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A. Erinç Yeldan

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Turkey: Challenges and strategies toward de-carbonization and sustainable development under the age of finance

A. Erinç Yeldan

Department of Economics, Kadir Has University, Fatih, Istanbul, Turkey

ABSTRACT

The aim of this paper is to present the key challenges and structural constraints as well as potential strategies toward de-carbonization and the green transformation in Turkey, and to argue that the current mode of global finance in many ways conspires to constrain Turkey's quest for a sustainable and green industrial policy. I consider Turkey's conundrum against the backdrop of its speculation-led growth patterns and ongoing fossil fuel-based production cycle and highlight the tradeoffs and dilemmas of the pursuit for green abatement policies, given the logic of financialization.

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De-carbonization; speculation-led growth; climate crisis; net zero emission targets; Turkey

Introduction

The aim of this paper is to present the key challenges and structural constraints as well as potential strategies on de-carbonization and the green transformation in Turkey, a typical middle-income developing (emerging market) economy with strong aspirations to become the industrial powerhouse for *Eurasia*, albeit one with a serious deficit in its energy balances. Moreover, I argue that the whole episode is taking place under the dire conditions of *dependent financialization* and *financial subordination* (Apaydın and Çoban 2023; Alami et al. 2023; Bonizzi, Kaltenbrunner, and Powell 2019), thus structurally restricting peripheral economies in the global economy and inhibiting their indigenous attempts to pursue sustainable and green trajectories of industrial development – Turkey being no exception.

On an all-encompassing scale, it ought to be a well-recognized fact to the readers of this special issue that the ecological and climate crisis is deepening despite efforts and rhetoric on immediate action. A recent Report published by the IPCC, for instance, cautions that global warming

CONTACT A. Erinç Yeldan erinc.yeldan@khas.edu.tr Department of Economics, Kadir Has University, Fatih, Istanbul, Turkey.

is *likely* to reach 1.5 °C between 2030 and 2052 if it continues to increase at the current rate (IPCC 2019). The Report reveals that limiting global warming to the 1.5 °C target is still possible, but that it will require *"deep reductions in emissions"* and *"rapid, far-reaching and unprecedented changes in all aspects of society"*. Even though climate change is undoubtedly a *planetary problem*, its effects are not symmetrical throughout the global economy, and the global efforts to combat climate change are severely hampered by the long-ignored differences between developed and developing countries concerning the ecological, economic, and political threats they confront. Accordingly, UNCTAD's *Trade and Development Report 2019*, rightly argues that "*the global economy does not serve all people equally. Under the current configuration of policies, the rules, market dynamics and corporate power, economic gaps are likely to widen and environmental degradation will intensify*".

Against this backdrop, the UNCTAD 2019 report refers to experiences of the Great Depression on a global scale – under a *Global Green New Deal* (GND), and proposes this as the right policy framework "*to make a clean break with years of austerity and insecurity following the global financial crisis, help bring about a more equal distribution of income and reverse decades of environmental degradation*". On a broader scale, the green new deal also entails a call for a *new industrial policy* together with "*designing institutional frameworks that counter both informational and political risks*" (Rodrik 2015). Chomsky and Pollin (2020) also lend support toward this new paradigm arguing that the fear of so-called economic disaster and unemployment arising from the transition to a green economy is misplaced, and is only a by-product of biased attitudes favoring fossil fuel-led growth fetishism.

Indeed, this new geopolitical approach seems to have introduced new opportunities and challenges when it comes to addressing the global climate crisis. However, while such a global climate project may potentially ease implementation and increase accountability for the global economy and thus expedite the global green transformation, there are mounting concerns over the potential drawbacks arising from the adverse implications of this new policy framework on the ecological and economic policy trajectories of the developing countries.

To begin with, the GND's most ambitious targets are set out 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 has become excessively financialized and fragile, global demand remains weak, investment is sluggish and income and wealth are highly concentrated. Emboldened 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*. In this setting, finance has successfully expanded its rationale on the global labor and commodity markets, destroying localities and all remaining regulations which may have inhibited the logic of free market mobility (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 constraining whims of speculative finance are vehemently observable for Turkey, where the warranted *de-coupling* between growth and emission reductions is yet far from being realized. As of 2021, Turkey's per capita emissions of carbon dioxide (CO_2) and other greenhouse gasses (CO_2 eq.) stood at around 6 tons while its total CO_2 eq. emissions per Dollar of GDP (in constant US$ terms) reached 0.524 kg.[1] In addition to these adverse performance indicators, Turkey is further cited among the three countries to exhibit the fastest rise in per capita gaseous emissions (Orhangazi and Yeldan 2023c). Turkey's CO_2 eq. emissions increased from 214 million tons in 1990 to 564 million tons in 2021 (recording a cumulative increase of 156.9%). Projections by Acar et al. (2018) suggest that total CO_2 emissions will reach 680 million tons by 2030 under a scenario of "low commitment".

In fact, one of the main criticisms leveled at Turkey's climate abatement pathway is that it does not yet admit any fall in absolute emissions, rather that it is only tailored in terms of declines *relative* to a hypothetical base path – which itself is severely criticized due to its exaggerated and dubious assumptions.[2] This suggests that Turkey will follow a trend divergent from many developing emerging market economies, as well as the global averages over the next decades.

Instruments of environmental policy in Turkey have thus far principally consisted of excise duties on energy consumption with little concern toward earmarking for environmental abatement. However, it is now well-documented that pricing instruments, administered through the market alone, cannot suffice in either achieving the broad objectives of controlling global gaseous concentrations or maintaining a sustainable and eco-friendly growth path (Acar et al. 2018). Part of the problem arises from the failure of the impatient market optimizers to capture the positive spill-overs associated with long term technological change driven by renewables. At the root of these problems are market failures due to mismatches in the time horizon, where (private) gains are imminent while the (social) costs are part of the long durée.

In what follows, the main purpose of this paper to present the key challenges and the underlying structural constraints Turkey faces in its

potential green transformation, and to discuss viable policy proposals against this challenging background. The next section starts with a brief review of the recent macroeconomic developments under Turkey's specific history of financialization and rent seeking-driven patterns of growth, and continues in Section 3 with an analytical overview of the energy sector and energy policies. The specifics of Turkey's climate policies under these turbulent pathways are discussed more formally in section 4, while section 5 discusses the strategies toward a green and egalitarian development pathway for Turkey. The summary and conclusion is set out in section 6.

Turkey after the 2001 crisis: the macroeconomics of financialization

In this section, I provide a brief overview of Turkey's financial integration into the global economy and evaluate its economic policy choices along with their implications for growth, stability, and crisis dynamics. Following its trade and financial liberalization in the early 1980s, Turkey removed the remaining set of capital controls in 1989. This transformation ushered in deep fluctuations and resulted in boom-bust cycles where pathways of national output were ultimately conditioned by capital flows, especially short-term speculative finance. Rapid capital inflows and economic growth gave way to outflows and crises, much like the experiences of many developing economies in Latin America in the aftermath of their episodes of liberalization of the capital flows (Orhangazi and Yeldan 2023a; Boratav, Yeldan, and Köse 2002; Cizre-Sakallioglu and Yeldan 2000).

This aforementioned experience which relied (and was constrained by) speculative hot money flows had been termed *speculation-led growth*, a la Grabel (1995). Originally setting its course mainly with the militarized episodes of neoliberal re-structuring in the late 1970s and 1980s, many Latin American economies – as well as the Turkish economy – had been trapped into an (imported) capital intensive, debt-ridden growth path with a fragmented industrial structure and declining capacity to generate employment. The contours of this financially dependent mode of growth were succinctly described in a series of influential contributions by the structuralist school (see Diaz-Alejandro 1985; Taylor 1998). Depicted as the *Alejandro-Taylor cycle* in Yeldan (2022), the speculative discourse is typically set into motion by the vastly inflated real interest rates as warranted by the foreign finance capital. An indigenous developing economy with a typically shallow financial market and lacking regulative powers on its capital account is constrained by a relatively high interest rate trajectory due to the ongoing threat of capital flight. Nevertheless, such a choice leads to rapid inflows from the global financial market, piling pressure on the domestic currency to appreciate. As depicted in Figure 1, such appreciation unavoidably

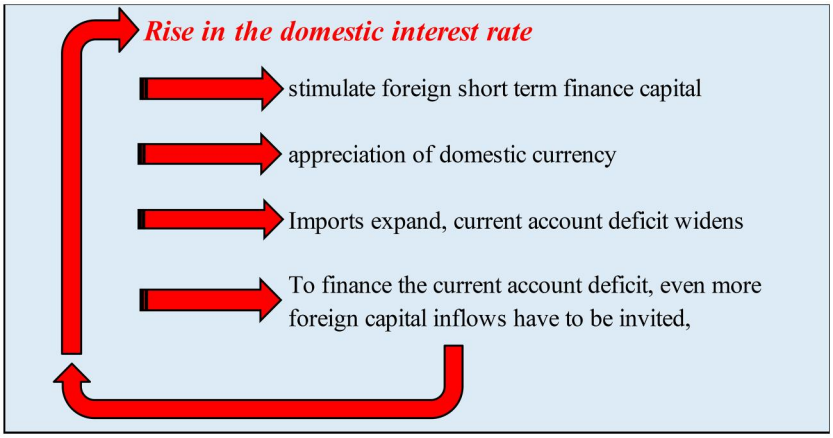


Figure 1. The Alejandro-Taylor Cycle: Vicious Circle of Capital Flows & Macroeconomic Disequilibria. Adapted from Yeldan (2022).

results in a widening current account deficit as well as an accumulation of foreign debt. In turn, to finance the widening external deficit, authorities often find themselves trapped in a high interest rate – appreciating currency modality to recommence the cycle.

Following the severe crisis of 2001, Turkey shared many instances of the *Alejandro-Taylor cycle* as it chose to implement an orthodox strategy of raising interest rates and maintaining an "overvalued" exchange rate, all administered under unfettered mobility of finance capital. These economic and political adjustments were mainly overseen by the then newly founded Justice and Development Party (AKP) which swept to power with an absolute majority in the parliament in the November 2002 general election. The AKP government further followed a *contractionary* fiscal stance and initiated a series of privatizations to be accompanied by so-called "market friendly" structural reforms under the direction of the IMF.[3]

Many observers have argued that the macroeconomic conjuncture that Turkey finds itself in today has its roots in the macroeconomic and policy environment of the previous two decades (*e.g.*, Orhangazi and Yeldan 2021, 2023a; Boratav and Orhangazi 2022; Apaydı n and Çoban 2023; Akçay 2021; Bedirhanoğlu 2019). Accordingly, a resurgence in capital inflows propped up a relatively overvalued real exchange rate, resulting in widening current account deficits with consumption and production becoming increasingly dependent on imports. Gaping current account deficits, an increased external debt stock and increasing domestic indebtedness created a series of fragilities while maintaining growth depended on continued inflows of foreign capital. The speculation and debt-led characteristic of growth resulted in fragile balance sheets for both the corporate and banking sectors while the government's focus shifted toward a

construction-centered growth strategy. All of these led developments sparked a premature deindustrialization tendency and put the economy on an unstable growth path characterized by insufficient employment generation and persisting inequalities (Orhangazi and Yeldan 2021, 2023a, 2023b; Yeldan 2022).

The main parameters of this episode are summarized in Table 1.

Data in Table 1 sets out three sub-periods, characterized by the intensity of foreign capital inflows. The first sub-period extends between 2002 to 2007 (from the post-2001 neoliberal restructuring to the eruption of the global financial crisis) and corresponds to the so-called *Era of Great Moderation*. Lured by the widening current account deficit financing in the USA, this period ushered in an era of cheap foreign liquidity and historically low interest rates. With its very wide interest rate arbitrage, Turkey attracted foreign financial inflows, resulting in a sharp appreciation of the domestic currency and widening of the current account deficit.

The second sub-period opens with the post 2008/09 global financial crisis episode of *quantitative easing* in developed financial markets. This sub-period was also characterized by another round of foreign inflows to Turkey. However, the era was also characterized by the *great recession* of the global economy and resulted in increased volatility and faltering exports. Unemployment remained stubbornly high and the foreign trade deficit widened. The final entry in this saga of events is the third sub-period, where increased instability has characterized the macroeconomic environment in Turkey since 2018. Even though real GDP growth reached 11 percent in 2021, this high growth came at the expense of a sharp depreciation in the currency (around 40 percent in 2021), a surge in inflation and precious little employment growth, with the official open unemployment rate still hovering at around 10 percent.[4]

This has all resulted in an increasingly capital-intensive technological pathway for the domestic economy. The secular rise in the per unit capital of employment has, in fact, been an indispensable characteristic of the many emerging economies that have prematurely deregulated their capital account to integrate with the global financial markets. Measured in fixed TL prices, the utilization of capital per worker employed doubled between 1989 (the year the deregulation of Turkey's capital account was completed) and the breakdown of the global financial crisis in 2008, from TL 4,000 to TL 11,600, and has hovered at around that rate since then.[5]

The implied pathway has resulted in labor-shedding and structurally persistent unemployment. As portrayed in Figure 2, meager job creation has been a concomitant theme of the post 2001 neoliberal era where labor employed per TL 1 million real value added (in 2017 prices) was almost cut in half, from 25 workers to less than 15 by 2022, with the rate of open

Table 1. Turkey, post-2000 selected economic indicators.

	Total foreign capital inflows (billion US$)	Ratio of Foreign Capital to GDP (%)	Rate of Growth of GDP (%)	Ratio of Current Acc Bal to GDP	Unemployment Ratio	Inflation (CPI)	Inflation (PPI)	Central Bank Interest Rate	TL/US$ (CBRT effective purchase rate))	Real Exchange Rate (PPI-based)
2000	13.0	4.7%	7.0	−3.6%	6,5	39.0	32.7	60.0	0.6	110.9
2001	−12.7	−6.3%	−5.9	1.9%	8,4	68.5	88.6	60.0	1.2	89.0
2002	4.2	1.7%	6.4	−0.3%	10,3	29.7	30.8	55.0	1.5	94.2
2003	10.0	3.2%	6.0	−2.4%	10,5	18.4	13.9	43.0	1.5	99.2
2004	26.9	6.6%	9.5	−3.5%	10,8	9.3	13.8	38.0	1.4	100.7
2005	45.5	9.0%	9.1	−4.1%	10,6	7.7	4.54	23.0	1.3	112.1
2006	62.9	11.3%	7.0	−5.6%	10,2	9.7	11.58	27.0	1.4	103.5
2007	60.4	8.9%	5.1	−5.4%	9.2	8.4	5.94	25.0	1.3	115.3
2008	46.7	6.1%	0.7	−5.1%	10.0	10.1	8.11	25.0	1.3	102.4
2009	5.8	0.9%	−4.8	−1.7%	13.1	6.5	5.93	15.0	1.5	105.0
2010	65.8	8.5%	8.6	−5.7%	11.1	6.4	8.87	14.0	1.5	111.4
2011	53.8	6.4%	11.0	−8.9%	9.1	10.5	13.33	17.0	1.7	97.9
2012	72.7	8.3%	4.8	−5.4%	8.4	6.2	2.45	13.5	1.8	103.5
2013	67.7	7.1%	8.7	−5.8%	9.0	7.4	6.97	10.3	1.9	94.8
2014	52.2	5.6%	4.9	−4.0%	9.9	8.2	6.36	9.0	2.2	102.3
2015	30.6	3.5%	6.0	−3.1%	10.3	8.8	5.71	9.0	2.7	97.4
2016	28.3	3.3%	3.3	−3.1%	10.9	8.5	9.94	8.8	3.0	90.7
2017	48.2	5.6%	7.5	−4.7%	10.9	11.9	15.47	8.8	3.6	84.1
2018	5.4	0.7%	3.1	−2.6%	11.0	20.3	33.64	18.5	4.8	83.0
2019	19.3	2.5%	0.8	1.4%	13.7	11.8	7.36	12.8	5.7	82.1
2020	11.8	1.6%	1.8	−4.4%	13.1	14.6	25.15	15.8	7.0	73.8
2021	51.1	6.2%	11.6	−0.9%	12.0	36.1	79.89	14.8	8.9	66.5
2022	47.1	5.2%	5.4	−5.3%	10.4	64.3	97.72	9.8	16.6	89.9

Sources: Central Bank of The Republic of Turkey (CBRT), TurkStat. Complemented by data in Orhangazi and Yeldan (2023b).

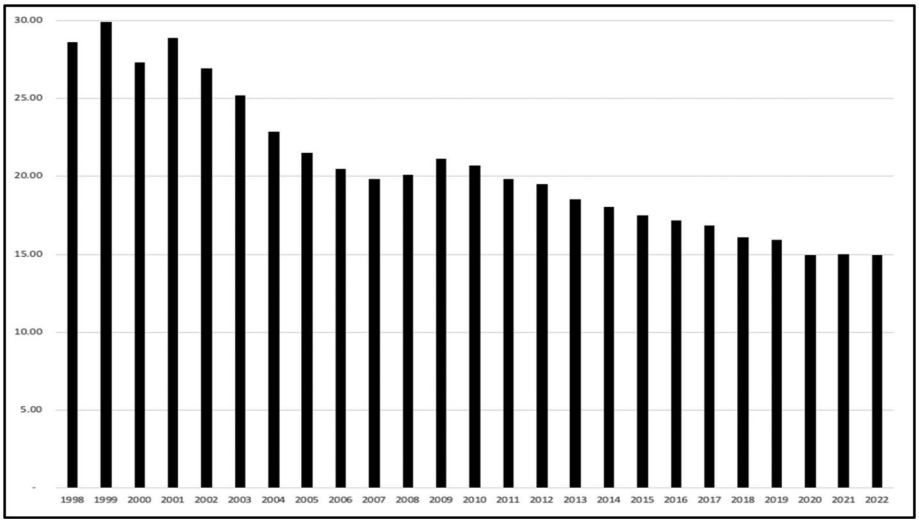


Figure 2. Labor intensity of gross value added (employment/real GDP), (persons/1,000,000 TL). Sources: Adapted from Orhangazi and Yeldan (2023a), with authors' calculations based on Turkstat Household Labor Power and National Accounts Statistics.

unemployment remaining stubbornly above 10 percent over the last two decades. Thus, it has to be noted that the adverse effects of the debt-intensive mode of financing of the external deficits are not solely a matter of increased external fragility with the end result of "loss of confidence and credibility" for the financial arbitrageurs, but also a diversion of the indigenous development pathways away from labor intensive technologies toward increasingly capital intensive modes of production, financed by way of speculative hot money finance and external debt accumulation. All of this has meant an intensification of the import-dependence of domestic industry and reduction in the domestic value-added content of output.

I now turn to a discussion of Turkey's climate score card given this macroeconomic structure.

Climate "(non-)abatement" under speculation-led growth

Turkey is attempting to pursue an indigenous industrialization strategy based on green growth and the acquisition of renewables. However, this is by no means a simple task; first of all, as discussed above, 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.

All of this necessitates a ready and continuous flow of foreign capital, which Turkey is not able to sustain through exports or other revenue sources such as tourism or remittances. Thus, while the Turkish economy is grappling with the challenges of ensuring a cost-competitive energy supply

for its industrialization ventures and ensuring energy security, its environmental indicators continue to slide. When it comes to gaseous emissions, while the overall level remains relatively low, it has exhibited one of the OECD's fastest rates of growth in *per capita emissions*. Total greenhouse gaseous (GHG) emissions rose from 219.7 million tonnes in 1990 to 564 million tonnes in 2021, pointing to a cumulative increase of 156%. Figure 3 illustrates the path of GHG emissions by source.

As indicated in the graph, the bulk of the emissions emanate from the energy sector. Turkey's official strategy on energy security and industrialization rests, overall, on first depleting *domestic supplies* of coal, to be complemented by *nuclear power* which is being constructed under Russian technology and administration. Renewable power, even though generously subsidized, is still in its infancy and, of more concern, suffers from many clientelist rent-seeking episodes of patronage among the bureaucracy and favored conglomerates. The lion's share in public procurement is often dealt under clientelist maneuvers favoring rentiers and speculative arbitrageurs. To this end, a number of market and non-market mechanisms and policy instruments have been out in place, including direct subsidization of the coal producers amounting to as much as 0.2% of GDP (Acar and Erinç Yeldan 2016) and an excessive sum of payments (exceeding the market clearing price) to the private energy sector amounting to 0.62% of GDP (TMMOB (Chamber of Mechanical Engineers) 2022). The section below provides a more detailed discussion of the instrumentalization of this episode. In fact, the energy sector has become a lucrative bastion of rent-seeking (along with privatized health and education sectors) in the post-2001 AKP era. All this should be evaluated as a direct extension of the

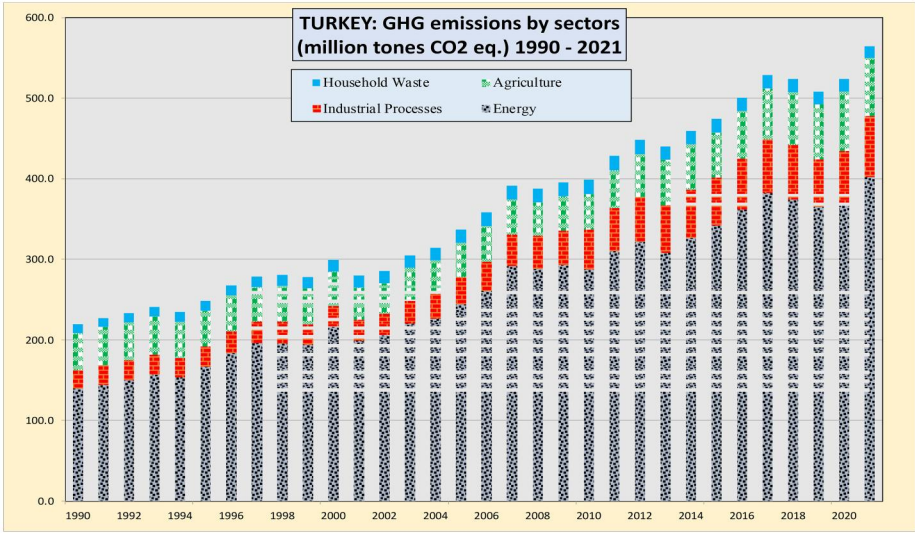


Figure 3. GHG emissions by sectors, 1990-2021. Source: Turkstat, Environmental statistics.

speculation-led patterns of growth and foreign finance as discussed in the above section.

Developments in the energy sector under the neoliberal era

To infer a bird's-eye-view of the energy economy, it would be instructive to study the general energy balances data. Table 2 summarizes the main components of the energy supply and demand flows across its sources and usage for 2002, 2020 and 2021 (the last available data at the time of writing).

In short, the general trends over the 2000s were a continued downward trend in the share of domestic production in total primary energy supply (see Figure 4) and the continued rise in the share of imports. The share of coal in domestic energy supply, meanwhile, has declined rapidly, especially since 2010, while the share of renewables (wind and solar photovoltaics) has surged at an annual expansion rate of 24.3%, although still constituting 10% of domestic production (and 3% of the total). Imported coal appears to have substituted domestic production of coal, with the share of imported coal in overall domestic energy supply increasing from 10.8% to 14.8%. Total primary energy supply accelerated during the 2010s, at an annual average rate of 5.1%, up from the 3.9% growth in the previous decade.

When it comes to demand, the power sector expanded at a CAGR of 4.9% in the 2000s and 3.9% in the 2010s. The share of coal in the generation of electricity (net of own utilization of electricity and petroleum in the generation and energy consumption) increased by 5 percentage points with an increased rate of growth of 7.2% over the second decade, up from

Table 2. Turkey, general energy balances: 2002-2021.

	'000 Toe			Share in Total (%)			Avg Annual Rate of Change (%)	
	2002	2010	2021	2002	2010	2021	2002-2010	2010-2021
Domestic Production	24,430	31,558	46,720	31.70	29.80	29.30	3.20	3.57
of which Coal	11,538	16,214	17,163	14.97	15.31	10.77	4.25	0.71
of which Renewables[1]	322	683	4,762	0.42	0.64	2.99	9.39	24.28
Imports	57,156	84,606	1,24,296	74.16	79.90	77.96	4.90	4.81
of which Coal	8,342	14,423	23,670	10.82	13.62	14.85	6.84	6.19
Exports (-)	3,162	7,991	9,012	4.10	7.55	5.65	11.59	1.50
Total Primary Energy Supply	77,075	1,05,888	1,59,432	100.00	100.00	100.00	3.97	5.12
Generation and Energy[2]	−17,590	−26,048	−35,573				4.91	3.90
Electricity Plants[2]	−11,580	−19,964	−30,566	100.00	100.00	100.00	6.81	5.32
of which Coal	−8,121	−13,037	−23,207	70.13	65.30	75.92	5.92	7.21
of which Renewables[1]	−4	−251	−3,902	0.04	1.26	12.77	51.33	34.31
Total Energy Consumption	59,486	79,840	1,23,859				3.68	5.49
Consumption of Industry	23,022	79,203	41,614	100.00	100.00	100.00	15.44	−8.04
of which Coal	8,693	8,641	10,739	37.76	10.91	25.81	−0.07	2.72
of which Renewables[1]	119	130	301	0.52	0.16	0.72	1.11	10.49

1. wind and solar
2. Net of Petroleum and Electricity usage
Source: TR Ministry of Energy and Natural Resources.

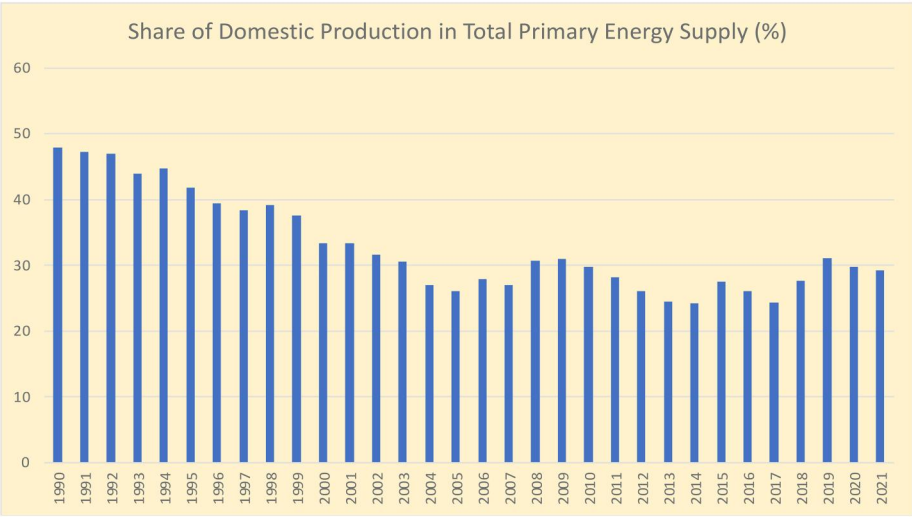


Figure 4. Share of domestic production in total primary energy supply (%). Source: TR Ministry of Energy and Natural Resources, General Energy Balances.

the 5.9% in the 2000s. Industrial production has also maintained its reliance on coal with a share of 25% in its energy consumption, at an annual rate of growth of 2.7% between 2010 and 2021.

Overall, the most striking observation of the neoliberal era (post-1990, marked by the complete liberalization of the capital account) is the declining trend of the share of domestic sources in the aggregate primary energy supply. Data derived from the Annual Energy Balances of the Min of Energy and Natural Resources corroborate this assessment, and are set out in Figure 4.

As illustrated in Figure 4, following the full liberalization of the capital account, the share of domestic production in the total primary energy supply has declined rapidly from 47.9% in 1990 to 33.3% in 2000. This trend continued under successive AKP governments, with domestic production accounting for just 26.5% of the primary energy supply in 2005, stabilizing around at that plateau thereafter. Thus, the onset of capital account liberalization has meant, among many other things, the intensified dependence of the domestic economy on energy imports. Trapped within the constraints of the *Diaz Alejandro-Taylor cycle* discussed above, Turkey's premature financialization not only been problematic in the balance of payments and monetary policy design, it has also triggered a structural shift toward increased dependence on imported energy and strategic intermediates manufacturing sectors. The availability of a cheap bonanza of short-term finance capital, along with a structural tendency toward currency appreciation limited the opportunities for domestic production of energy and intermediates, leaving the indigenous economy trapped in a circle of

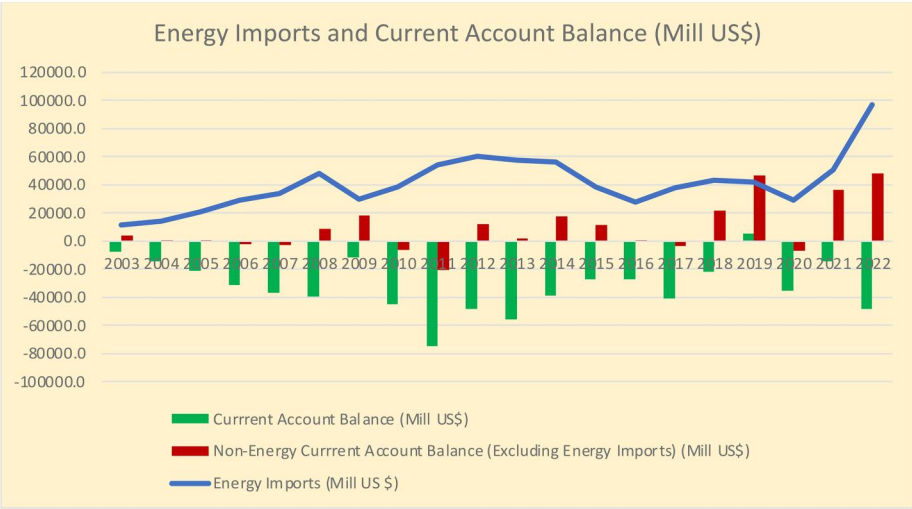


Figure 5. Energy imports and current account balance (Mill US$). Sources: TR Central Bank, electronic data dissemination, *evds*; TurkStat, International Trade Statistics.

structurally binding current account deficits. Figure 5 depicts the elements of this pathway.

The toll of the increased dependence on energy imports is especially apparent in the second half of the decade. A domestic economy driven by *speculative growth* patterns amid a decline in the propensity to save paves the way for a widening in the current account deficit as a result of the import-hungry energy requirements of the domestic industry. In fact, as depicted in Figure 5, with a few exceptions in 2011, 2017 and 2020, the current balance would have recorded a *surplus* after the global financial crisis of 2008 if energy imports were netted out.

The continued reliance on fossil fuel-based technologies in energy production

The official discourse on the technical design of the energy sector discloses increased (or, at best, continued) reliance on fossil fuels. An important institutional step has been the operationalization of the so-called *Turkey Capacity Mechanism* (*TRKM*). The *TRKM* was established in 2018 with the main purpose of sustaining supply security in the electricity market, targeting the development of a sufficient power capacity for the domestic economy. It set out official guidelines on incentives for domestic suppliers, their investment projects and future installations. Power plants joined the *Capacity Mechanism* in 2018, and by 2019 a total of 43 power stations were already under the coverage of the *TRKM* (Durmaz, Acar, and Kı zı lkaya 2022). Durmaz, Acar, and Kı zı lkaya (2022) note that an important

disclosure of the original *TRKM* regulation dated 20 January 2018 was its omission of the hydro, wind and solar based renewables power plants that are already incentivized under the newly invoked "*Renewables Energy Sources Support Mechanism*" (*YEKDEM*).[6]

Over the course of this episode, the private sector has been charged with a leading role in the establishment of a market-based energy economy and has been subsidized significantly as the state chose to leave the sector to unfettered market forces. Nevertheless, the prevalence of high fixed costs of upfront investment requirements precluded the warranted initiatives. The pragmatic policy option was the generation of a two-tier pricing scheme; one being the *Market Clearing Price* (MCP) as settled in the Istanbul Stock Exchange – Energy operations, and the second being set by the unit costs of the *YEKDEM* stations. Under the *TRKM*, the power stations (almost all fossil fuel based) received payments in excess of the MCP levels. In other words, the power stations under the TRKM captured subsidized payments exceeding the market clearing prices on the basis of each kWh of electricity generated. Durmaz, Acar, and Kızılkaya (2022) report that such subsidization reached 3.2% in excess of the average MCP in 2018 and 5.9% in 2019.

In its 2022 Report on The Energy Outlook (TMMOB (Chamber of Mechanical Engineers) 2022), the Chamber of Mechanical Engineers document that the total sum of excess payments to the private sector power plants was 0.48% as a ratio to aggregate GDP in 2018 and increased substantially to 0.62% by 2020. As a ratio of gross production measured in the market clearing price (MCP) values, these imply subsidy rates of 29.98% in 2018 and 43.75% in 2020 (See Table 3).

Against the backdrop of these developments, it would be most illuminating to decipher the official projections set out by the Ministry of Energy and Natural Resources with respect to electricity generation pathways. Gümüşel (2014) summarized the Ministry's electricity projections for the 2012-2030 period succinctly, with total electricity generation projected to reach 619 TWh in 2030 (up from the 210 TWh in 2010). The projected shares indicate that fossil fuels will still account for 55% of total electricity

Table 3. Excess payments and subsidization of the private power plants (billions TL).

	2018	2019	2020
YEKDEM Payments in Excess of Average Market Clearing Price	11.60	16.92	25.35
Payments in Excess of Average Market Clearing Price for Domestic Coal Plants	0.96	2.02	2.17
Capacity Mechanism Payments	1.41	2.00	2.20
Investment Subsidization for Natural Gas Power Plants	4.13	1.52	1.50
TOTALS	18.10	22.46	31.22
memo items :			
As % of GDP	0.48	0.52	0.62
As % of the Gross Market Clearing (MCP) Value	29.98	34.21	43.75

Source: Chamber of Mechanical Engineers, 2022.

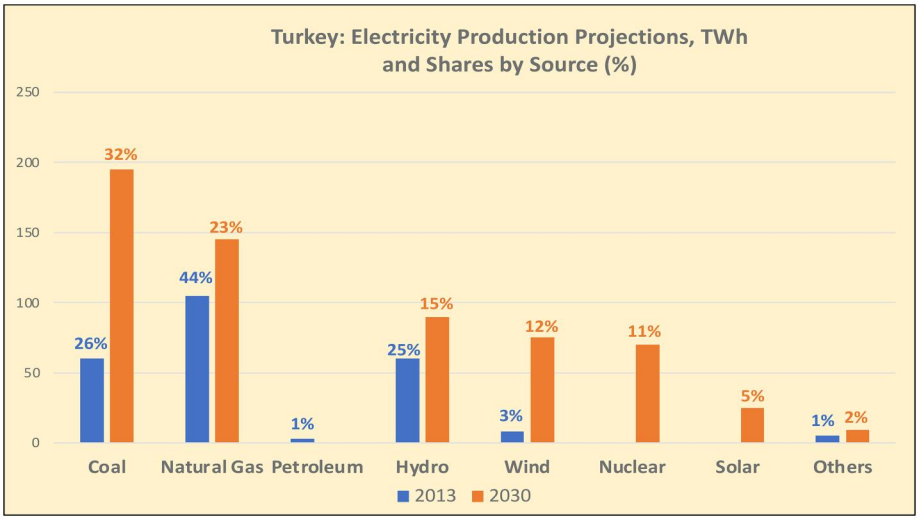


Figure 6. Excess payments and subsidization of the private power plants (billions TL). Source: Gümüşel (2014); Min of Energy & Natural Resources.

generation by 2030, with nuclear power projected to account for an 11% share of total generation (Figure 6).

Given all this evidence, one could argue that Turkey's energy policy has been cast as an extension of its clientelist networks of crony capitalism at the background.[7] It could even be claimed that *clientelism within the renewables sector is actually worse than elsewhere in the domestic economy*. On this assessment, one suggestion could be that renewables are actually more open to green-washing with easier under-the-cover, crony opportunities of implementation of state support. As Bedirhanoğlu (2019) notes, "*the 'gamble on the future' that neoliberalism launched through financial liberalization policies comes to its severest stage today*", where the aforementioned gamble is now played on the states of the *Global South*.

Pathways of emissions and production technology

As such, the ongoing trends in gaseous emissions reveal that, as with other comparable countries, Turkey has not yet decoupled its economic growth, mainly due to its heavy dependence on energy and capital-intensive growth. A simple correlation between annualized rates of GDP growth and CO_2 emissions, as depicted in Figure 7, finds a covariance of 0.49 with strong conformity across the two pathways.

As Figure 7 portrays, swings in the rate of GDP growth are closely matched with the pathways of CO_2(eq) emissions between 1990 and the current date. One of the main reasons for this sustained co-variation is the domestic economy's reliance on energy imports almost with zero price

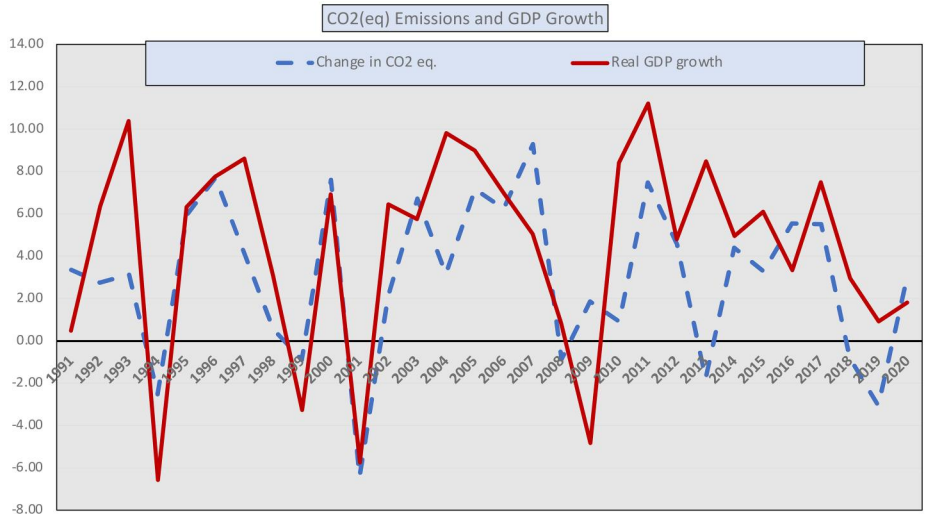


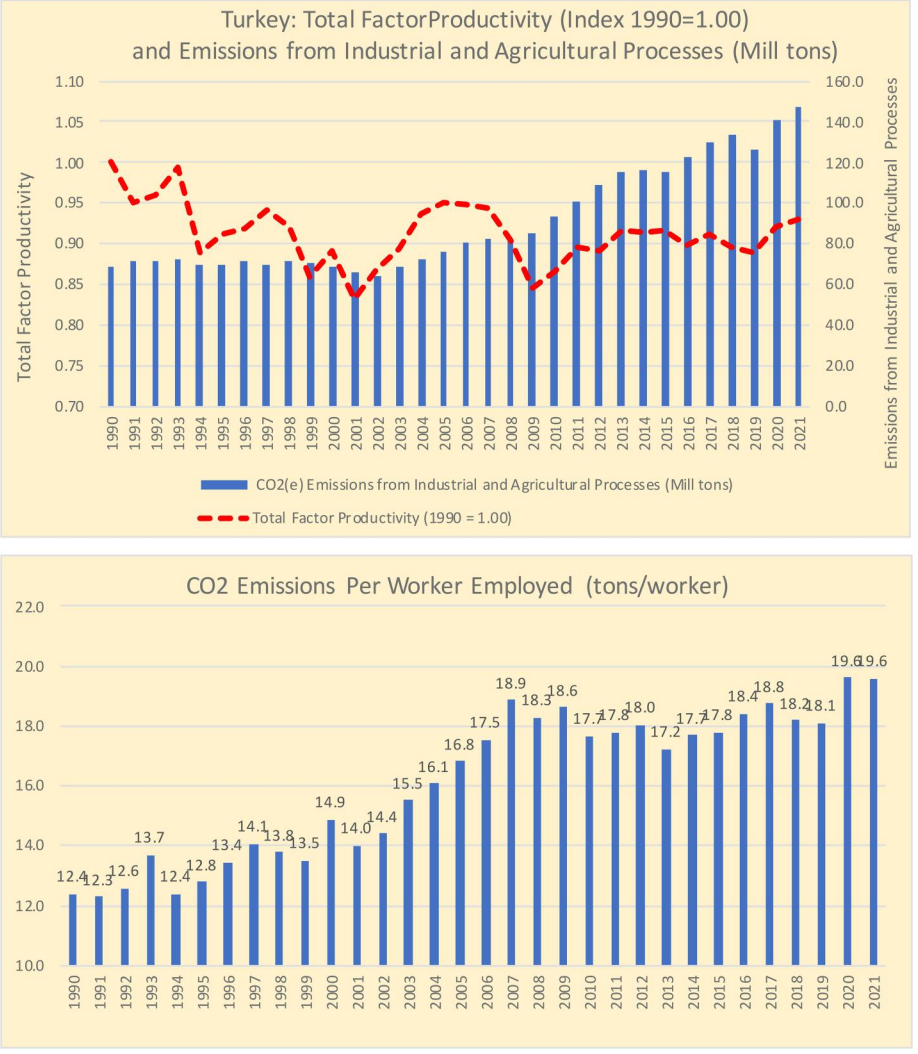
Figure 7. Turkey: annual rate of change in CO_2(eq) emissions and GDP, 1990-2021. Source: Author's own calculations from Turkstat data.

elasticity and over-reliance on fossil fuels in the power sector. According to TURKSTAT, CO_2 emissions from the energy sector have more than doubled since 1990 and are expected to continue to rise significantly in the medium and long term, closely following growth in energy demand. In fact, as highlighted above, increased dependence on imported energy and strategic intermediates is a key problem not only in the energy sector, but also the whole economy as it contributes to current account deficits.

One of the key technological attributes of the speculation-led growth driven by hot money finance is known to be the secular rise of capital intensities leading to structural unemployment across the late-industrializers. In fact, capital per unit employment has been an indispensable characteristic of many emerging market, developing economies which had prematurely deregulated their capital accounts in an attempt to integrate with the global financial markets.[8] The availability of the cheap bonanza of short term finance, often accompanied by currency appreciation, has diverted resources away from labor toward cheaper (and mostly imported) capital. This resource mis-allocation problem has been vehemently highlighted by Taylor (1991, 2004), Ros (2013) and recently by Akyüz (2017). Orhangazi and Yeldan (2023a) confirm this assessment of Turkey's neoliberal transition. They report that when measured in fixed TL prices, the utilization of capital per worker employment nearly tripled between 1989 (the completion of Turkey's capital account deregulation) to the eruption of the global financial crisis in 2008, from TL4,000 to 11,600 before hovering around near that level for the remainder of the 2000s and to the present day (Orhangazi and Yeldan 2023a).

The fragile and volatile nature of Turkey's economic growth in the post-2000 era has also led to a severe shortening of the macroeconomic time horizon, negatively affecting fixed investment decisions to effect technical change. The result, among many other setbacks, has been the low productivity performance of Turkey's overall economic activities. Based on these assessments, one can also highlight the dire consequences of this rather poor performance on the intensified carbonization patterns of the domestic production structure.

Figures 8.1 and 8.2 highlight two segments which underpin this observation. The first one documents the rapid rise of CO_2 emissions emanating from industrial and agricultural economic activity and contrasts this



Figures 8.1 and 8.2. Turkey: total factor productivity and CO_2 emissions per labor in the non-agricultural sector. Sources: Author's calculations from Turkstat Environmental Statistics and the University of Groningen, Pwt database, https://www.rug.nl/ggdc/productivity/pwt

pathway with the trend index of total factor productivity (TFP) growth. In Figure 8.1 the rapid acceleration of emissions since 2005 – the year Turkey's productivity performance started to lose momentum – is clear. The argument that the capital-intensive production patterns of the speculation-led growth trajectory has been a key factor behind inertial structural unemployment was already mentioned. Thus, another key outcome of this capital-biased trajectory has been the rapid rise of emissions per worker. As can be followed directly from the lower slide seen in Figure 8.2, emissions per laborer hovered at around 13 tonnes between 1990 and 2001 before rapidly surging from 14.4 tonnes per worker to 19.6 tonnes per worker under the speculation-led growth era (2002 to the current day).

Assessment of climate policies

As documented above, Turkey has been experiencing a dramatic change with respect to its escalated utilization of primary energy sources and the rise in its per capita gaseous emissions. The bulk of its electricity generation technology relies on the utilization of fossil fuels, comprised mainly of natural gas and coal. Since the country does not own any significant oil or gas reserves, it is highly dependent on energy imports. In order to decrease its reliance on foreign energy resources, ensure energy security and meet growing energy demand, Turkey has pursued a strong commitment to the utilization of all the domestic coal resources, together with its plans to install three nuclear power plants in the near future. On the other hand, the tremendous potential reserves of renewable resources such as solar, geothermal and wind remain largely untapped in producing energy.

Despite these laudable attempts, it is still worth pointing out that Turkey still lacks a clear strategy toward de-carbonizing its development pathway, notably in its energy sector (Şahin et al. 2021; TÜSİAD 2016; 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 steer Turkey away from any emission reduction targets and to sustain its low-tech, high-carbon developmentalism*". Thus, "*this defensive position has persisted, and efforts to support international recognition of Turkey's special circumstances have remained the number one priority in Turkish climate politics*" (121).

Thereby, the priorities of Turkish climate policy mostly rest upon the arguments of "special circumstances" noting the country's relatively small responsibility in global emissions, and as quantified in its official targets to be discussed below, it can be succinctly summarized with the official motto: "*environmental policies should not harm development*". Against this backdrop, Şahin (2016) summarizes the main contours of Turkey's hesitant

climate policies sequentially as "(*1) economic growth being the primary driver of the rise in emissions; (2) the rise in energy generation in parallel with economic growth; (3) there lack of movement in the intensity of emissions from energy production; (4) a national energy policy where coal is the preferred fuel in expanding Turkey's energy production capacity; and (5) therefore, the energy-economy nexus being strongly dependent on fossil fuels, thus leading to a constant rise in emissions*". Şahin refers to this state of affairs as one of *frozen climate policy*, and argues that it "*needs courage to challenge old-fashioned, low-tech, and high-carbon developmentalism*" (*ibid*, 216).

A clearer view of Turkey's position is depicted in Table 4, which documents the relevant data in alongside the global emissions scorecard.

As can be seen, Turkey's total CO_2 emissions have been increasing at an annual rate of 3.19% over the 2000s, in excess of the global rate of growth and in the comparable regions. This assessment is particularly valid for per capita emissions, which have been increasing at almost the double the global average rate. CO_2 emissions per US$1 of GDP have maintained a falling trend, indicating some modest gains in efficiency. Even so, the depletion in domestic natural resources and decline in environmental wealth are developing at alarming rates. The World Bank's Concept note on Turkey's INDC clearly sets out this point 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*

Table 4. CO_2 emissions intensities: turkey and comparable regions.

	2000	2010	2019	Annual Rate of Change over 2000-2019
CO_2 emissions (kt)				
Turkey	2,16,400.0	2,97,110.0	3,96,840.0	3.19
Upper middle income	38,46,860.0	47,00,769.9	51,31,190.0	1.52
Middle East & North Africa	13,31,978.7	21,37,451.1	25,55,925.5	3.43
Europe & Central Asia (excluding high income)	25,82,853.9	28,46,013.4	29,42,675.3	0.69
World	2,34,45,433.3	3,10,43,477.0	3,43,44,006.1	2.01
CO_2 emissions (kg per 2015 US$ of GDP)				
Turkey	0.523	0.484	0.398	−1.43
Upper middle income	0.727	0.586	0.531	−1.66
Middle East & North Africa	0.743	0.791	0.738	−0.03
Europe & Central Asia (excluding high income)	1.706	1.153	0.905	−3.34
World	0.485	0.479	0.406	−0.94
CO_2 emissions (metric tons per capita)				
Turkey	3.375	4.059	4.754	1.80
Upper middle income	3.145	3.805	3.973	1.23
Middle East & North Africa	4.149	5.371	5.401	1.39
Europe & Central Asia (excluding high income)	6.969	7.507	7.364	0.29
World	3.816	4.454	4.436	0.79

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

doubled from 0.16% in 1995 to 0.32% in2016. In terms of total wealth, despite a near doubling between 1995 and 2010, the amount of total natural capital decreased from US$907 billion to $511 billion over the same period, while per capita natural capital decreased more than halved from US$15,499 to $7,095" (World Bank 2016).

The main document which reflects the country's official stance in setting a specific trajectory for abatement is that of the (Intended) Nationally Determined Contribution which was submitted to the Paris COP Meetings on 20 September 2015.[9] Under this framework, Turkey declared its commitment to a 21% reduction from its projected base-path (see Figure 9). Accordingly, it was projected that in a base-case scenario depicting unchanged historical conditions, Turkey's aggregate GHG emissions would reach 1,175 million tonnes in 2030, doubling its CO_2 (eq) emissions with respect to its 2012 levels over the course of the next 18 years. The INDC, in turn, has declared its intention to reduce these emissions by 21% to 929 million tonnes by 2030.

This declaration has been regarded as a very poor commitment by the scientific community and was criticized for making use of an exaggerated base-case (business-as-usual) projections that would enable the country to eventually claim a reduction in emissions, even without the pursuit of any real abatement. United Nations Environment Program (UNEP) has been particularly critical of Turkey's meager INDC efforts and attested that, along with Russia and India, Turkey was one of the three countries displaying abatement targets which fell short of the commitments set out in the Paris INDC pathway (UNEP 2019).

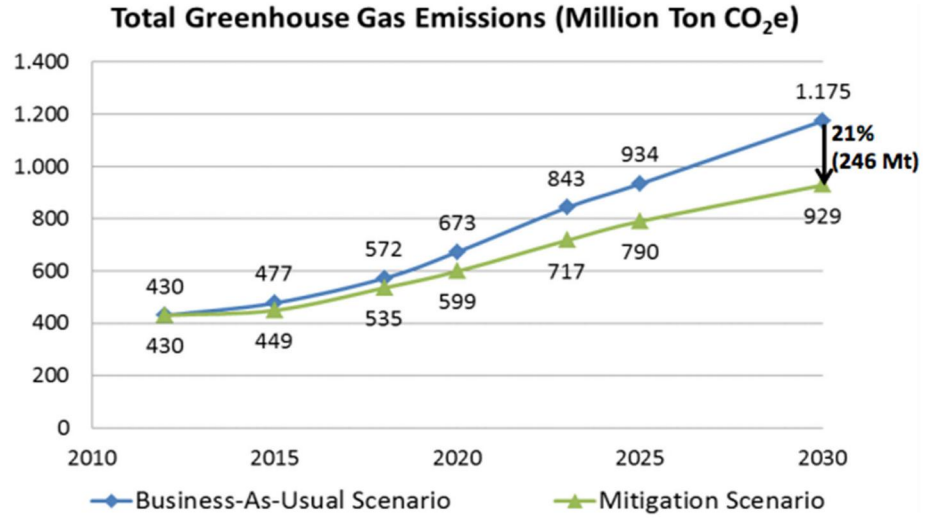


Figure 9. Turkey's INDC pathway submitted to Paris COP Meetings, 2015. Source: https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Turkey/1/The_INDC_of_TURKEY_v.15.19.30.pdf

More recently Turkey has joined the international community in setting out *net zero emissions* (NZE) targets which in the latest round of climate diplomacy advocacy. Turkey has declared that it will reach NZE by 2053 (resonating with the 600th anniversary of the conquest of Istanbul –then Constantinople). Although the specifics of the 2053 NZE pathway have not yet been declared officially, many independent studies have already addressed it. In its modeling study within the CCDR (Country Climate and Development Report), for instance, the World Bank (2022) claimed 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 generation sector, a combination of energy efficiency and electrification in buildings, electrification in transport and a change in current practices to maximize carbon sequestration from forest landscapes*". Accordingly, Turkey's aggregate emissions are on course to peak in 2023 and decline to 120 million tonnes by 2053, with these emissions planned to be *netted out* by an extensive re-forestation campaign. The model's hypotheses with respect to its base-path projections disclose a cumulative increase of 18,055 million tonnes over the 2022-2053 period to be reduced to 10,153 million tonnes under a *resilient and net zero pathway (RNZP).*

The World Bank's CCDR modeling work further emphasizes the importance of the transition from coal on the grounds that "… *even without a carbon constraint, new coal power plants are neither needed nor the cheapest option when it comes to meeting the growing demand for electricity . Instead, Turkey can achieve energy security through an accelerated pace of least-cost investments by developing domestic solar and wind power, building on its track record of tripling renewable energy capacity in the last decade, and investing in energy efficiency, battery and pumped storage, geothermal, and gas generation with carbon capture and storage*" (emphasis mine).

In contrast, an alternative modeling exercise under the Istanbul Policy Center (Şahin et al. 2021) has projected that in a base-case scenario, Turkey would need to increase its electricity generation to 460 TWh by 2030 and to 769 TWh by 2050. According to projections based of this historically given business-as-usual (base) path, emissions produced by power stations running on fossil fuels would increase to 280 million tonnes in 2050 (up from the current 149 million tonnes). Şahin et al. (2021) documented that by expanding its wind and solar based installation capacity at a rate of 3 GW per year for each source, Turkey can reduce its emissions arising from electricity generation to just 15 million tonnes by 2050. The main component of this NZE pathway is its requirement to phase out coal by 2035.

Toward resilient, green and egalitarian development

At the outset, many would argue that Turkey offers very strong potential in renewables-led power generation given its geographical opportunities and wide array of potential gains from decarbonization of its industrial production. In contrast to all of this, however, Turkey's macroeconomic outlook exhibits the characteristics of a typical late-industrializer, developing market economy trapped within the constraints of its growing population and speculation-driven patterns of growth. The country's overall ambitious targets on green industrialization are marred by short-termism and rentier characteristics of its investment patterns, with a heavy reliance on (imported) fossil-fuel based production and consumption patterns which, in turn, have limited domestic substitution possibilities. These pathways are often driven by extreme cyclical fluctuations in the rate of growth of the economy. Conditioned by an over-zealous quest for short term profitability and rent-seeking, the main outcomes have been a fragmented labor market along with dualities and widespread gaps in resource allocation and intensified foreign dependence on energy resources. All of these have hindered the transition toward a sustained and egalitarian green economy.

Furthermore, within the financially dependent globalization logic, the need to continuously supply global finance capital with an indisputable agenda of "structural reforms" has ultimately exhausted states' ability to create and sustain traditional modes of acquisition and transfer of the economic surplus in favor of the domestic clientele (Orhangazi and Yeldan 2023a); the insatiable appetite of global finance capital to an endless flow of structural reforms along the so-called dictates of market discipline and corporate governance has not only resulted in limiting the national conglomerates' ability to capture the domestic surplus, but is now expected to be redistributed and redirected to international finance power houses. As such, the institutional mechanisms dictated under the technocratic cadres have also contributed to democratic backsliding and constrained the indigenous policy space (Orhangazi and Yeldan 2023a; Apaydin and Çoban, 2022; Buğra and Savaşkan 2014) while giving rise to the creation of new institutions in a *de-risking state* (Gabor 2020). This leaves not only Turkey, but almost the whole developing world within binding structural constraints, inhibiting their indigenous attempts toward *resilient, green and egalitarian development*.

The resolution of these constraints in favor of a sustainable growth pathway will necessitate deployment of a whole new strategy of structural transformation based on renewables, decarbonization and phasing out of the present fossil-fuel dependent technologies and their institutions. This structural transformation will have to orientate its priorities

to the well-being of our planet, as well as the rights of the future generations, while enhancing the social welfare of the present.

Under the current realm of intensified global competition and the class struggle, this will not be an easy task. Nevertheless, the main pillars of such a viable transition program can still be investigated. Such an avenue has been pursued in the study carried out by Orhangazi and Yeldan (2023c) where the authors argue that the *first* step should call for "*revitalization of the fiscal space and its instruments. Fiscal policy will need to be re-balanced in favor of a low-carbon economic structure, not only characterized by fiscal expansion but also a re-orientation away from fossil fuel-based activities to decarbonization. This should entail the removal of direct and implicit subsidization of the fossil economy, in particular coal*" (Orhangazi and Yeldan 2023c).

A *paradigm shift in monetary policy* must be an indispensable component of the new strategy. The neoliberal dogma of passive monetary policy in inflation targeting regimes that underwent a *de facto* transformation where indigenous central banks of developing countries merely play the role of an accounting agency of global finance capital has to be abandoned. The 2009 global financial crisis had already taught us the lesson that achieving price stabilization alone without due stabilization in asset markets will not suffice in achieving macro stabilization (Akyüz 2017). Especially under a green growth trajectory, central banks will have to shift toward a more active policy stance which is more engaged with eliminating structural bottlenecks rather than market neutrality instrumentalization in their pursuit of price stability along with esoteric communication languages. At the very least, central banks will be required to follow a biased stance in favor of de-carbonization and against "brown" industries, rather than maintaining equal distance from all "participants". In fact, as Dikau and Ryan-Collins (2017) noted, "*in advanced economies, central bank mandates are predominantly focused on price stability, and yet many of the central banks in [emerging and developing countries] have a wider remit to support sustainable development and the government's economic policy agenda*", and that "*higher inflation in less-developed and middle-income countries leave them more vulnerable to climate change-related supply side shocks, emphasizing the urgent need for taking climate change into consideration in their monetary policy interventions*" (Dikau and Volz 2021).

In the case of the Turkish Central Bank (CBRT), such a proposal geared toward the *greening* of monetary operations was recently suggested by Ünüvar and Yeldan (2022, 2023) and Yeldan (2023). As a starting point, Ünüvar and Yeldan (2023) note that using CBRT policy interest rates as a control instrument in matters of climate mitigation is obviously a very cumbersome approach, and quote Vestergaard (2022) in proposing a set of

common principles that, at the minimum, should "*(i) signal a substantive mitigating effect on climate change, (ii) entail no significant, negative impact on the effectiveness of monetary policy and (iii) not carry potential negative consequences for market liquidity*".

Clearly a successful green design will require a well-designed and transparent taxonomy. Thus, for a central bank to satisfy its functions as a micro prudential or a financial supervisor armed with macroprudential responsibilities, the CBRT would have to instrumentalize its green policy tools under the guidance of an agreed green taxonomy. Based on the seminal work carried out by Baer, Campiglio, and Deyris (2021), Ünüvar and Yeldan (2023) tabulate the potential green monetary instruments for the CBRT under *informational, incentive-based* and *quantity-based* categories. Accordingly, the *informational tools* are to be designed to "*trigger awareness of the impact of climate change*", while the *incentive-based* measures are expected to "*serve to support the green transition*". *Quantity based* tools are, in turn, "*highly specialized instruments which would impose direct control over the financial system*". Table 5 sets out such a set of potential green policy instruments in summary.

Clearly, addressing the climate crisis will require a comprehensive policy approach. In the words of Ünüvar and Yeldan (2023, 12), a redirection of the monetary policy toward "*designing disclosure requirements, running climate related stress tests, expanding the coverage of research to include climate change associated risks and applying differentiated reserve requirement ratios that will redirect the loan composition to encourage green investments*" are the readily available instruments under the CBRT's current mandates. In what follows, "*supporting the development of green financial markets will be a move complementary to the green monetary transmission*" (*ibid*, 13).

Strategies to reclaim the policy space in both the fiscal and monetary spheres will call for increased control over the in/out-flows of international finance capital. As Adelman and Yeldan%% (2000) testify, "*no country,*

Table 5. Taxonomy for Green Monetary Tools.

Green Policies With Different Direct Goals		
Informational	Incentive Based	Quantity Based
Expanding the climate related information available to market participants and bridging the market failures stemming from imperfect and asymmetric information	Making low carbon strategies financially more convenient	Imposing direct control over financial flows
Tools		
Developing climate risk assessment models	Differentiated capital requirements and / or reserve requirements	Sectoral credit quotes
Disclosure requirements	Collateral frameworks	Minimum credit floors
Green taxonomy	Asset purchase programs	Maximum credit ceilings

Source: Ünüvar and Yeldan (2023) summarization from Baer, Campiglio, and Deyris (2021).

regardless of how developed its financial institutions and market systems are, can withstand the onslaught of herd psychology fueled by hundreds of billions of liquid hot money in daily foreign exchange transactions". Thereby, redesigning of a democratically controlled, international infrastructure to manage mobility of capital flows will constitute an important step toward gaining command of the indigenous policy space independent of the international financial institutions. (See, *e.g.,* Epstein and Pollin 2011 and Epstein and Yeldan 2009 for further discussion of the original statement).

Finally, our experience of financial dependence and speculation-led growth episodes since the 1980s clearly highlight that "*a dramatic feature of these trajectories has been one of polarization of per capita income across the globe, as well as national/regional economies. The expected smooth transition of uplifting traditionally stagnant rural economies and lifting the masses out of poverty into the ranks of modern urban centers of growth has either not taken place or has been extremely slow and erratic*" (Orhangazi and Yeldan 2023c). Over this period, the role of falling profitability in industrial sectors and a global tendency toward *de-industrialization* has been rampant (UNCTAD 2016). Investment expenditures on fixed capital has stagnated, forming the basis for faltering productivity gains and rising structural unemployment. Industrial labor productivity growth has reportedly stagnated entirely in Latin America, while East Asia reports sustained, yet significantly volatile, rates of labor productivity growth (Akyüz 2017). In the words of Acar et al. (2018) "*Informalization, fragmentation and social exclusion are observed as the inescapable outcomes of modern enclaves; in short, modern/formal centers of growth have simultaneously created their informal bases, with fragmented informal structures produced and sustained by their modern, formal counterparts*" (17).

Consequently, in what follows, "*in the contextual realm of Turkey, the modern urban centers not only retain and generate backwardness in the rest of the country, but also create further poverty traps within its geographical domain. As cycles of the informal economy surround the core, fragmented and dualistic activities form the basis of sources of cheap labor consisting mainly of the socially excluded ranks of migrants who are, in turn, are pressed to offer their labor power in a race to the bottom. Turkey's experience is, by no means, unique. It is part of a larger picture of the international division of labor within the global economy where formal and informal structures co-habit side by side as part of a larger social formation*" (*ibid,* 18).

Thus, it is clear now that meeting the challenges of the *Net Zero Emissions-Economy* requires the initiation of indigenous strategies of industrialization, energy use and of development that are beyond the use of the tax-cum-subsidization interventions of the market apparatus. What is strategically at stake is a new mode of development and energy transition

strategy to address issues of tackling climate change and environmental abatement under such *dualistic* (fragmented) pathways of production and employment, and a tendency for productivity patterns to fall.

Concluding comments

In this paper I have sought to present the key challenges and structural constraints as well as potential strategies toward de-carbonization and the green transformation for Turkey. I argued that even though it is a generally accepted contention that Turkey is at a conjuncture where the urgency for a new growth model is increasing, its arsenal of potential policy instruments is nevertheless subject to the constraints of global speculative finance.

Nevertheless, in spite of all the constraints, a viable green development strategy ought to be pursued. As stated originally in Orhangazi and Yeldan (2023c), I propose that the main premise of this alternative growth model emphasizing the *green industrialization strategy* should include:

- the transition from fossil fuel-based production to sustainable and renewable forms of energy, industry and agricultural activities to be led by a *socially responsible*[10] state sector;
- addressing the informalization and fragmentation of labor markets and introducing decent job programs;
- addressing the wide imbalances in incomes and opportunities, not across not only when it comes to paid labor and capital or the regional sphere, but also on the basis of gender, ethnicity and all forms of social exclusion;
- granting geographical regions a realistic role in resource mobilization and resource allocation within the principles of social evaluation, rather than myopic expectations of the oligopolistic markets.
- democratic control of the state apparatus and increased transparency of the public procurement system, together with a new design of the procurement auctions based on a competitive structure which conforms to international norms.

Finally, the main message as distilled from almost two hundred years of successful development transformations is to invigorate a mechanism of *crowding in* of private initiative where capital accumulation is directed under democratic planning which supports the structural transformation and the generation of employment. This would mean, in the words of UNCTAD (2019), "*… policy coherence – combining clear climate commitments with policy measures that demonstrate decisive following through on those commitments – is probably the most important single factor that supports an integrated approach to structural transformation and climate adaptation*" (115).

Notes

1. 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
2. See, *e.g.*, Voyvoda & Yeldan 2016; Şahin 2016; Acar and Erinç Yeldan (2016).
3. See Akyüz and Boratav (2003), Boratav, Yeldan, and Köse (2002), Yeldan (2022), Ertuğrul and Selcuk (2002), Cizre-Sakallioglu and Yeldan (2000), and Orhangazi (2020) for a thorough overview of the post-1990 Turkish macroeconomic history. Biçcr and Yeldan (2003), Oniş and Aysan (2000), and Yentürk (1999) provide similar analyses based on the effects of international speculative financial capital flows on the Turkish economy. Somel (2003) and Yeldan (1995, 1998), in turn, discuss the characteristics of the post-1990 Turkish macro adjustments in terms of creation and absorption of the economic surplus, and provide a quantitative analysis on the strategic role played by the state apparatus.
4. https://www.tuik.gov.tr
5. See Orhangazi and Yeldan (2021, 2023a) for further assessment and data sources.
6. In a Decree dated 10 November 2018, hydro-electric power stations were later added to the TRKM coverage.
7. See, Buğra and Savaşkan (2014), Bedirhanoğlu (2019), Boratav and Orhangazi (2022) and Cizre-Sakallioglu and Yeldan (2000) for further discussion on the attributes of this clientelist, crony capitalism.
8. For more elaboration, see *e.g.*, U of Groginnen Penn World Tables at https://www.rug.nl/ggdc/productivity/pwt/?lang=en
9. Nevertheless, Turkey was still reluctant to ratify the Paris INDC Agreement in its parliament even as late as October 2021. Turkey was among the few remaining countries not to be a party to the Agreement at that point, along with Eritrea, Libya, Iraq, Iran and Yemen.
10. Arguments of which can be found in Taylor (2004) and Telli, Voyvoda, and Yeldan (2006).

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

A. Erinç Yeldan http://orcid.org/0000-0002-3123-4374

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