

THE NEW CLIMATE REGIME

THROUGH THE LENS OF ECONOMIC INDICATORS



EXECUTIVE **SUMMARY**



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Why does the new climate regime matter?

Climate change is one of the leading risks threatening sustainable development as well as the overall ecosystem. Therefore, climate mitigation and adaptation top the agenda of many countries and international organisations and institutions that work on environmental, economic, and societal issues, such as the United Nations.

Adopted at the 21st Conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement entered into force on November 4th, 2016, and opened a new era in the international climate regime. The most important feature of this new era is that it obliges all developed and developing countries, which are party to the agreement, to take measures to reduce emissions and act “in accordance with their common but differentiated responsibilities and respective capabilities”.

In line with this commitment, in December 2019 the European Union (EU) announced the climate change targets of its European Green Deal (EGD) which puts climate change and environmental concerns at the centre of all policy areas. The purpose of the EGD’s main

constituents is to transform the EU’s economy for a sustainable future. In line with this transformation plan, in the period 2020-2021 the Union will prepare a transformation programme and the related financing issues. For this purpose the EU will pursue the following strategy:

- Reduction of greenhouse emissions within a certain program to make the EU climate neutral by 2050
- Ensuring clean, accessible, and secure energy
- Zero pollution
- Protecting ecosystems and biodiversity
- A fair, healthy, and environment-friendly food system through the ‘Farm to Fork’ strategy
- Sustainable and smart transportation
- Energy and resource-efficient buildings
- Incentivizing new circular economy business models
- Supporting those most affected by the transformation, (Commitment of “Leaving no one behind”)

The transformation pursued by the EU with its EGD includes strategic policies for a wide range of areas from industry to transportation, and packaging to data protection. In this context it needs to be stressed that the European Commission’s EGD is not only an “environmental” strategy but also involves the establishment of a new international trade

system and division of labour, which are of immediate interest for our country. The EGD foresees a “climate neutrality” target to be achieved by member states by 2050. For this purpose a new economic growth strategy based on a more efficient use of natural resources, a stepwise reduction of fossil fuel-based energy consumption, re-manufacturing and a circular economy has been formulated and a new business model been devised whose main features are energy and raw material efficiency and the use of renewable energy resources. To achieve its climate targets, the EU Commission has identified effective carbon pricing in the entire economy as key precondition. In this context, the EU is working on a new system to reduce carbon leakage¹. It is based on a carbon border adjustment mechanism (CBA) which involves new trade taxes and non-tariff barriers. As part of this approach, a “green taxonomy” has been developed to define climate-related investments. The aim is to provide climate financing only to investments that conform to the definition.

Carbon leakage occurs between regions and countries with and without carbon regulations. To prevent EU investors from choosing countries with a relatively lax carbon legislation, and to protect the competitiveness of actors in the EU's internal market against products originating in such countries, the EU has identified products with a “carbon leakage risk”. Exports of such products into the EU market will be subject to taxation depending on their carbon

intensity. This tax will be one of the main EGD instruments. The CBA has been designed both to solve the problem of carbon leakage and to oblige business stakeholder to adopt the EU's goal of global greenhouse gas reduction. In other words, the carbon cost which would have been incurred had an imported product been manufactured in the EU will be taxed at the EU border. How the mechanism will work and which sectors it will be applied to is not yet clear. It is clear, however, that the greenhouse gases emitted during the manufacture of a product entering the EU market from abroad will be priced, if it has not been taxed or priced in the country of origin. If it has been priced there, that price will be deducted from the carbon price valid in the EU (Sartor, 2020)².

As one of its anti-climate change measures, the EU is applying its Emissions Trading System (ETS) which it has implemented in phases since 2005. Under this system the emission rights a company can buy are being reduced annually. For products defined with the purpose of protecting sectors under risk of carbon leakage, emission rights up to the reference value are issued free of charge. In case manufacturers active in those sectors exceed the emission reference value assigned to them, they have to purchase the excess amount on the free market. It has been announced that the assignment of free-of-charge quotas will be continued until 2030. In other sectors covered by the ETS no exemption exists for emissions for which they are responsible. It is highly likely that

¹Carbon leakage refers to production in energy and foreign trade-intensive sectors being transferred from a carbon-pricing region (EU) to a country without carbon pricing, thus putting production, employment and greenhouse gas emission targets at risk.

²Sartor, O. (2020). EU Border Carbon Adjustments and possible implications for the Turkish industry. Agora Energiewende, Shura webinar presentation of 14 May 2020

the CBA will be applied in the form of an extension of the EU's current ETS on an international level. Measures such as the CBA mechanism, which is part of the EU's new growth strategy and which serves the purpose of fighting climate change and environmental challenges, constitute a risk factor for the Turkish economy, because the measures may cause rising costs. This matters, because the EU region is our country's most important foreign trading partner. Ideas on how to turn those risks into opportunities will be of critical importance.

Another - from the point of view of Turkey - critical consequence of the EGD is the integration of the concept of sustainability and of the Paris Agreement's implementation provisions into the EU's free trade agreements. Turkey has signed the Paris Agreement, but due to the uncertainty of its status under the agreement, has not ratified it. However, on 30 September 2015 our country announced its Declaration of Intention of a National Contribution (Intended Nationally Determined Contribution – INDC) which includes a "Reference Scenario (BAU)" with a 21% reduction target for greenhouse gas emissions by 2030 and defines measures for its achievement comprising all areas of economic policy but foremost the energy and industrial sector.

While Turkey has not ratified the Paris Agreement it will have to adapt to developments in the wake of the new climate regime, like the ones we are seeing in the EU. Feeding the discussion with economic data will make a critical contribution. It will help decision makers to generate holistic, complementary and applicable policies for our country which is situated in a fragile region which,

according to scientific research, will be affected by global climate change. And it will also support our position in the global arena in the fight against climate change.

What are the goals of this report?

In this report, a quantitative evaluation of the fight against climate change is based on the possible direct effects of the new climate regime on our country's economy and trade. The policy instruments designed to fight climate change will also be examined in this context. Where relevant, this report also refers to the indirect positive effects of an adoption of the new climate regime (lower health expenses, easy access to international green financing, etc.) as well as the indirect negative effects if this is not done (negative external effects, trade diversion and related increase in unemployment, threat to market shares of Turkish companies in European markets, etc.)

The following focal points of this report serve the purpose of contributing to an evaluation of Turkey's position in the context of a global climate regime:

- The likely reduction of greenhouse gas emissions if Turkey becomes a party to the European Green Deal mechanisms and the "Paris Agreement", and a detailed examination of the effects on the national economy caused by the implementation of harmonisation measures
- Evaluation of the likely consequences on a national level and with respect to strategic sectors
- Determination of the likely size of the harmonisation needs with respect to economic indicators
- Evaluation of the changes in production, employment and exports in the economy (and the related changes in competitiveness) in case of harmonisation.



Results of the models and scenarios regarding the sectoral and macroeconomic effects of the new climate regime

The report is based on economic models and scenarios whose purpose is to facilitate the intended multidimensional evaluations.

1. The impact of the BCA on various sectors of the economy

To calculate the potential effect of the BCA on sectors of the Turkish economy which export into the EU, a sector-based input-output analysis was carried out. For this purpose, TUIK's 2012-based input-output data were updated with data from 2018. The Analysis was applied to 24

manufacturing/producing sectors which represent the entire economy. In a first step, the TUIK inventory of greenhouse gas emissions was used to calculate the total greenhouse gas emissions of the selected sectors' exports to the EU28 region. Then the "carbon cost" of these exports was calculated on the basis of the assumption that for those greenhouse gas emissions the Emission Allowance Unit (EAU) per ton carbon dioxide equivalent (CO₂e) was to be paid.

The total carbon cost of Turkey's exports is shown in figures 1 and 2. Figure 1 is based on the current price³ of € 30 / tCO₂e, Figure 2 on the expected price under the CBA (€ 50 / tCO₂e).

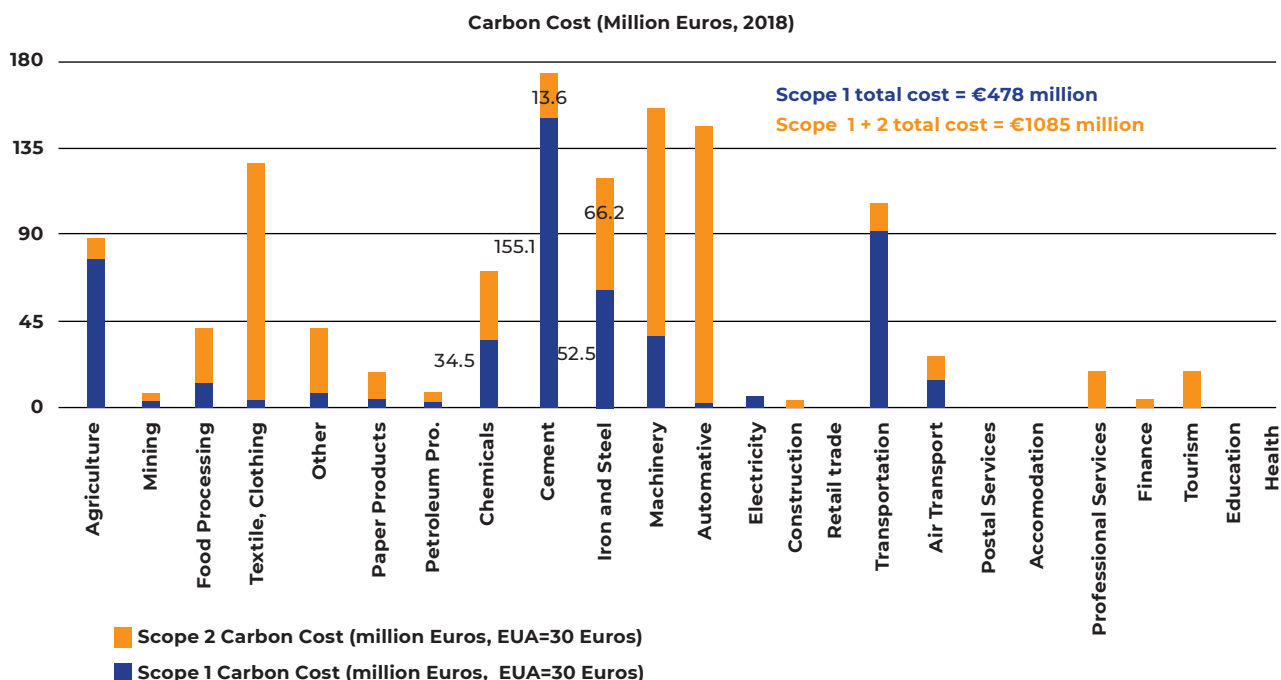


Figure 1. The carbon cost of Turkey's exports based on a the price assumption of EUR 30/tCO₂e⁴

³ Oliver Sartor, May 14th, 2020. Shura Energy Transition Center and Agora Energiewende, "The European Green Deal's Border Carbon Adjustment: Potential impacts on Turkey's Exports to the European Union", Webinar

⁴ Scope 1 + 2 emissions: Production-related emissions can be separated into scope 1 and scope 2 emissions. Scope 1 emissions are generated directly in a factory/sector and fall into the responsibility of the manufacturer (e.g. burning of fossil fuels), while scope 2 emissions are generated in the production of semi-finished products (e.g. steel) or electricity used by a factory/sector as input.



SCOPE 1

Emissions generated directly in a factory/sector which fall into the responsibility of the manufacturer (e.g. burning of fossil fuels)

SCOPE 2

Emissions generated in the production of semi-finished products (e.g. steel) or electricity used by a factory/sector as input.

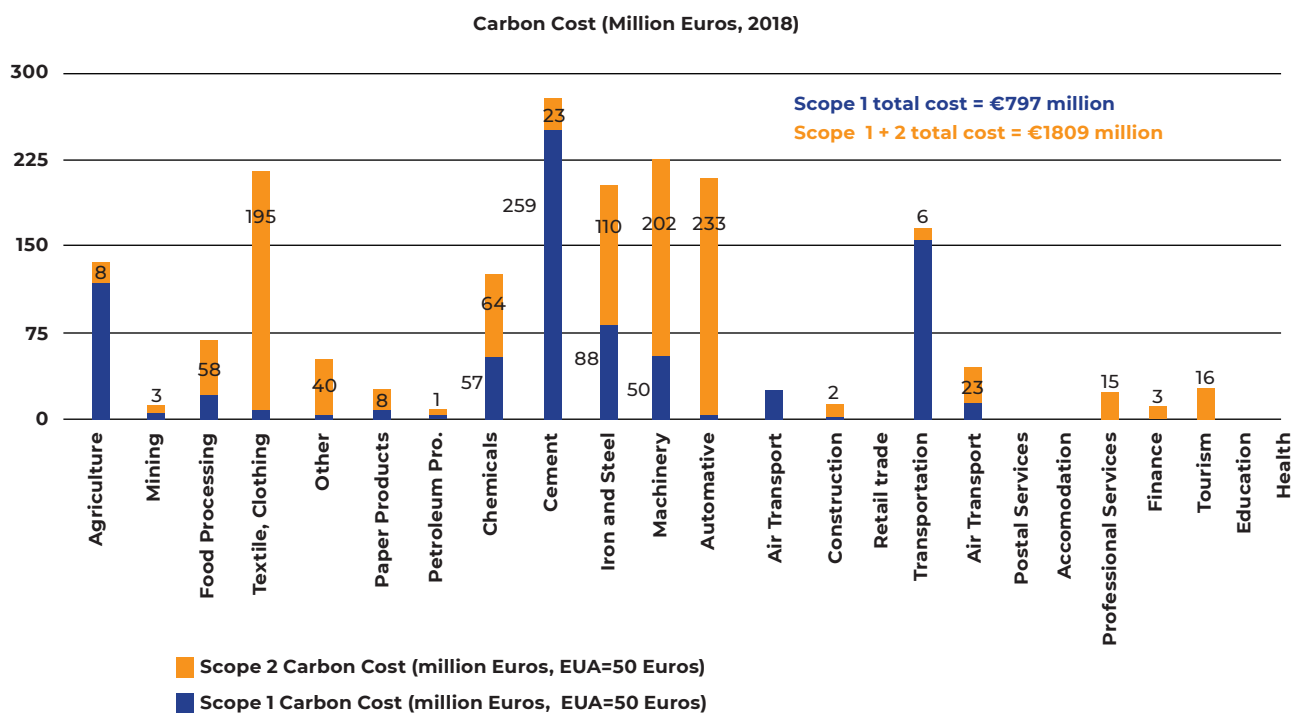


Figure 2. The carbon cost of Turkey's exports based on a the price assumption of EUR 50/tCO₂e⁵

⁵ carbon embodied in exports

The ratio of carbon cost and export revenues yields the “tax” rate of exports from Turkey to the EU28 as a result of the CBA.

Under the € 30 / tCO₂e scenario the cement industry will be most affected (€ 170 m), followed by mechanical engineering, automotive, iron and steel, and textile products.

Taking Turkey’s current export distribution and its sectoral carbon efficiency into account, (with a carbon price of € 30 / ton and € 50 / ton respectively) the potential export revenue losses are as follows (Fig. 3): cement industry (13.2 – 22%), iron and steel (1.7-2.8%), chemical industry (1.1-1.9%) and automotive industry (0.7-1.2%).

As can be seen in Fig. 1 and Fig. 2, the scope 1 and scope 2 emissions differ with respect to the sectoral greenhouse gas composition. While sectors with high scope 1 emissions such as iron and steel (IS), and transport need to find ways at the sector level to reduce their carbon cost, sectors with high scope 2 emissions such as the automotive industry (AU), mechanical engineering (MW) and textile (TE) require a change of the economy in order to reduce their carbon bill.

170 million €

Under the € 30 / tCO₂e scenario the cement industry will be most affected

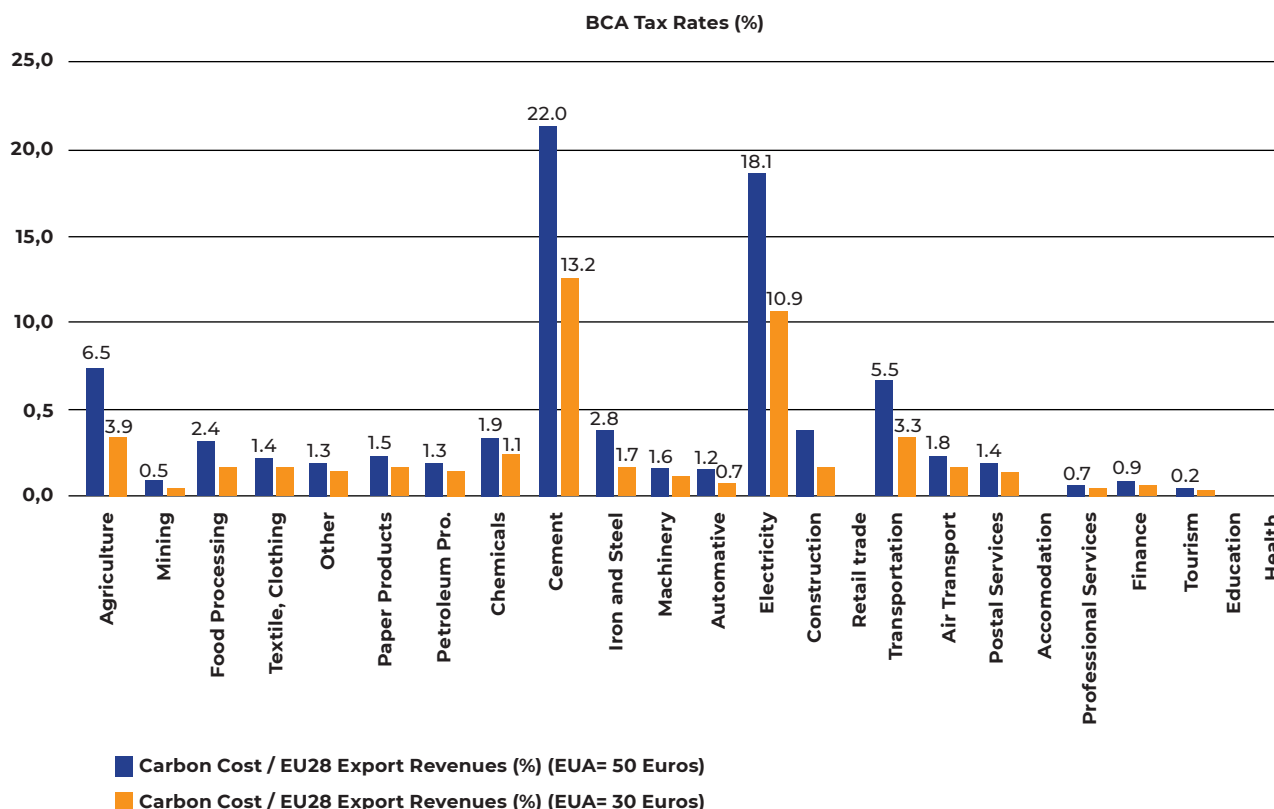


Figure 3. BCA tax as a ratio of export revenues from the EU28 market



2. The macroeconomic impact of BCA and INDC

With the aid of a Computable General Equilibrium model (CGE)⁶ based on the structure and equilibria of the Turkish economy in 2019, it has been attempted to analyse the direct effects of alternative policies, which ensure a reduction in greenhouse gas emissions, on the economy in general but also their long-term effect on macroeconomic variables such as on technological advancement, capital accumulation, the balance of public finances and foreign trade balances. This model permits a holistic evaluation of the effects of alternative policies, including the relationship between sectors. Policy choices which ensure emission limits and emission reductions serve as input data for this model. The output is information on the effects on the national economic production, income distribution, consumption, savings, investments, public sector balances and foreign trade relations.

The CGE model was used to examine three scenarios and one alternative scenario for a period up to the year 2030.

● **BCA_30 scenario:** Based on the assumption that Turkey does not change its current climate policy measures and is subject to a carbon price of EUR 30/tCO₂e for exports to the EU

● **BCA_50 scenario:** Based on the assumption that Turkey does not change its current climate policy measures and is subject to a carbon price of EUR 50/tCO₂e for exports to the EU

● **Baseline scenario:** This scenario serves to answer the question: What would Turkey's overall macroeconomic and

sectoral indicators look like if there were no BCA_30 or BCA_50, in other words, if Turkey were exempted from the BCA mechanism and the pre-December/2019 conditions continued to apply. (The baseline scenario is a hypothetical situation with no probability of being realised. It is a benchmark scenario useful for comparison only.)

EU_EGD alternative scenario: This scenario simulates the adoption of the EU's green economy transformation as an alternative to Turkey's current policies. It assumes a carbon pricing strategy leading to a 21% reduction as stated in Turkey's INDC which the country submitted to the United Nations in the context of the Paris Agreement.

The results of the **Applied General Equilibrium (AGE) Model** for the various scenarios are as follows:

● Gross domestic product (GDP) in 2030 (at 2018 prices): Baseline scenario (TL 5.357 trillion), BCA_30 (TL 5.213 – 2.7% lower than the baseline), BCA_50 (TL 5.166 trillion – 3.6% lower than the baseline).

● EU_EGD alternative scenario: In 2030 GDP is 5.7% higher than in the BCA_30 and 6.6% higher than in the BCA_50 scenario, while greenhouse gas emissions are 16.5% (BCA_30) or 15% (BCA_50) lower (Fig. 4)

In the EU_EGD scenario greenhouse gas emissions are 21% lower than the baseline (acc. to the model this translates into 481 million tons CO₂ instead of 608 million tons, or 580 million tons CO₂e instead of 710 million tons in 2030).

⁶ Applied general equilibrium models of the AGE variety employ algebraic equations to describe the processes of production, employment, income generation and saving-consumption in an economy.

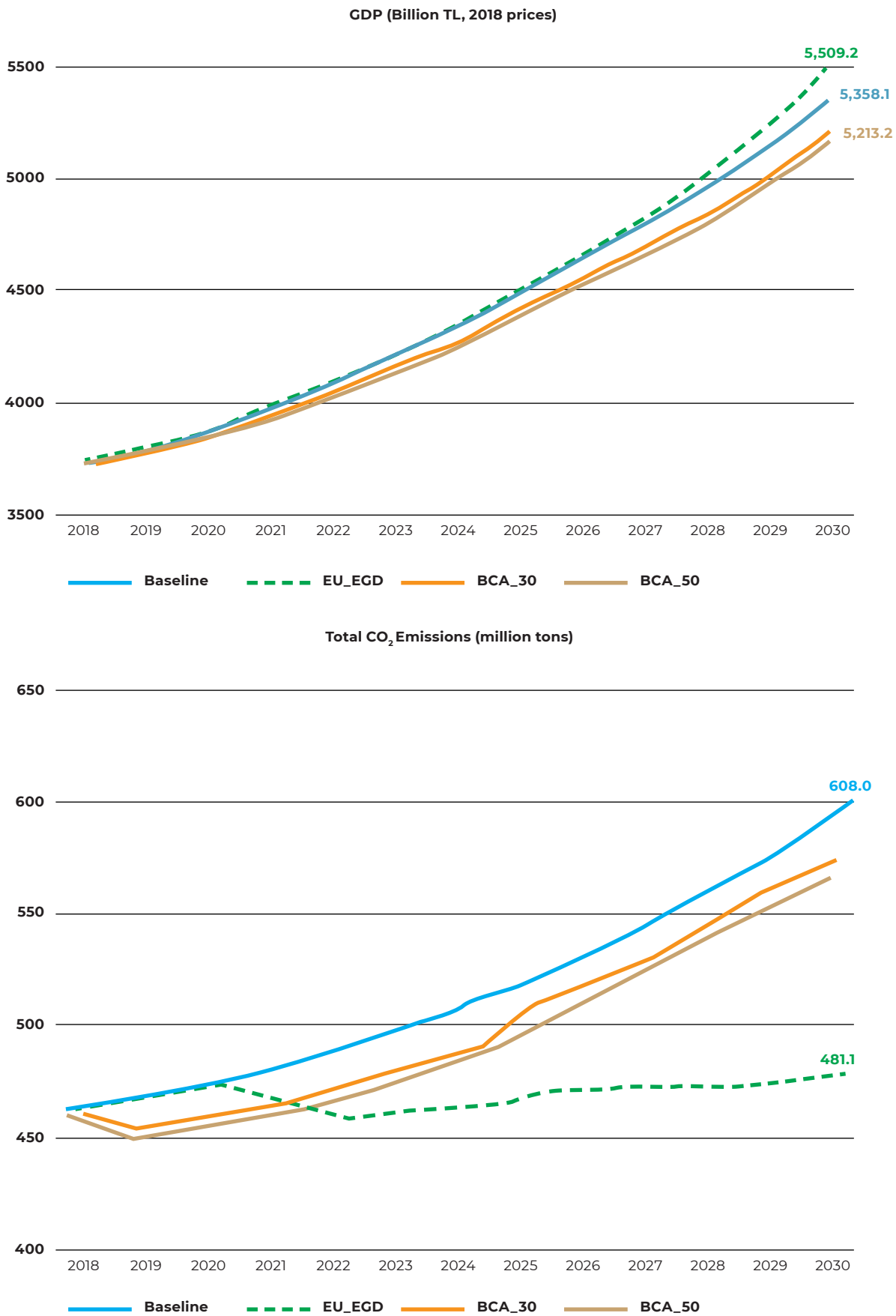


Figure 4. Results of the Macroeconomic Equilibrium Analysis

To achieve this reduction requires limits in total CO₂ emissions and the introduction of quotas after 2021. The quotas would require the “purchase” of CO₂ emission rights and thus become a cost factor. Under this system emission permits would have a market value and be traded. Polluters would be forced to buy emission rights from companies or sectors which are more efficient and employ cleaner technology. The model self-determines the price and describes the operations of a nationwide carbon trade mechanism. Meanwhile, the total permit revenue generated under a carbon quota system would be redistributed to the companies in the form of an investment fund for green transformation. This procedure prevents the carbon pricing mechanism from having an impact on public finances, or any other macroeconomic variable. Based on the assumption that the INDC is fulfilled and thus access to international green funds facilitated, this will result in additional financing from international markets in the order of 0.5% of GDP. And as a result of investments with these funds, an additional improvement in energy efficiency of 1% is expected. These assumptions are very conservative and reasonable, and, furthermore, supported by international studies.

Results and Conclusion

If the assumptions of the EU_EGD scenario become reality, CO₂ emissions per 1 USD GDP will fall from 0.66 kg/USD⁷ in 2018 to 0.49 kg/USD. In other words, carbon emission efficiency per unit GDP will increase.

The results obtained with the AGE model show that in the EU_EGD scenario private disposable income will be 3% and private

consumption expenditure 5.9% higher than in the Baseline scenario. Compared with the BCA_30 scenario those values are 10.9% and 8.6% higher.

In other words, a green economic regime improves social welfare. And this conclusion does not even include other positive consequences of lower greenhouse gas emissions such as improved health conditions (Fig. 5).

The alternative EU_EGD scenario is based on emission reduction, energy efficiency gains through green transformation and access to international green financing as a source for investment funds.

In addition to that, decision makers and policymakers can design extra measures taking employment, exports, forward-backward linkages, and the carbon intensity of individual sectors into consideration. In this context, tax advantages which encourage investments in alternative technologies which in turn facilitate the transition to a low carbon economy will generate great benefits. It would also be beneficial to provide the private sector with technical support such as knowhow regarding European regulations and decisions and a clear road map for the transformation as well as with low-cost financing instruments for its green transformation projects.

When applying new policies to fight climate change, it is necessary to take global and sectoral competitiveness as well as socio-economy policies into account and to design a comprehensive package that is not limited to a single tool. Such a package should not only include carbon pricing and emission reduction but also, as has

⁷ 1 Euro = 1.12\$

been mentioned above, new measures on how to improve energy efficiency, and new technologies (e.g. standards on energy efficiency, foreign trade regulations supporting such standards, energy performance certificates, incentives for industry such as the inclusion of investments in renewable energy in the category of efficiency improving projects, should a product-based CBA come into effect.) as well as incentives and practices encouraging a wider use of renewable energy resources (e.g. YEKA and/or feed-in tariffs). If designed in this fashion, such packages may contribute to a speedier long-term rise of our country's national income. In this context, support for R&D, technological improvements and innovation would also be of great importance.

The results of the AME model also highlight the cost of not changing the country's climate policy. If the CBA is implemented, the consequence will be a GDP loss in the order of 2.7-3.6% by 2030. This should not lead to the conclusion

that it is unnecessary to incur additional obligations with an active climate policy, because highly likely developments which cannot be modelled will significantly increase those costs. The Partnership for Market Readiness (PMR, 2018) project states clearly that the EU is expected to take countries' climate stance (for example those related to the Paris Agreement) and their environmental measures into consideration when negotiating free-trade agreements or the Customs Union, etc., with its trading partners. **Steps taken by the public and private sector with the aim of strengthening Turkey's fight against climate change with concrete measures will bolster the country's competitiveness in an environment shaped by the dynamics of a green economy, and serve to protect our country's global market share.**

The global economy will contract in a post COVID-19 world and the consequences will be severe for both developed and developing countries. Before this background it is expected that

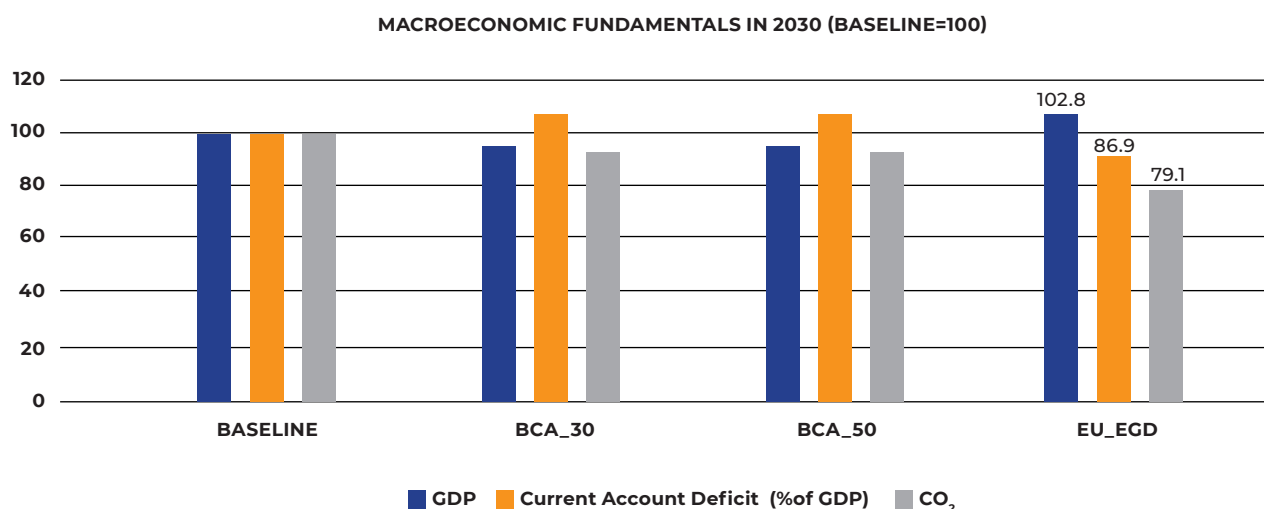
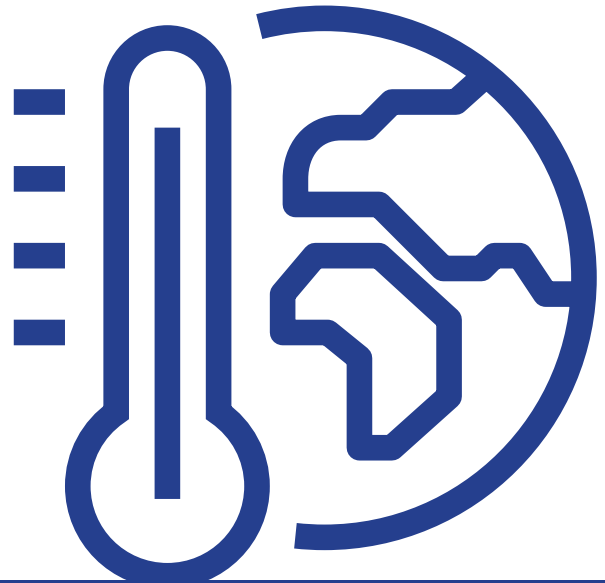


Figure 5. The effects of a green economic transformation on macroeconomic fundamentals and CO₂ emissions

international fund providers will support a Green Recovery vision. **Countries which, in line with this vision, present their climate policies for the public and private sector in a transparent and predictable fashion to an international audience will thereby improve their potential to attract climate financing.**

Failure to explain such activities on the basis of a road map may carry the risk of receiving less climate finance than peer countries.



The conclusions reached on the basis of the macroeconomic findings of this report can be summarised as follows:

- 1** The European Green Deal presents Turkey with a risk, but also a new opportunity, if it serves as instrument of change that initiates sustainable development.
- 2** With an alternative Green Economic Transformation scenario, characterised by a reduction in emissions, the use of funds for the green transformation of companies and a focus on renewable energies as well as energy efficiency, it should be possible – within the framework of a transformation strategy with clearly defined elements – to significantly improve the national income and reduce the emission of greenhouse gases.
- 3** A green economy transformation strategy can achieve the goals of emission reduction while at the same time increase production and employment in the national economy. It presents an important alternative in Turkey's search for a sustainable development strategy.



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