

# Turkey: Country Private Sector Diagnostic (CPSD)

## Concept Note, March, 2022

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# Turkey: Country Private Sector Diagnostic (CPSD)

## Concept Note

### I. Introduction

1. **This concept note outlines the objectives and proposed content of the Country Private Sector Diagnostic (CPSD) for Turkey.** The CPSD aims at identifying opportunities and policy reforms for a more forceful contribution of the private sector to: (i) the achievement of the Government of Turkey (GoT) development objectives; (ii) the transition to a low-carbon economy and the accomplishment of Turkey's climate change commitments; and (iii) the reduction of the country's large regional disparities.
2. **The private sector plays a critical role in boosting Turkey's productivity and external competitiveness to ensure faster economic growth and macroeconomic stability.** The GoT's priorities are spelled out in the 11<sup>th</sup> National Development Plan (NDP) for 2019-2023, which includes five pillars: (1) Competitive production and productivity; (2) Stable and strong economy; (3) Qualified people, strong society; (4) Livable cities, sustainable development; and (5) State of law, democratization, and good governance. The proposed CPSD will identify policies aimed at increasing private investment, productivity and innovation in sectors that would enhance Turkey's external competitiveness and its integration into global value chains (NDP's pillar 1), would accelerate economic growth and reduce external accounts imbalances (NDP's pillar 2), and would ensure a more sustainable urban development and balanced regional economic growth by improving urban infrastructure and connectivity between leading and lagging regions within the country (NDP's pillar 4).
3. **The transition to a low carbon economy and the accomplishment of Turkey's international climate change commitments also require a stronger private sector participation in the economy as the decarbonization agenda will require higher investment levels, innovation and technological upgrades.** Reducing emissions in energy generation, manufacturing, agriculture, transport and buildings entails higher spending in renewable energy sources, the replacement of current technologies in manufacturing, the renewal of equipment, machinery and buildings, and new investments in transport and urban infrastructure. This means that overall investment levels will have to increase substantially. Indeed, the Climate Change Development Report (CCDR) for Turkey, estimates additional investment needs for the resilient and net-zero development pathway (RNZP) amounting to almost US\$70 billion over 2022-2030 and US\$165 billion over 2022-2040, which implies an additional 1 percentage point for the investment to the annual GDP ratio.<sup>1</sup> Decisions on how to finance these large investment needs have important macro-fiscal implications. The first is that, given Turkey's hard external financing constraints, higher investment needs can only be met through a shift from consumption to investment. The second is that increased government deficits and indebtedness in the post-COVID-19 period clearly suggest that higher private sector investments will be needed during the transition to a low carbon economy. Third and equally important, the expected changes in relative prices related to the use of trade, tax and subsidy instruments and the adoption of more stringent regulations on carbon emissions are expected to unleash a new wave of innovation, technological adaptation and will demand higher investments in research and

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<sup>1</sup> This amount covers investments in energy, transport, residential buildings and forestry.

development (R&D). In addition, improved firms' capabilities will be also critical for a successful transition.

4. **The proposed CPSD will scan private sector investment opportunities in sectors with strong potential to address Turkey's climate change challenges and support the accomplishment of the country's climate change commitments.** The CPSD for Turkey follows and complements the Turkey Climate Change Development Report (CCDR). The CCDR assesses how climate change and (domestic and foreign) climate policies are expected to impact or contribute to Turkey's development trajectory and identifies mitigation, adaptation, and resilience-building actions to improve the country's development outcomes at the sectoral level. The CPSD plans to provide a more granular identification of private sector opportunities in selected sectors of the economy that hold considerable potential for mitigation, adaptation and enhancement of the country's resilience to climate change. While the CCDR provides estimations of investment needs supporting the RNZP and indicates the contribution of the private sector to finance those investment needs, the CPSD aims at assessing how investable they are and plans to propose sector reforms to increase their attractiveness from a private sector perspective. The selection of sectors to be assessed is oriented by leveraging synergies between climate change mitigation and adaptation, competitiveness and productivity, and a more balanced and sustainable regional and urban development.

5. **As other large developing countries, Turkey exhibits substantial regional disparities in socioeconomic development related to the spatial concentration of economic activity and population in few places.** Turkey's socioeconomic development is characterized by large differences in income levels and productivity between the industrialized and more densely populated Northwest and the lagging and more sparsely populated South-East regions. Historically, the more industrialized Northwest has benefited from the concentration of firms, labor force, skills and markets that enabled economies of scale, higher productivity and income levels which attract more firms and population generating a virtuous cycle of economic concentration, higher productivity and welfare. Differences in private sector development are also huge with larger, more productive, and competitive firms located in the Northwest while informal and smaller firm are predominant in the lagging regions. While the gaps in regional developments have been closing over the past two decades, regional economic convergence has slowed down in recent years as the most advanced regions have increased their integration to global and regional value chains whereas a less dynamic private sector in poorer regions, with limited availability of providers of critical intermediate goods and access to finance, have prevented these regions to take advantage of the increasing integration to global markets. Moreover, these disparities have recently exacerbated due to the strong macroeconomic volatility and, in particular, the COVID-19 crisis hit the lagging regions the hardest largely due to the weak digitalization and inability to cope with adverse shocks exhibited by their firms. Indeed, while employment in Turkey declined by 4.6 percent between 2019 and 2020, the largest job losses took place in lagging regions in the east Overall, while eastern regions accounted for 10 percent of total employment before COVID-19, they accounted for 19 percent of job losses during the pandemic. (World Bank, 2022, forthcoming)

6. **This CPSD will explore policy options and investments in connectivity including logistics and digitalization that could facilitate national integration and enable agglomeration economies and**

**accelerate economic growth in lagging regions.** Higher trade costs and reduced accessibility to larger markets inhibit the ability of firms in economically distant regions to take advantage of economies of scale, specialize and increase trade within the country. With improved access to national markets, productivity in lagging regions is expected to increase due to the entry of new and productive firms and the exit of inefficient firms. Digital technologies can also play a key role in reducing trade costs and spread economic activity; however, the extent to which they are successful is contingent on complementary factors, such as the provision of public infrastructure and educational services in the urban centers of lagging regions. In addition, policies supporting firms' capabilities and innovation in lagging regions are needed to accelerate regional economic convergence.

7. **The remainder of this concept note is structured as follows.** Section II sets the state of play and provides a brief description of the country's medium-term development trends, a snapshot of the private sector and the general constraints faced by the private sector in Turkey, the climate change challenges faced by the country and ends summarizing the regional socioeconomic disparities. Section III outlines the proposed criteria orienting the selection of sectors to be assessed. Section IV presents a brief description of the sectors that have been initially selected for the diagnostic. Section V describes the CPSD quality control process, client participation and dissemination arrangements. Annex 1 informs the team composition, budget and the timetable for the preparation of the proposed CPSD.

## II. The State of Play

### a. Medium-Term Economic Growth Trends

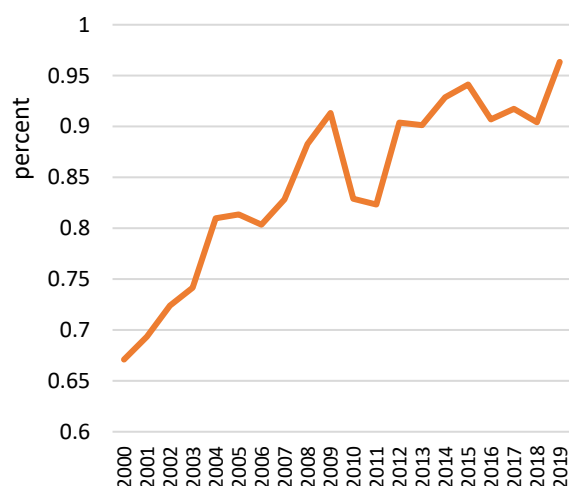
8. **In the last 20 years, Turkey's pace of income convergence has been remarkable.** Accelerated factor accumulation has been one of the main drivers of strong economic growth performance. Fostered by macroeconomic stability in the early 2000s, private and public investment speeded up capital accumulation, while the demographic bonus boosted labor supply. Regulatory reforms enhancing competition and increased trade and financial integration with the global economy also enabled the reallocation of factors to more productive sectors, elevating economy-wide productivity. Between 2000 and 2020, GDP grew at an average rate of 4.8 percent, from US\$274 billion in 2000 to US\$720 billion in 2020, making Turkey the 19<sup>th</sup> largest economy in the world. Rapid GDP growth almost tripled the country's income per capita from around US\$9,500 in 2000 to US\$27,500 (current, PPP adjusted, US\$). Growth in income per capita enabled Turkey to improve the welfare of its population and reduce poverty from 37 percent in 2003 to 8.5 percent in 2018.

9. **Turkish firms have become increasingly integrated into global markets.** After having tripled and doubled in the 2000s, between 2011 and 2019 Turkey's export values and volumes grew more than 30 percent and 50 percent, respectively, outperforming global exports by a large margin. As a result, Turkish merchandise exports as a share of global merchandise exports increased from 0.5 percent in 2000 to 1 percent in 2015. Metals and vehicle exports experienced the fastest growth rates, while textiles have been losing importance in the export basket. Exports are diversified in terms of destination and products. Exporters reach almost all countries in the world, although exports tend to be concentrated within the EU and the Middle East and North Africa (MENA) regions (World Bank 2021). At the product level, export

concentration is relatively low and slightly decreasing over time. Excluding tourism, travel and transport services (that represent about 25 percent of export revenue) the top 5 products exported represent about 15 percent of export revenues in 2019.<sup>2</sup> Moreover, the number of firms exporting has increased by 70% over the period 2006-2016,<sup>3</sup> while the number of importers, mostly of intermediate goods and services, has increased by 41.5%. Turkish exports show a gradual substitution of low-tech for mid-tech products with increasing shares of electronics, vehicles and machinery, while imports continue being concentrated in more tech-intensive sectors, such as electronics and machinery, and ICT services imports have been also growing substantially (World Bank, 2019 and Atlas of Economic Complexity, CID-Harvard, 2020).

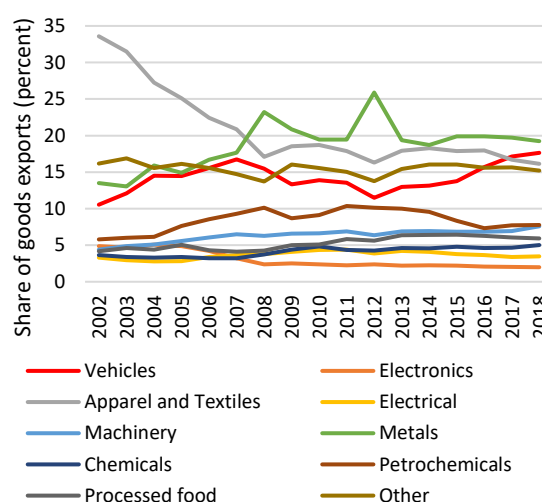
10. **Turkey's integration into the world economy happened on the back of global value chains.** Turkish firms participate in GVCs by buying intermediate products and producing final goods, as well as by producing intermediate goods themselves and exporting them to producers of final goods. Turkey's backward participation into GVCs – measured as the portion of import content in Turkey's exports - increased dramatically at the turn of the century and continued growing during the following fifteen years. In 2000, every US\$100 of revenue exported by Turkish firms had US\$10 of import content. In 2016, this increased to US\$17. Forward participation – measured as the portion of Turkish content in other country's exports - has also increased. In 2000, of every US\$100 exported, 11 ended up in the exports of other countries, while in 2015, this was US\$13. Participation in GVCs also helped to increase the domestic value-added of Turkey exports with it almost tripling between 2000 and 2015.

**Figure 1: Share of Turkey in world exports, 2000-2019**



**Sources:** World Bank (2021) with data from World Development Indicators (WDI)

**Figure 2: Turkey's goods exports, by product group**



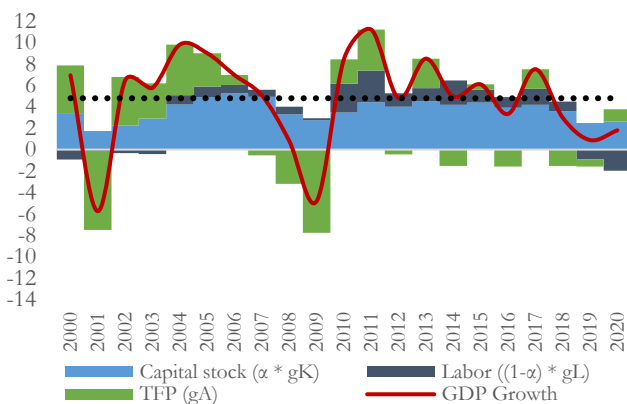
**Sources:** World Bank (2021) with data from UN Comtrade, TiVA 2018.

<sup>2</sup> Passenger cars, auto parts, buses, precious metals, petroleum oil refined and textiles are the most relevant exports (Atlas of Economic Complexity, CID-Harvard, 2020). See annex 1 for more details

<sup>3</sup> Based on sample from EIS data; according to TURKSTAT data, the number of exporters increased by 52 percent from 2006 to 2016.

11. **Nonetheless, macroeconomic volatility in the post global financial crisis period has inhibited domestic savings, investment and undermined the sources of sustainable economic growth.** Despite Turkey having successfully navigated its way out of the global financial crisis of 2008, in the past ten years, economic growth has been lower and more volatile than in the 2000s, and highly dependent on short-term demand-side macroeconomic management and foreign savings. High and persistent external current account deficits reflect the wide investment-savings gap and the strong reliance on foreign short-term capital inflows. Macroeconomic imbalances, as reflected in foreign exchange volatility and high inflation, have tapered investment and hampered faster and more sustainable economic growth. Procyclical credit policies and subsidies have favored consumption, inefficient investment and firms' indebtedness. Macroeconomic instability has also deterred foreign direct investment (FDI) and stimulated procyclical short-term portfolio investments which have further exacerbated volatility. FDI fell to around 1 percent of GDP in the last years from over 3 percent of GDP in the 2000s, and it was mostly allocated to construction and real estate rather than innovative sectors.

**Figure 3: GDP growth decomposition (%), 2000-2020**



Source: TURKSTAT, WB Staff estimates

have lowered potential GDP growth below 4 percent which is expected to slow-down the country's convergence to EU income levels.

13. **While Turkey's economic rebound from the COVID-19 crisis has been robust, the GoT response to the pandemic has heightened internal and external macroeconomic imbalances.** Turkey closed 2020 as one of the few economies worldwide to experience positive economic growth and the recovery continued firmly in 2021, with the country's GDP growing at more than 10 percent. Before the pandemic outbreak, Turkey had been facing high and persistent inflation, and high external account imbalances. Inflationary pressures further intensified as a result of the Government's COVID-19 monetary response. Fueled by a monetary and credit expansion, inflation reached 14.6 percent in 2020 and accelerated to 36 percent in 2021. The fall in manufacturing exports and tourism revenues related to the pandemic and the monetary easing, resulted in a large current account deficit of 5.2 percent of GDP in 2020, which was reduced to around 2.5 percent in 2021, following a strong export recovery. Large current account deficits, low levels of international reserves, high debt repayment obligations and heightened policy uncertainty resulted in a cumulative exchange rate depreciation of 120 percent since the start of the COVID-19

12. **Productivity growth has slowed down in the last decade and its contribution to GDP growth has been declining path in recent years.** Low productivity growth is associated with allocative inefficiencies with resources shifting to low productivity sectors, even within manufacturing sectors, which apart from motor vehicles, basic metals and textiles, have stagnated in recent years. Construction and services, on the other hand, have expanded rapidly, however they suffer from low and declining productivity. Low and declining capital investment and total factor productivity growth, among other factors,

pandemic. Reflecting the deterioration of the country's external position, the credit default risk (CDS) increased by more than 80 percent since the onset of COVID-19.

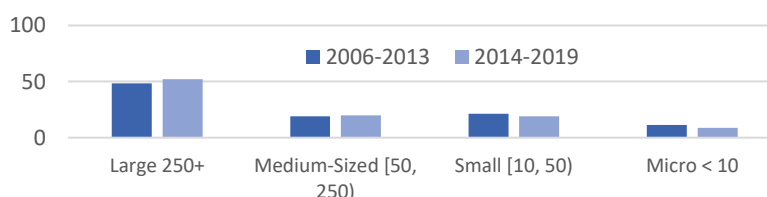
14. **The impacts of the heightened volatility are considerable and may have persistent effects which are expected to undermine medium-term economic growth.** High inflation is expected to negatively affect labor income and consumption in the short run. The strain on banks and firms' balance sheets provoked by the exchange rate depreciation may tighten financial conditions and reduce investments, with negative impacts on medium term growth. Raising country risk premiums will make external credit more expensive for domestic firms and less favorable external financial market conditions will further increase borrowing costs.

15. **Higher and more sustainable economic growth depends on macroeconomic stabilization and the resumption of supply side reforms to enhance productivity.** A more stable macroeconomic environment addressing internal and external imbalances is needed for boosting confidence for increasing private investment and attracting FDI. Some of the policy actions required to do so include reducing macro-economic volatility and boosting investor confidence by enhancing the credibility of the economic policy framework, reducing inflation and external sector imbalances, resolving corporate debt-distress and improving the asset quality of the financial sector that were negatively affected by COVID-19 pandemic, and maintaining a prudent level of public debt.

#### **b. A glimpse of Turkey's private sector**

16. **Despite micro firms being the largest group in terms of number of firms and employment shares, large firms on average have the greatest share of sales in Turkey.** When firms are divided into 4 size groups in terms of their number of employees micro firms (<10) accommodates the largest number of firms (91.9 percent) while the share of small firms [10, 50) in total number of firms is 6.8 percent, the share of medium-sized firms [50, 250) is 1.1 percent and the large firms' (250+) share is 0.2 percent. In terms of the labor shares in total employment, large firms employ 28 percent of the total employment, while this share is 16.3 percent for medium-sized, 19.9 percent for small and 35.6 percent for micro firms as of 2020. Large firms, however, dominate the sector in terms of total sales (see Figure 4). Moreover, the dominance of the large firms expanded more recently, so that the sales share of large firms was on average 48.5 percent for the period from 2006 to 2013, and it raised over 52 percent between 2014 and 2019.

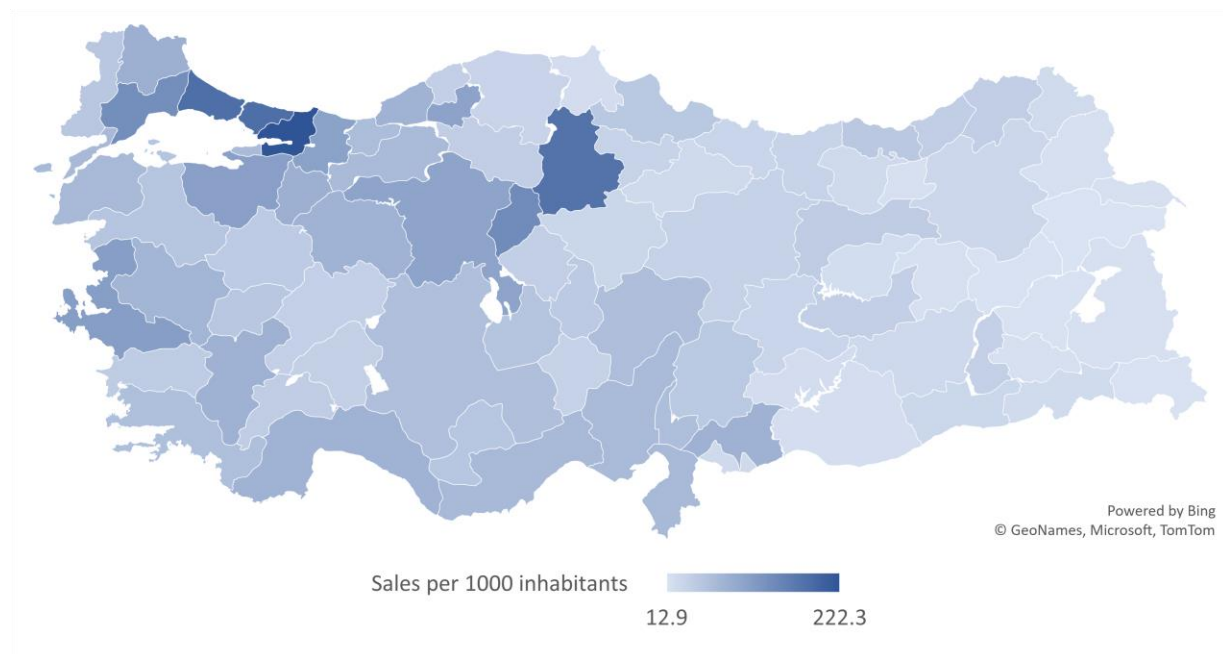
*Figure 4: Share of Firm Size Groups in Total Sales (%)*



Source: Enterprise Information System, Ministry of Industry and Technology of the Republic of Turkey  
<https://gbs.sanayi.gov.tr/>

17. **The largest portion of total sales in Turkey comes from the Western and Central Anatolian regions.** Istanbul accommodates firms that produce the largest portion of total sales (36.7 percent), followed by Ankara and Izmir where shares in total are 7.6 and 6.4 percent respectively. In general, cities with larger sales share are concentrated in the Western, Central and Southwest Anatolia where in the southwest region, most of the sales come from the tourism sector. The share of sales and the population of cities are positively correlated in Turkey, so that the regional differences in the sales shares diminish when sales per inhabitant is taken into account. As can be seen in **Figure 5**, when population density is considered, sales per inhabitant is the lowest in the southeast Turkey. Sales per inhabitant is generally highest in the Marmara region, in the cities surrounding Istanbul where large scale manufacturing activities take place.

*Figure 5: Distribution of Sales across Cities in Turkey, Sales per 1,000 inhabitants*



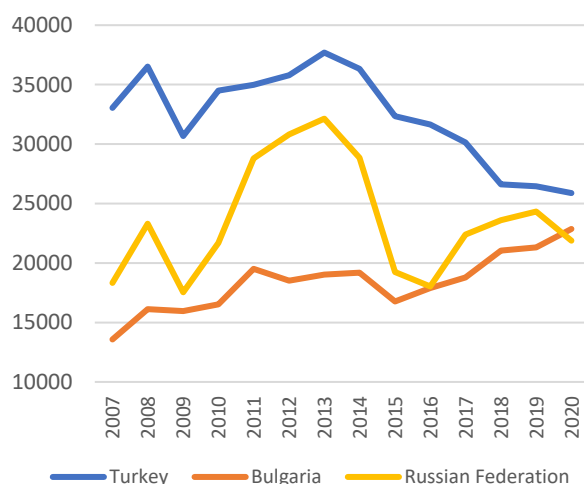
**Source:** Entrepreneurship Information System, Ministry of Industry and Technology of Turkey, <https://gbs.sanayi.gov.tr>.

18. **Notwithstanding efforts to increase the competitiveness of the private sector, labor productivity in Turkey is on a diminishing trend since 2013, along with GDP per capita (see Figure 6).** As the breakpoint for the Turkish economy, the year 2013 has witnessed increasing turbulence and violence in the Middle East which later affected, to some degree, all economies in the wider region. The positive growth path in GDP per capita since 2001 was interrupted twice, in 2009 and in 2013, with the latter shock being permanent. In addition to the worsening macroeconomic and socio-political conditions, slowdown in firm specific performances was observed almost simultaneously. Akçiğit et al. (2020),<sup>4</sup> for instance, find

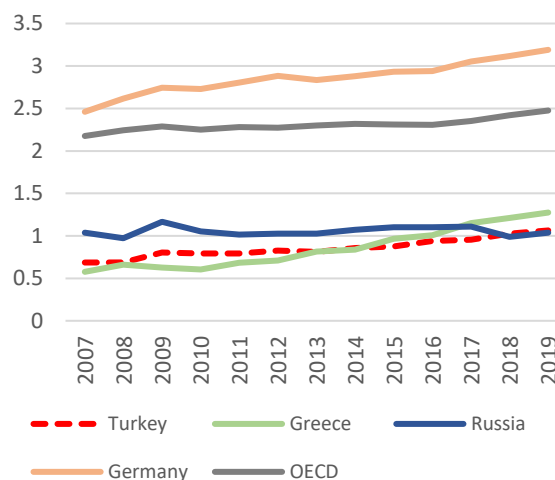
<sup>4</sup> Akçiğit, Ufuk and Akgündüz, Yusuf Emre and Cilasun, Seyit Mumin and Özcan-Tok, Elif and Yılmaz, Fatih (2020) "Facts on business dynamism in Turkey", European Economic Review, Vol.128.

that there is a period of slowdown in business dynamism started in 2013 which is attributed to the increase in the cost of R&D investment. The study suggested an explanation for the rising costs that is the tapering announced by FED in 2013 which caused an increase in the investment costs particularly for follower firms that could have otherwise challenged market leaders. Akçiğit et al. (2020), however, do not exclude the role of worsening macroeconomic conditions that increased the level of uncertainty faced by firms. Uncertainty is among the key factors that lowers the incentives of producers to invest in Turkey.

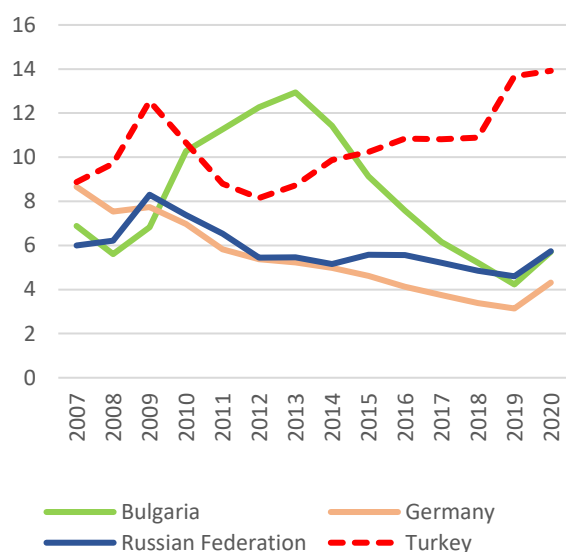
**Figure 6: Labor Productivity (GDP in Current USD/#Employees); Turkey vs Comparators**



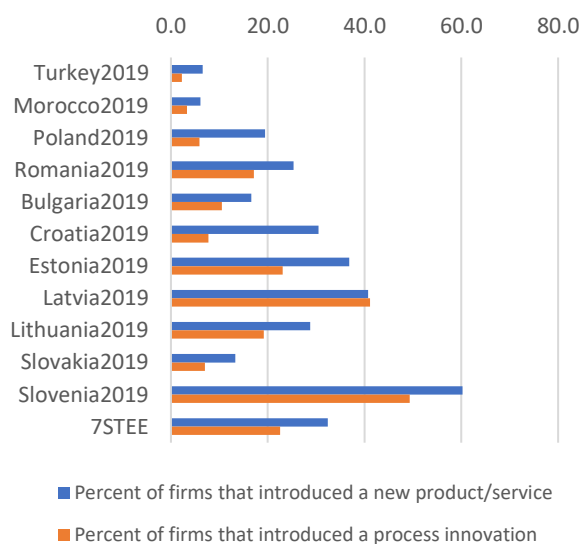
**Figure 7: Gross domestic spending on R&D, % of GDP**



**Figure 8: Unemployment (% of Labor Force)**



**Figure 9: Process and Product Innovation, Turkey and Selected Peers, 2019**



Source: World Bank, DataBank  
<https://data.worldbank.org/>.

Source: World Bank Enterprise Survey, 2019.

19. **Although rising continuously until 2019, the share of total R&D investment in GDP is still low in Turkey in comparison with the OECD average.** R&D is an investment in technology and capabilities which is likely to be transformed into new products and processes. R&D refers to all types of creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this stock to develop new and improved products and processes. Empirical evidence suggests that R&D improves firms' productivity performance because of its critical role in firm-level innovation process. In Turkey, the share of R&D investments in the GDP rises rapidly in the last decade, but it is still less than half of the OECD average. Moreover, Turkey's speed of increase in the R&D share is not the fastest in the region. **Error! Reference source not found.** displays the GDP share of R&D was lower in Greece before 2013, but it outpaced the share in Turkey after 2013 and the gap seems to widen over time. Figure 9 shows that self-reported rates of product and process innovation among Turkish firms are lower than the reported by firms in selected peers.

20. **Access to finance seems to be the biggest obstacle faced by firms and inefficiencies in the tax system and political instability are seen as major institutional and regulatory barriers to entrepreneurship.** The World Bank's Enterprise Survey (2019) shows that 29 percent of Turkish firms in the survey sample consider access to finance is a major impediment to entrepreneurship in Turkey, while this share is on average 10 percent in ECA and 14.3 for all the countries in the sample. The share of firms that identify tax rates as a major constraint in Turkey is 67 percent, which is twice as high as that of the average country in the sample. Moreover, the share of Turkish firms that find tax administration as a major constraint and the share of those choosing political instability as the biggest obstacle are significantly higher than the shares observed in other countries. Firm perceptions on the main obstacles they face vary with the size and across regions. While access to finance is seen as the top obstacle for small, medium and large firms, high tax rates seem to be a major obstacle in the transition and less developed regions of the country, while political instability seems to be seen as a top constraint in transition and more developed regions. Competition with informal sector seems to be more relevant for small firms in the less developed regions of the country, while labor regulations are perceived as binding constraints in the less developed regions (see Figure 10 below).

*Table 1: Obstacles to Entrepreneurship from Firms' Perspective*

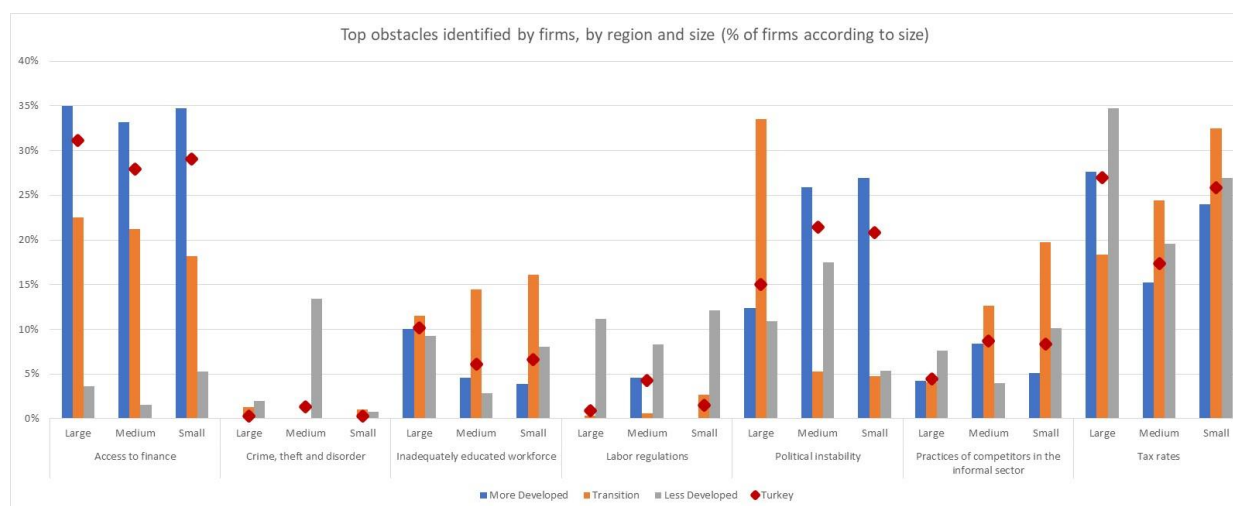
|                                                                           | Turkey | Europe & Central Asia | All Countries |
|---------------------------------------------------------------------------|--------|-----------------------|---------------|
| Percent of firms choosing access to finance as their biggest obstacle     | 28.9   | 9.6                   | 14.3          |
| Percent of firms identifying tax rates as a major constraint              | 66.6   | 29.5                  | 30.5          |
| Percent of firms identifying tax administration as a major constraint     | 32     | 16                    | 21.3          |
| Percent of firms choosing political instability as their biggest obstacle | 20.8   | 9                     | 11.6          |

Source: Enterprise Survey 2019. <https://www.enterprisesurveys.org/en/data/exploreeconomies/2019/turkey#performance> (accessed on 4/3/2022)

21. **Firms' perceptions on the main obstacles to business activity vary with the size and across regions (Figure 10).** While access to finance is seen as the top obstacle for all firms, regardless of size, high tax rates seem to be a major obstacle in the transition and less developed regions of the country, while

political instability is seen as a top constraint in transition and more developed regions. Competition with the informal sector seems to be more binding for small firms in the less developed regions of the country, while labor regulations are perceived as binding constraints in the less developed regions.

**Figure 10: Top obstacles by firms' size and regions, 2019**



**Source:** World Bank Enterprise Survey, 2019.

**22. Female entrepreneurship and female labor force participation are low in Turkey compared to other ECA countries.** Low female labor force participation is not only an indicator of inefficient use of the labor force in a country, but also an indicator of a poor institutional setup. The recent Enterprise Survey estimated that the share of female full-time workers in the survey sample was only 19.5 percent, which is half of the ECA average. In addition to female labor force participation, female entrepreneurship is an important source of economic growth. Women entrepreneurs tend to have different perspectives to certain problems, which enhances the quality of managerial decisions. Women entrepreneurs can reduce the unfair treatment of women in the workplace and contribute positively to efforts to increase female labor force participation. The female entrepreneurship, however, is very low in Turkey. The share of firms that have any degree of female ownership is 11.3 percent in Turkey, while this share is on average above 30 percent in other countries from around the world. Moreover, in Turkey, the share of firms with a majority female ownership is 3.9 percent, while it is estimated to be above 10 percent, on average, in the rest of the world according to the Enterprise Survey sample.

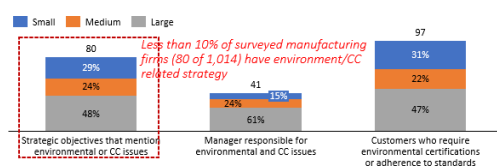
**Table 2 Female Entrepreneurship and Female Labor Force Participation**

|                                                               | Turkey | Europe & Central Asia | All Countries |
|---------------------------------------------------------------|--------|-----------------------|---------------|
| Percent of firms with female participation in ownership       | 11.3   | 33.7                  | 33.1          |
| Percent of firms with majority female ownership               | 3.9    | 13.7                  | 14.8          |
| Percent of firms with a female top manager                    | 3.9    | 18                    | 17.8          |
| Proportion of permanent full-time workers that are female (%) | 19.5   | 38.6                  | 32            |

**Source:** Enterprise Survey 2019. <https://www.enterprisesurveys.org/en/data/exploreeconomies/2019/turkey#performance> (accessed on 4/3/2022)

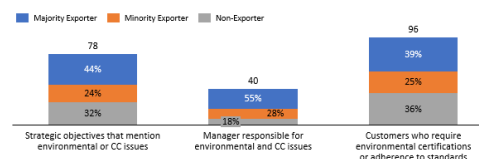
23. **Climate change and environmental sustainability are not the biggest priority for managers of firms in Turkey; however, this may change as the greening of processes, products, and value chains becomes financially sustainable for firms.** The World Bank’s Enterprise Survey for Turkey (2019) revealed that less than 10 percent of surveyed firms have firm-level strategic objectives related to climate change and less than five percent have a dedicated managerial role with an overview of environment or sustainability issues (Figure 11). However, this trend may have weakened in more recent times with more companies in Turkey publicly announcing their decarbonization and net zero ambitions in the last two years. The availability of financially feasible climate-friendly solutions which help firms reduce operating expenses will be essential to further drive firm-level climate action. For instance, in the chemical industry incumbent technology, such as steam crackers (each costing \$2 billion) and furnaces (each costing \$0.5-1 billion), are substantial capital expenditure items and using the best available energy efficiency technology for such heavy capital investments can only be financially justified by future sizeable reductions in operating expenses. Additionally, lack of direct monetary losses, due to climate change related extreme weather events<sup>5</sup> or due to pollution-related negative externalities, and insufficient emissions monitoring may also explain the low focus on climate prioritization among manufacturing enterprises.

**Figure 11: Share of firms (by size) with a strategic, managerial, or customer-driven focus on environment and climate topics**



**Source:** World Bank Enterprise Survey for Turkey, 2019. NB: Simple (and not weighted) averages have been used. | \*Excludes firms categorized as “Medium and Large” and excludes firms with sub-sector categories of “Construction”, “Retail”, and “Other Services”

**Figure 12: Share of firms (by export orientation) with a strategic, managerial, or customer-driven focus on environment and climate topics**



**Source:** World Bank Enterprise Survey for Turkey, 2019. NB: Simple (and not weighted) averages have been used. | Majority exporter is a firm with more than 50% of its sales being exported (directly or indirectly)

24. **While larger and more export-oriented enterprises have been relatively more proactive in their climate focus, decarbonizing manufacturing also needs strengthening innovation capacities.** Disaggregating by firm size shows that larger firms are relatively more proactive in incorporating climate as part of firms’ strategic objectives and having sustainability officers responsible for environment-related concerns – possibly reflecting their better management and overall capacity for change (Figure 11). Similarly, a climate focus was much more prevalent among export-oriented firms compared to domestically-focused businesses as the former may have to adhere to sustainability standards required by export destinations – particularly the key EU market (Figure 12). Moreover, not surprisingly, the less innovative firms<sup>6</sup> were also the firms which did not have climate-related strategic objectives (Figure 13).

<sup>5</sup> Such as storms, floods, droughts, or landslides

<sup>6</sup> In terms of R&D spend and/or implementation of product/process innovation in the last three years

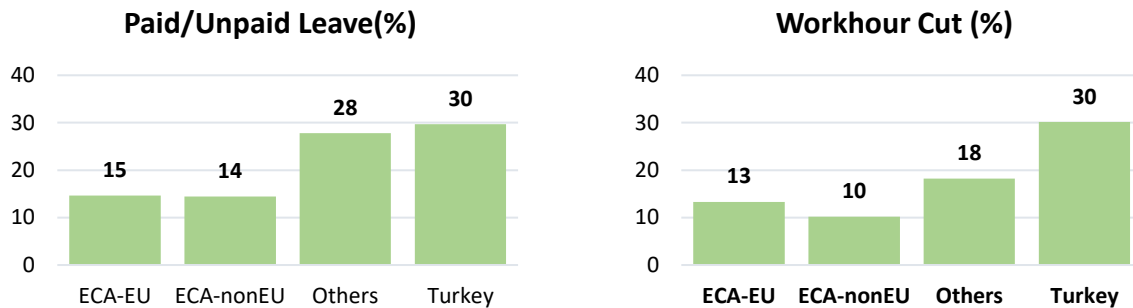
**Figure 13: Innovation and CC prioritization - Majority firms which did not invest in innovation also did not have strategic climate objectives**

| <i>N = 206</i>                  |                                     |                                        |
|---------------------------------|-------------------------------------|----------------------------------------|
|                                 | Strategic climate objectives (2019) | No Strategic climate objectives (2019) |
| R&D spend (2019)                | 20%                                 | 21%                                    |
| No R&D spend (2019)             | 2%                                  | 56%                                    |
| <i>N = 985</i>                  |                                     |                                        |
|                                 | Strategic climate objectives (2019) | No Strategic climate objectives (2019) |
| Process innovation (2016-19)    | 1%                                  | 2%                                     |
| No process innovation (2016-19) | 7%                                  | 90%                                    |
| <i>N = 988</i>                  |                                     |                                        |
|                                 | Strategic climate objectives (2019) | No Strategic climate objectives (2019) |
| Product innovation (2016-19)    | 2%                                  | 7%                                     |
| No product innovation (2016-19) | 6%                                  | 85%                                    |

**Source:** Enterprise Survey for Turkey, 2019. NB: Simple (and not weighted) averages have been used.

25. **The COVID-19 pandemic was the most prominent shock faced by the private sector in the last two decades and Turkish authorities prioritized employment protection policies.** To mitigate the adverse effects of pandemic, Turkish authorities introduced a set of measures prohibiting labor dismissals and firm bankruptcy for a temporary period which was lasted more than a year. During this period, the job destruction rates diminished considerably while the observed destruction in the official statistics was mostly due to the termination of temporary contracts. Despite the introduction of the ban on firm closures and firing, many firms discontinued production either voluntarily, for instance, because of health concerns of the employees or involuntarily, due to governmental lockdown. Thus, a large number of firms who had to reduce their production capacity during the pandemic, reported that they adjusted the amount of labor used in production by reducing workhours or issuing paid or unpaid leave to their employees. Thus, the average share of employees who received leave or workhour reductions is significantly higher in Turkey in comparison to countries in the ECA (see **Figure 14**). To mitigate the financial burden of the pandemic, the authorities also introduced new forms of credit policies to support firms or increased the scale of existing firm support mechanisms.

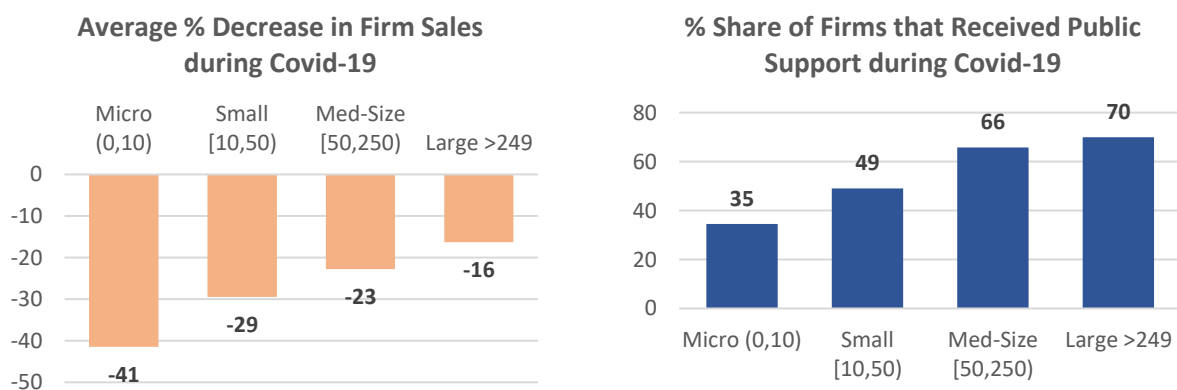
**Figure 14: Firms' Average Share of Employees who Received a Specific Treatment during the Pandemic**



**Source:** Data collected by World Bank's Business Pulse Survey (<https://www.worldbank.org/en/data/interactive/2021/01/19/covid-19-business-pulse-survey-dashboard>).

26. During the COVID-19 pandemic, the percentage of supported firms was higher for larger firms in Turkey although large establishments experienced, on average, a milder shock in sales in comparison to smaller producers. One potential reason behind the positive correlation between firm size and the chance of receiving support during the pandemic could be that authorities tend to protect strategic establishments, such as those that employ an important share of the labor force or such as exporting firms which are generally larger than the average firm in the same industry. This, however, may imply a sub-optimal allocation of public support, since SMEs employ a larger portion of the total employment (72 percent as of 2020) in Turkey. Apart from the inefficient use of public support, favoring large firms may have detrimental effects on the long-run evolution of industries. When large firms gain further monopolistic power due to favoring policies, they tend to develop strategies to preserve their positions in the market. This behavior can neutralize incumbents' innovative efforts, create barriers to creative destruction and halt aggregate productivity growth.

**Figure 15: Impact of Covid-19 and the Policy Response in Turkey by Firm Size**



**Source:** Data collected by World Bank's Business Pulse Survey (<https://www.worldbank.org/en/data/interactive/2021/01/19/covid-19-business-pulse-survey-dashboard>).

### c. Turkey's climate change challenges and government goals and commitments

27. **The growth of Turkey's private sector and its contribution to the country's development goals are exposed to physical and transition risks associated to climate change and the global decarbonization agenda.** More frequent and intense natural hazards related to climate change, such as floods, droughts, forest fires and earthquakes, as well as changes in weather patterns and water scarcity, are expected to increasingly impact output, productivity, the continuity of businesses operations, the attractiveness and profitability of economic sectors, and ultimately discouraging private sector investments. Acknowledging that the country's development objectives are vulnerable to climate change, the GoT has directed its efforts towards addressing climate change challenges, and recently committed to achieve net zero emissions by 2053 and ratified the Paris Agreement. In addition, transition risks, including the adoption of the Carbon Border Adjustment Mechanism (CBAM) and the European Green Deal, are expected to shape Turkey's integration into Global Value Chains (GVCs) and substantially affect its manufacturing exports as the EU is Turkey's largest trading partner. This is the case especially in emissions-intensive industries with a high trade exposure.

28. **Turkey ratified the Paris Agreement and strengthened a set of domestic commitments on climate change.** At the April 2021 Climate Change Summit, Turkey announced a broad set of commitments and priorities related to climate change, with a strong emphasis on resilience and adaptation, and proposed actions around energy-efficient, climate-sensitive residential areas, agriculture, the Zero Waste Project, and renewable energy. Ahead of the Glasgow COP26 Summit, it also announced its net zero target by 2053, and it must now submit an updated NDC with a more ambitious emission reduction target that is in line with its long-term commitment.

29. **Turkey has several climate-policy documents.** Climate change-related issues are regulated through the articles of various laws, including Agricultural Insurance Law, Nature and Biological Diversity Protection Law, Energy Efficiency Law, Building Energy Performance By-Law, and By-Law for Preparation of Spatial Plans. The main climate policy documents are the National Climate Change Strategy (2010–2023)<sup>7</sup>, with short-, medium- and long-term objectives on adaptation and mitigation; NCCAP (2011–2023)<sup>8</sup>, covering key areas, including energy, buildings, industry, transport, waste, agriculture, land use and forestry, and adaptation; the NCCAP Monitoring System<sup>9</sup>; and the National Climate Change Adaptation Strategy and Action Plan (2011–2023).<sup>10</sup>

30. **Significant cuts in GHG emissions would require coordinated actions in the key emitting sectors, including the power sector, manufacturing and transport while also pursuing greater energy efficiency in buildings.** The power sector consumes more than half of coal resources (63%) and is responsible for 32% of GHG emissions (Figure 16). Selected manufacturing sectors and construction are responsible for up to 14% and transport 16%. Residential and public buildings are particularly energy intensive, using up to 33% of total energy and represent up to 19% of GHG emissions. Agriculture also represents up to 12% of emissions.

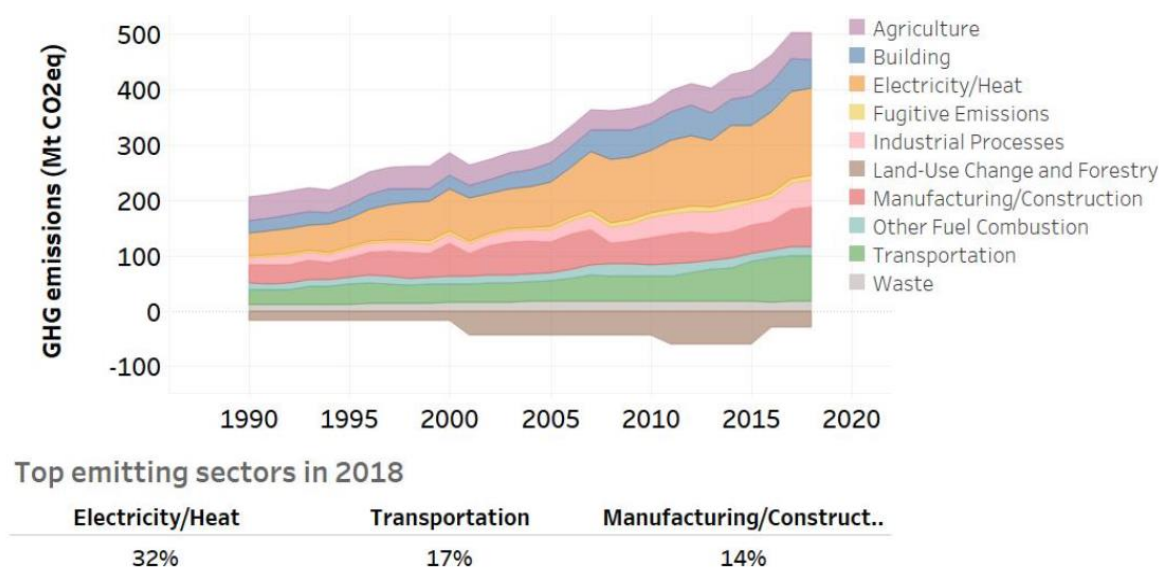
<sup>7</sup> [https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim\\_degisikligi\\_stratejisi\\_EN\(2\).pdf](https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim_degisikligi_stratejisi_EN(2).pdf)

<sup>8</sup> [https://webdosya.csb.gov.tr/db/iklim/editordosya/file/eylem%20planlari/iklim\\_degisikligi\\_eylem\\_plani\\_EN\\_2014.pdf](https://webdosya.csb.gov.tr/db/iklim/editordosya/file/eylem%20planlari/iklim_degisikligi_eylem_plani_EN_2014.pdf)

<sup>9</sup> <https://iklim.csb.gov.tr/e-iklim-sistemi-i-100>

<sup>10</sup> [https://webdosya.csb.gov.tr/db/iklim/editordosya/file/eylem%20planlari/uyum\\_stratejisi\\_eylem\\_plani\\_EN\\_Final.pdf](https://webdosya.csb.gov.tr/db/iklim/editordosya/file/eylem%20planlari/uyum_stratejisi_eylem_plani_EN_Final.pdf)

Figure 16: GHG emissions (including LUCF) by sector



Source: CAIT Climate Data Explore

31. **Turkey's current GHG emissions are about 15% lower than the mitigation scenario in its INDC and the proposed mitigation actions are aligned with many of the priority areas above.** The INDC targets up to a 21% reduction in GHG emissions from the BAU level by 2030 – although this is less ambitious than others such as the EU and its Member States which committed to a binding target of least 40% domestic reduction compared to 1990 levels. Turkey's INDC encompasses a full range of mitigation areas: energy, industry, transport, urban transformation, agriculture, waste, and forestry. Energy actions focus on ramping up renewable energy options and reducing the inefficiencies in the current grid. There is a focus on reducing emissions intensity and energy inefficiency in industries and transport with a shift to cleaner fuels, vehicles, and transport modalities (i.e., rail). New construction requirements and energy efficiency standards in buildings is another major mitigation pillar. Options in agriculture mostly focus on input-saving measures, though there are no emissions reduction targets or plans. Afforestation activities have contributed significantly to the reduction of emissions (i.e., LULUCF). Actions among waste prioritize safer disposal in landfills and greater recovery and reuse of waste streams (i.e., waste to energy) that are in the direction of a more circular economy.

32. **Turkey has made progress in reducing air pollution, but the health costs remain high relative to higher-income countries.** Although the growth in Nitrogen dioxide (NO<sub>2</sub>) and particulate matter, ten micrometers in diameter (PM<sub>10</sub>), has been stable or declining relative to Turkey's economic growth, Sulphur dioxide (SO<sub>2</sub>) and particulate matter, less than 2.5 micrometers in diameter (PM<sub>2.5</sub>), emissions have increased, but at a slower rate than economic growth (Annex 1, table 1). The main contributors are in the power, manufacturing and transport sectors. Given air pollution's link to human health, the growth in PM<sub>2.5</sub> is concerning; and its economic cost is also equivalent to over 5 percent of GDP - double that in OECD countries.

33. **Land, soil, and forest degradation continue to be under pressure from climatic and human-induced factors, but efforts toward reforestation have been successful.** The combination of geographic, topographic, climatic, soil characteristics, and unsuitable farming practices makes Turkey particularly prone to soil erosion. An average of 642 million tons of soil is transported every year in Turkey due to water erosion. Of this amount, 60% of the total surface area is classified as very light erosion, 19% as light, 8% as moderate, 6% as severe, and 7% as very severe.<sup>11</sup> A recent study estimates 32% of the country's territory is at high risk of land degradation and desertification, 34% is considered "fragile," and 8% is at "potential" risk.<sup>12</sup> About 43% of Turkey's forests remain degraded,<sup>13</sup> despite the ongoing reforestation efforts since the 1970s (Turkey ranked 6<sup>th</sup> globally in terms of its average annual net forest gain between 2010 and 2020).<sup>14</sup> These resources support the livelihoods of millions of rural villagers who diversify their income between agriculture- and forestry-based income. Many of the products (both wood and non-wood) they produce are at the bottom of the value chain and the Government has been working with forest village communities to create greater processing and value-added.

34. **Resource efficiency and recycling need to grow as part of a transition to a circular economy.** Although Turkey's municipal waste generation was lower than the OECD average (424 kg/capita/year in 2018 versus 525) and has been declining since 2001, the bulk of municipal waste is sent to landfills or dumpsites. Most domestic material consumption is in sectors related to non-metallic mineral extraction for construction and use in buildings - including cement, stone and ceramic products, glass and glass products, stone, sand, and clay - and biomass used by rural households for domestic heating purposes. Growing demand for energy has prompted a 34 percent increase in fossil energy material imports since 2010.

35. **Climate-related disasters and extreme events<sup>15</sup> are increasing in Turkey.** Extreme events are occurring with greater frequency and intensity in the last two decades with 935 extreme events in 2018 alone, and mainly from heavy rain/floods, windstorms and hail.<sup>16</sup> Long-term average annual losses due to disasters in Turkey are estimated at \$711 million per year for earthquakes, and \$843.4 million for floods<sup>17</sup>. Together, these hazards are expected to provoke losses in the amount of \$1.5 billion per year.

36. **Turkey is also exposed to transition risks as the world, and particularly the EU, works towards a low or net zero carbon future.** As part of its ongoing commitment to mitigating climate change, the

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<sup>11</sup> ÇEM, 2018. "DEMİS Türkiye Su Erozyonu İstatistikleri, Teknik Özet" Çölleşme ve Erozyonla Mücadele Genel Müdürlüğü Yayınları, Ankara, Türkiye; GDDEC, 2018. "DEMIS Turkey Water Erosion Statistics, Technical Summary". General Directorate of Desertification and Erosion Control Publications, Ankara, Turkey.

<sup>12</sup> Dengizb, O. Ş Uzunera, C. (2020). Desertification risk assessment in Turkey based on environmentally sensitive areas. Ecological Indicator 114.

<sup>13</sup> World Bank. 2017. Turkey: Forest Policy Note. Washington, D.C.: World Bank.

<sup>14</sup> FAO (2020). Global Forest Resources Assessment 2020: Main report. Rome. <https://doi.org/10.4060/ca9825en>

<sup>15</sup> In line with IPCC (2012), extreme events are a weather or climate events that are above (or below) the range of naturally observed events. A disaster is a severe alteration in the normal functioning of a community, society or economy (e.g. requiring emergency responses) due to hazardous physical events, such as extreme weather or climate events. See [https://www.ipcc.ch/site/assets/uploads/2018/03/SREX\\_Full\\_Report-1.pdf](https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_Full_Report-1.pdf)

<sup>16</sup> Turkish State Meteorological Service (2020). State of the Climate in Turkey in 2019. Accessed on November 30, 2020. [https://mgm.gov.tr/eng/Yearly-Climate/State\\_of\\_the\\_Climate\\_in\\_Turkey\\_in\\_2019.pdf](https://mgm.gov.tr/eng/Yearly-Climate/State_of_the_Climate_in_Turkey_in_2019.pdf)

<sup>17</sup> World Bank (forthcoming). Overlooked: Examining the impact of disasters and climate shocks on poverty in the Europe and Central Asia Region. Washington DC.

European Commission is considering the use of a CBAM, which would put a carbon price on imports of certain goods to the EU, based on their emissions intensities.

37. **The CBAM will have significant impacts on Turkey, but only on a few emissions-intensive industries that have high trade exposure to the EU market.** Although the EU absorbs 49 percent of Turkey's total goods exports, only 4 percent are likely to be covered by the current proposed CBAM. The iron and steel sector is of most concern: 37 percent of Turkey's likely covered exports in this sector are absorbed by the EU, and its ferrous metals sector has higher emissions intensity than other major exporters, such as the EU and Republic of Korea, though lower than China and the Russian Federation.<sup>18</sup> Aluminum production is also highly exposed, although the emissions intensity of Turkey's production of non-ferrous metals (including aluminum) fares slightly better when compared with other major exporters, such as the EU and China. The European Commission has kept the door open to a future expansion of the CBAM's scope, potentially covering sectors such as chemicals, petroleum products, and glass. The implementation of an EU CBAM presents opportunities for Turkey to reduce emissions to capture market share at the expense of more emissions-intensive competitors.

38. **In August 2021, the government released its Green Deal Action Plan<sup>19</sup>** to help Turkey transition to a sustainable and resource-efficient economy and in response to the comprehensive changes envisaged by the European Green Deal. The Action Plan comprises a total of 32 objectives, and 81 actions under 9 main headings including: carbon border adjustments, green and circular economy, green finance, clean, affordable and secure energy supply, diplomacy, combatting climate change, sustainable smart mobility, sustainable agriculture and information and awareness raising activities. Across all these activities there is a significant role to play by the private sector – from innovation, emissions reduction, and finance.

#### **d. Regional Socioeconomic Disparities**

39. **Turkey exhibits substantial regional disparities in socioeconomic development.** Differences in economic development, income levels, and social indicators are huge between the industrialized western and the less developed eastern regions. In 2019, the country's wealthiest region, Istanbul, had a GDP per capita (US\$15,228), more than three times higher than the observed in the least developed region of Central East Anatolia (US\$4,562). These disparities are reflected in household income, poverty rates and other socioeconomic indicators. Household income in Istanbul is more than 2 times larger than the one observed in the southeast. The poverty rate in Istanbul is 3 percent whereas it is 27 percent in in Southeast Anatolia.<sup>20</sup>

40. **Differences in economic structure, urbanization and population density explain in productivity and levels of income.** While less developed regions have experienced factor reallocation towards services and industry sectors, differences in economic structure between less and more developed regions are still

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<sup>18</sup> Due to the high level of sector aggregation, comparisons between countries mask differences in the outputs of sectors between countries.

<sup>19</sup> <https://ticaret.gov.tr/data/60f1200013b876eb28421b23/MUTABAKAT%20YE%C5%9E%C4%B0L.pdf>

<sup>20</sup> Poverty line set at \$5.50 per person per day in 2011 PPP.

substantial.<sup>21</sup> Agriculture in lagging regions employs 31 percent of labor and generates more than 15 percent of total GDP, while the same figures in developed regions correspond to 4 percent and 11 percent, respectively. In fact, the weight of industry in developed regions is much higher and it is associated with higher urbanization, population and economic density that are reflected in larger economies of scale and agglomeration spillovers which, in turn, explain a considerable productivity gap between lagging and developed regions. High urbanization enables firms' access to specialized inputs, technology and international markets, and the concentration of skills, financial capital, markets, amenities, information and innovation. Indeed, the density of firms in lagging regions is much lower than the observed in developed regions (nearly 30,000 firms per million of inhabitants in the eastern compared to 55,000 registered in westerns regions). Moreover, the output per square kilometer produced in Istanbul is 22 times higher than in Gaziantep, the region with the highest economic density in less developed regions, which also reflects that firms are not only less numerous but smaller in less developed regions. All this is reflected in differences in labor productivity, which in developed regions is about 60 percent higher than the observed in lagging regions in both industry and services sectors.

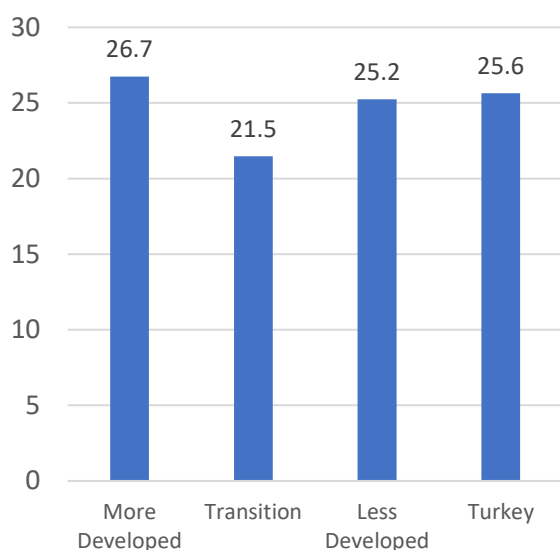
**41. The limited capabilities of firms and their limited exposure to international trade and foreign investment in less developed regions are other roadblock to accelerating regional convergence.** Firms in the eastern regions are smaller than their western peers and are characterized by weak managerial skills and experience, modest trade exposure, low levels of financial sophistication, and low innovation and technological uptake. In addition, lower access to finance constrains private sector investment and the growth of firms.

**42. Regional disparities narrowed in the 2000s as a result of strong growth and productivity, including in less developed regions.** The less developed eastern regions experienced faster economic growth which enabled to reduce the income gap with the more developed regions in the country. Indeed, GDP per capita growth in the less developed regions averaged more than 5.5 percent per year between 2004 and 2019, almost two times the growth rates recorded in the most developed regions. Higher growth rates in lagging regions were supported by the reallocation of factors of production from agriculture to services and industry, and by shifts of labor and capital from lower productivity activities to activities with higher productivity within agriculture and services, which enhanced overall productivity. The growth rate of labor productivity in less developed regions has been 20 percent higher than in the most developed regions of the country and between- and within-factor reallocations accounted for two thirds of this productivity increase. This convergence was also accompanied by more equal access to basic services, such as education, health, electricity and water and waste management which leveled welfare conditions across the country. Indeed, faster growth in lagging regions was also supported by massive public investments in infrastructure and social services which favored higher urbanization, greater connectivity and integration with the rest of the country, and improvements in the welfare of the population in eastern regions.

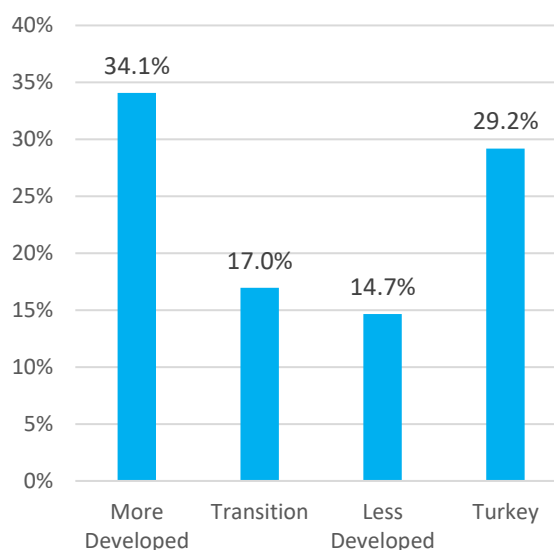
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<sup>21</sup> Regions are grouped as follows: More Developed include Aegean, Las Marmara, Istanbul, West Anatolia, West Marmara; Transition include Central Anatolia, East Black Sea, Mediterranean, West Black Sea; Less Developed include Central East Anatolia, Southeast Anatolia.

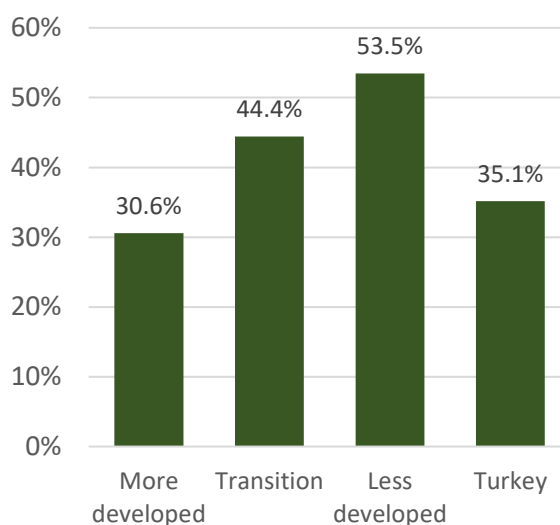
**Figure 17: Average firm size, by region and sector**



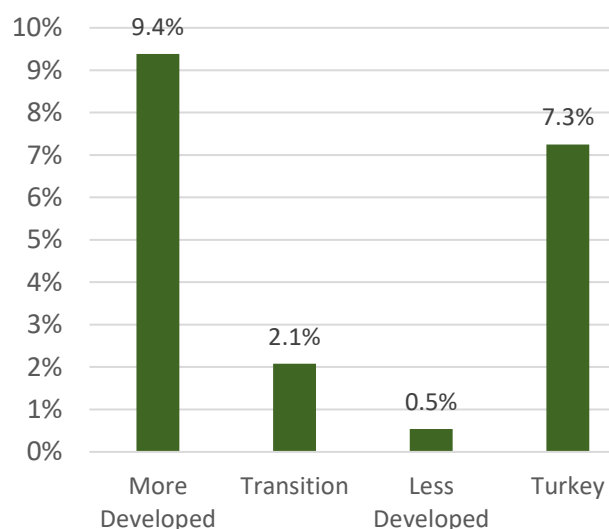
**Figure 18: Share of Firms with Internationally Recognized Quality Certification, by region**



**Figure 19: Share of firms that reported no need for a loan**



**Figure 20: Share of firms that report spending on R&D among respondents, by region (n = 280\*)**



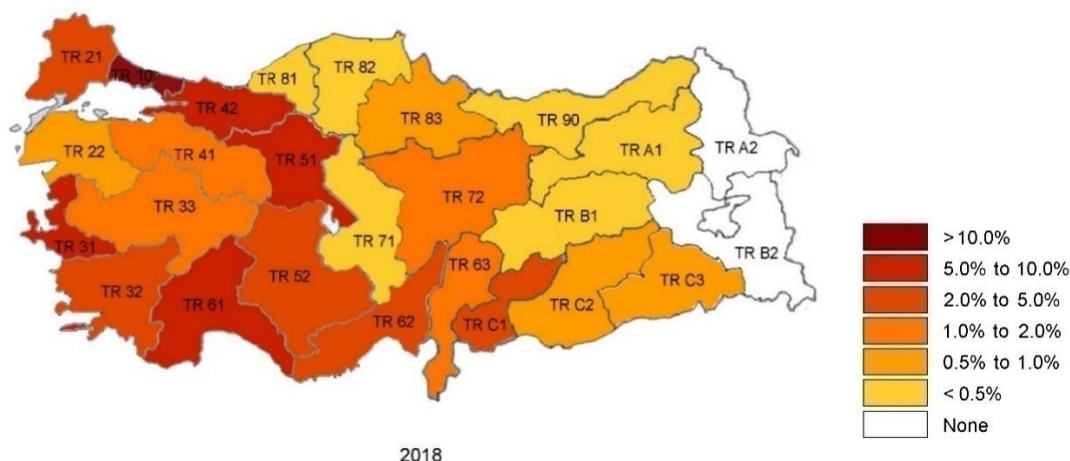
Source: World Bank Enterprise Survey, 2019

43. **However, the speed of regional convergence has slowed down in recent years.** The catching up observed in the 2000s decelerated in the 2010s and the speed of convergence almost halved in the past decade. As the structural transformation of less developed regions progressed, the productivity gains generated by the intersectoral reallocation of factors of production have been in decline. Moreover, transfers of labor force from agriculture toward low-productivity services have also contributed to the

slowdown of the productivity growth and the catching-up of the less developed regions. Indeed, job creation in less developed regions was concentrated in service sectors with sluggish productivity growth. High informality in lagging regions has also limited productivity growth and impeded the acceleration of the catching-up of these regions. While regional gaps in the coverage of public services have been closing, the lower quality of service delivery in lagging regions has also undermined income convergence between lagging and more developed regions. In particular, whereas investments in transport infrastructure resulted in improved connectivity of lagging regions, differences in the quality of the road network and lack of integration of transport modes, together with weaker digitalization, prevent a stronger integration with larger domestic markets and limit the use of economies of scale and specialization.

44. **The increasing integration of Turkey's manufacturing sector into global value chains may have perversely weakened interregional convergence.** Taking advantage of their location, agglomeration effects and higher productivity, the most developed region in the western areas have benefitted from the integration to European production networks. Remoteness, low levels of productivity and sophistication, and less skilled labor force, have impeded lagging regions from benefiting from the country's increasing trade integration as they were unable to upgrade their production systems and plug into value chains segments operating in the country. Nearly 50 percent of all GVC activity is in the Istanbul region, and the Aegean and the Mediterranean regions together account for a further 30 percent of GVC activity. The Eastern regions have the least GVC activity. This is consistent with what it is observed worldwide showing that integration to global value chains is associated with greater spatial concentration and slowdown of regional economic convergence (Grover and Lall 2021, Dagupta and Grover, 2021; Redding and Fagjelbaum, 2018; Cosar and Fagjelbaum, 2016).

*Figure 21: Spatial Distribution of GVC activity*



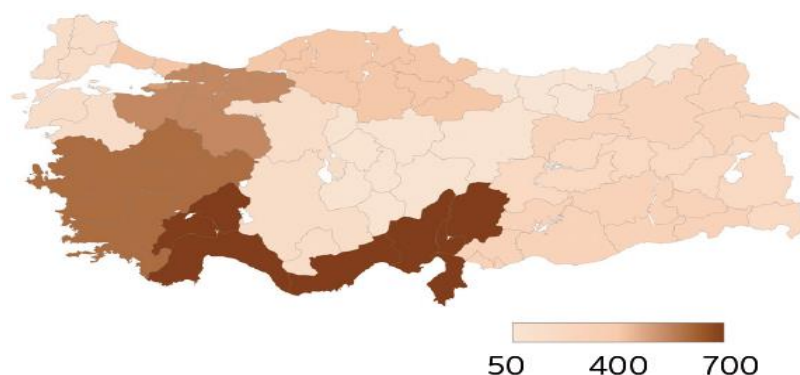
**Source:** World Bank (2021). Turkey Country Economic Memorandum Leveraging Global Value Chains for Growth in Turkey with data from Enterprise Information Survey of the Ministry of Information and Technology.

45. **Another factor that has also contributed to reduce the speed of convergence is the higher vulnerability of lagging regions to both exogenous shocks and macroeconomic instability.** Turkey's

volatile economic growth rate, the succession of negative shocks and instability in the second part of the last decade have harmed economic convergence. Whereas more developed regions have a wide range of resources and abundant productive factors, less developed regions are less diversified and tend to focus on a narrow set of activities which makes them more vulnerable to shocks. For example, the heightened macroeconomic instability of 2018-19 hit lagging regions hardest largely due to the slowdown in the construction sector, a key driver of regional growth. Similarly, with lower levels of digitalization and labor force able to use digital tools, the effects of Covid-19 are being felt more strongly in Eastern regions. More generally, while lagging regions have a lower environmental footprint relative to the rest of the country and they are not structurally more exposed to natural hazards, the relative economic losses that natural disasters inflicted on lagging regions are more significant than in more developed ones.

46. **The NDP objectives and targets related to “livable cities and sustainable development” are highly vulnerable to climate change and natural disasters.** Because resilience is heterogenous (and lower in poor communities), disasters and environmental shocks are exacerbating regional differences, with significant impacts around the Mediterranean (Figure 22). Housing and urban transit are also highly exposed to disaster risks, including seismic risks (with 70% of Turkey’s population located in first- and second-degree seismic risk zones<sup>22</sup>) and urban floods (which are expected to increase with temperature). Cultural heritage (both built environment, natural environment, and artifacts) is similarly at risk of being damaged or destroyed by natural disasters, and the natural environment is particularly vulnerable to climate-driven changes in landscapes. The NDP also proposes policies and measures<sup>23</sup> to tackle climate change under the Environmental Protection subsection and develop regional climate change action plans for the country’s seven regions.

**Figure 22: Annual average well-being losses from natural disasters (in US\$ million)**



**Source:** World Bank (forthcoming), Overlooked: Examining the Impact of Disasters and Climate Shocks on Poverty in the Europe and Central Asia Region

**Note:** Total annual well-being losses in the country are US\$3,800 million per year. Well-being losses combine the direct impacts of disasters (i.e., physical damages and reconstruction costs) with the resilience of the affected population (i.e., its ability to cope with and recover from disasters) to estimate an equivalent impact on well-being. It means that spending \$3,800 million per year to prevent all disasters would increase wellbeing.

<sup>22</sup> World Bank, 2019. Building Resilience in Turkey. Quantifying Climate and Disaster Risks to Critical Infrastructure, Lifelines, and Agriculture in Turkey: New Approaches. World Bank Publication.

<sup>23</sup> These include tackling climate change in sectors causing GHG emissions, making the economy and society more resilient to climate risks, improving capacities for adaptation to climate change, controlling emissions in the building, energy, industry, transportation, waste, agriculture, and forestry sectors, and increasing capacities to adapt to the impacts of climate change.

47. **Some cities and municipalities have introduced Local Climate Change Action Plans and policies and measures to strengthen resilience to climate change, while some sectoral policies and plans incorporate aspects or elements of climate change.** Twenty-seven Turkish cities and municipalities have joined the Global Covenant of Mayors for Climate and Energy (GCoM), the largest global alliance for city climate leadership, with over 10,000 city and local government members. Of these, 16 have committed to a climate change mitigation target, but much remains to be done: 10 are still working on their emissions inventories and mitigation plans; none have adaptation plans;<sup>24</sup> and one (Izmir) has a Climate Change Action Plan and Green Cities Action Plan.

### III. Proposed criteria for the selection of sectors to be included in the CPSD

48. **The main criterion for the selection of sectors in the CPSD is maximizing synergies between 3 development objectives: (i) boosting Turkey's productivity and external competitiveness; (ii) addressing the country's climate change challenges and achieving the government's climate change commitments; and (iii) reducing regional disparities in socioeconomic development.** The proposed CPSD will identify investment opportunities in sectors that may enable productivity gains across the economy (enabling sectors) and export sectors in which Turkey has comparative advantages and that are integrated to global and regional value chains and may generate spillovers and technological upgrade in other sectors. The CPSD will also assess private sector investment opportunities in sectors with strong potential to address Turkey's climate change mitigation and adaptation challenges. Finally, sectors will be selected by their ability to increase productivity, accelerate economic growth, and generate employment in the country's lagging regions.

49. **The 3 development objectives are intertwined. First, Turkey's external competitiveness and further integration into GVCs are exposed to risks associated to the global decarbonization agenda and particularly to the EU trade policies aimed at reducing carbon emissions in the region and trade partners.** Indeed, the global decarbonization implies that the competitiveness of countries will depend not only on low production costs but also on the ability in reducing carbon emissions as this will increasingly define accessibility to external markets. Moreover, the decarbonization agenda provides opportunities for industries to plug in to new (and potentially green) GVCs, including the production of electric vehicles (EVs) and parts, and components for renewable energy generation. In turn, reducing emissions in enabling sectors, in particular, energy, transport and water and waste management are expected to generate productivity gains across all productive sectors. Lower energy and transport costs associated with renewable energy and a more electrified and integrated multi-modal transport system and more efficient water and waste management, would enhance Turkey's external competitiveness. In addition, shifting from fossil fuels to renewable energy generation will contribute to the improvement of Turkey's trade balance and strengthen energy security.

50. **Equally important is the impact of climate change on the competitiveness of the tourism services which generate about 15 percent of Turkey's export revenues (by far the most relevant export item).** The negative impact of climate change on the sector through ocean acidification and warming (with

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<sup>24</sup> [www.globalcovenantofmayors.org/our-cities/](http://www.globalcovenantofmayors.org/our-cities/)

impact on fauna/flora, sea level rise, among others), calls for urgent adaptation actions to maintain the sustainability and competitiveness of tourism activities. In particular, waste management in Turkey is a nationwide problem, but it is particularly severe in coastal tourist areas due to the pollution of water resources. More generally, the increasing dependence on mass-market tourism, characterized by strong seasonality and geographic concentration, poses concerns regarding the economic and environmental sustainability of tourism in some highly visited coastal areas.

**51. Second, the links between Turkey's productivity and competitiveness, and its regional disparities are diverse.** Closing the productivity gaps between more developed and lagging regions will have a strong impact on the overall productivity of the economy. As productivity gains generated by the sectoral reallocation of capital and labor in lagging regions are declining, productivity gains in these regions will be created by within-industry reallocations, and by enhancing their economic integration with the most advanced regions in the country which will enable agglomeration and economies of scale. In this regard, improving connectivity through improvements in the transport system and digital infrastructure are critical elements for enabling the reduction of regional disparities. Lower transportations costs have several impacts on the productivity of lagging regions. Firstly, it does so by increasing the market size available to areas that are economically and geographically distant. Secondly, because it can enable the identification of comparative advantages in specific sectors in lagging regions that are hidden by high transport costs. Thirdly, because lower transport costs remove protection from outside competition for local producers in lagging regions and then can promote factor reallocation from less efficient firms to more competitive firms within lagging regions. New digital technologies that are a key factor improving productivity, could also potentially connect distant places as low-cost communication can attenuate restrictions imposed by distant and remoteness.

**52. Third, addressing climate change challenges in agriculture, forestry and water management have relevant implications for the reduction of regional disparities.** Agriculture is one of the bigger contributors of Green House Gases (GHG) emissions and at the same time is the main source of employment and income in the lagging regions. Policies in agriculture, water, forestry, and landscape management can contribute to reducing pollution and environmental degradation and at the same time they can also deliver large economic and poverty-reduction gains, especially for lagging rural areas, and valuable ecosystem services (i.e., water filtration or flood reductions, etc.). Agriculture and forestry also offer large opportunities for job creation through strong multiplier effects in the rural sector with about 180 jobs created per US\$1 million spent on livestock and crops and 233 jobs created per US\$1 million spent on forestry. These jobs are mostly low-skilled and can, therefore, provide economic opportunities for low-skilled and poorer communities in lagging regions. Investing in more sustainable and efficient use of inputs, such as seeds, fertilizer, water and energy through Climate Smart Agriculture (CSA) techniques can generate a cumulative market size of approximately US\$24 billion and create over 733,000 CSA-related jobs in 2020 – 2030.<sup>25</sup> Over two thirds of the country's 25 river basins are facing severe water scarcity, including important agricultural areas in the central and eastern parts of the country. Irrigation consumes about 74 percent of all withdrawn water and severe droughts threaten the sustainability of agriculture. By improving agricultural productivity, investments in climate adaptation to modernize

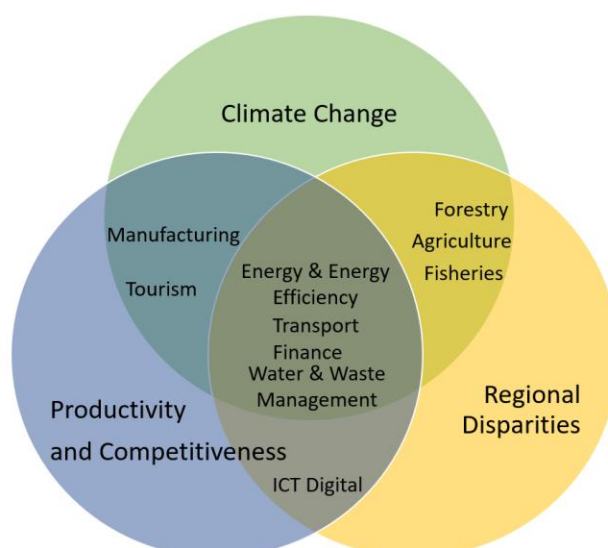
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<sup>25</sup> IFC (2021). A Green Reboot For Emerging Markets.

irrigation and reforms that encourage demand-side management are expected to support the attenuation of regional disparities.

53. **The proposed rationale for the selection of sectors to be assessed in the CPSD is reflected in the Venn-Diagram below which shows the interplay between the 3 development objectives and the placement of sectors simultaneously supporting them.** The criterion for selection of sectors consists of maximizing synergies between these 3 objectives. Those at the intersection are *enabling sectors* in the sense that investments in these sectors enhance the ability of other sectors to contribute to the 3 objectives: they enhance the productivity of other economic sectors, they facilitate the reduction of emissions and the resilience of other sectors; and make investments more attractive in lagging regions helping to reducing spatial inequalities.

**Figure 23: Criterion for the selection of sectors**



**Source:** CPSD Team

54. **In this regard, it is proposed that the CPSD should focus on these enabling sectors which include energy, transport, finance and water and waste management.** Low-cost renewable energy (RE) will favor the overall productivity of the economy and the competitiveness of tradable sectors, the decarbonization of the power sector, whereas more affordable and reliable energy will disproportionately benefit firms and consumers in poorer regions as energy costs represent a higher share of their expenses. Improving the efficiency of logistics and transport would enhance the country's overall export competitiveness and a denser transport network system will also favor regional integration and enable economies of scale and specialization in the lagging regions of the country. Moreover, a larger share of rail and sustainable

maritime transport to reduce heavy reliance on trucks, has substantial environmental and climate gains. As mentioned above, access to finance is identified as the main obstacle faced by Turkish firms and this constraint is more binding for SMEs and the access to and usage of finance in lagging region firms is much lower than national averages. In addition, by mobilizing capital towards sustainable activities aligned with climate goals, the financial sector can be a key enabler of green and resilient growth. Improving solid waste management can enable circular economy practices and reduce input costs in manufacturing sectors and simultaneously reduce GHG emissions. Widespread pollution from the discharge of untreated industrial and domestic wastewater and agricultural uses of fertilizers and pesticides, is threatening aquatic life and economic activities, such as tourism and fisheries. Large parts of the country face high or severe water scarcity. This applies to not only large urban centers in the Western region but also important agricultural areas in the lagging Eastern regions which also face increased drought severity, threatening the sustainability of agriculture which, given its importance in the lagging regions, may further exacerbate spatial income inequalities.

**Table 3: Sectors and development objectives**

| Sector                                                                        | Competitiveness                                                                                                                                      | Climate Change                                                                                                                                                                                                  | Regional Disparities                                                                                                                            |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Energy &amp; Energy Efficiency</b> (Green Buildings and E-urban transport) | REs lowering energy costs<br>Reduction of fossil fuel imports favoring trade balance<br><br>Energy efficiency in commercial and industrial buildings | Most relevant emitter, critical role on mitigation<br>Support the reduction of emissions in other sectors<br><br>Reduction of energy consumption in heating/cooling systems<br><br>Reduction of urban pollution | More reliable and cheaper energy in lagging regions<br>Lagging eastern regions more suitable for solar and wind energy                          |
| <b>Transport</b>                                                              | Improved logistics and trade competitiveness                                                                                                         | Relevant emitter, critical role on mitigation                                                                                                                                                                   | Lower transport costs in remote regions<br>Support regional integration                                                                         |
| <b>Finance</b>                                                                | Access to long term capital for productivity enhancement<br>Lower borrowing costs                                                                    | Green and Blue Finance in mitigation and adaptation                                                                                                                                                             | Improve access to finance in lagging regions where SMEs are more predominant                                                                    |
| <b>Water &amp; Waste Management</b>                                           | Facilitate circular economy in tradable manufacturing sectors<br>Loss reduction of water supply systems reduces costs                                | Adaptation to water scarcity in agriculture and urban areas<br>Sustainability of tourism areas depends on efficient waste management                                                                            | Extreme and high-water stress regions are mostly in lagging eastern parts<br>Equalize access to public waste management services in urban areas |
| <b>Manufacturing</b>                                                          | Exports, integration to GVCs<br>Innovation, technological spillovers to other sectors                                                                | Decarbonization of large emitter sectors<br>Green Global Value Chains                                                                                                                                           |                                                                                                                                                 |
| <b>Tourism</b>                                                                | Most relevant source of export receipts                                                                                                              | Sector sustainability vulnerable to climate change calls for actions on adaptation                                                                                                                              | Neutral effect, coastal areas and other tourism centers are not the poorer in the country                                                       |

|                    |                                                                                        |                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Agriculture</b> | Important emitter and water user<br>Sector sustainability vulnerable to climate change | Largest employer in lagging regions<br>Critical in reducing urban-rural gaps                         |
| <b>Forestry</b>    | The most relevant carbon sink<br>Improved resilience to natural hazards                | Forestry to be developed in more dispersed and poorer regions<br>High employment generation capacity |
| <b>Fisheries</b>   | Sector sustainability vulnerable to climate change calls for actions on adaptation     | Neutral effect, coastal areas are not the poorer in the country                                      |
| <b>ICT</b>         | Relevant to improve productivity in several sectors                                    | Critical to reduce distance<br>Economic integration                                                  |

55. **Sectors that contribute to 2 out of the 3 objectives may also be considered and the rationale for their inclusion in the CPSD should be articulated with a view toward contributing to the existing WBG knowledge and ongoing engagements in the country.** Sectors with a positive impact on productivity and competitiveness and climate change but that have ambiguous impacts on regional disparities are e-urban mobility, green buildings, manufacturing and tourism services. In turn, given their strong exposure to climate change and their regional development implications, agriculture, forestry and fisheries would be candidates for study, however, their effects on productivity and competitiveness are weaker. Finally, ICT and digital infrastructure have substantial effects on productivity and the reduction of regional disparities, but their climate change effects are modest. Additional criteria for the selection of sectors can be based on recent analytical work and operational engagements in Turkey across the WBG, including the CPF for 2019-23 and its Progress Learning Review (2021), the IFC Country Strategy, the Climate Change Action Plan (CCAP) for the ECA Region (2022), the Country Economic Memorandums (CEMs) of 2016 and 2021, the CCDD (2022), The Turkey Green Growth and Sustainable Recovery (2022), The Turkey E-Mobility Technical Assistance Program, and the Technical Assistance to Support Turkey's NDC Update. Collaborative IFC-WB internal consultations and cross-leveraging the inputs prepared for the CCDD are expected to provide additional criteria for the selection of sectors. High-level consultations with the GoT and with the Turkish Industry and Business Association (TUSIAD) conducted as part of the CCDD can also provide information on the CPSD counterparts preferences.

56. **To include sectors contributing to 2 development objectives, 'tradable opportunity highlights' are proposed to shed light on how improvements in the enabling sectors could support the development of these tradable sectors.** While the sector selection analysis does not warrant the preparation of sector assessments, the identification of investment opportunities in sectors that can benefit from addressing the constraints identified in the enabling sectors. Three 'tradable sectoral opportunity highlights' are proposed: Manufacturing, Agriculture and Tourism.

**Figure 24: Enabling Sectors and Tradable Opportunities**



**Source:** CPSD Team

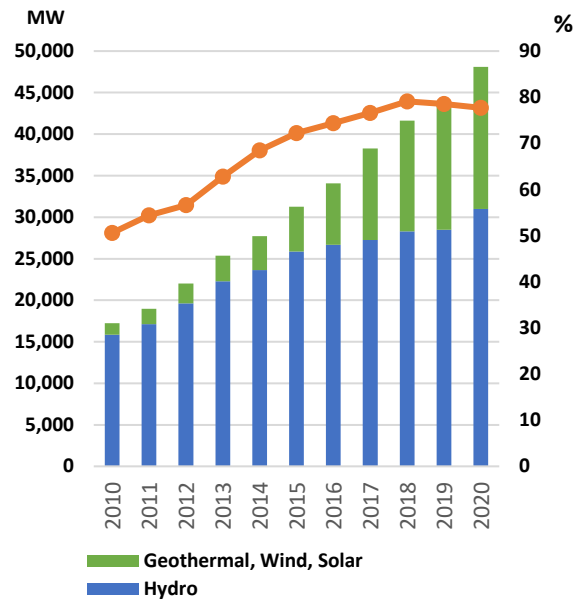
#### IV. Snapshot of sectors proposed to be assessed

##### A. Enabling Sectors

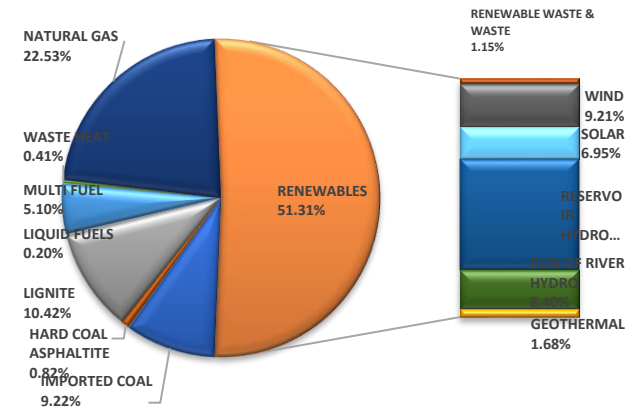
##### i) Energy:

57. **Turkey's energy sector has a substantial participation of the private sector and a well - diversified energy matrix with an increasing share of renewable energy which is predominantly operated by private firms.** Turkey has taken significant steps in electricity market liberalization. As a result of successful privatizations since 2008 and increasing investments by independent power producers, the share of the private sector in the country's generation capacity increased from 50 percent in 2010 to 78 percent in 2020. While the transmission remains in the hands of the state-owned monopoly (TEİAŞ), private companies are also heavily present in the distribution, wholesale, and electricity supply segments. While electricity is the largest contributor to emissions, Turkey has a diversified installed generation capacity, of which 51% is renewables (31 percent hydro, 19 percent non-hydro). Non-hydro renewable capacity grew substantially and currently makes 19 percent of total capacity. Wind (9 percent) and solar (7 percent) investments benefited heavily from the decline in renewable energy technology costs and government subsidies. Private companies own and operate nearly 100 percent of wind, solar, geothermal, and biomass generation capacity.

**Figure 25: Renewable Generation Installed Capacity (LHS) and Private Sector Share in Power Generation (RHS)**



**Figure 26: Installed Capacity by Energy Source (MW), 2020**



Source: TÜRKİYE ELEKTRİK ÜRETİM-İLETİM İSTATİSTİKLERİ (teias.gov.tr)

58. The participation of the private sector in the sector is undertaken through different modalities. Build-Own-Operate (BOO)<sup>26</sup>, Build-Operate-Transfer (BOT)<sup>27</sup>, and Transfer of Operating Rights (TOR)<sup>28</sup> contracts were used initially to foster the participation of the private sector in power generation. Most of the BOO and BOT contracts expired in 2019<sup>29</sup>. Currently, operators in the generation sector include independent private producers, EÜAŞ (state-owned company), a small number of remaining private generation companies under the BOT/TOR schemes, and unlicensed power generation assets. The total number of generation licenses is 1,895<sup>30</sup>, comprising mainly private companies (1216)<sup>31</sup>. Unlicensed generation schemes, which were created to incentivize industrial players and households to generate their own electricity, accounts for 4% of total installed capacity.

59. In terms of generated power, coal continues to be dominant (34.5 percent), followed by hydropower (25.5 percent), natural gas (23 percent), wind, solar, geothermal, and other renewables (16%).<sup>32</sup> As such, Turkey has already passed the 11th National Development Plan target of 38 percent of renewables in Turkey's total generated electricity. The 2019-2023 Strategic Plan by the Ministry of Energy and Natural Resources (MENR) envisages wind installed capacity to reach 11,883 MW and solar 10,000

<sup>26</sup> BOO contracts allow private organization to build, own and operate power plants with some degree of encouragement from the government. The government doesn't provide direct funding in BOO model, it may offer other financial incentives such as tax-exempt status. The government sells to a private sector party the right to construct a power plant according to agreed design specifications and to operate the project for a specified time.

<sup>27</sup> Under BOT contracts, private companies build and operate power plants for a fixed term under agreed conditions and transfer the plants to the state at the end of the contract period.

<sup>28</sup> TOR contracts enable private companies to operate an existing state-owned plant under a lease-type agreement.

<sup>29</sup> PWC Turkish Power Market English.pdf

<sup>30</sup> EPDK | Enerji Piyasası Düzenleme Kurumu, & <http://lisans.epdk.gov.tr/epvys-web/faces/pages/lisans/elektrikUretim/elektrikUretimOzetSorgula.xhtml>

<sup>31</sup> <https://seffaflik.epias.com.tr/transparency/piyasalar/genel-veriler/lisans-tipine-gore-katilimci-sayisi.xhtml>

<sup>32</sup> Source: TÜRKİYE ELEKTRİK ÜRETİM-İLETİM İSTATİSTİKLERİ (teias.gov.tr)

MW by 2023.<sup>33</sup> The Turkey Green Deal Action Plan adopted in 2021 has set targets of 17,000 MW and 14,400 for solar by 2027.<sup>34</sup>

**Table 4: Installed Generation Capacity (MW) and Generated Power (GWh) by Energy Source in 2020**

|                                                                      | Generation Capacity |            | Generated Power  |            |
|----------------------------------------------------------------------|---------------------|------------|------------------|------------|
|                                                                      | MW                  | %          | GWh              | %          |
| Imported Coal                                                        | 8.841,9             | 9,22       | 62.505,6         | 20,38      |
| Hard Coal & Asphaltite                                               | 782,5               | 0,82       | 5.368,1          | 1,75       |
| Lignite                                                              | 9.988,7             | 10,42      | 37.938,4         | 12,37      |
| Fuel Oil (Liquid)                                                    | 189,4               | 0,20       | 322,7            | 0,11       |
| Multi Fuels                                                          | 4.889,1             | 5,10       |                  |            |
| Waste Heat                                                           | 397,5               | 0,41       |                  |            |
| Natural gas                                                          | 21.599,4            | 22,53      | 70.931,3         | 23,13      |
| Biomass (Waste & Renewable waste)                                    | 1.105,3             | 1,15       | 5.736,6          | 1,15       |
| Wind                                                                 | 8.832,4             | 9,21       | 24.828,2         | 8,10       |
| Solar                                                                | 6.667,4             | 6,95       | 10.950,2         | 3,57       |
| Hydropower (Reservoir)                                               | 22.925,0            | 23,91      | 57.463,9         | 18,74      |
| Hydropower (Run of River)                                            | 8.058,9             | 8,40       | 20.630,4         | 6,73       |
| Geothermal                                                           | 1.613,2             | 1,68       | 10.027,7         | 3,27       |
| <b>TOTAL</b>                                                         | <b>95.890,6</b>     | <b>100</b> | <b>306.703,1</b> | <b>100</b> |
| Source: TÜRKİYE ELEKTRİK ÜRETİM-İLETİM İSTATİSTİKLERİ (teias.gov.tr) |                     |            |                  |            |

60. **Deepening the decarbonization of the power sector requires sustained investments of around US\$150 billion to scale up and integrate renewable energies, battery and gas storage and the gradual reduction of coal generation.** Simulations indicate that achieving a 45 percent emission reduction in the power sector by 2030 and a 90 percent reduction by 2040 relative to the government targets, which are in line with achieving the economy-wide net zero target of 2053, would require 91 percent non-fossil fuel use in the power mix, of which around 57 percent is variable RE (solar and wind). To achieve this target, solar, wind, and hydro power capacities should increase from 50 GW today to 155 GW. With 57% of the power system capacity coming from variable RE, grid integration is critical, and 30 GW of battery storage will be needed. A least-cost pathway with less ambitious emission reduction targets (80 percent emissions reduction by 2040) also implies increasing RE capacity from the current 50 GW to 145 GW which corresponds to 90 percent non-fossil use in the power mix, of which 53 percent is variable RE. This pathway also indicates no new coal power plants, as coal is no longer the least-cost option and includes additional investments in new gas power plants. With around 55 percent of the power system capacity coming from variable RE, grid integration is critical, and 30 GW of battery storage would be needed. Natural gas and battery storage will primarily provide capacity reserves to the power system, and security

<sup>33</sup> ETKB 2019-2023 STRATEJİK PLANI (enerji.gov.tr) MUTABAKAT YEŞİL.pdf (ticaret.gov.tr)

<sup>34</sup> MUTABAKAT YEŞİL.pdf (ticaret.gov.tr)

of electricity supply should be maintained with well-designed grid codes and power markets. Achieving the 90 percent reduction in emissions in the power sector, would require an additional US\$47 billion investment than the estimated US\$100 billion in the government target scenario.

61. **Both in the government and net zero emissions scenario increasing the participation of the private sector is critical to meet the investment needs in the 2 scenarios.** Turkey has been successful transitioning its electricity sector towards a market-based system with increased private sector participation and renewable energy generation. Following the introduction of renewable energy support mechanisms through the feed-in tariff system (YEKDEM) in 2011, private investments in non-hydro renewable energy capacity experienced a strong expansion in the past decade. The main challenge for deepening the decarbonization of the energy sector will be securing financing for the necessary investments. Since private companies own and operate almost 100 percent of existing wind, solar, geothermal, and biomass generation capacity, additional investment projects expanding renewable energy capacity are likely to be undertaken by private sector players.

62. **The CPSD plans to review the challenges and options for attracting additional private investment and enhancing the contribution of the private sector in the country's energy decarbonization efforts.** Initially, the following aspects of the current regulatory framework seem to be problematic:

- **Capacity Payments to non-renewable and hydro-power generation:** To ensure energy security, the government grants capacity payments to natural gas, hydroelectric, and domestic coal generators that meet certain eligibility criteria. The capacity mechanism is targeted mainly towards local resources (coal and lignite), with the remaining budget allocated to natural gas, imported coal, and hydro plants. Plants receiving capacity payments can participate in the energy market, which creates distortions and reduces competition.
- **Government Support to Coal Power Plants:** Existing coal plants running on domestic coal benefit both from both capacity payments and purchase guarantees. The financial support for the domestic coal-fired power plants is substantial and distorts competition with other sources for electricity, like hydro, geothermal, solar, and wind.
- **New YEKDEM mechanism:** Following the expiration of the previous YEKDEM scheme where renewable generators were receiving guaranteed prices based on USD/MWh, the government introduced a new feed-in tariff scheme in July 2021. While the new YEKDEM scheme is still a ten-year feed-in tariff, the new scheme provides guaranteed purchase prices at much lower levels<sup>35</sup> compared to the previous YEKDEM FIT. Moreover, prices are based on a Turkish Lira/MWh corrected by a combination of consumer (CPI) and producer prices (PPI), which does not provide a hedge for operators that normally obtain finance in USD given the limited access to long term finance in domestic currency negatively affecting the bankability of new renewable projects.
- **Energy Pricing & Wholesale Power Market:** Currently, regulated tariffs in Turkey are lower than the marginal cost of electricity. In addition, the purchase of coal-fired electricity via mechanisms

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<sup>35</sup> As an example, for solar power plants, previous YEKDEM price was 13.3 cents/KWh (133USD/MWh) for solar plants, the new FIT is 32 TL kurus/kWh (corresponding to 34.6 USD/MWh at the 1 \$=9.23 TL as of 15 Oct 2021)

described above and mixing it with EÜAŞ's own cheap hydropower cause wholesale markets to be not fully cost-reflective and competitive.

- **YEKA Auctions and reduced investment options:** Turkey introduced a competitive tender scheme for large-scale renewable energy projects in renewable energy zones in 2016. While the establishment of competitive auctions for RE is an encouraging step toward the right direction and potentially can fully replace the feed-in tariffs, there are excessive requirements for companies which reduce the bankability of private projects, including minimum national content, establishment of domestic factories, employment generation and investments in R&D. Moreover, private companies can only develop wind and solar projects through YEKA auctions, no merchant power plant is possible without auction which reduces substantially investment options due to strict location requirements for solar plants.
- **Lack of market access for Distributed Solar Generation:** Turkey's unlicensed power scheme for generation up to 5MW and its monthly net metering system<sup>36</sup> support the development of small-scale power generation. However, the development of rooftop PVs is slow due to high installation costs and the impossibility to sale their excess energy.<sup>37</sup> Moreover, the lack of financing is another impediment, given the high installation costs.
- **Gas Markets and Gas-Fired Plants:** The domestic gas market development is well behind the electricity market. The lack of a deregulated wholesale market for gas with a transparent price signal for flexible LNG imports prevents the use of natural gas-fired plants providing flexibility and security which are essential for increasing the penetration of renewable energy overall and energy system reliability.

## ii) *Water and Wastewater Services (WSS)*

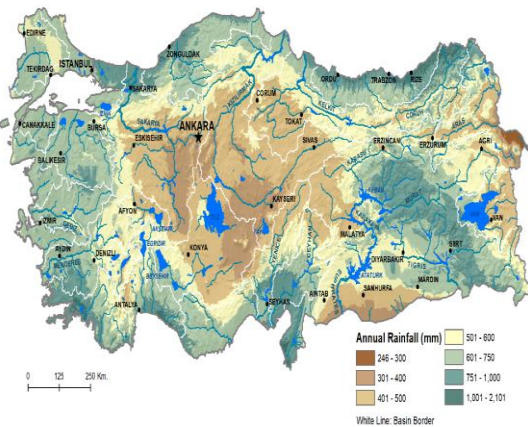
63. **While there is significant regional variation in water availability, in general Turkey faces increasing levels of water stress.** The country has an average annual precipitation of 593 mm. The Black Sea and Mediterranean in the Western regions have relatively more precipitation (average amount of 2,500mm), while the Central Anatolia and Eastern Anatolia Region in the middle and East regions are water scarce (with average amount of 230 mm). Overall, Turkey's available per capita freshwater amount is only half the global average, and 15 of its 25 river basins are water stressed. This includes some of the highest populated basins, such as the Marmara and Sakarya where Istanbul and Ankara are located. Similar trends in large cities, such as Izmir and Antalya, are observed. Important agricultural areas, such as the Konya plains in the central part of the country, are also facing increasing water stress.

*Figure 27: Average annual precipitation in Turkey 2019*

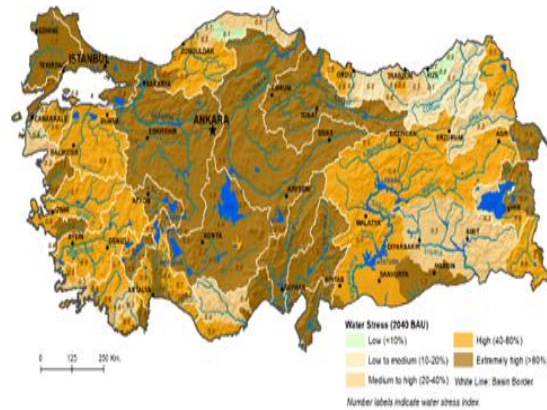
*Figure 28: Projected Water Stress in 2040 (under business-as-usual prediction)*

<sup>36</sup> Generation and consumption are settled at the end of the months at retail tariff and active energy prices.

<sup>37</sup> Estimated at 1500-2000\$/kW by [SHURA Rooftop-solar-energy-systems-in-Turkey.pdf](#)



Source: World Bank. Turkey Water Sector Engagement Note, 2020.



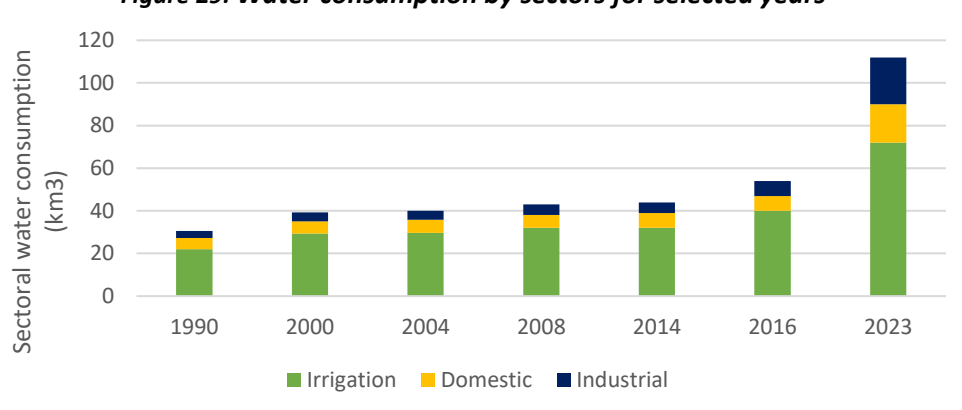
Source: World Resources Institute Aquaduct Risk Mapping Tool (2019)

64. **The use of water has steadily increased in the last decades and water withdrawal is projected to continue to grow in the next years.** An estimated 95 percent of exploitable groundwater resources are already being used for irrigation, domestic, and industrial purposes. While most European countries were able to reduce their annual water extraction, between 1990 and 2016, Turkey's water use increased significantly: water consumption for agricultural and industrial purposes more than doubled and currently represent 75 percent and 13 percent of total water demand. Indeed, water use in Turkey is less efficient than that in high-income countries. For example, GDP per ton of water used in Turkey is only about 40 percent of that of high-income countries. Most of the irrigation is done through gravity irrigation, which has low water efficiency. The use of water saving irrigation techniques (sprinkler and drip irrigation systems) gained momentum in the 2010s but is still a small fraction of the irrigation methods in use. According to the Ministry of Environment and Urbanization (2016), it is estimated that water demand, especially for irrigation purposes, has accelerated and may reach 112km<sup>3</sup> in 2023.

65. **Because of climate change, urbanization and increased demand driven by economic growth, the risk of hydrological extremes and scarcity are likely to increase in the future.** The combined impacts of climate change and excessive groundwater pumping due to increasing water demand have caused a significant decline in groundwater levels. Drought severity has exacerbated groundwater depletion leading to unsustainable levels of groundwater in some basins. For example, in the Konya basin groundwater levels have dropped by more than two meters, threatening the long-term sustainability of agriculture and contributing to the occurrence of massive sinkholes. Simulations of aquifer behavior until 2050 projects reductions in groundwater availability in Turkey, particularly in the coastal plains along the Mediterranean Sea where groundwater is the main source of irrigation water.<sup>38</sup>

<sup>38</sup> Avci et al. 2021. Assessing the effect of climate change on groundwater use in Demre coastal aquifer (Antalya, Turkey), coupled use of climate scenarios and numerical flow modeling

**Figure 29: Water consumption by sectors for selected years**



Source: Data from Harmancioglu and Altinbilek (2019); State of the Environment Report for Republic of Turkey published by Ministry of Environment and Urbanization (2016)

66. **Despite improvements in the coverage of water and wastewater services, Turkey is still below international standards in terms of treatment and pollution which affect the quality of water.** According to OECD's Environmental Performance Review in 2019, almost 91 percent of the population in Turkey has access to piped water supply, but only 54 percent is served by drinking water plants which increases vulnerability to risks from pollution and other contaminants. Pollution from the discharge of untreated industrial and domestic wastewater into freshwater bodies and the sea, and pollution from agricultural practices, such as use of fertilizers and pesticides, affect the quality of water supply. About 90 percent of urban populations and 50 percent of rural population have access to safely managed sanitation, with the rest using on-site sanitation. Approximately 16 percent of residential wastewater and 38 percent of industrial wastewater is not treated before being discharged into water bodies (OECD, 2019). A third of Turkey's lakes and up to half of its rivers are considered either "contaminated" or "highly contaminated" by phosphorus and nitrogen. Turkey ranked 75 out of 179 countries, based on the Yale Environmental Performance Index (EPI).

67. **Metropolitan Municipalities are responsible for the provision of water and wastewater services in the whole geographic area of their regions.** There are 30 Water and Sewerage Administrations (WSAs) which belong to the Metropolitan Municipalities, but they have some autonomy for budgeting and management. Responsibilities of WSAs include: (i) water services including supply, distribution and treatment; (ii) planning, design, construction, operation and maintenance of facilities needed to provide these services, (iii) preventing pollution of water resources, (iv) ensuring protection of the water basins (even those located outside the boundaries of their service area), and (v) defining and collecting tariffs. Smaller municipalities provide WSS services through a municipal department. Special provincial administrations (SPA) provide services in non-municipal areas

68. **Institutional complexity, the lack of a national regulatory framework and the financial weaknesses of municipalities and WSAs are key constraints for improving the quality of water and wastewater services.** The sector's governance involves several stakeholders and a multi-level decision framework. Multiple institutions at the national and municipal level with scattered mandates and

responsibilities and the overlapping of numerous laws, strategies, action plans and investment programs, limit the efficiency of the sector. At the national government level, the Ministry of Forestry and Water Affairs (MoFWA) and the Ministry of Environment and Urbanization (MoEU) share most of the water sector mandates. The primary roles of MoFWA are to develop policies on protection of water resources and their sustainable use and to coordinate national water management. MoEU has responsibilities regarding environmental protection and rehabilitation and defines treatment standards for wastewater treatment plants, issues discharge permits, and is in charge of monitoring the performance of wastewater facilities. The General Directorate of State Hydraulic Works (GDSHW) under the Ministry of Public Works, develops all water and land resources in Turkey and undertakes investments in the supply of potable and industrial water and wastewater treatment plants for municipal settlements. The Water Management Coordination Board fosters cooperation and coordination among all ministries, institutions, and organizations. Service delivery is provided at the municipal level by the 30 WSAs. An important drawback is the lack of WSS sector regulator in Turkey. Each WSAs sets tariffs and information on tariffs, costs, water losses, service quality and other performance indicators needs to be collected from each WSAs. Indeed, the lack of a centralized benchmarking system collecting data on WSS providers' technical and financial performance does not enable the same quality of services across regions and differences in the quality-of-service delivery are huge between underdeveloped small towns and large and wealthy urban centers. The absence of clear economic regulation for quality and sustainability of WSS service provision are major institutional constraints affecting the WSS sector performance.

69. **The financial situation of the majority of WSAs in Turkey is weak and their access to finance constrained, undermining their ability to undertake capital investments needed to improve efficiency.** The majority of WSAs operate at a loss, although they define tariff levels, and the lack of financial and operational information makes their creditworthiness low. A World Bank report of 2016 showed that the creditworthiness of more than half of the WSAs, is low: budget deficits are common, capital expenditures are low, and total debt as a percentage of total revenues is in excess of commonly accepted norms. Thus, WSAs' investments are likely to be limited to minor replacement investments of existing assets and to some additional operational expenditures, unless they improve their financial management. A long-standing constraint is the lack of access to private capital markets. IIBank, the state-owned development and investment Bank of Turkey (subordinated to the MoEU) is the major financing source of municipal WSS. IIBank provides loans to WSAs and municipalities at subsidized rates. It also provides guarantees and channel funds from IFIs lending. Domestic private finance is not easily available. There is little information and data on investments in water and wastewater financed by commercial loans or bilateral aid without a state guarantee.

70. **This CPSD plans to review obstacles and to assess different options and modalities for increasing private sector participation in the WSS sector in Turkey, from financing to the own service delivery.** While the state can transfer its right to exploring and operating water resources to private institutions for a defined period, private sector participation is modest and limited to the operation of water and wastewater treatment plants without direct contact with customers and to specific contracting opportunities. The specificities of the water and sanitation sector and specific features of the institutional arrangement in Turkey explain the constraints on private participation: i) the sector involves high fixed costs coupled with long-term irreversible investments which, together with the lack of appropriate risk

sharing mechanisms and the large presence of state-owned companies, reduces the attractiveness of the WSS to private sector investments; ii) state-owned companies provide services in metropolitan municipalities without bidding processes preventing competition by private sector companies; iii) water and sanitation are managed at the local level, exposing the private sector to sub-sovereign risk, iv) the complexity of the institutional framework due both to the number of stakeholders and to the segmentation of responsibilities across government tiers and agencies, v) the lack of a national regulatory framework and standardization and basic rules, including tariff revision criteria, indemnity, inspection, targets and contractual obligations, elevates transaction costs and discourage the entry of new private players in the sector, given the greater degree of insecurity and uncertainty.

### *iii) Transport Logistics*

**71. From an international perspective, Turkey's transport system performance is considered reasonable.** The World Bank's Logistics Performance Index (LPI) 2018 ranks Turkey 47th out of 167 countries. In the past decade, the country has made substantial progress in developing its transport infrastructure, mainly roads, ports and airports to support passenger mobility, connectivity and freight transport. The quality of Turkey's current transport infrastructure compares favorably to peer countries, being the fifth among top performer among upper middle-income countries, but it ranks below the average for the Europe and Central Asia region. The 2018 LPI report highlights the poor performance of railways: 50 percent of the respondents believe that quality of railways in Turkey is either low or very low. This percent is around 15 percent for roads and ports and 13 percent for airports. This is confirmed by the World Economic Forum (WEF) competitiveness report of 2019. Turkey's transport infrastructure ranks 49<sup>th</sup> out of 141 countries and it is better than Mexico's, Morocco's, Poland's or Brazil's, but below the EU average. The best performer areas are air transport connectivity (ranks 12<sup>th</sup>) and road networks (ranks 27<sup>th</sup>). According to the 2019 Enterprise Performance Survey, 15 percent of firms see the transport system as a major constraint to their activities. But firms' perception regarding the performance of the transport system varies substantially across regions: 46 percent of firms in the West Black Sea, 26 percent Central and Northeast Anatolia and 24 percent of firms in Mediterranean see transport as a major obstacle, while only 3.5 percent of firms in Istanbul do so. Firms' perceptions also vary across transport modes: railways and maritime ports and the lack of integration between transport modes are seen as an obstacle to the country's competitiveness. Indeed, 20 percent of exporting firms in Turkey saw transport as a major constraint to their export activities.

**72. The transport sector is dominated by road transportation and the underutilization of rails.** Turkey's transport infrastructure includes: 68,633 km of roads, 12,803 km of railways, 55 airports (35 of which are international private airports<sup>39</sup>) and 9 ports (of which 7 are privately owned). More than 75 percent of the freight moved in Turkey was transported by trucks. While this share is similar to the EU average (76 percent), the very low share of rail in the transportation of freight—4 percent, is less than a

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<sup>39</sup> Private airports were built and operated by private consortiums under contracts with the State Airports Authority (DHMI), notably the largest projects are the new and older airport in Istanbul.

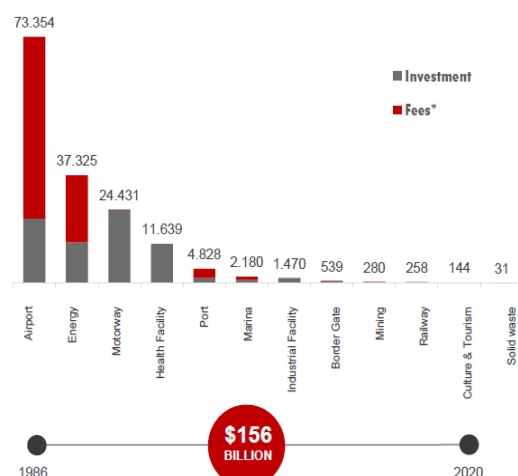
quarter of that of the EU (17 percent). Turkey's current main exports are transport-intensive and would benefit from improved transport quality and lower transport costs. Turkey's geography and international trade features suggest that there is space for a stronger penetration of rail and rail intermodal (i.e., containers and trailers) in the country's freight matrix. Turkey is a large country with a relatively small railway network compared to other European railways. Turkey's trade flows, intense in bulk and breakbulk goods fit better with greater use of bulk rail and rail intermodal than actually observed. Surveys of Turkey-based shippers show that a primary reason for the low adoption of rail freight in Turkey is a generalized lack of last-mile railway connectivity to/from major centers of cargo generation and attraction, such as organized industrial zones, major manufacturing facilities, maritime ports, logistics centers, and other types of logistics clusters. Efforts are underway in some of Turkey's Organized Industrial Zones (OIZs) to connect to the national railway grid by constructing dedicated rail tracks and thereby improving connectivity and lowering freight costs.

**73. The modernization of the logistics sector in Turkey is simultaneously instrumental to the enhancement of its trade competitiveness and the decarbonization agenda.** In 2019 freight transport emitted 41 megatons of CO<sub>2</sub>. More efficient and competitive logistics implies low-carbon logistics. Infrastructure investments and improvements in service delivery on railway can increase the share of rail freight mode, which would, in turn, reduce logistics costs, reduce highway congestion and road infrastructure wear and tear, and reduce emissions. Indeed, it is the Government of Turkey's stated policy objective to increase the modal share of freight rail from the current 4 percent to 15 percent of all ton-km transported—in the near term. Complementary measures to increase the efficiency of the existing trucking and logistics are also needed. While battery technology is likely to evolve to accommodate long-haul trucking operations, no zero-carbon alternatives for long-haul trucking, alternative fuels, or infrastructure solutions such as electrified highways will be needed. Examples of efficiency-enhancing measures that can both reduce logistics costs and help decarbonize logistics include wider incidence of cargo consolidation, equipment sharing and standardization, digitalization of corridors through technologies like intelligent highways (ITS) and smart railway signaling systems (digital rail traffic management), and more seamless inter-modal truck-rail transitions for containerized freight. According to the Turkey CCDD, investment needs in transport logistics related to deep decarbonization scenarios estimated at around US\$60 billion are not significantly higher than the implied in baseline scenarios (about 30 percent higher), but these deep decarbonization generate sizable savings of US\$100 billion in oil consumption and US\$50 billion from avoided carbon emissions confirming that decarbonization and competitiveness of the freight sector go hand on hand.

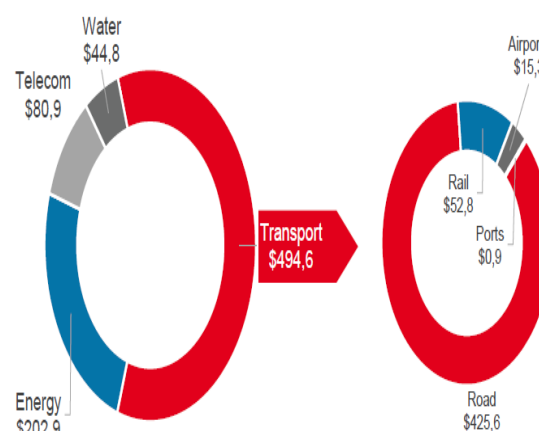
**74. The private sector plays a significant role in the transportation sector.** In the last two decades, Turkey has invested heavily in transportation and more than a fifth of total transport investment was financed by the private sector. From 2003 to 2020, PPP contracts on the transport sector amounted US\$ 138bi, representing 88 percent of total investments under the PPP modality. Built-Operate-Transfer (BOT) has been the main contract model. Turkey's PPP model has had remarkable success in airports (US\$73bi) and ports (US\$24 bi), sectors where demand uncertainty is limited. In the road sector, higher demand risks have limited the scope for partial or full cost recovery through tolls, particularly for high density motorways between major cities. In railways, increased private sector management and investment is possible, but poor governance and performance of the state-owned Turkish railways (TCDD), the use of

subsidies and transfers and an uncertain regulatory framework have inhibited private sector investments in this transport mode (US\$0.3 million in 2003-2020). The alignment of the legislative framework with the EU under the Turkey's reformed railway market can bring make this mode more attractive for the private sector.

**Figure 30: PPP Contracts by Sector, 2003-2020 (US\$ Million)**



**Figure 31: Investment Needs by Sector, 2021-2040, (US\$ Billion)**



**Source:** GoT. Investment Office. Presidency of the Republic

75. **Prospects for further participation of the private sector in the transport sector are encouraging and will be assessed by this CPSPD.** According to the Investment Office under the Presidency of the Republic, investment needs in the sector for the period 2021-2040 amount US\$495 billion, with 85 percent to be allocated to roads and 10 percent to railways. The network of motorways (toll-roads) is expected to increase from the current 3,500km to more than 8,000, offering good opportunities for PPPs. Investments in railways are planned to increase as a share of total transport investment, particularly in high-speed passenger rail services. The transformation of the rail infrastructure from conventional to high speed and the reformed railway market consistent with the EU acquis, also offer good opportunities for increased private sector participation. The government investment plan includes intermodal logistic centers which are expected to be built and operated by the private sector. In addition, efficiency-enhancing investments in road maintenance and betterment which also support the decarbonization may attract private sector investors.

76. **This CPSPD will also assess investment opportunities in transport aimed at reducing regional economic disparities and better connect eastern and inland regions with urban centers and coastal trading hubs.** As lower transport costs reduce distance favoring economic integration and agglomeration economies, specialization on intermediate goods in remote regions, the modernization of the country's transport system is expected to also attenuate regional disparities. However, it is recognized that returns to some of these investments are often lower than those of investments promoting increased economic

density in the metropolitan centers of economic activity. Non-economic benefits may still justify investments in transport infrastructure to connect lagging regions, but such benefits should be explicitly valued and transparent subsidies can be adopted to attract private sector investments. Given high fixed costs, high-speed railways are profitable only for high density routes, such as Ankara-Istanbul, and its potential use connecting lagging regions with denser markets should be carefully assessed.

iv) *Green Finance*

**77. Turkey's financial sector plays an enabling role for the country's decarbonization agenda by mobilizing capital for financing climate change mitigation and adaptation actions.** As mentioned above, investment needs for transitioning to a low-carbon economy are large and mobilizing private sector finance will be critical for meeting these investment needs. Investments in renewable energy, energy efficiency, low-carbon technologies in manufacturing, transport and resilient infrastructure require long-term capital. The finance for climate action in Turkey will need to come from domestic and external sources and enabling macroeconomic, regulatory and policy conditions are needed for scaling up green financing in the country. To access that money, firms and project developers will need to demonstrate the combination of financial and climate returns that their projects can generate. Some climate change initiatives are profitable, for example, reducing emissions in manufacturing and transport also reduce energy costs. They are win-win. But others are not, and they generate long-term and uncertain gains but also short-term costs. The perceived riskiness of green projects and technological innovation may increase the cost of capital. Therefore, many climate change initiatives only happen if they are funded through a financing system that values and incorporates in its operations climate goals, assesses appropriately climate impacts, profitability and risks. Indeed, capacity building, both on the supply, demand, and on the policy makers and regulator's side, is another requirement for scaling up green finance<sup>40</sup>.

**78. Turkey's financial sector has made good progress in providing finance for climate change actions, but much more remains to be done to meet the investments needs for the country's climate transition.** According to the World Bank Report Unlocking Green Finance in Turkey (2022), the country has been a recipient of significant international finance for climate action over the years, including concessional funds. The largest providers of concessional finance were the Global Environment Facility (GEF) and the Climate Investment Funds (CIFs). Turkish financial institutions have been incorporating environmental and social issues with a blend of risk management (screening and managing environmental & social (E&S) risks as part of banks' decision-making processes) and loan origination (supporting businesses and industries with a positive impact on the environment and society). Several banks have increased environmentally friendly practices and obtained external funds through sustainable finance for environmentally friendly housing projects, energy efficiency and renewable energy, sustainable water management, environmentally friendly transportation, and support for entrepreneurial women. The amount of green/sustainable bonds issued by the banking sector has gradually increased and reached a

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<sup>40</sup> Green finance refers to financing for investments that provide environmental benefits and contribute to climate action by financing projects that lead to reducing greenhouse gas (GHG) emissions (mitigation) and support adaptation to changing climate. (World Bank, 2022)

total of USD 2.7 billion from 2016 to 2021 (CBRT, 2021). The cumulative amount of green bonds from 2016 to 2021 reached US\$700 million. TSKB (a private development bank) and Garanti BBVA, Yapı Kredi, Isbank, and Akbank (large commercial banks) are the few financial institutions that have issued green products. Unfortunately, those green finance amounts are negligible when compared to the total security and loan portfolios of the Turkish financial system. Moreover, from an international perspective, Turkey's sustainable finance is relatively underdeveloped. For example, in 2020, emerging markets' green bonds amounted US\$40 billion in issuance from 101 issuers. The largest issuers were Chile (US\$3.8 billion), the Czech Republic (US\$2.5 billion), Hungary (US\$2.2 billion), Brazil (US\$1.9 billion) and Indonesia (US\$1.9 billion).

**Table 5: Sustainable and Green Bond issued by the Turkish Banking Sector, 2016-2021 (US\$ million)**

| Date of Issuance | Amount | Term     | Type                 | Currency |
|------------------|--------|----------|----------------------|----------|
| 18.05.2016       | 300    | 5 years  | Green Bond           | USD      |
| 28.03.2017       | 300    | 10 years | Tier-2 Green Bond    | USD      |
| 30.06.2017       | 150    | 5 years  | Green Bond           | TL       |
| 11.06.2018       | 75     | 6 years  | Gender Equality Bond | USD      |
| 21.08.2019       | 50     | 10 years | Green Bond           | USD      |
| 20.12.2019       | 50     | 5 years  | Green Bond           | USD      |
| 21.01.2020       | 50     | 5 years  | Green Bond           | USD      |
| 5.08.2020        | 50     | 5 years  | Green Bond           | USD      |
| 8.12.2020        | 750    | 5 years  | Sustainable Bond     | USD      |
| 14.01.2021       | 350    | 5 years  | Sustainable Bond     | USD      |
| 28.01.2021       | 600    | 5 years  | Sustainable Bond     | USD      |

Source: CBRT, 2021

**Figure 32: EM ESG Thematic Bond Market Size, 2016-2020 (US\$ billion)**



Source: IFC, Bloomberg. Environmental Finance, Climate Bonds Initiative.

79. **Despite overall progress in setting the framework for green and sustainable finance since 2014, several macro-financial, structural and institutional challenges need to be addressed.** On the macroeconomic and financial side, the persistent macroeconomic stability which exacerbates the huge investment-savings gap is a constraint that not only affects sustainable and green finance but inhibits overall long-term capital financing. On the structural dimension, the banking-centered financial sector has a limited ability to provide affordable longer-term green finance for green investments due to its short-term funding structure (deposits). Non-bank financial institutions and institutional investors, e.g., insurance and pension funds, are small by peer emerging market standards, which explains the financial system's limited capacity to mobilize resources for green investments. On the institutional front, Turkey's existing regulatory framework and institutional capacities at the sector level do not provide the necessary conditions for expanding green finance and greening the financial sector.

80. **This CPSD will explore options for improving the policy and regulatory frameworks needed for scaling-up green investments in Turkey. Initially, options to be discussed and detailed include:**

- **Establishing a national regulatory framework for sustainable finance.** Turkish financial institutions have voluntarily been incorporating environmental and social issues in two main dimensions: identifying and managing environmental and social risks affecting their portfolios and financing businesses and industries with a positive impact on the environment and society. Although several banks in Turkey apply sustainable finance guidelines, the provision

of a national regulatory and supervisory framework consistent with international best practices on disclosure and supervisory practices, would ensure transparency on sustainability across financial markets in a standardized manner and enhance comparability by defining a set of environmental and social indicators for the principal adverse impacts that financial institutions need to report. This regulatory framework will be instrumental for scaling up the financing of sustainable projects and activities in emerging markets, creating additional trust in the market, broadening the investment base and enabling the development of capital market instruments for green finance, including green mortgage loans, green and sustainability-linked loans, ESG money market funds, private equity and venture capital.

- **Establishing a green finance taxonomy, ideally aligned with the EU taxonomy.** Diverging international and national standards are a constraint for the development of a market for green finance, given it leads to different views on what constitutes “green” and results in inconsistent issuance, reporting and transparency practices. This makes it challenging for investors and lenders to incorporate sustainable principles into their capital allocation processes. For issuers this lack of consistency implies relatively higher costs of launching green bonds, given non-harmonized reporting and more complicated and expensive external review requirements. Establishing a uniform and recognizable standard at the national level, in line with global practices, is expected to enhance the transparency and comparability in the green finance market, especially for green bond issuance across borders. In particular, alignment to the EU Green Taxonomy outlined in the EU Green Bond Standard (GBS), will enable international investors in Turkey to use the GBS as a benchmark for their own investments, regardless of the location of the underlying economic activity and attract international capital for green projects.
- **Strengthening institutional and technical capacities on the demand and supply sides as well as on regulators and supervisors.** Given the relative novelty of green finance instruments compared to other loan and debt instruments, there is a need to enhance the technical capacity of banks, corporations and issuers to manage specific complexities associated with the design of verification and eligibility criteria of green projects. Turkey’s financial institutions need to build capacity to identify climate change opportunities, pricing mechanisms, disclosure practices, and loan origination processes and securitization. To access finance, firms need to evaluate initiatives in terms of both their climate impact and their financial returns and put in place a reporting system for climate metrics, which runs in parallel to the standard financial reporting system and is integrated into the financial decision-making process. Regulatory authorities and supervisors should build internal capacity to enable adequate risk assessment and to formulate supportive policies and regulations for expanding investments in green projects. In particular, the Central Bank of The Republic Turkey (CBRT), the Banking Regulation and Supervision Agency (BRSA), and the Capital Markets Board (CMB) could step up their recent efforts to lead financial institutions on environmental sustainability (World Bank, 2022).
- **On the supply side, the use of guarantees, insurances and other instruments can help “de-risk” green investments, lowering risk premiums.** As mentioned above, green projects entail significant risks that may imply prohibitive borrowing costs. Guarantees are flexible instruments, which can be tailored to different circumstances and types of risk. The use of climate-weather-related insurance mechanisms can provide adequate risk-sharing, reduce risk premiums and unlock finance for adaptation and resilience. Loan loss reserves can be

structured to increase private sector risk-sharing. SME financing and small projects that imply high transaction and borrowing costs can be aggregated in larger portfolios to pool risks.

- **On the demand side, reducing sectoral regulatory risks is likely to foster the demand for green finance.** Investments in infrastructure require a credible and durable policy environment. Beyond traditional regulatory risks in infrastructure projects, green infrastructure projects face specific risks that limit the interest of investors. The regulatory framework for renewable energy has been instrumental to the growth of the renewable energy generation capacity that now corresponds to more than 40 percent of electricity generation in Turkey. The framework for solid waste management has been also supportive for investments aimed at reducing waste, recycling and the circular economy. But in other sectors such as agriculture, regulatory frameworks do not provide incentives needed to unlock finance and investments in climate change actions. Therefore, government action on incentives for greening the Turkish economy beyond renewable energy would generate demand for green finance as well.

## B. Tradable Opportunities

### i) *Manufacturing*

81. **The manufacturing sector is a significant contributor to the Turkish economy - particularly exports - and similarly, emissions related to the sector account for a substantial share of total GHG emissions.** Manufacturing activities account for nearly one-fifth of Turkey's GDP and foreign direct investment (FDI), one-third of employment, 16 percent of all registered firms, and over 90 percent of exports from the country. Manufacturing-related emissions accounted for a quarter of all GHG emissions in the country. While the emissions from manufacturing activities are relatively low in absolute terms at 120 million tons of carbon dioxide equivalent (MtCO<sub>2</sub>e) compared to OECD (~2,100 MtCO<sub>2</sub>e) and World (>9,000 MtCO<sub>2</sub>e) aggregates, sector emissions account for a quarter of total GHG emissions, a share that is higher compared to OECD and World averages, suggesting that there is substantial decarbonizing potential.

82. **Turkey's manufacturing sector is exposed to transition risks as the world, and particularly the EU, transitions to a low or net zero carbon future.** As mentioned in Section II, the adoption of a Carbon Border Adjustment Mechanism (CBAM) will put a carbon price on imports of certain goods to the EU according to the products' emissions intensities. The CBAM will have significant impacts in Turkey but initially only on a few emissions-intensive industries which have high trade exposure to the EU market. The iron and steel sector are expected to be the most affected. Aluminum production is also highly exposed, although the emissions intensity of Turkey's production of non-ferrous metals (including aluminum) fares slightly better when compared with other major exporters. In addition, some higher value-added sectors, like metal products, machinery and equipment, motor vehicles and parts and other manufacturing which will not be covered by CBAM, have an opportunity to grow, as their EU competitors face higher input costs when the CBAM is applied to inputs like iron and steel.

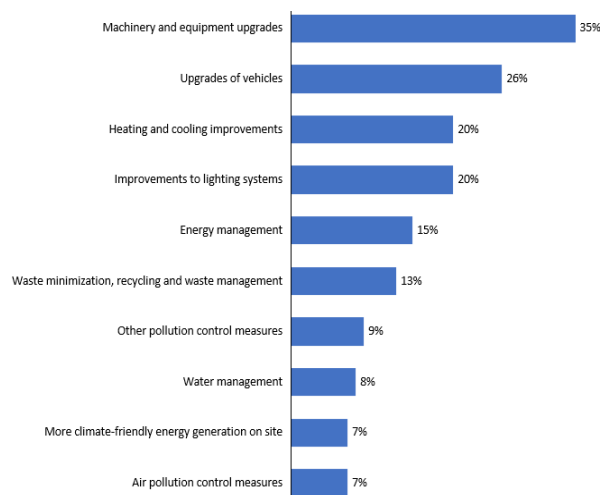
83. **By incentivizing the decarbonization of manufacturing sectors, the implementation of the CBAM also presents opportunities for Turkey to capture market share at the expense of more emissions-intensive competitors.** Decarbonization of the manufacturing sector activities can be achieved by using a three-pronged strategy:

- Adopting sector-specific technologies for lower-carbon manufacturing and cross-cutting technologies, such as hydrogen, biomass, oxy-fuel combustion, carbon capture utilization and storage (scope 1);
- Transitioning towards the use of renewable energy sources, improving energy efficiency via trigeneration, heat integration, economizers, absorption chillers, variable frequency drives, alternative fuels, waste-to-energy, switching to green buildings (offices, factories, warehouses, industrial parks) and adopting circular economy strategies including industrial symbiosis, material reuse, and waste recycling (scope 2).
- Greening and decarbonizing manufacturing requires a comprehensive strategy for entire value chains. Decarbonizing efforts go beyond the reduction of individual firms' emissions (scope 1 and 2 emissions) and should be deployed in the whole value chain to target indirect emissions as well (particularly scope 3). The role of leading firms within value chains is critical as they can influence the behavior and emissions in other segments of the value chain and collaborate with other firms, focusing actions and incentives in segments where the bulk of emissions of the value chain are generated.

84. **Enhanced managerial capabilities will be critical for greater decarbonization in the industry.** Differently from the decarbonization of energy and transport sectors which have clear roadmaps, available technologies, metrics that enable the assessment of climate impacts of different options and their costs, strategies for decarbonizing industrial sectors seem to be more complex and uncertain. Decarbonizing implies not only switching energy sources, technologies and equipment but also the redesign of entire business models including, firms' managerial practices and incentives, relations with clients (both B2B and B2C) and investors. Uncertainties around the climate impacts of new technologies demand a managerial system that awards and allocates resources for experimentation and innovation.

85. **Turkey's manufacturing firms have been already adopting measures encompassing the strategies outlined above.** Upgrades to machinery, equipment, and other assets were adopted by 35 percent of firms. Improvements to heating, cooling, and lighting systems were also used by one-fifth of all firms surveyed and circular economy practices, such as waste reduction, recycling, and management, were leveraged by 13 percent of firms. Firms integrated in value chains are focusing on segments where the bulk of the emissions are and are collaborating with providers, defining standards and influencing clients to reduce emissions in the whole value chain. While still not significant, a growing number of manufacturing firms in Turkey have publicly announced decarbonization and net zero ambitions.

**Figure 33: Measures taken by manufacturing firms in the last 3 years to reduce their environmental impact (n = 1,014)**



**Source:** Enterprise Survey for Turkey, 2019. NB: Simple (and not weighted) averages have been used.

86. **The global decarbonization trend also offers opportunities in the production of goods and services which create net environmental benefits.** As the transition to the green economy transforms the landscape of global competitiveness, countries that have the capabilities to produce green products are likely to reap economic benefits. In Turkey, the production of electric vehicles and renewable energy related value chains hold promise to directly lead green change in the manufacturing industry.

87. **This CPSD plans to explore options for supporting manufacturing export-oriented firms to understand implications of the CBAM, the EU Green Deal and more broadly the transition risks and opportunities brought by the global decarbonizing trends.** Technical assistance services provided through the Turkish Exporters Assembly (TİM) and/or Investment Support and Promotion Agency (ISPAT), in alignment with the MoT's Green Deal Action Plan (July 2021,) will be critical to assess competitiveness implications of the EU Green Deal, and specific trade measures such as the CBAM, for Turkish export-oriented manufacturers.

88. **Facilitating green innovation uptake and supporting green finance, particularly among SMEs.** As seen in the Enterprise Survey firm-level data, smaller firms are less likely to have managerial and strategic focus on climate issues. This, in turn, translates into lower capacities for climate-specific targeting and monitoring. Incomplete understanding of firm-level climate effects, coupled with limited availability of green financing, may be precluding firms from investing in green innovations, such as more energy-efficient upgrades to machinery and equipment as well as waste management and recycling.

89. **Leveraging public procurement standards and broader industry standardization tools to spur transition.** Government procurement standards on a national and subnational level can be an effective tool to accelerate the uptake of cement and concrete produced in a low-carbon way.<sup>41</sup> Revising industry

<sup>41</sup> IFC Green Reboot Report (2021)

and material performance standards can also provide an important stimulus to promote the usage of new lower-carbon-content industry products, contingent on meeting safety requirements.

90. **Promoting circular economy solutions, particularly in petrochemicals and end-user plastics industry.** In contrast to a linear 'take-make-waste' model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources.<sup>42</sup> The circular economy is, therefore, based on three principles: i) design out waste and pollution; ii) keep products and materials in use; iii) regenerate natural systems. There is significant potential for circular economy practices like recycling of Polyethylene terephthalate (PET) and Polypropylene (PP) in Turkey. The country is one of the largest importers of PP and having appropriate recycling capacities for such petrochemicals would not only reduce emissions from waste but also make it less import dependent. Turkey's Circular Economy Platform: Turkey Materials Marketplace (TMM)<sup>43</sup> is a step in the right direction as it provides a digital marketplace for secondary raw materials from one industry to be bought and used by another industry. Specific examples of how manufacturing firms in Turkey are undertaking this circular economy approach to recycle raw materials and reduce virgin consumption in the plastics industry.

## ii) Agriculture

91. **Despite its declining contribution to GDP over the past two decades, agriculture continues to be a mainstay of the Turkish economy and remains the primary source of income for a large part of the population.** Primary agriculture, forestry and fishing accounted for 5.6 percent of GDP in 2021. Turkey is the world's seventh largest producer and exporter of agricultural and food products and has a very diversified export basket which includes wheat, sugar beet, milk, poultry, cotton, tomatoes and other fruits and vegetables, being the top producer in the world for apricots and hazelnuts. Agriculture and food exports grew from US\$4 billion in 2002 to US\$29 billion in 2021, representing more than 13 percent of total exports. The agricultural sector is also an important source of employment responding for 17 percent of total employment in 2021. Agriculture and forestry activities support the livelihoods of millions of rural villagers and provide valuable ecosystem services and help reduce regional and urban-rural socioeconomic disparities. Agriculture also contributes to Turkey's food security. Turkey performs well in terms of sufficiency of food supply, micronutrient availability, market access and agricultural financial services, food safety, protein quality and food safety net programs.

92. **The development of the agriculture sector is highly vulnerable to physical risks associated to climate change.** Increasingly frequent climatic shocks, including frequent drought spells and irregular precipitation, are affecting the sustainable development of the agriculture sector and are expected to exacerbate food price pressures, increase poverty and threaten the country's food security. Moreover, the combination of geographic, topographic, climatic, soil characteristics, and unsuitable farming practices makes Turkey particularly prone to soil erosion. A recent study estimates that 32 percent of the

<sup>42</sup> Ellen MacArthur Foundation, Circular Economy, [https://archive.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail?gclid=Cj0KCQjwm9yJBhDTARIsABKlcGZS6PmB5O0kTb5QXHqOKBkpQ8xrw3yqS1vojyLs4PO86L3uCdBD2EaApzEALw\\_wcB](https://archive.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail?gclid=Cj0KCQjwm9yJBhDTARIsABKlcGZS6PmB5O0kTb5QXHqOKBkpQ8xrw3yqS1vojyLs4PO86L3uCdBD2EaApzEALw_wcB)

<sup>43</sup> <http://www.skdturkiye.org/en/surdurulebilir-sanayi-ve-dongusel-ekonomi#:~:text=Turkey's%20Circular%20Economy%20Platform%20Turkey,one%20industry%20to%20another%20industry.&text=Until%20July%202019%2C%20more%20than,TMM%20members%20circular%20economy%20projects>

country's territory is at high risk of land degradation and desertification, 34 percent is considered "fragile," and 8 percent is at "potential" risk.<sup>44</sup> Water scarcity also constrains the growth and productivity of agricultural activities. Climate change is expected to exacerbate land degradation through soil erosion, fertility losses and nutrient depletion, with negative impacts on agriculture/livestock productivity and on the capacity of soils to serve as carbon sinks.

93. **Agriculture activities also contribute to climate change.** Turkey's agriculture sector is relatively carbon-intensive compared to the rest of the economy, with the sector's share of emissions about double its share in GDP. In 2019, agriculture represented 13.4 percent of the country total GHG emissions (the second emitter sector after the energy sector). It contributes 62.4 percent of the country methane (CH<sub>4</sub>) emissions and 72.5 percent of the country emissions of nitrous oxide (N<sub>2</sub>O), the latter two gases with a higher global warming potential than carbon dioxide (CO<sub>2</sub>).<sup>45</sup> Current food consumption and agricultural expansion trends suggest a continued growth in the intensification activities in the decades to come. The increasing intensification of livestock and the increased use of chemical fertilizers are generating water pollution problems via nitrates and phosphorus pollution. Last but not the least, agriculture is also the largest consumer of water. About 14 percent of 28 million hectares of arable land in Turkey is irrigated land<sup>46</sup> and the sector currently consumes about 75% of total water consumption in Turkey, corresponding to about 30% of renewable water availability.<sup>47</sup> A growing demand for expanding irrigated areas and no tangible improvements in water-use efficiency would result in unsustainable consumption and higher levels of water stress.

94. **Climate change actions in adaptation and mitigation focused in agriculture's water consumption are needed to improve the sector's resilience, reduce emissions and environmental and land degradation.** Priority actions are focused on enhancing water-use efficiency. Options to optimize the use of water include efficient irrigation systems and digital technologies to optimize irrigation decisions. Water storage capacity for both surface and groundwater sources can be improved by investing in improvements in dams and reservoirs that can effectively help store surface water sources while also mitigating climate-related hydrological risk. In addition, infrastructure solutions such as wetlands, afforestation, and riparian zone restoration can help retain, protect, and improve the quality of water sources, reduce surface runoff and sedimentation, and buffer against natural and climate-induced disasters.

95. **As in manufacturing, a holistic value chain approach is warranted to identify efficient actions attenuating climate change related to agriculture and food systems production.** For many food-processing businesses, most of the emissions are generated outside their direct operations, and the potential for climate action, lies in Scope 3 (emissions are embodied in the value chain, including both upstream and downstream emissions). Indeed, the climate change actions should approach existing food

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<sup>44</sup> Dengizb, O. Ş Uzunera, C. (2020). Desertification risk assessment in Turkey based on environmentally sensitive areas. Ecological Indicator 114.

<sup>45</sup> Methane is a powerful greenhouse gas with a 100-year global warming potential 28-34 times that of CO<sub>2</sub>. Measured over a 20-year period, that ratio grows to 84-86 times. Nitrous Oxide (N<sub>2</sub>O) has a GWP 265–298 times that of CO<sub>2</sub> for a 100-year timescale.

<sup>46</sup> Data source: World Bank, <https://data.worldbank.org/indicator/AG.LND.IRIG.AG.ZS?locations=TR>.

<sup>47</sup> Cakmak, 2010, p.6

supply chain inefficiencies. Influencing the adoption of low-carbon, water efficiency and climate-smart agriculture (CSA) practices by farmers in the initial stages of the food value chain and reducing food losses and waste at the end of the value chain can bring about larger climate change benefits than focusing on direct food processing activities. A recent Life Cycle Assessment (LCA) assessment of the carbon, water, and energy footprints throughout the food supply chain in Turkey, estimated food losses and waste in the amount of 18 million tons in 2010, representing GHG emissions, water and energy footprints of 23.7 Mt of CO<sub>2</sub>-eq;  $6.2 \times 10^9$  m<sup>3</sup> of water and  $13.5 \times 10^4$  TJ<sup>48</sup> of energy, respectively.<sup>49</sup> Promoting healthy and sustainable diets also presents important opportunities for reducing GHG emissions from food systems and improving health outcomes.<sup>50</sup> For example, although consumption of red meat in Turkey is below global and regional averages, it is projected to increase steadily in the years to come. Keeping low growth rates of red meat consumption (particularly of beef) and achieving gains in GHG intensities/kg of meat produced via improved animal health, improved production and feeding practices, and effective manure management will be key to reduce total agricultural emissions.

96. **Significant opportunities exist for improving productivity and competitiveness of the agricultural sector via climate-smart agriculture (CSA) technologies.** Implementing CSA technologies could improve yield/productivity and revenue at the farm/enterprise level, reduce greenhouse gas emissions for the country, and improve the long-term resilience of agriculture. A recent work commissioned by IFC, based on very broad estimates, suggests that investing in CSA in four emerging economies in Europe, including Turkey, could generate a cumulative market size of over US\$8 billion, while reducing significantly GHG emissions and generating jobs.<sup>51</sup> CSA technologies with the potential of increasing agricultural competitiveness include fertilizers, crop protection chemicals, crop rotation, irrigation, agritech/data and planning, and seeds. Expanding the adoption of CSA, particularly in the livestock sector, could significantly reduce methane emissions from the agricultural sector which is seen as the single most effective strategy to reduce global warming in the near term.

97. **However, there are key constraints to the adoption of CSA practices and this CPSD plans to identify actions to address some of them, with a focus on broadening access to finance for investments in CSAs, particularly in those sub-sectors and areas with higher mitigation and productivity enhancement potential and in greater need for enhancing resilience.** Some agriculture firms are already implementing best-practice CSA technologies, but most of the agricultural production is developed by medium and small farms which face multiple constraints. These include lack of access to finance, knowledge, and skills. Indeed, small and medium enterprises in the agribusiness sector are constrained by their ability to obtain finance not only for the adoption of CSAs technology but broadly for other type of investments and working capital. The limited reach to this segment by commercial banks is mainly driven by the niche demands of this sector, including: (i) farmers are located in rural and remote areas, where most commercial banks are not located; (ii) customized credit analysis tools, with the flexibility to adapt to the nature and seasonality of the sector and the lack of financial information for small farmers;

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<sup>48</sup> Terajoule

<sup>49</sup> Cakar, B; Serdar A; Varank H; Ozcan K. 2020. Assessment of environmental impact of Food waste in Turkey. Journal of Cleaner Production. Volume 244, 20 January 2020, 118846, <https://www.sciencedirect.com/science/article/pii/S0959652619337163>

<sup>50</sup> Global assessments estimate the mitigation potential of dietary changes as 0.7–8.0 GtCO<sub>2</sub>-eq yr<sup>-1</sup> by 2050.

<sup>51</sup> IFC (2021). A Green Reboot For Emerging Markets.

and, (iii) long gestation period and uncertainty for improving yields and revenues, also adds a barrier for farmers to obtain credit which is normally offered for shorter maturities by domestic banks. Moreover, the lack of carbon accounting metrics or a market that hinders climate finance flows, and the risk aversion of banks to lending for CSAs, given the long gestation period for improving yields, and hence revenues, also add barriers for farmers' access to credit. The CPSD could explore innovative financial instruments that can address issues related to maturity, uncertainty and risk sharing that prevent access to finance for underserved segments, such as the agribusiness sector.<sup>52</sup>

98. **This CPSD plans also to assess regulatory changes that can attract private investments to the sector.** These include removing regulatory barriers to allow farmers flexibility in choosing effective marketing channels; reforming state commodity marketing enterprises to improve their efficiency and financial independence; deepening regulatory reforms around land markets and mainstreaming approaches to aligning land consolidation efforts with productive investments.

### *iii) Tourism*

99. **The travel and tourism (T&T) sector in Turkey is one of the main engines of growth and the country's most important export revenue source.** Fueled by public and private investments, the tourism sector in the country has experienced substantial growth in the last two decades. Foreign tourist arrivals increased from 8 million in 2000 to 51 million, making Turkey the third world tourism destination, only behind Spain and Italy. At around 11 percent, the direct contribution of T&T to Turkey's GDP is almost three times than both the global average (3.4 percent) and the EU average (3.8 percent), and larger than the share in Greece (8.5 percent) and equivalent to China and Australia, though smaller than the share in Mexico (15.5 percent), Spain (14.3 percent) and Italy (12 percent). T&T services represent Turkey's largest source of foreign exchange, generating more than US\$30 billion or 13 percent of the country's total exports of goods and services, far above both the global and comparator-group averages. T&T services employ 1.6 million people corresponding to 9 percent of total employment.

100. **The country's supply of tourism is diversified.** Tourism in Turkey is focused largely on a variety of historical sites, and on coastal areas. The most popular destinations within Turkey are mainly the major cities of Istanbul and Antalya. With over 7000 km of coastline on the Mediterranean Sea and the Black Sea, a mass tourism model based primarily on sun-and-sand attractions is typically developed around high-volume hotels and resorts, which anchor dense clusters of retail stores, entertainment venues, and guided-tour operators. In recent years, Turkey has also become a popular destination for alternative, culture, spa, and health care tourism.

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<sup>52</sup> For example, IFC participates in a program of senior secured notes as part of a US\$400 million 5-year issuance under a Diversified Payment Rights (DPR) modality sponsored by Denizbank, the country's market leader in agricultural lending, to increase access to funding for agricultural MSMEs in Turkey. DPR transactions make available to FIs such as Denizbank, a funding approach that can facilitate international financing characterized by terms and conditions that are more favorable than those made possible by unsecured borrowing. Compared to traditional forms of finance, DPR transactions reduce the risk of providing funds to emerging market borrowers by mitigating the transferability and currency/convertibility risks.

101. **The Turkish tourism sector is vulnerable to climate change.** Warmer temperatures, extreme summer temperatures, loss of environmental amenities (e.g., erosion of beaches and coral reefs), extreme weather events, loss biodiversity, sea level rise and decrease in precipitation are expected to diminish the preference of tourists. Turkish coasts and seas are also threatened by increasing levels of pollutions and climate change may exacerbate these detrimental effects. A recent WWF Report estimated Turkey's coastlines receive the highest plastic debris flux of any Mediterranean coast and its economy loses over US\$95M annually due to plastic pollution, as it affects the tourism, shipping and fishing economies. The likelihood and severity of forest fires will also increase, possibly destroying tourism assets. Drought will also restrict the tourism supply options and drive up operating costs of tourist facilities such as air conditioning, water, swimming pools and golf courses. Moreover, climate change impacts on tourism activities vary regionally. Highly vulnerable regions in Turkey are located in the coastline, and there are more resilient tourism centers cities are mostly located inland. Climate change may also alter tourists flows seasonality. The demand in summer period is expected to decrease in the summer and tourism may choose other destinations in the country during this season which in turn will alter the patterns of mass tourism vis a vis other types of tourism. This will affect regional socioeconomic disparities as the socio-economic impacts of changing climatic conditions will be more intense for more tourism-dependent regions located in the coastline. The changing pattern of tourism flows may also influence regional allocation of investment opportunities in the T&T sector, and they will require addressing the vulnerabilities and risks through regionally based climate adaptation strategies.

102. **On the other hand, T&T activities have impact on climate change.** Tourism activities especially air transportation services generate greenhouse gas emissions. Emissions from tourism related transport have grown steadily over the past decades, reaching almost 1,600 million tonnes of CO<sub>2</sub> in 2016, amounting to 5% of all energy-related CO<sub>2</sub> emissions. According to the UNWTO, three quarters of CO<sub>2</sub> emissions from T&T are transport-related activities while accommodation respond for 20 percent and other tourism activities by the remaining 5 percent. CO<sub>2</sub> emissions from tourism are forecasted to increase by 25% by 2030 from 2016 levels, against the current ambition scenario. Therefore, reducing emissions through mitigation strategies should accompany the adaptation efforts needed to ensure the sustained growth of the sector and its contribution to growth, exports and employment in Turkey.

103. **Climate adaptation for T&T encompasses a set of actions that start with the design of a medium-term adaptation strategy informed by a climate change vulnerability assessment.** As climate related impacts affecting tourism activities have a localized nature, T&T climate adaptation strategies should be local or regional. Adaptation measures include investments in seawalls to prevent coastal erosion, desalination, beach nourishment, improve ability for monitoring real time weather conditions, early warning systems, related regulations regarding building standards; seasonal management of tourism flows, regional diversification to avoid crowds, natural disasters risk management plans, rainwater collection, improvements in water, water-waste and solid waste management, promoting recycling.

104. **Mitigation measures need to approach the T&T value chain from travel, passing to tourism operators, accommodation, and consumers.** The decarbonization of tourism related aviation and other transport modes serving the tourism sector is part of the broader transport sector decarbonization transition. The zero-carbon fuels that will be needed to decarbonize aviation and maritime transport are

not yet commercially available, but Turkey can already take steps towards facilitating and incentivizing the adoption of zero-carbon fuel aircraft and vessels in domestic transportation in the future. In the short time, tour operators have also an important role in mitigation because of their influence on supply chain and demand patterns. Low-carbon travel packages in terms of accommodation, transportation and activities should be fomented. Mitigation actions in the accommodation sub-sector include shifting to renewable energy sources, promoting energy saving, certification of accommodation facilities in energy efficiency. Tourists can avoid contributing to emissions by planning less often but longer trips especially for long distance, using less air travel, preferring closer destinations that can be reached by alternative more environmentally friendly transportation modes, and favoring airlines, tour operators or accommodations with environmentally friendly management system. (Scott & Gössling, 2018; UNWTO, 2008).

**105. This CPSD plans to focus on adaptation and mitigation actions related to the enhancement of the enabling sectors that will be assessed in this report.** In particular, the upgrade of municipal water and water-waste management systems as an important adaptation action particularly severe in coastal areas due to the pollution of water resources given the pollution of bathing sites which is a major obstacle to the development of blue tourism. The CPSD will focus on assessing energy efficiency and options for green buildings in the accommodation sector.

## V. CPSD Arrangements

**106. Regular World Bank review processing will be carried out to ensure quality control of the study.** A concept note review meeting is expected to assess the proposal in terms of its scope and methodology to be used. Senior management from WB and IFC will provide guidance and advice to the team throughout the process. A quality enhancement review meeting is also proposed before the decision review of the CPSD. The final report will be subject to a decision review meeting and will be benefitted by the feedback from authorities before publication.

**107. The main government counterpart is the Ministry of Treasury and Finance (MoTF).** Other government institutions to be involved are the Ministry of Industry and Technology, the SME Organization of Turkey (KOSGEB), the Ministry of Energy and Natural Resources (MENR), the Ministry of Environment Urbanization and Climate Change (MoEU), Ministry of Forestry and Water Affairs (MoFWA) and the Ministry of Transport and Infrastructure (MoTI), the Scientific and Technological Research Institution of the Republic of Turkey (TUBITAK) and the Central Bank of the Republic of Turkey (CBRT)). The team will work closely with the MoTF which will coordinate with other ministries and government agencies, and it is expected to provide feedback on the report. Private sector stakeholders include the Turkish Industry and Business Association (TUSIAD), the Union of Chambers and Commodity Exchanges of Turkey (TOBB), the Turkish Bank Association (TBB) and banks with a developmental mandate and climate mandate such as the Turkish Industrial and Development Bank (TSKB).

108. **Dissemination.** The final report will be delivered to the Ministry of Finance and Economy and other official stakeholders for comments before its final delivery. In addition, a seminar to discuss the findings with all the GoT's stakeholders and private sector representatives

## Annex 1: Team Composition, budget and timeframe

### (i) Team composition:

#### 109. Core team:

- Stefka Slavova (Co-TTL, WB), Fernando Blanco (Co-TTL, IFC), Craig Meisner (Co-TTL, WB); Raha Shahidsales (WB), Sunita Varada (WB), Umut Kilinc (WB), Miles McKenna (IFC) and David Bassini (IFC). [Please add colleagues from WB]

#### 110. Extended team:

- Basak Odemis (IFC, Consultant), Tarik Sahovic (IFC), Emmanuel Pouliquen (IFC), Samu Salo (IFC), Enrique Lora (IFC),

#### 111. Peer reviewers:

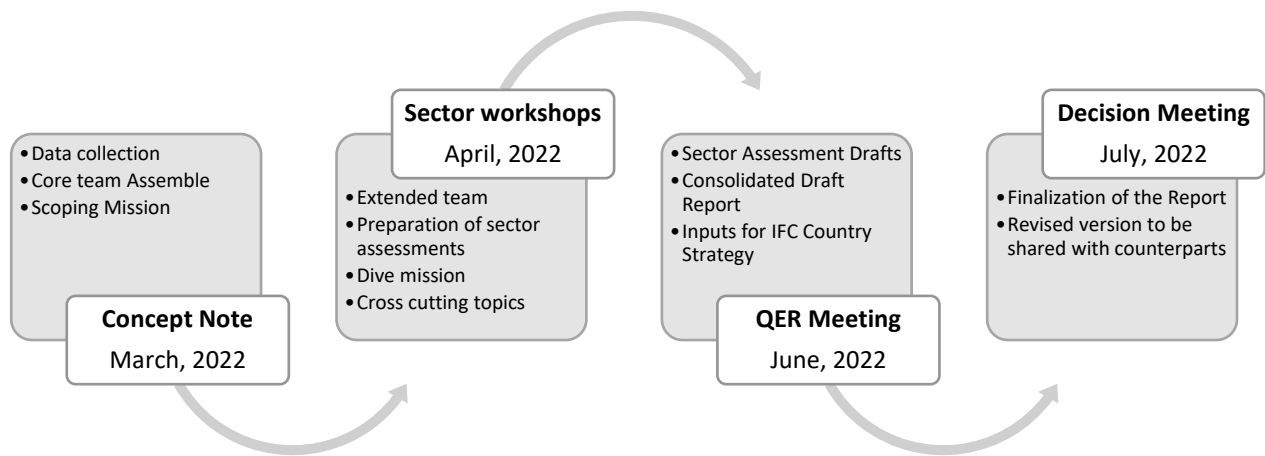
David Knight (WB), Habib Rab (WB), Tom Farole (WB), staff from IFC (TBD)

### (ii) Budget:

112. The budget of 200k, is expected to be allocated according to the breakdown presented in the table below.

|                                     | Estimated Cost (US\$) |             |
|-------------------------------------|-----------------------|-------------|
| <b>Core Team</b>                    |                       | <b>70k</b>  |
| Stefka Slavova                      | 4 weeks               | 20k         |
| Fernando Blanco                     | 4 weeks               | -           |
| Craig Meisner                       | 4 weeks               | 20k         |
| Raha Shahidsaless                   | 4 weeks               | 15K         |
| Sunita Varada                       | 4 weeks               | 15k         |
| Umut Kilinc (WB)                    | 4 weeks               | 8k          |
| Miles Mckenna                       | 3 weeks               | -           |
| Kazumaza Oba                        | 4 weeks               |             |
| <b>Extended Team</b>                |                       | <b>85K</b>  |
| 3 to 4 FCI staff sector specialists | 12 weeks              | 25k         |
| 3 to 4 IFC industry specialist      | 12 weeks              |             |
| 3 consultants                       | 80 days               | 60k         |
| <b>Travels</b>                      | <b>6 trips</b>        | <b>45k</b>  |
| <b>Total</b>                        |                       | <b>200k</b> |

### (iii) Timeframe



Annex 1. Table 6. Summary of environmental and sustainability trends and benchmarking

| Indicator                                                                                                       | Decoupling trend | Key sources and main issues                                                                                                                                                                 | Benchmark                     |                              |
|-----------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------|
|                                                                                                                 |                  |                                                                                                                                                                                             | Turkey                        | Comparator                   |
| SO <sub>2</sub> emissions (kg per capita)                                                                       | RD               | Power, industrial combustion                                                                                                                                                                | 29.4                          | OECD: 7.2                    |
| NO <sub>2</sub> emissions (kg per capita)                                                                       | AD               | Transport, power, industrial combustion                                                                                                                                                     | 9.3                           | OECD: 13.1                   |
| PM <sub>10</sub> emissions (kg per capita)                                                                      | AD               | Industrial combustion and processes, other combustion                                                                                                                                       | 3.0                           | OECD: 3.4                    |
| PM <sub>2.5</sub> emissions (kg per capita)                                                                     | RD               | Industrial combustion, agriculture                                                                                                                                                          | 2.4                           | OECD: 2.2                    |
| CO <sub>2</sub> emissions (kg per capita), excluding the Land Use, Land-Use Change and Forestry (LULUCF) sector | RD               | Power, manufacturing, transport, buildings                                                                                                                                                  | 5,090                         | OECD: 9,000                  |
| GHG emissions (kg per capita), excluding LULUCF                                                                 | RD               | Energy, industrial processes, agriculture, waste                                                                                                                                            | 6,070                         | OECD: 7,740                  |
| Power (% renewable energy in generation)                                                                        |                  | 3.8kg CO <sub>2</sub> /\$ of value added<br>Reliance on indigenous lignite is increasing                                                                                                    | 43                            | EU: 38                       |
| Transport (kg CO <sub>2</sub> /\$ of value added)                                                               |                  | 29% of total final energy consumption (TFC)<br>Road transport is the fastest-growing emissions source                                                                                       | 0.5                           | EU: 0.7                      |
| Manufacturing (kg CO <sub>2</sub> /\$ of value added)                                                           |                  | 33% of TFC                                                                                                                                                                                  | 0.2                           | EU: 0.1                      |
| Agriculture (kg CO <sub>2</sub> /\$ of value added)                                                             |                  | 62.4% of total methane emissions                                                                                                                                                            | 0.8                           | EU: 1.7                      |
| Buildings (average kWh/m <sup>2</sup> /y)                                                                       |                  | Residential energy consumption: 21% of TFC in 2018<br>Commercial and public buildings: 13% of TFC in 2018                                                                                   | SF: 220<br>MF: 175<br>NR: 270 | EU (SF & MF): 180<br>EU: 250 |
| Welfare cost of premature deaths from PM <sub>2.5</sub> (% GDP equivalent)                                      | RD               | Ambient concentrations are high in urban centers                                                                                                                                            | 5.3                           | OECD: 2.4                    |
| Municipal waste (2018, kg/capita/year)                                                                          | RD               | 87% of all waste goes to landfill or dumpsites and only 12% is recycled                                                                                                                     | 424                           | OECD: 525                    |
| Material consumption (1,000 kg/capita/year)                                                                     | RD               | Turkey imported 50% of all ferrous metal waste from EU in 2019                                                                                                                              | 12.1                          | OECD: 13.6                   |
| Land degradation, desertification, and forests (2010–2020, annual net gain in forest area, %)                   |                  | 642 million tonnes of soil transported per year; 43% of forests classified as degraded and in need of rehabilitation; the production value of wood and non-wood products is below potential | 0.5                           | EU: 0.2                      |
| Water scarcity and quality (2017, Water Exploitation Index: water use/water resources)                          |                  | 15 of 25 river basins are water-stressed; a third of lakes and up to half of rivers are contaminated by phosphorus and nitrogen                                                             | 23.3                          | OECD: 8.4                    |
| Environmental protection expenditures (% GDP)                                                                   | ND               | Mostly waste (45%) and wastewater management (40%)                                                                                                                                          | 0.9                           | EU: 1.9                      |
| Natural hazards and disasters (average annual asset losses in % GDP)                                            |                  | 935 extreme events in 2019, with heavy rain/floods (36%), windstorms (27%), hail (18%) and significant earthquake risks to lives and infrastructure                                         | 0.20                          | OECD: 0.09                   |

Sources: World Bank staff calculations, based on data from Turkstat, Eurostat, OECD Stat, various years.<sup>53</sup>

Notes: Decoupling trend is based on comparison with GDP for the latest year of data. AD (green) = *absolute decoupling*, where the growth of air pollutants is stable or declines relative to economic growth; RD (yellow) = *relative decoupling*, where emissions increase at a slower rate than economic growth. Although it is rated as *negative decoupling* (ND) under *Environmental protection expenditures*, it is also rated as positive (green) because expenditures are growing faster than GDP growth. Under *Benchmarks*, the indicators are rated green when Turkey's indicator is better than the comparator (OECD or EU) and red when it is worse. The Water Exploitation Index plus (WEI+) is a measure of total freshwater use as a percentage of renewable freshwater resources (groundwater and surface water) at a given time and place. It quantifies how much water is abstracted and how much is returned after use to the environment. SF = single family, MF = multi-family, NR = non-residential.

<sup>53</sup> <https://www.tuik.gov.tr/>; <https://ec.europa.eu/eurostat/data/database>; <https://stats.oecd.org/>

