



Executive Summary:

Financing the Energy Transition in Turkey within the Context of the Green New Deal

About SHURA Energy Transition Center

SHURA Energy Transition Center, founded by the European Climate Foundation (ECF), Agora Energiewende and Istanbul Policy Center (IPC) at Sabanci University, contributes to decarbonisation of the energy sector via an innovative energy transition platform. It caters to the need for a sustainable and broadly recognized platform for discussions on technological, economic, and policy aspects of Turkey's energy sector. SHURA supports the debate on the transition to a low-carbon energy system through energy efficiency and renewable energy by using fact-based analysis and the best available data. Taking into account all relevant perspectives by a multitude of stakeholders, it contributes to an enhanced understanding of the economic potential, technical feasibility, and the relevant policy tools for this transition.

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This report is available for download from www.shura.org.tr. For further information or to provide feedback, please contact the SHURA team at shura@shura.org.tr

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Key Messages

- Covering energy and digital transition in line with the goal of net zero carbon
 emission, the Green New Deal is steadily becoming the dominant development
 paradigm for the second quarter of the 21st Century at the global scale. The holistic
 policy combination, while eliciting an investment effort that is unparalleled in the
 last fifty years, will result in the growth and diversification of both the need and the
 sources of financing for the energy transition.
- The financing Turkey will need for its energy transition by the year 2030 amounts to just 0.5% of the global resources that are expected to be available in the same period. A move towards low-carbon and high value-added production, alongside the transition in energy, can bring in the resources Turkey needs. The implementation of this strategy requires, in turn, an effective green finance strategy consistent with the targets set in order to attract medium-to-long term financing at affordable cost levels.
- In comparison to the past two decades, the macroeconomic environment and access to financial resources worldwide as well as in Turkey is marked with new challenges. As a result, strategic planning for climate diplomacy, development, and finance is even more crucial.
- It is imperative to develop financing mechanisms and models for matching the
 needs of users of finance with appropriate sources of finance, in a perspective
 integrating renewable energy, energy efficiency and new technologies with
 energy consumption in industry, transport and buildings. In this context, it is
 recommended to develop and introduce instruments specific to the needs of
 different types of users.



Executive Summary

Introduction

This study entitled "Financing Energy Transition in Turkey in the context of Green New Deal" was planned by the SHURA Energy Transition Center in the first half of 2021. The goal was to review and update the "Financing the Energy Transition in Turkey" study prepared in 2019 in the light of the funding options expected to be expanded through the Green New Deal paradigm and develop policy recommendations focusing on the expected pathways for the financing of the energy transition within this framework. A number of steps taken by policy makers as the study proceeded, such as the ratification of the Paris Agreement, the declaration of the net zero target for the year 2053, the commencement of efforts to establish a net-zero strategy, and the convening of a Climate Council not only made the study even more relevant, but also expanded its scope.

Integration based on green investments at the international level, including but not limited to the European Green Deal, is gaining importance. Turkey's level of integration with the international system, as well as its position in value chains, necessitates a robust step for green investment, beginning with investments into the energy transition to advance its existing economic structure further.

Both the international circumstances and the macro-economic pressures Turkey is feeling have led to a tightening of access to funding through conventional channels. The conditions are likely to become more dire in the near future. However, the expansion in the means for climate-related financing is compatible as well as consistent with Turkey's structural transition perspective in the context of a Green New Deal. A focus on this axis will allow the development of consistent industry, energy, trade and finance strategies, and thus the utilization of new financing opportunities available worldwide.

Macroeconomic Global Environment and Twin Transition

Following the financial crisis of 2008, the world economy came to face a structural predicament, which can be expressed as "productivity decline". From a perspective covering past decades, progress on the "total factor productivity" front can help overcome the problem of slowdown in productivity growth and the resulting a fall in social welfare for the vast majority of economies worldwide. Increasing "total factor productivity" levels depends strongly on technological and innovative developments as well as improvements in energy and resource efficiency. In this framework, the "twin transition" encompassing "green transition" and "digital transition" stands out as the dominant growth paradigm of the second quarter of the 21st century. Conjectural developments including but not limited to the Covid-19 pandemic also emphasize this axis.

In 2020, the global economy shrank by 3.5 percent, due to the impact of the Covid-19 pandemic. It was a year of mandatory lockdowns leading to supply shocks affecting the global value chain, along with the demand shocks caused by the changing consumption structures and fluctuations. Thus came the biggest recession of the past 60 years. The rate of negative growth was twice the figure endured during the global recession of 2008-2009. The lockdowns introduced due to the Covid-19 pandemic not

only caused interruptions in production and circulation, but also led to changes in the structure of consumption. Supply and demand shocks led to substantial volatility.

In spite of the relatively significant bounce back in economic activity in 2021, and the estimates that the global gross product surpassed the levels reached in 2019, a lasting recovery and overcoming the inequalities the pandemic caused among and within nations is expected to take several years. The ongoing war between Russia and Ukraine is also constricting the global supply of energy and other commodities, and adding to the negative effects.

The consequences of the Covid-19 pandemic indicate an acceleration of the investments in the "Twin Transition" (Green Transition and Digital Transition). In the case of energy transition, the consequences of Russia's military intervention on Ukraine in 2022, once again underlined the need for energy supply security for many nations, including European countries. While a number of distinct solutions were proposed as quick responses in the context of the efforts to secure energy supply and to overcome the effects of energy price hikes, energy transition investments gained even more importance in the medium to long-term. The picture is one where the European Green Deal presents a strengthening trend, and where Turkey can see certain practices precede the development of strategies and policies.

Global Energy Transition Investments and Financing

With the effect of the Covid-19 pandemic, global fixed capital investments exhibited a sharp decline in 2020, despite increased liquidity due to financial measure packages introduced, and the associated fall in the cost of borrowing. On the other hand, in light of the need for medium to long-term investments from a "Twin Transition" perspective, it can be reckoned that the world now is in a unique threshold, with high-volume physical investment potential in a trend led by developed economies.

Channeling the assets of institutional investors such as pension funds, insurance firms, sovereign wealth funds and foundations, whose structure make them capable of long-term investments, to financing low-carbon investments is a potentially sound move. Assuming one percent of the funds worth USD 87 trillion controlled by institutional investors is invested directly to renewable energy or energy transition until year 2030, 15 to 30 percent of the additional financing required for energy transition investments may be covered.

The economic growth model or paradigm denoted by the Green New Deal concept differs from previous models emphasizing crisis recovery due to two basic characteristics: First of all, the Green New Deal paradigm incorporates a solid mass of climate and environmental concerns and efforts into the economic and social policies envisaged. Secondly, robust international commitments and targets well beyond the national/country scale are part of the new model. The European New Deal and its relevant documents, with the most distinct and detailed policy framework to date, strongly underline climate commitments. Moreover, it is evident that the EU is accompanied by Japan and South Korea in presenting the "Green New Deal" as the fundamental economic growth paradigm, while the US and China have also been taking important steps in this direction. Individual nations are not the only entities to voice investment and financing commitments to mitigate medium to long-term climate change. International organizations including but not limited to Multilateral

Development Banks, institutional investors, and large corporations have also made pledges of their own.

As approximately EUR 1.8 trillion is set aside out of the EU budget for investments within the framework of the European Green Deal in the period 2021-2027, the European Investment Bank Group (EIB) is expected to play a major part in the financing of the investments required under the European Green Deal, through direct as well as indirect funding. In this context, plans are in place for the structuring of the EIB as a "Climate Bank", with the share of funding for climate-related projects set to rise from the current level of 25 percent to 50 percent by the year 2025.

Estimates suggest that USD 110 trillion will be required in investments for energy transition in the global scale by the year 2050. More than 50 percent of that figure would be required in the period 2021-2030.

Looking at the increase in the institutional investors' commitments on the climate front, and ever more frequent declarations of programs to directly finance energy transition, combined with growing commitments on part of multilateral development finance institutions, not to mention the increasing government budget shares devoted as in the case with the European Green Deal, it is evident that financing supply is expanding and the structure of finance is diversifying. Projections indicate that financing available will be sufficient to provide for the 55 billion US\$ required for the investments by year 2030.

Sources of Finance for the Energy Transition

	2030	2050
Institutional Investors	> USD 10 trillion	> USD 25 trillion
Multilateral Development Banks and Other Development Financing Institutions	> USD 2 trillion	> USD 5 trillion
Other Financial Institutions	> USD 10 trillion	> USD 30 trillion
Government Agencies	USD 10-15 trillion	USD 45-50 trillion
TOTAL	USD 47-52 trillion	USD 135-140 trillion

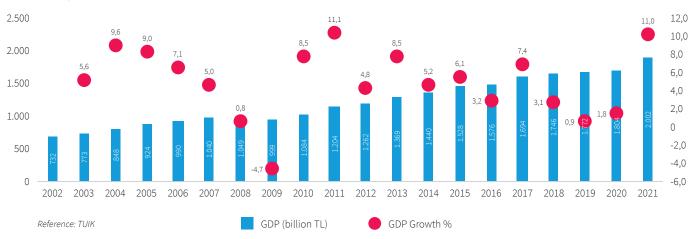
Macroeconomic Environment in Turkey and the Twin Transition

There is a noteworthy overlap between the need for structural transformation of the Turkish economy, and the agenda for the Green New Deal. In spite of intensifying challenges, especially the limited means of financing available, the opportunities presented by the Green New Deal paradigm at the international level, including but not limited to the European Green Deal, provide the foundations for a speedy and significant leap for Turkey.

In the period 2002-2021, the Turkish economy registered an average annual growth of 5.5 percent. However, the average growth rate of 5.8 percent in the period 2002-2017 receded to 1.9 percent in the period 2018-2020. The declining economic performance was brought about by first the debt crisis unraveled by the exchange rate shocks in 2018, followed by the supply and demand shocks brought about by the Covid-19 pandemic. The most important development that triggered rapid devaluation of

Turkish Lira was the difficulty of financial debt service exacerbated by foreign debt. In 2021, on the other hand, the GDP bounced back substantially, as the restrictions associated with the Covid-19 pandemic, including but not limited to the lockdowns, were eased, while the demand levels were strong worldwide.

Real GDP Figures - Chain-Linked Volume Index (Base Year: 2009)



- Turkey's dependence on the inflow of foreign funding makes it hard to service debt, and renders the country susceptible to sudden exchange rate shocks. However, a more comprehensive assessment leads to the conclusion that the troubles experienced after 2017 were essentially due to Turkey's structural problems:
 - o Lack of progress to achieve the necessary transformation in industry
 - o Industrial production structure making current account deficits unavoidable
 - o Reaching natural limits of demographic and sectoral shifts
 - o State's withdrawal from economic activity being nearly completed
 - o Blockages in financing growth
- One of the most prominent consequences of the debt crisis, which arrived with the rapid devaluation of TRY in 2018, and which had remained in effect with ups and downs ever since, was the change in the composition of foreign debt. Even though the total foreign debt fell by 3 percent by the end of 2021 compared to the end of 2017, a substantial shift occurred in the structure of foreign debt. The foreign debt of the private sector in general, including both the financial sector and the real sector, fell significantly whereas the foreign debt of the government increased sharply. The bond issues by the treasury as well as foreign borrowing by stateowned banks and the Turkey Wealth Fund grew in scale and quantity. In parallel to the change in the composition of foreign borrowing, the share of loans extended by private banks declined whereas lending by state-owned banks grew.

Energy Transition Investments and Financing in Turkey: Current Situation

• In the period 2002-2021, the energy markets in Turkey were liberalized substantially through a number of steps including the privatization of power plants, electricity and natural gas distribution regions, refineries and fuel distribution networks, and the issuing of licenses for power generation. The share of the private sector in electricity generation grew from 32% in 2002 to 84% in 2021. The same period was one of rapidly expanding energy demand and supply, in parallel to the robust economic growth in the country.

- As of the first quarter of 2022, the total installed power generation capacity of Turkey exceeds 100 gigawatts (GW). Renewables constitute 54% of the installed capacity while the remainder is fossil fuels, composed of natural gas and domestic and imported coal. As the installed capacity grew by 252% in the period 2001-2021, electricity generation increased 170%, in connection with the developments on the demand side. On the other hand, during 2018-2021 the growth in installed capacity declined due to the challenging financial environment, already high levels of installed power, the complexity and uncertainties of the political mechanisms involved, slowing power demand in connection with the slowing economy, and the pressures on electricity prices due to excess capacity.
- 2019 had registered a fall, albeit limited, in electricity generation –the first fall since 2009– followed by a limited increase in 2020 and a solid increase in 2021, in connection with the robust growth of GDP. In 2021 renewable resources constituted 36% of the 331 billion kWh electricity generation while 33% was from natural gas and petroleum products, and 31% was coal. The share of renewable energy in generation reached 42% in 2020, but fell in 2021 due to the fall in hydroelectric power generation caused by drought conditions.
- In the period 2000-2020, energy intensity of Turkey decreased by 20%. This reduction was a result not only structural changes in the economy, but also energy of efficiency investments by the end-users of energy. The Energy Efficiency Strategy Document of Turkey, published in 2012, set a target of 20% energy intensity reduction in the period 2012-2023. However, after 2010, energy intensity fluctuated, culminating in a reduction of 12.7% in primary energy intensity for the period 2012-2020.
- Approximately 44% of 125 billion US\$ invested in energy in the period 2002-2021
 was for renewable energy generation and network integration. When energy
 efficiency investments are included, total investment level goes up to 140 billion
 US\$ with energy transition investment constituting 70 billion US\$.

Energy Transition Financing Needs in Turkey within the framework of the Green New Deal

- On 7 October 2021, Turkey ratified Paris Agreement, and committed to a net zero carbon emissions target by the year 2053. On this axis, in line with the strategic direction taken as the "Green Development Revolution", work began on preparing a long-term climate change strategy and action plan, and establishing a road map to reflect climate goals of Turkey.
- According to the scenarios ran by the SHURA Energy Transition Center, 135 billion
 US\$ will be needed in energy transition investments during the period 2022-2030,
 while USD 107 billion will be needed for financing other than own capital. In this
 context, the annual investment requirement will double compared to the average
 amount in the period 2002-2020, whereas the need for financing other than own
 capital will be 2.5 times higher.

Need for Investment in Energy Transition - billion US\$ (2022-2030)

Renewable Energy	47.0
Energy Efficiency	27.9
Storage (batteries, electrical vehicles)	24.1
Electrification	22.8
Grid	5.0
Hydrogen and Other New Technologies	8.2
Total	135.0

Reference: SHURA Energy Transition Center 2020, authors

Recommendations for Policy and Action Areas within the framework of the Green New Deal

The policy and action area recommendations were developed based on extensive stakeholder interviews as well as current documents such as policy documents, reflecting basic strategies and trends. Interviews were held with 76 representatives from 51 entities comprised of the representatives of government agencies, international and local financial institutions, energy firms, technology firms, industrial institutions, and industry associations, as well as academic staff and consultants. Recommendations regarding the following policy and action areas were developed on the basis of the interviews and desk-based analyses. Policy and Action Areas 1, 2 and 3 cover the macro-level areas where action under the leadership of and coordination by the state along with the participation of the private sector and civil society is needed. Policy and Action areas 4, 5, 6, and 7, on the other hand, cover the areas where the state would develop, in cooperation with the finance sector, the private sector, trade associations, and stakeholders from civil society, the regulations and incentives needed. The implementation and action, on the other hand, will mostly depend on the finance sector and the private sector stakeholders. Policy and Action Area 8, in turn, is envisaged as an area where the state will provide both guidance and assistance in cooperation with the private sector, taking a relatively more active part in resource mobilization compared to the other policy areas.

Policy and Action Area 1: Developing Long-Term Energy Transition Strategy recommended to develop a comprehensive "Energy Transition Strategy" to provide an umbrella for the strategy and policy action taken with respect to energy transition issues along the "Green New Deal" axis, including but not limited to the "Long Term Energy Strategy" study. It should be ensured that the "Energy Transition Strategy" is consistent and mutually reinforcing with the industry, transportation, energy, and financing policies to be integrated into the framework of the upcoming 12th Development Plan and the "Green New Deal" paradigm. The national industrial policy and sector policies should prioritize industries and product mixes that would reduce energy and carbon intensity; actions and incentives should aim to reduce carbon emission / value added and energy consumption / value added ratios. A long-term road map including targets for 2030 and 2053 should be prepared with the "Energy Transition Strategy" emphasizing the role of the public sector in developing access to financing in combination with its regulatory / oversight functions as well as assuming responsibility for providing

- support as investor and establishing the needs for energy transition investment and finance with respect to scale by technology type.
- Policy and Action Area 2: Carrying out National Taxonomy Activities in accordance with the Needs / Priorities of Turkey: It is necessary to identify the priority investment areas within the framework of the "Green New Deal" and to come up with a clear definition and to develop a common classification system in order to bring in favorable funding for sustainable projects and activities. Along similar lines, an "EU taxonomy" is being developed by the EU. It is necessary for Turkey to achieve compliance with a common international classification system including the one the EU is building, and to work on its own taxonomy taking into account its domestic needs. Consideration should be given to covering as part of the energy transition, related sub-sectors of manufacturing in addition to electricity generation and distribution, storage, heating-cooling systems more comprehensively than the one envisaged in the EU's taxonomy. Moreover, steps should be taken to eliminate uncertainties where problems are encountered in the financing of investments due to the lack of a specific definition, including but not limited to energy efficiency.
- Resources: Expanding access to long-term and low-cost financing for energy transition investments is necessary, along with the diversification of financing sources. Turkey's need for medium to long-term investments in the context of energy transition is projected to go well beyond the levels in the previous decades. It is imperative to develop a "Green Financing Strategy" covering all aspects of energy transition, with a view to making most effective use of the growth of climate financing funds at the international level, and the diversification in the types and sources of available financing. The establishment of a "Climate Bank" responsible for the coordination and implementation of the said strategy, as well as facilitating access to international sources of funding in particular is an important item to be included in this context. So are investigating the structure of international financing supply and identifying domestic sources.
- Policy and Action Area 4: Developing an integrated Energy Management **Approach:** The development of an integrated and consumer-centered energy management approach, covering different areas of the energy transition, as a concept to facilitate building both a main theme in securing international financing and devising innovative financing mechanisms / models will provide many conveniences. Such an approach would go beyond combining renewable energy investments with energy efficiency in industry and buildings and would make it possible to develop projects containing a rather comprehensive "investment package" and thus design a "financing package" incorporating investments and practices regarding new technologies, electrification of transportation and heating, and the manufacturing of equipment to achieve energy efficiency. The efforts in this context can focus on defining the integrated energy management approach as an element of the fundamental strategies, including the "Long Term Energy Transition Strategy" and the "Green Financing Strategy", identifying opportunities for industry, transport, buildings, and electricity generation-distribution, as well as the benefits and opportunities in terms of access to international financing and the development of financing mechanisms / models.

- Policy and Action Area 5: Development of Utility Scale Renewable Energy Financina Mechanisms / Models: Renewable energy investments at the utility scale can be considered an advanced area of investment in which the finance sector is rather experienced. However, models other than financing based on guaranteed feed-in tariffs need to be developed in order to ensure required levels of investment. Against this background, renewable energy supply agreements (Power Purchase Agreements - PPAs) and similar long-term sales agreements will be part of the agenda. The adaptation of the new financing models in light of the increasing diversification of stakeholder groups and new business models will also increase their effectiveness. In this context, industrial and commercial enterprises seeking to purchase green energy, and larger corporations, electricity distribution and fuel distribution firms in the light of the electrification of transport will stand out as potential players at the supply and the demand side of financing. Considering such diversification, alternative means of financing such as issuance of international green bonds by energy firms, institutional investor funds, and venture capital shall be required in addition to the corporate loans / project financing to provide funding for renewable energy projects at the utility scale.
- Policy and Action Area 6: Financing Distributed Renewable Energy Sources: The investments based on distributed renewable energy sources stand out as the field most amenable to the development of new business and financing models. The targets to be set with respect to the distributed system within the framework of the "Long Term Energy Strategy" mentioned above are crucial for determining the volume and rate of investments in this context. Setting of general technology-based targets for distributed generation taking into account the potential in primary segments, including industry, commerce, government, and local governments, will enable the development of business and financing models. While part of the investment can be financed within the framework of the "Integrated Energy Management" approach provided above, a range of diversified business and financing model options can also be developed for individual segments. This policy and action area can cover securing resources for distributed renewable energy investments, business and financing model options applicable within the aggregator model for distributed investments, social investments by government agencies and local governments, support mechanisms and financing models based on the investment feasibility perspective taking into account the total effect on households and social investments.

- Policy and Action Area 7: Financing of Energy Efficiency: Some difficulty exists in energy efficiency financing due to uncertainties involving collateralization, assessment and evaluation The following measures cross-cutting Policy Action Areas 2, 4 and 6 can be recommended to reduce such uncertainties:
 - Financing energy efficiency investments as part of an energy management package with renewable energy investments and the inclusion of electrification of transport and heating.
 - Developing energy efficiency and energy management definitions in the context of taxonomy efforts; introducing definitions for the financing of energy efficiency investments in this context.
 - Developing a loan guarantee fund mechanism for energy efficiency and energy management investments to expand the use of energy performance contractbased agreements and the ESCO model.
- Policy and Action Area 8: Financing of New Technologies and Other Areas: It is necessary to increase the efficiency of the public sector in the financing of investments for new technologies. Supporting both R&D processes for technologies being developed, and participating in large scale and/or emerging technology investments will increase effectiveness. The development of publicprivate cooperation models such as Turkey Automobile Enterprise Group (TOGG) in the context of the electrification of transportation will allow the mobilization of the private sector's resources as well.

NOTES

About Istanbul Policy Center at the Sabancı University

Istanbul Policy Center (IPC) is a global policy research institution that specializes in key social and political issues ranging from democratization to climate change, transatlantic relations to conflict resolution and mediation. IPC organizes and conducts its research under three main clusters: The Istanbul Policy Center–Sabanci University–Stiftung Mercator Initiative, Democratization and Institutional Reform, and Conflict Resolution and Mediation. Since 2001, IPC has provided decision makers, opinion leaders, and other major stakeholders with objective analyses and innovative policy recommendations.

About European Climate Foundation

The European Climate Foundation (ECF) was established as a major philanthropic initiative to help Europe foster the development of a low-carbon society and play an even stronger international leadership role to mitigate climate change. The ECF seeks to address the "how" of the low-carbon transition in a non-ideological manner. In collaboration with its partners, the ECF contributes to the debate by highlighting key path dependencies and the implications of different options in this transition.

About Agora Energiewende

Agora Energiewende develops evidence-based and politically viable strategies for ensuring the success of the clean energy transition in Germany, Europe and the rest of the world. As a think tank and policy laboratory, Agora aims to share knowledge with stakeholders in the worlds of politics, business and academia while enabling a productive exchange of ideas. As a non-profit foundation primarily financed through philanthropic donations, Agora is not beholden to narrow corporate or political interests, but rather to its commitment to confronting climate change.





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