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## Second Party Opinion

# Türk Telekom's Sustainable Finance Framework

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**Location:** Türkiye

**Sector:** Telecommunications

## Alignment With Principles

Aligned = ✓ Conceptually aligned = ○ Not aligned = ✗

- ✓ Social Bond Principles, ICMA, 2023
- ✓ Social Loan Principles, LMA/LSTA/APLMA, 2023
- ✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)
- ✓ Green Loan Principles, LMA/LSTA/APLMA, 2023
- ✓ Sustainability Bond Guidelines ICMA, 2021

See [Alignment Assessment](#) for more detail.

## Strengths

**The framework's inclusion of green projects underpins the shift toward a low-carbon society.** We view Türk Telekom's commitment to funding projects that progress towards a Low Carbon Climate Resilient Future (LCCRF) as positive.

## Weaknesses

No weaknesses to report.

## Areas to watch

**Some eligible activities provide energy efficiency savings, but Türk Telekom did not provide quantitative energy efficiency thresholds for others, including digital solutions.** This constrains our visibility into energy efficiency improvements and alignment with a LCCR future.

**The energy efficiency projects category includes potential investments into expanding the 5G network.** We believe 5G investments could lead to increased overall energy and emissions, but they could decrease the use of less efficient networks. Such investments could have positive impacts on climate mitigation and adaptation strategies, though this is uncertain and difficult to quantify.

**Türk Telekom aims to achieve net zero by 2050, but its target only includes scope 1 and 2 emissions.** The issuer currently reports on scope 3 but in a limited capacity by including only the emissions under a few categories.

## Eligible Green Projects Assessment Summary


Eligible projects under the issuer's green finance framework are assessed based on their environmental benefits and risks, using Shades of Green methodology.

### Renewable energy

 Dark green

Investments or expenditure related to the construction, development, installation or procurement of renewable energy

### Energy efficiency

 Light green

Investments or expenditure related to new or existing network infrastructure and buildings to improve cumulative energy efficiency by at least 30%

Investments or expenditure related to new or existing data centers to improve power usage effectiveness (PUE)

Investments or expenditure related to fixed-line and mobile network projects to reduce energy consumption


Investments or expenditure related to digital products and services to enable customers to reduce their energy consumption

### Clean transportation

 Dark green

Investments or expenditure related to low-carbon passenger transportation and related infrastructure

### Pollution prevention and control

 Medium to Light green

Investments or expenditure to promote waste prevention, reduction, reuse, or recycling, and reduce emissions from refrigerant gases

See [Analysis Of Eligible Projects](#) for more detail.

## Issuer Sustainability Context

This section provides an analysis of the issuer's sustainability management and the embeddedness of the financing framework within its overall strategy.

## Company Description

Türk Telekom is an incumbent telecom operator and the leading integrated telecommunications company in Türkiye. The company offers fixed-line, mobile, and internet services to individual and corporate customers across the country's 81 provinces. In 2022, the company generated revenue of USD 2.56 billion. Türk Telekom generates its revenue from various business segments: mobile (38%), fixed broadband (27%), others (24%; which includes TV, international sales, interconnection, IFRIC 12 standard, eliminations, and other revenues), fixed voice (5%), and corporate data (6%). Türkiye Wealth Fund (TWF) is the largest shareholder of Türk Telekom with a 61.68% stake (1.68% of which is publicly traded), the Ministry of Treasury & Finance holds a 25% stake, and 15% of the shares are listed on Borsa Istanbul.

# Material Sustainability Factors

## Climate transition risk

Climate transition risk is material for the telecom sector due to its financial, operational, and regulatory implications. While the telecom sector is responsible for 1.6% of global GHG emissions (source: Boston Consulting Group), the growth in usage of mobile data traffic linked with the expansion of 5G technology is causing an increase in energy consumption within the sector. Moreover, the rapid increase in data traffic across telecom networks raises electricity use at data centers and in network infrastructure, a trend that will likely continue. Indirect (scope 2 and 3) greenhouse gas emissions associated with electricity generation will likely face increasingly stringent regulation globally, which could increase input costs over the medium to long term. Climate transition also represents an opportunity for the telecom sector, due to the enabling effect of technologies such as 5G, which can be key in facilitating climate mitigation and adaptation strategies.

## Waste and recycling

Electronic waste, plastics, and scrap metals are generated during the manufacturing of telecom network equipment and indirectly via mobile handsets and at end-of-life. This leads to potential impacts including environmental pollution and biodiversity harm. Reducing manufacturing waste upstream and reuse and recycling of equipment downstream can mitigate impacts and is increasingly a focus for companies as circular economy principles expand in the sector. Waste and recycling regulations are continuously evolving globally, bringing the needs for companies across different sectors to adapt. For instance, in July 2023, Türkiye introduced new regulations to manage electronic waste (e-waste) and restrict the use of hazardous substances in electronics.

## Physical climate risk

The telecom sector has large physical infrastructure footprint that is increasingly exposed to damage and disruption. From a stakeholder perspective, more frequent and severe climate hazards (acute risks like storms and floods, and chronic risks like rising sea levels) absent adaptation, could damage mobile infrastructure and equipment, fixed lines, switches, and data centers. This would affect network uptime, disrupting services to customers. Operators can proactively invest in network resilience to buffer these impacts. Türkiye faces risks linked to extreme precipitation patterns, rising sea levels, extreme temperatures, among others, which can damage telecom infrastructure such as cables, towers, and equipment and disrupt services. Therefore, it is key for telecom companies to have adequate risk management strategies in place to mitigate these physical risks and ensure the continuity of their services.

## Access and affordability

Access to affordable telecom services is increasingly essential for people globally to partake in universal needs such as health care, financial services, education, and the modern economy. This can result in distinct social and economic disadvantages for underserved populations that can persist and exacerbate inequality. As a result, regulatory and public pressure on operators is increasing. In Türkiye, approximately 92% of household are connected to broadband internet (source: International Trade Administration). Nonetheless, there is variance in internet access across the country, with lower levels of connected population in rural areas when compared to industrialized cities.

## Privacy protection

Telecom companies collect, access, and transmit large amounts of client information and data and are therefore exposed to intentional or unintentional privacy risks. These incidents can harm clients' reputation as data lost could be sensitive, such as personally identifiable information, locations, numbers called, purchasing behaviors, search history, or others. A company's strategy and policies surrounding data privacy and security are therefore important mitigating factors for stakeholders. Telecom companies operating in Türkiye need to comply with privacy and data protection regulations, such as the Law on Protection of Personal Data (LPPD). Failure to comply with these regulations can result in significant fines and legal consequences.

## Issuer And Context Analysis

**All project categories included in this framework address material sustainability factors for the telecom industry and Türk Telekom specifically.** The renewable energy, energy efficiency, and clean transportation categories aim to address climate transition risk, while the pollution prevention and control category addresses waste related risks. The access to essential services (digital inclusion and education) category addresses digital inclusion and access to education.

**Türk Telekom aims to achieve net zero by 2050, but its target only includes scope 1 and 2 emissions, with scope 3 emissions only being calculated on a limited basis.** Türk Telekom has recently updated its mid-term targets and commits to reduce its scope 1 and 2 GHG emissions by 45% till 2030, compared with a 2020 baseline. To achieve its net-zero target (scope 1 and 2), Türk Telekom is focusing on the implementation of energy-saving and efficiency projects. This includes replacing outdated equipment with more efficient systems, implementing energy-saving solutions at base stations, and increasing the use of renewable energy sources such as solar and wind power. The company has committed to set SBTi-approved targets. As per the SBTi process, once committed, the company has 24 months to submit their targets to the SBTi.

Türk Telekom reports on scope 1 and 2 emissions according to the GHG Protocol, and the data has been verified by an independent third party, which we view favorably. The issuer currently reports on scope 3 but in a limited capacity by including only the emissions under a few categories. In 2024, Türk Telekom initiated a project to calculate its scope 3 emissions across all 15 categories. As a result, the visibility regarding the entity's indirect emissions is limited at this point and we have yet to observe ongoing actions to limit them. Nonetheless, we expect scope 3 emissions to represent a significant portion of Türk Telekom's overall emissions.

**Türk Telekom's waste management practices tackle waste from its own operations and e-waste from the services it provides.** Türk Telekom separates all types of waste at the point of generation to facilitate recycling of materials. The company tracks waste by type (hazardous and non-hazardous waste), and its operations are certified according to the ISO 14001 standards, which we view positively. Türk Telekom is collaborating with the Turkish Informatics Industry Association (TÜBİSAD) to recycle e-waste it generates from the services it provides. This collaboration enabled the collection and recycling of more than 33 tons of domestic e-waste between 2017 and 2022. We view positively that Türk Telekom is not mandated by national legislation to recycle waste, including e-waste, as this is a requirement only for equipment manufacturers. Therefore, the entity is going beyond regulatory requirements in its customer e-waste collection practices.

**Through projects focusing on digital equality, accessible connectivity and digital literacy, Türk Telekom aims to improve society's access to information.** The entity has a population coverage rate exceeding 99.6% in terms of mobile communication services. Within the Türk Telekom group, two companies (Innova and SEBIT) have focused on collaboration and sharing online, with the aim of equal opportunity in education. Nonetheless, Türk Telekom does not have in place a basic discounted tariff for customers on a fixed income, such as pensioners, a common practice among some of its peers in the telecom sector.

**Türk Telekom prioritizes data privacy risks mitigation, through its policies and program.** Its Information Safety Policy clearly outlines information security requirements to be followed by the group, and Türk Telekom also conducts information security awareness trainings with its employees. The entity's information management systems are certified according to several international standards, including ISO 27701 Personal Data and Information, and ISO 27017 Information Security in Cloud Services, which we view positively. To prevent cyber attacks, Türk Telekom has two ongoing projects: a blockchain authentication platform and security incident management.

**Türk Telekom is proactively managing physical risks related to its operations.** The entity obtains from official authorities and institutions risk and threat information, including maps, and integrates this data in its Geographical Information Systems. In this manner, Türk Telekom is able to identify physical risks that could affect its assets and implement preventive measures. For instance, due to increased risks of flooding and earthquakes in certain areas where it operates, Türk Telekom continuously makes improvement investments to ensure high standards in terms of resilience of its assets.

## Alignment Assessment

This section provides an analysis of the framework's alignment to the Social and Green Bond/Loan principles and the Sustainability Bond Guidelines.

### Alignment With Principles

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#### ✓ Use of proceeds

We assign a shade of green to all the framework's green project categories and consider all social project categories aligned. The issuer commits to allocate the net proceeds raised under the framework exclusively to eligible green and social projects, and the maximum refinancing look back period is of 36 months. Türk Telekom commits to disclosing the proportion of funds used for financing versus refinancing in its allocation reporting, which we view as a stronger practice. Please refer to the Analysis of Eligible Projects section for more information on our analysis of the environmental and social benefits of the expected use of proceeds.

#### ✓ Process for project evaluation and selection

The framework describes the process to determine how projects fit within the eligibility criteria. Türk Telekom has established a Sustainable Finance Working Group (SFWG), that consists of members of different departments, including finance, technology, and human resources, and is chaired by the investor relations and sustainability director. The SFWG is responsible for ensuring that the company allocates proceeds to projects that meet the eligibility criteria laid out in the framework. The SFWG also assesses known material social and environmental risks, in line with group's risk assessment procedures. Türk Telekom has outlined an exclusion list within the framework, ensuring that proceeds will not be used to finance activities related to fossil fuel extraction and power generation, alcohol, and gambling, among others. We view this practice positively.

#### ✓ Management of proceeds

Türk Telekom will deposit the proceeds of the sustainable financing instruments in a general treasury account and earmark them for allocation through a sustainable financing register. The issuer commits to ensure that, during the time when sustainable financing instruments are outstanding, the balance of the tracked net proceeds will be periodically adjusted to match the allocations to eligible projects made during that period. It will hold the unallocated proceeds funds in cash and cash equivalents and will manage them per the company's general cash management policies and will not allocate them to greenhouse gas intensive or controversial activities as per the exclusion criteria laid out in the framework.

## ✓ Reporting

Türk Telekom commits to reporting annually on the allocation of proceeds and the impact of the sustainable financing instruments, until full allocation of net proceeds. Through its impact reporting, the issuer will also disclose information regarding the methodology and assumptions considered when calculating the impact metrics selected. Reporting may be based on actual annual impacts, and, if feasible, expected impact. The framework consists of examples of impact indicators, which the issuer may report on, including annual renewable energy generated (MWh/GWh), and number of people connected to fiber optic network. We view positively that Türk Telekom will receive an independent assessment and verification of the tracking and allocation of funds in connection with the issuance of proceeds.

## Analysis Of Eligible Projects

This section provides details of our analysis of eligible projects, based on their environmental benefits and risks, using the "[Analytical Approach: Shades Of Green Assessments](#)," as well as our analysis of eligible projects considered to have clear social benefits and to address or mitigate a key social issue.

Over the three years following issuance of the financing, Türk Telekom expects to allocate the majority of proceeds to the renewable energy and energy efficiency project categories.

The issuer expects a slightly larger amount of proceeds to be allocated to financing existing projects, while the remaining of proceeds will be directed to finance new projects.

### Green project categories

#### Renewable energy

##### Assessment

 Dark green

##### Description

- Solar photovoltaics (PV)
- Onshore wind
- Hydropower which meets any of the criteria below:
  - Lifecycle GHG emissions of below 100gCO<sub>2</sub>e/kWh
  - Power density greater than 5W/m<sup>2</sup>
  - Electricity generation facility is a run of river plant and does not have an artificial reservoir
- Geothermal (Lifecycle GHG emissions of below 100gCO<sub>2</sub>e/kWh)

#### Analytical considerations

- Given that oil (28.8%), natural gas (27.4%), and coal (25.1%) were Türkiye's primary power sources in 2022, as reported by the IEA, it's imperative to invest in renewable energy to diversify its energy mix and lessen fossil fuel reliance. In this context, we positively regard the renewable energy projects within the framework such as solar PVs, hydropower, geothermal, and onshore wind projects, which are distinguished by their low lifecycle emissions. This underscores their important role in progressing toward a LCCRF. Nonetheless, it's important to acknowledge that there are potential risks associated with these projects and the effects they may have on biodiversity, land, and resources.

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- To mitigate environmental risks associated with renewable energy projects, the issuer complies with local regulations, including undergoing EIAs conducted by the EIA Permit and Inspection Directorate, part of the Turkish Republic's Ministry of Environment, Urbanization, and Climate Change. These EIAs will evaluate potential impacts on biodiversity, endemic species, and bird migration routes, ensuring that the projects align with environmental conservation standards.
- Solar PVs are a key component in the transition to clean energy and therefore assess it as Dark green. However, the production process of PVs carries potential environmental risks, particularly in the extraction and processing of raw materials. Türk Telekom has recognized these issues and initiated a supplier due diligence program focusing on material recyclability, product longevity, and end-of-life management. While we view these efforts positively, these practices are in their nascent stages and haven't been fully operationalized throughout the company's procedures.
- The issuer commits to funding hydropower projects that meet environmental criteria, including maintaining lifecycle greenhouse gas (GHG) emissions below 100g CO2 equivalent per kilowatt-hour, ensuring a power density greater than 5W per square meter, or requiring that the electricity is generated by a run-of-river plant without the creation of an artificial reservoir. We recognize the significance of renewable energy sources, like hydropower, prompting us to classify this project as Dark green. However, we recognize their infrastructure can affect local biodiversity if not carefully managed.

### Energy efficiency

#### Assessment

 Light green

#### Description

Investments or expenditures related to new or existing network infrastructure and buildings to improve cumulative energy efficiency by at least 30%:

- Modernization, replacement and upgrade of network equipment and network technology
- Software and automation solutions to reduce power consumption including, Smart Energy Management System machine learning and artificial intelligence (AI) applications based on energy demand and consumption
- More efficient cooling solutions for RAN sites and data sites (e.g. CRAC, free cooling); change of site layout (indoor to outdoor)
- Deployment of specific energy efficiency installations including more efficient network equipment, heating, ventilation, air conditioning units, refrigeration, lighting and electrical equipment in buildings to improve energy efficiency

Investments or expenditures related to new or existing data centers to improve power usage effectiveness (PUE):

- Improve PUE of existing data centers to below 1.4, for example for centers that use chiller + crah (computer room air handler) technologies and of new data centers to below 1.2 using, for example, highly efficient cooling solutions (e.g. indirect evaporative cooling {IEC} technologies)

Investments or expenditures related to fixed-line and mobile network projects to reduce energy consumption, including:

- Gigabit passive optical network (GPON) investments
- Deployment of fiber to the home (FTTH), fiber to the building (FTTB) or fiber to the curb (FTTC) to replace copper-based networks
- Deployment of 5G technology and network infrastructure which can enable significant efficiency compared to older generations in terms of energy consumption per data traffic transmitted

Investments or expenditures related to digital products and services to enable customers to reduce their energy consumption:

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- IoT solutions and AI applications such as modelling and optimization software to reduce emissions and energy use.
  - Potential technologies include: microgrid monitoring and optimization model aiming to minimize energy usage and optimization model that recommends for example eco-friendly transportation operations, supplier selection, and carbon trading mechanisms
- Research & Development on smart metering

### Analytical considerations

- Activities that seek to improve energy efficiency and promote renewable energy are necessary to transition to a low carbon economy in line with the Paris Agreement 2050 objectives as they allow for the reduction in overall energy consumption and decrease demand for fossil fuels. Türk Telekom will use the proceeds under this category for a diverse range of activities spanning from replacement and upgrade of network equipment, upgrading and, to a lesser extent, expansion of 5G technology and networks, and digital solutions. The issuer has shared investments and expenditures related to GPON, which we view as Light green, representing a large majority of its current green asset register for this project. Moreover, the Light green shade reflects the inclusion of potential investments into the deployment of fiber and 5G. Nonetheless, this project category also contains Medium green elements, specifically investments or expenditures related to new or existing network infrastructure and buildings.
- The criterion regarding the investments or expenditures related to new or existing network infrastructure and buildings is considered Medium green. We understand Türk Telekom expects to use most its proceeds for upgrading existing networks or buildings. The entity has specified in the framework that these investments or expenditures must lead to cumulative, overall reduced energy consumption of at least 30% compared with a historical baseline. Türk Telekom will achieve these energy savings through activities that include more efficient network equipment, heating, ventilation, and air conditioning units. The entity will also use an AI-supported smart energy management platform, which monitors energy consumption of devices in its fixed and mobile networks and detects outages in these devices. The platform also allows to compare energy use and energy costs and is a tool for Türk Telekom to understand and predict energy consumption, enabling consumption reduction.
- The criterion regarding the investments or expenditures related to PUE improvement for data centers is considered Light green. Data centers are one of the most energy-intensive building types. Türk Telekom currently operates three commercial data centers (Umitkoy, Esenyurt, and Gayrettepe) and two for Türk Telekom's use (Umraniye and Ahlatlibel). The issuer aims to bring down the PUE of existing data centers to below 1.4, and new data centers to below 1.2, which we view as ambitious PUE thresholds. According to Türk Telekom, among these existing data centers, the PUE average is between 1.5 and 1.6. This is in line with the global average and below the average for Türkiye, of 1.7 to 1.9. We note the optimum PUE is 1.0, the closer the number is to 1.0, the more energy efficient the data center is. We note positively that Türk Telekom is implementing water saving measures across some of its data centers. For instance, the entity has a rainwater recovery system at its Esenyurt data center and a fogging system at its Ümitköy data center to minimize the consumption of water by the outdoor units of DX cooling units. We also view favorably that for its new data centers, the issuer has plans to use heat recovery with IT cooling solutions like immersion cooling and chiller, to heat office areas. Although the data centers will be located in Türkiye, where currently 44% of electric power generation capacity consists of nonrenewable energy, the issuer has shared that it has been purchasing I-REC certificates for all of the electricity consumed in these data centers since 2021. Türkiye has a goal of achieving net-zero carbon emissions by 2053, and as part of its decarbonization journey aims to increase the share of renewables in installed power to 65% by 2035.
- The upgrade of 3G/4G to 5G may lead to energy efficiency savings, which we view positively. This is because 5G networks are considered more energy efficient per traffic unit, both on the network and device side, than 3G/4G. The upgrade and expansion of 5G technology and network infrastructure can also enable technology for climate mitigation and adaptation strategies. However, this potential positive environmental impact is nonetheless difficult to quantify and disputed because 5G expansion could increase overall energy use. According to Türk Telekom, investments in 5G will mainly go toward both upgrading 3G/4G equipment to 5G and, to a very limited extent, financing the expansion of the 5G network. This is in line with the current rate of mobile population coverage of Türk Telekom, which is 99.6%. Given the coverage, expanding the 5G network can lead to lower use of less efficient networks. However, in cases of increased traffic not originating from these less efficient networks, the expansion could lead to increased emissions and energy use.



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- Regarding the investments or expenditures related to digital products and services, Türk Telekom specifies that these would target IoT solutions and AI applications focused on the reduction of emissions and energy use, by improving from an environmental standpoint, the management of transportation or supplier selection processes. Türk Telekom's framework mentions that only projects where Türk Telekom can report on the quantitative environmental impact will be eligible for financing (i.e., one or more of the impact indicators listed under section 2.4 Reporting).
- While Türk Telekom does not undertake physical climate assessments including different scenarios, it takes a proactive approach in identifying physical risk that may affect its operations. The company receives risk and threat data from official authorities and institutions, and integrates it in its systems, to identify physical risks which could affect its assets, and implement preventive measures.

### Clean transportation

#### Assessment

 **Dark green**

#### Description


- Electric vehicles (EVs) with zero direct emissions
- Electric transportation infrastructure (e.g. electric car charging stations)

### Analytical considerations

- EVs are crucial for the transportation industry's shift toward a low-carbon future, aligning with the goals of the Paris Agreement. They can offer considerable reductions in lifecycle emissions compared with traditional internal combustion engine vehicles. This reduction depends on, among other things, whether their manufacturing and charging are fueled by renewable energy sources. Nonetheless, the environmental benefits of EVs also hinge on the energy mix of the grid supplying their power. In Türkiye, the predominant energy sources are oil (28.8%), natural gas (27.4%), and coal (25.1%), which can influence the overall emissions savings achieved through the adoption of EVs.
- We assess the financing of a 100% EV fleet, along with its accompanying charging infrastructure, as Dark green. Workplace charging stations are pivotal in encouraging EV adoption, offering convenient and rapid charging solutions. However, similar to EVs, the net lifecycle emissions savings from these charging stations are contingent on the grid's energy composition. It's important to recognize that this aspect of the emission savings is outside the direct influence of Türk Telekom.
- Battery packs in EVs, along with charging stations and low-carbon technologies, face risks from the mining of essential minerals like nickel, iron, aluminum, lithium, and cobalt. The extraction processes for these materials can lead to environmental harm, water pollution, labor exploitation, and community conflicts, particularly in countries across the southern continents. Despite these challenges, we note Türk Telekom's strategy for selecting suppliers with environmental and social criteria is in its initial phases.

### Pollution prevention and control

#### Assessment

 **Medium to Light green**

#### Description













Investments or expenditures to promote waste prevention, reduction, reuse, or recycling and reduce emissions from refrigerant gases:

- Customer electronic device waste recovery and recycling programs
- Waste sorting, collection, recycling, and reduction programs for non-hazardous waste including network waste, IT equipment, and other office waste
- Switching of refrigerant gases to lower GWP refrigerant gases
- Recovery and reutilization of refrigerant gases during repair and maintenance
- Recovery and recycling of refrigerant gases from decommissioned AC equipment

### Analytical considerations

- We assess Türk Telekom's customer recovery and recycling programs and waste sorting, collection, recycling, and reduction programs for non-hazardous waste as Light green, as they provide a disposal solution for e-waste which could otherwise end in landfill, but lacking visibility regarding the end fate of the collected and recycled waste. This is because entities outside of Türk Telekom manage the recycling process. The customer recovery and recycling programs are conducted in partnership with the Turkish Informatic Industry Association and will include electronic waste starting in 2024. Türk Telekom's aim is to collect and recycle household electronic waste at its sales points throughout Türkiye. As a telecom company, Türk Telekom is not mandated by national legislation to recycle waste, including e-waste, as this is a requirement only for equipment manufacturers. Therefore, Türk Telekom is contributing to the recycling obligations of the manufacturers, while going beyond regulatory requirements. The issuer has informed us that it will ensure the financed projects will follow a waste hierarchy (waste prevention, followed by re-use, recycling, recovery and finally disposal).
- We assess switching of refrigerant gases to lower global warming potential (GWP) refrigerant gases as Medium green. This is because hydrofluorocarbons (HFCs), commonly used as refrigerants in refrigeration and air conditioning equipment, have a very high GWP and are hence potent greenhouse gases. However, the lack of specific quantitative thresholds that must be met for projects to be eligible for financing constrains our visibility of the expected emission mitigated and how these align with a LCCR future. The issuer has shared that it has been continuously replacing refrigerant gases with lower GWP refrigerant gases since 2008, and that currently more than 70% of its air conditioning units have already low GWP level refrigerant gases. Moreover, we view positively that Türk Telekom is currently already well below the regulatory limits as per Türkiye's fluorinated gas regulation, for instance for chiller AC types, Türk Telekom has shared that its GWP is 7, while the requirement as per the regulation is below 150.
- In terms of activities linked to recovering and reutilization of refrigerant gases during repair and maintenance and from decommissioned equipment, the issuer shared that air conditioning using high GWP refrigerant and with leakage failure have priority, which we view positively. While Türk Telekom plans to conduct these activities in the most environmentally friendly way possible, we have limited visibility on concrete actions targeting a lower environmental impact during the process, including robust systems to prevent leakage during the process. We therefore view these activities as Light green.

## S&P Global Ratings' Shades of Green

Assessments					
 Dark green	 Medium green	 Light green	 Yellow	 Orange	 Red
<b>Description</b>					
Activities that correspond to the long-term vision of an LCCR future.	Activities that represent significant steps toward an LCCR future but will require further improvements to be long-term LCCR solutions.	Activities representing transition steps in the near-term that avoid emissions lock-in but do not represent long-term LCCR solutions.	Activities that do not have a material impact on the transition to an LCCR future, or, Activities that have some potential inconsistency with the transition to an LCCR future, albeit tempered by existing transition measures.	Activities that are not currently consistent with the transition to an LCCR future. These include activities with moderate potential for emissions lock-in and risk of stranded assets.	Activities that are inconsistent with, and likely to impede, the transition required to achieve the long-term LCCR future. These activities have the highest emissions intensity, with the most potential for emissions lock-in and risk of stranded assets.
<b>Example projects</b>					
 Solar power plants	 Energy efficient buildings	 Hybrid road vehicles	 Health care services	 Conventional steel production	 New oil exploration

Note: For us to consider use of proceeds aligned with ICMA Principles for a green project, we require project categories directly funded by the financing to be assigned one of the three green Shades.

LCCR--Low-carbon climate resilient. An LCCR future is a future aligned with the Paris Agreement; where the global average temperature increase is held below 2 degrees Celsius (2 C), with efforts to limit it to 1.5 C, above pre-industrial levels, while building resilience to the adverse impact of climate change and achieving sustainable outcomes across both climate and non-climate environmental objectives. Long term and near term--For the purpose of this analysis, we consider the long term to be beyond the middle of the 21st century and the near term to be within the next decade. Emissions lock-in--Where an activity delays or prevents the transition to low-carbon alternatives by perpetuating assets or processes (often fossil fuel use and its corresponding greenhouse gas emissions) that are not aligned with, or cannot adapt to, an LCCR future. Stranded assets--Assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (as defined by the University of Oxford).

## Social project categories

### Access to essential services (digital inclusion and education)

Investments or expenditures to enhance digital inclusion:

- Deployment, extending, and optimization of mobile (3G/4G/5G) or fiber optic network for populations in less developed areas at risk of digital exclusion
- Investments to enhance access to digital solutions or support the development of digital skills for all women, elderly, people with disabilities, those affected by earthquakes

Investments or expenditures to enhance access to education services and related infrastructure:

- Investment in providing telecom services, educational programs, and vocational training for women and disadvantaged people such as those with special needs or disabilities (mobility, cognitive, hearing, vision, and speech), including deployment of adaptive products and services for customers

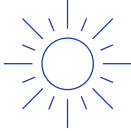
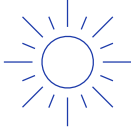
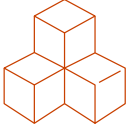

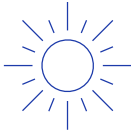






### **Analytical considerations**

- Türk Telekom is committing to financing access to essential services, aiming to boost digital inclusion and education. This initiative encompasses the deployment, expansion, and optimization of mobile (3G/4G/5G) and fiber optic networks in less developed areas at risk of digital exclusion, investments to improve digital accessibility and skills, and support for educational and vocational training programs. We believe these projects contribute to the social goal of digital inclusion and access to education, catering specifically to a well-defined target population. Consequently, we believe that these projects are aligned with the principles.
- Türk Telekom is committed to serving underprivileged populations in Türkiye, including the elderly, individuals with disabilities, women, veterans, and youth. We believe the company's method of identifying these areas is good—it uses the SEDI-2022 Report from the Turkish Republic Ministry of Industry and Technology. The report includes a ranking of the country's 973 districts, across its 81 provinces, in terms of socio-economic development. The ranking is based on more than 50 variables that measure socioeconomic development and are grouped under eight categories including demographics, employment and social security, education, health, finance, competitiveness, innovation, and quality of life. The issuer has shared that it considers as most vulnerable the districts that with socioeconomic development levels of 5 and 6, which represent areas where 9.5% of Türkiye's total population live. Additionally, the focus extends to those affected by the 2023 earthquakes in Türkiye's southeastern region.
- Türk Telekom established its Sustainable Finance Working Group (SFWG) to affirm its commitment to promoting digital inclusion and supporting a low-carbon economy. This group assesses all known material risks of adverse environmental or social impacts, ensuring that the pursuit of environmental and/or social objectives does not compromise other areas.
- Enhancing broadband infrastructure to broaden access can significantly boost socioeconomic outcomes, especially for rural and low-income communities. Türk Telekom prioritizes expanding its network to remote areas, concentrating on improving access within this project category. Despite ongoing development of affordability strategies, the company's commitment to align network access costs in targeted areas with those of other regions contributes to our assessment.

# Mapping To The U.N.'s Sustainable Development Goals

Where the Financing documentation references the Sustainable Development Goals (SDGs), we consider which SDGs it contributes to. We compare the activities funded by the Financing to the International Capital Markets Association (ICMA) SDG mapping and outline the intended linkages within our SPO analysis. Our assessment of SDG mapping does not impact our alignment opinion.

This framework intends to contribute to the following SDGs:

Use of proceeds	SDGs			
Renewable Energy	 <p data-bbox="451 751 649 814"><b>7. Affordable and clean energy*</b></p>			
Energy Efficiency	 <p data-bbox="451 1003 649 1066"><b>7. Affordable and clean energy*</b></p>	 <p data-bbox="678 1003 852 1087"><b>9. Industry, innovation and infrastructure*</b></p>	 <p data-bbox="898 1003 1068 1087"><b>11. Sustainable cities and communities</b></p>	
Clean Transportation	 <p data-bbox="451 1276 649 1339"><b>7. Affordable and clean energy</b></p>	 <p data-bbox="683 1276 852 1360"><b>11. Sustainable cities and communities*</b></p>		
Pollution Prevention and Control	 <p data-bbox="451 1556 649 1640"><b>12. Responsible consumption and production*</b></p>			
Access to Essential Services (Digital Inclusion and Education)				

1. No poverty\*

8. Decent work  
and economic  
growth\*

9. Industry,  
innovation and  
infrastructure\*

4. Quality  
education\*

\*The eligible project categories link to these SDGs in the ICMA mapping.

## Related Research

- [SPO Spotlight: Second Party Opinions](#), March 28, 2024
- [Analytical Approach: Second Party Opinions: Use of Proceeds](#), July 27, 2023
- [FAQ: Applying Our Integrated Analytical Approach for Use-of-Proceeds Second Party Opinions](#), July 27, 2023
- [Analytical Approach: Shades of Green Assessments](#), July 27, 2023
- [S&P Global Ratings ESG Materiality Maps, Telecom](#), 2022

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## Second Party Opinion: Türk Telekom's Sustainable Finance Framework

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