

TUSIAD



**Addressing Climate Change
from an Economic Policy
Perspective**



ADDRESSING CLIMATE CHANGE FROM AN ECONOMIC POLICY PERSPECTIVE

Executive Summary

*This publication is the executive summary of TUSIAD
“Addressing Climate Change from an Economic Policy Perspective”
report.*

December 2016

***Publication Number:
TÜSİAD- T/2016,12 – 583***

***ISBN Number:
978-605-165-019-7***

Meşrutiyet Caddesi, No: 46 34420 Tepebaşı/İstanbul
Pbx: +90 212 249 07 23 Fax: +90 212 249 13 50

© 2016, TÜSİAD

“All rights reserved. No part of this publication shall be processed/adapted, reproduced, circulated, re-sold, rent, lent, represented, performed, recorded, transmitted with cord/cordless or any technical, digital and/or electronic devices without prior written permission from the author(s)/right holder subject to Article 52 of Law No. 4110 amended by Law No. 5846 for Intellectual and Artistic Works

ISBN Number: 978-605-165-019-7

Editors: Dr. Nurşen Numanoğlu, Tanyeli Behiç Sabuncu

Cover Design: Marjinal Porter Novelli

PREFACE

TUSIAD (Turkish Industry and Business Association), which was founded in 1971, according to the principles laid in the Constitution and in the Associations Act, is a non-governmental organization working for the public interest. TUSIAD aims at enhancing the development of a social structure committed to the universal principles of human rights, together with the freedoms of enterprise, belief and opinion, secular state governed by the rule of law, participatory democracy, liberal economy and the rules and institutions of competitive market within a sustainable environment. TUSIAD, in conformity with Atatürk's principles and objectives, with a view of seizing and outreaching the contemporary civilization level, works for the realization of the above-mentioned objective believing in the pioneer and entrepreneurial nature of business people who consider gender equality in politics, economy and education. TUSIAD representing Turkish business working for the public interest, strives for entrepreneurs to operate in conformity with the universal business ethics; supports all the policies aimed at improvement of competitiveness of Turkish economy and social welfare in the globalization process through enhancement of employment, productivity, innovation capacity and the scope and quality of education. TUSIAD contributes to the formulation of national economic policies, in an environment with persisting social peace and compromise, for the economic and social development by taking into account the regional and sectoral potentials. TUSIAD contributes to Turkey's communication taking into account competitiveness at global level, initiates a range of studies to develop political, economic, social and cultural relations as well as communication, representation and cooperation networks at international level to support the accession process of Turkey to the European Union. TUSIAD conducts researches, generates opinions, develops projects and organizes activities in order to expedite international integration and interaction as well as regional and local development. TUSIAD, in the name of Turkish business, forms opinions and proposals, conveys them to the national parliament, the government as well as foreign states, international organizations and public opinion directly or through media and by using other means, aims to create a unity of opinion and action in the direction of the above-mentioned objectives.

Conducting economic activities with a consciousness that notes environmental concerns, is one of the fundamental principals of TUSIAD. That is why climate change and sustainable development became one of the priority areas of TUSIAD. Following the entry into force of the Paris Agreement in November 4, 2016; which was adopted at 21st Conference of Parties to United Nations Framework Convention on Climate Change (COP 21); accelerated discussions on policy tools for emission reduction in Turkey.

Sustainable Development requires a wholistic approach which includes environmental, social and economic perspectives. We believe that policy tools to address climate change should be discussed in this context.

With the aim making solid contribution to those discussions TUSIAD initiated a study which included an overview of climate policy tools with global practices, an analysis of current and planned instruments in Turkey in terms of costs and benefits as well as suggestions on a policy package for Turkey. The study also made an economic impact analysis on appropriate areas.

This study was conducted under the coordination of Prof. Dr. Erinç Yeldan, instructor at Bilkent University, by Sevil ACAR, İstanbul Kemerburgaz University; Ahmet A. AŞICI, ITU; Osman Balaban; METU; Mustafa Özgür BERKE, WWF-Turkey; İlder ÇAKMAK (Project Assistant), Macalaster College; Semra C. MAZLUM; Marmara University; Göksel N. DEMİRER, METU; Pinar İPEK, Bilkent University; Bora KAT, METU; Vesile KULAÇOĞLU, Former head of Environment and Trade division of World Trade Organization; Levent KURNAZ, Boğaziçi University; Ümit ŞAHİN, Sabancı University; Ramazan SARI, METU; Uğur SOYTAŞ, METU; Fatma TAŞKIN, Bilkent University; Ethemcan TURHAN, Sabancı University; Burcu ÜNÜVAR, Bilkent University; Ebru VOYVODA, METU; Bengisu V. ÖZENÇ, TEPAV Ayşen YILMAZ, METU; İsmail YÜCEL, METU.

We would like to thank distinguished representatives of Akçansa, Allianz Sigorta A.Ş, BASF Türk Kimya San. ve Tic. Ltd. Şti, Koç Holding A.Ş, Türkiye Garanti Bankası A.Ş, Zorlu Enerji Elektrik Üretim A.Ş, those have contributed this study via providing information and analysis as members of the Steering Committee. We also would like to thank Ernst & Young Turkey, our carbon foot print sponsor. We also thank the members TUSIAD Environment and Climate Change Working Group for their valuable contributions. Lastly we would like to express our gratitude to the officials of the Ministry of Environment and Urbanization of Turkey, those have shared their valuable opinions with us during the drafting process of this report.

December 2016

AUTHORS

Sevil ACAR, İstanbul Kemerburgaz Üniversitesi; Ahmet A. AŞICI, İTÜ; Osman BALABAN; ODTÜ; Mustafa Özgür BERKE, WWF-Türkiye; İlder ÇAKMAK (Proje Asistanı), Macalaster College; Semra C. MAZLUM; Marmara Üniversitesi; Göksel N. DEMİRER, ODTÜ; Pınar İPEK, Bilkent Üniversitesi; Bora KAT, ODTÜ; Vesile KULAÇOĞLU, Dünya Ticaret Örgütü Ticaret ve Çevre Bölümü eski Müdürü; Levent KURNAZ, Boğaziçi Üniversitesi; Ümit ŞAHİN, Sabancı Üniversitesi; Ramazan SARI, ODTÜ; Uğur SOYTAŞ, ODTÜ; Fatma TAŞKIN, Bilkent Üniversitesi; Ethemcan TURHAN, Sabancı Üniversitesi; Burcu ÜNÜVAR, Bilkent Üniversitesi; Ebru VOYVODA, ODTÜ; Bengisu V. ÖZENÇ, TEPAV; A. Erinç YELDAN (Proje Direktörü), Bilkent Üniversitesi; Ayşen YILMAZ, ODTÜ; İsmail YÜCEL, ODTÜ

EXECUTIVE SUMMARY

Why We Conducted This Study

- Conducting economic activities with an understanding that takes environmental concerns into consideration constitutes one of TÜSİAD's key working principles. Based on this understanding, sustainable development and climate change mitigation have been endorsed by TÜSİAD as focus areas among others. Recent global developments, including the Paris Agreement in particular, have fuelled the debates in Turkey regarding policy instruments for reducing emissions. With this study, TÜSİAD aims to address the policy options in front of Turkey on the basis of relevant practices worldwide and to offer an economic impact analysis in possible areas.

What the Global Agenda Brings Forward

- The Paris Agreement, adopted under the 21st Conference of Parties held in Paris in December 2015, entered into force on November 4, 2016. This agreement is an unprecedented step towards climate change mitigation on a global scale. The Paris Agreement takes a different approach than the Kyoto Protocol. Instead of setting a quantitative global target for greenhouse gas emissions to be collectively met by the state parties, the Paris Agreement adopts the goal of taking action towards limiting global warming to below a certain level. The most significant feature of this new era is the stipulation that all state parties, both developed and developing, take measures towards emissions reduction in accordance with the principle of “*common but differentiated responsibilities and respective capabilities*” as stated on the United Nations Framework Convention on Climate Change.
- Within this framework, all states take part in global efforts to fight climate change through setting reduction targets calculated in various methods. Therefore, both developed and developing countries now undertake reduction responsibilities in a similar vein, though with different weights. The goals of keeping global warming below 2 °C and intensifying the efforts to limit it to 1.5 °C, as set by the Paris Agreement, place a serious collective responsibility on all countries worldwide.

Current Situation in Turkey

- In the aftermath of the Paris Agreement, Turkey will have to join in the global trend towards gradually reducing the economy's carbon intensity. All major emission-generating sectors will have to be transformed in the coming period; renewable energy sources will have to come to the forefront in the primary energy mix; high-emission industries will have to adapt to this new era, and low-emission modes of transportation, such as railroad and combined transportation, will have to be developed.
- In particular, it is assessed that enhancing the use of renewable energy sources and improving energy efficiency will play the largest part in emissions reduction, as is the case in the rest of the world, and that the significant potential embodied by these areas should be benefited from.

- In addition to this, the insurance and finance sectors, which are and will be directly affected by the present-day and future consequences of climate change, will have to take an appropriate position and be prepared in the face of these impacts.
- Furthermore, enhancing Turkey's measurement, monitoring and reporting capacity and reinforcing its transparency and accountability with regard to emissions and relevant policies are the preconditions for the proper functioning of the implementation instruments devised for emissions reduction policies.
- Transition to a low-carbon economy does not only entail greenhouse gas emissions reduction, but also involves other benefits that should also be taken into account. These additional benefits include, in the first place, the reduction of import dependency in energy, enhancement of energy safety, elimination of air pollution, and creation of new employment opportunities.

Which Economic Instruments?

- The environmental economics literature puts forward two main instruments as *Market Based Mechanisms* to be used against climate change:
 - Taxation (e.g. carbon tax) or subsidies (e.g. energy efficiency subsidies, subsidies for renewable energy technologies, feed-in tariffs for renewable energy),
 - Emissions trading system (ETS) based on quota allocation
- Among emissions trading systems, the most significant scheme was designed by the EU member states within the framework of the Kyoto Protocol. In addition to this, energy efficiency certificates (white certificates) and renewable energy certificates trading systems that aim to promote energy efficiency and the use of renewable energy sources are also available. New tools will certainly be added to this list in line with evolving market conditions.
- It is known that taxation and the ETS have their strengths and weaknesses. Though the emissions control mechanism based on carbon trading is more compatible with market rationality, one may face serious problems in auditing and monitoring stages. Furthermore, which quota allocation method will be used for trading; whether positive pricing will be implemented during allocation, and/or how the price will be determined; and how sectoral allocations will be determined are the factors that bear critical importance for the success of the system. On the other hand, sectoral variability and company participation are key to the designing of this system.
- On the other hand, taxation based control mechanisms cause rigidity between direct producers and end-users, and affect the decisions of market agents in a negative way.
- Besides market based mechanisms, technological standards and associated restrictions pertaining to fuel oil, energy efficiency and greenhouse gas emissions may also be employed for climate change mitigation. In addition to these, energy performance certificates and green bonds can be cited among other instruments for emissions reduction.

Current Practices and Debates in Turkey and Their Possible Impacts

- The main instruments that could currently serve to develop a low-carbon economy in Turkey are taxes, the renewable energy subsidies system, project supports to improve energy efficiency and regulations governing energy efficiency in buildings.
- However, relatively high taxes, in particular, that are levied on the basis of the unit price of electricity and gasoline, and are also addressed within the scope of the fiscal regulations aiming at environmental protection, do not serve to materialize a meaningful progress towards the goal of CO₂ emissions reduction.
- Here, the primary source of the problem is the inability, despite taxation, to develop alternative resources to energy-intensive, low-efficiency and linear processes. In a context where alternative options to contaminating industrial processes are not subsidized, high taxes serve merely to increase production costs and provide income for the Treasury, failing to reduce the environmental effects in a substantive manner.
- For Turkey, control mechanisms based on the carbon trading system is considered to be a nascent instrument. SWOT analyses conducted by the Ministry of Environment and Urbanization list the most significant deficiencies and threats that impede the development of the ETS in Turkey as follows:
 - Insufficient deepening of the national financial markets,
Failure of financial auditing mechanisms to yet gain institutional competence, and,
 - Failure to eliminate deficiencies in auditing and monitoring systems.
- On the other hand, renewable energy investments receiving emissions reduction certificates that have been voluntarily traded since 2006 have gained momentum in recent years, which constitutes an important step for the emergence of future emissions trading markets for Turkey.
- The results obtained under the Partnership for Market Readiness (PMR) Project, a programme coordinated by the Ministry of Environment and Urbanization for developing market based mechanisms in Turkey, predict that the ETS pilot scheme will be initiated in 2018 at the earliest.
- The assessments conducted within the scope of the PMR Project and the recommendations put forward under the Draft Energy Efficiency Action Plan have sparked debates in Turkey regarding the ETS and the carbon tax. Based on these debates, our report examines the effects of prospective measures towards emissions reduction in Turkey. For this purpose, it employs the Computable General Equilibrium (CGE) models, which are the main tools of analysis in economic policy studies. These tools can model the economy on a microeconomic scale, reflecting its entirety and its multiple sector nature as fully as possible. The CGE model designed for macroeconomic analysis adopts a dynamic analytical approach in an attempt to assess the primary impacts on the overall economy of alternating policies to reduce greenhouse gas emissions, as well as to observe how macroeconomic variables, such as technological advancement, capital accumulation, public finance balance, and

balance of foreign trade, will be affected in the long run. Within the context of this study, this model was fashioned to measure the potential economic effects of levying a tax to reduce emissions in Turkey on the basis of the “polluter pays” principle. It was not possible to conduct a similar analysis for the ETS due to lack of data and to the unsuitability of the theoretical basis for this kind of modelling.

- Within the framework of the model, a reference scenario (base path) is laid out and the tax burden necessary for achieving the 21 % reduction target (as envisaged in the INDC) compared to this reference scenario is calculated. The model results indicate that the tax burden in question will reach 99 billion TL by 2030 (based on fixed 2010 prices), which amounts to 4.62 % of the national income. In other words, a 21 % reduction in CO₂ emissions compared to the reference scenario, a target set forth in the INDC, can be achieved by means of an energy tax burden amounting to 4.62 % of the national income. This gain most certainly involves costs. First of all, a carbon tax levied on energy use gives rise to production losses in fossil fuel-intensive sectors in particular. These losses signify an 8.7 % decline in the total national income by 2030, compared to the reference scenario.
- These results evidence that an emissions reduction strategy based on energy taxation will bring high costs. Based on this observation, an alternative approach where the energy tax burden is balanced with a reduction in other taxes was contemplated. Being referred to as “neutral taxation” in the economics literature, this model ensures CO₂ emissions reduction while at the same time aiming at minimizing production losses by using neutralizing instruments for the total tax burden. With this alternative approach aiming for neutral tax income, energy taxes are retained on the levels envisaged by the initial scenario while a corresponding reduction in employment taxes and a consequent growth in employment rates and in the overall economy are targeted. A transformation that would increase industrial production and resource efficiency denotes that such a growth in employment can be achieved by skilled labour¹. The neutral tax income scenario reduces energy-related CO₂ emissions from 560 million tons to 470 million tons. When CO₂ emissions are measured per unit of GDP, it is seen that the emission intensity hovers around 0.55 kg/\$ under the base path scenario while it is in continuous decline relative to national income produced under the neutral tax scenario. By 2030, CO₂ emissions per \$1 GDP will be reduced to 0.46 kg. The model analyses show that, if a neutral tax approach is adopted, national income will see growth up until 2020 compared to the base path, but losses will arise thereafter. National income will be 2 % lower by 2025 and 3.7 % lower by 2030. When the effects on the sectoral level are examined, changes in production and employment show variation depending on the energy and labour intensities of the respective sectors.

¹ The impacts of this transformation, also referred to as Industry 4.0, on the Turkish economy had been analysed in the report entitled “Industry 4.0 in Turkey as an Imperative for Global Competitiveness”, which was released in March 2016.

Expectations from Decision-Makers...

- For a transition towards a low-carbon economy, legislative changes that take account of sectoral practices and international competitiveness need to be materialized. Given Turkey's growing energy demand, these changes should no doubt pay due regard to the provision of energy supply security and to the related perspective of energy resource diversity.
- Taking measures to accelerate investments in renewable energy sources will be an important step forward in this respect. Technical, administrative and financial standards should be introduced for pre-license/license applications within the context of wind and solar power tenders. Furthermore, it is of critical importance for the emergence of a predictable investment environment that the subsidies system and other regulations be sustained long term. In addition to these, adjustments should be made to enable the expansion of the solar energy use starting from households (e.g. solar roof systems).
- In order to improve energy efficiency, sectoral road maps should be prepared and the liberalization of the energy sector should be accelerated. Reducing the energy intensity at least by 20 % by 2023 compared to the 2011 level is a favourable target and the progress towards this goal needs to be monitored. In addition, transition to a free market structure in the electricity and natural gas sectors will contribute a great deal to an effective utilization of the efficiency potential.
- The primary deficiency regarding a possible ETS implementation in Turkey is the failure to have detailed carbon emissions data at sectoral level. The improvement of the data inventory in this direction is a prerequisite for implementing an ETS.
- It is important that the ETS needs to be put in action after the firms gain an MRV experience. In case such a system is implemented in Turkey, it is suggested that a dynamic, instead of a static, approach is undertaken while determining the upper limit for emissions, and that the business sector is consulted while evaluating the sectoral growth assumptions and sector-specific dynamics.
- Despite the fact that the neutral tax approach precludes the economic losses identified in the initial scenario that is based on a significant reduction in emissions and on energy taxation, sectoral production losses still persist, though in lesser quantities, under this approach. These losses, observed in spite of the decline in employment taxes, reveal the need to make sectoral adjustments to the neutral tax scheme depending on the vulnerability of each sector. In this respect it could be highly beneficial to offer tax advantages that would serve not only to increase employment, but also to provide incentives for investing in alternative technologies that would facilitate the transition towards a low-carbon economy. For instance, it is very important to reduce taxes in low-carbon products and services (in accordance with the relevant standards and regulations).

- When it comes to the implementation of a new policy tool, including neutral taxation, for climate change mitigation, there arises the need to design a comprehensive package that is not confined to a single instrument and takes into account sectoral and global competitiveness as well as macroeconomic policies. Should such a package be devised, simultaneously with the ETS and/or neutral taxation, to include new measures and technologies to enhance energy efficiency (e.g. standards concerning energy efficiency and external trade regulations to reinforce these standards, energy performance certificates, etc.) as well as subsidies and practices to expand the use of renewables (e.g. renewable energy certificates), it is assessed that national income might even increase in the long run. Supports for research and development, technological advancement and innovation play an important part in this respect.
- If a comprehensive model can be designed as explained above, then this means that the essential elements of a sustainable and environment-friendly growth strategy for Turkey that would also favour increased employment are all in place.