CIF CLIMATE INVESTMENT FUNDS

Intersessional Meeting of the Clean Technology Fund (CTF) Trust Fund Committee

Virtual

Wednesday, October 30 and Thursday, October 31, 2024

TURKIYE (REI) INVESTMENT PLAN

CLIMATE INVESTMENT FUNDS
1818 H Street NW
Washington, D.C. 20433 USA
T: +1 (202) 458-1801
www.cif.org

CTF/TFC.IS.5/02
September 24, 2024

PROPOSED DECISION

The Committee, having reviewed the document *Investment Plan for Türkiye for the CIF Renewable Energy Integration (REI) Program (CTF/TFC.IS.5/02):*

a. Thanked the Government of Türkiye for the work it has done in preparing the Investment Plan;
b. Endorsed the Investment Plan as a basis for the further development of the projects foreseen in the plan, and took note of the total requested funding of USD 70 million (inclusive of MDB project preparation and supervision services -MPIS-), consisting of USD 68 million of concessional finance and USD 2 million of grant financing, to support the following projects:
    a. USD 38 million CTF lending and USD 2 million CTF grant financing (World Bank -IBRD-) for **Component 1: Transforming Power Transmission System for REI.**
    b. USD 30 million CTF lending (USD 15 million for European Bank for Reconstruction Development -EBRD- and USD 15 million for International Finance Corporation -IFC-) for **Component 2: System Flexibility, Balancing, Stabilization, and Strengthening Power Infrastructure**.

c. Took note of the estimated budget of USD 825,000 for MDB project preparation and supervision services (MPIS): USD 450,000 for the European Bank for Reconstruction Development (EBRD); and USD 375,000 for the International Finance Corporation (IFC), to be deducted from each of the loan amounts in component 2.

REPUBLIC OF TÜRKİYE
MINISTRY OF TREASURY AND FINANCE

Ref: 11954024.208.01.15

Ankara,

Ms. Tariye GBADEGESIN
Chief Executive Officer
Climate Investment Funds (CIF)

Dear Madam GBADEGESIN,

We are pleased to inform you that Türkiye has finalized the preparations for the Investment Plan (IP) under the Renewable Energy Integration Program (REI). We appreciate the strong partnership with the Climate Investment Funds (CIF) and the support from the World Bank and other participating Multilateral Development Banks throughout this process.

In our pursuit to align the IP with our Government's ambitious renewable energy scale-up program, we have meticulously ensured that the projects contained within the IP effectively contribute to Türkiye's clean energy transition and our net zero emissions target by 2053.

We are now delighted to present the IP for your consideration. We believe that the successful implementation of the projects included in the IP will significantly contribute to achieving our climate goals and further strengthen our collaboration with CIF.

Please find the Türkiye-REI IP attached to this letter.

We would like to express our deepest gratitude for your continued support and cooperation throughout this process. We remain steadfast in our commitment to working closely with CIF and all stakeholders for Türkiye's clean energy transition.

Sincerely yours,

Kerem DÖNMEZ
Director General for Foreign Economic Relations /
Member of CTF Trust Fund Committee and GCAP Sub-Committee

Encl.

Ministry of Treasury and Finance
Directorate General of Foreign Economic Relations
Devlet Mahallesi Dikmen Caddesi No:12 06420 Çankaya / ANKARA

e-mail: iklim@hmb.gov.tr
Tel: 0090 312 497 7126

CTF Trust Fund Committee Meeting

Washington D.C.

Hybrid

September 9, 2024

TÜRKİYE - RENEWABLE ENERGY INTEGRATION (REI) INVESTMENT PLAN

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List of Abbreviations

AMI	Advanced Metering Infrastructure
ASA	Advisory Services and Analytics
BAU	business-as-usual
BESS	battery energy storage system
BOT	build operate transfer
BOTAS	Petroleum Pipeline Corporation
bps	basis points
C&I	commerce and industry
CDSs	certificates of deposits
CAGR	compound annual growth rate
CBAM	Carbon Border Adjustment Mechanism
CBRT	Central Bank of Republic of Türkiye
CCDR	Country Climate and Development Report
CCMSAP	Climate Change Mitigation Strategy and Action Plan
CIF	Climate Investment Fund
COP28	United Nations Climate Change Conference
COVID-19	Coronavirus Disease 2019
CPF	Country Partnership Framework
CPI	consumer price index
CTF	Clean Technology Fund
DSI	State Hydraulic Works General Directorate
EBRD	European Bank for Reconstruction and Development
ECA	Europe and Central Asia
ECARES	Europe and Central Asia Renewable Energy Scale-Up
EEPB-2	Second Energy Efficiency in Public Buildings
EEX	European Energy Exchange
EML	Electricity Market Law
EMS	Energy Management System
EMRA	Energy Market Regulation Authority
ENTSO-E	European Network of Electricity Transmission System Operators
EPIAS	Enerji Piyasaları İşletme A.Ş. (EPİAŞ) known in English as EXIST
ETL	electricity transmission lines
ETS	emissions trading system
EU	European Union
E&S	Environmental & Social

EUAS	Electricity Generation Corporation
EV	electric vehicle
EXIST	Energy Exchange Istanbul (known in Turkish as EPİAŞ)
FIT	feed-in-tariff
FX	foreign exchange market
GCAP	Global Climate Action Program
gCO2e	grams of carbon dioxide equivalent
gCO2e	grams of carbon dioxide equivalent
GDP	gross domestic product
GHG	greenhouse gas
GSEP	Gas Storage Expansion Project
GW	gigawatt
HPP	hydroelectric power plant
HVAC	high voltage alternating current
HVDC	high voltage direct current
IBRD	International Bank for Reconstruction and Development
IEA	International Energy Agency
IFC	International Finance Corporation
IGOs	Intergovernmental organization
ILO	International Labor Organization
IP	Investment Plan
IPA	Instrumant for Pre-Accession
IRA	Inflation Reduction Act
IRF	Integrated Results Framework
ktoe	ton of oil equivalent
LCPs	low-carbon pathways
M&R	monitoring and reporting
MDBs	multi development banks
MENR	Ministry of Energy and Natural Resources
MIGA	Multilateral Investment Guarantee Agency
MoEN	Ministry of Energy and National Resources
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MoTF	Ministry of Treasury and Finance
MoTI	Ministry of Transport and Infrastructure
MoU	Memorandum of Understanding

MPA	multiphase programmatic approach
MPIS	MDB project implementation services
MSME	micro-, small-, and medium-sized enterprises
MTEP	million-tons equivalent of oil
MÜSİAD	Independent Industrialists and Businessmen's Association
MW	megawatt
MWh	megawatt-hour
NDC	Nationally Determined Contribution
NDP	National Development Plan
NEEAP	National Energy Efficiency Action Plan
NEP	National Energy Plan
NGOs	nongovernmental organizations
NØW	near-zero wastes
PMI	Partnership for Market Implementation
REI	Renewable Energy Integration
RES	Renewable Energy Sources

OIZ	organized industrial zones
OTC	over the counter
SCADA	Supervisory Control and Data Acquisition
SME	Small and medium sized enterprises
SOE	state-owned enterprises
SuTPs	Syrians under temporary protection
TA	Technical Assistance
TEİAŞ	Turkish Electriciy Transmission Corporation
TOE	tons of oil equivalent
TRY	Turkish lira
TwH	terawatt hours
tCO2e	tons of carbon dioxide equivalent
UN	United Nations
WPP	Wind power plants

1. Executive Summary

Over the past two decades, Türkiye has seen the highest surge in energy usage among the Organization for Economic Co-operation and Development (OECD) countries. At the same time, the country has effectively improved its energy efficiency, as evidenced by its ranking as the second-best in reducing energy intensity within the OECD in 2021.

Türkiye's energy sector began transitioning from a monopolistic to a competitive structure with the enactment of the Electricity Market Law (EML) in 2001 and its amendment in 2013. The EML created the Energy Market Regulatory Authority (EMRA) with extensively defined organization and duties; it introduced a new licensing requirement for the electricity market and eligible consumers, and regulated grid access. The EML also separated relevant activities into regulated sectors (transmission, distribution, and retail sales) and competitive sectors (generation, wholesale, and retail sales to eligible customers).

The 2005 Renewable Energy Law (REL) was amended in 2010 to enhance regulatory support and encourage investment in renewable energy. Incentives for renewable energy include the Renewables Support Mechanism namely YEKDEM, floor prices, priority dispatch, and feed-in tariffs (FITs), which were initially set in United States dollars (US$) in 2011 and adjusted to Turkish Lira (TRY) from 2020. Additionally, the Renewable Energy Zones (YEKAs) law facilitates auctions for generating electricity in high-potential solar and wind areas, awarding provisional licenses to the lowest bidders. By the end of 2023, Türkiye 's total installed capacity reached 109 gigawatts (GW), with renewable energy installed capacity increasing 114 percent from 28 GW at end-2001 to 62 GW at end-2023, mainly due to investments by the private sector.

Türkiye's greenhouse gas emissions (GHGs) increased by 7.7 percent in 2021 compared to the previous year, mainly from the energy sector. The government updated its Nationally Determined Contribution (NDC) to reduce emissions by 41 percent between 2023 and 2030. In July 2021, Türkiye issued a Green Deal Action Plan aligned with the European Green Deal to transition towards a sustainable, resource-efficient economy by focusing on carbon border adjustments, green finance, energy supply, sustainable agriculture, transport, and climate diplomacy. A Green Deal Working Group was established to monitor the plan's implementation. Türkiye ratified the Paris Agreement in October 2021, committing to net-zero emissions by 2053 and pushing forward resilient decarbonization plans. In line with the green development vision and the net zero emission target, efforts to regulate the reduction of greenhouse gas emissions, climate change adaptation, and the planning and implementation tools related to these issues are ongoing under the "Climate Law." The draft law, which has been largely completed, is anticipated to be introduced to the Türkiye Grand National Assembly in 2024, as part of the decarbonization efforts. An emissions trading system (ETS) to price carbon in line with Türkiye's 2053 net zero emission target and related policies is underway. The ETS would also help Türkiye align its environment policies with the European Union (EU)'s Carbon Border Adjustment Mechanism (CBAM). Türkiye has partnered with the World Bank to develop the ETS design with plans to pilot the system by the end of 2024. Additionally, Türkiye's energy exchange[1] will collaborate with the European Energy Exchange (EEX) to ensure compatibility with EU practices.

In December 2022, the government issued a National Energy Plan (NEP) with ambitious targets to scale-up renewable energy and flexibility resources by 2035, to lower electricity costs, reduce reliance on fossil fuels, and enhance industrial competitiveness and growth, on a path to a net zero emissions economy by 2053. Targets for 2035 include adding 60 GW of variable renewable energy over the next 12 years to reach a total of 52.9 GW solar photovoltaic, 24.6 GW onshore wind and 5 GW offshore wind by 2035. Hydroelectric power plants capacity is planned to reach 35.1 GW, and geothermal and biomass power plants 5.1 GW. Flexibility is expected to be provided by reaching 5 GW hydrogen electrolyzer capacity and 7.5 GW battery storage capacity by 2035. Türkiye announced

[1] Energy Exchange Istanbul (EXIST) or Enerji Piyasaları İşletme A.Ş. (EPİAŞ)

these targets to the international community at the 28th United Nations Climate Change Conference (COP28) in 2023.

The 12th National Development Plan (NDP, 2024-2028), also outlines a comprehensive agenda to transform Türkiye's economy in line with climate goals, focusing on immediate actions until 2028. In January 2024, the government launched Türkiye's Energy Efficiency 2030 Strategy and Second National Energy Efficiency Action Plan (2024-2030, 2nd NEEAP). These recent initiatives contribute to overhaul the nation's economic structure to meet climate objectives. These efforts are part of Türkiye's broader commitment to a sustainable and climate-resilient future, with a Long-Term Decarbonization Strategy under development to detail further climate actions. Türkiye's energy policies, outlined in the NDP, Medium-Term Program, 2022 NEP and 2nd NEEAP, prioritize local and renewable energy sources (particularly solar and wind), advance domestic energy technologies, improve energy efficiency, and enhance Türkiye's role in the global energy market.

Key development partners supporting Türkiye's energy transition include the World Bank Group's International Bank for Reconstruction and Development (IBRD) and International Finance Corporation (IFC), and the European Bank for Reconstruction and Development (EBRD).

The World Bank's June 2022 Country Climate and Development Report (CCDR) on Türkiye outlines a practical approach for the country to transition to net-zero emissions and realize substantial economic, social, and environmental benefits. The World Bank's involvement in Türkiye aligns with the CCDR's suggestions, with an existing energy portfolio of nine projects totaling over US$3 billion. The World Bank's energy sector portfolio consists of four projects that contribute to enabling renewable energy capacity (Renewable Energy -RE- Integration, Geothermal Development, Public and Municipal RE, and Accelerating the Market Transition for Distributed Energy), four in energy efficiency (Energy Efficiency in Public Buildings 1 and 2, Seismic Resilience and Energy Efficiency in Public Buildings, Organized Industrial Zones) and one in the gas sector (Gas Storage Expansion Project (GSEP)). In 2023, these projects facilitated the generation of 956 megawatts (MW) of renewable energy, with an expectation to contribute to 2,273 MW by 2028. Additionally, three technical assistance projects were recently approved, two under European Union (EU) IPA II - Phases 3 and 4, and one to support PMI. The World Bank's decarbonization program is set to grow with a new pipeline including Transforming Power Transmission System for REI Projects–Phases 1 and 2 (International Bank for Reconstruction and Development (IBRD) US$1.5 billion in total, FY26 and FY28 -tentative-).

The International Finance Corporation (IFC) has invested over $3 billion in Türkiye to support private sector projects that enhance energy generation, efficiency, and climate change mitigation. This includes 10 power generation projects with a capacity of 4.3 GW and distribution projects benefiting 3.9 million customers. These investments have fostered innovation and market creation, leading to more reliable electricity, economic growth, and higher labor force participation. IFC is committed to financing power generation to meet Türkiye's future energy demands and to strengthen the distribution network to better integrate renewable energy and enhance resilience. Following the approval of the World Bank Country Partnership Framework FY24-FY28 in April 2024, IFC, along with IBRD and Multilateral Investment Guarantee Agency (MIGA), plans to continue supporting renewable energy projects and the modernization of transmission and distribution networks. IFC is also focused on promoting the adoption of new clean technologies, including battery storage energy systems, to increase renewable energy generation, diversify the energy mix, and improve the resilience of the power system in Türkiye.

Over the past decade, the European Bank for Reconstruction and Development (EBRD) has invested EUR2 billion in 30 energy sector projects in Türkiye, encompassing renewables, energy efficiency, and power distribution. EBRD's total investment in renewables amounts to EUR9 billion, including significant solar and wind projects, and a major geothermal plant that boosted Türkiye's geothermal capacity by 30 percent. These investments have also enhanced human capital by fostering green and digital skills through nationally accredited certifications and promoting workforce diversity via Equal Opportunity Action Plans. Additionally, EBRD has worked with local authorities to support economy-wide decarbonization, helping to develop the Renewable Energy Action Plan aligned with the EU's

directive, design post-2020 renewable energy support schemes, and formulate the National Energy Efficiency Action Plan (NEEAP).

The Clean Technology Fund (CTF) has supported sustainable energy projects in Türkiye since 2012, with a total investment of US$4.6 billion, including US$464.5 million CTF co-financing and US$4.1 billion Multi Development Banks (MDB) co-financing (World Bank US$3 billion, IFC US$169 million and EBRD US$980 million). These projects are estimated to save 902,000 tons of carbon dioxide equivalent (tCO2e) and US$568 million in avoided oil imports annually. The CTF has collaborated with MDBs like the World Bank, IFC, and EBRD to fund pioneering projects in Türkiye, leveraging private sector capital to advance Türkiye's transition to a sustainable energy future as part of its broader digital and green transformation efforts.

Although Türkiye ratified the Paris Agreement relatively late (October 2021) compared to the other countries, the government has set out a plan for robust climate action to meet its net zero target by 2053, building upon the decarbonization efforts underway since the early 2000s. The Clean Technology Fund (CTF) funds will be instrumental in accelerating the implementation and the impact of the Government’s ambitious climate and energy strategies and plans towards achieving the Paris Agreement goals.

The objective of Türkiye’s new CTF Renewable Energy Integration (REI) Program Investment Plan (IP) is to support the scale-up renewable energy by 2035, including by enabling the flexibility of energy systems to smoothly integrate higher shares of variable renewable energy generation in Türkiye's grid. This objective aligns with the REI Program impact objective IP will also support the government’s efforts to tackle economic, financial, operational, social and regulatory barriers with regard to the REI. CTF-REI resources and its programmatic approach will strengthen the cooperation between public agencies, private actors and MDBs in Türkiye. The programmatic and coordinated approach developed under this Investment Plan brings enhanced synergies and dialogue between these actors, supporting the country to more efficiently and effectively address the aforementioned barriers.

CTF-REI concessional resources will catalyze MDBs financing (namely the World Bank as the lead MDB, EBRD and IFC as per the government’s request), private investment, and other co-financing in technologies/projects required to meet the country’s NDC and decarbonization commitments. The types of technologies, infrastructure, innovative models, and enhancement activities prioritized by the program which will be eligible for funding, such as those described in the Supported Activities section.

CTF-REI resources will be implemented through at least two components as follows: 1) Component 1 (Beneficiary: TEİAŞ) Transforming Power Transmission System for REI, and 2) Component 2 (Beneficiary: private sector): System Flexibility, Balancing, Stabilization and Strengthening Power Infrastructure, which covers e-mobility infrastructure, battery storage, and digitalization of the power distribution grid. In case of availability of additional CTF grant financing of $3 million, the Government of Türkiye would like to use it for Component 3 on technical assistance projects, including the first pumped hydro storage and hydropower energy efficiency technical assistance. The requested envelope for Türkiye´s CTF-REI amounts to US$70 million, of which US$68 million corresponds to the CTF-REI financing and US$2 million to the grant financing.

The US$70 million requested from CTF-REI financing mobilizes US$750 million from the World Bank and US$300 million from EBRD and IFC, a 15 to 1 leverage. Furthermore, the improved flexibility and resilience of the power grid will enable more investments in renewables, especially by the private sector, which will improve the leverage ratio further.

Monitoring and evaluation of the Investment Plan will be conducted using an Integrated Results Framework (IRF) as described in this IP. The IRF, based on the REI Monitoring and Reporting (M&R) System toolkit, includes a set of results indicators across the following levels: CIF impacts; REI program impacts; program outcomes (including co-

benefits); and program outputs. The Investment Plan's three components relate to each level of results with a view to achieving program-level impacts responding to the whole energy system analysis, as described in the main body. The proposed components will contribute individually and collectively to achieving the energy transition targets for 2035 under Türkiye's 2022 National Energy Plan.

2. Country Context

2.1 Economic and Political Context

As described in the recent Country Partnership Framework Document (CPF),[2] Türkiye's has achieved significant development over the past two decades. Real gross domestic product (GDP) growth averaged 5.4 percent between 2002 and 2023, with income per capita (in real terms) more than doubling. Since 2007, the poverty rate (US$6.85 2017 purchasing power parity –PPP-) decreased from above 20 percent to 7.6 percent in 2021. On the sustainability front, the country has managed, through expansion of services, to relatively decouple growth from greenhouse gas (GHG) emissions and maintain per capita emissions below the Organization for Economic Co-Operation and Development (OECD) and EU averages.

To ensure that these trends are sustained over time, Türkiye will need to address several emerging challenges related to growth, poverty, inclusion, and sustainability. First, the combination of a difficult macroeconomic situation in the aftermath of the Coronavirus Disease 2019 (COVID-19) pandemic, the composition of investment[3], and declining factor productivity since the mid-2010s raise questions about future medium-term growth prospects. Second, the speed of poverty reduction has slowed since 2016, as increases in inequality have offset the poverty gains from continued strong growth. Third, Türkiye suffers from an emissions intensive industrial base, continued reliance on fossil fuels, carbon-intensive transport, and inefficient buildings. The country's carbon intensive manufacturing sector exposes it to both risks and opportunities when the EU (which represents 41 percent of Turkish exports) starts implementing the Carbon Border Adjustment Mechanism (CBAM) in 2026. Fourth, the geographic, climatic, and socioeconomic conditions leave Türkiye particularly vulnerable to the impacts of climate change, making adaptation a high priority.

Following the May 2023 elections, the Turkish government has taken steps towards normalizing the economy in a gradual way to manage risks associated with the adjustment process. This includes monetary policy tightening, with interest rates increasing from 8.5 percent in May to 50 percent in March 2024, the unwinding of distortive financial regulations, and fiscal revenue measures to curtail the fiscal deficit. Markets are reacting positively, with 5-year certificates of deposits (CDSs) declining from around 700 basis points (bps) in May 2023 to below 300 bps in May 2024, major rating agencies upgrading their outlook to positive recently, and two of them (Fitch, S&P Global Ratings -S&P- and Moody's) upgrading the credit rating (to B, B and B3) on March 8, 2024, May 3, 2024 and July 19, 2024, respectively. The authorities are contemplating how to complement these actions with structural reforms that may help with growth. These efforts will need to be sustained and supported in the coming months given the significant monetary, fiscal, and macroprudential challenges and associated economic vulnerabilities.

In parallel, Türkiye continues to address the effects of the earthquakes that hit the country on February 6, 2023. With magnitudes of 7.8 and 7.5, the earthquakes were followed by thousands of aftershocks and another 6.7

[2] World Bank Group Country Partnership Framework for The Republic of Türkiye for the Period FY24-FY28 discussed by the Board of Executive Directors on April 9, 2024.

[3] Türkiye's investment structure has transformed in favor of productive areas over the years. In the 2010-2022 period, investments grew by 6.6 percent on average, while machinery and equipment investments and construction investments grew by 9.1 percent and 3.8 percent, respectively. Meanwhile, machinery and equipment investments have been growing uninterruptedly for the last 18 quarters. The share of machinery and equipment investments increased from 39.7% in 2010 to 46.8% in 2023.

magnitude earthquake on February 20. According to official statistics, they caused more than 50,000 casualties, injured 107,000 people, damaged or destroyed 1.9 million housing units, and displaced 3.3 million people, of whom 2 million needed shelters. An assessment[4] conducted by the Turkish government with support from the European Union) (EU), the United Nations (UN), and the World Bank estimated recovery and reconstruction needs associated with the earthquakes at around US$ 103,6 billion. Risks remain high: according to the UN, Türkiye ranks 9th globally with regards to human losses due to earthquakes, with about 70 percent of its population living in first- and second-degree seismic zones.

The country's geographic location as a door to the Black Sea and a bridge between Europe and Asia has elevated its profile in recent regional conflicts. Türkiye, because of its geographical and diplomatic position as well as its own socioeconomic interests, has turned into a key interlocutor between Russia and Ukraine, helping secure global shipments of food through Turkish straits. Also, the Syrian civil war led to an inflow of Syrians under Temporary Protection (SuTPs) into Türkiye (3.2 million in 2024) and to an agreement with the EU to support SuTPs and their host communities as well as to prevent irregular migration into the EU. The country is also a key stakeholder for the Middle Corridor[5], which represents an important Asia-Europe route for improved transport and trade connectivity.

Private sector development is key for Türkiye's transition to high-income status. The private sector constitutes 98 percent of the country's top 500 firms in terms of turnover and for 78 percent of investment; state-owned enterprises (SOEs) take up a smaller share of the economy compared to other countries.[6] The private sector also employs about 85 percent of Türkiye's workforce,[7] with small- and medium-sized enterprises (SMEs) employing 72 percent of the overall workforce. At the same time, SMEs generate more than 50 percent of gross value added.[8] In this context, Türkiye's ability to build a productive, sustainably growing economy depends on the capacity of SMEs to expand, adopt the latest technologies, innovate, and participate in global value chains.

COVID-19 is still on the policy agenda. Türkiye successfully mobilized to respond to the health and socioeconomic effects of the pandemic, and quickly intensified infrastructure investments for COVID-19 screening and treatment. It was among the first countries to launch a vaccination program, administering at its peak more than 1.5 million doses per day.[9] The government's policy response also helped cushion the blow for businesses and households, and Türkiye was among the few emerging-market economies that did not experience negative economic growth in 2020. Türkiye is working to build on the recent experience with enhanced pandemic preparedness in both monitoring and response.

Türkiye's geographic, climatic, and socioeconomic conditions make it highly vulnerable to the impacts of earthquakes, climate change, and other environmental hazards, making adaptation and resilience high priorities. It has a 'high vulnerability' in 9 out of 10 climate vulnerability dimensions, compared with a median of 2 out of 10 in other OECD countries. Climate-related disasters have been striking with greater frequency and intensity over the last two decades. In 2019 alone, 935 extreme events occurred, caused mainly by heavy rains and floods, windstorms, snow, and hail. Climate models predict this trend to continue with increasing abnormalities in precipitation patterns with more frequent extreme rain and floodings, as well as protracted drought and wildfires, and rising sea levels.

[4] https://www.sbb.gov.tr/wp-content/uploads/2023/03/Turkiye-Recovery-and-Reconstruction-Assessment.pdf

[5] "The Middle Corridor", which begins in Türkiye and passes through the Caucasus region via Georgia, Azerbaijan, crosses the Caspian Sea, traverses Central Asia and reaches China, is one of the most important components of the efforts to revive the ancient Silk Road.

[6] European Bank for Reconstruction and Development (EBRD), Country Diagnostic, April 2019, https://www.ebrd.com/documents/policy/country-diagnostic-paper-Türkiye.pdf.

[7] European Commission, Türkiye 2020 Report, https://neighbourhood-enlargement.ec.europa.eu/system/files/2020-10/Turkiye_report_2020.pdf.

[8] OECD, SME Policy Index: Western Balkans and Türkiye, 2022.

[9] Country Partnership Framework (CPF) of the Republic of Türkiye for the period FY24-FY28 approved by the World Bank's Executive Directors' Board as of April 9, 2024

Over 70 percent of the country's population and 80 percent of its GDP are in seismic risk zones, including its largest metropolis and major economic hub, Istanbul, according to the latest CPF. Climate change is expected to aggravate the pressure exerted by extreme events, thereby posing multidimensional risks to welfare and livelihood security. Türkiye has started to lay a foundation for building resilience and addressing depletion of natural resources through planning and policy development, including institutional arrangements at various levels of government and in various sectors. In addition, incentives for earthquake resilient reconstruction of existing non-resilient building stock and long-term, affordable local currency financing to enable residential reconstruction are much needed.

Climate change is having a significant effect on Türkiye and impacting policy making. Türkiye has experienced growing exposure to climate-related disaster risks. A serious drought occurred in the country's central and eastern regions during the 2020/2021 agricultural season, whereas flooding in the Black Sea region in 2021 caused the loss of many lives and significantly damaged or destroyed public and private infrastructure. Also in 2021, forest fires in the Mediterranean Region burnt around 1,700 square kilometers of forest. The outbreak of sea mucilage in the Marmara Sea affected sea life, damaged the fishing industry, and threatened to impede the only shipping access to the Black Sea. Although carbon intensity and energy efficiency have improved in recent years, total emissions have increased, and Türkiye ranks 15th among countries in annual GHG emissions, up from 18th in 2019. The country is responding to these challenges with adaptation and mitigation interventions, such as the Water Efficiency Campaign initiated in January 2023.

However, Türkiye's rapid economic growth alongside a rising population have led to unsustainable increases in resource use, waste generation, and GHG emissions. Total domestic extraction of natural resources more than tripled over the past two decades, while Türkiye's net GHG emissions increased from 164 metric tons of carbon dioxide equivalent ($MtCO_2e$) in 1990 to 467 $MtCO_2e$ in 2020, the fastest pace in the OECD over the last decade. This increase in GHG emissions reflects continued GDP and population growth and was observed across all sectors of the economy, but particularly in energy,[10] with emissions growing 3.8-fold between 1990 and 2020 as Türkiye still relies heavily on fossil fuels for its energy supply.[11]

As a large producer of emissions-intensive products, Türkiye faces risks from the global transition to a low carbon future. Türkiye is the fifth largest producer globally of cement and the eighth largest producer of steel. As countries take action to decarbonize their economies, demand will drop for fossil fuels and emissions intensive goods. The EU CBAM is a tangible example, where the EU will place a fee on the import of certain emissions-intensive products to create a level playing field for domestic producers subject to the EU emissions trading system. The CBAM will only apply to a select group of the most emissions intensive and trade exposed sectors beginning in 2026, although it is likely to expand to other sectors over time. As the EU is Türkiye's largest trading partner, absorbing 41 percent of its total goods exports, Türkiye's corporate sector will need to transition towards more sustainable production to preserve growth potential. This transition requires long-term finance to scale-up private capital and minimize costs, but macro financial volatility, specifically currency volatility and persistently high inflation, undermine the development of domestic sources of long-term finance in Türkiye.

In July 2021, the government released its Green Deal Action Plan[12] to address these challenges by transitioning towards a sustainable and resource efficient economy and prepare for the comprehensive changes envisaged by the European Green Deal. In October and November 2021, Türkiye ratified the Paris Agreement, committing to net zero emissions by 2053 and advancing plans for resilient decarbonization; it also created a new Directorate of Climate Change in charge of coordinating the climate transition across all levels of government, and signed a Memorandum of Understanding (MoU) for increased climate action with six key development partners of which the

[10] Energy combines electricity and heat production, petroleum refining, and fugitive emissions from fuels.
[11] In 2021, fossil fuels accounted for 84% of Türkiye's total energy supply, with natural gas comprising 31% of total supply, followed by oil (27%), and coal (25%). Despite considerable growth over the past decade, energy supply from wind, solar and other renewable energy sources only accounted for 16% of total energy supply in 2021.
[12] https://ticaret.gov.tr/data/60f1200013b876eb28421b23/MUTABAKAT%20YE%C5%9E%C4%B0L.pdf.

World Bank and IFC are two. As per the Climate MoU, the Bank is following through on its pledge to mobilize an additional IBRD US$2 billion across FY23-24 for climate financing, with a robust set of climate-focused projects prepared for FY23 and FY24. Local and global events have also led to increasing awareness of climate change impacts and the need for reduced emissions. In December 2022, the government issued the National Energy Plan (NEP) (2023-2035) with targets to massively scale-up renewables and flexibility resources by 2035. Issued in November 2023, the 12th National Development Plan (2024-2028) lays out a comprehensive agenda to transform Türkiye's economy to meet climate goals, with a focus on immediate actions until 2028. In January 2024, the Minister of Energy announced the new National Energy Efficiency Action Plan (NEEAP), aiming to reduce total loss in transmission and distribution grids to 8 percent in our country which is above the OECD average, improve energy efficiency in all sectors and increase the share of renewable energy in electricity generation. The Energy Efficiency Strategy sets the strategic goals for the sector under the title "improve efficiency in electricity generation, transmission and distribution; reduce energy losses and emissions harmful to environment.

2.2 Social Context

Vulnerability to climate change is unevenly distributed. As in other countries, it is the poorest and most geographically vulnerable areas and groups of Türkiye that will continue to bear the brunt of the adverse effects of climate change. Those most vulnerable include people in rural parts of the country.[13] Their predominantly agricultural livelihoods are highly dependent on natural resources and a healthy ecosystem. Data from the 2019 Survey on Income and Living Conditions (TurkStat) show that on average, 10 percent of the income of the country's households below the international poverty line of US$5.5 a day is from agriculture with the rest often coming from precarious, informal or seasonal jobs that lead to long spells of unemployment.[14] Such households consequently have fewer resources to draw on during times of need, as well as fewer options to diversify their sources of income towards sectors that are less sensitive to climate shocks.[15] The data also show that over half of poor households live in dwellings with a leaking roof, damp walls, floors or foundations, or rotting window frames or floor.[16] Making matters worse, they tend to live in more marginal and hazardous areas, such as those exposed to high levels of seismic or climatic risks; 13.7 percent of people living in poverty are exposed to flooding, Türkiye's second most frequent cause of disasters, after earthquakes.[17]

Climate change does not only widen regional disparities, but also exacerbates social inequalities, such as those based on gender and age. Female workforce participation is only at 35.8 percent and 37.1 percent in 2023 and May 2014, respectively, the lowest in the OECD, however with an increasing trend in the female workforce participation.[18] Women, who are predominantly responsible for sourcing water and ensuring household food security and wellbeing, are experiencing heavier care burdens as a result of immediate and longer-term climatic changes.[19]. Youth, who in general have fewer resources, coping mechanisms, social networks and safety nets to draw on, are likewise more vulnerable than other groups to the impacts of climate change. Because the impacts of current high levels of global GHG emissions will be felt by generations to come. Approximately, Türkiye's population is under the age of 32, yet

[13] (UNDP https://www.adaptation-undp.org/explore/europe-and-central-asia/t%C3%BCrkiye)
[14] https://documents1.worldbank.org/curated/en/099042723135539629/pdf/P174569094145902509070334d02fd1be1.pdf
[15] https://documents1.worldbank.org/curated/en/099042723135539629/pdf/P174569094145902509070334d02fd1be1.pdf
[16] https://documents1.worldbank.org/curated/en/099042723135539629/pdf/P174569094145902509070334d02fd1be1.pdf ; Rentschler et al. (flood WP)
[17] https://www3.weforum.org/docs/WEF_GGGR_2023.pdf
[18] IPCC (2022) Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.
[19] IPCC (2022); Fruttero et al. (2023) Gendered Impacts of Climate Change: Evidence from Weather Shocks. World Bank, Washington, DC. http://hdl.handle.net/10986/39813

the country has a youth unemployment rate of nearly 17.4 percent, with approximately 25.8 percent of young people between 15 and 29 not currently in employment, education or training.[20]

Türkiye's green transition is thus not only urgent for achieving its net-zero emissions target; but is also essential for ensuring the country's good progress on poverty reduction and socioeconomic development. The ongoing recovery from the devastating effects of February 2023 earthquake, the COVID-19 pandemic, and recent climate extremes, presents an opportunity for building a more resilient, prosperous and fairer future for the Turkish population.

A 'Just' Green Transition

Lowering emissions towards net zero and building resilience to climate change demand transforming key systems in Türkiye's economy, including those relating to energy, industry, transport, urban, agriculture, food and water. Doing so will create large opportunities and long-lasting benefits for the country. According to the World Bank, such a pathway leads to a net US$15 billion gain over 2022-30 and a US$146 billion gain over 2022-40.[21] These are largely due to reduced fuel imports (Türkiye currently imports 99 percent of its gas and 93 percent of its oil), increased investment in renewable energy, and health benefits from reduced air pollution. Analysis by the United Nations and International Labour Organization finds that a swift and comprehensive implementation of low-carbon policies in Türkiye will lead to over 300,000 extra jobs by 2030, spread across the economy.[22] Emerging green sectors open opportunities for social entrepreneurship, and the decentralized nature of green infrastructure (e.g. renewable energy) is well-suited for the establishment of citizen and community-owned cooperatives. Investments in climate adaptation and the rehabilitation of local ecosystems likewise create earning opportunities for households and populations at the frontlines of climate change impacts and environmental degradation.

These transformations may cause uneven risks and across households, workers, and regions, especially in the short- and medium-terms. Jobs will be created in some economic sectors but lost in others – notably in the traditional (fossil fuel) electricity industry.[23] Some regions and populations may be less able to benefit from the opportunities of the green transition than others. For instance, research from the World Bank finds a high concentration of 'brown' jobs in industries that have elevated rates of GHG emissions, and which tend to be held by prime-aged, male workers, not only in the economically leading, western regions of the country, but also in less prosperous (Hatay, Mardin and Malatya) and transition (Gaziantep, Zonguldak, Manisa, Aydin, Konya and Kayseri) provinces in the east.[24] Yet, emerging 'green' jobs have so far been concentrated in the western regions only, and are moreover expected to require higher-skilled workers. Given that the largest proportion of unemployed women and youth are in the eastern provinces, these vulnerable groups will likely face a double barrier to accessing such new economic opportunities without targeted support.

It is therefore imperative that Türkiye's green transition is also a 'just' transition' that means that the transition should help build inclusive societies, by expanding access to jobs, markets, services, and political, social and cultural spaces for all those affected – especially vulnerable who are currently excluded from such opportunities. It should strengthen trust, cohesion, and willingness to cooperate within and across communities, and between communities and the government. It should strengthen the whole population's resilience to external shocks, climate-related and other, ensuring that people are safe, protected and can thrive over time, rather than fall into poverty trying to cope.[25]

[20] CCDR

[21] CCDR, ILO report

[23] https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/publication/wcms_849761.pdf

[24] CCDR, ILO report

[25] Garrote-Sanchez, D. & Makovec, M. (2022) *Jobs, Skills, and the Green Transition: Challenges and Opportunities for Türkiye*.

The process of preparing for and implementing the transition, and achieving these just outcomes, also needs to be legitimate. [26] The extent to which communities accept who has authority over the green transition, what goals they pursue, and how policies and programs are implemented, depend on a transparent, accountable and inclusive decision-making process, which welcomes meaningful participation from and dialogue with all segments of society.

The Government of Türkiye will consider the following recommendations made by a team of World Bank experts for Türkiye to ensure a just green transition for people and communities.[27]

- First, the country should expand opportunities for all affected and vulnerable groups, with economic strategies for target sectors and regions. This includes diversifying local economies and expanding the economic base in carbon-intensive regions (such as in Bursa and Kocaeli, where jobs are concentrated in the steel, cement, chemicals and automotive sectors). [28]Doing so would create decent and sustainable work for people in the local area. Intervening in the labor market and building human capital is crucial, to ensure that workers have the skills needed to thrive during and after the transition; this means investing in reskilling, upskilling, and longer-term investment in education, particularly to take advantage of the demographic dividend brought about by Türkiye's large youth population. The government can furthermore establish community benefit-sharing measures in areas where green investment is high, such as in the western provinces, and repurpose funding from industry closure to support the just transition. Additional revenues from the removal of fossil fuel subsidies or a carbon tax, for instance, can be used to compensate low-income households for any adverse impacts arising from the transition.

- Second, Türkiye should adopt policies to protect and mitigate the costs of the transition for workers and communities. Social protection coverage, including in the forms of social safety nets, unemployment insurance, and health insurance, needs to be expanded so that workers who are adversely affected by the green transition are protected. Social protection measures can also be put in place to compensate for increased costs (e.g. of energy, heating, transport, housing) to consumers or businesses. In addition, care must be taken to ensure basic services and infrastructure are maintained in soon-to-be former, 'brown' mono-industry areas (such as in the coal regions of Zonguldak and Manisa). These communities' access to schools, health services, water, and digital connectivity should not be interrupted, nor should plans for future investments in the region. Proactive efforts are also needed to mitigate wider social risks in communities affected by job losses, migration, or other transition impacts, such as gender-based violence, challenges related to mental health, and substance abuse.

- Finally, Türkiye should establish the right processes to support change, empower citizens, and build trust in as well as a shared vision for the post-transition future. This includes regional processes to establish local, regional and national dialogues on climate change and action, as well as social dialogues in target carbon-intensive sectors and regions to ensure that affected workers and communities are informed, have a voice and play a meaningful role in decision-making. Existing community platforms may be used for mitigation and adaptation planning and supporting locally led climate action. Online platforms can further ensure widespread civic engagement and stakeholder consultation and input into green transition policies and programs.

[26] World Bank (2022) Türkiye Country Climate and Development Report. CCDR

[27] Janna t, Murat O., Ferdous J., Varalakshmi V, (2023), "A Just Transition For People and Communities", TPQ, Fall 2003, p.103-110.

[28] Garrote-Sanchez, D. & Makovec, M. (2022).

2.3 Sectoral and Institutional Context

Türkiye aspiration to achieve carbon neutrality by 2053, but reaching such a goal requires major changes to its energy system. Türkiye's ratification of the Paris Agreement in October 2021 and its pledge to achieve net zero emissions by 2053 signify the country's commitment to join the global community in tackling the climate global emergency. As part of the Paris Agreement process, Türkiye submitted the first iteration of its NDC to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat in April 2023, outlining its climate actions and targets. The government of Türkiye is also currently working on a long-term decarbonization strategy that will further define measures and actions to address climate change.

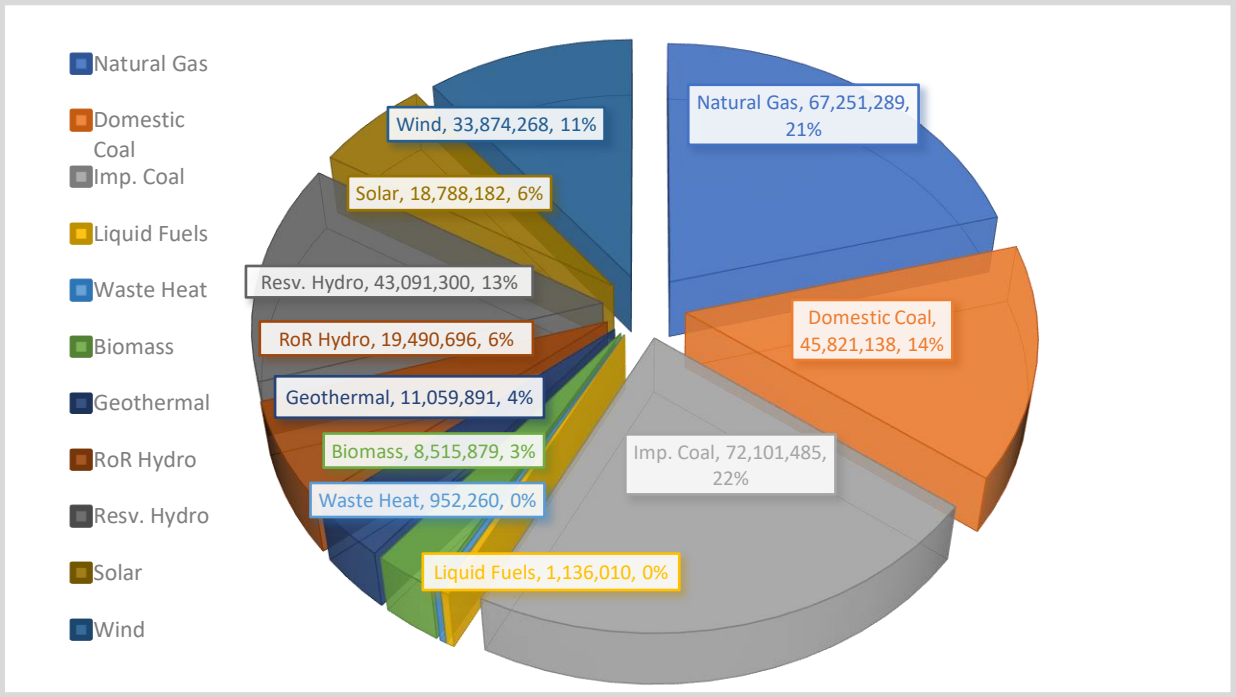
As indicated in the World Bank's Türkiye Country Climate and Development Report (CCDR, 2022), Türkiye can also improve energy security through an accelerated pace of least-cost investments in domestic solar and wind—building on its track record of tripling renewable energy capacity in the last decade and investing in energy efficiency, battery, and pumped storage, geothermal, and gas generation with carbon capture and storage. This would require substantial commercial financing to enable the country to meet a doubling of energy demand by 2053 needed to fuel its growth ambitions, with the added benefits of lowering emissions and improving energy security.

Increasing energy demand (expected over 3 percent per year for the next 10 years), driven by Türkiye's growing economy, constitutes another macroeconomic challenge and an energy security risk. Türkiye's primary energy consumption has more than doubled over the past two decades to fuel economic growth; it is projected to increase by 50 percent over the next two decades. Up to 75 percent of energy demand depends on imports (99 percent of gas and 93 percent of oils are imported). Türkiye's energy imports accounted for almost 20 percent of total imports in 2021, contributing to massive current account deficits (nearly US$51 billion in 2021). The country's high energy and carbon intensity, 145 tons of oil equivalent ktoe/US$ 2015 and 440 grams of carbon dioxide equivalent per kilowatt hour (gCO2e/kWh), respectively (well above the EU averages, which are 88 ktoe/US$ 2015 and 229 gCO2e/kWh, respectively), make it vulnerable to global energy prices. However, in response to increasing consumer energy price inflation (for 2022 around 137 percent), Türkiye has accelerated energy efficiency investments, which made it second among OECD countries in terms of improvement of energy intensity in 2021.

Türkiye is endowed with considerable solar, wind, and geothermal resources and utilizing these RE resources to achieve energy security has long been a government priority. By end-2023, the total installed capacity reached 107 gigawatts (GW) where 47 percent was thermal, 30 percent was hydro and 23 percent was other renewable resources namely wind, solar and geothermal. The electricity generated in 2023 is 326,302 GWh of which 39 percent is from hydro and other renewable energy resources,[29] as shown in figure 1 below.

[29] TEIAS 2023 Monthly Electricity Generation and Consumption Reports

Figure 1: Energy Generation Mix (kWh and %, 2023)



Source: TEİAŞ, December 31, 2023

2.4 Government Energy Strategies and Targets

The government's energy strategies and targets are outlined principally in four reference documents: the 12th NDP (2024-2028) [30], Medium-Term Program (2024-2026), Türkiye NEP, and NEEAP (2024-2028). These aim to ensure supply that is sustainable and affordable; to diversify resources of energy supply; to exploit indigenous and renewable energy target; to use nuclear energy in electricity generation; to increase energy efficiency; to prioritize localization of energy technologies and integrate new technologies; to gain a competitive structure to enhance the country's strategic position in the international energy trade. The Ministry of Energy and National Resources (MENR) will soon announce the new Strategic Plan covering the period from 2024-2028.

The government is planning to meet high energy demand in the medium term mainly from renewables and nuclear, nevertheless additional investments will be made for natural gas and indigenous coal power plants. Electricity consumption will reach 510.5 terawatt hours (TWh) in 2035 from 330.3 TWh in 2023, representing a compound annual growth rate (CAGR) of 3.7 percent. Wind installed capacity is expected to reach 29.6 GW (24.6 GW onshore and 5.0 GW offshore) whereas solar installed capacity is expected to reach 52.9 GW. Nuclear installed capacity is expected to reach about 7.2 GW while geothermal and biomass capacity will reach 5.1 GW. 10.0 GW of additional natural gas capacity and 1.7 GW of local coal capacity is forecasted to be added to the generation capacity.

Türkiye has designed one of the most ambitious strategies globally to scale-up renewable energy generation. The strategy plans to add up to 60 GW by 2035 (5 GW per year) (Figure 2) and is part of the country's effort to meet its energy security objectives and commitments to achieve net zero emissions by 2053. The MENR presented this

[30] https://www.sbb.gov.tr/wp-content/uploads/2023/09/Orta-Vadeli-Program_2024-2026.pdf

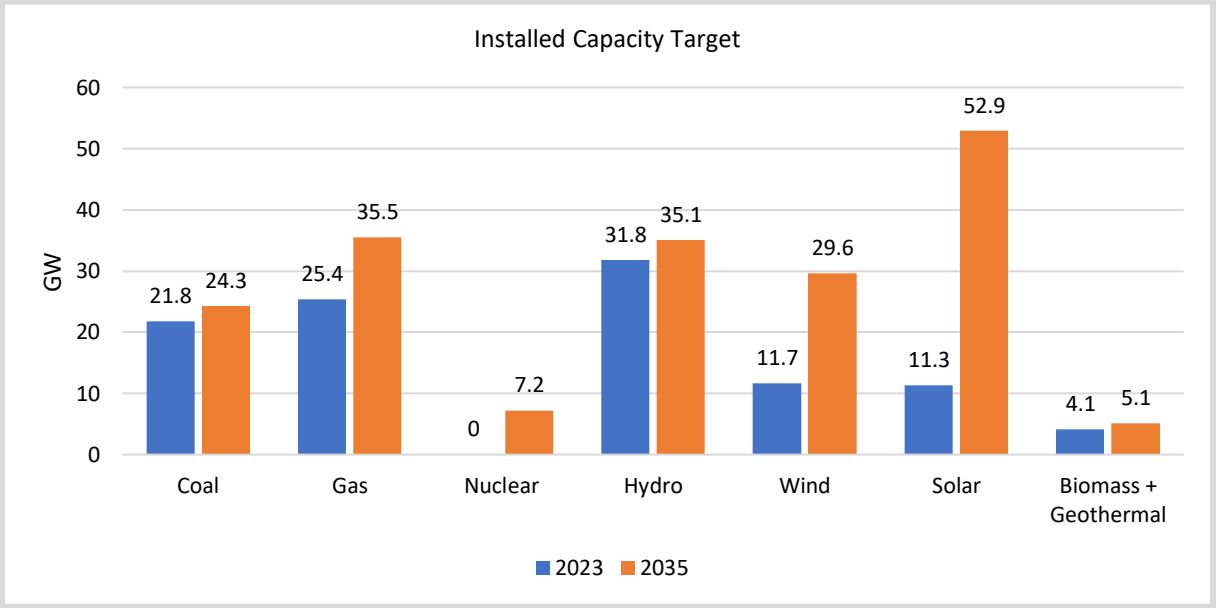
strategy during a World Bank-organized event at the 2023 COP28 in Dubai.

The ambition to scale-up RE generation requires qualified and diverse human capital. Türkiye's 12th Development Plan for 2024-2028 sets out a clear vision and enabling environment to equip the prospective workforce in line with the labor market requirements of the green and digital transformation. It promotes collaboration between the public and private sector and national education institutions to design market-oriented technical and vocational training and educations systems targeting greening and digitalizing sectors, including renewable energy.

Flexibility requirements needed to balance the intermittent renewable capacity need to be initiated to enable the planned scale-up of RE. In the World Bank CCDR, the required investment in the transmission and distribution systems is estimated at US$8 billion between 2022-2030 and US$14 billion from 2030-2040. The Minister of energy and natural resources has also recognized the need to ensure integration of RE through: (i) expanding, modernizing and digitizing the transmission networks, as well as international electricity interconnections; (ii) developing storage capacity, including pumped storage *hydroelectric power plants* (HEPPs); (iii) enhancing system balancing by improving efficiency of Türkiye's hydropower park; (iv) more flexible electricity networks, smart meters, *supervisory control and data acquisition (*SCADA) systems, and demand-side participation; as well as (v) increasing grid resilience.

The 12th NDP (2024-2028) also envisages that investments in energy efficiency, green hydrogen, and energy storage will play a critical role in achieving net zero emissions by 2053. In this direction, tenders for new Renewable Energy Resource Areas (YEKA) with domestic component obligations will be held, and studies will be carried out for the development of offshore YEKA projects. Transactions such as permits, licenses, and warrants related to investments will be streamlined by transferring them to the online platform in the Medium-Term Program (2024 – 2026).

Figure 2: Installed Capacity Targets in NEP by 2035 (GW)



Source: NEP, 2023

Policy and regulatory frameworks, including the update of the second Nationally Determined Contribution, preparation of a Climate Change Strategy for the energy sector in line with the 12th NDP, and the 2024-2029 TEİAŞ

Strategic Plan, will need to be strengthened to reach the climate targets**.**

Accelerating energy efficiency is another critical pillar of the government's energy policies aiming to decrease primary energy consumption by 16 percent and 100 million tons of CO_2 emissions. The 2nd National Energy Efficiency Action Plan valid for 2024-2030 is comprehensively structured around seven thematic subjects: industry and technology, building and services, energy, transport, agriculture, common topics, start-ups, and digitalization. It aims to provide 37.1 million tons equivalent of oil (MTEP) energy savings with a US$20.2 billion investment between 2024-2030.

A wide range of measures aims to increase energy efficiency from generation and networks to general lighting and tariffs.[31] External financing opportunities will be sought for investments that eliminate efficiency losses due to equipment and operation in reservoir hydroelectric power plants, and to increase energy efficiency in electricity transmission and distribution networks.

2.5 Government Climate Strategies and Plans

In October 2021, Türkiye ratified the Paris Agreement, adopted a net zero emissions target by 2053, created a Climate Presidency in charge of coordinating the climate transition across all levels of government, and signed a MoU for increased climate action with six key development partners, including the World Bank, European Bank for Reconstruction and Development (EBRD) and International Finance Corporation (IFC). Due to its geographical location, Türkiye is one of the most negatively affected countries from climate change. Rising temperatures are causing increasing droughts and flooding associated with sudden, torrential rains. As per the Climate MoU, the World Bank is following through on its pledge to mobilize an additional US$2 billion for climate financing with a robust set of projects planned for FY23 and FY24. The World Bank's Energy Program has significantly contributed to this MOU.

Türkiye's energy sector is a main contributor of the GHG emissions. According to the results of the greenhouse gas inventory, total GHG emissions in 2021 increased by 7.7 percent compared to the previous year, reaching 564.4 MtCo2e, while decreasing by 2.4 percent in 2022 compared to 2021, reaching 558.3 $MtCO_2e$. Total greenhouse gas emissions per capita were 4 tons of CO2e and 6.8 tons of CO2e in 1990 and 2021, respectively. Total greenhouse gas emissions per capita have been 6.8 tons CO_2e and 6.6 tons of CO_2e in 2021 and 2022, respectively. In 2022, 86.6 percent of total CO_2 emissions stemmed from the energy sector (of which 32.6 percent came from electricity and heat generation), 13.1 percent from industrial processes and product use, and 0.3 percent from agriculture and waste.[32]

The government updated Türkiye's Nationally Determined Contribution (NDC) declaration in April 2023 and submitted to the United Nations Climate Change Framework Agreement Secretariat, committing to decrease emissions by 41 percent**,** equivalent to a 500 million tons reduction in emissions. Emissions are expected to peak in 2038 and then start declining in absolute terms from that year.

The Green Deal Action Plan issued in July 2021 with a Presidential Circular[33] aims to adopt comprehensive measures envisaged by the European Green Deal. The Action Plan prioritizes nine areas as follows: (1) carbon border adjustments, (2) a green and circular economy, (3) green finance, (4) a clean, economical, and secure energy supply, (5) sustainable agriculture, (6) sustainable smart transport, (7) combating climate change, (8) diplomacy, and (9) European Green Deal information and awareness-raising activities. The Green Deal Working Group, chaired by the

[31] Energy Efficiency 2030 Strategy and II. National Energy Efficiency Action Plan (2024 - 2030)
[32] https://data.tuik.gov.tr/Bulten/Index?p=Greenhouse-Gas-Emissions-Statistics-1990-2022-53701&dil=2
[33] Circular numbered 2021/15, issued in the Official Gazette dated July 16, 2021.

Deputy Minister of the Ministry of Commerce, was established to monitor the implementation of the Action Plan with the participation of the Presidency Directorate of Strategy and Budget, as well as several ministries and—if necessary—with support from universities, nongovernmental organizations, professional associations, and the private sector.

The Green Deal Working Group's 2023 Activity Report revealed improvements in the country's energy intensity (6.2 percent improvement in 2022 compared to the previous year), with a 55 percent increase in installed capacity in 2022, and 90 million tons of GHG emissions avoided annually as a result of precautions taken in energy efficiency and renewable energy.[34]

In 2024, Türkiye issued the Climate Change Mitigation Strategy and Action Plan 2024-2030 (CCMSAP) which includes five energy sector strategies among other sectoral and cross-cutting priorities.[35] The energy sector strategies are to: (i) reduce carbon intensity of electricity generation; (ii) couple electricity sector with other sectors and supporting demand-side engagement; (iii) strengthen electrical infrastructure and reduce technical loss rate in transmission and distribution by increasing efficiency; (iv) promote use of low-carbon production technologies and strengthening alternatives in electricity generation; and (v) develop a roadmap on carbon capture, utilization and storage to reduce avoided GHG emissions. Energy targets for 2030 under these strategies are consistent with the 2035 target under the 2022 NEP.

Efforts are also underway to establish an Emission Trading System (ETS), to spur decarbonization while maintaining trade competitiveness with the European Union. Türkiye's Medium Term Programme 2024-2026 lays down measures for the establishment of an ETS and possible complementary carbon tax. Development of Türkiye's ETS has occurred through World Bank Partnership for Market Readiness (PMR) projects from 2014-2021, and a follow-up Partnership for Market Implementation (PMI) project approved in August 2023, continuing to 2028. In addition, Türkiye's energy exchange (EXIST, also known as EPİAŞ) is working with the European Energy Exchange (EEX), which has been organizing emission allocation tenders since 2010, ensure practices being developed in Türkiye are compatible with the EU. A memorandum of understanding on the subject was signed by the parties on February 28, 2024.[36]

In line with the green development vision and the net zero emission target, efforts to regulate the reduction of greenhouse gas emissions, climate change adaptation, and the planning and implementation tools related to these issues have been ongoing under the "Climate Law." The draft law, which has been largely completed with the participation of comprehensive stakeholders, is anticipated to be introduced to the Türkiye Grand National Assembly agenda in 2024.

2.6 Gap/Barrier Analysis and Needs Assessment

2.6.1 Political, Social and Economic Barriers

A key government concern is the end-user consumer price of electricity, which impacts households and SMEs that are extremely sensitive to the electricity price, thus these are subsidized by the government. The government has aimed to control electricity and natural gas prices since they affect producer and consumer prices.

[34] The National Energy Efficiency Action Plan prepared by the MENR.

[35] https://iklim.gov.tr/db/turkce/icerikler/files/CLIMATE%20CHANGE%20MITIGATION%20STRATEGY%20AND%20ACTION%20PLAN%20_EN(1).pdf

[36] https://www.epias.com.tr/en/announcements/epias-and-eex-sign-mou-for-the-development-and-implementation-of-a-turkish-ets/

The Ministry of Energy and National Resources (MENR), Electricity Generation Corporation (EUAS), and EMRA cooperate to subsidize end-user electricity prices. EMRA legislated gradual tariffs for households and commercial customers depending on daily consumption. These tariffs have been highly subsidized by EUAS, and they are far from cost reflective. According to the statements of government officials, 50 percent of household electricity and 75 percent of the natural gas consumption of households are subsidized. However, the cumulative impact of the price controls has become financially unmanageable.

Subsidies via end-user tariffs lead to a deterioration in investors' working capital and create a burden on the government budget. The deterioration in working capital affects the entire energy value chain, from distribution to retail sales and from electricity generation to natural gas because companies experience tariff deficits. State-owned companies such as EUAS and Petroleum Pipeline Corporation (BOTAS) sell electricity and natural gas below cost and usually default on their tax to the government, causing a burden on the budget.

The situation has deterred both local and foreign investments in energy efficiency, renewable energy, and reserve capacity investments, except for those with the offtake guarantees.

Urgent action is needed to implement cost-based prices for all customer groups. This could encourage investments and lower the financial burden on the treasury. The Ministry of Family and Social Services launched an initiative in 2019 to provide monthly electricity consumption support to citizens receiving social assistance, based on the number of household members.

2.6.2 Financial Barriers

Long-term commercial financing is insufficient in Turkish markets and there is a maturity mismatch between the loan repayments and investment payback periods. Therefore, companies, that are willing to invest, need to provide bridge credits. The average term for bridge credits is less than two years, which creates uncertainty for the investors since they need to roll over the financing in a highly volatile and unpredictable macroeconomic environment.

Due to the monetary tightening policy of the Central Bank of Republic of Türkiye (CBRT), companies are having difficulty providing Turkish Lira-denominated credits. Borrowing rates increased considerably after the May 2023 Presidential and Parliamentary elections. The CBRT policy rate reached 50 percent in 2024 March compared to 8.5 percent in May 2023. Therefore, some of the companies have focused on the bond market although bond volumes are far less than their financial needs.

Foreign Exchange (FX) financing conditions are not supportive and borrowing rates are still high compared to the last 10-year historical average. Companies avoid FX financing due to the volatility in the markets and high hedging costs despite a considerable decrease in the country's risk premium.

These conditions are even more challenging for smaller companies that aim to invest in renewables. Moreover, some bigger corporations opt to invest in foreign markets such as the United States due to predictability and supportive mechanisms such as the Inflation Reduction Act (IRA), due to the crowding-out effects in Türkiye.

Lack of long-term power purchasing agreements (PPAs) is another issue that prevents long-term financing for investments in renewable energy sources (RES). A volatile macroeconomic environment forces market players, especially private generators, to make transactions at organized markets such as day ahead and intraday markets instead of engaging in long-term PPA contracts. To overcome this issue, transmission and distribution companies

procure their energy needs for losses and general lighting from long-term RES PPAs.

Although the electricity distribution companies have started to invest in digitalization and smart grid distribution systems, the regulatory body, Energy Market Regulation Authority **(EMRA), has not approved some of the new technologies under the regulated asset base.** The result is that companies require financial support to expedite digitalization, implement smart grid systems for the electricity distribution system, and upskill their workers with necessary digital skills.

Moreover, a massive amount of grid investment is needed to comply with increasing demand and growing RES capacity. Every year 1.4 million new consumers are connected to old power grids (both at transmission and distribution) that need replacing. Additional investment is needed to integrate renewables, heat pumps, and electric charging stations, but utilities lack the capacity and favorable market borrowing conditions to finance these much-needed investments.

2.6.3 Operational Barriers

Lack of sufficient transmission capacity to integrate RES is a major challenge to meeting the 2035 targets envisaged in Türkiye's National Energy Plan (NEP). MENR aims to increase the RES capacity by 5 GW annually. However, Turkish Electricity Transmission Company's (TEİAŞ) long-term strategies and plans are ambiguous, deterring potential investors, who need clarity and predictability on connection capacity, volumes and locations.

Allocation of transmission capacities with regard to investor groups on the generation side creates further uncertainty for investors. Allocation of capacities for self-consumption, hybrid storage with wind and solar, and conventional RES investments are not publicly shared in advance, creating unpredictability for merchant investors.

A one-stop application process combining all rules and procedures under a single institution would simplify and shorten permitting processes and encourage RES investors. Türkiye's complex and lengthy approval and permit process is one of the main operational barriers for investors. Depending on the RE source, investors need to apply to various authorities and institutions to receive necessary approvals and permits. The long lead time involved in the permitting process and lack of coordination between stakeholders complicates RE investments.

Instant load management is a significant concern as more, unlicensed RES capacity is connected to the transmission and distribution grid. Monitoring, controlling, and balancing the supply of these RES facilities is critical to manage the overall energy system. However, sufficient investment for smart grid and digitalization is absent.

2.6.4 Regulatory Barriers

Transparency of policy and regulatory processes is another major concern. Some private sector investors state that draft legislation is not shared with stakeholders, or that stakeholder opinions are not included in the legislative processes. The regulations should be transparent and there should be no information asymmetry.

Frequent changes in regulations create uncertainty and complications for market players and deters investment. For example, the unlicensed generation regulation has undergone several amendments since its first implementation in 2019. While amending regulation according to needs is normal, a consistent regulatory framework provides a more stable investment environment.

The low realization of projects from license to operation phase is perceived by some investors as another regulatory barrier. According to public authorities, approximately 28,000 Megawatt (MW) of licensed projects have not been realized, resulting in idle transmission capacity. Regulations should be developed to decrease idle capacities.

Some merchant investors complain about the conditions that favor unlicensed RES investors. Unlicensed investors have recently been given priority for transmission capacities, and they are exempt from the balancing requirements to which merchant investors are subject.

Some investors also complain that some investment processes, such as those involving wind and solar RE, are not inclusive due to information asymmetries and a "first come, first served" approach, rather than bidding processes. As a result, some qualified investors do not acquire sufficient generation capacities, while others act as intermediaries and trade their allocated licenses for higher prices in the second-hand market.

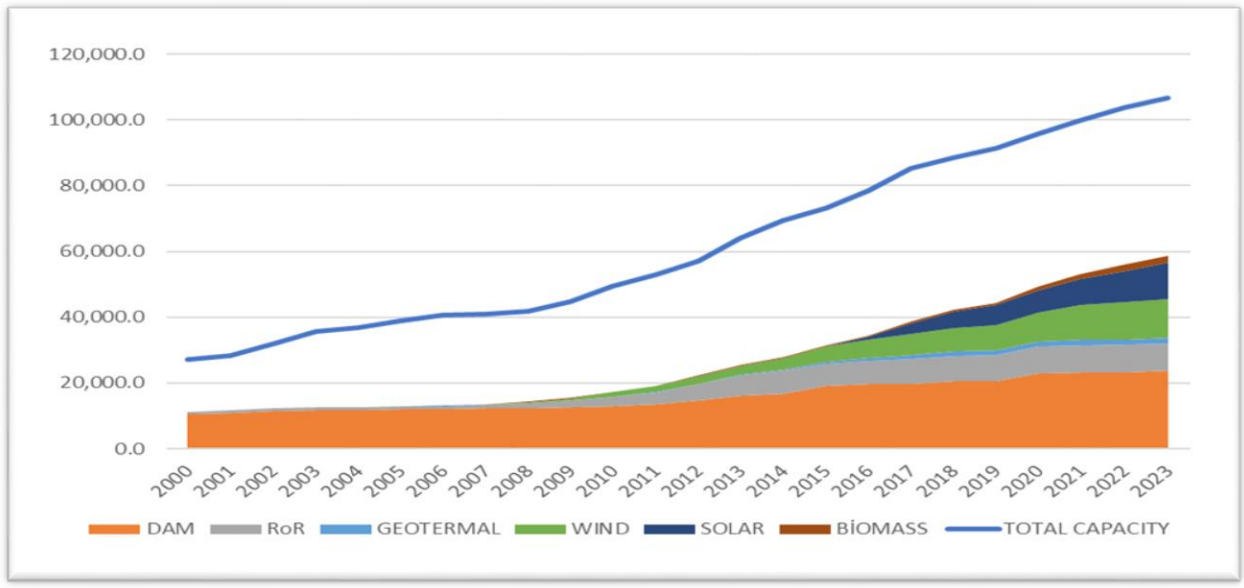
3. Renewable Energy Integration Context

3.1 Renewable Energy Framework

The 2005 Renewable Energy Law (REL) No. 5346 defines renewable energy sources as non-fossil fuel energy, including hydraulic, wind, solar, geothermal, biomass, wave, current, and tide. However, the reservoir area of dam-type Hydroelectric Power Plants (HPPs) exceeding 15 square kilometers (km^2) is not eligible to benefit from the feed-in-tariff (FIT) Mechanism. Appendix B provides detailed information on the renewable energy legislation and the authorities in its execution.

Renewable energy investments began increasing with the enactment of 2001 Electricity Market Law (EML) to liberalize the market, as well as the 2005 REL. Prior to this legislation, the only way that a private investor could construct a renewable power plant was either to install an auto producer facility or to realize a build-operate-transfer (BOT) project. In 2000, projects utilizing renewable energy had 11,2235 MW installed capacity, and the renewables share in total capacity was 41.2 percent. Three wind power plants (WPP) with total installed capacity of 18.9 M, and 13 HPP with total installed capacity of 846,91 MW were constructed and operated under the BOT in 2000. In the early years of reform, neither the administration nor investors were ready to invest in renewable resources for electricity generation because the technical prerequisites were not determined, a support system was not developed, and the study of the determination of connection capacity limits of grid was not finalized. As legislation developed, the installed capacity developed and constructed by the private sector reached 15,487.1 MW in 2009, but its share in the total capacity decreased to 34.6 percent due to the construction of the thermal plants. Following the legislation related to unlicensed generation, the construction of renewable facilities boomed. In 2015, total renewable capacity reached 31,606 MW, comprising 43.2 percent of total capacity. By end-2023, renewable capacity reached 59,600 MW, representing 55.7 percent of total capacity. This exceeded the original target of 38.8 percent of RE in the power generation mix by 2023 set in the National Renewable Energy Action Plan (2013–2023), placing Türkiye as the fifth largest RE generator in Europe and the 12th largest in the world. Please see appendix C for Türkiye power sector overview.

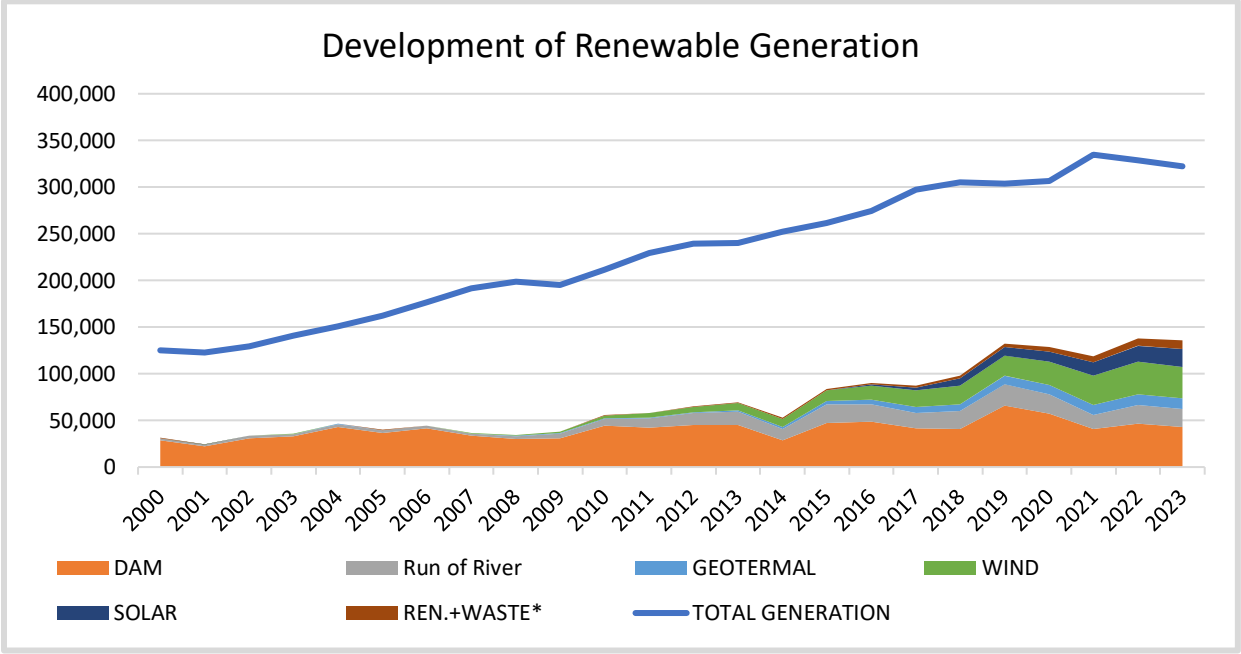
Figure 3: The Development of Renewable Capacity and the Total Capacity (2000 – 2023)



Source: TEİAŞ

Share of renewables in the generation mix increased from 24.9 percent in 2000 to 32 percent in 2015 and 42 percent in 2022, as shown in figure 4.

Figure 4: Development of Renewable Generation in the Total Generation (2000-2023)



Source: TEİAŞ

The REL was enacted to introduce incentives to investors, such as floor prices and priority of dispatch. The regulatory framework for renewable energy was strengthened in January 2011 with amendments to the REL and

with the introduction of FITs in US$ for each type of renewable power generation. The amendment[37] to REL regarding unlicensed RES generation allowed unlicensed RES generators to benefit from the FIT. This was followed by the law on Renewable Energy Zones (YEKAs). YEKAs are areas with demonstrated potential to generate electricity through solar or wind sources. When an auction is held, a contract is executed with the company that offers the lowest electricity sales price, and the company is entitled to receive a provisional license.

Another amendment was made to the REL[38] in 2020 to denominate the FIT in Turkish Lira (TRY), with amounts and the updating method of FIT to be decided by the President. In line with this amendment, the tariff, tariff escalation principles, and implementation duration applicable to electricity generators using renewable energy were determined[39] and updated.[40]

Currently, there are four ways of installing renewable energy facilities to generate electricity:

- By using announced connection capacities applying to EMRA for receiving FIT. However, in case of connection capacity scarcity and/or project site overlapping with other applicants, the applicant can only obtain the right to a provisional license by offering (and receiving) the lowest price in an auction process
- By participating in the YEKA tenders announced by the MENR
- By developing an unlicensed project considering the connection capacities issued by distribution companies and TEİAŞ
- By establishing an electricity storage facility for the purpose of developing a wind and/or solar electricity generation facility up to the installed capacity of the said electricity storage facility[41]

In February 2024, TEİAŞ announced 3,750 MW connection capacity following the MENR's announcement of a 7,500 MW capacity allocation for unlicensed renewable investments. However, some capacities allocated have not yet been realized by investors, resulting in idle capacity in the transmission grid.

Despite impressive growth in the RE market in recent years, Türkiye still uses only 3 percent of its solar and 15 percent of its onshore wind potential. The government has made progress in defining its strategy to achieve carbon neutrality, but this needs to be translated into more concrete sector-level actions. As mentioned, the recently released NEP represents a key milestone in setting energy sectoral targets by 2035 and helping the country to meet its carbon neutrality objectives by 2053. However, additional details on implementation are needed. In this context, the government and in particular the MENR, is working toward the release of the next Strategic Energy Plan, covering the period from 2024 to 2028, that will provide further details on sectoral targets and refine implementation modalities.

3.2 Energy Storage

The government's ambitious plans to scale-up RE involves new legislation related to energy storage systems that will play a crucial role in system balancing, peak shaving, and grid stabilization. The Regulation on Storage Activities[42] enables generation licensees, supply licensees, TEİAŞ, distribution licensees, and consumers to establish storage facilities.

EMRA published the Regulation on Storage Activities in the Electricity Market in May 2021 (and subsequent amended), which regulates the installation, connection, and general market activities for storage facilities. It also

[37] Issued in Official Gazette on January 8, 2011.
[38] With Law no 7257, issued in the Official Gazette dated November 25, 2020.
[39] Presidential Decision no. 7189, dated April 30, 2023.
[40] EPIAS website February 6, 2024.
[41] EML no: 6446, Article 7/10.
[42] Issued on the Official Gazette dated May 9, 2021.

updated other regulations to incorporate storage. With an amendment to Electricity Market Law (EML) in 2022,[43] legal entities that undertake to establish a battery storage facility gain the advantage of receiving a provisional license by EMRA for the establishment of an electricity generation facility based on wind and/or solar energy up to the installed capacity of the electricity storage facility they have committed to establish. This article resulted in an increase in battery storage provisional license applications exceeding 120 GW[44] in capacity. EMRA consequently suspended the receipt battery storage applications.[45]

Although the energy storage capacity should grow in proportion to the capacity of RES, investments in BESS are difficult to justify economically. It is unlikely that these applications will result in actual installed capacity in the short term because capital costs remain high and access to finance is limited. A World Bank analysis carried out in 2020–2022 found that very few BESS applications were commercially viable in Türkiye at that time. The deployment of BESS requires further investment to account for the incremental capital cost. Going forward, policy and regulations, including incentive systems, for storage could positively affect market confidence and allow early adopters to move ahead with investments in BESS. In particular, distributed BESS at commerce and industry (C&I), and later residential customers, could help provide decentralized storage and ancillary services.

The recent introduction of storage license applications and the NEP targets has set the Turkish battery storage market on a path for substantial growth, with over 25 GW of battery storage licenses awarded, translating into over US$20 billion in medium-term investments. This regulatory progress is fostering an environment ripe for innovation. While private sector players are still in the early stages of understanding costs and revenue structures associated with building energy storage systems, their interest in developing trial battery storage projects with smaller capacities is a step towards larger investments. Concessional financing is essential to support these early-stage projects, as it will help investors to overcome the high capital and operating costs and enhance their capacity to design and install these innovative and clean technologies, leading to improved RE availability and reliability.

Increasing uptake of electric vehicles (EV) has created growing demand for associated EV-related infrastructure in Türkiye. As of November 2023, the number of EVs in Türkiye was 80,043, representing 0.53 percent of the total vehicle fleet. EV traffic increased 5.5 times in 2023, as well, signifying a need to accelerate investments in EV infrastructure.

3.3 Role of the Private Sector, Innovation and Leverage of Resources

The private sector will play a key role in Türkiye's RE energy transition. The 2022 NEP aims to have installed capacity of solar and wind at 52.9 GW and 29.6 GW (24.6 GW onshore, 5 GW offshore), respectively by 2035. To meet this goal, there are plans to build 41.5 GW of solar, 12.8 GW onshore wind, and 5 GW offshore wind facilities in the coming 11 years. The investment needed to reach this capacity totals about US$100 billion, including US$80 billion for generation, US$10 billion for transmission, and US$10 billion for distribution. The private sector needs to provide 90 percent of total investment needed. Significantly more investment is needed—about US$640 billion—to reach the net zero emissions target by 2053. The private and public sectors will need to work together, alongside multilateral development banks (MDBs), to mobilize these resources.

In addition, RE generation developers could require financing for the connecting lines, as it can finance or construct transmission lines connecting the generation facility to the transmission grid on behalf of TEİAŞ if TEİAŞ does not have sufficient financing or cannot make timely investments.[46] The ownership and operation responsibility of the facilities and lines built within this scope belong to TEİAŞ and the generation licensee reimburses the cost of the investment from TEİAŞ.

[43] EML Article 7/10 dated July 1, 2022.
[44] EMRA Website, as of the end of January 2024.
[45] License Regulation Temporary Article 41/2.
[46] Connection and Use of System Regulation, Article 20.

Private RE developers could also construct private direct transmission lines. A generation licensee may request to establish a private direct line between the generation facility and its customers, affiliates, or eligible consumers. The establishment of a private direct line is possible with a system control agreement made between the generation licensee and TEİAŞ or the distribution company. The private direct line must be installed outside the national transmission and distribution network and in accordance with the standards applicable to these networks. All kinds of facilities, equipment and immovable property required for the establishment and operation of the private direct line are acquired by the applicant.

Similarly, a generation licensee operating a generation facility located in the provinces on the border, with permission of the EMRA Board, could construct a private direct line without connecting it to the transmission or distribution system in accordance with the standards applicable to the national transmission or distribution system, and export the electricity generated in the subject generation facility.

3.4 Summary of MDB Engagement in the Türkiye Energy Sector

Please see appendix G for details on MDB engagement in Türkiye's energy/RE sector, as well as a summary of activities by the private sector, nongovernmental organizations (NGOs), and bilateral institutions.

The World Bank

The World Bank's energy portfolio in Türkiye currently includes eight operations amounting to over US$3.5 billion, which will be expanded with a pipeline of new operations amounting to nearly US$3 billion. The World Bank's Türkiye energy sector portfolio consists of four projects (including some with additional financing) that contribute to enabling renewable energy capacity (Renewable Energy Integration, Geothermal Development, Public and Municipal RE Project, Accelerating the Market Transition for Distributed Energy), four in energy efficiency (First and Second Energy Efficiency in Public Buildings Projects, Seismic Resilience and Energy Efficiency in Public Buildings parent project and Additional Financing).

IFC

Building on World Bank support in Türkiye, IFC has been a long-term investor in comprehensive reform of the energy sector, helping to create new markets, increase access to reliable electricity, accelerate economic growth, and increase labor force participation. **IFC has leveraged over US$3 billion in Türkiye to support private-sector efforts to increase energy generation, improve energy efficiency, and mitigate the impacts of climate change**. IFC investments include 10 power generation projects with an installed capacity of 4,300 MW, as well as power distribution projects to improve services for 3.9 million customers. Strengthening the distribution network is a key priority for increasing renewable energy integration and resilience. In April 2024, the World Bank Country Partnership Framework FY24-FY28 was approved. IFC, together with IBRD and Multilateral Investment Guarantee Agency (MIGA), will continue to support projects aimed at increasing RE production, as well as modernizing transmission and distribution networks. IFC remains keen to support the adoption of new clean technologies such as battery storage energy systems (both stand-alone and consolidated into renewable generation facilities), which will scale-up renewable generation and diversify the country's generation mix, as well as build up the resilience of power system.

EBRD

In the past 10 years, EBRD has invested EUR2 billion across 30 projects in Türkiye's energy sector (including in renewables, energy efficiency, and power distribution). To date, EBRD has invested EUR9 billion in supporting renewables, including large solar and wind projects. EBRD has also invested in one of the largest geothermal power

plants in the world, which increased Türkiye's geothermal capacity by 30 percent. These investments also contributed to strengthening human capital in the sector by promoting the green and digital skills development (for example skills related to the design, maintenance, and remote management of WPPs) via nationally accredited certifications granted by local education institutions. They also supported workforce diversity through the development and implementation of Equal Opportunity Action Plans.

EBRD is closely cooperating with national authorities to create an enabling environment for economy-wide decarbonization. For example, EBRD has assisted the local authorities in Türkiye in developing the Renewable Energy Action Plan (in line with the EU's Renewable Energy Directive) and in designing post-2020 renewable energy support schemes based on competitive tendering and the NEEAP.

4. PROGRAM DESCRIPTION

Türkiye's Clean Technology Fund (CTF) Renewable Energy Integration (REI) Program Investment Plan (IP) aims to support the country's plan to scale-up renewable energy by 2035, including by enabling flexibility of energy systems smooth integration of higher shares of variable renewable energy generation in Türkiye's grid. This objective aligns with the REI Program Impact Objective, excluding its focus on increasing off-grid access to renewable energy because this is not relevant for Türkiye.

CTF-REI concessional resources will catalyze multilateral development bank financing, private investment, and other co-financing in technologies/projects required to meet the country's NDC and decarbonization commitments. The technologies, infrastructure, innovative models, and enhancement activities prioritized by the program and eligible to receive funding correspond to those described below in the 'Supported Activities' section.

CTF-REI resources will be implemented through two components with US$70 million as follows, and a prospective Component 3 in case of availability of additional CTF grant financing of US$3 million.

Component 1 (Beneficiary: TEİAŞ) Transforming Power Transmission System for REI

US$38 million CTF lending and US$2 million CTF grant financing are being considered to support the Transformation of the Power Transmission System Project (2025, World Bank nearly US$750 million, CTF US$40 million.).

Component 2 (Beneficiary: private sector): System Flexibility, Balancing, Stabilization, and Strengthening Power Infrastructure (EBRD US$150 million, IFC US$150 million, CTF US$30 million)

- E-mobility infrastructure (EBRD and IFC)
- Battery storage (EBRD and IFC)
- Digitalization of the power distribution grid (EBRD)

The CTF REI will support Türkiye's clean energy transformation by scaling up low-carbon investments and technologies with significant potential for long-term greenhouse gas emissions savings. It will support an array of clean technologies across different areas, including REI, energy efficiency (hydropower), and clean transport. The CTF-REI will amplify the results obtained by the previous CTF Program in Türkiye, that is still on-going. Please see appendix D for the CTF co-financed investments in Türkiye from 2012.

Supported Activities[47]

The infrastructure, technologies, and transformational activities eligible for support through the CTF-REI program are described in the sections below, outlining the strategic areas of intervention prioritized in the CTF-REI IP:

Component 1: Transforming Power Transmission System Project (2025, the World Bank US$750 million loan financing and CTF US$40 million -US$38 million loan financing and US$2 million grant financing-)

The first phase of this component, the Transforming Power Transmission System (TPTS) Project - 750 million REI program that Türkiye's government requested from the World Bank. The program aims to support the transformation of the transmission system to enable an additional 60 GW of RE (specifically wind and solar) of generation capacity by 2035, in line with the government's pledge to achieve net zero emissions by 2053.

Under this component, CTF-REI concessional financing will support the government in its ambition with regard to the renewable energy scale up program; the digitalization and smart grid development to integrate higher share of share of renewable energy generation (especially utility scale wind and solar PV) and to scale-up distributed generation; as well as. system dispatch and control and transmission system reinforcement to avoid a system failure stalling the process of energy transition and decarbonization efforts in Türkiye.

The parties agreed and the Ministry of Treasury and Finance (MoTF) shared on January 19, 2024 with the World Bank a formal request from the TEİAŞ for new World Bank and CTF loans.

The proposed Project Development Objective (PDO) is to assist Türkiye in scaling-up renewable energy generation by strengthening and further digitizing the power transmission system and facilitating large-scale renewable energy integration. The project will consist of four subcomponents as follows:

- Subcomponent 1.1: Development of transmission infrastructure to facilitate scale-up of RE
- Subcomponent 1.2: Strengthening of transmission networks and interconnections
- Subcomponent 1.3: Digital and smart-grid investments to strengthen grid operation and management
- Subcomponent 1.4: Technical assistance and capacity building, as well as preparation for a second phase of the project.

Subcomponents 1 and 2 are comprised of both greenfield and brownfield investments. The modernization and transformation of the power system will contribute significantly to ensuring future demand and improving the flexibility, adaptability, and resilience of the system to absorb higher volumes of variable renewable energy. Subcomponent 3 comprises digital and smart-grid investments to strengthen grid operation and management, such as by upgrading the nationwide supervisory control and data acquisition (SCADA)/EMS.

The Government expressed interest in including in the scope of the proposed project a technical assistance component. CTF grant financing will facilitate the improvement of TEİAŞ' capacity for further integration of renewable energy and digitization of the power grid. A few potential ideas that the Government and TEİAŞ discussed with the World Bank, falling under the sub-component 4 of the project, are as follows:

- **Technical assistance for introduction of high voltage direct current (HVDC)**: As the HVDC technology is unique and different from traditional high voltage alternating current (HVAC) technologies, TEİAŞ needs to develop the technical capacity to select the right technology, undertake necessary system planning, perform economic analysis of HVDC, and develop an understanding of operating the line at its optimal capacity. The project could

47 The supported activities under Component 1 and Component 3 reflect the decisions made by the MoTF and the MENR; and conveyed, via email on June 25, 2024, to the participants of the IP preparation joint missions.

cover various technical assistance including feasibility studies, market analysis, and capacity building.

- **Capacity building and training for SCADA/EMS:** As new functionalities are included in the latest SCADA/EMS, training for TEİAŞ dispatchers is critical to take full advantage of these challenging functionalities to optimize system dispatch and manage system control. The project can support capacity-building activities for TEİAŞ, including hiring of supervision consultants.

- **System management for variable renewable energy (VRE) integration**: Given the ambitious government's plan to develop variable renewable energy, TEİAŞ needs to develop its capability to manage a large amount of VRE in the system. The project can support various areas for VRE integration including technical assessments, and capacity building.

The CTF co-financing for the subcomponents 1.1 and 1.3 will facilitate the urgent and critical investment needs of the country's power system with regard to green and digital transformation towards its net zero target; and reduce private investment risk and encourage a more active participation in financing green investments.

Project Preparation Timeline Regarding Component 1 – Phase 1:

The major milestones and their respective timeline with regard to the project, as agreed with the Government are as follows:

- Concept review : September / October 2024
- Project appraisal : December 2024
- Negotiations : March 2025
- World Bank Board of Executive Directors' approval : May 2025
- Effectiveness and start of implementation : September 2025

The subcomponent 1.4 covering technical assistance and capacity building, as well as preparation for a second phase of the project, that the CTF funds will solely finance, cover critical and derisking studies and capacity building activities that would not be done otherwise, since the counterpart, TEİAŞ, prefers to use only grant and/or concessional financing money for such activities. This subcomponent will inform more transformative, innovative and impactful investments to be supported in the second phase of the proposed project, enabling further transformation of the power system, enhancing the impact of the project and unlocking additional financing. This subcomponent will come much timely, as the studies and capacity building activities will be conducted in the first two years of project implementation and will timely inform aforementioned new investments to be financed in the second phase.

Component 2: System Flexibility, Balancing and Stabilization and Strengthening Power Infrastructure (EBRD and IFC US$150 million loan financing, each, and CTF US$30 million loan financing)

This component will help Türkiye's government to enhance the system flexibility, balancing, and stabilization through energy storage operations. It will also support the co-financing of investments with regard to e-mobility, specifically EV charging stations, and digitalization of the power distribution grid.

The use of concessional funding is important to finance the viability gap which will allow the government to test innovative business models that can have high replication and private sector engagement potential. Under this component, the CTF co-financing will support the piloting and subsequently scale-up of the near commercial technologies, such as energy storage.

2.A) Battery storage:

Activities under this subcomponent will support projects that advance the adoption of battery storage and demonstrate the viability and/or large-scale application of battery storage solutions.

EBRD and IFC are exploring several potential projects with battery storage components in the early stages. Given the allocation of pre-licenses under solar/wind power projects with battery storage components, several local and international developers are seeking early-stage financial support. EBRD and IFC expect to receive increased financing requests in this area starting from 2025.

IFC collaborates closely with private sector players who are actively developing such projects. Based on preliminary discussions with a selected number of companies, IFC is looking to deploy potentially US$100-150 million in financing towards battery storage projects subject to the bankability and credit due diligence, expected to be implemented in 2025-2026.

Given the government's ambitious RE scale-up plans, energy storage systems will play a crucial role in system balancing, peak shaving, and grid stabilization. The need for concessional finance is immense to help mitigate the high capital and operating costs and enhance the capacity to design and install innovative energy storage systems. This support will lead to improved RE availability and reliability. EBRD and IFC will ensure that activities under this subcomponent align with other CIF programs, such as the CTF Global Energy Storage Program (GSEP), and with interventions by other development partners, creating valuable synergies. The focus on utility-scale applications of storage, connected with bulk renewable energy power plants at high voltage level, would complement existing CTF financing for distributed battery systems in Türkiye under the World Bank Accelerating the Market Transition for Distributed Energy program (as described in Appendix G).

2.B) E-mobility (EV charging stations):

Activities will focus on identifying opportunities for private sector participation and financing for options promoting the adoption of e-mobility solutions, with a primary focus on expanding EV charging infrastructure.

EBRD and IFC have already engaged with several existing and new clients, including leading players in EV infrastructure, to explore new business opportunities in the e-mobility sector. Many of these players are experienced energy generation/distribution companies trying to expand into the EV business. The potential projects focus mostly on EV charging station investments, with the financing product of choice (i.e., debt, equity, etc.) dependent on the financial strength of the potential counterparties.

Specifically, EBRD has provided US$25 million financing to date for EV charging infrastructure development. EBRD also has a private sector pipeline focused on EV charging infrastructure and is in discussions with a number of companies for an up to US$30-40 million financing for supporting EV business expansion. Investments are expected to start in 2025 in line with the EV adoption progress in the country.

IFC has a pipeline of private sector players looking to expand their EV charging infrastructure and is in early discussions with a selected number of EV charging infrastructure companies for an investment size of US$20-30 million financing (depending on the project size and overall investment need), expected to be implemented in 2025-26.

2.C) Digitalization of the power distribution grid:

EBRD's pipeline clients' potential investments include operational technology systems such as wider smart metering coverage, SCADA upgrade at field level and grid control center, geographic information system integration, and other

activities to reduce distribution losses, increase operational efficiency, as well as to reinforce grid flexibility for RE integration.

EBRD is currently in talks with several companies for financing of up to US$10-15 million dedicated to investments in digitalization and smart grid for distribution. Investments are expected to start in early 2025. These could be paired with gender-responsive capacity building and training support to ensure that the new technologies are adopted by the local workforce.

Component 3: Capacity Building for System Flexibility and Security of Supply (World Bank: US$900 million loan financing, and US$3 million CTF grant financing)

Türkiye would like to explore opportunities with regard to adding a Component 3, in case of availability of additional CTF grant financing of US$3 million as follows. In addition, the independent technical reviewer has supported the requested technical assistance ($3 million) to evaluate the pre-feasibility of pumped storage sites and prioritize the rehabilitation/upgrading of existing hydro plants, by mentioning that it would be wise to focus also on existing cascades, which could become pumped storage sites with the addition of inexpensive pumping systems and minimal E&S impacts. Currently, US$2 million of grant will be used from the current IBRD grant envelope to finance subcomponent 1.4... If and when there becomes a top-up to the MDB grant envelops, the Government requests a consideration for an additional US$3 million grant to finance more capacity building activities supporting transformation efforts. Alternatively and/or additionally, should there become an opportunity of funding from other sources/trust funds, the Government would like to explore this opportunity, as well, as indicated in the financing plan.

3.A) First pumped hydro storage (2028) (World Bank: US$600 million loan financing, US$1.5 million CTF grant financing):

The CTF-REI funded TA project will assess the potential sites for pumped hydro storage facilities with regard to associated costs and risks (e.g. environmental, social, financial, hydraulic); and inform the government on the most appropriate three or four sites. The feasibility study of the best option will be conducted under the $600 million World Bank-financed investment project.

3.B) Hydropower energy efficiency (2026) (World Bank, US$300 million loan financing, US$1.5 million CTF grant financing):

The World Bank has conducted analyses of the necessary energy efficiency measures for the 22 EUAS-owned hydro-power plants through the EU-IPA funds. The proposed TA project will help the government sequence the rehabilitation activities without jeopardizing the security of power supply. The prioritized rehabilitation activities will be conducted under the US$300 million World Bank-financed investment project.

5. Financing Plan and Instruments

5.1 Requested Budget Envelope

This section presents the financing plan for implementation of activities proposed under Türkiye's CTF-REI Program, including costs and sources of funding. The requested envelope for Türkiye´s CTF-REI amounts to US$70 million, of which US$68 million corresponds to the CTF-REI financing, and US$2 million to grant financing. Table 1 below presents how CTF-REI is to leverage and complement funding with regard to the two components.

Table 1: Indicative Financing Plan for Türkiye's CTF-REI IP

	Subcomponents	Investment / TA	MDBs	MDB Share [in US$ millions]	CTF/REI	CIF/CTF Grant	Private Sector	Gov/SOE/other	Total [In US$ m.]	Board Date	1st Disbursement date
Component 1 (Phases 1 and 2): Transforming Power Transmission System for REI											
Transforming Power Transmission System Project	Subcomponent-1: Development of transmission infrastructure to facilitate scale-up of RE Subcomponent-2: Strengthening of transmission networks and interconnections Subcomponent-3: Digital and smart-grid investments to strengthen grid operation and management	Investment	WB	750	38				WB: 788	May 2025	Sep. 2025
	Subcomponent 4: Technical assistance and capacity building	TA	WB			2		**3**	2	May 2025	Sep. 2025
Component 2: System Flexibility, Balancing, Stabilization and Strengthening Power Infrastructure											
System Flexibility, Balancing, Stabilization and Strengthening Power Infrastructure	Component 2A: Battery storage Component 2B: E-mobility (EV charging stations) Component 2C: Digitalization of the power distribution grid	Investment	EBRD & IFC	EBRD: 150 IFC: 150	EBRD: 15 (inclusive of 0.45) MPIS IFC: 15 (inclusive of 0.375) MPIS		TBD[48]	TBD	EBRD: 165 IFC: 165		
Component 3: Capacity Building for System Flexibility and Security of Supply *[49]											
System Flexibility, Balancing and Security of Supply	Component 3A: Pumped hydro storage	TA	WB	600	*				600	Jan. 2028	Mar. 2028
	Component 3B: Hydropower energy efficiency	TA	WB	300	*				300	Jan. 2026	Mar. 2026
IP TOTAL				**1,950**	**68**	**2**		**3**	**2,023**		

[48] As per usual EBRD practice, the Bank will seek cofinancing from private sector as well as other sources.

[49] In case of availability of additional CTF grant financing of US$3 million, the Turkish government would like to use it for Component 3.

5.2 Costs and Sources of Funding

CTF-REI resources will be allocated through the World Bank, IFC and EBRD, and channeled to TEİAŞ and private sector clients.

Component 1: Transforming the Power Transmission System for REI (World Bank US$750 million, CTF-REI financing for investments US$38 million, and CTF-REI grant for TA US$2 million). Financing from CTF-REI is proposed to co-finance the Transforming Power Transmission System Project, that will be financed by the World Bank in an amount of US$750 million. World Bank and US$38 million CTF-REI loan financing is proposed to lower financing costs of this sizable project including REI and innovative investments and technical assistance projects, lengthen the loan periods, and diversify the Government's funding sources, thus better responding to the financing needs of private and public investors in sustainable energy in Türkiye. In addition, a US$2 million CTF grant financing will fund TA activities under the subcomponent 4 of the project.

TEİAŞ will be the recipient of funding for this component, complying with the program's eligibility criteria, fiduciary requirements, and the environmental and social standards of the World Bank.

Costs, fees, and financial conditions applicable to CTF-REI resources upon disbursement to TEİAŞ correspond to CIF funds' FY24 Financial Terms and Conditions.

Component 2: System Flexibility, Balancing and Stabilization and Strengthening Power Infrastructure (EBRD US$150 million, IFC US$150 million, CTF US$ 30 million).

EBRD will provide US$50 million in financing in addition to US$5 million CTF-REI loan financing for each of battery storage, e-mobility (EV charging stations) and digitalization of the power distribution grid activities. IFC will deploy US$15 million CTF-REI concessional resources in support of battery storage and e-mobility (EV charging stations) and aim to leverage at least US$150 million in own account financing. IFC will also seek to mobilize additional resources from private sector players and other partners.

6. Implementation Potential with Risk Assessment

Per the IP preparation guidelines, assessed country/regional risks include institutional, technology, environmental, social, and financial, as well as absorptive capacity for REI Program and associated investments.

6.1 Macroeconomic Risk

Macroeconomic risk is considered substantial. Key macroeconomic risks to the IP include: (a) any further significant depreciation of the currency and high inflation could raise construction costs and foreign exchange risk faced by sector entities; and (b) supply-side constraints due to a spike in imported intermediate goods and equipment price and delays in project implementation resulting from elevated pricing uncertainty; and (c) geopolitical tensions in the region adversely affecting commodity and energy prices and causing a slowdown in the EU and other major markets. Sector entities generally have strong internal risk-based control systems and are well-placed to manage macroeconomic shocks. These characteristics will be considered for implementing entities yet to be selected. The World Bank will also continue to monitor macro-financial risk, engage with the authorities on economic policies, and offer technical assistance as requested by the government.

6.2 Institutional Capacity for Implementation and Sustainability Risk

TEİAŞ' capacity has increased significantly during the implementation of ongoing and previous World Bank financed investment projects and technical assistance activities. The implementation of large-scale REI investments requires a large and highly skilled team from TEİAŞ composed of technical, procurement and safeguards specialists. The World Bank has continuously provided training on new and updated policies and standards related to these fields. During the procurement and implementation of the subprojects, the World Bank will continue to support TEİAŞ's activities through the review of documents and necessary trainings.

6.3 Technology

Development of EV charging infrastructure and digitalization of the power distribution sector do not represent a high technological risk. However, battery storage technology carries a high technology risk as it is relatively new, currently lacks economic feasibility and commercial availability, and there is uncertainty regarding its overall performance and useable lifespan. Legislation related to battery storage need to be revised to make investments in the technology economically feasible.

6.4 Environmental Risk

The environmental impacts of the program are expected to be positive given the focus on renewable energy. Environmental risks relate to construction activities, such as (i) air pollution, noise and vibration from construction machinery during construction phase; (ii) soil disturbance and loss during earthmoving; (iii) tree-cutting and loss of vegetation; (iv) waste management; and (v) construction camp management; (vi) community health and safety (such as traffic safety); and (vii) potential impacts on cultural and natural areas. The anticipated environmental impacts are mostly temporary, predictable, and/or reversible, and the nature of the projects does not preclude the possibility of avoiding or reversing them. The potential impacts are medium in magnitude and in spatial extent.

Climate change and disaster risks, including the risks of earthquake, water scarcity, extreme heat, river flood, urban flood, tsunami, coastal flood, landslides, cyclone and volcano, are being screened for the locations of each proposed investment.

6.5 Social Risk

Potential social risks related to the program may pertain to labor, community health and safety, cultural heritage, and land acquisition. Specifically, the Transforming the Power Transmission System Project involves purchasing small amounts of lands where permanent components of electricity transmission lines (ETLs) will be located. While land acquisition impacts of ETLs are limited to tower and station locations, the acquisition of lands may still cause physical and economic displacement. For example, the locations of permanent components such as towers and stations may affect the physical assets of nearby communities such as shelters, animal troughs, irrigation wells, and informally used public lands for agricultural or grazing purposes by people who do not hold a title deed. The project may also affect nearby communities due to construction related impacts such as noise, dust, waste generation and traffic disturbance. The social risks related to the project described above can be minimized or mitigated by implementing appropriate measures.

During the design and the implementation of the projects, the social and environmental risks, including the risks with regard to the physical and economical displacement of people due to land acquisition, are thoroughly being considered and mitigation measures are being taken. The environmental management plans developed include specific measures to mitigate the impact of construction activities on women, such as noise reduction, dust control,

and safe transportation routes. In addition, the Stakeholder Engagement Plans are being disclosed; public consultations for the public including women are being organized to inform the public on the projects, potential risks and mitigation measures; and the Grievance Redress Mechanisms are being established for each project. For elaborate information on the social context of this CTF REI program, please see Section 2.2. Social Context.

6.6 Financial Risk

Transformation of the Power Transmission System Project - Phases 1 and 2, which are under preparation, does not pose a substantial financial risk, as the World Bank has been helping TEIAS to enhance its institutional capacity in terms of fiduciary responsibilities—namely procurement and financial management, in line with the Bank's requirements and standards.

6.7 Absorptive Capacity for REI Program and Associated Investments

As mentioned earlier, Türkiye's net zero commitment by 2053 is demonstrated in numerous strategies such as the NDP, Medium-Term Program, NEP and NEEAP, which aim to accelerate country's green energy transition and decarbonize the energy sector. These Government plans have the capacity to absorb the proposed CTF-REI Investment Plan of US$70 million plus US$2.7 billion to be leveraged, Türkiye's macroeconomic context, together with an existing comprehensive legal and regulatory framework, enables it to receive concessional financing as well as technical assistance to support the country's ambition to use more renewable energy.

Both Türkiye´s financial system and developers´ execution capacities are able to manage the required capital challenges and project development challenges. Furthermore, the offering of concessional resources through the CTF-REI program, targeting specific investments, provides additional comfort to investors.

MENR and its affiliates such as TEİAŞ have extensive technical capacity and experience managing a high-quality workforce and investments. TEİAŞ is familiar with MDBs, and specifically World Bank-financed projects, and has the capacity to comply with banks' international fiduciary, environmental, social standards. Although the management of energy sector SOEs has changed, the SOEs' institutional memory will enable them to continue to cooperate effectively with MDBs.

7. Monitoring, Evaluation and Transformational Change

7.1 Theory of Change and Integrated Results Framework

The theory of change of the Türkiye CTF REI Investment Plan is as follows. If Türkiye's REI program helps develop Türkiye's electric power transmission and distribution systems, battery energy storage systems, and electric vehicle charging infrastructure through the identified investments and technical activities, then Türkiye will be better able to integrate the target additional 60 GW variable renewable energy by 2035 on a path to decarbonize the economy by 2053 with socio-economic benefits shared through a sustainable inclusive and resilient approach. Through execution of the components described, thanks to the use of concessional resources, specific outcomes are expected to be obtained as described below.

Monitoring and evaluation of the Investment Plan will use an Integrated Results Framework (IRF), as described in this section. The IRF, based on the REI Monitoring and Reporting (M&R) System toolkit,[50] includes a set of results indicators across the following levels: CIF impacts; REI program impacts; program outcomes (including co-benefits);

[50] CIF 2023 "Renewable Energy Integration (REI) Program Monitoring and Reporting (M&R) Toolkit: Operational Guidance on the REI M&R System" https://www.cif.org/knowledge-documents/rei-program-monitoring-and-reporting-toolkit

and program outputs,[51] as elaborated in the CIF REI Integrated Results Framework in appendix J. The Investment Plan's four components relate to each level of results with a view to achieving program-level impacts as detailed below.

The Ministry of Environment, Urbanization, and Climate Change (MoEUCC) has published the 2024-2030 Climate Change Mitigation Strategy and Action Plan, defining the responsibilities and actions of relevant stakeholders in alignment with the NDCs. This plan, developed through a participatory approach, provides a detailed roadmap for reducing sectoral GHG emissions, with actions for the energy sector consistent with the NEP. A robust monitoring and evaluation framework has been established, including the creation of an online monitoring system managed by the Climate Change Directorate of the MoEUCC. Institutions are required to annually update the system with their progress, which will inform the preparation of monitoring and evaluation reports by the Directorate. These reports will be reviewed by the Climate Change and Adaptation Coordination Board (CCACB) and will contribute to the periodic evaluation of the IP.[52]

In addition, the REI program impact indicators include essential targets from NEP that need to be monitored by the related authorities. The NEP, which is updated and published by the MENR every five years, serves as a cornerstone in this regard. This plan is developed with contributions from the Presidency of Strategy and Budget, the Ministry of Treasury and Finance, and other relevant authorities. The five-year cycle of the NEP is designed to inherently include the necessary processes for revision, monitoring, and evaluation. These processes ensure that the plan remains dynamic, responsive to new developments, and aligned with the overarching goals of sustainable energy transformation. The periodic review and update of the NEP ensure that mechanisms for evaluation, learning, and stakeholder engagement are not only established but also continuously refined. This approach allows for the ongoing assessment of targets and impacts, facilitating the necessary adjustments to enhance the effectiveness of REI in ways that are both socially and environmentally beneficial.

7.2 CIF Level Impacts

CIF's ultimate global mission is to "achieve accelerated transformational change and climate financing that enable progress toward net-zero emissions and adaptive, climate-resilient development pathways, in a just and socially inclusive manner." CIF's impact is measured through four standard indicators: CIF 1 Mitigation; CIF 2 Adaptation; CIF 3 Beneficiaries; and CIF 4 Cofinance. Values for these indicators are aggregated from countries program- and project-level indicators, as relevant.

[51] The toolkit categorizes indicators in the following seven categories:
1) CIF Impact.
2) REI Country Impact Indicators.
3) REI Core Indicators (outcomes).
4) REI Co-Benefits (outcomes).
5) Optional Indicators (outcomes and/or outputs).
6) Project-specific indicators (outcomes and/or outputs); and
7) Energy storage indicators (outcomes).

52 The Plan establishes a robust monitoring and evaluation framework. To ensure effective monitoring, an online monitoring system will be developed within the climate portal managed by the Directorate of Climate Change under MoEUCC, enabling continuous and timely tracking and reporting of activities by all responsible and relevant institutions. Institutions accountable for each action will be required to input developments from the previous year into the online monitoring system annually from January 1st to March 31st. The Climate Change Directorate of the MoEUCC will prepare annual monitoring and evaluation reports by June 30th of each year, incorporating contributions from key responsible institutions and based on the information provided in the system. The recommendations and necessary actions identified in the monitoring and evaluation report will be discussed in the Climate Change and Adaptation Coordination Board (CCACB) Working Groups. The annual evaluation reports, prepared in coordination with the Directorate of Climate Change of MoEUCC, will be submitted to the CCACB by December 31st of each year.

The present IP is expected to contribute to the following CIF impact indicators:

- CIF 1. Mitigation: GHG emissions reduced or avoided (Mt CO2 eq).
- CIF 4. Cofinance: Volume of cofinance leveraged (US$).

These two CIF impact indicators (CIF 1 and 4) correspond to respective program outcome indicators as detailed below.

CIF 1 and 4 correspond to respective program outcome indicators as detailed below.

7.3 REI Program Level Impacts

The REI Program Impact is to “enable flexibility of energy systems for smooth integration of higher shares of variable renewable energy generation into the grid and increase in off-grid access to renewable energy.” The REI monitoring and reporting (M&R) system asks for program impacts to be measured with three to five country impact indicators, selected by country recipients for the specific investment plan. These indicators are intended to provide a high-level view of country progress on renewable energy integration are not necessarily attributable to the investment plan. The investment plan aims to contribute to achievement of these indicators alongside other broader efforts of Türkiye.

Table 2: REI Program Impact Indicators for Türkiye REI Investment Plan

Program Impact Indicator	Baseline value	Target value (2030)	Target value (2035)	Source
Increase renewables in the total primary energy supply	27.1 Mtoe; 17.2% (2022)	40.6 Mtoe; 20.4%	48.7 Mtoe; 23.7%	NEP and Energy Balance Sheet[53]
Increase renewable energy generation	137.2 TWh; 42.2% (2023)	214.3 TWh; 47.3%	278.3 TWh; 54.8%	NEP
Increase variable renewable energy generation	18.6 TWh, 5.7% solar; 34.0 TWh, 10.54% wind (2023)	52.2 TWh, 11.5% solar; 53.7 TWh, 11.9% wind	84 TWh, %16.5 solar; 90.1 TWh, %17.7 wind	NEP
Increase variable renewable energy installed capacity	13.998,25 MW; 12.8% solar; 11.806,50MW; %10.8 wind (2023)	32,900 MW solar; 18,100 MW wind	52,900 MW solar; 29,600 MW wind	CCMSAP[54] and NEP
Increase battery capacity	0 MW (2023)	2,100 MW [55]	7,500 MW	CCMSAP and NEP
Reduce carbon intensity of electricity	0.437 kg CO_2/kWh (2020)	0.352 kg CO_2/kWh (20 percent reduction from 2024 level)[56]		CCMSAP

7.4 Program Outcome Results

Program outcome results cover four categories of indicators:

- REI core indicators, all nine of which must be reported for every project where relevant;[57]
- REI co-benefit indicators, at least one of which must be reported for each project;
- Energy storage indicators, which must be reported if the REI project being appraised contains an energy storage component; and
- Optional outcome indicators.

This IP proposes program outcome indicators as follows: REI Core Indictors 1 (mitigation) and 6 (cofinance) correspond to CIF impact indicators 1 and 4 respectively. REI 2 (MW capacity) covers wind and solar power only, while REI 3 (GWh production) covers all renewable energy sources. REI 2 (MW capacity) will be taken as proxy for the World Bank core indicator 'Renewable Energy Generation Capacity Enabled (MW)', noting that the REI 2 includes wind and solar power only, while the latter covers all renewables. Additional outcome indicators, as shown below,

[53] Energy Balance Sheet: https://enerji.gov.tr/eigm-raporlari

[54] The Ministry of Environment, Urbanization and Climate Change Climate (2024) Climate Change Mitigation Strategy and Action Plan (CCMSA P, 2024-2030) https://iklim.gov.tr/db/turkce/icerikler/files/%C4%B0klim%20De%C4%9Fi%C5%9Fikli%C4%9Fine%20Uyum%20Stratejisi%20ve%20Eylem%20Plan_%202024-2030.pdf is consistent with and reflects Türkiye's 2023 National Energy Plan.

[55] Türkiye does not currently have a target for aggregate energy rating of battery storage. The 2023 National Energy Plan assumes an average energy capacity of two hours for battery systems associated with the power rating target.

[56] The emissions intensity target is defined as 20 percent reduction from 2024 level, the absolute equivalent of which will be determined *ex post*. The 2020 and 2030 values shown in the table are "Electricity Generation Emission Factors" representing the total amount of carbon dioxide emitted per unit of gross electricity generation from power plants in Türkiye using IEA methodology https://iea.blob.core.windows.net/assets/bf862218-7fd8-4637-aca6-5a347b6ca4f1/IEA_Methodology_Emission_Factors_2023.pdf.

[57] Core indicators may be excluded where justifiably irrelevant to a given project's context (REI 2023 page 23).

draw on the REI optional indicators (numbered 1 through 7 at outcome level) from the REI M&R System toolkit (table 3). Complementary activities with support from participating MDBs, as described in Appendix G, address policy issues in Türkiye for renewable energy integration. The REI Co-Benefit Indicator will capture enhanced climate resilience of power system infrastructure resulting from integration of physical climate risk screening and design measures.

Table 3: Program Outcome Indicators for Türkiye IP by Component

Program Outcome Results Indicators	1. Transforming the Power Transmission System for REI	2. Power System Flexibility, Balancing, Stabilization and Strengthening Power Infrastructure	3. Capacity Building for System Flexibility and Security of Supply
REI Core Indicators			
REI 1. Mitigation (Mt CO_2 eq)	Applicable	Applicable	n/a
REI 2. Variable renewable energy installed capacity available to the grid (MW) – direct/indirect	Applicable	Applicable	n/a
REI 3. Renewable energy production (GWh/year)	Applicable	Applicable	n/a
REI 4. Grid services (number)	Applicable	Applicable	n/a
REI 5. Cofinance (US$)	Applicable	Applicable	n/a
REI 10. Number of persons trained (number)	Applicable	n/a	n/a
Energy Storage Indicators[58]			
GESP 1. Energy rating of storage system installed (MWh)	n/a	Applicable	n/a
GESP 2. Power rating of storage system installed (MW)	n/a	Applicable	n/a
REI Co-Benefit Indicators			
Deployment of at least one female controller from TEIAS in each sub-project site for civil work supervision. (Yes/No)	Applicable	n/a	n/a
Optional Outcome Indicators			

[58] The storage indicators would apply to Component 2 but not to Component 3 since the pumped hydro storage assessment would be for feasibility study rather than deployment. The energy storage indicator is for systems 'rendered operational' during the reporting period (REI 2023 page 78).

REI Optional 1: Increase in grid interconnections to accommodate higher share of variable renewable energy (number)	Applicability to be determined
REI Optional 2: Reduced curtailment (% or MW)	
REI Optional 3: Reduced loss of load (%)	
REI Optional 4: Reduced reserve inadequacy (% or MW)	
REI Optional 5: Reduction in unplanned system outages (number)	
REI Optional 7: Number of innovative products, services, technologies, and processes that have entered a new market context	

See respective appendices on each Component Brief for further details of results indicators and target values.

7.5 Program Output Results

Program output result indicators are chosen for specific projects or components as applicable. These indicators are selected independently, drawing from REI optional indicators (numbered 8 through 18 for output level). See table 4.

Table 4: Program Output indicators for Türkiye CTF-REI IP by component

Program Output Results Indicators	1. Transforming the Power Transmission System for REI	2. Power System Flexibility, Balancing, Stabilization and Strengthening Power Infrastructure	3. Capacity Building for System Flexibility and Security of Supply
REI Optional Output Indicators			
REI optional 9: Technical/financial analyses completed to enhance the enabling environment for renewable energy uptake (number)	Applicable	Applicable	Applicable
REI optional 10: Persons trained on issues related to renewable energy markets and systems (number)	Applicable	n/a	n/a
REI optional 13: Energy storage systems installed (number)	n/a	Applicable	n/a
REI optional 14: End-use electrification solutions deployed (number)	n/a	Applicable	n/a
ES.2.2 Number of green charging stations	n/a	Applicable	n/a
ES.3.4 Number of smart grids installed	Applicable	Applicable	n/a

Note: Indicators marked 'ES' refer to those in Republic of Türkiye (2024) Climate Change Mitigation Strategy and Action Plan 2024-2030.

7.6 Transformational change

CIF aims to drive transformational change across funded programs and activities, defined as "fundamental change in systems relevant to climate action with large-scale positive impacts that shift and accelerate

the trajectory of progress towards climate neutral, inclusive, resilient, and sustainable development pathways".[59] Changes produced by the CIF-supported investments can be considered through the five dimensions of transformational change, as identified by CIF's Transformational Change Learning Partnership (TCLP). These five dimensions are: relevance, systemic change, speed, scale, and adaptive sustainability.[60] Arenas or entry points for actions that can enable transformational change include: financing, governance and engagement, institutions, knowledge and information, markets, natural capital, policies, practices/mindsets, and technologies and infrastructure. Transformational change across the five dimensions will be assessed by 'signals' to evaluate and learn through the program lifetime.[61] Disaggregated data collection will capture impacts on women. Ongoing learning and adaptive approaches will include the identification and tracking of new and emerging signals as programs and contexts evolve. For each dimension, the remainder of this section answers 'what' outcomes are characterized with 'emerging signals' and 'advanced signals' as well as 'how' the change will be achieved through relevant processes.

Dimension 1: Relevance

'What': The fundamental changes and large-scale positive impacts which need to be brought about, relevant to REI and just, inclusive energy transitions, include the following.

- **Emerging signals outcome:** Türkiye has designed one of the most ambitious strategies to scale up renewable energy generation, aiming to add 60 GW of solar and wind capacity by 2035 as part of its effort to meet energy security objectives and achieve net zero emissions by 2053. The country's leading mitigation policy in the energy sector, defined in the NDC, focuses on maximizing energy efficiency and renewable potential while considering feasibility, market conditions, and energy security. The REI program's alignment with NDCs and Paris Commitments ensures meaningful contributions to climate targets while fostering a just and inclusive energy transition, driving positive societal impacts. Achieving these fundamental changes and large-scale positive impacts requires a multifaceted approach, including modernizing infrastructure, deploying advanced technologies, reforming regulatory frameworks, fostering economic transformation, ensuring environmental benefits, promoting social equity, establishing long-term supportive policies, and enhancing international collaboration. These efforts collectively pave the way for a resilient, efficient, and sustainable energy future.
- **Advanced signals outcome:** Türkiye's development policies, with international developments in mind,

[59] Transformational Change Concepts, May 2021, https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/tclp_workshop_updated_tc_concepts_may2021.pdf). In the context of the climate crisis, this refers to the profound, rapid changes in social, economic, and technical systems needed to achieve net zero greenhouse gas emissions, increase social inclusion, manage distributional impacts, enhance resilience and adaptation to climate change, and reduce stress on finite natural systems.

[60] CIF 2022 "The Transformational Change Learning Partnership" https://www.cif.org/sites/cif_enc/files/knowledge-documents/tclp_overview_0.pdf, and CIF 2024 'REI Evaluation and Learning (E&L) Toolkit: Maximizing Transformational Intent and Impact of REI Investments' https://www.cif.org/knowledge-documents/rei-investment-program-evaluation-and-learning-toolkit. Signals of transformational change are referenced in the evaluative components of the REI Integrated Results Framework and are separate from, but complementary to, the indicators outlined in the REI Program Monitoring and Reporting Toolkit.

[61] Signals—which can be advanced or emerging—offer an alternative conceptual framework for recognizing and capturing transformational change through the program lifetime (https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/tclp_workshop_signalsenergy_framework_may2021.pdf). Unlike indicators, signals mark multiple levels of complex systems dynamics based on mixed-methods data collection and analysis of CIF contributions toward transformational change in-situ.

aim to make progress toward sustainable development by addressing economic, social and environmental issues in a balanced way. Türkiye pursues a green growth policy and contributes to the global efforts to combat climate change with its special circumstances and national capabilities. In this context, Türkiye's ambitious renewable energy strategy will result in significant large-scale positive impacts, including substantial economic growth through the creation of new jobs and the development of local manufacturing industries, as well as positive environmental impact through the reduction of greenhouse gas emissions and improved air quality.

'How'. The interventions are relevant to global, national and local priorities, and the intervention logic (theory of change) is relevant to REI, aligned with and integrating ecological, social and economic priorities, as follows.

- The government aims to ensure energy supply that is sustainable and affordable; diversify resources of energy supply; exploit indigenous and renewable energy target; and prioritize localization of energy technologies and integrate new technologies; to gain a competitive structure to enhance the country's strategic position in the international energy trade. Country-led stakeholder engagement and consultation processes to develop country investment plans are aligned with these commitments to decarbonization, access to clean energy and just transitions. Additionally, policy, regulation, and governance structures are in place and operational for addressing barriers to REI, clean energy access, and just transitions.
- REI efforts place a priority on enabling the incorporation of RE resources, technologies, and infrastructure into the power system that are well-suited for leveraging assets, advancing climate and socioeconomic goals, as well as ensuring sustainable, accessible, affordable and reliable energy. CTF REI program will help develop Türkiye's electric power transmission and distribution systems, battery energy storage systems, and electric vehicle charging infrastructure through the identified investments and technical activities, then Türkiye will be better able to integrate the target additional 60 GW variable renewable energy by 2035 on a path to decarbonize the economy by 2053 with socio-economic benefits shared through a sustainable inclusive and resilient approach.

Dimension 2: Systemic Change

'What': The systems that need to be changed, and the changes required between and within these systems include the following.

- **Emerging signals outcome:** Key governance structures possess a well-defined mandate and the necessary support to effectively plan for REI programs that prioritize social justice and ecological benefits. Türkiye's comprehensive renewable energy law outlines market rules, designates responsible authorities, and establishes an incentive mechanism, ensuring a robust framework for the development and implementation of renewable energy projects.
- **Advanced signals outcome:** Early shifts in key systems and structures (including institutions, knowledge, policy, financing, market systems and technology) that address barriers and advance opportunities to successfully plan for REI programs in socially just and ecologically beneficial ways, have occurred. The government fosters strong collaboration with stakeholders to ensure the maximization of benefits from renewable energy potential.

'How'. The interventions identify and define the system, including system boundaries, remove entrenched

barriers and open new pathways for systemic changes to ensure REI, and elevate the influence of beneficiaries and other stakeholders, including vulnerable groups, to contribute to REI and benefit from it, as follows.

- Efficient institutional dialogues, along with long-term coordination and planning processes between stakeholders, are identifying the underlying governance, financial, technological, infrastructure, and social barriers and opportunities concerning REI and energy access that would be safe and just. This process includes assessing the geographical areas impacted, the technological infrastructures utilized, and the social and economic contexts of the communities involved. Such a comprehensive approach ensures that the system is well-defined, and all potential barriers and opportunities are accounted for, paving the way for effective and equitable renewable energy initiatives.
- CTF REI program will help Türkiye mobilize concessional financing to reach the renewable energy target as well as building the technical capacity of relevant institutions. Stakeholder engagement is taking into consideration systems transformation and supports inclusive processes for REI and just transitions at the outset.
- The theory of change of the CTF REI aims to support the development of Türkiye's electric power transmission and distribution systems, battery energy storage systems, and electric vehicle charging infrastructure through targeted investments and technical activities. These initiatives will enable Türkiye to decarbonize its economy, providing socio-economic benefits through a sustainable, inclusive, and resilient approach. This transformation will ensure that all citizens benefit from a cleaner and more efficient energy system.

Dimension 3: Speed

'What'. It will take the following to achieve the transformational change in a time frame that is aligned with the urgency and complexity of the climate crisis.

- **Emerging signals outcome:** Türkiye has designed one of the most ambitious strategies globally to scale up renewable energy generation. By the end of 2023, the share of renewables in total installed capacity was 56.3 percent (61.5 GW). According to the National Energy Plan, it is forecasted that renewables will constitute almost 65 percent (122.7 GW) of total capacity by 2035.
- **Advanced signals outcome:** In alignment with the long-term net-zero emission target, the share of renewables in total electricity generation is projected to reach 70 percent by 2050.

'How'. The intervention accelerates progress toward REI and ensures adequate and inclusive engagement with complex and contested issues associated with REI, as follows.

- Türkiye has undertaken numerous reforms to accelerate the integration of renewable energy. Ongoing capacity enhancements are being implemented to expedite energy sector reforms, foster social development, drive technological innovation, and establish market incentives related to REI. As an example, the government plans to introduce legislation to the parliament aimed at reducing the permitting time for renewable investments.
- Coordinated actions across stakeholders are accelerated through enhanced institutional structures and multi-sectoral policies and agreements. Cross-cutting sectoral policies such as industry, agriculture, etc. further support this acceleration by aligning the goals and efforts of

different sectors, thereby maximizing the impact of the intervention, and hastening the transition to a sustainable energy future.

- Socially inclusive and equitable approach between women and men ensure that REI programs and projects have sufficient time to incorporate just-transition and social inclusion considerations, including the distributional impacts of energy system transformations. Türkiye is well-poised to push the frontiers on equality between women and men thanks to robust human and economic foundations. Its long-standing institutions and human capital progress have helped drive growth for decades, paving the way for the green and digital transition.

Dimension 4: Scale

'What'. Contextually large changes that need to be scaled within and beyond the intervention include the following.

- **Emerging signals outcome.** Türkiye faces some barriers that adversely affect the scaling up of REI beyond expectations. These barriers include the subsidization of end-user consumer energy prices, the insufficiency of long-term finance, the lack of long-term power purchasing agreements, the massive investment needs for grid infrastructure, long permitting times, and discrepancies in the allocation of renewable energy capacity. However, for these efforts to be successful, the government can remain determined and foster strong collaboration with all stakeholders involved.
- **Advanced signals outcome.** To address the barriers in the long term, the government has been proactive in implementing new incentive schemes, establishing a one-stop shop for permitting processes, working to remove energy price subsidization, and seeking concessional finance through MDBs. Necessary law amendments have also been made to remove obstacles to the development of REI. The latest amendment, made in May 2024, includes provisions related to floating solar power plants, procedures for YEKA competitions, steps for facilities whose license period for benefiting from unlicensed production support has expired to obtain licenses and sell energy, and changes in energy efficiency support criteria. Another initiative that will foster the development of REI is the commitment to establish battery storage facilities. This approach enables entities to gain the advantage of receiving a provisional license from the EMRA for the establishment of an electricity generation facility based on wind and/or solar energy, up to the installed capacity of the electricity storage facility they have committed to establish. This initiative has resulted in license applications exceeding 200 GW, significantly boosting the potential for renewable energy generation in the country.

'How'. The intervention deepens the understanding of REI and support for it and supports scaling pathways within and across policy and implementation processes associated with REI, and increases expands the geographic areas engaged with or benefitting from REI as follows.

- The CTF REI will support Türkiye's clean energy transition by scaling up low-carbon investments and technologies with significant potential for long-term greenhouse gas emissions savings. The CTF REI support an array of clean technologies across different areas, including REI, energy efficiency (hydropower) and clean transport. Activities include the followings:
  - Development of transmission infrastructure to facilitate scale-up of RE

- Strengthening of transmission networks and interconnections
- Digital and smart-grid investments to strengthen grid operation and management
- Technical assistance and capacity building, as well as preparation for a second phase of the project.
- Advancing the large-scale application of battery storage solutions.
- Expansion of EV charging infrastructure
- Digitalization of the power distribution grids
- Assessing the potential of first pumped hydro storage plant
- Increasing the hydropower efficiency

- Through comprehensive stakeholder engagement, robust policy, and governance frameworks, and coordinated actions supported by strategic financing, the intervention effectively deepens understanding, enhances support, and expands the reach of REI, driving significant progress towards a sustainable and equitable energy future.

Dimension 5: Adaptive Sustainability

'What'. Relevant changes to be sustained and advanced beyond the intervention to achieve sustainable development include the following.

- **Emerging signals outcome.** One of the important conditions for sustainable REI is to have a well-developed infrastructure. The CTF REI program will help transform the network infrastructure in both technical and digital ways. Additionally, the government is planning to restructure the permitting process to improve the investment environment. Advancing new technologies such as HVDC, smart grids, and pumped hydro storage will enhance the renewable connection capacity. Furthermore, network operators' capabilities to manage a highly integrated renewable energy system will also increase with REI support.
- **Advanced signals outcome.** Sustained changes also hinge on long-term policy and regulatory frameworks that support innovation and investment in renewable energy. CTF REI program will help ensuring the capability of continuous government commitment to favorable policies, incentives, and regulatory clarity to create a stable environment for ongoing advancements. Policies that promote research and development, coupled with financial incentives, drive the growth and scalability of renewable energy technologies. The sustained and advanced changes necessary for achieving sustainable development extend beyond the initial intervention through the transformation of infrastructure, adoption of advanced technologies, enhanced management capabilities, digitalization, supportive policies, and robust public-private collaboration. These elements collectively ensure that REI contributes to a resilient, efficient, and sustainable energy future.

'How'. The intervention enables experimentation and flexibility, including the ability to learn and course-correct when necessary, builds the capacity of stakeholders and institutions to advance change along sustainable development pathways, and insulates change from backsliding due to internal and external pressures or shocks, and enable recovery when required, as follows.

- The intervention enables experimentation and flexibility in REI by leveraging the support of the CTF REI Program to pilot innovative technologies and approaches. This process includes

continuous monitoring and evaluation, enabling stakeholders to learn from initial results and make necessary adjustments. The ability to course-correct ensures that projects remain adaptive and responsive to emerging challenges and opportunities. Ongoing monitoring, evaluation, and learning processes, based on multi-stakeholder engagement, are in place to ensure the enhanced relevance of targets and impacts, enabling refinement and course-correction for greater REI in ways that are socially and environmentally beneficial and sustainable. New technologies are supported through policies, new business models, and social backing to sustain and accelerate investments in REI and just transitions.

- The intervention builds the capacity of stakeholders and institutions by providing comprehensive training programs, knowledge-sharing platforms, and technical assistance. These efforts focus on enhancing the skills and expertise of government agencies, utility companies, in managing and integrating renewable energy systems.
- The intervention insulates change from backsliding and enhances resilience through several mechanisms. It promotes an increase in renewable energy potential, reducing dependency on fossil energy supply and mitigating risks associated with external shocks. It also incorporates financial instruments to protect investments in renewable energy projects. By embedding resilience into the planning and implementation phases, the intervention ensures that renewable energy systems can withstand and recover from both internal and external pressures. Resilient, responsive, and influential institutions and policies are supported to sustain and accelerate investments in clean energy innovation. The decades-long collaboration between Türkiye and MDBs serves as a well-indicative example of sustainable support.

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Appendix A: Assessment of Country's Absorptive Capacity for Integration Activities

Macroeconomic Context

Türkiye achieved an average 5.4 percent annual increase in GDP per capita terms 2002-23. While the Covid-19 pandemic negatively impacted growth, Türkiye still managed a 1.9 percent GDP growth rate in 2020. This performance was largely due to the government's economic response to the pandemic, which focused on loosening monetary policy and rapid credit expansion. Türkiye achieved 11.4 percent GDP growth in 2021, 5.5 percent in 2022, and 4.5 percent 2023. (See table A.1 for key economic indicators.)

However, the policy framework that led to strong economic performance also heightened macroeconomic risks and created vulnerabilities in the economy that have been compounded by the effects of other recent shocks. The country has been affected by persistently high inflation in recent months (61.78 percent as of July 2024 after having peaked at 85.5 percent in October 2022)) This was accompanied by a decline in Central Bank reserve buffers, which started to recover after the May 2023 elections. But even before the emergence of these challenges, there were concerns about growth prospects given: (i) declines in the contribution of total factor productivity[62] to growth (down to 0.4 percentage points over 2016-2022 from 1.2 percentage points over 2004-2015); (ii) the trend and composition of investment, which since 2010 was mainly driven by residential and commercial property construction (despite a decline in recent years); and (iii) food price inflation, which has outpaced overall inflation.

Following the May 2023 elections, the Government has taken steps towards normalizing the economy in a gradual way in order to manage risks associated with the adjustment process. This includes monetary policy tightening, with interest rates increasing from 8.5 percent in May to 50 percent in March 2024, the unwinding of distortive financial regulations, and fiscal revenue measures to curtail the fiscal deficit. Markets are reacting positively with 5-year CDSs declining from above 500 basis points (bps) in May 2023 to around 250bps in July 2024, all three major rating agencies upgrading the credit rating and changing the outlook to positive. The authorities are also contemplating how to complement these actions with structural reforms that may help with growth prospects going forward.

Table A.1: Türkiye: Key Economic Indicators

	2020	2021	2022	2023	2024	2025	2026
Real GDP growth, at constant market prices	1.9	11.4	5.5	4.5	3.0	3.6	4.3
Private consumption	3.2	15.4	18.9	12.8	2.3	3.1	4.2
Government consumption	2.2	3.0	4.2	5.2	2.5	2.1	1.7
Gross fixed capital formation	7.3	7.2	1.3	8.9	2.9	2.9	3.1
Exports	-14.6	25.1	9.9	-2.7	4.5	5.2	5.9
Imports	6.8	1.7	8.6	11.7	3.7	4.2	5.6
Real GDP Growth, at constant factor prices	1.2	11.9	6.5	4.5	3.0	3.6	4.3
Agriculture	5.8	-3.0	1.3	-0.2	1.4	1.5	1.5
Industry	3.0	17.1	1.1	0.8	4.6	4.8	5.0
Services	0.2	14.6	9.8	4.4	2.5	3.3	4.2
Inflation (CPI), avg.	12.3	19.6	72.3	53.9	57.8	28.9	16.4
Current account balance (% of GDP)	-4.3	-0.8	-5.1	-4.0	-2.8	-2.4	-2.5
Net foreign direct investment (% of GDP)	0.6	0.8	1.0	0.4	0.9	1.1	1.4
Fiscal balance (% of GDP)	-3.9	-2.6	-0.8	-5.4	-5.4	-3.7	-2.4

[62] In the 2010-2023 period, investments grew by 6.8 percent on average, while machinery and equipment, and construction investments grew by 9.4 percent and 3.9 percent, respectively. Machinery and equipment investments have been growing consistently for the last 17 quarters.

Debt (% of GDP)	39.4	40.4	30.8	29.5	29.9	30.5	31.2
Primary balance (% of GDP)	-1.1	0.0	1.4	-2.5	-0.8	0.6	0.7
Upper middle-income poverty rate (US$ 6.85 in 2017 PPP)	9.8	7.6	7.0	6.6	6.4	6.1	5.7
Source: World Bank Macro Poverty Outlook for Türkiye, April 2024, and World Bank estimates. Notes: f = forecast. Poverty calculations based on SILC data from the TURKSTAT, actual data: 2021, nowcast: 2022-2023, forecasts are from 2024 to 2026.							

The heterodox policies introduced before May 2023 to stabilize the lira, reduce dollarization, and direct credit to selected sectors led to distortions in the financial sector. In that context, banks and corporations grew more sensitive to exchange rate volatility and liquidity risks because of their reduced yet still considerable amount of foreign exchange (FX)-denominated liabilities. The introduction of extensive regulatory forbearance, including a relaxation of the nonperforming loan (NPL) classification criteria and the option for banks to apply a more favorable FX rate when calculating risk-weighted assets and capital adequacy ratio has somewhat shielded the banking sector. At the same time, this added a layer of complexity to the policy adjustment efforts.

Since the May 2023 elections, the government has taken steps towards normalizing the economy gradually to manage risks associated with the adjustment process. These steps include monetary policy tightening, with interest rates increasing from 8.5 percent in May to 50 percent in March 2024, the unwinding of distortive financial regulations, and fiscal revenue measures to curtail the fiscal deficit. Markets are reacting positively, with 5-year CDSs declining from around 700 basis points (bps) in May 2023 to below 300 bps in May 2024. Major rating agencies have recently upgraded their outlook to positive, and three of them (Fitch, S&P Global & Moody's) upgraded the credit rating (to B+, B+ and B1) on March 8, 2024, May 3, 2024, and July 19, 2024, respectively. The authorities are contemplating how to complement these actions with structural reforms that may help with growth prospects going forward. These efforts will need to be sustained and supported in the coming months because the monetary, fiscal, and macro-prudential challenges and associated economic vulnerabilities were of such magnitude that despite the significant progress, there is some road ahead.

After achieving growth rates of 5.5 percent in 2022 and 4.5 percent in 2023, Türkiye's economic growth is projected to slow to 3.1 percent in 2024 before recovering to 3.9 percent in 2025 and 4.7 percent in 2026. In response to the recent monetary tightening, inflation should decline gradually, supporting higher investment as well as progress on poverty and inequality. Fiscal consolidation after 2024 (when the earthquakes recovery and reconstruction efforts will peak), macro-financial stabilization, and policy support to exporters should further narrow the current account deficit. Poverty is projected to stay at 7.8 percent in the next few years.

Future growth prospects will also be affected by developments associated with the global climate change agenda. The EU CBAM is perhaps the most tangible example. The EU will place a fee on the import of certain emissions-intensive products to create a level playing field for domestic producers subject to the EU emissions trading system. The CBAM applies to a select group of the most emissions-intensive and trade exposed sectors, although it is likely to expand to other sectors over time. CBAM entered its transitional phase in October 2023 and the permanent system will come into force from 2026. Türkiye is a large producer of emissions- intensive products (it is the 5th largest cement producer and 8th largest steel producer). The EU is Türkiye's largest trading partner, absorbing 41 percent of Türkiye's total goods exports. Initially, CBAM's effect on Türkiye's iron and steel sector is of most concern: 40.5 percent of Türkiye's likely covered exports in this sector are absorbed by the EU at a value of around US$7.7 billion. Aluminum is also exposed, with 59 percent of exports going to the EU. However, Türkiye could capitalize on progress towards decarbonizing its power sector, its proximity to EU markets, and strong existing trade relationships to increase exports to the EU if it decarbonizes its industrial base ahead of other countries.

Türkiye's tourism industry, which is a major contributor to GDP and the most important source of export revenue, is being impacted by climate change. The regional distribution of tourism activity and investment is closely correlated with climate risk. For example, Antalya Province, accounting for almost half of the country's tourism

accommodation, suffers from the most frequent meteorological disasters of any province, with over 370 events recorded between 2010 and 2021. The hotel sector faces an especially acute decarbonization challenge due to the long asset-life of most hotel properties. This concentration of tourism infrastructure offers opportunities to invest collectively in climate adaptation and mitigation measures, with costs and risks shared among a range of stakeholders. For policymakers and private actors, the challenge is to sustain the sector's growth while reducing emissions, reinforcing climate resilience, and offering innovative value propositions for less carbon intensive, climate resilient tourism products.[63]

Legal, Regulatory and Institutional Context:

The Turkish electricity market reform began in early 2000s with the enactment of EML No. 4628 to increase competition and sustainable growth in the market. The EML identified major market activities in a liberalized environment and laid the foundation for the establishment of the necessary institutions, such as EMRA in 2001 as an autonomous body responsible for regulating the market, and Energy Exchange (EPIAS) in 2006, operating spot and future electricity and natural gas markets. EPIAS is also expected to start an Emissions Trading Market in 2024 depending on the approval of Climate Law in the Assembly.

As explained in appendix B, Türkiye has a strong legal and legislative framework related to REI.

Technical and Management Context

MENR and its affiliates such as TEİAŞ have extensive technical capacity and experience managing a high-quality workforce and investments. TEİAŞ is familiar with MDBs, and specifically World Bank-financed projects, and has the capacity to comply with banks' international fiduciary, environmental, social standards. Although the management of energy sector SOEs has changed, the SOEs institutional memory will enable them to continue to cooperate effectively with MDBs. [64]

[63] Although the tourism is one of the most being impacted sectors by climate change, there are some remarkable efforts to mitigate these effects. Since 2022, tailored promotional and marketing activities continue to improve tourism diversification alongside the implementation of a sustainable tourism program. In addition to these efforts, within the scope of the "Climate Change Adaptation Strategy and Action Plan (2024-2030)," published in March 2024, there are some specific actions to overcome the effects of climate change on the tourism.

[64] https://iklim.gov.tr/db/turkce/icerikler/files/%C4%B0klim%20De%C4%9Fi%C5%9Fikli%C4%9Fine%20Uyum%20Stratejisi%20ve%20Eylem%20Plan_%202024-2030.pdf

Appendix B: Key Legislation relevant for Renewable Energy in Türkiye

Note: The Executing Authority for each legislation is indicated in parentheses after each item.

- Electricity Market Law, numbered 6446 (MENR, EMRA),
- Law on the Use of Renewable Energy Sources for Electrical Energy Generation 5346 (Council of Ministers – the President),
- Geothermal Resources and Natural Mineral Waters Law 5686 (Council of Ministers – the President),
- Presidential Decrees 1044, 2949, and 7189,
- Electricity Market Licensing Regulation (EMRA),
- Regulation on Certification and Support of Renewable Energy Sources (EMRA),
- Competition Regulation Regarding Provisional License Applications to Establish a Wind or Solar Energy Based Production Facility (EMRA)
- Regulation on Renewable Energy Resource Guarantee Certificate in the Electricity Market (EMRA)
- Regulation on Storage Activities in the Electricity Market (EMRA)
- Regulation on Unlicensed Electricity Generation in the Electricity Market (EMRA)
- Regulation on Renewable Energy Resource Areas (MENR)
- Regulation on the Procedures and Principles Regarding the Signing of a Water Use Right Agreement to Carry Out Generation Activities in the Electricity Market (State Hydraulic Works – DSI - General Directorate)
- Regulation on the Use of Geothermal Resource Areas for Electrical Energy Generation (MENR)
- Geothermal Resources and Natural Mineral Waters Law Implementation Regulation (MENR)
- Regulation on Solar Energy Based Electricity Generation Facilities (MENR),
- Regulation on the Technical Evaluation of Solar Energy Based Electricity Generation Applications (MENR)
- Regulation on the Technical Evaluation of Applications for Wind Resource-Based Electricity Generation (MENR)
- Regulation on the Connection of Wind Power Plants to the Wind Power Monitoring and Forecasting Center (MENR)
- Domestic Components Regulation (MENR)
- Communiqué on Wind and Solar Measurements Applications for Wind and Solar Energy Based License Applications (the Ministry of Environment, Urbanization and Climate Change)

Appendix C: Overview of the Power Sector

Türkiye's electricity market has undergone extensive reform since the enactment of Electricity Market Law (EML) number 4628 in 2001, with market liberalization, the establishment of an autonomous energy regulatory authority, unbundling of sub-sectors such as generation, transmission and distribution, privatization, and the establishment of organized power markets.

The EML introduced the eligible consumer concept, licensing for market entrance, regulated third-party access to transmission and distribution grid, and functional unbundling. However, the EML was amended multiple times to meet the requirements of market implementation, leading to a new EML numbered 6446 enacted on March 14, 2013.

Türkiye's electricity market reform since early 2000s aims to transform the sector's structure from a vertically integrated monopolistic system to a market system with full retail competition. The 2001 EML defines electricity market activities as generation, transmission, wholesale, distribution, retail sale, system operation, and market operation. Among these activities, transmission, distribution and incumbent retail sales (ineligible customers and supply of last resort) as well as EUAS's wholesale to distribution companies (for losses and general lighting) and incumbent suppliers are regulated. Wholesale and retail sales to eligible customers are free market activities open to competition.

Distribution and retail sales activities were legally unbundled since January 1, 2013, when an incumbent supplier concept was introduced. Incumbent suppliers are suppliers that can sell electricity to ineligible and last-resort customers in a designated electricity distribution region which matches the region.

Before 2013, Türkiye Electricity Distribution Corporation (TEDAS) owned and operated all distribution regions in the country. Distribution regions were restructured as 21 subsidiaries of TEDAS, and all were privatized between 2008 and 2013. The ownership of the distribution assets remained with TEDAS, and operational rights were transferred to the private companies. Following the privatization process, electricity distribution activities are performed by distribution companies (DistCos) in regions indicated in their respective licenses. DistCos are to operate and maintain the distribution grid, carry out necessary grid investments, provide non-discriminatory electricity distribution and connection services to all system users including eligible consumers connected and/or to be connected to the distribution system.

DistCos must also prepare regional demand projections and distribution investment plans for required distribution facilities to be constructed in the regions specified in their licenses. TEDAS remains the asset owner and audits the investment by the authority of MENR. EMRA approves distribution investments.

Following the electricity market liberalization process in 2001, the private sector gained the right to construct power plants by bearing the risk of investment. Since then, a private sector actor obtaining a license from the EMRA could invest in constructing a new generation facility or attend public generation facilities' privatization auctions to generate electricity. At the time of liberalization, there was some private sector participation in generation activities in the form of build-operate-transfer (BOT), build-own-operate (BOO), transfer of operational rights (TOOR), and auto production (self-generation). BOT and TOOR generators operate state-owned generation facilities, and at the end of their contract period, assets are transferred to the public company, Electric Generation Co. (EUAŞ). Thermal and small hydro generation assets under the control of EUAŞ have gradually been privatized. At end of their contract period, some private sector-run TOOR and BOT facilities were transferred to EUAS, waiting to be privatized again.

EUAS, however, will continue to have and operate high-capacity reservoir hydroelectric power plants (HPPs) as these are very effective in keeping the transmission system stable. Also, some strategic HPPs are located on border crossing rivers and should be operated by a public company for geopolitical reasons.

With the introduction of unlicensed generation,[65] real persons in addition to legal persons gained the right to generate electricity for their needs using renewable energy sources.

In the liberalization process, generation and wholesale activities were separated from the Türkiye Electric Generation and Transmission Company (TEAS), and a new public company was established to carry out only transmission and related activities. Other transmission assets under the control of private companies were placed under The Turkish Electricity Transmission Company (TEİAŞ). Hence, TEİAŞ became a regulated public monopoly. TEİAŞ is currently the only authorized company to construct and operate transmission systems except for generation companies whose generation facilities are near the country border; these can construct transmission facilities up to the border to export electricity to neighboring countries with unit dedication[66] method. Also, if TEİAŞ does not have sufficient financing or cannot make timely investment planning to connect a new generation facility to the grid, such investments may be made or financed by the subject generation facility licensee on behalf of TEİAŞ.

The transmission lines and transformer station data of TEİAŞ as of the end of April 2024 are given in table C.1 below. A concessionary company had previously constructed 66 kilovolt (kV) transmission lines and transformers in the past and they are gradually being transformed to 154 kV.

Table C.1: Transmission Lines of TEİAŞ

TRANSMISSION LINES (km)	400 kV	220 kV	154 kV	66 kV	TOTAL
National grid overhead lines	25,381.81	-	47,824.74	99.03	73,305.58
International interconnection overhead lines	633.00	85.35	227.80	20.50	966.65
Total overhead lines	26,014.81	85.35	48,052.54	119.53	74,272.23
National grid underground cables	86.96	-	531.75		618.71
National grid submarine cables	24.78	-	-	-	24.78
TOTAL	26,126.55	85.35	48,584.29	119.53	74,915.72

Table C.2: Transformers of TEİAŞ

Voltage	Number of Transformer Stations		Number of Transformers	Transformer Installed Capacity (MVA)
	Total	Connected to Abroad		
400	125	7	441	92,078
220	-	-	-	-
154	672	4	1701	134,548
66	1	3	19	243
TOTAL	798	14	2161	226.869

[65] The Regulation on Unlicensed Electricity Generation in Electricity Market Issued in 2011.
[66] In the unit dedication method, the generation facility is isolated from the national grid and operated as a generation facility of the neighboring country.

The main tasks of TEİAŞ are to carry out load distribution and frequency control, to operate the ancillary services market and balance power market within the scope of the market operation license, to monitor real-time system reliability, to determine the necessary ancillary services to ensure system reliability, and to provide electrical energy under the stipulated quality conditions. It is also responsible to make a transmission investment plan to establish new transmission facilities, to establish these facilities, to operate the transmission system per the competitive environment in the generation and supply of electrical energy, and to invest in substitution and capacity increase in the transmission system when necessary. Also, in line with the decision of the MENR, international interconnection studies are conducted by TEİAŞ.

Since September 18, 2010, the Turkish Electricity System has been operated in parallel with the European Network of Electricity Transmission System Operators (ENTSO-E) via interconnections with Greece and Bulgaria. There are interconnections with other neighboring countries that do not meet ENTSO-E standards, so direct energy flow is not possible because the electricity quality is not equivalent. For such cases, for example with Georgia and Iran, through back-to-back direct current (DC) connections. For interconnections with Azerbaijan, Iraq, and Syria, either an isolated region is formed in the importing country or an electricity generation facility is isolated from the exporting country's system to act as a facility of the importing country's system.

For new generation investments, TEİAŞ prepares and publishes a report by October 1 each year on the capacities of regional generation facilities that can be connected to its systems on a connection point and/or regional basis, for the following five and 10 years.

TEİAŞ has a National Load Dispatch Center in Ankara and nine regional load dispatch centers throughout the country. Depending on the regional electricity supply-demand balance, 15 tariff regions are determined. Generation and consumption facilities connected to the transmission grid in these regions should pay the transmission fee based on the tariff valid for that region. The transmission tariff is determined and proposed by TEİAŞ and approved by EMRA to cover all expenses of TEİAŞ.

The main market players are as follows:

- MENR – determines the policy for the sector.
- EMRA – prepares secondary legislation and regulates, monitors, audits and approves tariffs.
- TEİAŞ– the state-owned transmission company that also operates the system, balancing power market and ancillary services market.
- EUAS – the state-owned generation and trading company that also acts as the party of guaranteed energy contracts.
- Distribution companies – private companies operating distribution regions which are owned by TEDAS, the state-owned distribution company.
- Incumbent suppliers – private retail sales companies in distribution regions, supplying electricity to non-eligible and last-resort consumers.
- Suppliers – private companies supplying electricity to eligible consumers and other suppliers.
- EPIAS – the market operator established under commercial law which operates the organized wholesale power markets and financially settles the transactions made in these markets.
- Organized Industrial Zones (OIZ) – industrial areas that can generate and distribute electricity in their zones.

The eligible consumer concept was introduced with EML in 2001 and the eligibility threshold was determined as 9 GWh per year to be effective as of March 3, 2003. Consumers directly connected to the transmission grid or OIZs are also considered eligible. This limit has been reduced regularly and for 2024 it is 950 kWh per year.[67] Practically all consumers are eligible and either purchase their electricity from the market or incumbent supplier in their region at

[67] EMRA Board Decision no: 12295, dated December 28, 2023.

the last-resort tariff.[68] However, household and agriculture consumers with annual consumption of 100 million kWh/year or less are allowed to purchase electricity from their assigned suppliers at the last resort consumer tariff.[69]

Türkiye's electricity market currently has spot markets such as day ahead, intraday, balancing power (power exchange), and futures. There is also a YEK-G market, which enables the monitoring, proof, and disclosure that the energy used by end-consumers is produced from renewable energy sources. On the technical side, an ancillary services market is operated by TEİAŞ for system reliability and stability.

The new EML (2013) also amended the provisions for license exemptions. The following renewable facilities are exempt from setting up a company and obtaining a license for generating electricity:[70]

- Generation facilities that use renewable energy sources with a maximum installed capacity of 5 MW;[71]

- Renewable generation facilities, which consume all the electricity that they generate, without feeding it into the transmission or distribution system;

- Market activities carried out within the scope of electricity storage and demand-side participation within the framework of the limits, procedures, and principles to be determined by the EMRA Board in consultation with MENR.

- Generation facilities based on renewable energy sources, provided that the capacity is limited to twice the contractual power in the connection agreement by municipalities and their affiliates; industrial facilities and facilities for agricultural irrigation; and other persons limited to the contractual power in the connection agreement.

- Also, some activities carried out by irrigation facilities and irrigation associations using renewable energy sources.

[68] Last resort tariff is determined as the average market price plus a profit component for the last resort supplier.
[69] EMRA Board Decision no: 12158, dated October 26, 2023.
[70] New EML, Article 14. (2013)
[71] The capacity was increased to 5 MW by Presidential Decree dated May 9, 2019, number 1044, while in the new EML **It** was determined as 1 MW, and the President was given the authority to increase it up to 5 times.)

Appendix D: Previous CIF / CTF Program in Türkiye

Since 2012, CIF's investment in Türkiye has been through its Clean Technology Fund (CTF). Türkiye's US$440 million, multiphase CTF investment plan has been supporting wind power expansion, smart grid upgrades, and complementary programs with local banks and leasing companies to address market barriers and drive investments in renewable energy and energy efficiency.

In the first phase (through end-2012), US$172 million from the investment plan helped to mobilize US$1.8 billion through 430 subprojects via local financial intermediaries. Savings have amounted to 902,000 tons of carbon dioxide equivalent and US$568 million in avoided oil imports per year.

A summary of Türkiye's experience with CTF programs in collaboration with CIF partner MDBs is provided in table D.1. In addition to the financing from the CTFs and MDBs, cofinancing from private sector sources was mobilized through the CTF programs and projects.

Table D.1: CTF-MDB Cofinancing in Türkiye (in US$ millions)

	MDB	CTF	Total
World Bank			
Renewable Energy Integration Project (P144534)- ongoing	625	50	675
Renewable Energy Integration Technical Assistance Project (P155510)- closed		1	1
Private Sector EE and RE (P124898)- closed	1,000	100	1,100
Energy Efficiency in Public Buildings Projects- 1 and 2 (P162762)- ongoing	150	50	200
Geothermal Development Project (P151739)- ongoing	550	39.8	589.8
Accelerating the Market Transition for Distributed Energy PfR	664.4	30	694.4
Sub-Total: World Bank	2989.4	270.8	3,260.2
IFC			
Commercializing Sustainable Energy Finance	101.8	20.5	122.3
Commercializing Sustainable Energy Finance Program Phase II	66.8	34.7	101.5
Sub-Total: IFC	168.6	55.2	223.8
EBRD			
Türkiye Sustainable Energy Financing Facility (TurSEFF) (fully disbursed; implementation ongoing)	193.0	46.7	239.7
Türkiye Residential Energy Efficiency Finance Facility (TuREEFF) (fully disbursed; implementation ongoing)	115.0	42.0	157.0
Near Zero Waste (NØW) Programme (fully disbursed; implementation ongoing)	156.1	12.1	168.2
Türkiye Climate Stars (fully disbursed; implementation ongoing)	396.6	24.3	420.9
High Climate Impact for the Corporate Sector Programme (1 subproject in Türkiye approved under this regional program; implementation ongoing)	44.4	8.1	52.5
Türkiye Green Cities Programme (1 subproject in Türkiye approved under this regional program; implementation ongoing)	74.9	5.4	80.3
Sub-Total: EBRD	980.1	138.5	1,118.6
TOTAL	**4,138.1**	**464.5**	**4,602.6**

Appendix E: Development Co-Benefits

Human Capital and Gender

The CIF Gender Program outlines (i) improved asset position, (ii) voice, and (iii) resilient livelihoods of women through institutions and markets as its key impact objective. CIF assesses these aspects through evaluative and learning-based approaches, as relevant to the REI program, in combination with other monitoring data. Areas for further analysis include mechanisms through which women and their organizations are represented in decision-making on renewable energy generation; share of women working in the energy sector; and the impact of off-grid access on women's labor/time use.

Renewable energy employment has steadily expanded worldwide, with an estimated 13.7 million direct and indirect jobs in 2022. Many governments are prioritizing renewable energy development to reduce emissions and achieve international climate goals as well as to pursue broader socioeconomic benefits, including human capital and equality between women and men. Jobs serve as a tangible benefit, providing individuals, with a stake in this transformative process. However, various analyses indicate that these advantages have not been equitably distributed across the energy sector workforce, and there is a notable gap. This gap is particularly evident in skilled trades, technology innovation and commercialization, and upper-level management roles in rapidly growing industries such as renewable energy development. In Türkiye's energy sector, women constitute 25 percent of the workforce despite being 47 percent of the total national workforce. Women represent 32 percent of the workforce in renewable energy. The International Energy Agency (IEA) reports that women in energy earn nearly 20 percent less than men, even with similar skills, education, and experience.

Türkiye is well-poised to push the frontiers on equality between women and men thanks to robust human and economic foundations. Its long-standing institutions and human capital progress have helped drive growth for decades, paving the way for the green and digital transition. These assets are key to continuing its economic recovery following the spillover effects from regional conflicts regarding migration and trade, Covid-19 effects, and the 2023 earthquakes in southeastern Türkiye.

Maximizing human capital utilization is essential to economic development in Türkiye. Türkiye's female labor force participation rate was 37 percent in 1990, 23.3 by 2005, and 37.1 percent in May 2024. This compares modestly to countries like Chile and Mexico that started at lower levels in 1990 but reached over 45 and 41 percent, respectively, by 2020-202, nearly in line with OECD levels. Over 2014-2022, Türkiye saw an expansion of the labor underutilization rate from 14 to 17 percent, but the underutilization rate was nearly double among women, partly due to the Covid-19 pandemic and labor market contraction. Women's labor force participation in Türkiye lags that of men by a factor of at least 2:1.

Renewable energy investments will provide a window of opportunity to boost human capital and gender equality. A recent study by United Nations Development Program (UNDP) and International Labor Organization (ILO) indicates that investments in renewable energy will generate 300,000 new jobs in Türkiye.[72] This represents an opportunity to equip women with market-relevant skills and promote their enhanced access to employment in renewable energy industry while contributing greater equality between women and men across the country. Gender data and analysis with regard to the Türkiye energy sector is not widely shared and fragmented. The World Bank team will conduct a social assessment of the energy sector to identify the entry points for more women participation and enhanced outcomes.

[72] https://www.ilo.org/ankara/news/WCMS_849762/lang-en/index.htm#:~:text=the%20Turkish%20,Going%20green%20could%20create%20300%2C000%20new%20jobs%20for%20the%20Turkish,fuels%20to%20renewable%20energy%20sources.

Throughout the FY2018-FY2023, the share of active gender-tagged projects of the World Bank averaged 87 percent while reaching 100 percent levels in FY19, FY20, and FY23. The World Bank program continued to bring significant benefits to women and vulnerable groups through its lending, trust-funded activities, and (Analytical and Advisory) ASA interventions, including energy- and climate-related interventions. The Renewable Energy Integration Project (REIP), that is currently co-financed by the World Bank and the CTF, is gender tagged. The Transforming the Power Transmission System Project under the Component 1, that is similar to the REIP, will highly likely be gender-tagged during the project preparation, as well. The other MDBs, IFC and EBRD, will make an effort to gender tag the private sector financed projects under Component 2 of the IP. The opportunities for designing gender-responsive interventions within each component, specifically targeting female employees during capacity-building and training support provided to clients, will be considered during the design and preparation of the projects. A preliminary organizational assessment of TEİAŞ to identify and address barriers to women's employment and working conditions within the organization and to develop standards that contractors must comply with during project implementation was done during the preparation of the REIP. This has resulted in the inclusion of women-specific results indicators to the project such as “deployment of at least one female controller from TEIAS in each sub-project site for civil work supervision” which has been fully met since the beginning of project implementation; and the improvement of the working conditions of the contractors’ project sites such as separate women toilets.

Appendix F: Stakeholder Consultations

Türkiye´s CTF-REI Investment Plan is the result of a consultative process, led by the MoTF, relevant Ministries and institutions to identify and prioritize activities for which financing support mechanisms are required to accelerate the integration of RE. This plan has been conceived as an important instrument to advance in Türkiye's energy transition and climate action policies.

The consultation process involved ministries, government institutions, MDBs, nongovernmental organizations (NGO), thinktanks, and representatives from the private sector and academia.

Two major consultations were held during the preparation of the IP. The first occurred during the Scoping Mission in November 2022, which initiated discussions among different levels of government and relevant stakeholders. Participants of the Scoping Mission included IFC, EBRD, World Bank and representatives from several ministries and institutions including MoTF, MENR, MoEUCC, the Strategy and Budget Office, Ministry of Trade (MoT), Ministry of Industry and Technology (MoIT), Ministry of Transportation and Infrastructure (MoTI), Türkiye Energy, Nuclear and Mineral Research Agency Institute (TENMAK), Energy Market Regulatory Authority (EMRA), the Scientific and Technological Research Council of Türkiye (TUBİTAK), Turkish Electricity Transmission Corporation (TEİAŞ), Türkiye Industrial Development Bank (TSKB), Türkiye Development and Investment Bank (TKYB), Türkiye Industry and Business Association (TUSİAD), and the Independent Industrialists and Businessmen's Association (MÜSİAD). Participants are listed in table F.1. Based on these discussions, the main strategic themes to be included in this IP were identified.

The following areas were selected for further discussion and elaboration during the Scoping Mission:

a) Strengthening and further digitizing the power transmission system and facilitating large-scale renewable energy integration.
b) Increasing the efficiency of the existing hydropower projects.
c) Storage of electricity both as battery storage and pumped hydro storage.
d) Supporting e-mobility.
e) Generation, storage, transportation, and usage of green hydrogen.

The following consultations took place during the three Joint Missions in January, April, and May 2024. The Joint Mission participants included IFC, EBRD, World Bank, and representatives from several ministries and institutions including MoTF, MENR, Ministry of Transportation and Infrastructure (MoTI), Türkiye Energy, Nuclear and Mineral Mine and Nuclear Research Agency (TENMAK), Energy Market Regulatory Authority (EMRA), Turkish Electricity Transmission Corporation (TEİAŞ), Türkiye Industry and Business Association (TUSİAD), Electricity Generation Association (EUD) as well as private sector companies (Koc Holding, Borusan Holding, Guris Holding) and think tanks (Shura). Participants in the first Joint Mission are listed in Table F.2. This Mission discussed the major activities to be included in the IP.

- The three Joint Missions, dated January 17-18-19, April 3, and May 21, 2024, met all the objectives, and identified potential activities to be included in the IP, as follows:

    1. Transformation of the Power Transmission System for REI (investment project)
    2. Private sector projects (investment projects)
        a. E-mobility infrastructure
        b. Battery storage
        c. Digitalization and smart grid for distribution
    3. Technical Assistance (TA) for

a. Pumped hydro storage;
b. Hydropower energy efficiency;
c. Streamlining policy for renewable energy regulation; and
d. Capacity building for power transmission system operator (TEİAŞ) with activities such as:
    i. TA for introduction of HVDC.
    ii. Capacity building and training for SCADA/EMS.
    iii. System management for variable REI.

An independent technical reviewer and the CIF Secretariat reviewed and shared comments on the IP on July 7, 2024 and July 10, respectively. The draft of the IP was published for comments on the MENR´s website for 15 days from June 27-July 12, 2024, receiving comments from relevant stakeholders, associations and the general public until July 12, 202. In addition to the publication in the MENR's website, that is a frequently visited website announcing critical events in the sector, some energy and climate related companies / agencies announced in their websites the IP details and its public consultation process, as well as contact information.[73] The comments were considered for the final round of revision to which the document was subjected leading to this final presented version. The IFC and EBRD provided responses to the respective questions/requests by the technical reviewer on July 12 and 18, 2024, which were incorporated in the final IP, which also includes the final review and comments of the MoTF received on August 5, 2024. Please see Appendix K for the overall comments and responses.

Table F.1: Participants of the Scoping Mission, November 2-3, 2022

Name Surname	Institution	Position
Özgür SARHAN	Ministry of Energy and Natural Resources	Head of Department
Engin BOSTANCI	Ministry of Energy and Natural Resources	Acting Head of Department
Gözde ERTEMİR	Ministry of Energy and Natural Resources	Specialist
Merve ŞENOL ÖNEY	Ministry of Energy and Natural Resources	Specialist
Yaprak Serenay TAŞKIN	Ministry of Energy and Natural Resources	Assistant Specialist
Dr. Yelda ALTINSOY	Ministry of Energy and Natural Resources	Engineer
Muhammed Baki AKSU	Ministry of Energy and Natural Resources	Assistant Specialist
Yusuf Çağrı VEYİSOĞLU	Ministry of Energy and Natural Resources	Assistant Specialist
Furkan YARDIMCI	The Electricity Generation Corporation	Engineer
Yücel KARTAL	The Electricity Generation Corporation	Head of Department
Zafer SONBAY	The Electricity Generation Corporation	Branch Manager
Ali LOĞOLU	The Electricity Generation Corporation	Branch Manager
Selma ÜLKER	The Electricity Generation Corporation	Assistant Director
İlknur ATAN	The Electricity Generation Corporation	Chief
Mehmet KEMİKLİ	The Electricity Generation Corporation	Assistant Manager
Kürşat DAL	The Electricity Generation Corporation	Engineer
Ozan OLGUNER	The Electricity Generation Corporation	Engineer

[73] Solarist (https://www.solar.ist/turkiyenin-yenilenebilir-enerji-entegrasyon-yatirim-plani-goruse-sunuldu/)
Energy Agency (https://enerjiajansi.com.tr/yenilenebilir-enerji-entegrasyon-programi-icin-taslak-calisma-yayimlandi/)
Green Economy (https://yesilekonomi.com/enerji-bakanligi-27-milyar-dolarlik-kredi-icin-hazirlanan-plani-sektor-gorusune-acti/)

Dilek CİVAK ERDAŞ	Energy Market Regulation Authority	Head of Group
Okan YARDIMCI	Energy Market Regulation Authority	Head of Group
Hakan KAYSI	Energy Market Regulation Authority	Energy Specialist
Mehmet YALILI	Energy Market Regulation Authority	Energy Specialist
Mustafa Çağrı PEKER	Energy Market Regulation Authority	Energy Specialist
Melih YETİŞ	Energy Market Regulation Authority	Energy Specialist
Mehtap ALPER SAĞLAM	Energy Market Regulation Authority	Energy Specialist
Alaaddin Emre EVGALLIOĞLU	Energy Market Regulation Authority	Energy Specialist
Metin SEVER	Energy Market Regulation Authority	Energy Specialist
Nidanur YILDIRIM	Energy Market Regulation Authority	Energy Specialist
Handan KAYALAK	Energy Market Regulation Authority	Assistant Energy Specialist
Dr. Celal ERBAY	Turkish Energy, Nuclear and Mineral Research Agency	Energy and Technology Policy Coordinator
İrem IŞIK ÇETİN	Turkish Energy, Nuclear and Mineral Research Agency	Specialist
Damla KESTEL ERDOĞAN	Ministry of Trade	Trade Specialist
Didem ARTUNÇ ÜNALTEKİN	Ministry of Trade	Trade Specialist
Erhan ÇALIŞKAN	Development Investment Bank of Türkiye	Director
Pınar Bahar YÜCEL	Development Investment Bank of Türkiye	Senior Specialist
Hande Merçan AYGEN	Ministry of Industry and Technology	Acting General Director
Mehmet Ali YILMAZ	Ministry of Industry and Technology	Acting Head of Department
E. Meriç MERİÇLİ TAŞAN	Ministry of Industry and Technology	Specialist
Gökçe Kangal	Ministry of Industry and Technology	Assistant Specialist
Ayşe Sena Akdeniz	Ministry of Industry and Technology	Assistant EU Expert
Elif Gökçe Öz	Directorate of Climate Change	Head of Department
Emre Acar	Directorate of Climate Change	Economist
Dr. Bengu Ozge Akyurek	Directorate of Climate Change	Specialist
Ece Coşkuntürk	Industrial Development Bank of Türkiye	Director
Bahadır Koçaker	Industrial Development Bank of Türkiye	Group Executive
Tulu Ertem	Industrial Development Bank of Türkiye	Director
Orçun Yıldızca	Industrial Development Bank of Türkiye	Manager
Faruk CİRİT	Presidency of Strategy and Budget	Assistant General Manager
Feyza ELDENİZ	Presidency of Strategy and Budget	Head of Department
Hatice Hilal ŞEN	Presidency of Strategy and Budget	Head of Department
Emre ÇALIŞKAN	Presidency of Strategy and Budget	Strategy and Budget Expert
Tülay MORSÜNBÜL PARMAKSIZ	Presidency of Strategy and Budget	Strategy and Budget Expert
Berna TUNCER	Presidency of Strategy and Budget	Assistant Strategy and Budget Expert
Mustafa İMAMOĞLU	Ministry of Transport and Infrastructure	Head of Department

Hayrettin BEYHAN	Ministry of Transport and Infrastructure	Branch Manager
Ufuk KOCA	Ministry of Transport and Infrastructure	Engineer
Sinan OĞUZ	Ministry of Transport and Infrastructure	Head of Department
Dr. Banu YAĞCI	Ministry of Transport and Infrastructure	Statistician
Merve ŞİMŞEK	Ministry of Transport and Infrastructure	Engineer
Eylem CEYLAN	Ministry of Transport and Infrastructure	Transportation and Communication Specialist
Alperen AKAR	Ministry of Transport and Infrastructure	Engineer
AHMET BERKAN KORKMAZ	Director General of Civil Aviation	Coordinator
EMRE ZAİMOĞLU	Director General of Civil Aviation	Aviation Specialist
Adnan KÜCE	Ministry of Transport and Infrastructure	Environmental Engineer
Osman PEMPECİ	Ministry of Transport and Infrastructure	Environmental Engineer
Büşra Günaydın	Ministry of Transport and Infrastructure	Engineer
Açelya Yenilmez	Ministry of Transport and Infrastructure	Stakeholder Engagement Specialist
Defne Arısoy	Ministry of Transport and Infrastructure	Environmental Specialist
Özlem MULUN AKPINAR	Ministry of Transport and Infrastructure	EU Expert
Mustafa İnsel	The Port Operators Association	Prof.Dr.
Tuba YENİLMEZ	General Directorate of Highways	Environmental Management Chief
Hatun ÖKSÜZTEPE	General Directorate of Highways	Environmental Engineer
Elçin Soyhan KURTULMUŞOĞLU	General Directorate of State Airports Authority	Specialist
Songül KOCADAYI ESEN	General Directorate of State Airports Authority	Economist
Gülhan KARAKULAK	General Directorate of State Airports Authority	Electrical Engineer
Aykut KARAKOCA	General Directorate of State Airports Authority	Electrical Engineer
Emine Zeynep BİLGİLİ	General Directorate of Turkish State Railways	Certified Engineer
Coşkun BİLGİN	General Directorate of Turkish State Railways	Environmental Engineer

Table F.2. Participants of the Joint Missions (1,2, and 3) dated January 17-19, April 3, and May 21, 2024

Name	Surname	Institution Name	Position/Title
Stephan	Garnier	WB	Deputy Country Director, Lead Energy Specialist
Yesim	Akcollu	WB	Team Leader for Türkiye CIF/CTF Program, Senior Energy Specialist
Alan David	Lee	WB	Senior Energy Specialist
Frank	Van der Vleuten	WB	Advisor
Megan	Meyer	WB	Senior Energy Specialist
Eyup	Mermer	WB	Program Assistant
Sedef	Kaynarkan	WB	Program Assistant
Andrey	Shlyakhtenko	IFC	Senior Operations Officer, Blended Finance
Tendai	Madenyika	IFC	Operations Officer, Blended Finance
Sudipta	Husain	IFC	Senior Investment Officer
Elif Karakas	Oglak	IFC	Investment Officer
Fatih	Avci	IFC	Operations Analyst
Sule	Kilic	EBRD	Associate Director, Deputy Head Türkiye
Andrea	Iro	EBRD	Associate Manager, Donor Partnerships
Gianpiero	Nacci	EBRD	Director, Climate Strategy and Delivery
Cristian	Carraretto	EBRD	Associate Director, Climate Strategy and Delivery
Muharrem	Askin	EBRD	Principal, Climate Strategy and Delivery
David	Managadze	EBRD	Associate Director, Sustainable Infrastructure Group
Sumeet	Manchans	EBRD	Associate Director, Climate Strategy and Delivery
Tatevik	Dadivanyan	EBRD	Climate Finance Specialist, Climate Strategy and Delivery
Mehmet Erdem	Yasar	EBRD	Associate Director
Jimmy	Pannett	CIF Secretariat	Energy Specialist
Daniel	Morris	CIF Secretariat	Senior Climate Change Specialist
Maria Ann	Dumpert	CIF Secretariat	ET Consultant
Dr. Nurşen	Numanoglu	TUSIAD	Deputy Secretary General, Industrial Transformation, Sectorial Policies
Hazal	İnce	TUSIAD	
Elif	Taşyürek	TUSIAD	

Name	Surname	Institution Name	Position/Title
Hale	Onursal Hatipoğlu	TUSIAD	Deputy Secretary General - External Relations
Mehmet	Acarla	TUSIAD	Head of Energy Working Group, Borusan
Vahit	Yazici	TUSIAD	Manager, Government Relations & Sustainability Incentives, Brisa Bridgestone Sabancı
Bahar	Arslan	TUSIAD	Development Engineer, Brisa Bridgestone Sabancı
Volkan	Yigit	TUSIAD	Managing Partner, Aplus Enerji Yatırım Danışmanlık
Burak	Yitgin	TUSIAD	Business Development Manager, Aplus Energy
Murat	Gordeslioglu	BORUSAN	CFO
Tuba	Yalim	MOTF	Head of Department
Ozge	Bilgin	MOTF	Assistant Treasury and Finance Expert
Arda	Uludag	MOTF	Treasury and Finance Expert
Aygün	Demirors	MOTF	Treasury and Finance Expert
Elif Gozde	Doyuran	MOTF	
Obahan	Obaoğlu	KOC HOLDING	Official Relations Manager
Arda	Ozlu	KOC HOLDING	CFO
Yagiz	Caglar	KOC HOLDING	Finance Director
Ayhan	Ozan	KOC HOLDING	Finance Manager
Volkan	Akturk	KOC HOLDING	Business Development Director
Betul	Kok	KOC HOLDING	Business Development Manager
Ozkan	Basar	KOC HOLDING	Business Development Supervisor
Yener	Buyukgursan	KOC HOLDING	Senior Business Development Specialist
Ufuk	Bor	EUD	CFO
Taskin	Kizilok	EUD	Representing EÜD Board - IC Enterra General Manager
Mustafa Murat	Orhan	EUD	EÜD Secretary General
Gamze	Soylu	EUD	Expert
Fuat	Yildiz	EUD	Executive Assistant
Yael	Taranto	SHURA	Analyst

Name	Surname	Institution Name	Position/Title
Engin	Bostanci	MENR	Department of Foreign Investment Coordination, Head of Department
Merve	Senol	MENR	Department of Foreign Investment Coordination
Gozde	Ertemir	MENR	Department of Foreign Investment Coordination
Nevin	Erturk	TEİAŞ	Head of PIU
Serhat	Metin	TEİAŞ	Head of Planning and Investment Management
Murat	Akgunduz	TEİAŞ	Manager of Expense Accruals
Yesim	Erdemir	GURIS	Project Deputy Finance Manager
Zeyep	Bodrumlu Cetin	GURIS	Project Finance Supervisor
Derya	Sozen Onder	GURIS	Project Finance Supervisor
Yücel	Kartal	EUAS	Head of Department
Etem	Camci	EUAS	Head of Department
Esma	Dilek	UAB	Deputy Director General
Murat Mustafa	Harman	UAB	
Ozgur	Talih	UAB	

Appendix G: Existing Activities in the Field of Renewable Energy, Particularly Those of Other Development Partners

A) Summary of the World Bank's Engagement in the Türkiye Energy Sector

In June 2022, the World Bank published the Country Climate and Development Report (CCDR) on Türkiye. It provided a practical pathway for a net-zero transition delivering significant economic, social, and environmental benefits. The World Bank's current and planned engagement in Türkiye is fully aligned with the CCDR recommendations.

The World Bank's energy portfolio in Türkiye currently includes six operations totaling over US$3 billion. An additional US$3 billion of operations are planned. The World Bank's energy sector portfolio consists of four projects that contribute to enabling renewable energy capacity (Renewable Energy Integration, Geothermal Development, Public and Municipal RE and Accelerating the Market Transition for Distributed Energy); four in energy efficiency (Energy Efficiency in Public Buildings - 1 and 2, Seismic Resilience and Energy Efficiency in Public Buildings, Organized Industrial Zones); and one in the gas sector (Gas Storage Expansion Project – GSEP). In 2023, these projects facilitated the generation of 956 MW of renewable energy, expected to contribute to 2,273 MW by 2028. Additionally, three technical assistance projects were recently approved, two under European Union (EU) IPA II - Phases 3 and 4, and one to support PMI. The World Bank's decarbonization program is set to grow with a new pipeline of projects, including Transforming Power Transmission System for REI Projects– Phases 1 and 2 (IBRD US$1.5 billion in total, FY26 and FY28 -tentative-).

Investment Operations:

- **REIP (IBRD US$625 million and CTF US$50 million).** REIP aims to assist Türkiye in meeting increased power demand by strengthening the transmission system and facilitating large-scale renewable energy generation.
- **Energy Efficiency in Public Building Projects 1 and 2 (IBRD US$450 million and CTF US$50 million).** In 2019 and 2024, the World Bank approved two energy efficiency projects with the Ministry of Environment, Urbanization, and Climate Change and the Ministry of Energy and Natural Resources in an amount of a US$500 million (IBRD US$450 million, CTF US$50 million) to support energy efficiency renovations of public buildings.
- **Gas Storage Expansion Project (GSEP) (IBRD US$600 million).** GSEP aims at increasing the reliability and security of Türkiye 's gas supply by expanding underground gas storage capacity in the country.
- **Geothermal Development Project (IBRD US$550 million, CTF US$39.8 million, and ESMAP US$0.35 million).** The project development objective is to scale-up private sector investment in geothermal energy development in Türkiye.
- **Public and Municipal Renewable Energy Project (IBRD EUR500 million)** aims to scale-up renewable energy (RE) generation for self-consumption in central government buildings.
- **Accelerating the Market Transition for Distributed Energy Program (IBRD EUR600 million, CTF US$30 million, and ESMAP US$3 million).** Approved in March 2023, this Program-for-Results (PforR) aims to expand Türkiye's distributed solar photovoltaic market and pilot distributed battery electricity storage to increase renewable energy. The PforR is the first operation in a broader Europe and Central Asia Renewable Energy Scale-Up (ECARES) multiphase programmatic approach (MPA) with the objective to increase renewable energy capacity in participating countries of the ECA region. CTF US$30 million from the Global Energy Storage Partnership (GESP) supports distributed battery energy storage systems to enable renewable energy.

Technical Assistance Interventions

- **Energy Sector Support under EU-IPA Phase IV for offshore wind** (EU IPA Grant of EUR7.98 million, executed by MENR)
- **Energy Sector Support under EU-IPA Phase III** (EU IPA Grant of EUR3.65 million, executed by MENR)
- **Partnership for Market Implementation Facility - Carbon Market Development Project** (PMI Facility Grant of US$4.95 million, executed by MEUCC)
- **Energy Transition Program of Advisory Services and Analytics** (Energy Sector Management Assistance Program Trust Fund grants executed by the World Bank)

Pipeline Development in Türkiye

The pipeline and potential energy sector pipeline operations that will be financed by the World Bank include:

Pipeline

- **Second Energy Efficiency in Public Buildings (EEPB-2) - (IBRD EUR300 million).** This project is a follow-up to the ongoing Türkiye Energy Efficiency in Public Buildings Project. The proposed development objective is to cost-effectively reduce energy use in central government buildings. Two proposed components are: (i) energy efficiency investments in central government buildings; and (ii) technical assistance and implementation support.
- **Transforming Power Transmission System for REI - Phase 2** (IBRD US$750 million, FY26)

Potential Pipeline for FY26 and Beyond

- **The Hydropower Energy Efficiency (Rehabilitation) Project** - (IBRD US$200-250 million)
- **Transforming Power Transmission System for REI - Phase 2** (IBRD US$750 million)
- **Development of the First Hydropower Pumped Storage in Türkiye** (discussions are ongoing with MENR and TEİAŞ) - (IBRD US$500-750 million)

B) Summary of IFC's Engagement in the Türkiye Energy Sector

In Türkiye, IFC has leveraged more than US$3 billion to support private sector efforts designed to increase energy generation, improve energy efficiency, and mitigate the impacts of climate change. IFC investments include 10 power generation projects with an installed capacity of 4,300 megawatts (MW), as well as power distribution projects that have reached improving services for 3.9 million customers. Building on World Bank reforms in the country, IFC has been a long-term investor, supporting the comprehensive reform of the sector. These efforts have successfully spurred innovation and created new markets, resulting in greater access to reliable electricity, accelerated economic growth, and an increase in labor force participation. IFC continues to finance power generation to meet Türkiye's growing medium to long-term needs. Strengthening the distribution network is also a key priority for increasing renewable energy integration and resilience. In April 2024, the World Bank Country Partnership Framework FY24-FY28 was approved. IFC, together with IBRD and MIGA, will continue to support projects aimed at increasing renewable energy production, as well as modernizing transmission and distribution networks. IFC remains keen to support the adoption of new clean technologies such as battery storage energy systems (both stand-alone and consolidated into renewable generation facilities), which will scale-up the renewable generation and diversify the country's generation mix as well as enhance the resilience of power system.

C) Summary of EBRD's Engagement in the Türkiye Energy Sector

In the past 10 years, EBRD has invested EUR2 billion across 30 projects in Türkiye's energy sector (including renewables, energy efficiency, and power distribution). To date, EBRD has invested EUR9 billion in supporting renewables, including large solar and wind projects. EBRD has also invested in one of the largest geothermal power plants in the world, which alone increased Türkiye's geothermal capacity by 30 per cent. Those investments also helped to promote the green and digital skills development of the prospective workforce (i.e. design, maintenance, remote management of WPPs) via nationally accredited certifications granted by local education institutions. They also supported workforce diversity of the companies through the development and implementation of equal opportunity action plans.

EBRD is also closely cooperating with national authorities to create an enabling environment for economy-wide decarbonization. For example, EBRD has assisted the local government in Türkiye in developing the Renewable Energy Action Plan (in line with the EU's Renewable Energy Directive) and in designing post-2020 renewable energy support schemes based on competitive tendering and the National Energy Efficiency Action Plan (NEEAP).

To help Türkiye achieve its net-zero target by 2053, EBRD has supported the country to develop low-carbon pathways (LCPs) for four hard-to-abate industrial sectors, including steel, cement, aluminum and fertilizers. The LCPs show that investments of more than US$70 billion are needed to reduce emissions from the sectors by 135 million tCO2 annually. Türkiye launched a National Industrial Decarbonization Platform at the 2023 COP28 in Dubai to drive decarbonization efforts and investments across sectors. Massive deployment of renewables, with adequate grid and storage investments, will be required to achieve this ambition.

EBRD is also exploring small battery storage project that is at early stage. EBRD expects to receive increased interest for financing requests in this area starting from 2025.

Appendix H: Component 1 Brief: Transforming the Power System for REI

1.Problem Statement

To achieve carbon neutrality by 2053, Türkiye requires major changes to its energy system. Türkiye's ratification of the Paris Agreement in October 2021 and its pledge to achieve net zero emissions by 2053 demonstrate the country's commitment to tackle climate change. As indicated in the World Bank's Türkiye Country Climate and Development Report (CCDR, 2022), Türkiye can also improve energy security through an accelerated pace of least-cost investments in domestic solar and wind, building on its track record of tripling renewable energy capacity in the last decade and investing in energy efficiency, battery, and pumped storage, geothermal, and gas generation with carbon capture and storage.

The country's high dependency on energy imports means it faces risks to the security of supply as well as high energy costs. Türkiye's energy imports (99 percent of gas and 93 percent of oil accounted for almost 20 percent of Türkiye's total imports in 2021 and contributed to a massive current account deficit (nearly US$51 billion in 2021).

Scaling up RE is critical to both strengthen Türkiye's energy security and achieve its 2053 net zero emission target. Türkiye is endowed with considerable RE resources, including solar, wind, and geothermal. Utilizing these RE resources and achieving energy security has long been at the core of government strategies. According to the 2022 NEP, by 2035, the installed capacity of solar and wind is targeted as 52.9 GW and 29.6 GW (24.6 GW onshore, 5 GW offshore), respectively, thus the construction of an additional 41.5 GW of solar, 12.8 GW onshore wind and 5 GW offshore wind facilities is planned to by 2035. The government's ambitious RE scale-up program necessitates strengthening and further digitizing the power transmission system and facilitating large-scale renewable energy integration.

2.Implementation Readiness

Implementing this project requires the commitment of the government and its implementing agency, TEİAŞ, which has already been endorsed by the official request letter sent by the MoTF to the World Bank in January 2024 for the financing of this project by the World Bank and CIF co-financing.

The proposed project activities will be implemented by TEİAŞ in its role as the electricity transmission system owner and operator. TEİAŞ is very familiar with the high quality MDB standards, specifically the World Bank's policies and guidelines, including the procurement, financial management and safeguards aspects. In the last decade, it has satisfactorily implemented four other World Bank and/or CTF-REI funded projects, including Renewable Energy Integration Project (REIP), ECSEE APL2, ECSEE APL3, ECSEE APL6, the TEK Restructuring and the National Transmission Grid projects.

The eligibility of any new or revised investments under the project shall be appraised and selected in accordance with standards, criteria, and procedures acceptable to the World Bank, which shall include determining that the proposed investments: (i) are technically feasible; (ii) are economically and financially viable; (iii) are demand- and needs- driven; (iv) are environmentally sustainable; and (v) are or can be designed and implemented in compliance with the World Bank's fiduciary requirements and environmental and social standards, including, as appropriate, application of the environmental review and land acquisition procedures.

3.Rationale for CTF Financing

The subprojects to be financed by this component shall fall within either of following categories:

- Development of transmission infrastructure to facilitate scale-up of RE by integrating the RE to the transmission grid in a timely and efficient manner.
- Strengthening of transmission networks and interconnections to cater to growing demand and supply of electricity in Türkiye.
- Digital and smart-grid investments to strengthen grid operation and management.
- Technical assistance and capacity-building activities to help TEİAŞ improve its REI capacity, including but not limited to technical assistance for the introduction of HVDC capacity building and training for SCADA/EMS, and system management for VRE integration.

All of these shall contribute to current or future integration of scaled up RE investments and technologies with significant potential for long-term greenhouse gas emissions savings. The preparation work has already been initiated by the World Bank as of February 2024, by identifying a preliminary list of over 40 investments to be financed under the project. These potential investments are comprised of transmission infrastructure to integrate to the grid mainly solar and wind power plants and strengthen transmission networks and interconnections; and digital and smart-grid investments such as SCADA-EMS upgrade. The technical, fiduciary, and environmental and social due diligence are on-going.

4.Results Indicators

The indicative result indicators to be monitored throughout the execution of this project within CTF-REI Investment Plan for Türkiye are as follows:

1. Reduction in CO2 emissions (Mt CO_2 eq)[74]
2. Variable renewable energy installed capacity (MW)
3. Renewable energy production (GWh/year)
4. Co-financing (US$)
5. RE capacity connected to sub-stations funded under the project (GW)
6. RE generated from plants connected to sub-stations funded under the project (GWh)
7. Percentage of grievances recorded by the project and resolved within one-month period (%)
8. Transmission lines constructed or rehabilitated under the project (km)

Financing plan, including financial instruments

Financing from CTF-REI program is proposed to co-finance the Transforming Power Transmission System Project, financed by the World Bank in an amount of US$750 million, as per the MoTF's official request from the World Bank.

[74] In line with the REI Core Indicator 1, i.e. reduction in CO2 emissions. The project will provide grid connection to new WPPs and solar power plants, and these wind and solar power plants will not be developed without the necessary investment in transmission infrastructure under the project, in which case gas-fired generating plants would likely be built to meet the increasing local demand for electricity. The project will therefore contribute to the reduction in carbon emissions from gas-based electricity generation.

The proposal is for CTF-REI program to co-finance US$40 million of the project to lower financing costs of this project, lengthen the loan periods, and diversify its funding sources. In addition, the government is seeking US$3 million CTF grant financing to finance TA activities under the subcomponent 4 of the project. In case this cannot be realized, the same amount of concessional CTF-REI financing is requested.

Project preparation timetable for Phase 1:

The major milestones and their respective timeline with regard to the project, as agreed with the Government are as follows:

- Concept review : September/October 2024
- Project appraisal : December 2024
- Negotiations : March 2025
- World Bank Board of Executive Directors' approval : May 2025
- Effectiveness and start of implementation : September 2025

Appendix I: Component 2 Brief: Power System Flexibility, Balancing, and Stability, and Strengthening Power Infrastructure

Subcomponents:

A. Battery storage (EBRD and IFC)
B. E-mobility (electric vehicle (EV) charging stations) (EBRD and IFC)
C. Digitalization of the power distribution grid (EBRD)

1.Battery Storage (EBRD and IFC)

Problem statement

Türkiye faces critical challenges in its energy sector, marked by a growing demand for electricity, increasing penetration of renewable energy sources, and a need for grid stability. These challenges highlight the urgent requirement for significant investments in battery storage infrastructure and technologies throughout the country. Despite having more than 50 percent of installed power generation from renewable sources, actual generation in the country is heavily dependent on fossil fuel. Government of Türkiye's RE scale-up plan can only address decarbonization concerns if battery storage is also adopted and implemented successfully in tandem.

By embracing battery storage investments as a cornerstone of its energy transition strategy, Türkiye can unlock a range of benefits, including enhanced grid stability, reduced carbon emissions, improved energy security, and economic growth. However, achieving these objectives will require collaboration amongst government, industry stakeholders, and the broader energy community to overcome regulatory barriers, mobilize investment, and accelerate the adoption of battery storage solutions across the country.

Proposed contribution to initiating transformation

The Turkish battery storage market is set for substantial growth, driven by the effects of recent storage pre-license applications and the National Energy Action plan targets. More than 25 GW of battery storage licenses have been awarded, translating into more than US$ 20 billion required investments in the medium term. However, it is worth noting that despite the regulatory progress, private sector players are still in the early stages of understanding costs associated with building battery storage systems and navigating their revenue structures. Consequently, clients in EBRD and IFC's pipelines are primarily interested in developing trial battery storage projects with smaller capacity to assess system functionality before committing to larger future investments. Enabling such early mover transformational battery storage projects will require concessional financing due to the nascent stage of the storage industry.

Implementation readiness

Private sector activities closely follow developments in the market, which are driven by the regulatory and policy regime set by the government. It is expected that the investment projects will start gaining traction in 2025. EBRD has completed a concept review for a potential battery storage project with an approximate investment volume of US$5 million and is in discussions with the client regarding project details. EBRD also expects to receive increased interest for financing requests for battery storage starting from 2025. IFC is considering several potential projects with energy storage and expects a requirement of US$15-20 million concessional financing to be applied in early 2025.

Rationale for REI financing

Financing battery storage projects is crucial for enhancing grid flexibility and integrating higher shares of variable renewable energy. These projects address technical and operational barriers, stabilize the grid, and support off-grid access to clean energy. By providing ancillary services and improving market design, battery storage accelerates the transition to a low-carbon energy system in line with the Paris Agreement's goals.

Results indicators

The final list of indicators will be available during the project preparation stage. Anticipated outcomes of the project include the following:

1. Greenhouse gas (GHG) emissions reduction/avoidance (metric tons/year)
2. Installed capacity of variable renewable energy available to the grid (MW)
3. Annual renewable energy output (MWh)
4. Increase in available grid services and improvements (see examples below)
    a. new front-of-the-meter (utility-scale) battery storage systems installed
    b. number of new behind-the-meter (residential or commercial and industrial) battery storage systems installed
5. Financing mobilized, including from MDBs and other parties

E-Mobility (EV Charging Stations) (EBRD and IFC)

Problem statement

As a rapidly developing nation with a burgeoning population and growing urbanization, Türkiye faces escalating environmental and economic costs of conventional transportation systems. The reliance on fossil fuel-powered vehicles in Türkiye's transportation sector has led to severe environmental impacts, including poor air quality and heightened greenhouse gas emissions. Additionally, dependence on imported fossil fuels and unsustainable energy consumption increases the country’s vulnerability to global energy price fluctuations, which adversely affects energy security and economic growth. To combat these issues and foster a more sustainable future, there is an urgent need for substantial investments in e-mobility infrastructure and technologies. Decarbonization of the transportation system is not only a key pillar of the country's net zero carbon path by 2053 but is also a way to stimulate economic growth. Decarbonization initiatives such as electric vehicles and related transportation infrastructure can stimulate new industries and create jobs and business opportunities in the clean energy sector.

By taking decisive action to transition towards e-mobility, Türkiye can mitigate environmental degradation, reduce fossil energy dependency, alleviate urban congestion, improve air quality, reduce noise pollution, and seize the economic opportunities presented by technological innovation in the clean energy sector. However, achieving these goals will require concerted efforts from government, industry stakeholders, and civil society to overcome barriers and accelerate the adoption of sustainable transportation solutions across the nation.

Proposed contribution to initiating transformation

With the increasing adoption of EVs, there is a growing need for infrastructure to support EV adoption in Türkiye. As of November 2023, the number of EVs amounted to 80,043, representing 0.53 percent of the total vehicle fleet. EV traffic increased 5.5-fold in 2023, demonstrating the need for accelerated investments in the EV infrastructure. According to the statement made by the MENR, the number of EV charging sockets, which was 3,378 in 2023, is expected to increase to 37,946 in 2053 to support the EV scale-up. Charging infrastructure must grow in tandem with vehicle sales to ensure an efficient and extensive transition to EVs.

The proposed project will focus on identifying opportunities for private sector participation and financing for options promoting the adoption of e-mobility solutions. This project will primarily focus on expanding EV charging infrastructure.

Implementation readiness

The 2019 National Energy and Mining Policy announced by the Ministry of Energy and Natural Resources set a target for electric and hybrid vehicles to constitute 30 percent of all vehicles in Türkiye by 2030. Türkiye's 2023 updated NDC listed the main mitigation policies in the transport sector until 2030. Among other policies, these include i) increasing the use of electricity instead of fossil fuels on highways and ii) promoting electric vehicles by establishing a national fast charging station network. Under the Green Transformation section, the Medium-Term Development Plan (2024-2026) also refers to the policy to enhance the charging station network to promote electric vehicles and encourage the use of domestic electric vehicles. The Ministry of Industry and Technology and Energy Market Regulatory Authority (EMRA) are leading the efforts to establish the legislation for electric vehicles charging infrastructure. A set of regulations was unveiled in February 2022. The Ministry also prepared a support program and tendered out the installation of 1,572 units of fast-charging stations across the country in April 2023. According to EMRA, there were over 6,058 charging stations installed by January 2024. EMRA has provided licenses to 152 companies for the installation of electric charging stations.

Ambitious government targets, coupled with regulations and incentives, are helping to drive the e-mobility market and EV adoption in the country. Several private sector companies are currently considering investments to expand EV charging infrastructure. EBRD and IFC engagements can support this developing pipeline in Türkiye by financing projects that accelerate the deployment of e-mobility technologies, thereby decarbonizing the transport system.

EBRD and IFC have already engaged with a number of existing and new clients to explore new business opportunities in the e-mobility sector. Most of these companies are experienced energy generation/distribution companies and are now trying to expand into EV business. The potential projects focus mostly on EV charging station investments, with the financing product of choice (i.e., debt, equity, etc.) dependent on the financial strength of the potential counterparties.

To date, EBRD has provided US$25 million financing for EV charging infrastructure development and intends to increase its exposure in the sector to the extent possible and feasible. Notably, prominent energy players are actively investing in EV infrastructure, and EBRD is well-informed about the pipeline clients in this sector. Currently, EBRD is in discussions with a number of companies to provide up to US$30-40 million in financing to support the expansion of EV charging infrastructure. The investments are expected to start in 2025 in line with the EV adoption progress in the country. IFC has a pipeline of private sector players looking to expand their EV charging infrastructure and is in early discussions with a selected number of EV charging infrastructure companies for financing investments of US$20-30 million, expected to be implemented in 2025-26.

Rationale for REI financing

The suggested interventions in the sector of e-mobility are in line with REI's overall objective of enhancing RE enabling technologies including for transportation and overall decarbonization. CTF REI concessional finance support is needed to address market barriers through a programmatic approach, tackling barriers outlined in Section II Country Context. Additionally, the CTF-REI financing will help overcome first-mover costs, build confidence among local stakeholders and communities, and accelerate the participation of private sector players and commercial lenders along the process.

Results indicators

The final list of indicators will be available during the project preparation stage. Anticipated outcomes of the project include the following:

1. Greenhouse gas (GHG) emissions reduction/avoidance (metric tons/year)
2. Installed capacity of variable renewable energy available to the grid (MW)
3. Increase in new smart-charging EV stations installed (number)
4. Financing mobilized, including from MDBs and other parties

3. Digitalization of the Power Distribution Grid (EBRD)

Problem statement

Türkiye's energy sector is grappling with a myriad of challenges, including rising energy demand, aging infrastructure, inefficiencies in distribution systems, and the need for greater integration of renewable energy sources. Substantial investments in digitalization and smart grid technologies for distribution networks across the country are needed to address these challenges and build a more resilient, efficient, and sustainable energy system.

By embracing digitalization and smart grid technologies for distribution networks, Türkiye can enhance energy reliability, improve operational efficiency, integrate renewable energy sources, and build a more resilient and sustainable energy infrastructure for the future. However, achieving these objectives will require a concerted and coordinated effort to drive innovation, mobilize investment, and facilitate the transition to a smarter, more adaptive electricity grid across the country.

Proposed contribution to initiating transformation

Electricity distribution companies have been investing in digitalization and smart grid for electricity distribution systems over the last decade. As the regulator body does not approve some new technologies under the regulated asset base, companies require financial support to expedite digitalization, implement smart grid systems for the electricity distribution system, and upskill their workers with necessary digital skills. EBRD's pipeline clients' potential investments include operational technology systems, such as wider smart metering coverage, SCADA upgrade at field level and grid control center, and geographic information system integration, and other activities to reduce distribution losses, increase operational efficiency, as well as to reinforce grid flexibility for RE integration. These could be paired with gender-responsive capacity building and training support to ensure that the new technologies are adopted by the local workforce.

Implementation readiness

EBRD is currently in talks with several companies for financing of up to US$10-15 million dedicated to investments in digitalization and smart grid for distribution. The investments are expected to start in early 2025.

Rationale for REI financing

Investing in the digitalization of power distribution grids supports the integration of renewable energy sources by optimizing grid operations, facilitating demand response, and improving grid resilience. Digital technologies enable the seamless integration of distributed energy resources, enhance data-driven decision-making, and support regulatory reforms. Such investments are crucial for overcoming barriers to renewable energy integration and accelerating the transition to a low-carbon energy future in line with the goals of the Paris Agreement.

Results indicators

The final list of indicators will be available during the project preparation stage. Anticipated outcomes of the project include the following:

1. Greenhouse gas (GHG) emissions reduction/avoidance (metric tons/year)
2. Installed capacity of variable renewable energy available to the grid (MW)
3. Increase in new smart-charging EV stations installed (#)
4. Financing mobilized, including from MDBs and other parties

Financing plan, including financial instruments

The contemplated financing structures will depend on the individual projects and the risks associated with the potential counterparties. EBRD and IFC are currently exploring transactions that require debt and equity and may need to offer other financial instruments as new opportunities emerge. The final selection of the specific financing structure and terms will be done at the subproject level and take macroeconomic conditions and sectoral dynamics into account.

Table H.1: Indicative Financing Source

Subcomponent	Indicative Financing Source (US$ million)					
	REI	EBRD	IFC	Private Sector	Other	Total
Battery storage	30	150	150	TBD	TBD	330
E-mobility						
Digitalization						

Project preparation timetable

The detailed timeline for the three subcomponents will be developed once the CTF Committee endorses the proposed IP program. It is expected that implementation of the battery storage, e-mobility, and digitalization

projects could start early after approval or in 2025, depending on the licensing and permitting processes, among other factors. EBRD and IFC have already begun engaging with potential clients and expect to be submit projects for CTF Committee approval within timelines consistent with the CIF Pipeline Management and Cancellation Policy.
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Appendix J: CIF Integrated Results Framework Toolkit- Renewable Energy Integration Program

CIF INTEGRATED RESULTS FRAMEWORK – RENEWABLE ENERGY INTEGRATION PROGRAM

CIF IMPACT
Accelerated transformational change toward net-zero emissions and inclusive, climate-resilient development pathways

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES AND SDG ALIGNMENT	KEY AREAS
CIF-LEVEL IMPACTS						
Accelerated transformational change toward net-zero emissions and inclusive, climate-resilient development pathways	**CIF 1. Mitigation:** GHG emissions reduced or avoided (mt CO_2 eq)	See Core Indicator REI 1 below.	Annual and lifetime reporting by projects and/or countries	See Core Indicator REI 1 below.	This is a CIF impact-level indicator that must be reported as an annual and lifetime estimate of each investment. Core indicator 1 below will feed this indicator for REI. Disaggregation: Direct vs. indirect reduction of GHG emissions, based on an approved methodology per MDB.	**This impact area will be measured through CIF-driven evaluation and learning activities, which will not be the direct responsibility of MDBs for annual reporting.** This includes Transformational Change (see Section 7)[75] **New and additional climate finance mobilized:** Beyond the immediate cofinancing CIF leverages, CIF aims to plays a role as a market catalyst by contributing to the creation of markets and driving non-concessional financing through replication of CIF investments, technologies and innovations, regulatory improvements, and other areas. Evaluation and/or learning approaches may be employed to better understand CIF's contributing role in market systems transformation and volumes of follow-on green financing in CIF-supported markets. Data might also be sourced through national/local market reports and other third-party data aggregators (e.g., IRENA, BNEF, etc.).
	CIF 2. Cofinance: Volume of cofinance leveraged (US$)	0 (2024)	TBD	2030	Total non-CIF resources leveraged in REI projects. Core indicator 6 below will feed this indicator for REI.	

[75] Projects are encouraged to estimate GHG emissions reductions using a "whole of energy system" baseline analysis, which would differentiate between new renewable energy generation from REI investments and the catalytic effects of other investments (energy storage, grid management technologies, grid interconnections) on annual production cycles, as compared to the approved reference scenario, i.e., counterfactual.

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES AND SDG ALIGNMENT	KEY AREAS
					Disaggregation: Source of cofinancing (MDB, Government, Private Sector, Bilateral, and Other).	

REI PROGRAM THEORY OF CHANGE:
If CIF improves market design and system operations, provides enabling technologies and infrastructure, and develops new business models, countries will increase renewable energy penetration in their energy mix, achieve a more flexible and decentralized energy system, improve policies and capabilities, mobilize capital, increase renewable energy access, reduce systems costs, and foster renewable energy innovation, which will all contribute toward CIF's transformative impact.

RESULT STATEMENT	MONITORING APPROACH						EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)		NOTES	KEY AREAS
REI PROGRAM-LEVEL IMPACTS							
				2030	2035		
Flexibility of energy systems for smooth integration of higher shares of variable renewable energy generation	Increase renewables in the total primary energy supply	27.1 Mtoe; 17.2% (2022)	NEP and Energy Balance Sheet	40.6 Mtoe; 20.4%	48.7 Mtoe; 23.7%	Program-level impacts focus on alignment with NDCs and related climate policy mechanisms, national and sectoral development priorities, and available statistics at the Investment Plan and/or country level. This aspect of monitoring and reporting is country-driven and will be tailored to the needs,	**Signals of transformational change:** Signals of transformational change at the program level will focus on more narrowly bounded aspects of energy systems transformation than in the section above (i.e., CIF-level impact). They might cover dimensions of systems transformation that are more closely tied to individual REI recipient countries, Investment Plans and/or project-level impacts. Specific definitions and methodologies are to be determined.
	Increase renewable energy generation	137.2 TWh; 42.2% (2023)	NEP	214.3 TWh; 47.3%	278.3 TWh; 54.8%		

RESULT STATEMENT	MONITORING APPROACH						EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)		NOTES	KEY AREAS
						demands, and interests of each CIF recipient country. **MDBs will <u>not</u> be responsible for program-level impact reporting. All core indicators are situated at the CIF program outcome level.**	
	Increase variable renewable energy generation	18.6 TWh, 5.7% solar; 34.0 TWh, 10.54% wind (2023)	NEP	52.2 TWh, 11.5% solar; 53.7 TWh, 11.9% wind	84 TWh, %16.5 solar; 90.1 TWh, %17.7 wind		
	Increase variable renewable energy installed capacity	13.998,25 MW; 12.8% solar; 11.806,50MW; %10.8 wind (2023)	CCMSAP and NEP	32,900 MW solar; 18,100 MW wind	52,900 MW solar; 29,600 MW wind		
	Increase battery capacity	0 MW (2023)	CCMSAP and NEP	2,100 MW 76	7,500 MW		
	Reduce carbon intensity of electricity	0.437 kg CO2/kWh (2020)	CCMSAP	0.352 kg CO2/kWh (20 per cent reduction from 2024 level)			
REI PROGRAM-LEVEL OUTCOMES							

[76] Türkiye does not currently have a target for aggregate energy rating of battery storage. The 2023 National Energy Plan assumes an average energy capacity of two hours for battery systems associated with the power rating target.

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES	KEY AREAS
A. Increased penetration of variable renewable energy into power systems and maximized renewable energy potential of countries	**REI CORE 1 (= CIF 1, Component 1). Mitigation:** GHG emissions avoided annually through wind and solar power plants connected to substations funded under the project (TonesCO2eq/year) [77] – indirect	0	Annual estimates by projects	1,167,226 (2030)	This indicator feeds into **CIF Impact 1 (Mitigation)** and should be reported as direct vs. indirect reductions (per MDB-approved methodologies) with evidence provided.	**MDBs are encouraged to undertake "whole of energy systems" analyses** as baselines during the Investment Plans and project appraisal process and to fully incorporate monitoring, evaluation, and learning aspects into such analyses. Integrated, energy systems-levels analyses can be used to build a theoretical model and reference scenario for how specific renewable energy grid and off-grid integration interventions will affect multiple results areas: renewable energy installation and grid interconnection, annual production, GHG emissions reductions, and changes in energy access. Both estimated and real operational data can also then be consolidated effectively to report across these multiple indicators. Additional guidance on whole of energy systems analyses will follow separately from this IRF.

[77] This indicator has been calculated by multiplying "the estimated energy generated from wind and solar power plants connected to the substations funded under the project" and "the grid emission factor" announced by MENR.

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES	KEY AREAS
	REI CORE 2. Installed Capacity (Component 1): Wind and solar energy capacity connected to sub-stations funded under the project (Megawatt, MW) – indirect	0; 0	MDB project results/ utilities data	500 MW solar; 300 MW wind (2030)	Estimated capacity from renewables (e.g., solar and wind energy) connected, operationalized, and integrated into power grids as a result of REI interventions. Disaggregation: Renewable energy type (solar, wind, hydro, geothermal, etc.). Indirect capacity (MDB-approved methodology).	**CIF's targeted evaluations and/or sector studies to fill strategic knowledge gaps:** Moving down the results chain, the monitoring function becomes increasingly important to capture program outcomes and outputs, whereas the evaluation and learning function will complement core indicators by filling strategic knowledge gaps. Evaluation and learning activities will be selected based on overall stakeholder demand, evidence gaps, and cross-learning opportunities.
	REI CORE 3. Renewable Energy Production (Component 1): Energy generated from wind and solar power plants connected to the substations funded under the project (MWh)- indirect	0	MDB project results/ utilities data	1,839,600 (2030)	Measured by applying the methodology used for REI CORE 2 in combination with annual production data. Disaggregation: Renewable energy type (solar, wind, hydro, geothermal, etc.).	

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES	KEY AREAS
					Direct vs. indirect production (MDB-approved methodology). Grid-connected vs. off-grid/distributed energy supply.	
	REI CORE 4. Grid Services (Components 1 and 2): Increase in available grid services and improvements (#)	0	MDB project results/ utilities data	**Component 1:** - 3 substations funded under the project, connecting wind/solar power. - Upgraded SCADA/EMS (TEIAS) (2030) **Component 2:** **IFC:** EV charging stations (US$ 25m) Number of smart-charging EV stations installed: 400 EV stations **EBRD:** EV charging stations (US$ 40m) - Number of smart-charging	<u>Disaggregation:</u> Type, volume, and assets (as established by each MDB).	

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES	KEY AREAS
				EV stations: nstalled: 600 EV stations Digitalization of the power grid (US$ 15m) -Number of existing distribution lines and/or networks rehabilitated or modernized: 3 networks (2030)		
B. Mobilized public and private capital	**REI CORE 5 (= CIF 4, Components 1 and 2). Cofinance:** Volume of cofinance leveraged (US$)	0	MDB Data	US$750 m. (the World Bank), US$150 m. (IFC) and US$150 m. (EBRD) (2030)	Total of non-CIF resources leveraged in REI projects. Reporting on this indicator feeds directly into **CIF Impact 4 (Cofinance)**. Disaggregation: Source of cofinancing (MDB, government, private sector, bilateral, and other).	
REI PROGRAM-LEVEL CO-BENEFITS						
	CO-BENEFIT 1. Employment and Livelihoods: Jobs created (Component 1) – direct	No	MDB project results data	Yes (2030)	**MDBs will only need to report on one co-benefit indicator per REI project and can select among a**	**Quality and distribution of jobs:** Through gender-responsive approaches, employment opportunities are being created for women's access to medium- and high-skilled green jobs.

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES	KEY AREAS
	and indirect: "Deployment of at least one female controller from TEIAS in each sub-project site for civil work supervision. (Yes/No) "				**range of options or propose another relevant co-benefit.**	
REI PROGRAM-LEVEL OUTPUTS						
	OPTIONAL (REI Optional Output 9): Number of technical/financial analyses completed to enhance the enabling environment for RE uptake (#)	0	MDB project results/ operations data	2030	This includes sectoral or market modelling, analyses, pricing methodologies, country diagnostics, studies, net billing schemes, poverty and social impact assessments (looking at accessibility, affordability and targeting of subsidies) and related technical assistance deliverables used to inform policy, regulatory change, and/or investment designs.	
	OPTIONAL- (REI Optional Output 10, Component 1) Number of persons trained on issues related to Component 1 (#)	0	MDB project results data	10 staff (30% women) of TEIAS trained (2030)	This indicator will feed into CIF 3 (total number of beneficiaries) where relevant. Disaggregation: By gender.	

RESULT STATEMENT	MONITORING APPROACH					EVALUATION AND LEARNING APPROACH
	INDICATORS	BASELINE	MEANS OF VERIFI-CATION	TARGET (DATE)	NOTES	KEY AREAS
B. Deployment of energy storage systems	**GESP 1. Energy Rating (Component 2):** Energy rating (MWh) of storage systems installed	0	MDB project results data/ technical specifications	**Component 2** – Battery Storage: Energy rating (MWh) of storage systems installed IFC (US$140 m.) : 250 MWh EBRD (US$ 110 m.): 200 MWh (2030)	**This indicator corresponds to GESP-Specific Indicator 1 in the GESP M&R System and should only be reported by REI projects with energy storage components.** Disaggregation: By type of technology (i.e., thermal, mechanical, electrochemical). By location on the energy value chain (generation, transmission, distribution, stationary end use, mobile end use). Distributed storage vs. utility-scale applications.	
	GESP 2. Power Rating (Component 2): Power rating (MW) of storage systems installed	0	MDB project results data/ technical specifications	**Component 2** – Battery Storage: Power rating (MW) of storage systems installed IFC (US$140 m.) : 125 MW EBRD (US$ 110 m.): 100 MW (2030)	**This indicator corresponds to GESP-Specific Indicator 2 in the GESP M&R System and should only be reported by REI projects with energy storage components.** Disaggregation: should follow the format of the above indicator.	

Appendix K: Comments and Responses Matrix

A) Independent Technical Review

1. Title of the investment plan: **Renewable Energy Integration Program for Türkiye**
2. Program under the GCAP: **CTF Renewable Energy Integration Program**
3. Name of the reviewer: **Stratos Tavoulareas**
4. Date of submission: **July 7, 2024**

Overall Assessment: The proposed program supports both the short-term and long-term climate goals of Türkiye by increasing the capacity and resilience of the power grid; hence, increasing the potential integration of more renewables. Furthermore, the program provides support for batteries (energy storage), e-mobility and digitalization of the distribution system, all options supporting the greening of the power network.

Türkiye ratified the Paris Agreement on October 2021 and committed to net-zero emissions by 2053. In its NDC plan (November 2022), the country commits to 41% GHG reductions by 2038. Türkiye has 59 GWs of renewable capacity already installed (55.2% of the total installed capacity of 107 GWs) and aims to expand it further by adding another 60 GWs by 2035.

The IP complies with the general and REI-specific criteria and the proposed activities are consistent with international practices aiming to decarbonize the power sector and the economy, in general. A number of recommendations are made, and questions raised to improve the clarity of the IP, as well as the design and implementation of the program.

	Questions/Comments	**Answers/Comments**
General criteria	The IP complies with the general criteria of CIF and the principles, objectives and criteria of the REI Program. The capacity of the country and the implementing agencies are adequate to implement the proposed programs; the World Bank, European Bank for Reconstruction and Development (EBRD) and International Finance Corp (IFC) are all very active in Türkiye and the key power sector organizations have worked with them to implement projects and programs of similar size and complexity. The proposed components of the program have been developed based on prior experience working in the power sector of the country. Component 1 is based on on-going loan preparation, while Component 2 on discussions between EBRD, IFC and private investors. Successful implementation of the IP is transformative because it is going to enhance further the capacity of the grid to increase the renewable generation and achieve the net zero strategy of the country. On the hardware side, grid-strengthening, smart components, advanced electronics and batteries will improve the capacity of the power grid to accommodate more renewables. On the soft side, policy support, training and technical	As per the World Bank's procurement policies, the procurement process supports the borrowers to achieve value for money with integrity in delivering sustainable development. To achieve this vision, the World Bank seeks assurance from borrowers that acceptable procurement arrangements are applied to the financial resources it provides to borrowers and supports borrower countries in enhancing and implementing sound procurement systems and institutions. While in practice the specific procurement rules and procedures to be followed in the implementation of a project depend on the circumstances of the particular case, the following Bank's Core Procurement Principles generally guide Bank decisions under these Procurement Regulations: value for money, economy, integrity, fit for purpose, efficiency, transparency and fairness. The other MDB's namely EBRD and IFC will also apply similar principle regulations to achieve these goals.

	assistance will strengthen the capacity of the country to achieve its climate goals. The proposed program includes components of high priority; certainly the grid strengthening scope is urgent and will have immediate positive results on the reliability and quality of power supply. This is particularly relevant as Türkiye has a very aggressive goal to add 60 GWs of renewables by 2035. Adequate stakeholder consultation has been done. The IP investments reflect additional funding requirements on top of on-going and planned funding from MDBs. Adequate justification is provided in the IP regarding their additionality. Institutional arrangements and coordination are appropriate, as the implementing agencies are already recipients of loans from the MDBs and have relevant experience. The MDBs are very active in Türkiye and have established working relations with the key Ministries, State-owned Enterprises and the Government in general. Also, EBRD and IFC have been engaged in Türkiye extensively and have close relationships with the investors considered in this program. There is no information on cost-effectiveness of the proposed investment, but the investments are part of the country's power development plan, which should be considered as the "least cost" scenario. MDB procurement requirements ensure that the installed assets will be selected through competitive bidding which should result in the lowest cost.	
Compliance with the investment criteria or business model of the REI	The proposed IP involves the strengthening of the power grid, increasing its operating flexibility, adding energy storage (batteries), and smart grid components, which increase its capacity to absorb more renewables. Türkiye ratifiedthe Paris Agreement (October 2021) and committed to net-zero emissions by 2053. The Nationally Determined Contributions aiming to achieve 41% GHG emission reductions by 2038. The long-term decarbonization strategy and plan are being developed. The specific goals are reflected in official documents, laws and policies, including: • National Energy Plan (NEP) issued in December 2022 • 12th National Development Plan (NDP, 2024-2028)	Gender data and analysis with regard to the energy sector is not widely shared and fragmented. The World Bank team will conduct a gender-responsive social assessment of the energy sector to identify the entry points for more women participation and enhanced outcomes. This is reflected in the IP. The Renewable Energy Integration Project (REIP) that is currently co-financed by the World Bank and the CTF is gender tagged. The Transforming the Power Transmission System Project under the Component 1, that is similar to the REIP, will highly likely be gender-tagged during the project preparation, as well. The other MDBs, IFC and EBRD, will make an effort to gender tag the private sector financed projects under Component 2 of the IP. This is reflected in the IP.

	• National Energy Efficiency Action Plan (NEEAP, 2024) • In the process of designing and implementing an Emission Trading System (ETS); in partnership with the World Bank; polit expected in 2024 • Türkiye's Green Deal Action Plan (July 2021) • Establishment of a Green Deal Working Group to monitor the plan's implementation • Renewable Energy Zones (YEKAs) law • The 2005 Renewable Energy Law (REL) The IP ($70 million requested from CIF-REI) mobilizes $1.5 billion from the World Bank and $300 million from EBRD and IFC, a 15 to 1 leverage. Furthermore, the improved flexibility and resilience of the power grid should enable more investments in renewables (especially from the private sector), which will improve the leverage ratio further. The implementing agencies have well-proven capacity to implement the proposed project. This capacity is demonstrated by the history of prior and on-going projects with the MDBs. Gender aspects have been considered, even though more efforts should be made. The proposed program is the planning stage; the final scope is yet to be developed, but the type of investments is clear. The scope for Component 1 will be developed as part of the World Bank loan preparation, while EBRD and IFC investments still depend on the willingness of private investors to proceed.	The opportunities for designing gender-responsive interventions within each component, specifically targeting female employees during capacity-building and training support provided to clients, will be considered during the design and preparation of the projects. A preliminary organizational assessment of TEİAŞ to identify and address barriers to women's employment and working conditions within the organization and to develop standards that contractors must comply with during project implementation has already been done during the preparation of the REIP. This has resulted in the inclusion of women-specific results indicators to the project such as "deployment of at least one female controller from TEIAS in each sub-project site for civil work supervision" which has been fully met since the beginning of project implementation; and the improvement of the working conditions of the contractors' project sites e.g. separate women toilets. This is reflected in the IP. It is important to note that achieving Türkiye's ambitious renewable energy targets cannot solely depend on public funding. Private sector investment is essential for realizing these significant goals. Increasing the share of renewable energy in the national grid and promoting battery storage projects are key strategies. Battery storage is especially important for integrating a higher portion of renewables into the grid. By end 2023, the applications for battery storage integrated wind and solar power plants totaled 260 GW (for 6,000 facilities), out of which 25,6 GW (493 facilities) were granted pre-licenses which allow these investors to start carrying out necessary legal and regulatory processes. These pre-licenses will have to be converted to actual licenses within 3 years, after which the implementation will start. While this segment is expected to grow significantly in the upcoming period in line with the investor appetite/ interest in pre-license applications, the key considerations (which are covered in the first query above) will guide the pace and the progress towards the materialization of such investments in energy storage and EV-charging stations. IFC is keen to support the adoption of new technologies to decarbonize the energy sector in Türkiye, but this remains subject to the readiness of private investors to move forward with such investments. Similarly, concessional sources offered by EBRD are well-suited to support investments in battery storage and EV charging stations, making this technology more accessible.
Recommendations	While the overall assessment of the IP is positive, a number of recommendations are made to strengthen further the program and increase the likelihood for success:	We appreciate the technical reviewer's support and recommendation on the requested technical assistance ($3 million) to evaluate the pre-feasibility of pumped storage sites and prioritize the rehabilitation/upgrading of existing hydro plants.

	• As mentioned above, the scope of the IP is not fully defined. While this is not uncommon at this stage, more specificity is desirable. • The reviewer supports the requested technical assistance ($3 million) to evaluate the pre-feasibility of pumped storage sites and prioritize the rehabilitation/upgrading of existing hydro plants. Included in this scope, it would be wise to focus also on existing cascades, which could become pumped storage sites with the addition of inexpensive pumping systems and minimal E&S impacts. • Add a comprehensive assessment of the balancing needs of the power system for the planning period (present to 2038 at least; possibly until 2053). This will guide investment decisions, especially with regard to balancing/ancillary services including energy storage, reserves, etc. This assessment could be done as part of Component 1. • On energy storage: While concessional financing could help a number of projects, more sustainable regulatory framework is needed for private investments in such projects. The possible role of the public sector in the interim (short- to medium-term) should be considered, too. • Similarly, it is difficult to envision the EV-charging infrastructure being developed solely from the private sector, even if some concessional financing is available. The public sector would need to play a more prominent role and/or regulatory support needs to be provided for the private sector to be incentivized to invest. • On training needs of TEİAŞ: training on "grid-forming inverters" (and relevant technologies, in general) should be added, as they will be used more and more in the future.	In order to establish a comprehensive and transparent regulatory framework and business models on energy storage and EV-charging stations, so as to de-risk the investment environment as much as possible; the following are needed, and incorporated in the IP: ***1-Predictable tariff / revenue stream for the energy storage investments and EV-charging stations – similar to YEKDEM (Feed-in-tariff) for energy generation investments***: The investors will look for stable, predictable, fixed tariff over the investment horizon which would be the basis for the compensation for the investment costs related to energy storage and EV-charging stations. ***2-Development of viable contracting regimes (e.g., PPAs etc.):*** Uncertainties about revenue streams have an adverse impact on investments. In this regard, standardized contracts such as PPAs will be developed specifically for energy storage and EV charging stations**.** ***3-Protection for foreign exchange volatility: Since*** the key equipment is likely procured in hard currency (US$ or EUR), the investors typically raise the required debt financing in hard currency. Similar to other infrastructure investments (such as healthcare, PPPs or motorway PPPs), it is expected that the investor is protected from potential losses due to foreign exchange volatility which would otherwise hamper the revenue projections and overall sustainability of the investments. Therefore, either a fixed tariff in hard currency or in TRY (with a floor level in hard currency) would need to be considered for such investments in these segments. ***4-Clarity on regulatory constraints and incentives***: Given the battery storage technology is under development with gradual expected decline in investment costs over the next years, regulatory constraints or incentives play a role to support the feasibility of such investment projects for investors. For example, the storage capacity requirements (the ratio of storage capacity: generation capacity), the schedule requirements for construction of facilities and the usage of facilities (for the purposes of ancillary services, load shifting, imbalance management) will need to be cleared defined and communicated to the investors. ***5-Increased availability of data/transparency***: There is a need for reliable data to assess market potential, grid conditions and overall infrastructure status. Limited/unreliable source of data hinders evaluation of risks and returns. Therefore, to allow investors to make well-informed decisions, transparency can be increased by requiring data collection and sharing of data on electricity demand forecasts, grid capacity, and existing charging stations.

		6-Mapping of eligible investment locations for energy storage and EV charging infrastructure: A publicly available map that clarifies suitable locations based on factors such as high renewable energy penetration and projected EV adoption rates, is needed to enable investors to target areas with the greatest potential return. On the comment with regard to the potential training needs of TEİAŞ on "grid-forming inverters" and relevant technologies, this will be discussed with TEIAS under TPTS Project's Component 4 on TA. Similarly, adding a comprehensive assessment of the balancing needs of the power system for the planning period (present to 2038 at least; possibly until 2053) will be discussed with TEIAS as part of the technical assistance needs of TEIAS.
Additional comments and questions	• Page 16 states that "0.3% of the GHGs come from agriculture and waste". Typically, the contribution of these sectors is much higher. Please double-check. • Substantial subsidies of households (both for electricity and gas) are a serious issue affecting the long-term sustainability of the sector and needs to be addressed as soon as possible. • It would be wise to assess the impact of subsidies on energy efficiency, based on which the design of the subsidy programs may be improved. We can plan to study the design of the subsidies and whether they go to the right people. • The way renewable projects are presently developed (see pages 21-22) seems very constraining, casting doubts on the ability of the country to achieve its ambitious goal of 60 GWs additional renewables by 2035. • Table 4/" REI Optional 13: Number of energy storage systems installed (#)": it would be better to change this to MWh of storage.	On the GHG figures, we double-checked and confirm that the official (TURKSTAT) figures states that "0.3% of the GHGs come from agriculture and waste". The energy subsidies and the impact of subsidies on the energy efficiency, could be elaborated under other projects / programs of the Government, as well as the participating and other MDBs. The target of 60 GW of additional renewable capacity deployment by 2035 will require significant investments both from public and private sectors (around US$100 billion over 11 years, including US$80 billion for generation, US$10 billion for transmission, and US$10 billion for distribution segments). Given that Türkiye still has ample potential to utilize its solar and wind resources, this target remains achievable although potentially in a longer time span given the macroeconomic / the regulatory considerations. Türkiye's past track record over the last decade in the rapid expansion of renewable capacity gives assurance that once the regulatory/ legal framework is well-defined in line with the international standards, the investments will materialize in the target sectors. The MDBs will support the Government can help to achieve this ambitious target: 1-IFC supports both tendering and financing of renewable with battery storage projects, while IBRD supports the regulatory/ legal reforms needed to unlock private sector investment. 2-IFC can bring in reputable, large-scale developers (such as ACWA Power, Masdar) to rapidly complete the required investments and to transfer their expertise/ knowledge to the market given existing good relationship with such large groups in other geographies.

		3-IFC and EBRD can mobilize concessional/ blended funds to help support the deployment of new technology such as BESS in the country. Similar to solar panels, the cost of investments in battery storage will likely decline in future years but such concessional funds may support the feasibility of investment projects today. Access to long-term, lower-cost lending can help decrease financing costs and thus create more space for private sector participation. 4-IFC and EBRD can guide foreign investors on market entry thanks to their local presence and extensive experience in the Turkish energy market over the years. Additionally, IFC and EBRD usually collaborate with other DFIs and IFIs. Therefore, IFC and EBRD leverage a wider network of expertise and funding sources, potentially bringing additional capital to Turkish renewable energy projects. REI Optional 13 indicator "Number of energy storage systems installed (#)" has been replaced with energy storage systems installed (MW/MWh) in Table 4 of the IP.

B) CIF Secretariat's Comments

Comments from:	Questions/Comments	Answers/Comments
The CIF Energy Team	• The IP has been well thought through, and there is thorough information regarding the status of the sector and the plans laid out by Türkiye. The proposed actions fit within the eligible criteria of REI and there is a balance between what IBRD is proposing as well as IFC and EBRD. Also, the co-financing ratio is high (noting that it is all MDB financing). • The proposed investments conceptually make sense, but the IP is missing the full context. While the context section is very comprehensive regarding plans and regulatory issues, and markets, the explanation of the transmission barriers or why they need strengthening is very limited. ▪ For example, what are the upgrades/extensions going to be used for? To interconnect with other countries? Is it because the VRE generation is sparsely located? Is it because the system as a whole is obsolete? Please ensure this comes through more clearly and comprehensively. ▪ The regulatory barriers section discusses issues with allocation of transmission capacity, making about 28,000 MW sit idle due to non- realization of the licensed	• Thank you for the recognition of the efforts by all participants during the preparation of the IP. • The Transforming Power Transmission Project, aiming to scale-up renewable energy generation by strengthening and further digitizing the power transmission system, comes at a critical time to support the Government and TEİAŞ in their efforts for ambitious RE scale-up of 60 GW by 2035 as part of their net-zero targets by 2053. TEIAS' transmission system currently operates well, and needs to be well equipped to accommodate the ambitious RE scale-up. given the new ambitious targets of the Government.

	projects. This warrants further analysis on whether building new transmission capacity is the best way of addressing existing bottlenecks in the presence of regulatory barriers, leading to its underutilization. ▪ Regarding the focus on transmission, why is there a request for CIF financing for component 1? Component 1 is bringing US$ 1.5 billion of IBRD financing, so CIF is a drop in the bucket of the concessional financing. In the case of Brazil, the REI financing is covering the riskier aspects of financing that the private sector stays away from (most of the US$ 8 billion in co-financing there is private sector). In the case of Türkiye, what is it that REI/CTF is financing that necessitates our concessional financing, which IBRD cannot finance – or is different from what IBRD can cover? ▪ The proposed investment needs to be more detailed. While the project concept date is scheduled for September of this year, so clearly still being developed, a little more information would be useful. • The IP describes the impact of energy subsidies which lead to deterioration of working capital. The IP would benefit from the description of whether the same effect is expected to spillover to areas supported by the IP (transmission, storage, digitalization) and if there is a material risk that this would affect the required maintenance and longer-term impact of the supported investments. • In the financial risk section, the IP mentions that the regulatory body does not approve some of the new technologies related to digitalization, however, it is not clear whether the proposed activities in the digitalization component may be affected. A deeper description of the regulatory issues that seem to be relevant to supported investment would be useful.	• As the new licenses for the investments projects will replace the non-realized licensed projects to meet the RE scale-up target, the new transmission capacity will be needed. • Although CIF is a drop in the bucket of the concessional financing for the Component 1, as IBRD is bringing US$ 1.5 billion of IBRD financing, under this component, CTF-REI concessional financing will support the government in its ambition with regard to the renewable energy scale up program through VRE integration; and the digitalization and smart grid development to integrate higher share of share of renewable energy generation (especially utility scale wind and solar PV) and scale-up distributed generation. • More information has been provided in the IP in terms of the proposed transmission investments.
The CIF Resources and Risk Team	• Grant Use: Please be advised that any grant amount, including the US$ 2 million requested under Component 1.4, would come for the respective requesting MDB's grant allocation (in this case, it looks like WB; and it would come from FY25 if the project is submitted in this FY or subsequent FY if submitted later). • Total Amount: The total amount available for this REI IP is US$ 70 million. If US$ 3 million in additional grant resources is requested for Component 3, then (a) the above applies in terms of MDB grant use under CTF, (b) US$ 3 million would need to be removed elsewhere so that the total IP amount remains at US$ 70 million, and (c) Component 3 should be articulated in the main text rather than as a footnote. • Financial Products: We note that the financial instrument requested under component 1 is a loan. However, under component 2, it mentions "CTF funds" and "CTF-REI concessional resources"; Please clarify what financial products will be sought under the IP. • Co-Financing: The high co-financing ratio proposed is worth highlighting; We kindly request mentioning it in the IP financing section, in addition to the amounts.	• Grant Use: The US$2 million requested under Component 1.4, will come from the respective requesting MDB's grant allocation, i.e. in this case the World Bank. • The total amount of the IP is US$70 million, exclusive of potential additional grant of US$ 3 million, as the additional grant amount will only be available in case of availability of additional funding for Türkiye on top of the existing US$70 million. As per recommendation, the Component 3 has been removed from footnote and moved to the main text. • Financial products: “CTF funds” have been replaced with “CTF-REI loan financing” for clarity. • Co-Financing: The high co-financing ratio proposed has been added to the IP.

	• The executive summary mentions total financing of US$ 5.6 billion in sustainable energy sources in Türkiye, of which about US$ 0.47 billion from CTF and US$ 4.1 billion from MDBs. These numbers do not add up to US$ 5.6 billion.	• The typo in the executive summary has been corrected.
The CIF Monitoring and Reporting(M&R) Team	• While the IP includes a lot of contextual and macro-level detailing, there is insufficient detail on the exact deliverables and their systemic addressing of the barriers/bottlenecks. In particular, please include specific targets in the IRF, including especially for estimated co-financing and GHG emissions reductions, as well as other core indicators. **Impacts** • For the indicator currently provided "*Share of renewable energy generation in supported countries grid-connected energy systems (%)*" please provide the baseline value (alongside date and reference document) and the target value (and target date). • The IP's IRF currently carries only one IP/country program level indicator. In line with guidance of the REI Monitoring and Reporting Toolkit, please provide 3-5 indicators at the national level, detailing the composite, national/macro-level impacts to be delivered over the duration of the IP. These remain particularly important for REI, given that the program intends to deliver system-wide, grid-level impacts beyond those of individual projects. For more detailed guidance and definitions (including examples), please refer to pages 32-33 of the REI M&R Toolkit. • Given the document's reference to Türkiye's energy sector's dependence on imported fossil fuels (75%, per page 12 of the IP, including a reference to related contributions towards the country's current account deficit), this may also warrant inclusion in the IRF, were reduction of such to be a priority for the IP and its impacts. In addition, reference to the country's high energy and carbon intensities may also warrant inclusion within national level impact targets. • The capture of latent solar/wind potential (currently at 3% and 15%, per page 22) may also warrant inclusion within national level impact targets. **Outcomes** • For all indicators listed within the IP IRF, please **provide targets values (and target dates),** including clarity/detail/disaggregation within the IRF and/or the narrative text of the outcomes that will be delivered (i.e. on the impact pathways from activities/outputs/outcomes). • **The document also should include a narrative theory of change** to clarify the upward cascade of discrete activities/components to program level outcomes and impacts (vis-à-vis the systemic barriers to REI identified). At present, there is a gap in the logical model between the high-level issues outlined in the IP and the way in which the projects address these issues. This is significant in that a number of evaluations of CIF supported programs	• The estimated co-financing amount by the MDBs has been added to the RF. The GHG emissions reductions will be determined once the sub-projects and investments under the identified activities will be identified and agreed with the counterparts during the project preparation processes. **Impacts** • For the indicator "*Share of renewable energy generation (%)*", the baseline value (alongside date and reference document) and the target value have been included in the IP. • Additional indicators at the national level have been added to the Table 2 of the IP. • A national level indicator regarding the amount and the share of renewables in the total primary supply has been added to the Table 2 of the IP. The more the share of the renewables, less the share pf the fossil fuels. • The solar/wind potential installed capacity and generation figures have been included in Table 2 as part of the national level indicators. **Outcomes** • For the national indicators listed within the IP IRF, the please targets values (and target dates), including clarity/detail/disaggregation within the IRF have been added to Table 2 of the IP. On the REI Program outcomes/outputs, the target values will be determined during the design and preparation of the specific activities and project in the IP. • A narrative on the theory of change has been added to the IP.

	have highlighted the disconnect between the programmatic intent contained in the IPs and the way in which the individual projects respond to these issues. A clearer theory of change would be useful to set out this relationship and also to provide the basis for subsequent evaluation and learning processes. • We note the inclusion of Table 2 (page 34) with a subset of target values—please include the same within the IRF, in line with definitions/guidance provided within the REI M&R Toolkit (including targets related to results of REI interventions), indicating within the "notes" column the disaggregated component/sub-component contributions to these values. • When providing targets for indicator *"REI CORE 2. Installed Capacity: Installed capacity of variable renewable energy available to the grid (MW) – direct/indirect"* please note that the MW target value is to consider only variable RE (please refer to page 39 of the REI M&R Toolkit for additional guidance/definitions). • When providing a target for the indicator "*REI CORE 4. Grid Services: Increase in available grid services and improvements (#)*", please provide quantitative detail/disaggregation within its notes for the relative contributions to the following IP components: ▪ Component 1: • Sub-component 1: Development of transmission infrastructure to facilitate scale-up of RE • Sub-component 2: Strengthening of transmission networks and interconnections. • Sub-component 3: Digital and smart-grid investments to strengthen grid operation and management. ▪ Component 2: • E-Mobility (EV Charging Stations) • Digitalization of the Power Distribution Grid • Given the document's underscoring of the need to strengthen policy and regulatory frameworks for RE integration, we recommend inclusion of the indicator *"REI CORE 5. Policies: Number of policies, regulations, codes, or standards related to renewable energy integration that have been amended or adopted (#)*" (and targets), speaking to how the IP will address these regulatory/governance barriers. • Given the document's underscoring of the significant need for private sector investment to reach RE capacity targets, within the notes of the indicator *"REI CORE 6 . Co-Finance: Volume of cofinance leveraged (US$)",* please provide a disaggregation of the share of finance to be mobilized via the private sector. • Given the applicability of Table 3 (page 35) to the IP indicators "*REI 7: Renewable Energy Access*"; "*REI 8: System Costs*"; and "*REI 9: Innovation*", please include these within the IRF alongside targets—detailed definitions available within the Toolkit.	• The new national indicators, that are added to Table 2, are also reflected in the IRF. • When providing targets for indicator *"REI CORE 2. Installed Capacity: Installed capacity of variable renewable energy available to the grid (MW) – direct/indirect"*, we considered only variable RE. • With regard to a target for the indicator "*REI CORE 4. Grid Services: Increase in available grid services and improvements (#)*", the quantitative detail/disaggregation will be determined during the design and preparation of the specific investment projects, covered under the IP. • As per the dialogue with and decision of the Government, it was determined that there was no need for new policies or regulations directly related to the activities covered under the IP. • Disaggregation of the share of finance with regard to the indicator *"REI CORE 6. Co-Finance: Volume of cofinance leveraged (US$)",* has been added. • With regard to a target for the indicators "*REI 7: Renewable Energy Access*"; "*REI 8: System Costs*"; and "*REI 9: Innovation"*, the quantitative detail/disaggregation will be determined during the design and preparation of the specific investment projects, covered under the IP.

The CIF Evaluation and Learning (E&R) Team	Overall, while the IP clearly articulates the context within which Türkiye is developing the plan, the linkages with the broader global context as well as the more detailed local implications of the energy systems changes required have not been fully substantiated. The transformational intent and impact of the investment plan is not as clear. Also, considerations related to just transitions and reducing inequality should be addressed more explicitly. Finally, the evaluation and learning aspects of the IP are presently underdeveloped, making it difficult to predict or assess their sufficiency. • Although the IP is linked to Türkiye's recently updated NDCs, the country NDP, and other local policies, these have been described as "critically insufficient" by Climate Action Tracker. Some targets have been set for renewable energy, but these occur within the context of ongoing investments in and expansion of fossil fuel exploitation. The criteria of relevance in the transformational change framework used by the CIF asks "What is needed, what is planned, and are they aligned?". Some further detail would be required to provide insight into how Türkiye and the partner MDBs justify relevance in the context of significant challenges / insufficiencies in the depth of action proposed in the country's energy plans, and thus in this IP, in the context of climate change and Paris Alignment. • **Transformational change** is central to CIF's impact statement and is a key investment criterion of the REI Program. It is thus concerning that it is not mentioned or engaged with in the main body of the IP and is only really described in footnotes in Annex 11. The CIF has done substantial work on identifying dimensions of change that need to be present to some extent in order for this change to be more transformational. The IP should consider a narrative and a table making explicit how the IP seeks to deepen engagement and impact across these dimensions. The CIF have developed an Evaluation and Learning Toolkit to support engagement with the key investment criteria of the CIF, including a strong focus on transformational change. It will be important for this IP to demonstrate a strong engagement with how it will contribute to the CIF impact statement and particularly "accelerating transformational change. • **Just Transition:** Although domestic coal only makes up 14% of the energy mix the plans to increase local coal and gas infrastructure suggests that Türkiye may not yet be faced with substantial issues related to a just transition of the fossil fuel sector. However, there are significant risks associated with some developments becoming stranded assets (and the associated communities being left stranded in the process). More significantly for this IP are considerations of energy pricing and access and the implications of potentially reducing energy subsidies as new (including private sector) providers are encouraged to enter the energy sector. The 'Social Risks' section with its emphasis on the localized impact of 'tower and stations' construction is insufficient. Substantial attention is needed for broader just transition consideration in this IP. **It is suggested that both procedural justice and distributional justice considerations be expanded on in this IP with regards the proposed transformation of the energy system.** Please find attached a guidance note which includes a	• The criteria of relevance in the transformational change framework used by the CIF asking "What is needed, what is planned, and are they aligned?" has been addressed within the IP. In addition, further details have been provided into how Türkiye and the partner MDBs justify relevance in the context of significant challenges / insufficiencies in the depth of action proposed in the country's energy plans. • Transformational change narrative has been added to the IP. • Just Transition: A new section has been added to the IP with regard to just transition also including the procedural justice and distributional justice considerations be expanded on in this IP with regards the proposed transformation of the energy system. • The information from a relevant publication prepared by the World Bank staff, regarding the potential implications of the proposed energy transition on vulnerable sectors of society, and issues of inclusivity and inequality has been included in the IP. A team of social specialists, led by Ms. Ferdous Jahan, senior social development specialist of the World Bank, will be leading social/gender/just transition aspects of the overall program, during the design and implementation of the projects. • The investment criteria section has been added to the IP, in line with the evaluation policies within Türkiye, the MEL Policy of the CIF, the IRF, and the evaluation guidelines of the MDBs.

	series of questions and example activities that could help to mainstream just transition across the Investment Plan – this is still being finalized but this draft can be shared if helpful. • The IP notes that "increases in inequality have offset the poverty gains from continued strong economic growth". There is little in the current IP that addresses the potential implications of the proposed energy transition on vulnerable sectors of society. The lack of participation of civil society and labor in the lists of attendees at key scoping meetings is noted. It is proposed that the development of the IP be more inclusive and that issues of inequality be addressed more explicitly in the IP and associated projects. At this point active engagement with more diverse stakeholders in the review of the IP and explicit incorporation of their concerns and suggestions in the final IP will be vital. • The section on Monitoring and Evaluation in the main IP (i.e. before the Annexes) does not reflect the investment criteria listed in the REI Design document. It is proposed that this section be expanded to include a discussion on evaluation and learning in line with the evaluation policies within Türkiye, the MEL Policy of the CIF, the IRF, and the evaluation guidelines of the MDBs. In order to support Türkiye, we have linked the Evaluation and Learning Toolkit and we would be happy to engage with the IP developers to enhance the focus on both evaluative approaches and the key investment criteria including just transition and transformational change.	
The CIF Gender Team	• A gender specialist/social development specialist should be included within the IP's projects' teams. Based on the document and the list of participants in joint missions, it appears that none have been involved in preparing the IP. This is reflected in the content of the IP, which lacks substantial focus on gender. Our comments below will not replace the value of having an in-house gender specialist associated with the projects. • The IP briefly analyzes gender gaps in the global energy and RE sectors and includes data on the female labor force participation rate in Türkiye. However, to enhance the analysis, we recommend incorporating **more context-specific information and data related to women's participation in the energy sector**, particularly in the RE subsector in Türkiye. In addition, the **analysis should provide insights into the barriers and challenges faced by women in the Türkiye energy sector, such as sociocultural factors, gender-based violence, and discrimination.** While the analysis mentions the World Bank's track record on gender-tagged projects, it remains unclear whether projects under this REI IP plan to be **gender tagged.** Kindly clarify. The gender tag and REI IP guidelines requires teams to **establish strong links between gender analysis, actions, and monitoring and evaluation. This link is not evident in the current version of the IP.** • Despite the project's primary focus on enhancing transmission networks and infrastructure, there are still opportunities for designing gender-responsive interventions within each component. At a minimum, we recommend specifically targeting female employees during capacity-building and training support provided to clients. In addition,	• The social and environmental specialists of the World Bank have already supported the relevant sections of the IP preparation. A gender specialist/social development specialist will be assigned to each of the IP's projects' teams. Ms. Ferdous Jahan, senior social development specialist of the World Bank, will be leading social/gender aspects of the overall program. • On the gender-based violence, globally, an estimated 736 million women—almost one in three—have been subjected to physical and/or sexual intimate partner violence, non-partner sexual violence, or both at least once in their life. In Türkiye, 36% of women experience physical or sexual violence from a partner, with many facing repeated incidents and 12% encountering lifetime sexual violence. The Government of Türkiye has taken several steps towards addressing gender-based violence through adopting international standards as well as enacting strong domestic policy

	potential gender-focused interventions under this IP could include an organizational assessment of TEİAŞ to identify and address barriers to women's employment and working conditions within the organization and to develop standards that contractors must comply with during project implementation. • To address potential gender inequalities in access to employment opportunities resulting from the IP's investments in Türkiye, projects could conduct **studies to assess the demand for jobs by women in the construction and operation of energy infrastructure and identify skills gaps that prevent women from pursuing such opportunities.** Projects can also prioritize female employment, ensure equal pay for equal work, and create gender-responsive and safe work environments, such as ensuring sufficient facilities for women and addressing gender-based violence risks where applicable. The projects could also consider developing skills training programs for women, offering hands-on training for women in installation and maintenance of project-relevant equipment (e.g. smart meters, EV chargers), coupled with mentorship from industry professionals. • Gender interventions should be monitored by including relevant indicators in the proposed IRF. At a minimum, please ensure that REI core indicator 7 (Renewable Energy Access – number of people, direct/indirect) and output indicator 10 (number of persons trained on issues related to renewable energy markets and systems) are disaggregated by sex. • Potential risks described in the IP do not have corresponding mitigation actions articulated. For example, in the social risk section, the IP mentions possible negative impacts on people using land informally without titles. Very often such people are women. However, the IP does not include any activities such as appropriate measures especially for women. Example activities could include: ▪ Establishing advisory boards consisting of women from the affected communities to participate in decision-making processes, ensuring that their needs and concerns are addressed. ▪ Developing environmental management plans that include specific measures to mitigate the impact of construction activities on women, such as noise reduction, dust control, and safe transportation routes. ▪ Using targeted communication strategies to reach women, such as social media, and community workshops, ensuring they are fully informed about the project and their rights.	and legal reforms to address this issue. This is reflected in the IP. • Gender data and analysis with regard to the energy sector is not widely shared and fragmented. The World Bank team will conduct a gender-responsive social assessment of the energy sector to identify the entry points for more women participation and enhanced outcomes. This is reflected in the IP. • On the gender-tagging, the Renewable Energy Integration Project (REIP) that is currently co-financed by the World Bank and the CTF is gender tagged. The Transforming the Power Transmission System Project under the Component 1, that is similar to the REIP, will highly likely be gender-tagged during the project preparation, as well. The other MDBs, IFC and EBRD, will make an effort to gender tag the private sector financed projects under Component 2 of the IP. This is reflected in the IP. • The opportunities for designing gender-responsive interventions within each component, specifically targeting female employees during capacity-building and training support provided to clients, will be considered during the design and preparation of the projects. A preliminary organizational assessment of TEİAŞ to identify and address barriers to women's employment and working conditions within the organization and to develop standards that contractors must comply with during project implementation has already been done during the preparation of the REIP. This has resulted in the inclusion of women-specific results indicators to the project such as "deployment of at least one female controller from TEIAS in each sub-project site for civil work supervision" which has been fully met since the beginning of project implementation; and the improvement of the working conditions of the contractors' project sites e.g. separate women toilets. This is reflected in the IP. • During the design and the implementation of the projects, the social and environmental risks, including the risks with regard to the physical and economical displacement of people due to land

		acquisition, are thoroughly being considered and mitigation measures are being taken. The environmental management plans developed include specific measures to mitigate the impact of construction activities on women, such as noise reduction, dust control, and safe transportation routes. In addition, the Stakeholder Engagement Plans are being disclosed; public consultations for the public including women are being organized to inform the public on the projects, potential risks and mitigation measures; and the Grievance Redress Mechanisms are being established for each project. This is reflected in the IP.

C) Türkiye Renewable Energy Integration Investment Plan Public Consultation (published from 27 June-12 July on MENR's website)

Comments from:	Questions/Comments	Answers/Comments
Enerjisa Enerji	• **Renewable Energy and Storage Capacity:** While the current status and strategy of renewable energy sources are addressed with numerical data, a projection and installation targets for storage capacity for the coming years are missing. Adding this section will make the strategies more concrete and trackable. Increasing storage capacity plays a critical role in more effectively supporting renewable energy and the grid. • E**quipment Manufacturing and Battery Factories:** There are investments that have been made and are being made in the field of equipment production in the renewable energy sector. Battery factories that have been established and will be established in our country also hold an important place in this context. These factories will increase our competitive power in the global market by encouraging the domestic production of technology. • **Energy Efficiency and Decarbonization:** Although the issue of energy efficiency is included in the document, examples are generally given in the field of electricity production and transmission. Adding innovative technologies such as heat pumps and waste heat for decarbonization will strengthen energy efficiency strategies. • **Social Risks and Labor Force:** The "Social Risk" item in the Implementation potential with risk assessment section, which includes the labor force, is one of the biggest challenges we face in our IFC process. In particular, the demands for auditing the labor practices of subcontractors are issues that we as a country struggle within such agreements. • **Use of Corporate Financing**: We request that the necessary regulations be made so that these funds can be used not only for project financing but also for corporate financing. This will further facilitate achieving strategic goals and, more broadly, our country's Carbon Zero targets by increasing the financial flexibility of companies. • **Charging Network Infrastructure and Government Incentives:** The creation of government incentives to support the charging network infrastructure, the establishment of charging stations, and the provision of suitable financing solutions for high costs to ensure efficient returns are necessary. In addition to these and similar investment needs for electric vehicles and charging stations, the continuation of the Special Consumption Tax incentive applied to electric vehicles is another requirement on the path to the Carbon Zero target. Therefore, it is requested that financial support in this area be increased. • **Grid Investments and EV Charging Stations:** There are grid investments that need to be made to mitigate the disruptive effects that may arise from the integration of renewable energy sources and EV charging stations into the grid under the Component-2 title. Therefore, increasing the financing in this area will be beneficial.	Thank you very much for the review of and the comment on the Türkiye CTF REI IP. On the energy storage capacity, the National Energy Plan (NEP) of the Government has a target of 5 GW and 7.5 GW with regard electrolyzers and battery storage, respectively by 2035, and this aspect is now included in the IP. The Government would develop strategies in line with this target. Energy efficiency related projects are not directly covered under the REI IP. Having said this, should there be additional grant resources in the future, a technical assistance study will be conducted with regard to increasing the efficiency of the hydropower plants. On the social risks including the ones related to the labor force are analyzed for the World Bank Group Projects in order to identify the risks and take mitigation measures. Accordingly, a Labor Management Plan is being prepared for the investment projects. The current structure of the CTF REI Program finances investment and technical assistance projects with regard to the renewable energy integration, as concurred and submitted by the Governments. The CTF REI IP includes the grid enhancement investments taking into account the disruptive effects of the EV charging stations, as well as the financing for the investments of the privates sector.
The Middle East Technical Well Control Training	Upon reviewing the Integration program investment plan on the Ministry of Energy and Natural Resources website, it has been observed that our country lacks sufficient natural gas storage capacity, should there be a need.	Thank you very much for the review of and the comment on the Türkiye CTF REI IP. The financing with regard to the gas sector and carbon capture and storage activities are not covered under

Company (METW)	Furthermore, it has been noted that the said investment plan does not include planning for CO2 storage in the face of targeted CO2 emissions. It is recommended to increase the underground natural gas storage capacity and to accelerate the efforts for capturing and storing CO2 gas. This will enable our country to carry out the necessary exports to European Union countries without facing any penalties in the near future and to ensure the continuity of production and heating functions against possible pipeline malfunctions and gas interruptions during cold winter days.	this IP. The participating MDBs have different programs and financing schemes related to the gas sector.
JESDER	On June 27, 2024, the Ministry of Energy and Natural Resources opened the draft study of the Turkey Renewable Energy Integration Investment Plan, which was prepared with a loan request of US$2.7 billion, to sectoral opinion on its institutional website until July 12, 2024. While it is stated that this resource generally aims to increase the flexibility of the energy system and the integration of renewable energy sources, it will cover works aimed at increasing the flexibility, balancing, stabilization, and strengthening of the power infrastructure of the electric transmission system, investments to increase the efficiency of hydroelectric power plants, energy storage, digitalization, and reducing gas emissions. Within the scope of the steps to be taken for the integration and efficiency of renewable energy sources, the effective use of geothermal energy, which is one of the renewable energy sources, is also included. Since we have not seen the details of how the targeted credit request will cover an investment process specifically for geothermal energy, we anticipate that the request will be carried out within the framework of the Medium- and Long-Term Investment Plans of the Presidency of the Republic of Turkey. As you know, geothermal energy is used not only in electricity production but also in greenhouses, residential heating, thermal tourism, and drying, and especially these secondary activities need investment and encouragement. In this context, we believe that in addition to the use of geothermal energy in electricity and its widespread distribution through pipelines and increasing its efficiency, it should also cover integrated greenhouse and drying systems as well as residential heating activities.	Thank you very much for the review of and the comment on the Türkiye CTF REI IP. The financing with regard to the geothermal energy is not directly covered under this IP. The participating MDBs have different programs and financing schemes related to this aspect.

The Climate Investment Funds

The Climate Investment Funds (CIF) were established in 2008 to mobilize resources and trigger investments for low carbon, climate resilient development in select middle and low income countries. To date, 14 contributor countries have pledged funds to CIF that have been channeled for mitigation and adaptation interventions at an unprecedented scale in 72 recipient countries. The CIF is the largest active climate finance mechanism in the world.

THE CLIMATE INVESTMENT FUNDS

c/o The World Bank Group
1818 H Street NW, Washington, D.C. 20433 USA

Telephone: +1 (202) 458-1801
Internet: www.cif.org

@CIF_action
CIFaction
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