January 2025

Integrated Policy Strategies and Regional Policy Coordination for Resilient, Green and Transformative Development: Supporting Selected Asian BRI Partner Countries to Achieve 2030 Sustainable Development Agenda

Project Paper No. 12

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Role of Finance in Türkiye's Green Transition: Investigating for Opportunities under Current Trends and Path Dependence

Abstract

This paper examines the essential role of financial sector reform in advancing Türkiye's green transition and achieving global climate targets. While pathways to net zero emissions are well-researched, the financial sector's involvement in financing this shift remains insufficiently explored. The report underscores the need to realign financial systems to support the large-scale investments required for sustainable development, while addressing challenges posed by financialization, debt overhang, and rising inequality. It evaluates Türkiye's financial operations in relation to its increasing greenhouse gas emissions and emphasizes the necessity of integrating climate objectives into financial practices. The study proposes a comprehensive policy framework focusing on green central banking, sustainable credit allocation, and the implementation of carbon pricing mechanisms, including a domestic emissions trading system (ETS), to promote decarbonization and long-term economic resilience.

Contents

KEYWORDS: Green Transition, Green Finance, Emissions Trading System, Financial Subordination, Türkiye

Acknowledgements

This paper has been prepared under the UNCTAD project "Integrated Policy Strategies and Regional Policy Coordination for Resilient, Green and Transformative Development: Supporting Selected Asian BRI Partner Countries to Achieve 2030 Sustainable Development Agenda", funded by the 2030 Agenda for Sustainable Development Sub-Fund of UN Peace and Development Trust Fund of DESA. The author would like to thank UNCTAD staff for comments on earlier drafts. This paper represents the personal views of the author only. The author accepts sole responsibility for any errors.

Introduction

As the signals of an ecological and climate crisis are escalating, calls intensify towards green transition to achieve a net zero emissions global economy by mid-century. Researchers at the *International Panel on Climate Change* (IPCC) share their assessments that meeting the 1.5°C target is possible, and yet it will require "*deep emissions reductions*" and "*rapid, far-reaching and unprecedented changes in all aspects of society*". The *International Energy Agency* calls to double the pace of energy efficiency progress towards green transition, and notes that "*large scale financing mechanisms ought to be enacted*".

The main motivation of this *Report* is that pathways to a net zero emission for Türkiye, as well as the global economy are relatively well-studied and understood, and yet, many of these studies thus far focused mostly on green transition of the *power sector* and decarbonization of the *industry (agro-industry included)*. In contrast, *financing of this transition,* and particularly the *potential role of the financial sector* at large, is a relatively neglected area in the design of the green policy infrastructure. This gap is highlighted, for instance, by former Governor of the Bank of England, Mark Carney, who shares the observation that the *"global financial system is funding global warming up to a 4°C increase through its operations"* (Carney, 2015; Guardian, 2019).

Furthermore, there is a clear need to elevate the current capacities of global financial markets to cover the investment costs of transitions towards a green development pathway. To this end, Carney (2021) remarks that the required level of expenditures to get net zero emissions in line with the 1.5-degree target is projected to range from $100-150 trillion throughout the next thirty years. Emerging and developing countries will require two-thirds of the overall expenditure, making their requirement the most significant. Thereby, The International Energy Agency (IEA)emphasizes the need to double energy efficiency while indicating the necessity for *"very high new financial mechanisms"* to sustain the green transformation (IEA, 2023).

The shift from a fossil fuel-dependent energy system to a completely renewable one is the paramount issue of our era. Responsible financial responses can be categorized into two main actions: firstly, halting the flow of funds towards fossil fuels, and secondly, gradually reducing investments in fossil assets. The prevailing discourse on financial institutions, with a specific focus on central banks, and climate change has primarily centered in the initial phase. However, climatic science clearly suggests an urgent necessity to rapidly decrease the combustion of fossil fuels by approximately 10% annually, comparable to the reduction observed during the Covid epidemic, until the era of fossil fuels comes to an end. Such acceleration can solely be attained by implementing ambitious actions. Ceasing the funding of fossil fuels is arguably the most challenging action to undertake, as it requires overturning a long-standing economic mindset that has persisted for over a century. However, the task of liquidating fossil assets is the most significant and urgent work that must be completed without further delay.
Several financial proposals have been suggested to tackle this challenge, including coal asset transition (CAT) mechanisms[1], just energy transition partnerships, full

[1] Such as, *e.g.*, The Coal Asset Trasition Tool advocated by the Transition Zero Network: https://www.transitionzero.org/products/coal-asset-transition-tool

divestment, the one-for-one rule, green interest rates[2], and green quantitative easing. Each of these proposals has its own advantages and limitations. In response to the climate emergency, central banks, as well as numerous other financial entities, must embrace novel approaches. An implementation of a climate bailout instrument would also be a valuable and advantageous feature.

Therefore, the significance of the financial sector in the green transformation manifests in two aspects: first, *redesign of the financial sector* in line with the green transformation; second, the *development of financial system products* to generate the necessary financial resources for the green transitions.

Given these observations, it is pertinent, however, to note that the developing economies are severely constrained in their operations under the dire conditions of *dependent financialization* and *financial subordination* (Apaydın & Çoban, 2023; Alami, *et.al*, 2023; Bonizzi, *et.al*, 2019) which structurally restrict the peripheral economies of the global economy and inhibit their indigenous attempts to pursue sustainable and green trajectories of industrial development –Türkiye being no exception.

As Yeldan notes “the ambitious targets of GND are cast within the shadowy realm of the *age of anxiety* where, led by the hyper-globalization episodes of premature financial deregulation especially within the developing world, the global economy is excessively financialized and fragile; global demand remains weak; investment is sluggish; and distribution of incomes and wealth is heavily concentrated. Invigorated by the collapse of the Bretton Woods system and the elimination of the gold standard against the US dollar, this new financial order had been working under the conditions of almost *no rule of gravity* where the *objective value* of money is exclusively left to the *caprices* of the *speculative arbitrageurs*” (Yeldan, 2023). In this context, the financial industry has effectively broadened its justification to include the global labor and commodity markets, eroding local communities and any remaining restrictions that stand in the way of the logic of free market mobility. The development failures and continued vulnerability of developing countries to external shocks have exacerbated the problems associated with financialization (UNCTAD, 2016).

In fact, in the words of UNCTAD (2019), “*most of the current industrialization and governance problems originate from the excessive volatility of speculative finance flows characterizing the current realm of markets*”.

The likely adverse impacts of premature and dependent financialization can be argued to operate through many channels. First one refers to what we might call *the time horizon mismatch*. In an attempt not to miss the arbitrage opportunities, the time horizon of financial arbitrageurs is extremely short; and thus, the “*tick-nature*” of financial operations make it pertinent that economic decisions ought to be unavoidably quick and almost automated. Translated over to the realm of the *real sectors* of the economy, this often causes short-sightedness and mis-allocation of resources (Stiglitz, 2000) (see also Diaz-Alejandro, 1985, for the original statement of the problem).

[2] See, for example, the proposal advocated by the research group Finance Watch who is leading a new campaign that aims to enforce regulations requiring banks and insurance companies to boost the amount of capital they hold against assets related to fossil fuels to 1250%! This would oblige them to only use their own funds to finance new fossil fuel projects. This measure, arguably, would safeguard depositors, policyholders, and taxpayers from the negative impacts of stranded assets and other risks associated with climate change.
https://www.finance-watch.org/press/joint-press-release-call-for-one-for-one-prudential-capital-requirements-on-fossil-fuel-financing-to-prevent-an-economic-crisis/

Secondly, the cut-throat competition in the financial sector has led the global asset markets to generate excessive credit and debt over-accumulation. Popular narrations of this debt-overhang underscore the fact that global debt stock has surpassed US$313 trillion in the first quarter of 2024 (238% of global gross income)[3]. Lure of the ongoing financial instrumentalization leads to over-consumption, over-stretching of global resources, and an intensified ecological footprint. Thirdly, financialization has often been seen concomitant with the rise of concentration of power and oligopolization of the global asset and commodity markets (a recent narration is provided in an IMF Working Paper penned by Diez & Leigh, 2018). Narrating Diez and Leigh, "*in advanced economies, rising corporate market power has been blamed for low investment despite rising corporate profits, declining business dynamism, weak productivity, and a falling share of income paid to workers.*" Fourth, and related with this, the post-1980 financial globalization has witnessed a worsening of income distribution (see Piketty 2013, narrating the most popular version of this episode along with Milanovic 2012), together with a secular stagnation of real wage remunerations, and falling wage share (OECD, 2014). Worsening income positions of the middle-income strata often lead to over-utilization and buildup of excessive pressure over environmental resources.

The combination of these observations led Daniela Gabor (2020) and Dafermos *et.al* (2021) to coin the term "*Wall Street Consensus*." Gabor and her colleagues contended that the key climate policy tools of this consensus, including debt-driven climate infrastructure asset instruments, carbon pricing through international climate markets, and co-alignment with global financial investors to close the so-called "infrastructure investment gap", will only increase financial vulnerability in the Global South and produce little to no progress toward the goal of a green development pathway.

Türkiye is a prime example of the above-mentioned whims and *capricés of speculative finance*, as the country has yet to realize the necessary decoupling between growth and carbon reductions. Türkiye emits around 6 tons of carbon dioxide (CO2) and other greenhouse gases (CO2 eq.) per person as of 2021; and the country's total CO2 eq. emissions per $GDP (in constant US dollars) is 0.524 kg.[4] Apart from these unfavorable performance indicators, Türkiye is also mentioned as one of the top three nations revealing the fastest rate of increase in per capita greenhouse gas emissions (Orhangazi & Yeldan, 2023c). Türkiye recorded a cumulative rise in CO2 equivalent emissions of 156.9%, rising from 214 million tons in 1990 to 564 million tons in 2021. According to Acar et al. (2018), in a "*low commitment*" scenario, global CO2 emissions are expected to reach 680 million tons by 2030.

It is the purpose of this report to explore the sustainability conditionalities of green transition along with the need for a renewed green design of the global financial infrastructure where *the central bank and the whole banking system will play a key role*; to study the potential of greening of the monetary policy instruments towards a *green central banking regime*; and to set the stage for a *new financial policy framework* conducive to the struggle against climate change.

More formally, the Report attempts to,

[3] IMF IIF Global Debt Monitor: https://www.iif.com/Products/Global-Debt-Monitor

[4] Comparative data adapted from the World Bank Development Indicators (Environment, Social and Governance (ESG) Data) at https://databank.worldbank.org/source/environment-social-and-governance-(esg)-data

- Provide an overview of the finance sector, including the global trends of GHG emissions, potential contribution of the financial sector to the fight against climate change –both in the indigenous case of Türkiye and the global economy at large.
- Discuss the policy landscape relevant to de structurally transforming the sector, including national and regional-level policies, and study the historical strength of the symbiosis between the climate policies and the operations of the financial sectors, including the policies which directly or indirectly impact the sector, including credit policies, environmental policies, and industrialization and agricultural policies.
- Critically review and evaluate the performance of existing and planned strategies to address GHG emissions and productivity issues for green structural transformation in the financial sector with emphasis on the allocation credit across polluting versus green sectors, and the potential role of “green” central banking.
- Analyze and critically discuss the key challenges and opportunities of the mitigation strategies of carbon pricing via the establishment of a domestic *emission trading system* under the proposed official policy agenda

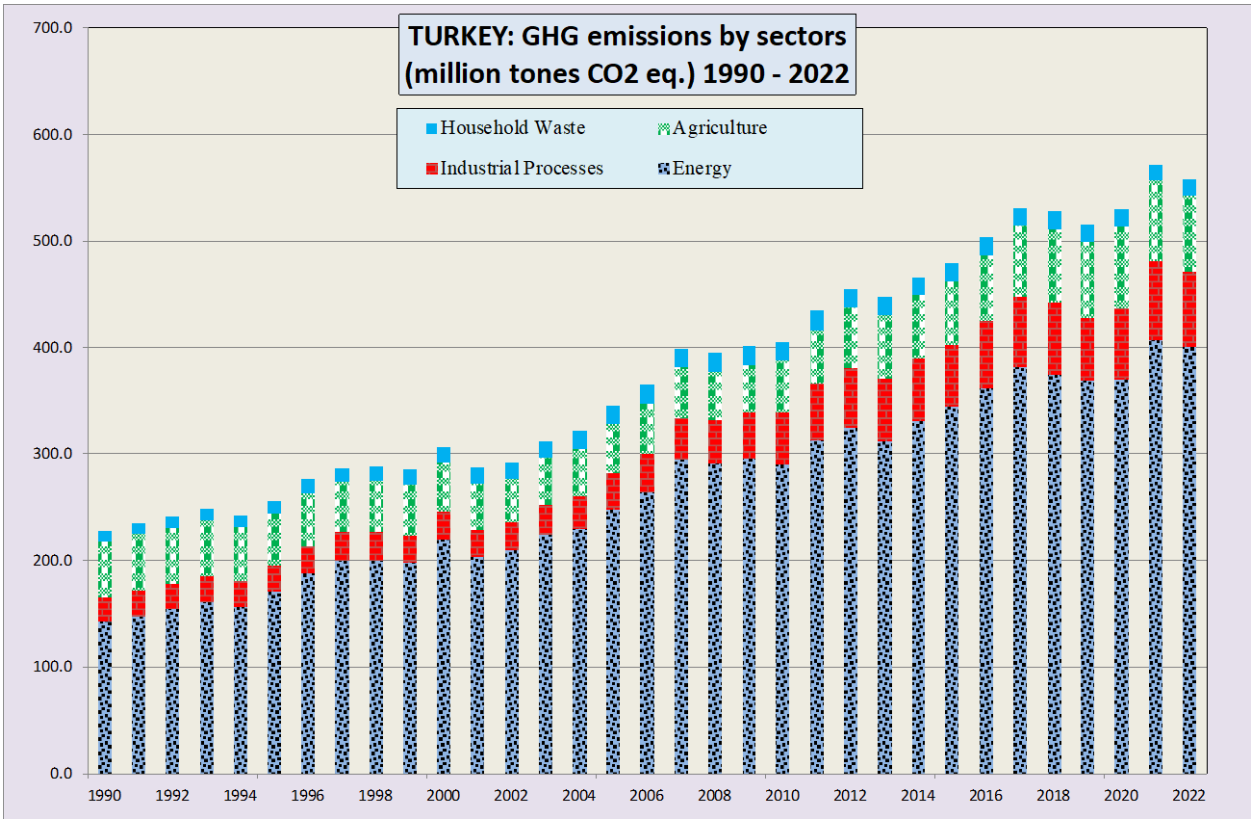
The report is planned under three sections. In the following section, Türkiye’s experience with the role and responsibilities of the domestic financial operations over the realized CO2 emissions are discussed. The evolution of the patterns of *adjusted net saving rates* and other sustainability indicators are evaluated within the context of financialization, and the responsibilities of the banking sector are underlined. Next, the paper dwells upon narration of the official policies of green finance and carbon pricing under the proposed domestic ETS; and offers a comprehensive evaluation as well as policy insights towards greening central bank’s monetary policy design. The third section summarizes and concludes.

1. The Role and Responsibilities of Türkiye's Financial Sector in Gaseous Emissions

1.1 Current Trends and the Heightening Path-Dependence

Türkiye displays typical characteristics of a developing / emerging economy with high energy deficiency, a historically given, structural imbalance of the savings – investment gap, and a lopsided, highly volatile rate of growth mostly driven by the speculative in- and out-flows of hot money finance. Even though per capita levels of GHG emissions in Türkiye are still relatively low, growth of per capita emissions is one of the fastest among the OECD countries. Total greenhouse gaseous (GHG) emissions rose from 219.7 million tons in 1990 to 558.3 million tons in in 2022, yielding cumulative increase of 14.8%. Figure 1 below portrays the path of GHG emissions by sources of origin.

Figure 1: GHG emissions by sectors, 1990-2022



Source: Turkstat, Environmental statistics

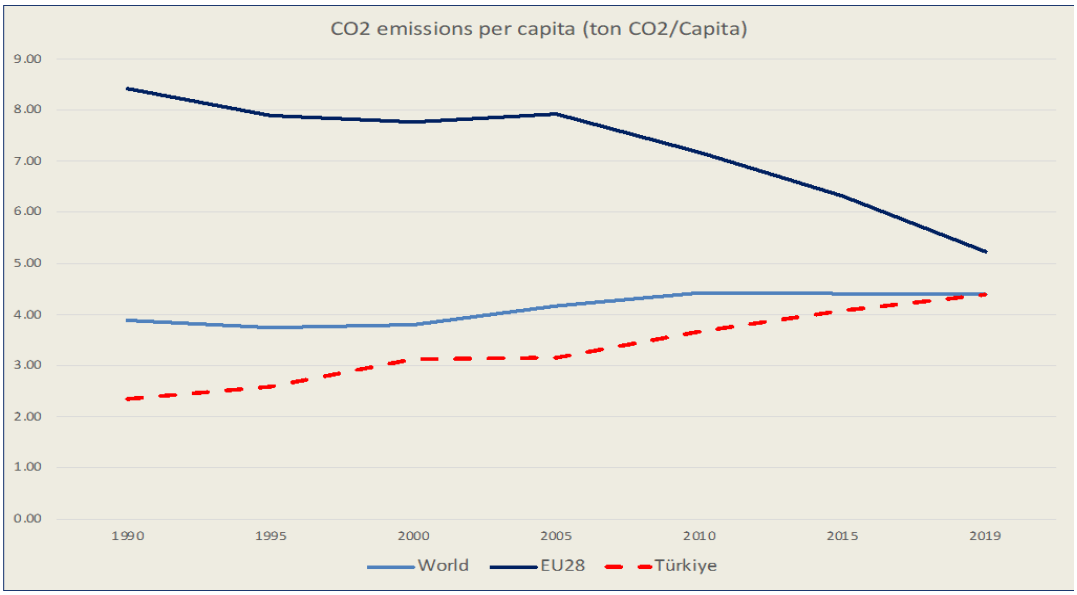
As observed from Figure 1, the bulk of emissions originate from the energy sector. The proportion of energy produced domestically in relation to the overall energy supply has experienced a significant decrease, dropping from 47.9% in 1990 to 33.3% in 2000. This trend persisted throughout the 2000s and peaked at 26.5% in 2005, remaining relatively stable at that level thereafter. Therefore, the initiation of capital account liberalization has resulted in increased reliance of the domestic economy on energy imports, among other consequences. The *premature financialization* of Türkiye

(Yeldan, 2023a; Cizre-Sakallıoğlu, 2000) has led to a problem of balance of payments and monetary policy design, as well as an increased reliance on imports in the energy and strategic intermediates manufacturing sectors. This has been exacerbated by the constraints of financial dependence. The abundance of inexpensive short-term financial capital, along with a consistent trend of currency appreciation, limited the possibilities for domestic energy and intermediate production and imprisoned the local economy in a situation where current account deficits became a structural constraint.

Currently, Türkiye is attempting to pursue an indigenous industrialization strategy based on green growth and renewables acquisition. However, this is by no means a simple task. For one, the economy is severely constrained in sustaining its energy security and is severely hampered by the binding import dependence on crucial intermediate inputs and foreign technology. Whats'more, the constraints of a financially dependent growth pattern limit the economy's capability in generating indigenous sources of development, taking hostage its scarce savings and directing them mostly to unproductive rent-seeking ventures (See Orhangazi & Yeldan, 2023a; Cizre-Sakallıoğlu and Yeldan, 2000; and Yeldan 2023 for more discussion on the role of speculation-led growth patterns for Türkiye).

For Türkiye to maintain a continued rate of growth of its gross domestic product, it is imperative that there is a constant and uninterrupted flow of foreign hot money capital. This is a challenge as it is unable to sustain this through exports or other sources of revenue such as tourism or remittances. Therefore, as the Turkish economy faces the difficulties of securing a cost-effective energy supply for its industrialization efforts and guaranteeing energy security, its environmental indices are deteriorating. In terms of gaseous emissions, the country acknowledges a comparatively low level; yet, it is worth noting that the growth rate of per capita emissions is one of the highest among the OECD countries. Figure 2 below portrays the paths of per capita emissions across Türkiye, EU28 and the world averages.

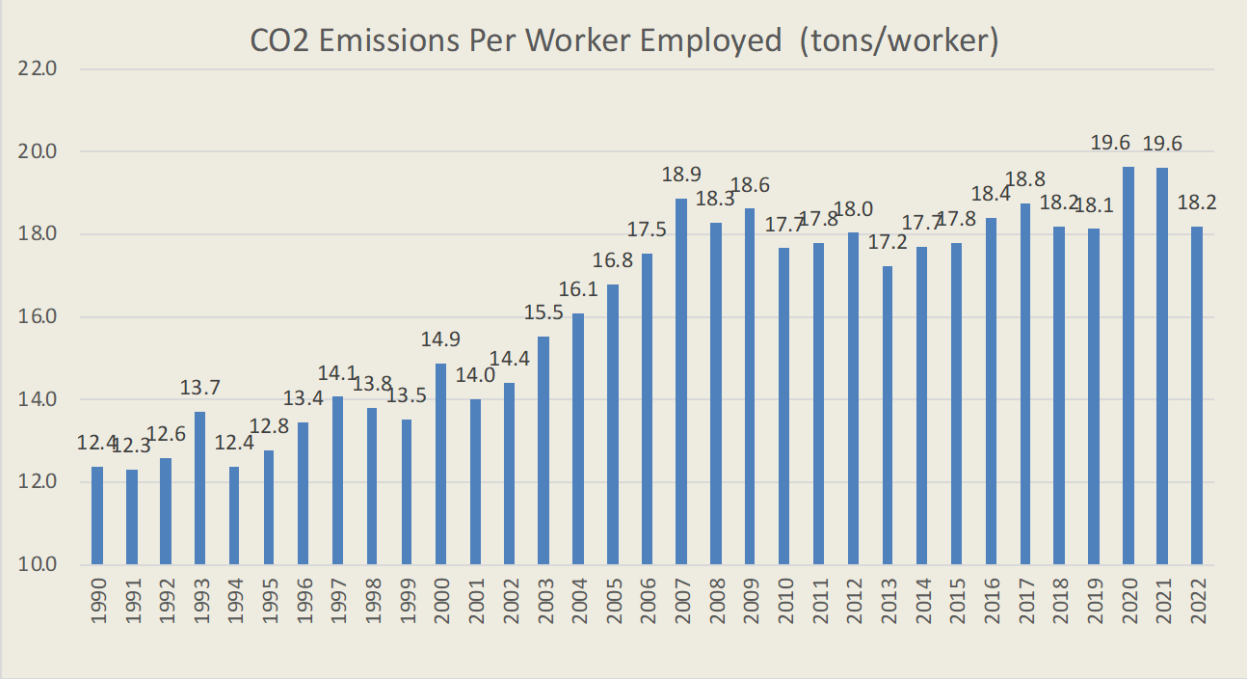
Figure 2. CO2 emissions per capita (ton CO2/Capita



Source: IEA IEA Data Services https://www.iea.org/data-and-statistics/data-products

One of the key technological attributes of this speculation-led growth driven by hot money finance is known to be the secular rise of carbon intensity given the pressures of structural unemployment across the late-industrializers. Thus, a key outcome of this speculation-biased trajectory has been the rapid rise of *emissions per worker*. As can be followed directly from Figure 3, emissions per labor employed hover around 13 tons per worker from 1990 to 2001, and then start to accelerate rapidly under the speculation-led growth era (2002 to current) from 14.4 tons per worker, to 19.6 tons/worker in 2020 and 2021. The most recent data reveals that CO2 emissions per worker employed hovers around 18.2 tons in 2022.

Figure 3. CO2 Emissions Per Worker Employed (tons/worker)



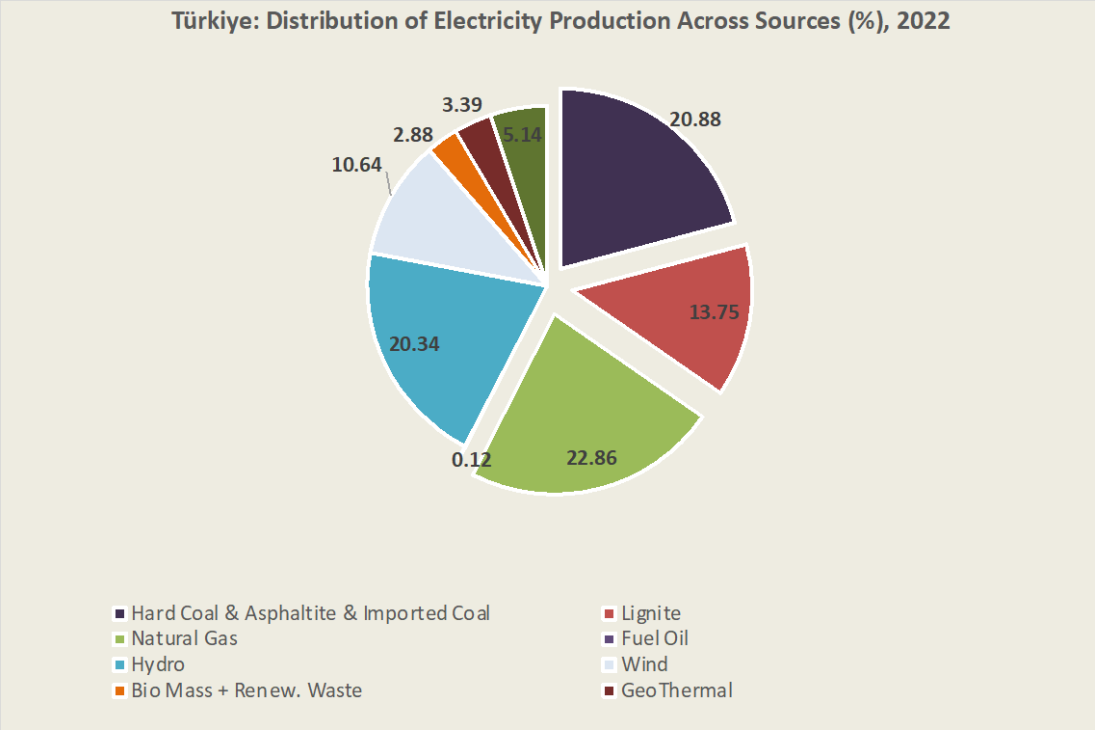
Source: Turkstat: Environmental Statistics, Household Labor Force Surveys

Türkiye's economic growth after 1980 was heavily reliant on energy consumption. From 1980 to 2022, the total primary energy consumption has increased three times rising from 100 terawatt hours (TWh) to 334.2 TWh. When evaluated on a per person basis, this resulted in a twofold increase in eelctricty consumption to 3,950 KWh by 2021. In comparison, the OECD-Europe countries display an average per capita electricity consumption of 5,900 KWH per annum.

Türkiye's overall installed power capacity has nearly doubled during the past decade, increasing from 49,524 MW in 1990 to 103,809 MW in 2022. During this time, Turkey managed to decrease its reliance on coal for load capacity from 24% to 21.1%, albeit the progress was slow. In 1990, the proportion of imported coal in coal plants was 28.5%, which increased to 48.2% in 2022 (equivalent to 10,373 MW of imported coal out of a total of 21,405 MW). Current emissions from coal-fired power plants amount to 165 million tons. In 1990, coal-based emissions were 61 million tons. Since then, there has been a cumulative rise of 168%.

The sources of electricity power production (as of 2022) are illustrated in Figure 4. Imports are observed to disclose a significant impact, with imported coal and natural gas plants contributing 10.0% and 24.4% of the total share, respectively. Fossil-based sources account for 45.7% of the overall electricity output.

Figure 4: Türkiye, Electricity production by source, 2022.



Sources: Chamber of Electricity (https://www.emo.org.tr/) and
TEIAS: https://www.teias.gov.tr/turkiye-elektrik-uretim-iletim-istatistikleri

1.2 Responsibilities and the Role of the Finance Sector, Türkiye

The finance sector, no doubt, had direct responsibility in sustaining these adverse developments over deepening emissions. The responsibilities of the financial sector had been manifested through various channels. First and foremost is the distribution of credit and loans. Table 1 documents the extend of carbon incidence of the loan operations of the Turkish banking sector over the 2000s.

Table 1. Emissions Incidence of Banking Loans Across Various Sectors

	Loan Intensity (kg / 1000 TL)			
SECTORS	2005	2012	2015	2019
Agriculture (AG)	9.07	4.04	3.31	3.42
Mining (MI)	2.09	1.95	0.47	1.28
Food Pr. (FO)	0.83	0.37	0.27	0.28
Textile Pr. (TE)	0.63	0.23	0.10	0.09
Petroleum&Chemicals Pr. (CHA)	4.24	3.12	2.14	3.00
Cement (CE)	11.28	9.65	7.49	5.35
Iron & Steel (IS)	2.38	0.94	0.67	0.66
Machinery (MW)	1.13	0.73	0.53	0.73
Automotive (AU)	0.47	0.08	0.04	0.03
Other Manufacturing (OMA)	2.21	0.74	0.51	0.46
Electricity (EL)	37.82	6.02	2.75	2.31
Construction (CN)	0.51	0.14	0.07	0.07
Transportation Act. (TRA)	16.61	6.46	4.14	3.39
Tourism (TS)	0.03	0.14	0.19	0.16
Professional Services (PR)	1.66	1.11	2.87	2.29
Financial Services (FSA)	0.41	0.29	1.35	0.71
Education Services (ES)	0.16	0.29	0.85	0.57
Heath Services (HE)	0.06	0.08	0.38	0.24
Other Economy (OE)	257.91	86.55	22.14	12.67

Adapted from: Yeldan (2023b) and Karabacak (2023)

The table quantifies carbon emissions intensity in kilograms of carbon emissions per 1000 Turkish Lira (TL) of loan amount. It highlights the sectors with the highest and lowest carbon emissions intensities associated with bank loans in each year. Data suggest that there is a general tendency for the loan intensity to fall across the most environmentally sensitive sectors, such as cement, iron & steel, and chemicals. There is a counter movement in the services sub-sectors, however, with a slight but sustained increase of the loan intensities over time.

Thus, there is need for a closer analysis. To this end, a cross-examination of the sectoral distribution of banking credits and sectoral emissions is deemed necessary. In the following Table, the shares of sectoral emissions are displayed against the banking credit allotment across the productive sectors.

Table 2. Sectoral Emissions and Credit Profile, Türkiye 2020

SECTORS	PBE (share in total)	DDE (share in total)	Credits (% share in total)
Agriculture (AG)	17.78%	11.94%	3.438
Mining (MI)	1.63%	0.25%	1.087
Food Pr. (FO)	1.66%	6.27%	4.020
Textile Pr. (TE)	0.77%	4.37%	5.819
Petroleum & Chemicals Pr. (CHA)	4.02%	2.58%	0.575
Cement (CE)	14.23%	6.18%	1.934
Iron & Steel (IS)	4.05%	5.76%	4.218
Machinery (MW)	1.76%	3.34%	1.676
Automotive (AU)	0.19%	1.60%	3.976
Other Manufacturing (OMA)	0.62%	2.28%	0.998
Electricity (EL)	32.11%	14.25%	8.819
Construction (CN)	1.35%	11.82%	12.637
Transportation Act. (TRA)	6.92%	6.41%	7.081
Tourism (TS)	1.02%	4.50%	4.324
Professional Services (PR)	2.91%	4.87%	0.602
Financial Services (FSA)	1.05%	3.19%	3.396
Education Services (ES)	0.36%	1.38%	0.398
Heath Services (HE)	0.33%	1.85%	0.825
Other Economy (OE)	7.25%	7.15%	34.174
	PBE (Mt CO2e)	DDE (Mt CO2e)	Credit Total (million TL, in constant 2003 prices)
Level in millions	445.16	445.16	858,566.92

Adapted from: Yeldan (2023b) and Karabacak (2023).
PBE: Production-Based (Direct) Emissions; DDE: Demand-Driven (Indirect) Emissions

The first column of Table 2 displays the so-called *direct emissions* that are due the *production-based operations* in each sector. It ought to be noted that, the data displayed under column PBE pertain solely the production-based emissions –that is emissions originating from the *direct production operations* in each sector. What is equally important, however, is the indirect emissions incidence of each sector though the resource pull effects of intermediate input usage. As output production in one

sector expands, it also stimulates production in another sector thorough the intermediate resource pulls. This, we call the indirect or *demand-driven* effect. Thus, when the banking sector induces economic activity in a given sector, its expansion also stimulates emissions in other sectors through the input-output intermediate linkages. In this regard, cement industry and the housing sector are clear examples. An increase of housing production activity stimulates cement production and the ongoing emissions of the cement sector. Machinery and Iron & Steel input-output relationship is also another classic case. Thus, any stimulus originating from the banking sector credits to boost investments and production activity in a given sector will augment demand for the other sectors as well. These actions invigorate a series of pressures to generate emissions across the domestic economy via intermediate input intensities in final demand. The resulting net generation of emissions is referred to as the indirect, demand-driven emission pathways. Thereby the indirect emissions incidence of the banking credits is further calculated under column DDE of Table 2.
Calculations reveal that *construction* has received the lion's share of banking credits (12.6%) with a sum of 542.7 billion TL as of 2020. The sector is observed to be responsible for 11.8% of the indirect emissions (totaling 445.16 million tons of CO2(eq) in the same year). Direct production-based emissions of the sector, however, have been on the order of only 2.4%. *Cement*, in contrast, was one of the leading emitters of direct CO2 pollution with a percentage share of 14.2%, receiving only 1.9% of the banking credits allotted.

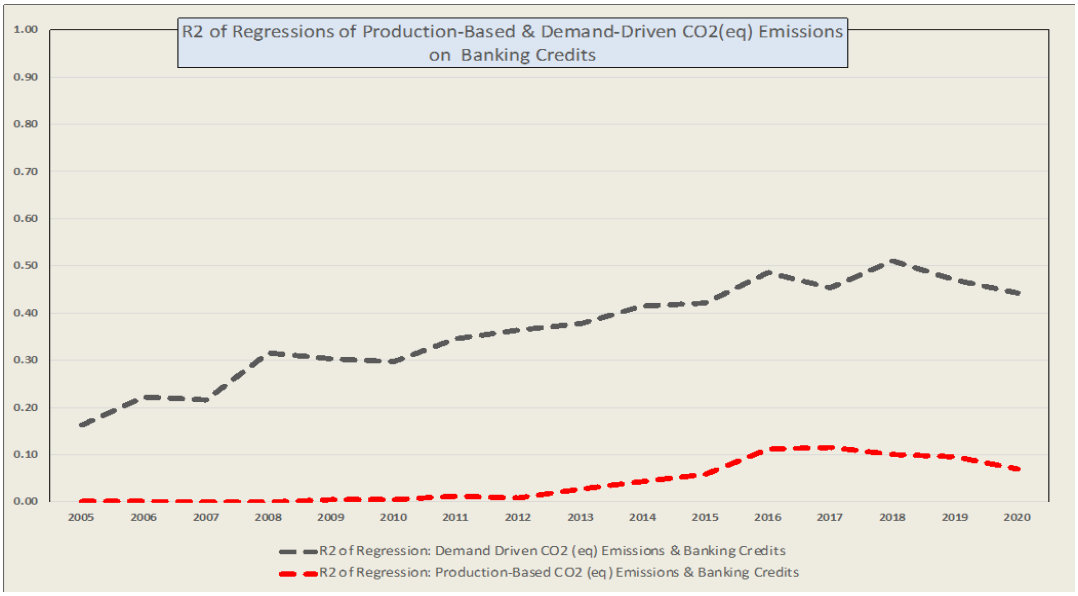
Iron & *Steel*, another environmentally sensitive sector, received 4.2% of banking credits and its emissions share had been evenly distributed among the DDE and PBE shares, with 5.8% and 4.4%, respectively. *Electricity,* the main polluter, generated 32.1% of direct, and 14.2% of the indirect emissions, with a credit share of only 8.8%. It is interesting to note that, *financial services* on its own was held responsible for 3.1% of the indirect demand-driven emissions with a credit share of 3.4%; while the *tourism* sector received 4.3% of credits and generated 4.5% of the indirect emissions.

The *brown* content of Türkiye's banking sector's credit operations can analytically be depicted via a simple regression over the emissions and banks' credit scheme. Consider the R^2 metric obtained from the simple regression of sectoral emissions across banking credits:

$$CO2_i = \beta_0 + \beta_1 CR_i + \varepsilon$$

where *CO2* and *CR* are emissions (million tons) and *real* credits (in *constant 2003 TL prices*), respectively. The exercise is repeated for both the direct (production-based) and indirect (demand-driven) emissions over the time horizon 2005-2020. Figure 5 discloses the trends of both regressions.

Figure 5



Adapted from: Şahin *et.al*., (2021); Ünüvar and Yeldan (2023); Ünüvar and Yeldan (2022); Yeldan (2023b) and Karabacak (2023).

It has to be noted beforehand, that the above regression should not be used as an *econometric explanation* of the source of Türkiye's emissions but has to be read as an indicator of the joint co-movement across the two data sets on emissions and credit magnitudes. As to be recalled, the R^2 summarizes the share of the variations of the dependent variable (CO2 emissions in our case) explainable with the variations of the independent variable (banking sector credits to the sectors). Thereby the Figure discloses that the explanatory power of the banking credits continuously increases over the 2000s until 2019, thenafter the observed break-up of the covid crisis is ensued. Variations of the banking credits are observed to explain half of the variations in indirect, demand-driven emissions by 2016 and 2018-two expansionary years of growth in Türkiye. It is also interesting to note that the explanatory power of the banking sector credits is significantly more robust for the DDE, in contrast to PBE data.

1.3 The Genuine (Adjusted Net) Savings

Another important variable of interest pertaining to the financial flows is the behaviour of the so-called *genuine* or *adjusted net savings*. *Genuine* or *Adjusted Net Saving* measures the true level of saving[5] in a country after accounting for

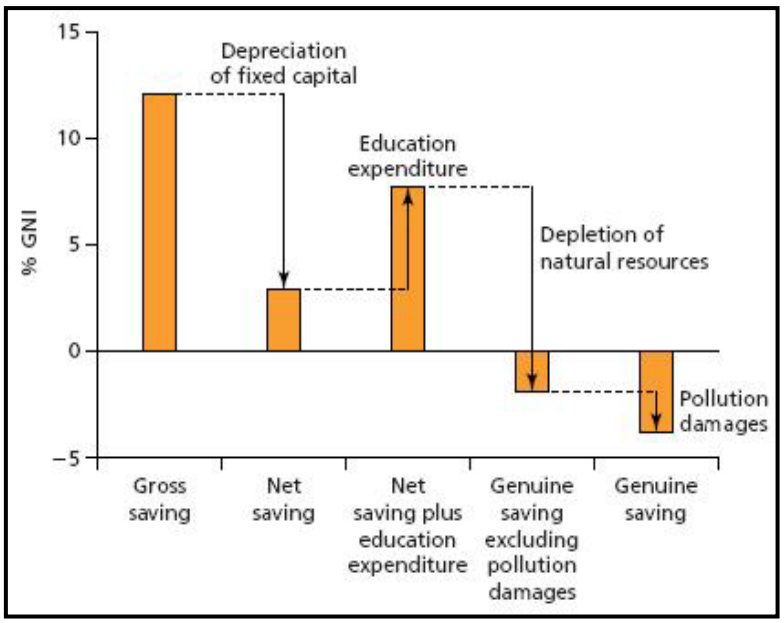
- depreciation of produced capital;
- investments in human capital (as measured by education expenditures);
- depletion of minerals, energy, and forests;
- and damages from local and global air pollutants.

[5] Economic theory suggests that current net saving should equal the change in future welfare, specifically the present value of future changes in consumption:

- If ANS > 0 → sustainable
- If ANS < 0 → unsustainable, i.e. "living off our natural capital"

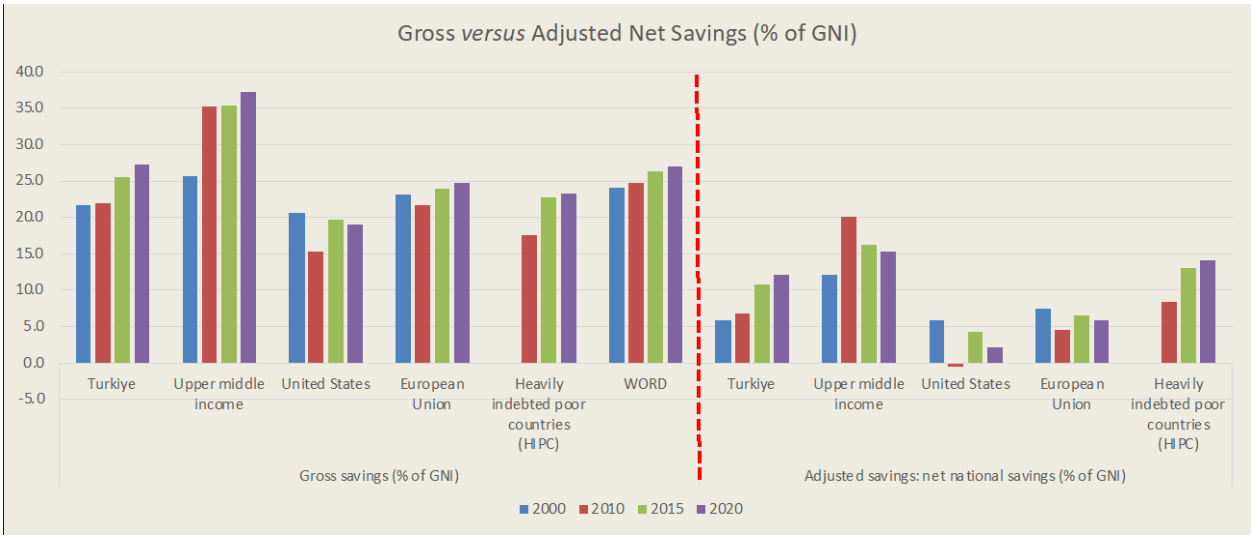
The World Bank calculates adjusted net saving (ANS) and its components as follows (See Figure 6):
ANS = Gross Saving - Consumption of Fixed Capital + Human Capital Investment - Depletion of Natural Resources - CO_2 Damage

Figure 6. Adjusted Net Saving and Its Components



Source: World Bank, 2016

Figure 7. Türkiye: Gross versus Adjusted Net Savings as Ratio to Gross National Income



Source: World Bank Development Indicators: https://databank.worldbank.org/source/world-development-indicators

The adjusted net savings ratio estimates for Türkiye are displayed in Figure 7. Overall, there is an improvement in the total value of the adjusted net savings ratio (ANS) . Nevertheless, it ought to be noted that Türkiye's ANS performance is well below the comparable figure of the upper middle income developing countries and reportedly its potential for sustainable economic development is declining. Acar & Gültekin Karakaş (2016) for instance note that the adjusted net savings ratio has declined by half on average in the first decade of the 21st century as compared with the last decade of the 20th century, largely driven by economic developments and high share of foreign savings (high current account deficits) in recent years. Acar & Gültekin Karakaş further examined the components of adjusted net savings over 1970-2011, with evidence that the rate of depletion of Turkey's natural capital had been intensified after 2000. Adaman & Arsel (2010) on the other hand, argued that this was mostly due to the "*conspicuous sacrifice of environmental quality*".

As has been documented above, Türkiye has been increasing its total CO2 emissions at an annual rate of 3.19% over the 2000s, and as such it reveals a higher growth rate against the global, as well as the comparable regions. CO2 emissions per US$ GDP is observed to maintain a falling trend, indicating some modest gains in efficiency. Even so, the rate of depletion of the domestic natural resources and the exhaustion of the environmental wealth are developing at alarming rates. The World Bank's Concept Note on Turkey's INDC makes this point clearly by stating that "*Natural capital has been depleted in recent years and this trend should be an area of concern that merits attention.* (…) *Resource depletion and environmental degradation have driven adjusted net savings (ANS) down by 1-2% of the Gross National Income (GNI). The percentage of natural resource depletion in total GNI has doubled from 0.16% in 1995 to 0.32% in 2016. In terms of total wealth, despite it nearly doubling between 1995 and 2010, the amount of total natural capital decreased over the same period from US$907 billion to $511 billion while the per capita natural capital decreased by more than half from US$15,499 to $7,095*" (World Bank, 2016).

All these trends underline that the path-dependence of Türkiye's economic structure on fossil fuel-based energy sources, along with an unregulated policy setting over the brown-preferences of the domestic banking sector, exert significant pressures on her abatement ambitions and warrant further regulatory institutions and instruments to ensure a decarbonized, green pathway to attain the net zero emission goals for 2053. These are the topics of discussion of the next section.

2. Policy Designs Towards Pricing Carbon and Beyond

It is widely believed that Türkiye has significant potential in generating power through renewable sources, thanks to its favorable geographical conditions and the various benefits it may get from reducing carbon emissions in its agricultural and industrial operations. The main focus of Turkish environmental policy is primarily based on the concept of "special circumstances," which highlights Turkey's relatively modest contribution to global emissions. This is further reflected in its official aims, which will be described below. In essence, the official motto of Turkish climate policy may be summarized in its official lines: "*environmental policies should not harm development*".

Türkiye participated in the COP21 Meetings in Paris in 2015 and presented its Nationally Determined Contribution (NDC) as a part of its efforts to combat climate

change. Nevertheless, Türkiye postponed the approval of the Paris Agreement by its parliament until September 2021 and eventually established a net zero emissions program for 2053 with quite broad objectives. However, both the publicly proposed recent action plans and the newly amended Nationally Determined Contribution (NDC) document (published at the 27th COP meetings in Sharm El Sheikh) lack specific interim measures for achieving their ultimate targets.

Despite these attempts, it is still a general observation that "*Türkiye does not yet have a clear strategy towards de-carbonizing its development pathway, in particular its power sector*" (Şahin *et.al*. 2021; Saygın *et. , al*. 2019; Şahin, 2016). In particular, Şahin (2016) writes, "T*urkey's climate policies can be defined through its fixation on its special circumstances with regard to the climate regime. This position is mostly utilized in order to keep Turkey away from any emission reduction targets and to sustain its low-tech and high- carbon developmentalism.*" Thus, "*this defensive position persisted, and efforts for international recognition of Turkey's special circumstances remained the number one priority in Turkish climate politics*" (p.121).

Türkiye has lately joined the international community in establishing net zero emissions (NZE) targets, which have sparked a fresh wave of climate diplomacy activism. Türkiye has announced that it aims to achieve net zero emissions (NZE) by 2053, which coincides with the 600th anniversary of the conquering of Istanbul, formerly known as Constantinople. The official declaration of the specifications of the 2053 NZE roadmap is still pending. However, numerous independent research have already addressed the subject. In its modeling study within the *CCDR* (*Country Climate and Development Report*), for instance, the World Bank (2022) claims that "*Turkey can achieve its 2053 net zero emissions target (figure S.3) but this will require major changes in many economic sectors. The transformation includes deep decarbonization of the power sector; a combination of energy efficiency and electrification in buildings; and electrification in transport; a change in current practices to maximize carbon sequestration from forest landscapes*".

2.1 The Climate Law Proposal and Preparations Towards a Domestic Emissions Trading System

Partially as a reaction to all these and the pressures of the international community, significant steps had been taken towards pricing carbon, and getting ready for enactment of a domestic *emissions trading system (ETS)*. The ETS is to be institutionalized within the newly proposed *Climate Law* that will soon to be approved by the Turkish Parliament. In fact, one of the main mandates of the Climate Law is to officially create a domestic ETS. This calls for three administrative actions: *first* set the quota and determine the aggregate level of carbon emissions; *secondly*, supply the market agents with a stream of "allowances" that give them the right to emit carbon just the amount of the quota –that's where the term "allowance" comes from. Then, finally, create an institutional mechanism –a market, where agents trade these "allowances" as they wish so as to satisfy their individual economic activity decisions. This across-the-board upper limit on maximum allowances determine both the size and efficiency of the market.

The major advantage of this emissions-trading-system is argued to be its simplicity and directness. As theory attests, it is expected that the market is informed about the aggregate level of permissions allowed in each sector and the agents are free to act in their decisions. Yet, to be able to operational, total amount of the carbon quota has to be severely binding. Otherwise, if all agents are comfortable with the initial levels of allowances allocated to them, then there would be no reason to engage into trade.

This had been one of the original designs of the European ETS in the early phases, 2005-2012 where the market has not worked at all at a reasonably positive price (UNEP 2019).

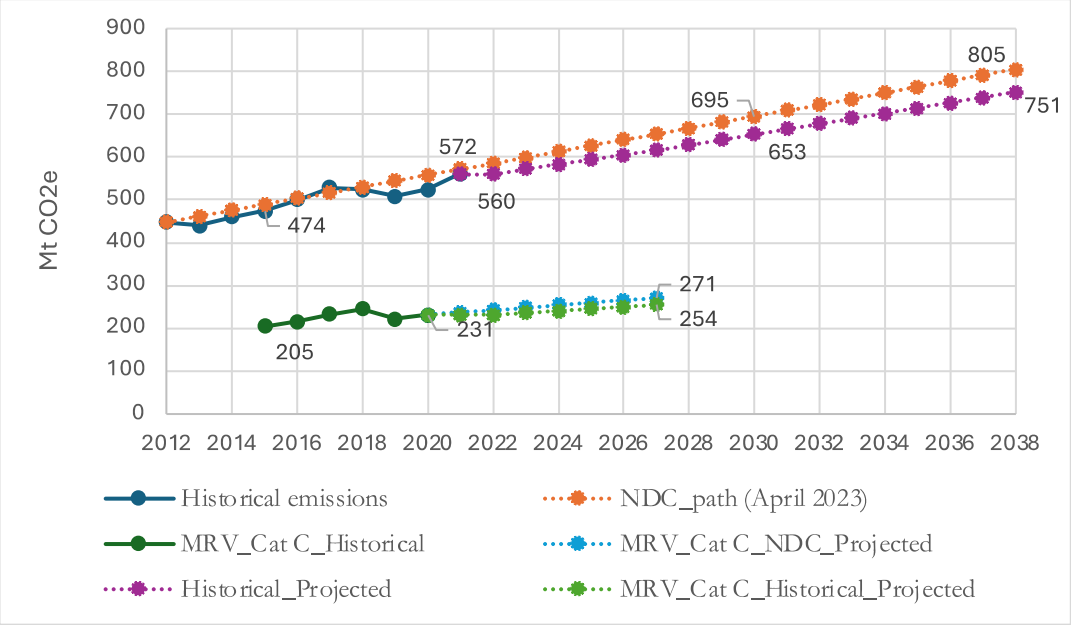
It is yet too early to assess the efficacy and impact of this mechanism, with an early analysis by Aşıcı (2023) serving as the most commendable evaluation thus far. Accordingly, the Turkish ETS has been announced to be initiated in 2025, where the scheme will follow up the *Monitoring-Reporting-Verification* (MRV) system that had been enacted back in 2017. As had been set out by the officially declared regulations, in the sectors of electricity, refinery, non-metallic minerals, basic metals, paper and chemicals, enterprise emitting above a threshold level of GHGs (> 500 ktCO2e) will be covered under the ETS regulations. Turkish MRV categorizes installations under three groups: *Category A* includes installations with emissions lower than 50 ktCO2e; *Category B* installations with emissions between 50 and 500 ktCO2e; and *Category C* installations with emissions higher than 500 ktCO2e. Data indicate that, under the Turkish MRV Category A, Category B, and Category C installations emit 1.2%, 6.7% and 92.1% of emissions, respectively. The Ministry documents that the Turkish ETS will cover only Category C installations during the pilot phase. As of 2020, 476 installations that had been listed under the Turkish MRV system, were responsible for a total of 251 million tons of CO2e (MtCO2e). This corresponds to 48.2% of the aggregate 520 MtCO2e total emissions in that year.

Aşıcı (2023) starts his analysis by noting that the Turkish ETS cap had been announced to follow the projected emissions under the announced NDC in April 2023[6] , in which Türkiye pledged to limit emissions to 695 MtCO2e in 2030, and to 805 MtCO2e in 2038 (peak year). According to the Turkish NDC; Turkish emissions would reach to 1,178 Mt CO2e by 2030 under the *Business-as-Usual* (BaU) scenario. As documented in Figure 8, Turkish authorities pledged to limit emissions to 695 MtCO2e in 2030, which corresponds to a 41% decrease from BaU. Historical emissions, however, reveal an entirely different path. Between 1990 and 2021 Turkish emissions grew, on average, by 11.2 MtCO2e annually. If this historical trend continues in the future, Turkish emissions would reach to 653 MtCO2e in 2030, and to 751 MtCO2e in 2038, both well below the levels reflected in the NDC.

This calculation means that, by employing the official NDC projected emissions rather than emissions reflecting the historical trend, would cause *a 17 million oversupply of allowances in 2027* (when the transition phase ends). Hence, there is a risk for the Turkish ETS to face with extremely low carbon prices, if not zero. To avoid this outcome, Aşıcı warns, Turkish NDC must be revised to reflect actual and expected trends in GHGs emissions.

[6] https://unfccc.int/sites/default/files/NDC/2023-04/T%C3%9CRK%C4%B0YE_UPDATED%201st%20NDC_EN.pdf

Figure 8. Historical and Projected GHGs Emissions in Türkiye (MtCO2e)

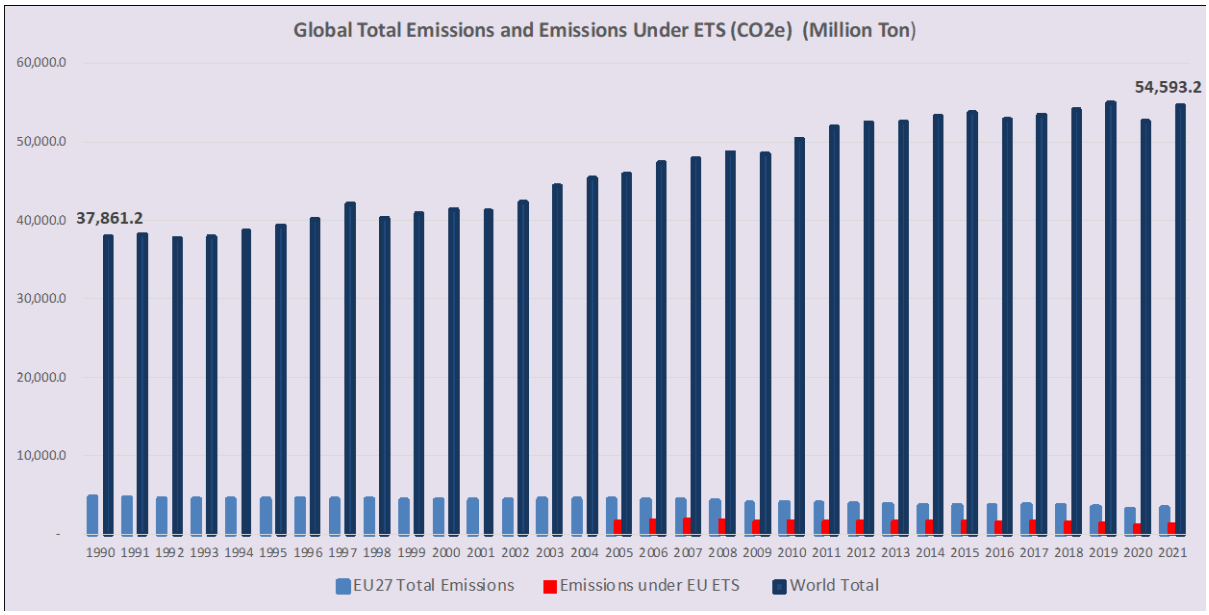


Sources: Calculations by Aşıcı (2023) based on data and projections from the Climate Action Tracker network; Turkish Ministry of Environment, Urbanization and Climate Change.

It should be acknowledged that ETS is not the only tool to decarbonize economies, and as is typical with methods of abstraction, the concept of the ETS also has its limitations and drawbacks. An issue that arises in practice is that of observing and verifying. It is essential to recognize that the current local bureaucratic system may not be suitable for the task at hand, and it may be required to include internationally recognized institutions to verify and take action. These methods may clearly lead to increasing surveillance costs and the creation of a rent-seeking bureaucracy, which goes against the expected market efficiency.

The system of emissions trading as a control instrument has been widely used in the EU. the European ETS has been implemented since 2005 and now covers around 15,000 businesses and 1,500 air transport companies operating in seven main sectors. Due to the excessive surplus created by free allowances in the first years of operation of the system, the carbon market failed to generate “positive” prices. The “market” started to function only after 2013, when the constraints on the allocations became binding. As a result of the carbon trading of companies under the EU ETS, approved emissions have decreased from 1,656.3 tons in 2013 to 1,285 tons in 2022. This corresponds to a cumulative 22.4% reduction after 2013. It ought to be noted, however, that this gain in seven years is unique to the *ETS installations* only. When we look at the *aggregate* greenhouse gas emissions of *all the EU countries*, we see that the reduction achieved reached only to 9%. All these “achievements” are in fact dwarfed in comparison to the global emissions over the 2010s. (See Figure 9).

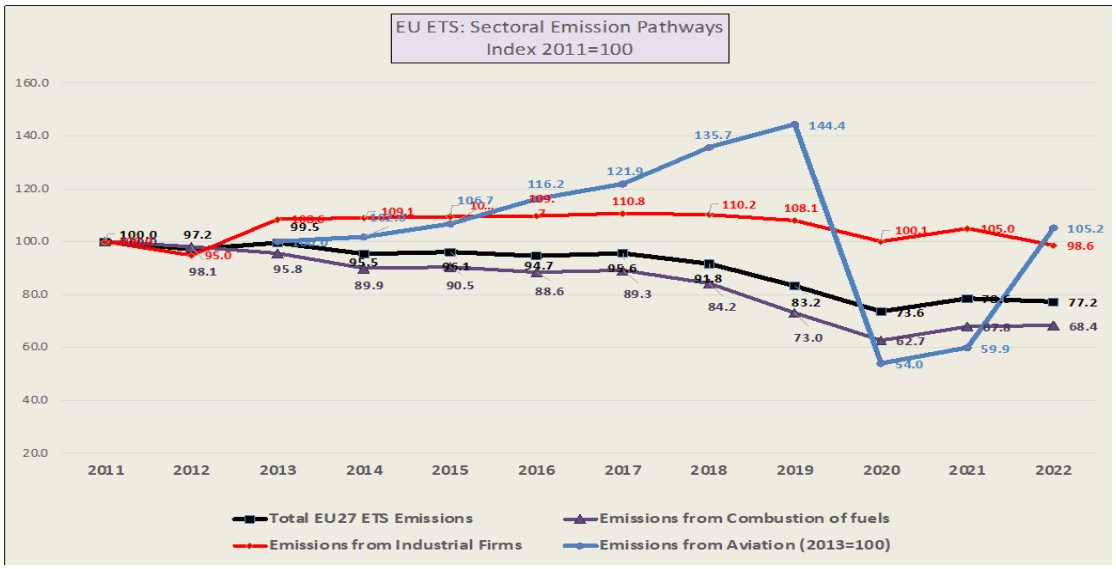
Figure 9. Global versus EU Emissions under the ETS



Source: European Energy Agency: ETS Viewer,
https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

By examining the sector-specific reduction levels of the European ETS, we can identify the primary cause of these trends. Figure 10 illustrates that the majority of these reductions actually originate from the power sector, specifically through increased efficiency in electricity generation. However, industrial production had the option to continue operating as usual without significantly reducing its emissions. Additionally, the air transportation industry had actually increased its emissions due to the availability of carbon trading at relatively low and cheap costs.

Figure 10. EU ETS: Sectoral Emission Pathways



Source: European Energy Agency: ETS Viewer,
https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1

Thus, the main observation obtainable from the experience of the EU ETS is that European industrial enterprises did, in fact, benefit from the workings of carbon trading. Against the theoretical expectations of carbon abatement, European industrial sectors actually maintained their emissions and, in the meantime, enjoyed windfall gains from the grants of free allowances and tradable permits. It is this intricate issue that we turn to in the next sect

2.2 On The Role of the Trans-Nationals and the IFIs: Who Are The Real Actors?

Financial markets are commonly regarded as susceptible to frequent speculation and crony actions. Moreover, numerous harsh truths persist. It is important to recognize that the majority of global economic production and trading activities are conducted by giant multinational corporations, rather than individual states. The activities of transnational corporations frequently extend beyond the borders of any specific nation. If confronted with the prospect of regulation on their production choices, such as the implementation of a carbon tax or any other pricing mechanism, these entities possess the capacity and authority to relocate from their current location to another host country that may have more permissive stances on pollution.

The 2017 Carbon Majors Report provides evidence that 25 multinational corporations and state-owned entities are responsible for 51% of worldwide greenhouse gas emissions. By expanding our data collection to include the 100 largest transnational corporations, we would encompass 72% of the worldwide industrial greenhouse gas emissions (CDP, 2017). The CDP Report further reveals that "*of the 635 Gt CO2 equivalent green house gas emissions of the 100 active fossil fuel producers, 32% is public investor-owned, 9% is private investor owned and 59% is state-owned, with the highest emitting companies since 1988 are observed as BP, Chevron, ExxonMobil, Shell, Total, Peabody and BHP Billiton*" (CDP, 2017). The magnitude of these corporations and the breadth of their operations, which span from energy generation to marketing services, hamper the efficacy of measures aimed at reducing emissions. This statement holds especially true for the European industrial giants that are structured around major petrochemicals and primary intermediates, such as iron and steel and cement.

The Climate Market Watch organization (CMW) conducted a recent study that strongly supports this claim. The recent report by the CMW on "industry windfall profits" reveals that certain highly polluting industrial conglomerates unexpectedly saw an increase in their profits. These conglomerates managed to evade the conditions imposed by market-based instruments and instead utilized their dominant market position to transfer the additional costs of carbon to the end consumers. According to the data presented in Table 3, windfall gains for the Iron&Steel industry amounted to 16 billion euros, while the cement industry saw profits of 10 billion euros, and the Oil Refineries industry had profits of 11 billion euros.

Table 3. Industry windfall profits by sector in million EUR 2008-2019

	From Surplus EUAs	From International Offsets	From Average Cost Pass-Thru	Total Windfall Profits
Refineries	-1,800	630	12,460	11,300
PetroChemicals	600	320	4,010	5,000
Cement	3,000	310	6,630	10,300
Iron & Steel	-710	850	16,000	16,100

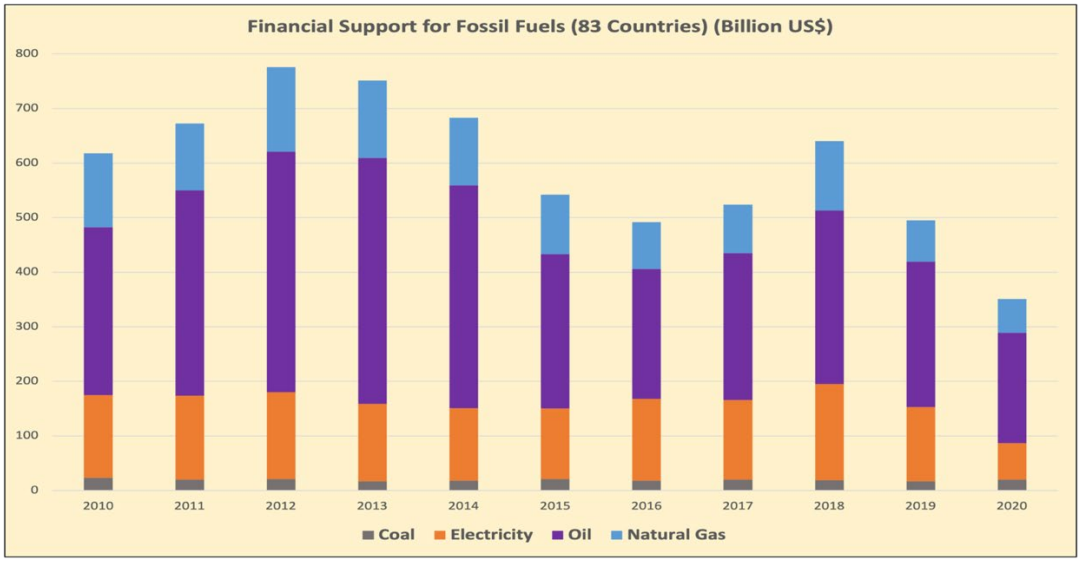
Source: Climate Market Watch, The Phantom Leakage, Windfall Profits of the EU Industries from the Carbon Market
https://carbonmarketwatch.org/wp-content/uploads/2021/06/Phantom_leakage_WEB.pdf

All these suggest that emissions gains thus far under the market-based mechanisms such as the emissions trading systems are too slow, and the global climate change struggle is over-delayed. To put it succinctly: "*the boundless quest for profit and the incorrigible consumption frenzy of the capitalist market system lie at the heart of the problem"*. Larry Lohman, in his statement in *La Nuova Ecologica* magazine in September 2021[7], emphasizes this point arguing that, "*by treating the climate crisis as only a problem of market failure, the carbon trading system actually ignores the essence of the problem and that the fossil fuel-based energy system and the global financial cum industrial complex simply divert the crisis to future generations with complicated designs of offsets, marketization games and speculative innovations*".

A further significant contributing element to the delay in addressing the global climate catastrophe is the sluggish execution of the transition away from fossil fuels and the whole process of converting to alternative energy sources. The main issue is in the ongoing provision of financial assistance to the fossil fuel sectors, particularly the rapid and substantial incentives given to the coal industry. According to OECD Environment Statistics, the annual financial assistance given to fossil fuel suppliers and consumers has reached a staggering amount of 600 billion dollars. The financial backing for fossil fuels experienced a decline to $310 billion in 2020 as a result of the economic downturn caused by the Covid epidemic. However, it has subsequently rebounded and surpassed $500 billion following the recovery. (See Figure 11).

[7] http://www.thecornerhouse.org.uk/resource/carbon-markets-do-not-need-be-fixed-they-need-be-eliminated

Figure 11. Financial Support for Fossil Fuel Producers



Source: OECD: https://www.oecd.org/fossil-fuels/

2.3 Calls for Greening the Global Financial Architecture and The Central Banks' Operations

Due to the persistent danger of climate change, there is now a growing agreement among monetary economists that central banks, as overseers of monetary control, should play a role in the efforts to reduce and alleviate its impact. Moreover, as previously mentioned, the inherent focus on short-term gains within the actors of the financial system raises worries about their potential to cause undue volatility in carbon trading prices. Using a short-term perspective, like financial trading in the immediate future, to address an issue that requires a long-term solution can lead to excessively hazardous judgments and cause suboptimal disruptions to the trading system. In the succinct words of Larry Lohman (2011), "*the boundless quest for profit and the incorrigible consumption frenzy of the capitalist market system lie at the heart of the problem"*.

Yet the biggest challenge is a practical one: governments and central banks, in particular, will need to find ways to financially dispose off the stranded assets –such as coal and oil-based power plants. As estimated by various NGOs and research institutions, the size of stranded assets on a global scale is huge, and commonly expressed close to US$12 trillions (see *e.g.*, Mercure, *et.al*, 2018). However, the cost of stranded fossil fuel assets is dwarfed by the looming economic damages of climate change. The relevant question, however, is "can taking big losses now be justified to avoid even bigger losses in the future?"

The response to this should unequivocally be affirmative, particularly if it aligns with other crucial goals such as financial and price stability. A recent study by Kotz, Leverman and Wenz (2024) find for instance that the world economy is headed to an income reduction of 19% within the next 26 years independent of future emission choices. The authors go on to suggest that these damages already outweigh the mitigation costs required to limit global warming to 2 °C by sixfold over the near-term time frame and thereafter diverge strongly dependent on emission choices.

Without question, the magnitude of both problems - stranded assets and climate harms - necessitates the involvement of central banks in finding solutions. In fact, the global distribution of environmental damages results in significant injustice in two aspects: (i) responsibility for the past emissions that have led to climate change, and (ii) the pre-existing levels of socio-economic well-being. Reseach initiated by Mercure *et. al.* (2018) indicate that committed damages are significantly larger in countries with smaller historical cumulative emissions, as well as in regions with lower current income per capita. Accordingly, on average, the quartile of countries with lower income are committed to an income loss that is 8.9 percentage points (or 61%) greater than the upper quartile (*ibid*).

However, there are also significant advantages. A climate bailout would be beneficial from the perspective of a central bank for at least two significant reasons: First and foremost, it has the potential to significantly mitigate the fundamental threats to financial stability that arise from stranded assets. Furthermore, transitioning to wind and solar energy sources would reduce the reliance of economies on unpredictable fossil fuels. From a financial standpoint, wind and solar energy are significantly more stable compared to oil, gas, and coal. It would enable proactive control of the risks associated with fossil fuel price inflation, leading to their complete elimination in the medium term. Additionally, it would mitigate climate-induced inflation, which refers to the impact of severe weather events on price levels (Kühne, 2024).

Therefore, as the pressing nature of the human-caused climate change becomes increasingly evident, the focus on incorporating environmentally friendly practices into the operations of central banks becomes a prominent aspect of monetary policy research. To this end, many economists argued that the "*net-zero central banking"* can be seen as *"a new phase in greening the financial system*". Given the observation that traditional models of central banks fall short of identifying climate related systemic risks, many economists indicate that there is clearly an unavoidable need to deepen our knowledge on the design of a "green central bank", *i.e.*, *a central bank that takes environmental risks including climate change into consideration in its actions* (Dikau & Volz, 2018).

Following this lead for Türkiye's central banking potential, Ünüvar and Yeldan (2023) cite Villeroy de Galhau (2021) with his emphasis *"on the effect of the climate change on the central banks' ability to achieve price stability*," while Robins *et. al.*, (2021) had already identified the "*net-zero central banking"* as *"a new phase in greening the financial system*".

Accordingly, Vestergaard (2022) suggests "certain principles noting the green policy mix with the following three objectives, *sine qua non:* it should (i) signal a substantive mitigating effect on climate change, (ii) entail no significant negative impact on the effectiveness of the monetary policy and (iii) not present potential negative consequences for market liquidity. Thus, while the arsenal of green monetary policy tools may be extensive, there should be a certain *sequence* to follow. Equally importantly, *green designs* should not conflict with certain operational or governance pillars. Therefore, we will stick to three main principles while designing a green monetary policy toolbox for a central bank" (Vestergaard, 2022: 203-04).

- *"Designing and managing the low carbon transition are tasks for the government, not for the central banks"*
- *"The given mandate of a central bank is to achieve price stability while maintaining financial stability"*

- *"Execution of green policy tools should not contradict the central banks' independence"*

Following Ünüvar and Yeldan's (2023) lead a set of "green CB" practices can be summarized. Table 4 sets out such a set green monetary policy pathways and the associated tools that can serve for the central banks' promotional and prudential motivations.

Table 4. Taxonomy of Green Monetary Tools

Green Microprudential Regulation	Green Macroprudential Regulation	Green Financial Market Development	Green Credit Allocation	Other
• Disclosure requirements • E&S Risk management standards • Reserve requirements	• Climate related stress testing • counter cyclical capital buffers • Differentiated capital requirements • Loan to value and loan to impact caps • Large exposure restrictions • Identification of systemically important financial institutions and capital surcharges	• Information disclosure requirements • Green bond guidelines	• Targeted refinancing loans • Minimum and maximum credit quotes • Preferred interest rates for priority sectors • CB assistance to development banks	• Greenfinance guidelines and frameworks • Soft power

Sources: Adapted from: Ünüvar and Yeldan, 2023; Dikau and Ryan-Collins (2017) and Dikau & Volz (2018)

Table 4 discloses that a wide range of potential green monetary interventions deem possible. Encompassing both *micro* and *macro prudential regulatory instruments*, central banks ought to cooperate with banking sector in realigning credit allocation and financial support away from the "brown" activities towards green ones. In the words of Ünüvar and Yeldan (2023):

> "*Central banks are heterogeneous in their operations, governance, mandates and legal environments. Therefore, each central bank must run its own assessment while selecting green monetary tools, pointing at the importance of country-specific design of green central banking. Addressing the climate crisis will necessitate a comprehensive policy approach and add to the credibility of the policy maker. Indeed, even under their price stability mandates,* (it can be argued that) *exploring green monetary areas and associated policy instruments are essential and also remain within the capacity of the central banks. Designing disclosure requirements, running climate related stress tests, expanding the coverage of research to include climate change associated risks, and communicating the results to the stakeholders reveal themselves as low hanging fruits, yet highly instrumental. At the minimum, the central banks will have to follow a biased stance in favour of de-carbonization and against the brown industries, rather than maintaining an equal-distance to all participants".*

3. Concluding Comments and Policy Suggestions

In this Report, utilizing evidence from Turkish economy, we have portrayed and discussed the role and responsibilities of the financial sector in the evolving climate crisis. Our analysis showed that, both the banking sector and the domestic financial system at large, have been contributing to the persistent path dependence of brown industries by way of supporting their expansionary activities through various mechanisms of credit finance, short term speculative actions, and subsidization. We have also underlined that the current realm of official climate policies in Türkiye are based on dubious assumptions and analytical misreading of the historical trends, and thereby a potential enactment of a domestic emission trading system faces the risk of failing to effectively price the carbon emissions.

It is evident that the design and implementation of the mitigation and adaptation policies through emission trading systems will have significant implications for both the commodity and the financial markets of the indigenous economies, as well as the global economy at large. Needless to assert, implementation of such a broad environmental policy framework will not only have considerable microeconomic effects on the energy-supply-demand and production structures but will also generate far-reaching socio-economic impacts to be distilled along macroeconomic conditions of aggregate demand. Failure to design an effective and binding system of constraints, the ETS will likely fail its theoretical premises, and may indeed signal detrimental consequences by activating the environmentally sensitive sectors contrary to expectations. This had been the case for the European ETS.

As Orhangazi and Yeldan (2023c) attest, to enhance the involvement of the financial sector in disaster risk financing and transfer, especially in financing for development, it is necessary to provide support and incentives through credit channels that are subsidized and facilitated by donors. In the immediate region of Türkiye, potential mechanisms to consider include enhancing the existing Europa Reinsurance mechanism, which was initially established by Albania, Republic of North Macedonia, and Serbia as a project implementation agency for catastrophe and weather risk insurance projects funded by the World Bank and other donors. Additionally, there is a need to optimize the use of current financing facilities for post-disaster recovery and to encourage regional fundraising campaigns aimed at strengthening the resilience of education and health infrastructures in the face of disasters. The established Reinsurance mechanism in Europe seeks collaboration opportunities and investors from the Turkish banking and insurance sector.

There are several opportunities for collaboration in technology, finance, and economics in the region. These opportunities are the focus of many institutional structures in both Türkiye and the greater region. Organizations like *The Black Sea Technological Cooperation* and *Euromed*, which are supported by MENA-The World Bank, gain prominence.(Orhangazi and Yeldan, 2023c)

To conclude, in setting the stage for decarbonization the *initial action* should be a *rejuvenation of the indigenous budgetary capacity* and its tools. Fiscal policy will require both fiscal expansion and a shift away from fossil fuel-based activity towards decarbonization. This should involve the elimination of both direct and indirect financial support for the fossil fuel industry, with a specific focus on coal.

A further essential requirement is a *fundamental change in monetary policy*. The prevailing ideology of neoliberalism, which advocates for a hands-off approach to monetary policy through inflation targeting regimes, has effectively reduced the central banks of developing countries to mere administrative bodies for global finance capital. This approach must be discarded. During the post-Covid transitions, central banks will need to adopt a more proactive policy approach that focuses on *addressing structural bottlenecks* rather than maintaining market neutrality. This shift is necessary to ensure price stability, and it also involves using clear and straightforward communication methods instead of complex and obscure jargon.

Thus, a viable green industrialization strategy based on green finance should include the following key elements:

- Shifting from fossil fuel-based production to sustainable and renewable forms of energy, industry, and agriculture.
- Tackling the informalization and fragmentation of labor markets and implementing programs to create decent jobs.
- Addressing wide disparities in incomes and opportunities, not only in terms of wage labor and capital or regional disparities, but also in terms of gender, ethnicity, and all forms of social exclusion.
- Giving the states a realistic role in mobilizing and allocating resources based on social evaluation principles, rather than relying solely on the expectations of oligopolistic markets.

Given these broad premises, one can forward the following policy actions for Türkiye towards attaining decarbonization in the medium to longer runs:

- Carbon has to be realistically priced so as to reflect its true social costs. Offsets and various other international mechanisms that lead to exceptions must be kept at a minimum and must be dissolved within a pre-announced time frame.
- Transitioning away from coal ought to be regarded an indispensable component of the overall policy package to attain the Net Zero Emissions pathway. Any energy and power sector that continues to rely on coal and fossil fuels will result in an astronomical price tag for CO2 and will prove the NZE pathway unrealistic.
- It is pertinent that certain *strategic* sectors, such as iron&steel, cement, transportation will need to be supported via exceptional treatment via free allowances, etc. Yet this has to be announced as a *transitory* period and must be phased out in a transparent manner.
- It must be recognized that over the decarbonization pathway based on pricing and restricting carbon emissions, there will be unavoidable costs in the short to medium run. It has to be understood that gains are to be realized over a longer run and will not materialize immediately in a miraculous fashion. Over this process, states will need to intervene simultaneously as an *administrator of social policy*, as a *regulator*, and also as an *investor*.
- Political will: the fight against climate change should be prevented from being turned into an area of financial speculation and rent-seeking.

Finally, policy advice that promote green washing based on hearsay and unrealistic models, dubious reforestation designs, technological expectations, unrealistic perceptions and surreal expectations should be abandoned.

Given the opportunities for regional collaboration, we have to remind ourselves the main message as distilled from almost two hundred years of successful development transformations, which can be summarized as: invigorate a mechanism of *crowding in*

of private initiative where capital accumulation is directed under *democratic planning* that will support *structural transformation* and the *generation of green employment.*

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