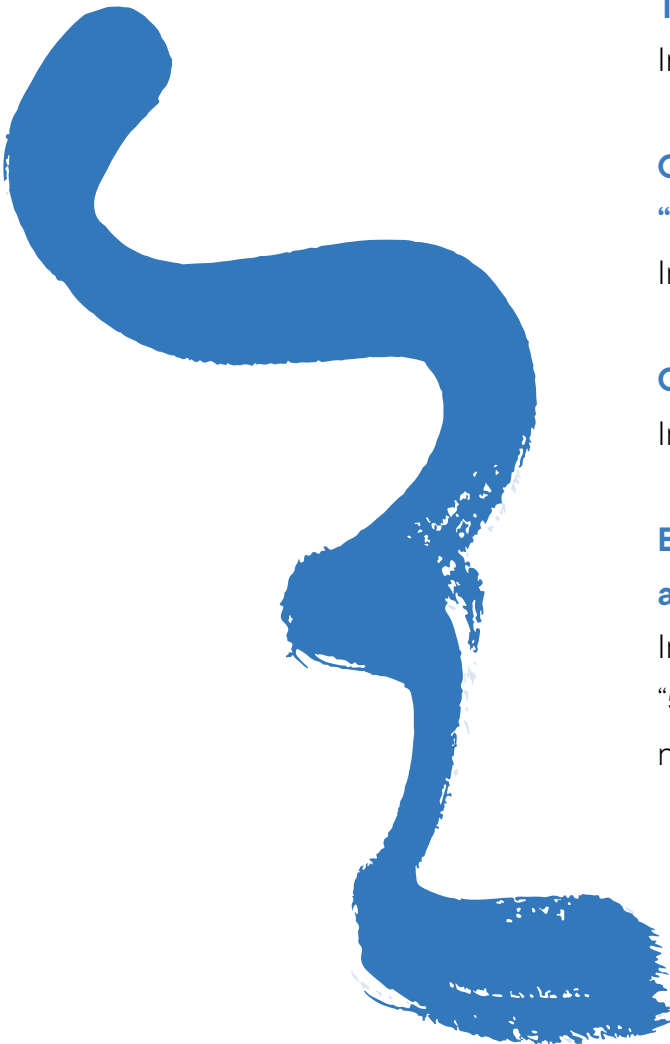
Information not available.

Clean energy investments

Information not available.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Koza Gold Enterprises received a “50.3 – Serious ESG Risk” rating from Sustainalytics.³⁵



Koza Anadolu Metal Madencilik İletmeleri A.Ş.

Koza Anadolu Metal Madencilik is engaged in research, development and production of copper, lead-zinc, iron-metallic mineral deposits and their continuous development. Koza Anadolu Metal Madencilik works under its 17 mining licenses, one in Western Anatolia, seven in Central Anatolia, and nine in Eastern Anatolia.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

Information not available.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Koza Anadolu Metal Madencilik İşletmeleri received a “48.1 – Serious ESG Risk” rating from Sustainalytics.³⁶



Pegasus Hava Tařımacılıđı A.ř.

Istanbul-based Pegasus Airlines is one of Turkey's privately-owned airlines. Established in 1990 as a joint venture of Aer Lingus, Silkar Investment and Net Holding, Pegasus entered the aviation industry offering charter flights. Following its acquisition by Yapı Kredi Bank in 1994, it was then acquired by Esas Holding A.ř. in 2005 and started scheduled domestic flights in December of the same year, becoming the 4th scheduled airline operating in Turkey. As of 2019, it operates scheduled flights to 111 destinations in 42 countries.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for "Net Zero"

Pegasus was among the airlines committing to the "Net Zero Carbon Emissions by 2050" resolution adopted at the 77th Annual General Assembly of the International Air Transport Association (IATA) in October. In this context, Pegasus has declared that it supports and is committed to the net-zero carbon target by 2050.

Carbon footprint and target date for "Carbon Neutrality"

Pegasus' total greenhouse gas emissions in 2020 were 1,245,098.59 tCO₂e for Scope 1 and 3,463.37 tCO₂e for Scope 2, while its total emissions were 1,248,561.96 tCO₂e.

Setting an interim target for 2030 in order to reinforce its commitment to net zero, Pegasus aims to reduce flight-related carbon emissions per realized passenger kilometer (RPK) by 20% by 2030 compared to 2019.

Clean energy investments

Information not available.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Pegasus received a "36.8 – High ESG Risk" rating from Sustainalytics.³⁷

Pegasus, which is included in the BIST Sustainability Index, is also evaluated by the CDP. It received a "B" rating from the CDP Climate Change Program for five years between 2015-2019, and this was upgraded to "A-" in 2020.

Petkim Petrokimya Holding A.Ş.

Petkim Petrokimya Holding A.Ş. was established on April 3, 1965 following explorations carried out under the leadership of TPAO. Following establishment of Yarımca Petrochemical Complex in 1970, the Aliğa Complex became operational in 1985.

Following the offering of 51% of Petkim's in 2008, these were purchased by SOCAR & Turcas Petrokimya. Petrochemical products are important inputs to the construction, electricity, electronics, packaging, textile, medical, paint, detergent, and cosmetics industries, and Petkim is an important raw material producer in the industry with more than 50 products in its range.

Level of interaction with fossil fuel assets/ investments

PETKİM achieved a reduction in fuel consumption of 0.3 lt/hour in 2021 by fixing the speed limit of the forklifts used in product packaging and storage areas to 10 km/h. This totals an annual reduction of 2,400 liters of fossil fuel and contributes to the company's sustainability.³⁸

Target date for “Net Zero”

Petkim's long-term goals are to reduce CO2 emissions by 40% by 2035 and to be net zero by 2050.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

As a player in an emission-intensive sector, Petkim Petrokimya Holding A.Ş. has initiatives to reduce its CO2 emissions by 1% per year. To this end, its CARMOF Project aims to capture the carbon dioxide contained in the combustion gases at SOCAR Turkey facilities by using innovative materials and methods. Its CO2 Focus Project aims to keep carbon dioxide in vent gas and convert it to dimethyl ether with innovative catalysts. With the development of this technology, it will be possible to convert carbon dioxide into a chemical product with high added value.

As a result of more than 50 projects carried out by Petkim Petrokimya Holding A.Ş. in 2020, 11,238 MW of electricity, 33 ktms of natural gas, 3 ktms of fuel gas, 38 ktms of boiler feed water, 249 ktms of steam, and 51,000 m³ of water were saved, while CO2 greenhouse gas emissions were reduced by 106,000 tons.

In addition, the Petkim RES brand operates a wind power plant with an installed capacity of 51 MW and a production license of 38 MW. A total of 600,733 GJ of energy was produced at the power plant in 2020.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Petkim received a “22.7 – Moderate ESG Risk” rating from Sustainalytics.³⁹

Sasa Polyester Sanayi A.Ş.

SASA started its production in the polyester industry in 1966, and manufactures polyester, fiber, filament yarn, polyester-based polymers, special polymers and intermediate products. Incorporating Nobel, ICI and Dupont technologies, SASA has more than 4,300 employees. Its integrated production facilities and headquarters are located in Adana, and its raw material storage facility is located in Iskenderun.

Level of interaction with fossil fuel assets/ investments

Within the framework of environmental sustainability principles, the bottom sludge from the process of a company owned by SASA Polyester is incinerated in a licensed co-incineration facility to recover energy and reduce fossil fuel use.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

SASA Polyester aims to half its 2019 emissions by reducing its carbon emissions to 0.333 t-CO₂e/ton production by 2030.

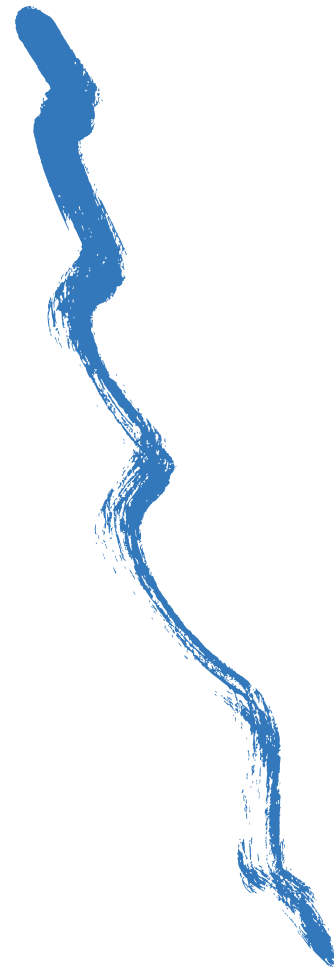
In addition, it aims to obtain the ISO 14064:2018 Greenhouse Gas Emissions Verification Certificate in 2022 to verify its 2021 data.

Clean energy investments

Within the scope of the Green Procurement Policy, SASA Polyester’s carbon emissions were reduced to 0.487 t-CO₂e/ton production in 2021 with the commissioning of new facilities with high energy efficiency and energy efficiency work, resulting in 27% improvement compared to 0.671 t-CO₂e/ton production in 2019.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Sasa Polyester received a “23.1 – Moderate ESG Risk” rating from Sustainalytics.⁴⁰



Tav Havalimanları Holding A.Ş.

TAV Airports was established in 1997 to develop and operate Istanbul Atatürk Airport. The company went through a restructuring process in 2006, and reorganized its “operation” and “construction” activities under TAV Airports Holding and TAV İnşaat. Following this restructuring, TAV Airports went public in February 2007. In May 2012, Groupe ADP became the majority shareholder of TAV Airports.

TAV Airports operates many airports in Turkey and abroad. Through its subsidiaries, TAV also operates in other areas of airport operations such as duty-free, catering, ground handling, informatics, private security, and commercial area management.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Electricity purchased at TAV Istanbul in 2017 increased due to malfunctions in its trigeneration facility, but carbon emissions per passenger decreased by 4% due to the increase in the number of passengers.

At TAV Ankara, on the other hand, the increa-

se in Scope 2 emissions caused an increase in the amount of emissions per passenger.

Clean energy investments

A trigeneration facility was commissioned at TAV Izmir in April 2016. As a result, Scope 2 emissions decreased in 2016 and 2017 compared to 2015. In 2016 and 2017, electrical energy emissions were included in Scope 1 as a result of trigeneration.

TAV Airports’s sustainability efforts also include:

- Airport Carbon Accreditation,
- Turkey’s First Carbon Neutral Airports,
- Carbon Footprint Calculation for Environmentally Friendly Flights.

ESG (Environmental, Social, Governance) and similar ratings

In ²⁰²², TAV received a “²³ – Moderate ESG Risk” rating from Sustainalytics. ⁴¹

Tekfen Holding A.Ş.

After its establishment in 1956, Tekfen Holding focused on basic construction and excavation works. In the following years, with more than 70 partners working in different sectors from contracting to milk production, from retail to aircraft operations, Tekfen Holding was reorganized into five main business lines through restructuring in 2000. Listed on the stock exchange under the BIST 30 and Sustainability Indices, Tekfen Holding operates with 39 companies and 13 subsidiaries in five key areas: Engineering and Contracting, Chemistry, Agricultural Production, Services, and Investment.

Level of interaction with fossil fuel assets/ investments

Tekfen Mühendislik, one of the group companies, continues to provide services across refinery, petrochemical facilities, terminals, fossil fuel, gas and renewable energy power plant projects.

Tekfen İmalat's main customer portfolio consists of international contracting companies, refineries, petrochemical, chemical and fertilizer plants, and domestic and foreign companies operating in LPG storage and distribution.

Target date for "Net Zero"

Information not available.

Carbon footprint and target date for "Carbon Neutrality"

Tekfen Holding set two Moderate and long-term targets for Scope 1 and Scope 2 emissions in 2020:

- Target 1: To reduce total Scope 1+2 emissions by 15% by 2025 compared to 2019.
- Target 2: To reduce total emissions by 40.2% by 2037 compared to 2019.

Although no concrete date has been set, Tekfen aims to become a carbon neutral group in the longer term.

Clean energy investments

With the filter investment made in the Nitric Acid Unit of Toros Tarım (a Tekfen Holding subsidiary) at its Mersin Plant, it aims to reduce emissions from N₂O by 80-85%. The project is still ongoing and is expected to be completed in 2023. Also, in 2020 at the Toros Tarım Samsun Plant, a controlled sulfuric acid feed was introduced to the gas cleaning system. With the changes made, natural gas consumption was reduced, 9,255 MWh of energy was saved, and 5,710 tCO₂e emissions were prevented.

While minimizing their operational emissions, Tekfen Group Companies completed 8 projects that contribute to emissions reduction in 2020. Thanks to these projects, 10,839 MWh of energy has been saved and approximately 7.4 million TL of financial savings have been achieved.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Tekfen Holding received a “26.0 – Moderate ESG Risk” rating from Sustainalytics. Tekfen Holding is also included in the BIST sustainability index.⁴²

Participating in the CDP Climate Change Program for the first time in 2017, Tekfen Holding received a rating of “A (-)” in the CDP Climate Change Program in 2019. In 2020, it joined the Global “A” List of CDP’s Climate Change and Water Security Programs.

Tofaş Türk Otomobil Fabrikası A.Ş.

Tofaş was founded in 1968 and continues its automotive production activities in Turkey with a workforce of nearly seven thousand today. Currently, 24.3% of its shares are traded on Borsa Istanbul. The remaining shares are controlled equally by Koç Holding and FCA Italy SPA. In addition, Tofaş’s publicly traded shares are included in the Borsa Istanbul Corporate Governance and Sustainability indexes.

Level of interaction with fossil fuel assets/ investments

As part of its transition to a low carbon economy and in fight against climate change, TOFAŞ is prioritizing work on energy efficiency in vehicles and alternative fuels.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

TOFAŞ’s target for 2024 is to reduce emissions by 33% compared to 2011, and it aims to be a carbon neutral facility in the long term.

Clean energy investments

In its transition to a low carbon economy and combat against climate change, Tofaş is focusing on 3 key areas:



- Reducing emissions from production activities,
- Increasing awareness of climate change and monitoring its emissions within its supply chain,
- Working on energy efficiency and alternative fuels in vehicles.

To this end, Tofaş’s emission reduction efforts constitute 21% of its R&D activities. By investing in energy efficiency in production facilities, greenhouse gas emissions originating from production are reduced. Similarly, efforts to ensure energy efficiency are prioritized in distribution operations.

In addition, efforts are being made to minimize emissions by providing energy savings through reduction of fuel consumption in vehicles. Solutions are being developed to ensure that less waste is generated by using resources more efficiently in the production of vehicles, as well as producing vehicles with lower emission values. This is in addition to reducing the amount of raw materials used per vehicle, in a way that does not risk vehicle safety.

Under the European Milkrun Project, the number of trips and emission values have been reduced by approximately 7%. Within the scope of Flow Improvement Projects, in addition to cost savings, a reduction of approximately 150 tons of CO2 emissions was achieved through annual savings of 58,250 nautical miles and 136,550 km of land journeys. In addition, thanks to the projects implemented in 2020 within the framework of the WCM Energy Management Methodology, 3,115 GJ of ener-

gy was saved and accordingly, approximately 3000 tons of CO2 emissions were avoided.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Tofaş Türk received a “28.0 – Moderate ESG Risk” rating from Sustainalytics.⁴³

TOFAŞ also received a “C” rating in the CDP Climate Change program and “B” rating in the Water program in 2020.



Turkcell İletişim Hizmetleri A.Ş.

With its inception in February 1994, Turkcell became Turkey's first GSM-based mobile communication operator. After signing a 25-year GSM license agreement with the Ministry of Transport in 1998, Turkcell started to provide GSM services across several countries internationally.

Turkcell became the first Turkish company to be listed on the New York Stock Exchange, following the sale of its shares in Borsa Istanbul in 2000. Turkcell is also included in the Borsa Istanbul Sustainability Index.

Level of interaction with fossil fuel assets/ investments

Turkcell is taking measures to reduce the carbon emissions of its vehicle fleet. For example, with a preference for hybrid vehicles, Turkcell aims to emit between 35 and 40 grams less CO₂ per kilometer, preventing approximately 960 tons of CO₂ emissions per year. In line with this, Turkcell replaced 677 diesel vehicles with hybrid vehicles in 2021. This resulted in the 12.7 g/km in 2020 falling to 9.1 g/km in 2021, thus reducing carbon emissions by 25%.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Turkcell aims to meet its electricity needs entirely from renewable sources by 2030. It also aims to be carbon-neutral by 2050.

Clean energy investments

Turkcell reported 74% and 2% emission reductions in Scope 1 and Scope 2 emissions, respectively, in 2021. Turkcell has also been calculating Category 3, Category 4, Category 5 and Category 6 emissions since 2021. Turkcell's greenhouse gas emission for 2021, which includes Direct and Energy Indirect Emissions, was calculated as 110,678 tons of CO₂e/Petabyte.

Thanks to the clean energy supply it provides to the Turkish grid, Turkcell prevents the release of 32.4 thousand tons of CO₂e emissions per year, and is also making various investments in solar energy. Turkcell produces 1.5 million kWh of electricity annually with its 900 kWp solar power plant established in the Turkish Republic of Northern Cyprus⁴⁴, which prevents the release of 676 tons of CO₂e emissions.

Turkcell's Ankara Data Center is the first data center in Turkey to generate its own electricity with solar panels. Thanks to next-generation solar energy panels, a portion of the electricity consumed is obtained from renewable sources. The data center building, which produces 380 thousand kWh of electricity annually, also prevents 171.34 tons of CO₂e greenhouse gas emissions per year.

Similarly, the solar energy project on the roof of the Turkcell Adana Plaza generates

electricity for the building. With the 70.3 thousand kWh electricity produced annually, approximately 31.7 tons of CO₂e greenhouse gas emissions are saved per year.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Turkcell received a “24.7 – Moderate ESG Risk” rating from Sustainalytics.⁴⁵

Turkcell has been evaluated by CDP since 2015. In 2020, it received a “B” rating from the CDP Climate Change Program. Over these years, the rating has fluctuated between “C-“ and “B”.



Türkiye Petrol Rafinerileri A.Ş.

Türkiye Petrol Rafinerileri, or TÜPRAŞ for short, produces petroleum products such as fuel products, bitumen, fuel oil, jet fuel, kerosene, LPG and motor oil. It was established as an umbrella company in 1983 by merging 4 state-owned oil refineries in Batman, İzmir, İzmit and Kırıkkale. . TÜPRAŞ was privatized in 2006 and transferred to the Koç Holding and Shell consortium. TÜPRAŞ has also owned 40% of the fuel retailer Opet since 2006, and holds a majority share (79.98%) in the shipping company, DİTAŞ.

Level of interaction with fossil fuel assets/ investments

Tüpraş has announced it will make new investments to diversify its activities, with the assumption that Turkey’s fossil fuel consumption will peak in 2030 and that diesel fuel will be partially replaced by hydrogen. In this context, in parallel with its Strategic Transformation Plan, Tüpraş will allocate a large part of its investments to new energy sources such as Sustainable Aviation Fuels, green hydrogen and zero-carbon electricity.⁴⁶

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

TÜPRAŞ has set emission reduction targets for Scope 1 and 2 emissions from production processes, with 2017 as the reference year. Accordingly, it aims to reduce emissions by 27% for 2030 and 35% for 2035.

In addition, it aims to reduce Scope-1 emissions from its activities by 45% in 2030.

TÜPRAŞ aims to become a carbon-neutral company by 2050.

Clean energy investments

In ²⁰²¹, a total of ⁶⁵ energy efficiency projects were implemented at TÜPRAŞ. Work on emissions reduction fall under four main headings:

- i. Use of clean fuels,
- ii. Reducing Nox emissions,
- iii. Reducing volatile organic emissions (VOC),
- iv. Recovery of gases from flares.

As a result of this work, ^{1,925} TJ of energy savings and ¹⁰⁷ thousand tons of CO² emission reductions have been achieved.

Prioritizing R&D in emission management, TÜPRAŞ has achieved an annual energy saving of ^{460,024} Gcal and a reduction of ^{106,708} tons of CO² emissions through energy efficiency projects.

Similarly, a total of ^{89,549} tons of emission reductions have been achieved through rapid recovery projects.

TÜPRAŞ’s first renewable energy project was commissioned at the Batman Refinery in ²⁰²¹.

TÜPRAŞ opts for sea and railway transportation where possible due to the high emissions of road transportation. It lowered emissions by approximately ^{3,000} tons of CO²e emissions in ²⁰²¹ compared to the previous year by using Körfez Transportation diesel locomotives.

ESG (Environmental, Social, Governance) and similar ratings

In ²⁰²², Tüpraş received a “^{34.5} – High ESG Risk” rating from Sustainalytics.⁴⁷



Türk Hava Yolları A.O.

Turkish Airlines (THY), headquartered in Istanbul and founded in 1933, is Turkey's national airline. Turkish Airlines' main field of activity is domestic and international passenger and cargo air transportation. As a member of Star Alliance, THY flies to a total of 324 destinations, 52 domestic and 272 international, as of the end of 2020.

THY has 6 subsidiaries and 12 joint ventures, and these subsidiaries are mainly companies providing services in the fields of maintenance, catering, ground handling and fuel supply. Originally established as a wholly state-owned enterprise, Turkish Airlines was privatized in 1990. Today, 50.88% of the Company's shares are publicly traded, and the remaining 49.12% of the shares held by the Privatization Administration of the Ministry of Treasury and Finance were transferred to the Turkey Wealth Fund by decree in 2017.

Level of interaction with fossil fuel assets/ investments

In pursuit of increasing the efficiency of aviation fuel, which constitutes 99.8% of its total greenhouse gas emissions, THY offset all 13,074 tons of carbon emissions caused by 4,151 tons of fuel consumed by 634 flights in Europe in 2020. It made a total of 11,962 EU General Allowance (EUA) payments for this.

In addition, with the Boeing 777F type aircraft

joining the Turkish Cargo fleet in 2018 and whose deliveries continue in 2020, 20% less emissions, 20% less environmental noise, and 15%-20% fuel savings have been achieved compared to previous generations of cargo aircraft with similar capacity and range.

Similarly, with the optimization of flight operations, dispatch, ground operations and aircraft technical maintenance activities, 22,760 tons of fuel were saved, and 71,695 tons of CO2 emissions were prevented.

Supporting sustainable biofuel R&D projects, THY also reduces emissions from flights by optimizing all flight routes and altitudes with the 4-D flight planning system.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Turkish Airlines is a member of IATA, and plans to halve the group's carbon emissions compared to 2005 by 2050.

Clean energy investments

THY has reduced greenhouse gas emissions by replacing steel brakes with carbon brakes in 30 aircraft. Other measures aimed at greenhouse gas emission reduction include the use of iPads instead of paper in the cabin; moving SKYLIFE magazine to digital only; the use of light nets and light pallets; the installation of sharklets (which also provides a 2-3% increase in fuel efficiency); and replacing luggage containers with composite containers.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Turkish Airlines received a "22.0 - Moderate ESG Risk" rating from Sustainalytics. Becoming part of the BIST sustainability index since 2015, Turkish Airlines participated in the CDP Climate Change Program for the first time in 2021.

Turkish Airlines also voluntarily participates in the performance assessments of international indexes and sustainability rating agencies such as DJSI, FTSE4Good, MSCI, EcoVadis and TPI.



Türk Telekomünikasyon A.Ş.

Türk Telekomünikasyon A.Ş. (Turk Telekom for short) was established by the state in 1995 to provide telecommunication services to Turkey following the separation of the postal and telecommunication services of the PTT, which was founded in 1840. As of January 2016, Türk Telekom has brought together mobile, internet, telephone and TV products and services under a single brand.

The Türk Telekom Group provides services in 81 provinces of Turkey with nearly 40 thousand employees, and began trading on Borsa Istanbul in May 2008. The current shareholding structure sees 60% of Türk Telekom shares held by the Turkish Wealth Fund and 25% held by the Ministry of Treasury and Finance. The remaining 15% of its shares are publicly traded.

Level of interaction with fossil fuel assets/ investments

Information not available.

Target date for “Net Zero”

Information not available.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

Information not available.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Türk Telekomünikasyon received a "23.3 - Moderate ESG Risk" rating from Sustainalytics.⁴⁹

Türkiye Şişe Cam Fabrikaları A.Ş.

Şişecam was established by İşbank in 1935 to meet Turkey's basic glass product needs, and today is a global player in key areas of the glass industry such as flat glass, glassware, glass packaging, automotive glass, glass fiber, and soda and chromium compounds.

Şişecam is the only global manufacturer operating in the three main areas of the glass industry: flat glass, glassware and glass packaging. Şişecam also has a presence in mining, energy and recycling business lines. With production operations in 14 countries on four continents and approximately 24,000 employees, it sells in more than 150 countries around the world.

Level of interaction with fossil fuel assets/ investments

ŞİŞECAM is carrying out design development work for next-generation all-electric and hybrid furnaces aimed at reducing fossil fuel consumption and energy efficiency.⁵⁰

Target date for “Net Zero”

After announcing its “2022-2030 Care For Next” strategy in 2021, ŞİŞECAM set a zero carbon target for the year 2050 in line with the SBTi.

Carbon footprint and target date for “Carbon Neutrality”

ŞİŞECAM aims to reduce the greenhouse gas emissions from glass production facilities in Turkey and abroad by 5% compared to 2017, and to reduce the annual specific energy consumption by 2% compared to 2017.

Clean energy investments

ŞİŞECAM is diversifying its energy efficiency efforts to reduce greenhouse gas emissions within the scope of the "PROTECT the Planet" philosophy included in its CareForNext 2030 strategy. With projects carried out in 2021, savings of approximately 58 million TL were achieved while reducing greenhouse gas emissions by 5%.

As one of the components of its emission reduction targets, ŞİŞECAM also aims to increase the use of renewable energy by 8 times by 2030, and to reach a renewable energy generation capacity of 53 MW, particularly for the electricity consumption in its factories.

ŞİŞECAM purchases the green electricity used at its headquarters under a Renewable Energy Certificate (I-REC) to support the green transformation in electricity generation, and aims to roll this out everywhere it operates.

With the transition to hybrid furnace technologies using electric melting furnace technology, ŞİŞECAM plans to invest in the use of green electricity in energy-intensive processes, and by making use of this technology, it plans to reduce emissions by 70-80% in glass melting. Currently, the amount of energy consumed in glass melting processes has decreased by around 15% in the last 20 years.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Turkey Bottle and Glass Factories received a "32.9 - High ESG Risk" rating from Sustainalytics.⁵¹

Turkey Bottle and Glass Factories have been assessed by CDP since 2011. ŞİŞECAM also participated in the CDP Supply Chain Program in 2012.

Vestel Elektronik Sanayi ve Ticaret A.Ş.

With its production facilities located in Manisa, Vestel started its activities in 1984. After Vestel Elektronik A.Ş. joined Zorlu Holding, the Vestel Group of Companies was established in 1994. It has production and marketing companies operating in the information technologies, defense industry, and electricity and electronics sectors.

Level of interaction with fossil fuel assets/ investments

As a result of giving more space to domestic alternative sources in 2021, a total of 12,000 air kilometers, and approximately 1,000 land kilometers were covered by domestic fuel. This achieved a reduction of approximately 2 tons of carbon emissions.

Target date for “Net Zero”

Vestel Beyaz Eşya aims to become a net zero company across the entire value chain by 2050, in order to achieve net zero emissions, particularly in its operations.

Carbon footprint and target date for “Carbon Neutrality”

Information not available.

Clean energy investments

Thanks to energy efficiency projects, Vestel Elektronik prevented 3,131 tons of carbon emissions. For example, it plans to produce 230 MWh of energy annually with the 142 kWp solar panel array installed on the roof of its facility, which will distribute energy to its refrigerator and washing machine factories.

Making a commitment to set a Science Based Target initiative (SBTI), Vestel Elektronik has also started a detailed data collection process to calculate Scope 3 emissions. As part of this process, it plans to decarbonisation both operations and the value chain.

ESG (Environmental, Social, Governance) and similar ratings

In 2022, Vestel Elektronik received a "25.6 - Moderate ESG Risk" rating from Sustainalytics. Vestel became a signatory to the United Nations Global Compact in 2021.⁵²

Vestel Elektronik has been reporting to the Carbon Disclosure Project (CDP) since 2012 and achieved a rating of “C” in the Climate Change and Water Program in 2020.



Conclusion

For Turkey to reach its net zero target by 2053, which was announced as the official target in 2021, the entire economy, from industry to services, must be decarbonised. In the coming years, we will see what kind of road plan will be implemented by the State and which legal regulations will be introduced to achieve this goal. We see that messages taken by other countries seeking to achieve similar goals, such as carbon tax, green taxonomy and the prioritization of green products are likely to be taken up in Turkey in the short term. We also anticipate that the dynamics of the investment environment will change as a result of taxing carbon emissions and encouraging low- or zero-carbon production. Statements by state officials at the ministerial level also indicate that such legislation is being developed.⁵³

On the other hand, Turkey and its companies are struggling with a historical current account deficit problem and rely on export revenues. However, with the Carbon Border Adjustment Mechanism (CBAM) introduced by the EU, which will impact more than half of Turkey's exports, it will be subject to carbon tax long before the country's domestic legislation on taxing carbon is implemented.

To understand how the country's economy will be affected by these developments, as representatives of their respective sectors, the sustainability and decarbonization positions and plans of the BIST 30 companies are likely to provide insight into the general economy.

Four companies that will be directly affected by the EU Carbon Border Adjustment Mechanism are notable. Erdemir and Kardemir op-

erate in the iron and steel sector, while Gübretaş and Hektaş operate in the fertilizer sector. In addition to these companies, Koç Holding, Sabancı Holding and Tekfen Holding are also expected to be indirectly affected by the CBAM through their group companies, subsidiaries and affiliates.

Only six of the 25 companies analyzed (Arçelik, Sabancı Holding, Aselsan, Vestel, Şişecam and Pegasus) have target dates for net zero, while 11 companies have target dates for carbon neutral (Arçelik, THY, Ford Otomotiv, Sasa Polyester, Aselsan, Turkcell, Tekfen, Tofaş, TÜPRAŞ, Pegasus and Koç Holding).

As can be seen from the table in Annex-1, there are only two companies with low ESG scores, while 12 companies are considered moderate risk. The number of companies with high- and seriously high-risk ESG scores is 11. Within the index (excluding Banking) 44% of companies are rated high and seriously high risk, while only 8% are considered low risk.

Therefore, the biggest lack of these companies is that they have not yet set or shared with the public their relevant targets to support the country's target for 2053.

It is naturally expected that these companies, which shape the Turkish economy with their size, will announce their goals and detailed business plans according to these goals in order to see their leadership in creating economic value in the fight against the climate crisis, which concerns the future of the country and the world. For this reason, while forming expectations for 2023, the announcement of a detailed strategy and business plan by these organizations regarding their approach to climate change in 2023 will both give confidence in achieving the country's goals and serve as a guide for other companies.

Annex-I: BIST 30 Companies ESG Scoreboard

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Arçelik	arclk	2050	2050	12,8	Low ESG Risk

Company activities: Arçelik Anonim Şirketi (Arçelik or the Company) and its subsidiaries and affiliates (Group) carry out all commercial and industrial activities related to production, marketing, sales and after-sales customer services, export and import in the fields of durable consumption and consumer electronics.

Company sector: MANUFACTURING / METAL GOODS MACHINERY ELECTRICAL DEVICES AND TRANSPORTATION VEHICLES

Notes: It is committed to achieving net zero emissions in the value chain by 2050. The first Turkish industrial company to be included on the Global A List of the Carbon Disclosure Project (CDP) twice.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Sabancı Holding	sahol	2050	-	13,9	Low ESG Risk

Company activities: FINANCIAL INSTITUTIONS / HOLDINGS AND INVESTMENT COMPANIES

Company sector: FINANCIAL INSTITUTIONS / HOLDINGS AND INVESTMENT COMPANIES

Notes: A Net Zero Emission and Zero Waste target by 2050 at the latest has been set across all operations.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Türk Hava Yolları	thyao	-	2050	22	Moderate ESG Risk

Company activities: TRANSPORTATION, COMMUNICATIONS AND STORAGE / TRANSPORTATION / AIR TRANSPORT

Company sector: TRANSPORTATION AND STORAGE / TRANSPORTATION AND STORAGE

Notes: Plans to reduce the carbon emission of IATA, of which it is a member, by half compared to 2005 by 2050.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Ford Otomotiv	froto	-	2024, 2040	22,2	Moderate ESG Risk

Company activities: Manufacture, assembly and sale of motor vehicles, especially commercial vehicles; import and sale of passenger vehicles; and production, import and sale of spare parts for these vehicles.

Company sector: MANUFACTURING / METAL GOODS MACHINERY ELECTRICAL DEVICES AND TRANSPORTATION VEHICLES

Notes: It is predicted that by 2024, there will be zero emission models across the entire commercial vehicle portfolio. A target of reducing emissions from heavy commercial fleet vehicles to zero by 2040 has also been set. Ford Otosan kept its B rating in the Carbon Disclosure Project (CDP) Climate Change and Water Programs in 2021. It is also received an A- rating in the CDP Supplier Assessment.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Petkim	petkm	-	-	22,7	Moderate ESG Risk

Company activities: Establishing and operating domestic and foreign factories, facilities in petrochemical, chemical and other industrial fields.

Company sector: MANUFACTURING / CHEMICAL PHARMACEUTICAL PETROLEUM TIRE AND PLASTIC PRODUCTS

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Sasa Polyester	sasa	-	2030	23,1	Moderate ESG Risk
Company activities: Artificial Synthetic Fiber Manufacturing.					
Company sector: Artificial Synthetic Fiber Manufacturing.		Notes: Aims to reduce the carbon emissions to 0.333 t-CO2e/ton production in 2030 - a 50% reduction compared to 2019.			

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Türk Telekom	ttkom	-	-	23,3	Moderate ESG Risk
Company activities: Within the framework of the relevant legislation and regulations of the authorized institutions and through the necessary permits, without prejudice to the provisions of Radio Law No. 2813, establishing telecommunication facilities and infrastructure that enables receiving and transmitting all kinds of symbols, sounds, texts, pictures, information, images and signs between different points over fiber, wire, wireless, optical, electrical, magnetic, electromagnetic, electrochemical, electromechanical or any other systems; and providing all kinds of telecommunication services (including new generation services), including the operation and use of all varieties of technology, with the resources allocated and/or to be allocated to it.					
Company sector: INFORMATION AND COMMUNICATION / TELECOMMUNICATION					

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Emlak Konut	ekgyo	-	-	23,6	Moderate ESG Risk
Company activities: REAL ESTATE INVESTMENT TRUST					
Company sector: FINANCIAL INSTITUTIONS / REAL ESTATE INVESTMENT TRUSTS					

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Aselsan	asels	2050	2022	23,8	Moderate ESG Risk
Company activities: WITHIN THE SCOPE OF LAND, AIR, SEA AND SPACE APPLICATIONS FOR ALL KINDS OF INSTITUTIONS AND CONSUMERS, ESTABLISHED TO PROVIDE RESEARCH, DEVELOPMENT, ENGINEERING, MANUFACTURING, TESTING, INSTALLATION, INTEGRATION AND SELLING, AFTER SALES SERVICE, TRADE, PROJECT ENGINEERING CONSULTANCY, SERVICE, TRAINING, CONTRACTING, AND COMMERCIAL SERVICES IN RELATION TO ALL KINDS OF ELECTRICAL, ELECTRONIC DEVICES, SYSTEMS, SOFTWARE, TOOLS AND PLATFORMS ON MICROWAVE, ELECTROOPTICS, GUIDANCE, COMPUTER, INFORMATICS, CRYPTOLOGY, SECURITY, MECHANICS, CHEMISTRY AND SIMILAR AREAS.					
Company sector: TECHNOLOGY / DEFENSE		Notes: ASELSAN, which has been included in the Carbon Disclosure Project (CDP) since 2012, increased its B rating to A- in 2019 as a result of the activities it carried out in the field of carbon emissions throughout 2018. It participated in the CDP Water Report for the first time and received an A- rating score, and also received an A- score in the CDP Climate Change Supply Chain Management. In 2021, it was among the 8 companies in the "CDP Turkey Climate Change Leaders" classification.			

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
TAV Havalimanları	tavhl	-	-	23,9	Moderate ESG Risk
Company activities: DOMESTIC AND OVERSEAS AIRPORT TERMINAL MANAGEMENT AND TERMINAL SERVICES					
Company sector: FINANCIAL INSTITUTIONS / HOLDINGS AND INVESTMENT COMPANIES					

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Turkcell	tcell	-	2030-2050	24,7	Moderate ESG Risk

Company activities: Established to provide all kinds of telephone and telecommunication and similar services and to carry out activities within the scope of authorization regarding IMT-2000/UMTS services and infrastructures as stipulated in the GSM Pan-European Mobile Telephone System tender signed with the Ministry of Transport and in accordance with Telegraph and Telephone Law No. 406.

Company sector: INFORMATION AND COMMUNICATION / TELECOMMUNICATION

Notes: it aims to meet its electricity requirements completely from renewable sources by 2030. It also aims to become carbon-neutral by 2050. Turkcell has been evaluated by the CDP since 2015. Its CDP Climate Change Program rating was B in 2020, though this has ranged from C- to B since 2015.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Vestel	vestl	2050	-	25,6	Moderate ESG Risk

Company activities: The company and its subsidiaries carry out production and commercial activities in the fields of consumer electronics and white goods, including production, marketing, sales and after-sales services.

Company sector: MANUFACTURING / METAL GOODS MACHINERY ELECTRICAL DEVICES AND TRANSPORTATION VEHICLES

Notes: In order to reach net zero emissions, it aims to be a net zero company across the entire value chain by 2050. Participating in Carbon Disclosure Project (CDP) since 2012, Vestel Elektronik's Climate Change and Water Program rating for 2020 was C.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Tekfen Holding	tkfen	-	2025-2037	26	Moderate ESG Risk

Company activities: Holding Activity

Company sector: FINANCIAL INSTITUTIONS / HOLDINGS AND INVESTMENT COMPANIES

Notes: It aims to reduce total Scope 1+2 emissions by 15% by 2025 compared to 2019, and by 40.2% by 2037 compared to 2019.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Tofaş	taoso	-	2024	28	Moderate ESG Risk

Company activities: Automotive Sector

Company sector: MANUFACTURING / METAL GOODS MACHINERY ELECTRICAL DEVICES AND TRANSPORTATION VEHICLES

Notes: Compared to 2011, it aims to reduce emissions by 33% by 2024 and to be a carbon neutral facility in the long term.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Bim	bimas	-	-	30,3	High ESG Risk

Company activities: Retail sale of a wide range of goods outside food products, beverages or tobacco products

Company sector: WHOLESALE AND RETAIL TRADE / RETAIL TRADE

Notes: Within the scope of sustainability targets, it aims to reduce greenhouse gas emissions (kgCO₂e/m²) by 20% by 2026 compared to 2019.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Hektaş Ticaret	hekts	-	-	30,2	High ESG Risk
Company activities: WHOLESALE AND RETAIL TRADE / RETAIL TRADE					
Company sector: MANUFACTURING / CHEMICAL PHARMACEUTICAL PETROLEUM TIRE AND PLASTIC PRODUCTS					

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Şişecam	sise	2050	-	32,9	High ESG Risk
Company activities: The company establishes auxiliary and complementary activities that directly or indirectly relate to all kinds of glass, glassware and the glass industry (and/or substitute industry), takes the necessary measures for their development, and operates them.					
Company sector: FINANCIAL INSTITUTIONS / HOLDINGS AND INVESTMENT COMPANIES		Notes: A zero carbon target has been set for 2050. It aims to reduce greenhouse gas emissions in glass production facilities in Turkey and abroad by 5% compared to 2017, and to reduce the annual specific energy consumption by 2% compared to 2017.			

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Karabük Demir Çelik	krdmd	-	-	33,8	High ESG Risk
Company activities: The actual field of activity is specified in article 3 of the articles of association, and the main field of activity is the production and sale of all kinds of raw iron and steel products, coke and coke by-products.					
Company sector: MANUFACTURING / BASE METAL INDUSTRY		Notes: On the 100th anniversary of its establishment, it made its goal of being a sustainable and carbon-neutral company public.			

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Tüpraş	tuprs	-	2030, 2035, 2050	34,5	High ESG Risk
Company activities: Provided that the necessary permits, licenses, etc., are obtained from the relevant institutions and organizations in accordance with the legislation to which the company is subject, established to procure and refine all kinds of crude oil, petroleum products and chemical products, and to carry out all kinds of commercial activities, including export, of produced and imported crude oil, petroleum and chemical products, as well as storage and transportation activities during production and sales, and all kinds of activities related to energy production.					
Company sector: MANUFACTURING / CHEMICAL PHARMACEUTICAL PETROLEUM TIRE AND PLASTIC PRODUCTS		Notes: It aims to reduce emissions by 27% in 2030 and 35% in 2035. It also aims to reduce Scope-1 emissions from activities by 45% in 2030. In addition, it aims to become a carbon-neutral company by 2050.			

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Pegasus	pgsus	2050	2030	36,8	High ESG Risk
Company activities: The company was established to carry out all kinds of air transportation works domestically and overseas and its main purpose and subject are as follows...					
Company sector: TRANSPORTATION AND STORAGE / TRANSPORTATION AND STORAGE		Notes: In order to reinforce its commitment to net zero, Pegasus has set an interim target for 2030, and aims to reduce its flight-related carbon emissions per passenger kilometer by 20% by 2030 compared to 2019. Included in the BIST Sustainability Index, Pegasus is also evaluated by the CDP. While it received a rating of B- in the preceding 5 years, in 2020 it received a rating of A-.			

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Ereğli Demir Çelik	eregl	-	-	38,8	High ESG Risk

Company activities: Purchasing, renting or otherwise acquiring immovables with all rights related to their use, directly or indirectly related to the purpose and subject of the Company, including pledging and leasing, and selling surplus immovables. To build, buy and operate, independently or through partnerships, all the necessary or related installations and equipment for the production of iron and steel rolled products of all types, qualities and sizes, alloyed or pure iron, steel and pig castings, casting and press products, and the inputs and by-products required for their production.

Company sector: MANUFACTURING / BASE METAL INDUSTRY

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Koç Holding	kochol	-	2050	44,9	Serious ESG Risk

Company activities: Established to facilitate the establishment of various companies or to participate in their capital, and to increase the success of these companies that it has established or in any other way participated in its management, to ensure that they are managed profitably, efficiently and in accordance with the conditions of the day, and to reduce the financial burden of these services by arranging common service areas.

Company sector: FINANCIAL INSTITUTIONS / HOLDINGS AND INVESTMENT COMPANIES

Notes: Ford Otosan, one of its holding companies, aims to reach net zero emissions by 2050. It also committed to reducing carbon emissions per vehicle by 55% by 2030 and to zero emissions in trucks by 2040, as part of its medium-term goals.

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Koza Madencilik	kozaa	-	-	48,1	Serious ESG Risk

Company activities: MANUFACTURING INDUSTRY MINING

Company sector: MINING AND QUARRY / METAL ORE MINING

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Koza Altın	kozal	-	-	50,3	Serious ESG Risk

Company activities: All types of mineral exploration, requesting and acquiring exploration and operating licenses and mining concessions, or taking over or transferring them. Extracting all kinds of minerals, any kind of mining, operating mines, preparing ores, extracting, enriching, liquidation, flotation roasting, execution, all kinds of mine smelting, grinding metal, reshaping, obtaining metal and establishing related industrial facilities. All activities written in Article 3 titled Purpose and Subject published in the T.T. Registry Gazette.

Company sector: MINING AND QUARRY / COAL AND LIGNITE MINING

Company	Stock code	Target date for net zero	Target date for carbon footprint and carbon neutral	ESG score	ESG rating
Gübre Fabrikaları	gubrf	-	-	55,1	Serious ESG Risk

Company activities: Chemical Fertilizer Production and Sales

Company sector: MANUFACTURING / CHEMICAL PHARMACEUTICAL PETROLEUM TIRE AND PLASTIC PRODUCTS

Annex-II: Water Management, Air Management and Waste Management Projects

In addition to the activities carried out/planned to be carried out in the fields of energy management and emission management, several companies in BIST 30 already have sustainability projects in water management, air management, and environment and waste management. More detailed information in these areas is provided on a per-company basis below.

ARÇELİK A.Ş.

In the last 12 years, Arçelik has saved 2.17 million m³ of water, which is equivalent to the daily water consumption of approximately 2.7 million households. In 2021 alone, it saved a total of 197,373 m³ thanks to water efficiency and rainwater harvesting projects.

There are also two important targets for 2030 within the scope of water management. The first is to reduce water consumption per product by 45% in all production facilities compared to 2015; the other is to increase the water recycling and reuse rate to 70% in all production facilities.

Within the scope of waste management, Arçelik aims to increase its waste recovery rate in global operations from 96% in 2021 to 99% by 2030. In terms of waste reduction projects, it has also reduced its waste production, which was 10.2 tons/TRY million in 2016, to 3.1 tons/TRY million in 2021.

Arçelik has two targets for the year 2030 regarding the use of plastics: increasing recycled plastic content to 40% and increasing bio-based material content ratio to 5%.

ASELSAN ELEKTRONİK SANAYİ VE TİCARET A.Ş.

With the Zero Waste Practice introduced in the last quarter of 2019, ASELSAN is implementing efforts to reduce its environmental impacts at its Macunköy, Akyurt I, Akyurt II and Gölbaşı campuses within the scope of the ISO 14001:2015 Environmental Management System. Separation was applied to a total of 1,806,076 kg of waste across the campuses in 2021.

Within the scope of the Zero Waste Project, the use of paper cups in all ASELSAN campuses was terminated in January 2020, and approximately 150 tons of waste has been reduced so far.

With its Zero Waste Project, the 15% target for a year-on-year reduction in total waste set for 2021 was also achieved. Analyzing the added value provided by the Zero Waste Project to the environment in 2021, ASELSAN reported that 7,732 trees were planted, 2,971,696 kWh of energy was saved, and 2,518 barrels of oil were saved through Zero Waste Principles.

In addition, projects were carried out aiming to reduce the amount of hazardous waste by 1% year-on-year, and the targeted 1% reduction by the end of 2021 was achieved. In this framework, efforts continue to maintain the reduction of hazardous waste by 1% year-on-year in 2022.

Within the scope of water management, ASELSAN carries out awareness-raising activities to increase water savings. In 2021, 48,705 m³ of water was discharged from Macunköy chemical wastewater treatment plant and 38,418 m³ of water from was discharged Gölbaşı biological treatment plant.

ASELSAN, which has moderate- and moderate-to-long-term water management objectives of 5 years and 10-15 years, also made changes to its pure water production system in order to increase its capacity in 2020. As a result of these changes, wastewater efficien

cy increased by 40% compared with the old system. In addition, efficiency in energy consumption for cooling water was increased by approximately 70%.

BİM BİRLEŞİK MAĞAZALAR A.Ş.

Within the scope of Packaging and Waste Management work carried out by BİM, 266 tons of plastic and 75 tons of paper were saved in 2021. As of 2021, approximately 7,600 stores have received Zero Waste certificates, and the application and approval processes for the remaining stores are ongoing. The proportion of waste to turnover was 0.50%. In addition, an annual efficiency saving of 341 tons was achieved in packaging and waste management resource consumption, while reaching financial savings of approximately 8 million TL.

In terms of water management, BİM consumed approximately 648,908 m³ of water in 2021. In addition, in parallel with the 16% increase in the number of employees in 2021, it reported an increase in water consumption of 33%.

EMLAK KONUT GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş.

As part of its efforts to keep its environmental footprint to a minimum, Emlak Konut has collected a total of 45,533 tons of recyclable waste since 2019, including glass, paper, plastic and metal.

Emlak Konut's post-2022 goals include the establishment of a zero-waste system by installing waste collection equipment in all the parcels it develops, in accordance with the Zero Waste Regulation.

Within the scope of Waste Management, with the "Zero Waste System" installed in the company building, throughout 2021:

- 6.3 tons of raw materials were saved from metal and glass recycling,
- With the separation of waste paper, 210 tons of trees were saved,

- With the recycling of waste plastics, approximately 4,000 liters of oil were saved. As a result of this system, the release of 2,440 kg of greenhouse gas emissions were prevented for the year.

According to the data shared within the scope of Water Management, and average 9,890 m³ water was consumed in its service buildings in 2021. Under the project implemented by Emlak Konut since 2016, approximately 300 tons of water have been saved annually. In addition, within the scope of the project, the need for mains water was reduced by 30% on average with the establishment of gray water and rainwater harvesting systems, and an average of 6.5 million TL worth of water is saved through the treatment of 1,162,500 m³ of gray water annually.

Emlak Konut aims to contribute to the sustainable management of water resources by reducing the need for mains water by 50% in total by the end of 2023, and by developing buildings where water is used more efficiently, and waste is prevented.

EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş.

Erdemir is striving towards a zero-waste approach, and in addition to reducing waste at its source as much as possible, it also implements recycling techniques and conducts waste disposal activities in a way that does not harm the environment. Erdemir reports a waste recycling rate of 89% and a disposed waste rate of 11%.

Within the scope of its Zero Waste Policy, Erdemir also:

- Collected 56.6 tons of waste paper, saving 963 trees;
- Collected 71.9 tons of waste plastic, saving 415,612 kWh of energy;
- Collected 88.7 tons of metal waste, saving 108.8 tons of raw materials.

Environmental performance indicators showed that while the amount of energy re-

covery from waste heat was 835,652 MWh at Erdemir, the total amount of water recovered in its Mining Metallurgy Companies was 1.098 million m³.

Erdemir also contributes to the circular economy by selling 100% of its blast furnace slag to cement plants and provides the steelwork's slag for use on highways. Similarly, in 2021, Erdemir sold 40% of its 20,000 tons of hazardous waste, bringing it back to the economy. Erdemir also brought 89.1% of 1.8 million tons of waste into the economy through internal recycling and external sales in 2021, and achieved financial savings of US\$ 15 million by using 347,522 tons of waste material as input.

FORD OTOMOTİV SANAYİ A.Ş.

Within the scope of the Circular Economy, Ford Automotive aims to reduce the use of natural resources and waste generation. It also aims to reuse waste as a by-product or raw material and to use secondary recycled materials.

Supporting the "Zero Waste" initiative started by the Ministry of Environment and Urbanization, all facilities of Ford Automotive hold a Zero Waste Certificate. With its ongoing efforts to raise awareness about waste separation, the company aims to reduce single-use plastics by using alternatives and reducing use in the packaging of products and raw materials from its suppliers. It also aims to switch to environmentally friendly products through the Green Packaging Project launched in 2020. Ford Otosan started process improvement work with six different suppliers in the first three months of 2021, and aims to save all packaging materials from becoming waste through this project. It also aims to reduce Scope 3 emissions arising through the circular economy and plastic production, in partnership with its suppliers.

Ford Otosan also carries out projects to reduce water consumption resulting from operati-

ons in order to protect water resources, and it reduced its water consumption in 2021 by 3.53% compared to 2019.

HACI ÖMER SABANCI HOLDİNG A.Ş.

According to water management data, Sabancı Group's total water consumption was 10.1 million m³ in 2020, while the amount of discharged water was 3.5 million m³. In 2020, the rate of water recycled back into the economy through methods such as recycling and reuse was 19% across the Group.

In addition, Sabancı Holding's vision is to become Zero Waste by 2050 at the latest, and it reduced its year-on-year waste production to 0.30 in proportion to its combined net sales revenues in 2020. Again in 2020, it reported that the rate of waste recycled into the economy through activities such as reuse and recycling was 87%.

The Group, which is also a member of the Business Plastics Initiative initiated by the Sustainable Development Association (SKD), has made a commitment to reduce the consumption of single-use plastics in certain categories by 100% across its offices by 2024.

KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş.

In 2021, a total of 22.1 million m³ of fresh water was consumed in production activities. While water withdrawal decreased compared to 2020, the water drawn per ton of crude steel produced compared to the last two years decreased to 7.06 m³/ton crude steel.

Through the water efficiency projects carried out at Kardemir, 584 million m³ of water was recovered in 2021.

Within the framework of waste management principles, approximately 319 thousand tons of raw materials were recycled in 2021.

Again in 2021, a total of 1,372,000 tons of solid waste was generated in Kardemir's operations, and 99.9% of the generated waste was recyc

led or reused in production processes. In terms of wastewater management, in 2021, 15,103,710 m³ of wastewater was discharged after reaching quality norms specified by legislation.

KOÇ HOLDİNG A.Ş.

Koç Group's waste recovery rate in 2020 was 96%, the same rate as the previous year.

Koç Holding also manages water risks to ensure an equitable and safe water supply, and consumption decreased from 137 m³/million TRY in 2019 to 113 m³/million TRY in 2020.

PEGASUS HAVA TAŞIMACILIĞI A.Ş.

In terms of waste management, the total amount of waste produced by Pegasus increased in 2021 compared to the previous year, amounting to 221.7 tons.

On the other hand, the amount of electronic waste (e-waste) decreased significantly in 2021, halving to 269 kg.

Waste recycling and reuse rates remained at 99% in 2021.

In terms of water management, when combining all main airports and company headquarters, the total amount of water discharge was 9,986 m³.

PETKİM PETROKİMYA HOLDİNG A.Ş.

Petkim's water consumption per raw material charge was 10.63 m³/ton in 2020, while its wastewater discharge was 7.09 million m³. With the Blowdown Optimization Project implemented to increase water efficiency, it also aims to save 68 ktms of water by reducing 11 ktms of CO₂ emissions per year.

Petkim's total amount of hazardous and non-hazardous waste produced is approximately 50 tons per year, and it states it recovers 53.83% of the waste.

In line with the Circular Economy approach

and Zero Waste principle, the renewal of the Petkim waste management system infrastructure in 2020 has also resulted in a decrease in emissions. Air emissions per charge (on Nox basis) decreased to 1,830 kg/ton in 2020.

SASA POLYESTER SANAYİ A.Ş.

After obtaining a Zero Waste Certificate in 2020, SASA produced 5,625 tons of steam in 2021 with the biogas generated in its existing wastewater treatment plant.

In addition, it aims to produce 118,000 tons/year of steam from biogas by 2025.

It also predicts that feasibility studies for the recovery of waste heat generated in the processes will be completed by 2025.

With the wastewater treatment plant and recycling plant under construction, it aims to achieve 55-60% water recovery by 2025.

At SASA's PTA facility, targets include 75% less wastewater discharge, 65% less greenhouse gas emissions and 95% less solid waste generation compared to conventional PTA facilities. Priorities in work on water consumption include:

- Recycling 7,884,000 m³ of water annually with an Integrated Recovery Unit to be installed in the PTA facility,
- Performing water treatment and biogas recovery simultaneously through EGSB (Extended Granular Sludge Bed), one of the advanced treatment technologies used at the PTA facility,
- Anaerobically treating wastewater in biobased EGSB reactors using the MBBR (Moving Bed Biofilm Reactor) process, which is an advanced biological treatment method.

TAV HAVALİMANLARI HOLDİNG A.Ş.

The water requirements of the buildings at TAV Istanbul are met from well water. It reported that water consumption decreased by 4% in 2017.

In TAV İzmir, on the other hand, water needs are met from mains water. Again in 2017, the water consumption here decreased by 8%.

In addition, well water is also used in TAV Ankara, and city mains water is used where needed. In 2017, there was a 3% increase in water consumption in Ankara, in contrast to other provinces.

In terms of the amount of waste generated, this decreased by 38% in 2016, though there was an increase of 20% in 2017. TAV Holding disposes of 87% of its waste through landfill.

TEKFEN HOLDİNG A.Ş.

Within the scope of water management, the amount of reused water reached 3762 megalitres in 2020.

The waste recovery projects and project outputs carried out by Tekfen Tarım (one of the Tekfen Holding companies that support the Zero Waste Campaign) are as follows:

- With the Agripark Zero Waste Project, a total of 272 tons of vegetable waste has been recovered in the last 2 years.
- With the Agripark Compost Project, a total of 3,390 kg of organic waste has been converted to date, and a total of 641 kg of compost has been obtained.
- With the Nevşehir Potato Seed Warehouse Project, the waste rate, which was 6.52% in 2019, decreased to 5.6% in 2020.
- The Innovative Agricultural Production with New Technologies Project is being implemented in cooperation with TürkTraktör and Doktor.

TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş.

Water consumption in the production processes water fell from 1,073,626 m³ in 2018 to 929,882 m³ in 2019. Water consumption per vehicle, which was 3.55 m³ in 2018, fell to 3.33 in 2019.

Water consumption in production activities fell from 1,073,626 m³ in 2018 to 788,444 m³ in 2020. Water consumption per vehicle, which was 3.55 m³ in 2018, fell again to 2.98 in 2020.

Achieving the "Zero Waste Certificate" issued by the Ministry of Environment and Urbanization, Tofaş recovered 60.57 million m³ of water in 2020 with its Zero Waste Management System, and discharged 510 thousand m³ of wastewater.

As per material and waste management data, the total amount of waste per vehicle of Tofaş was 3.06 kg in 2020.

TURKCELL İLETİŞİM HİZMETLERİ A.Ş.

Under YEK-G, Turkcell boasts 100% renewable energy consumption, and it recycles 100% of its waste, backed by a zero-waste certificate.

Turkcell purchased carbon credits to neutralize carbon emissions arising from its 2021 Integrated Annual Report.

Also in 2021, Turkcell made public that thanks to users of the "Dergilik" application, nearly 103 thousand trees had been protected, leading to a reduction in carbon emissions.

TÜRKİYE PETROL RAFİNERİLERİ A.Ş.

Although Tüpraş realized a total water consumption of 26.3 million m³ in its operations in 2021, water consumption per unit of refined crude oil was reduced by 22% compared to the previous year.

With its wastewater recycling investments and water efficiency projects, savings equivalent to the annual water consumption of a city with a population of 2.5 million have been achieved over the last five years. Tüpraş implements the following water-saving measures:

- Recovery of refinery and urban wastewater streams through a Wastewater Recovery Unit,
- Reuse of recovered wastewater in production units,
- Reduction of natural resource consumption in refineries by optimizing cooling tower water demand,
- Reuse of condensed steam streams as a water source.

Continuing to work with a circular economy approach to waste management, TÜPRAŞ increased its waste recovery rate to 85% in 2021 through its work in industrial symbiosis and recycling, and by bringing waste are into its circular economy.

TÜRK HAVA YOLLARI A.O.

Within the scope of its 2021 environmental targets, THY announced its target of reducing water consumption per employee by 2% compared to the previous year. However, this target could not be reached due to a relocation, and given the different consumption characteristics of its new building. The same target was revised to 5% for 2022.

Another target was to provide environmental and waste management training to at least 3,000 employees. Currently, the target has been achieved, and the number has been increased for 2022. It aims to continue training at least 3,800 employees.

Observing an increase in per capita water consumption in 2021 compared to previous years, THY consumed a total of 255,238 m³ of water throughout the year.

In 2021, 237,418 m³ of wastewater generated in Turkish Airlines operations was discharged into wastewater channels.

During the reporting period, a total of 1,608 tons of waste was generated in Istanbul and other domestic locations. 1,449 tons of the

waste was non-hazardous, 53.5 tons was packaging waste, and 105 tons was hazardous waste. Since only 0.5 tons was classed as non-recoverable medical waste, it was disposed of through licensed companies in line with the Waste Management Procedure and Zero Waste Regulation.

TÜRKİYE ŞİŞE VE CAM FABRİKALARI A.Ş.

ŞİŞECAM offers lightweight glass packaging solutions which use less raw materials and less energy in its glass packaging designs. With the design changes made to achieve this, a 14% reduction in greenhouse gas emissions % was achieved for single-bottle packaging.

Focusing on the Circular Economy, ŞİŞECAM reduced its specific energy consumption by 33% and greenhouse gas emissions by 46% by using 70% cullet in glass furnaces in the production of green glass. In addition, the Aware Collection reduced energy and raw material consumption during the melting process, resulting in a 39% reduction in natural gas consumption and a 41% reduction in greenhouse gas emissions. Within the scope of air emissions management, Şişecam continuously monitors NOx emissions, a primary emission in glass production at 10 of its facilities. As of the end of 2021, 11 glass furnaces have had emissions reduced as part of aims to "reduce NOx emission on primary measures in at least 10 glass furnaces" for the years 2017-2021.

Within the scope of water management, Şişecam is working towards the reduction of clean water consumption by 15% by 2030. Şişecam recycled/reused approximately 8 million m³ of water in 2021. Şişecam has also shared its expertise and contributed to the global sustainable development goal titled "Clean Water and Sanitation" (SDG 6) through 20% of its good practices and projects realized in 2021.

VESTEL ELEKTRONİK SANAYİ VE TİCARET A.Ş.

With the zero-waste approach adopted in 2019, Vestel reduced the amount of waste per-product-unit by 8% in 2021 to 3.71 kg/product.

Under the Business World Plastics Initiative (IPG), to which it became a signatory in 2021, Vestel Elektronik has committed to reducing the use of plastics, and recycling them where it does use them. It aims to use a total of 7,081 tons of recycled plastic; 1,983 tons by the end of 2021, 2,361 tons by the end of 2022, and 2,737 tons by the end of 2023.

In addition, Vestel Elektronik aims to reduce the use of plastic by 1,000 tons by the end of 2023 compared to 2020. It has already made a reduction of 1,212 tons of plastic and used 2,347 tons of recycled plastic, exceeding its 2021 commitments, thus preventing a total of 3,559 tons of unprocessed plastic use.

Vestel Elektronik also reduced its water consumption by 25% in 2021 compared to 2019, and has started to use 100% recycled and recyclable cardboard in white goods product packaging, in line with packaging management principles. As a result, 209,553 trees were saved through the use of a total of 12,327 tons of recycled cardboard in 2021.



References

- ¹ TURKSTAT Greenhouse Gas Emission Statistics 1990-2020
- ² <https://birbucukderece.com>
- ³ Carbon leakage occurs when there is an increase in greenhouse gas emissions in another country due to emission-intensive production processes being moved abroad as a result of the emission reductions enforced by a country with a strict climate policy. Carbon leakage, which occurs as production shifts and imports increase, is a type of spillover effect. Spillover effects can be positive or negative. For example, an emission reduction policy may also lead to technological developments that assist reductions outside the policy area. (IPCC, ²⁰⁰⁷)
- ⁴ European Commission (2021)
- ⁵ Arçelik ²⁰⁵⁰ Net Zero Roadmap
- ⁶ Company ESG Risk Ratings – Sustainabilitytics
- ⁷ Arçelik Global Press Release
- ⁸ Arçelik Annual Report ²⁰²¹
- ⁹ Arçelik Global Press Release
- ¹⁰ Energy Economics News
- ¹¹ Company ESG Risk Ratings- Sustainabilitytics
- ¹² <https://uzmanpara.milliyet.com.tr/haber-detay/gundem2/aselsan-yine-bist-surdurulebilirlik-endeksinde/96000/96406/>
- ¹³ ASELSAN 2021 Annual Report; ASELSAN Investor Presentation June 2022
- ¹⁴ Company ESG Risk Ratings- Sustainabilitytics
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- ³⁸ PETKİM Annual Report 2021
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- ⁵¹ Company ESG Risk Ratings- Sustainabilitytics
- ⁵² Company ESG Risk Ratings- Sustainabilitytics
- ⁵³ Murat Kurum, Minister of Environment, Urbanization and Climate Change

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