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Development of an institutional model for emission trading system: An approach to the carbon market of Turkey

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Abstract: Climate change negotiations focus on developing a new climate agreement with legal force under the Convention applicable to all Parties for the post-2020 climate regime. With this new agreement many developed Parties including Turkey would take quantified economy-wide emissions reduction targets. In that case, Turkey would benefit from flexibility and market mechanisms. Therefore, an emission trading system should be developed until 2020 in Turkey. This paper has been prepared for the purpose of describing and developing an institutional model for an emissions trading system in Turkey. The emissions trading system will consist of Designated National Authority/Designated Focal Point, Central Registry Agency, Istanbul Stock Exchange Turkish Carbon Market, Turkish Carbon Market and Istanbul Settlement and Custody Bank Inc.

Keywords: Climate change, Emissions trading, Carbon market, Institutional model, Turkey

Emisyon ticaret sistemi için kurumsal modelin geliştirilmesi: Türkiye karbon piyasası yaklaşımı

Özet: İklim değişikliği müzakereleri, 2020 sonrası iklim rejimi için bütün taraf ülkelere uygulanabilecek ve Sözleşme altında yasal bağlayıcılığı olacak yeni iklim anlaşmasının hazırlıkları üzerine odaklanmıştır. Bu yeni anlaşmayla, Türkiye dahil birçok gelişmiş ülke, ekonomi genelinde sayısallaştırılmış emisyon azaltım taahhüdü alabilecektir. Bu durumda, Türkiye, esneklik ve yeni piyasa mekanizmalarından yararlanabilir hale gelecektir. Bu nedenle, Türkiye’de 2020 yılına kadar bir emisyon ticaret sistemi kurulmalıdır. Bu çalışma, Türkiye’de bir emisyon ticaret sisteminin kurumsal modelinin tanımlanması ve kurulması amacıyla hazırlanmıştır. Türkiye Emisyon Ticaret Sisteminin, Yetkili Ulusal Mercii/Yetkili Odak Noktası, Merkezi Kayıt Kuruluşu, Borsa İstanbul Türkiye Karbon Piyasası ve İstanbul Takas ve Saklama Bankası A.Ş.’den oluşması öngörülmektedir.

Anahtar kelimeler: İklim değişikliği, Emisyon ticareti, Karbon piyasası, Kurumsal model, Türkiye

1. Introduction

Global warming, caused by increasing of human induced greenhouse gases emissions, is one of the major threats confronting the environment (Fan et al., 2007). The rising increase in the importance of climate change led to a series of international developments. In 1992, at United Nations Conference on Environment & Development in Rio, United Nations Framework Convention on Climate Change (UNFCCC), which was the first concrete cooperation on climate change, was signed (Daskalakis et al., 2009; Guðbrandsdóttir and Haraldsson, 2011). The Convention entered into force on March 21, 1994 and now there are 196 Parties to the Convention (UNFCCC, 2012a). Turkey joined the Convention on May 24, 2004.

The Kyoto Protocol was adopted on December 11, 1997 at the 3th Conference of Parties affiliated with UNFCCC. The Protocol, which entered into force on February 16, 2005 and to which currently 191 countries and the European Union, are Party, aims to the reduce the greenhouse gas emission rates, which essentially led to the climate change and could not be controlled with the Montreal Protocol (OG, 1990), below 5.2% relative to 1990 for the 1st commitment period (Im, 2007; Guðbrandsdóttir and Haraldsson, 2011;

Mnif and Davison, 2011; UNFCCC, 2012b; UNFCCC, 2012c). Turkey became Party to Protocol on August 26, 2009.

The “Flexibility Mechanisms” defined in the Protocol for the purpose of achieving the greenhouse gas reduction targets is regarded as the most important characteristic distinguishing it from the other international environmental conventions (MoEF, 2008). The flexibility mechanisms defined in the protocol are divided into three as follows; Joint Implementation (JI), Clean Development Mechanism (CDM), Emissions Trading (UNFCCC, 1998; Mnif and Davison, 2011; Ramírez and González, 2011).

There are different instruments for reducing emissions such as carbon tax and carbon markets (MacKenzie, 2009). Because of the variety of marginal monetary and political abatement costs across emitters (Lerner, 2010; Mnif and Davison, 2011) and other inefficiencies (Goers et al., 2010), carbon tax is suboptimal. Therefore as a cost-efficient instrument, carbon market, especially cap and trade mechanism, has been chosen in order to comply with emission reduction targets by many countries and emitters or organizations (Ermolieva et al., 2010; Mnif and Davison, 2011). Parties included on Annex B with the emission trading set out in Article 17 of the Protocol may participate

in emissions trading for the purpose of fulfilling their commitments stipulated in Article 3 (UNFCCC, 1998).

A country, company, an emitter or an individual that fails to fulfill its legal obligation may purchase carbon credits, carbon assets, emission allowances, permits or emission rights from a country, company or individual that has reduced its emission reduction goal at a rate higher than the expected level (Ermolieva et al., 2010; Ramírez and González, 2011). The “Carbon Market”, which is also called “Emissions Trading”, “Carbon Trade” or “Carbon Stock Exchange”, as a way of combating global climate change is gaining in popularity (Ermolieva et al., 2010) across the world and it is stated that countries make major amendments in their policies as well as ecological and economic implementations in order to enter this market and increase their share (Bayramoğlu and Toksoy, 2010).

In addition to that Certified Emission Reduction Units (CERs) issued for projects resulting from CDM projects and Emission Reduction Units (ERUs) issued for projects resulting from JI projects can also be traded in carbon markets. Also it is possible to offset emissions through Removal Units (RMUs) obtained through carbon sink activities (Ramírez and González, 2011).

Besides for the regulatory or mandatory carbon market included into the scope of the Protocol, there is also voluntary carbon market established for the purpose of reducing or offsetting the greenhouse gases emissions of companies, individuals or organizations (Ramírez and González, 2011), development of the organization's own social corporate responsibility and sustainability policy, competitive differentiation before their customers and an improvement in its access to financial resources (Pinkse and Kolk, 2007). Voluntary Emission Reductions (VERs), which are exchanged in the over-the-counter market and obtained from projects (Ramírez and González, 2011) conducted on topics such as forestry, energy efficiency, renewable energy, waste sector and biofuel that reduce the greenhouse gases emissions or increase sink areas are traded in the voluntary carbon market (Çikot, 2009a; Çikot, 2009b).

Turkey, as an Annex I Party under the Convention, has rapidly industrialized and developed since last two decades. As a consequence, Turkey's greenhouse gases emissions has increased 124.2% relatively to 1990 inventory in 2011 (UNFCCC, 2013). As mentioned above, the concept of carbon market, which emerged as a result of climate change, is a cost effective way of reducing, limiting or offsetting greenhouse gases and will become operative at a global level. Thus, mandatory and voluntary carbon markets should be followed up by Turkey and a model fulfilling the special conditions in Turkey should be developed.

Lastly, climate change negotiations focus on developing a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties for the post-2020 climate regime. With this new agreement many developed Parties including Turkey would take quantified economy-wide emissions reduction targets. In that case, Turkey would benefit from flexibility and market mechanisms. Therefore, an emission trading system should be developed until 2020 in Turkey. In this study, an institutional model proposal for the emissions trading system was described and developed.

In consequence to recent developments in Turkey in the context of climate change and carbon markets, the Carbon Markets Technical Working Group was established in 2010 within the body of the Coordination Committee on Climate Change and Air Management (CCCCAM) (OG, 2013a). With this working group it is aimed to identify the work required for enabling Turkey enter international carbon markets, establish the national carbon market and develop policies, strategies, plans and programs on emissions trading.

In order to achieve abovementioned goals, the “Notification on Registration Transactions of Projects Enabling the Reduction of Greenhouse Gas Emission” was brought into force first (OG, 2010; OG, 2011a). With this Notification it is aimed to register the projects developed for voluntary carbon markets and the reductions in the amount of greenhouse gas emissions achieved as a result of these projects and enhance the transparency of the market as well as the reliability of the certificates issued.

Upon the enforcement of the Notification on the Registration of Projects in the Voluntary Carbon Market, upon being published on the Official Gazette dated October 9, 2013, with No. 28790, the Notification on the Registration Transactions of Projects Enabling the Reduction of Greenhouse Gas Emissions, enforced upon being published on the Official Gazette dated August 7, 2010 with No. 27665, became abolished (OG, 2013b).

Consequently, the “Regulation on the Monitoring of Greenhouse Gas Emissions” became effective (OG, 2012a). With this Regulation, it is aimed to monitor, verify and report the greenhouse gas emissions emerging as a consequence of the activities indicated in Annex 1 of the said Regulation.

In addition to abovementioned developments, it is also aimed to harmonize with the new market mechanisms to be established in Turkey after 2012 with the “Partnership for Market Readiness” which was at a preparatory phase by the end of 2012. It is aimed to establish the monitoring, verification and reporting system and conduct capacity building and pilot studies within the scope of the project.

Furthermore, also the draft “Notification on Monitoring and Reporting of Greenhouse Gas Emissions”, comprising the procedures and principles relating to the monitoring and reporting of the data and emission amounts of the activities indicated in Annex 1 of the Regulation of Monitoring of Greenhouse Gas Emissions” was drawn up by the Head of Department on Climate Change and Weather Management of the General Directorate of Environmental Management.

In addition to that, it was aimed to conduct studies related with the establishment of a carbon market in Turkey by 2015 in the National Action Plan on Climate Change (NAPCC) (MoEU, 2011). Moreover, the establishment of the carbon market was mentioned among activities to be conducted in the Strategy and Action Plan of the Istanbul International Financial Center (SPO, 2009) and in the Energy Efficiency Strategy Paper (2012–2023) (MoENR, 2012).

2. Designation of an institutional model for emission trading system

Turkey does not have any Quantified Economy-Wide Emissions Reduction Targets (QEERTs) under Kyoto

Protocol until 2020. Therefore, Turkey is not a participant in flexibility mechanisms of Protocol. Turkey is a participant for voluntary carbon markets. In order to establish an emission trading system, country's institutions and legislation must be analyzed as well as other emission trading systems in the world.

Main objectives of this study and analysis focus on how to establish an emission trading system in Turkey? Therefore, Turkey's institutions related to carbon markets and climate change were analyzed and deficiencies for establishing an emission trading system were determined. Also 37 emission trading schemes/systems and carbon markets, especially European Union-Emissions Trading Scheme (ETS), New Zealand ETS, Chicago Climate Exchange, Chicago Climate Futures Exchange, Carbon TradeXchange, ICE Futures Europe and European Energy Exchange were analyzed in terms of institutional structure and transaction types. According to all analyses, institutional structure of ETS was described in Turkey.

3. The main outline of emission trading system for Turkey

In the climate change negotiations held in Doha in 2012 and in Bonn and Warsaw in 2013, Turkey recorded that it would fulfill its obligations in the new climate regime to be established for the period beyond 2020 and to comprise all countries, and that it would be involved in the new organization. From this respect, Turkey will commit to achieve quantified emissions limitation and reduction in the new system where all countries will make a commitment for the period 2020. In this case, Turkey will be able to benefit from the flexibility mechanisms, from which it cannot benefit due to her current status, and the new market and non-market mechanisms to be established.

Carbon credits obtained from projects enabling the reduction or limitation of greenhouse gases and increase of sink areas, can be sold or purchased in carbon markets pursuant to specific project preparation, implementation, and verification and certification phases. From this respect, it is necessary to make relevant arrangements in the legal legislation, align carbon credits with certain standards and enable their verification and approval by certain authorized agencies.

Additionally, the organizations causing greenhouse gases emissions should be subjected to certain legal and organizational arrangements for their emission reduction or limitation activities. Again, it is necessary for the markets where carbon credits will be traded to be established according to a certain legal legislation, technical and organizational structuring. Thus, it is important for Turkey to initiate the relevant work already now in order to avoid any technical, technological and financial losses in this field in the process beyond 2020.

The work of Arı (2010) is noted in particular in the assessment of the limited number of studies conducted in Turkey on carbon markets. Upon providing information on the emissions trading systems applied worldwide in his dissertation, Arı (2010) developed an emissions trading system model for Turkey, determined the greenhouse gases reduction potential related with the carbon markets in energy efficiency, renewable energy and solid waste sectors

and estimated the revenues to be obtained from carbon credits.

It was indicated that it is necessary conduct technical, political, organizational and legal arrangements for the purpose of preparing for the carbon market mechanism or to undergo these phases, and formulated some proposals relating to these phases (Aasrud et al., 2010).

Within the scope of researches related with the thesis, the works of Aasrud et al. (2010) and Arı (2010) were assessed and new emissions trading system model was designed in the light of the current legal status of Turkey in the international negotiations on climate change and the legal and organizational developments experienced in recent years within the scope of the fight against climate change.

3.1. Designated national authority/Designated focal point

Designated National Authority (DNA) is the organization that coordinates the work overseeing whether the project activities enabling the reduction or removal of greenhouse gases and increase of sink areas contribute in the achievement of development goals of a country and whether that country agrees to participate in project activities (Forner, 2005; MoEU, 2012). DNA is also responsible for investigating the current and potential opportunities in the carbon markets the activities related with the marketing of these opportunities to investors and global carbon funds as well as the follow up and monitoring of projects (MoEU, 2012).

The work related with climate change in Turkey is conducted by CCCCAM established in 2001 and chaired most recently by the Ministry of Environment and Urbanization as per the updates made in Circular 2013/11 of the Prime Ministry (OG, 2013a). From this respect, CCCCAM is the most authorized body in the activities to be conducted in relation with climate change, decisions to be adopted and the strategies and policies to be drawn up.

As CCCCAM is chaired by Ministry of Environment and Urbanization (MoEU) and MoEU holds the responsibility to "Formulate plans and policies on global climate change and the adoption of relevant measures about this change", as stipulated in clause 1 of Article 2 in Decree Law No. 644 on the Organization and Duties of the Ministry of Environment and Urbanization (OG, 2011b). In order to become a Designated National Authority/Designated Focal Point (DNA/DFP), it would be more appropriate to amend this duty of MoEU as "To formulate plans and policies on climate change and adoption of relevant measures about this change; conduct researches, legal, administrative and technical arrangements required for the establishment of a carbon market in Turkey in the capacity of the DNA/DFP".

Also, it would be more appropriate to amend clause m of Article 8 defining the duties of the General Directorate of Environmental Management of the said Decree Law as follows: "Achieve coordination with other agencies and organizations for the purpose of identifying the plans, policies and strategies on the adoption of measures about the global climate change and ozone layer depletion; to create the organizational structure required for the carbon market to be established in Turkey and make researches and legal, administrative and technical arrangements within the framework of the cooperation with Borsa Istanbul Inc. on

the establishment of the carbon market as well as the identification of its operation and principles”.

There are 11 working groups within the body of CCCCAM and the work related with carbon market is conducted by the “Technical Working Group on Carbon Markets” under the coordination of the Division for Monitoring and Emissions Trading of Greenhouse Gases in MoEU.

The duty of the DNA/DFP required to be established for achieving coordination in the work to be conducted at an international and national level on climate change and carbon markets. Pursuant to the conduct of abovementioned legislative and organizations structural amendments, the Head of Department of Climate Change will be appointed as the DNA/DFP. In order to ensure coordination, the referred information should also be reported to the Secretariat of UNFCCC.

The Head of Department of Climate Change will be responsible for keeping the national carbon registry records of projects, conducting monitoring and assessment work on projects, tracking greenhouse gas emissions, following up carbon credits to be obtained upon the implementation of projects, determining emission quotas, preparing emission allocation plans, formulating strategies and policies and conducting activities for training, media and promotion. Therefore, it would be beneficial to establish divisions such as those on Project Registry, Monitoring and Assessment, Greenhouse Gases Emissions Registry and Monitoring, National Allocation Planning and Distribution, Strategy and Policy Development, Training, Publications and Promotion. In addition to the organizational structure mentioned above, the Head of Department of Climate Change should cooperate with Borsa Istanbul Inc. (BIST), Turkish Statistical Institute (TUIK) and Ministries affiliated with energy, waste, transportation, Land Use, Land Use Change and Forestry (LULUCF), agriculture, buildings and industry. Public agencies and organizations as well as the private sector, the Capital Markets Board (CMB), and the representatives of designated operational entities who are expert on topics such as carbon market and inventory, project preparation and climate change should participate at a technical and decision-making level in the DNA/DFP unit (Ari, 2010; MoEU, 2012).

As the energy sector constituted a major portion such as 71.53% of the greenhouse gases emissions inventory between the years 1990-2011 (UNFCCC, 2013), the energy sector should primarily be involved in this unit as the technical and decision-making expert.

Also the LULUCF sector, which constitutes the sink areas and has provided a positive contribution such as 11.01% to the greenhouse gas emission inventory between 1990 and 2011 (UNFCCC, 2013), should be included into the market as it may procure carbon credits to carbon markets. In his study, Khan (2010) indicated that the LULUCF sector should be included among prioritized sectors in Turkey.

In accordance with the Notification on Project Registry of the Voluntary Carbon Market, the Division for Project Registry, Monitoring and Assessment will be responsible for keeping an electronic record of all other information including the information on the project developer, field of activity of the project, project status, current status of the project, organizational information and organization

information relating to the project to be developed for the reduction of greenhouse gas reduction and increase of sink areas, in the “Project Registry System of the Greenhouse Gas Reduction Project” established in MoEU, and to pursue monitoring and assessment activities related with the projects. Bando (2010) has proposed the following various membership types for the registry system.

- Full members: who are entities that will report regularly each year their greenhouse gases emissions within the scope of the Regulation on Tracking of Greenhouse Gases Emissions and commit to reducing their greenhouse gases emissions in percentage compared to the average emissions measured in the reference year over a specified period of time (Bando, 2010),
- Voluntary members: who are industrial entities that are not encompassed by the Regulation on Tracking of Greenhouse Gas Emissions and the Notification on Monitoring and Reporting of Greenhouse Gases, but would like to perform greenhouse gases reduction activities,
- Affiliate members: who are entities, operations and organizations in the service sector which operate in an office environment (Bando, 2010),
- Participant members: who are project developers, retailers, offset providers, wholesalers and liquidity providers (Bando, 2010).

In order to achieve international validity, the verification of projects will be performed by designated operational entities (DOE) while emission reduction or offsetting certificates or carbon credits, will be prepared by the voluntary carbon standard entities. Information on verified projects and carbon certificates will be reported to the MoEU in accordance with the Notification on Verified Carbon Market Project Registry (OG, 2013b).

The Division for Project Registry, Monitoring and Assessment will be responsible for the issuance of the letter of approval (LoA) of the project which indicates that approval has been granted for the transfer of emission reductions so as to enable the certified carbon credits to be obtained as a result of the implementation of projects to be traded and the issuance of the certificate of authority to designated operational entities accredited by the Turkish Accreditation Agency (TURKAK).

Division for Greenhouse Gases Emissions Registry and Monitoring will be responsible for the recording of greenhouse gases in a measureable, reportable and verifiable manner. The national emission registration and monitoring activities related with the greenhouse gases inventory in Turkey are conducted under the coordination of TUIK. The greenhouse gases inventory is calculated and reported in a manner so as to comprise CO₂, CH₄, N₂O, HFC, SF₆, PFC, NO_x, CO, NMVOC and SO₂ gasses and on the basis of energy, industrial processes sectors, sectors affiliated with the use of solvents and other products, and agricultural, waste and LULUCF sector.

In addition, monitoring, verification and reporting of the greenhouse gas emissions caused by the industrial organizations in Turkey will be achieved with the provisions of the “Regulation on Tracking of Greenhouse Gas Emission” (OG, 2012a) and the “Notification on Monitoring

and Reporting of Greenhouse Gas Emission” which is currently in draft form.

It is necessary for relevant facilities to make preparations within the procedures and principles stipulated in the referred Regulation and Notification, calculate the greenhouse gas emissions in accordance with the greenhouse gas monitoring plans to be approved by MoEU and report their inventory data to MoEU. Within this scope, the first reporting report has been designated as 2016.

The verification of the greenhouse gas inventory reports will be conducted by the verifying entities accredited by TURKAK, granted a certificate of authority by MoEU and bearing the characteristics designated in the Regulation, within the framework of the operating and verifying entity. As of today, the greenhouse gases inventory data relating to all sectors are kept in TUIK’s database. Within this scope, TUIK will send to MoEU its greenhouse gas inventory data and reports calculated on annually on a sectorial basis. Thus, the sectorial based inventory data, the inventory data calculated on a facility basis and the greenhouse gas emission reduction data achieved via projects will be merged under a single database.

The Division for Registry and Monitoring of Greenhouse Gas Emissions will be responsible for the submission and coordination of the greenhouse gases inventory data relating to facilities to the Division for National Allocation Planning and Distribution for the determination of annual quotas and allocations on facility basis and the submission and coordination of the data relating to the carbon credits, whose verification and certification phases have been completed.

The Division for National Allocation Planning and Distribution will be responsible for the preparation of the national allocation plans (NAPs) as implemented in many emission trading schemes like European Union Emission Trading Scheme (Mnif and Davison, 2011; Ramírez and González, 2011). Caps or upper limits will be set and emission allocations will be made in accordance with the national allocation plans to be prepared annually on a sectorial and/or facility basis in line with the identified quantified greenhouse gases reduction and emission limitation goals. The first reporting year or a specific reference year, such as the three-year greenhouse gas emission average, may be considered in the determination of the cap. The reference year emissions may be calculated as shown in Figure 1.

Whereas, the annual allocations are calculated by the multiplication of the quantified economy-wide emissions reduction targets of the emission level in the reference year and the commitment period and is expressed with the formula No.1.

$$AA = RYEL * QEERT * CP \quad (1)$$

Where; AA refers to Annual Allocation (tCO₂e), RYEL refers to Reference Year Emission Level (tCO₂e), QEERT refers to Quantified Economy-Wide Emissions Reduction Targets (%) and CP refers to Commitment Period (Year).

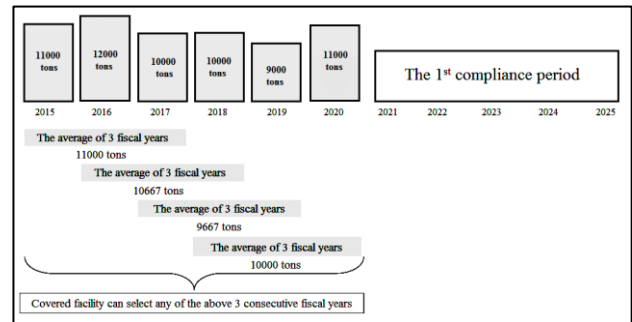


Figure 1. Determination of reference emission level (Anonymous, 2012)

In the first implementation period of the Turkish Carbon Market, it is important for the distribution to sectors and/or entities to be made free of charge according to NAPs in order to enable sectors and/or entities comply with the market. After the pilot implementation period of the Turkish Carbon market, the free allocation of certain parts of allowances to the sectors and/or entities according to the NAPs and the allocation of the rest of the allowances through auctions. The Division for National Allocation Planning and Distribution will also be responsible for the submission of carbon credits to the Central Registry Agency (CRA).

The Division for Strategy and Policy Development will conduct activities in Turkey on the legal arrangements to be made on climate change, policies and strategies to be formulated, preparation of plans and programs in Turkey, designation of the course of action of Turkey regarding international negotiations, development of Emission Reduction Purchase Agreements (ERPAs), designation of project approval phases, remedying of legal and administrative deficiencies related with carbon markets, conduct of market surveys.

Division for Strategy and Policy Development will also be responsible for determining the sanctions directed to administrative penalties and fines to be encountered by project developers, sector and/or entities in relation by with greenhouse gases emissions which occur when they do not prepare a report, cause excessive emission, do not participate in carbon markets in order to reduce their emissions or which arise due to deforestation.

The Division for Education will be responsible for organizing events such as national and international congresses, workshops, symposium on climate change, providing relevant trainings for the purpose of training specialized personnel on climate change topics, conducting activities for raising the level of consciousness and awareness of the society, providing trainings to the public and private sectors for enabling them develop projects for achieving greenhouse gas reduction, participating at trainings held abroad, preparing fact sheets on carbon markets and drawing up project preparation guidelines for sectors.

The Division for Publications and Promotion will be responsible for preparing educational printed materials such as leaflets, posters and books related with activities conducted on climate change and promoting the activities performed in Turkey and abroad. The assessment on the organizational structure and developmental phases of Turkish Carbon Market has been provided in Figure 2.

3.2. Central registry agency

Pursuant to the publication of a project's letter of approval by DNA/DFP and approval of the transfer of certified emission reduction credits and assigned amount units, the certified emission reduction credits and assigned amount units should be registered to the stock exchange for purchase and sale transactions in the market and recorded as securities. Within this scope, the CMB determines which securities are to be registered and to be monitored for records (OG, 2012b; CRA, 2013).

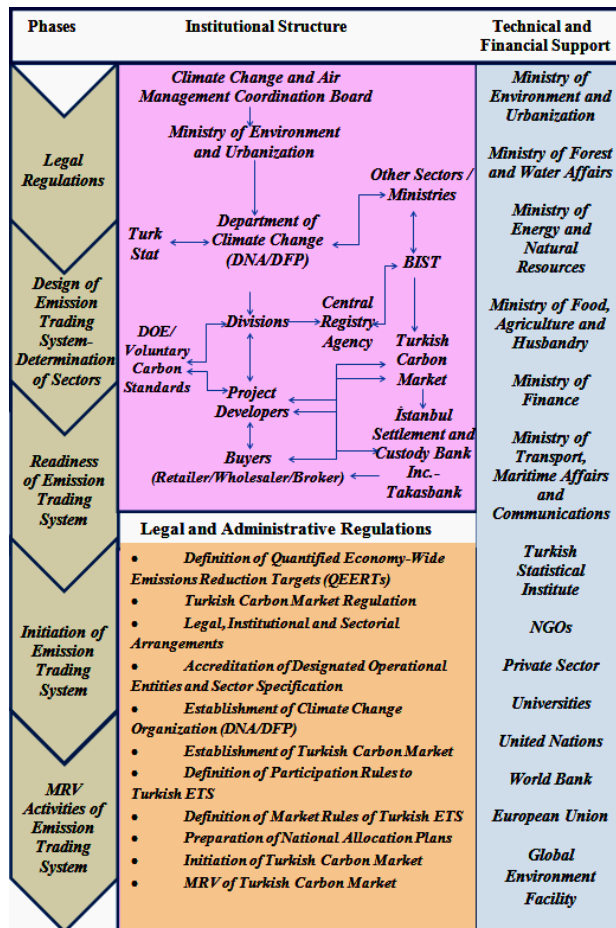


Figure 2. Institutional structure and development phases of carbon market in Turkey

As per Articles 13 and 81 of the Capital Market Law No. 6362 (OG, 2012b), the principles on the operation, duties, power, working and inspection of the Central Registry Agency (CRA) have been stipulated by the relevant Regulation (OG, 2001). CRA operates as the Central Depository Services for the purpose of monitoring electronically the capital market instruments as well as the of the rights relating to them on behalf of the members and right holders, pursuant to the registration of capital market instruments and the rights relating to them (CRA, 2013). The other duties of CRA have been indicated again in Article 81 of the Capital Market Law No. 6362 (OG, 2012b).

CRA will provide central custody services for the registration of national and international carbon credits (CER, ERU, RMU, etc.) and allocated units (AAU, EUA,

etc.). It will be possible for carbon credits and allocated units to be traded at the stock exchange pursuant to the completion of the registration transactions in the accounts to be opened by investors in their name within the framework of their membership at BIST and the Turkish Carbon Market as well as the Notification on the Procedures and Principles Keeping Records of Registered Capital Market Instruments (OG, 2002).

3.3. Turkish carbon market

As per Article 138 of the Capital Market Law No. 6362 (OG, 2012b), BIST has been established on December 30, 2012 in order to conduct activities related with stock exchange (BIST, 2013). BIST activities began with the direct registration and announcement of the prime contract prepared by CMB on April 3, 2013 and all stock exchanges in the capital markets of our country have been gathered under the umbrella of BIST (BIST, 2013).

As of today, there are 5 markets under the umbrella of BIST, namely the Equity Market, Emerging Companies Market, Debt Securities Market, Futures and Options Market and the Precious Metals and Diamond Market (BIST, 2013).

Considering its examples around the world, we may see that emission trading is performed within the framework of a new organizational stock exchange structure such as the established climate stock exchange. Carbon credits can be traded via cash, spot, futures, prepaid, swap and option contracts. Therefore, a market where transactions for each different type of contract may be conducted should be established.

The Turkish Carbon Market will be a stock exchange where not only carbon credits but also the other commodities that may be generated in relation with energy and climate may be traded in the future. The documents on the principles of membership application to Turkish Carbon Market will be prepared by BIST.

The trading of carbon credits will be achieved via ERPAs (Ramírez and González, 2011) to be drawn up between the buyer and the seller according to the payment methods in cash, spot, futures, prepaid, swap and options.

A batch number will be issued to each carbon credit to be traded on the market. Carbon credits to be traded will be recorded on transaction logs. It is necessary to keep the records of expired carbon credits separately so as to prevent double trading.

It will be possible to follow online the trading conducted in the carbon markets, new carbon credits issued on the market, transfer transactions, annulled transactions and transactions relating to retired carbon credits via the website of BIST Turkish Carbon Market created on the internet environment and the stock exchange screen.

Furthermore, the website of BIST Turkish Carbon Market will comprise various information's, such as history, details on membership, purchase and sale principles, transaction hours, traded products, transaction volume, contracts, projects, standards, registration systems, sector and/or entity based annual emission allocations, greenhouse gas emission reports and contact information.

Relevant arrangements should be made primarily in the Turkish Commercial Code and the Law on Obligations for

purchase and sale or trading of carbon credits (Ülgen and Güneş, 2013).

Additionally, private and legal persons or entities will obtain a certain amount of revenue at the end of carbon credit trading. Therefore, the revenue obtained should be subjected to taxation. In his study, Korkusuz (2010) assessed the concept of carbon rights, intangible rights and tax laws and made proposals on the taxation of the revenue to be obtained from the sale of carbon rights.

Within this scope, some arrangements need to be made in the relevant Stamp Tax Law, Income Tax Law, Value Added Tax Law and Corporate Tax Law with regard to the taxes to be charged on carbon credits (Korkusuz, 2010).

Again, in case foreclosure cases arising from non-payment of payments to be made due to the sale of carbon credits, arrangements should be made in Debt Enforcement and Bankruptcy Law as well as other relevant legislation.

As the first reporting year of the entities will be 2016 and the new international climate regime will begin in 2021, the 5-year period covering the years 2016-2020 will constitute the pilot period or the first phase of the Turkish Carbon Market to be established pursuant to legal regulations. During this period, upon a better perception of the operation of the system, fixed prices may be enforced, emission quotas may be distributed free of charge, it may be ensured that certain costs to be incurred during project preparation, implementation and monitoring are covered by the State or it may be guaranteed that the credits will be purchased by the State, for the purpose of enabling public and private sectors to be integrated more easily into the market.

In addition to the incentives mentioned above, Korkusuz (2010) proposes the exemption of the revenues to be obtained from carbon trade from income and corporate taxes, the exemption of the transactions to be made from value added tax and the exemption of the papers to be prepared from the stamp tax in order to reduce the cost of carbon credits and make the investments to be conducted in the field of environment more attractive.

It will be possible to perform updates and new arrangements in the emissions trading system affiliated with the developments in the international arena and the changes in the legal status of Turkey beyond 2020.

3.4. *Istanbul settlement and Custody Bank Inc.*

Transactions should be made with regard to the delivery and payment of the fees to arise in consequence to the purchase and sale transactions to be performed in the Turkish Carbon Market for certified emission reduction credits and allocated units to be registered by CRA.

The swap of the purchase and sale transactions of the securities arising from the purchase and sale transactions made in capital markets in Turkey is conducted by Istanbul Settlement and Custody Bank Inc. (Takasbank). Established as per the decision of the Council of Ministers dated January 26, 1995, with No. 95/6551 (OG, 1995) and the Regulation on the Central Settlement of Istanbul Settlement and Custody Bank Incorporation (OG, 2013c; Takasbank, 2013a).

The duties of Takasbank have been stipulated in the Prime Contract dated March 29, 2013 of Istanbul Settlement and Custody Bank Inc. According to the Prime Contract,

Takasbank is responsible for the provision of swap and custody services in accordance with the relevant legislation, render all of the financial services such as transfer, payment, central settlement services, central counter party services, custody and banking services for the purpose of enhancing the competitive power of the markets in Turkey and the realization of all types of economic activities, provided that these are in compliance with the provisions of the Banking Law, Capital Market Law and the other relevant legislations (Takasbank, 2013b).

Takasbank will also generate the international securities identification number of certified emission reduction credits and allocated units and the code of financial classification instruments and the legal entity identifiers relating to the parties will be allocated.

The conduct of the delivery of the securities to arise pursuant to the purchase and sale transactions of the certified emission reduction credits and allocated units in the Turkish Carbon Market and the exchange transactions relating to the payment of fees by Takasbank are regarded as suitable.

4. Conclusions

It is important to establish and operate an emissions trading system that will comprise especially the energy and forestry sectors and work in connection with the other emissions trading systems around the world in terms of achieving a more effective fight against climate change in Turkey, participating in the new market mechanisms the negotiations of which currently ongoing, controlling ever increasing greenhouse gas emissions, achieving quantified emissions limitation beyond 2020 upon provision of financial resources to projects developed within this scope and fulfilling reduction goals. From this respect, a model has been developed for an emissions trading system planned to be established in Turkey in the upcoming years.

It is necessary to complete the infrastructure required for the Turkish ETS to become operational and train the specialized personnel to work at this job. As a result of the work displayed within the scope of the transformation of Istanbul into a financial center, the markets have been convened under the umbrella of BIST. It will be appropriate for the Turkish Carbon Market, which will be established in an integrated manner with international stock exchanges, to be included under the umbrella of BIST.

It is envisaged for the Turkish Emissions Trading System developed as a result of the study to be composed of the Designated National Authority/Designated Focal Point, Central Registry Agency, Borsa Istanbul Turkish Carbon Market and Istanbul Settlement and Custody Bank Inc.

It is primarily necessary to make relevant arrangements in the legislation of agencies and establish an organizational structure for the establishment of abovementioned organizational structure. Some economic, social and environmental contributions are generated as a result of the launch of carbon markets and especially the implementation of forestry projects.

Economic contributions include achievement of low-cost greenhouse gas reductions, increase in financial flows and foreign exchange inflows provided to host countries where the project is implemented, creation of additional

employment opportunities for poor local community, generation of new business fields, increases experienced in forestry production, establishment of the organization infrastructure for carbon markets and technology transfer.

Social contributions include expansion of research and training opportunities in areas such as sustainable forest management, eco-tourism, carbon monitoring and certification, climate change and project management, generation of long-term benefits in areas such as wood and non-wood forest products and recreational services, achievement of a more efficient use of land, establishment of organization structures rendering service in the social field and development of public health.

Whereas environmental contributions include increase of biological diversity, achievement of regular use of water resources in forest areas, procurement of high quality water, decrease in natural disasters such as floods and inundations, enhancement of soil productivity, prevention of erosions, improvement of air quality and the visual beauty created by forests.

Due to the presence of economic, social and environmental contributions mentioned above, forestry sector should be included into the Turkish Emissions Trading System (Turkish Carbon Market) which is planned to be established. Transition from production forestry to carbon forestry will be achieved with the forestry sector to be included into the Turkish Carbon Market that will contribute to the reduction of deforestation and forest degradation, increase of forest areas and fight against climate change and thus forest areas will be protected more effectively.

Abbreviations

BIST	Istanbul Stock Exchange
CCCCAM	Committee on Climate Change and Air Management
CDM	Clean Development Mechanism
CERs	Certified Emission Reduction Units
CMB	Capital Markets Board
CRA	Central Registry Agency
DFP	Designated Focal Point
DNA	Designated National Authority
DOE	Designated Operational Entity
ERPAs	Emission Reduction Purchase Agreements
ERUs	Emission Reduction Units
ETS	Emissions Trading System
JI	Joint Implementation
LoA	Letter of Approval
LULUCF	Land Use, Land Use Change and Forestry
MoEU	Ministry of Environment and Urbanization
NAPCC	National Action Plan on Climate Change
NAPs	National Allocation Plans
QEERTs	Quantified Economy-Wide Emissions Reduction Targets
RMUs	Removal Units
SDU	Süleyman Demirel University
Takasbank	Turkish Settlement and Custody Bank Inc.
TUBITAK	Scientific and Technological Research Council of Turkey
TUIK	Turkish Statistical Institute
TURKAK	Turkish Accreditation Agency

UNFCCC United Nations Framework Convention on Climate Change
VERs Voluntary Emission Reductions

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