

MARKET READINESS PROPOSAL

Under the Partnership for Market Readiness Programme

TURKEY



Ministry of Environment and Urbanization

Ankara, 2013

Not for reproduction, circulation or distribution

Table of Contents

1	General Information & Executive Summary	4
1.1	<i>PMR contact point</i>	4
1.2	<i>MRP Development Team</i>	4
1.3	<i>Executive Summary</i>	5
2	Building Block 1: The Big Picture: Country Context	11
2.1	<i>Climate change mitigation and low emission development policy objectives</i>	11
2.2	<i>Consideration of Market Based Mechanisms in NCCAP</i>	12
2.3	<i>Assessment of historic and projected emissions trends, and key drivers of the Turkey’s GHG emissions</i>	14
2.4	<i>Pledged mitigation actions and its plan for their implementation</i>	21
2.5	<i>Carbon market experience</i>	22
3	Building Block 2: Policy Landscape, Objectives and Preparatory Work to Support and Inform Policy Decisions	25
3.1	<i>Policy-mapping to develop a comprehensive picture of inter-dependent policies and issues affecting climate policy objectives</i>	25
3.1.1	<i>Mapping of Existing Domestic Climate Policies</i>	25
3.1.2	<i>Experience with the use of market and non-market based approaches</i>	27
3.1.3	<i>Consideration of non-market instruments in NCCAP and EESP</i>	27
3.2	<i>Institutional Framework for Climate Policy Making</i>	27
3.3	<i>Sectoral Policy Mapping with Relation to the Climate Policy Objectives</i>	29
3.3.1	<i>Strategy Papers of Sectors</i>	30
3.3.2	<i>National Climate Change Action Plan (NCCAP)</i>	32
3.3.3	<i>Energy Efficiency Strategy Paper (EESP)</i>	33
3.4	<i>Assessment of Policy Mapping Analysis for Establishment of a Future MBIs</i>	34
4	Building Block 3: Core Technical and Institutional/Regulatory Market Readiness Components	37
4.1	<i>Data Management Systems for GHG Emission</i>	37
4.1.1	<i>Current GHG Inventory System of Turkey</i>	37
4.1.2	<i>MRV Regulation</i>	40
4.2	<i>Assessment of Market Readiness for Data Management System</i>	42
4.2.1	<i>Additional Legislation Needs for iMRV</i>	42
4.2.2	<i>Technical and Infrastructural Needs for Data Management System</i>	43
4.2.3	<i>Institutional and Organizational Needs for Data Management System</i>	44
4.3	<i>List of Needs for iMRV and Data Requirements for Other Sectors</i>	45
4.3.1	<i>To-do-list for iMRV</i>	45
4.4	<i>Target/Goal setting for market instruments</i>	47
4.5	<i>ToR(s) and Proposed Budget</i>	48
5	Building Block 4: Planning for a Market-based Instrument	50
5.1	<i>PART I - Assessment for Market Readiness</i>	50
5.2	<i>PART II - Needs Assessment for DoMBI(s)</i>	53
5.3	<i>ToR(s) and Proposed Budget</i>	55
6	Building Block 5: Organization, Communication, Consultation and Engagement	57
6.1	<i>Organizational framework for MRP activities and decision making process</i>	57
6.2	<i>Stakeholder Consultation, Communication and Engagement</i>	59
6.2.1	<i>Preliminary List of Stakeholders Identified for Implementation of MRP Activities</i>	59

6.3	<i>ToR(s) and Proposed Budget</i>	62
7	Building Block 6: Summary of Activities, Timeline and Budget.....	64

1 General Information & Executive Summary

1.1 PMR contact point

Name	Ercan Gülay
Organization	Ministry of Environment and Urbanization
Title	Head of Climate Change and Air Management Department
Address	Ehlibeyt Mahallesi Ceyhun Atuf Kansu Cad. 1271. Sok No:13 Balgat Ankara / TURKEY
Telephone	+90 312 5863018
Fax	+90 312 4740318
Email	ercan.gulay@csb.gov.tr
Website	www.iklim.gov.tr

1.2 MRP Development Team

Name	Organization
Ercan Gülay	Ministry of Environment and Urbanization
Mehrali ECER	Ministry of Environment and Urbanization
Tuba SEYYAH	Ministry of Environment and Urbanization
Orhan SOLAK	Ministry of Environment and Urbanization
Şule ÖZKAL	Ministry of Environment and Urbanization
Representative Experts	Coordination Board on Climate Change
Ramazan ASLAN	Consultant

1.3 Executive Summary

Turkey joined the Partnership for Market Readiness (PMR) in April 2011. A preparation grant for Turkey was approved by the Partnership Assembly (PA) in May 2011. Turkey submitted a draft Market Readiness Proposal (MRP) to the PMR Secretariat on February 2013, and presented it to the PA at PA5 meeting in Washington, DC on March 2013. The table below shows the timeline of PMR related developments for Turkey:

Dec 2010	• Partnership Program is established.
April 2011	• Turkey is approved as a participant to Partnership Assembly.
May 2011	• Preparation grant approved by PA.
Dec 2011	• PMR grant agreement is published in the Official Gazette of Turkey.
14 Jan 2013	• The first draft MRP is submitted to the Secretariat
24 Jan 2013	• PMR expert feedback received
25 Feb 2013	• Final draft MRP is circulated to the PA members.
11 Mar 2013	• Turkey presented draft MRP to PA for consideration

This MRP, prepared under the coordination of the Ministry of Environment and Urbanization (MoEU), is a revised version of the draft MRP presented at the PA5 meeting, taking into account the feedback from the PA, as well as providing more detailed plans, budget, and timeline for market readiness activities.

Being a party to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol (KP), Turkey has developed strategies, action plans, and programs to promote energy efficient, low carbon technologies. Turkey is also a candidate country to the European Union (EU), and has been taking the necessary steps for the full implementation of the EU Emission Trading Scheme (EU-ETS) directive, which is part of the environmental *acquis*. As part of these steps, in April 2012, Turkey enacted an EU-ETS compatible MRV regulation for the industry and power sectors, establishing the framework for a potential market mechanism under the UNFCCC.

In addition to providing an overview of climate change mitigation activities in Turkey and low energy and carbon intensive policy objectives, this MRP provides (i) detailed description of Turkey's MRV framework regulation for facilities within the energy and industry sectors, as well as additional MRV requirements to fulfil the data needs of possible emissions trading system (ETS) for the electricity sector, and (ii) a comprehensive assessment of options to establish market-based instruments, including a gap analysis of market readiness components and modelling needs.

The MRP is composed of 6 Building Blocks (BB). Summary of the BBs are given below:

Building Block-1: The Big Picture: Country Context

BB-1 provides an overview of Turkey's climate change policies and activities with an analysis for GHG emission sources and drivers. This block also includes an overview of Turkey's carbon market experiences, specifically with the CDM-based voluntary carbon markets.

Turkey's main strategy documents on climate change are the National Climate Change Strategy Document (NCCS) and the National Climate Change Action Plan (NCCAP). NCCAP sets clear objectives for both mitigation and adaptation aspects of climate change. Carbon market related studies and implementations are also included in NCCAP, aiming to create financial support for climate friendly projects. The PMR support would build on the NCCAP and allow Turkey to study implications and design elements of a cap and trade and/or accreditation of NAMA mechanisms and undertake demand analysis for tradable emission reduction certificates, reduction from baseline emissions, etc. in different sectors.

Turkey's economic growth in the last two decades has been accompanied with a significant increase in GHG emissions. In 2010, the total GHG emissions in Turkey reached 401.9 million tons tCO₂e (excluding LULUCF), which corresponds to a 115% increase compared to the 1990 levels. CO₂ emissions had the largest share of GHG emissions with 81% in 2010, industrialization and urbanization being the key drivers of GHG emissions.

Building Block-2: Policy Landscape and, Objectives and Preparatory Work to Support and Inform Policy Decisions

In this BB, a comprehensive general and sectoral policy mapping analysis on climate change has been performed in order to account for the current situation and identify the gaps and needs for a successful implementation of market based instruments (MBIs). This block also includes the organizational framework for the implementation of climate change policies.

BB2 reflects on the multi-sectoral and sectoral strategies and targets through an overview of the Energy Efficiency Strategy Paper (EESP), Environment and Renewable Energy Laws, and strategy papers for the electricity, industry, transport, and agriculture sectors.

An initial policy mapping analysis reveals that Turkey has already adopted several low energy and carbon intensity policies. The main motivation behind these policies has been the desire to decrease large import dependency on energy sources.

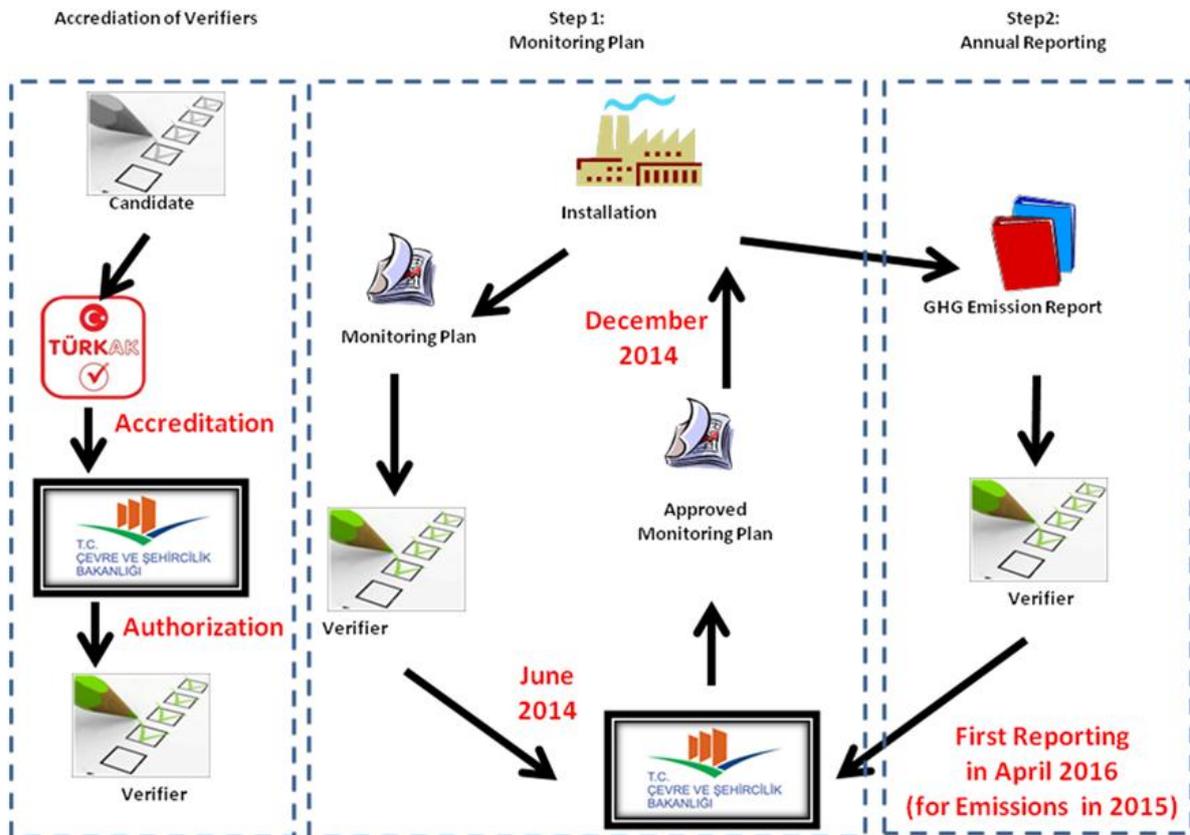
BB2 shows that there are some sectoral objectives that need to be taken into account during the design and implementation of an MBI in order to ensure acceptance by the sector participants.

BB-2 also includes information about the institutional and organizational framework for Turkey's main climate change policies.

Building Block-3: Core Technical and Institutional/Regulatory Market Readiness Components

BB-3 describes Turkey's existing GHG data management system and elaborates on the means to achieve a successful implementation of existing MRV regulation.

Turkey published a framework regulation for monitoring, reporting, and verification (MRV) of facilities from industry and energy sectors in April 2012. The regulation is based on the EU-ETS MRV regulation. Installations with a capacity over a certain limit will be required to submit their GHG emissions by 2016. The first monitoring year of compliance is 2015, and obligated entities need to prepare their monitoring plans and submit them to MoEU by June 2014.



A list of additional necessities along with the corresponding required budget for the full implementation of the MRV regulation (*iMRV*) is provided below:

1. Preparation of secondary and complementary legislations for *iMRV*
2. Establishment of a robust web-based database and registry system
3. Training and capacity building activities for stakeholders on *iMRV*, including a piloting of the MRV regulation.

Turkey-Germany has a technical partnership on MRV, which covers almost all of the items listed above. The total budget for this partnership is expected to be around 2,500,000 EUR (3,250,000 USD).

An additional activity that is needed as part of the *iMRV* but not covered under the Turkey-Germany technical partnership is the piloting of the MRV regulation. The piloting will enhance the capacity

building of operators and other relevant parties with respect to the requirements of the MRV regulation. Piloting will include the preparation of monitoring plans, monitoring reports, and verification of GHG emissions for the facilities that voluntarily participate in the piloting program.

Electricity sector have already expressed interest in being participating in the piloting program. During the PMR implementation phase, other willing sectors/facilities covered by the MRV regulation may be included in the piloting.

The cost of the MRV piloting, in total for 3 years of implementation, is estimated to be 700,000 USD. This amount is being requested from the PMR. This fund may also supplement GIZ fund, during the implementation of activities identified for *iMRV*.

During the implementation phase, at least 5 staff from related divisions of MoEU will devote significant time to *iMRV* activities for about 3 years. The corresponding amount of that contribution for *iMRV* activities is estimated to be 450,000 USD, which amounts to almost half of the total contribution of the 5 staff for all of the activities identified in this MRP (950,000 USD in total), as provided in BB-6.

The budget and distribution to the funding sources for the activities identified under BB-3 are provided in the table below:

Source of Funding BB-3 Activities and Needs	Budget (USD)
National Government	450,000 USD
Others (GIZ)	2,950,000 USD
PMR	700,000 USD
TOTAL	4,100,000 USD

Building Block-4: Planning for a Market-based Instrument

BB-4 includes two parts. In Part-I, a policy mapping assessment and a SWOT analysis are made in order to provide an assessment of needs for an informed decision on the implementation of MBIs (*DoMBI(s)*). Part-II provides a list of studies and activities for *DoMBI(s)* with an estimated timeline and budget.

As part of the DoMBI, the following reports are expected to be prepared:

- Report on GHG Emission Projections and Sectoral MACCs (*to be covered from the national budget*)
- Report on Consideration of ETS for the Electricity Sector
- Report on Recommendations for Selection of MBIs and Sectors for Modelling
- Report on GHG Market Modelling and Outcomes for Selected Sectors
- Market Based Instruments for GHG Emission Reduction Objective – Policy Options and Recommendations Report

The electricity sector, one of the largest contributors of Turkey's GHG emissions, already indicated its interest and willingness for an assessment of ETS for their sector. Such willingness is crucial for the

comprehensiveness and high quality of the analysis, which are essential factors for a successful implementation of any market based instrument. The assessment that will be made for the electricity sector is also important with respect to creating an awareness for such analyses for other sectors covered by the MRV regulation as well as those that are not covered by the existing regulation.

The timeline and budget for the deliverables and activities identified under BB-4 are provided in section 5.1

The cost of the “Report on GHG Emission Projections and Sectoral MACCs” will be covered from the national budget.

The cost of other deliverables as well as of trainings to be provided to stakeholders is requested from the PMR, considering that the deliverables and activities identified in this BB constitute the core of the market readiness assessment. The total cost of these deliverables and activities are estimated to be 1,300,000USD.

Source of Funding BB-4 Activities and Needs	Budget (USD)
National Government	1,700,000 USD
Others	0
PMR	1,300,000 USD
TOTAL	3,000,000 USD

Building Block-5: Organization, Communication, Consultation and Engagement

BB-5 provides an organizational chart for the decision making body of the PMR activities and an assessment for stakeholders consultation and engagement process during the whole implementation phase. BB-5 also includes the information on “MRV and MBI Working Team” which will have the responsibility of coordination for the full range of activities identified in the MRP and help strengthen the Government’s limited technical capacity and expertise on MRV and MBIs.

The Carbon Market Technical Working Group (CMTWG) and MoEU will be the main responsible bodies to undertake the activities identified in this MRP.

“Monitoring of GHGs and Emission Trading Division” (Division) of the Climate Change and Air Management Department (CCAMD) at MoEU, which will be the main implementing unit for the MRP implementation, involves 5 staff. It is estimated that the cost of staff time devoted to the MRP activities will be around 950,000 USD for the 3 years of estimated implementation time, as “in-kind contribution” from the national budget. 500,000 USD of this amount is considered to be allocated as a part of the cost for the implementation team.

Additionally, the capacity of the Ministry and its related divisions shall be increased and supported with experts on MRV and MBIs. For that purpose, an “MRV and MBI Working Team” will be established under the CCAMD of MoEU. In addition to the 5 staff from the division, the team is expected to have 3 new technical experts, of which one will be responsible for the *iMRV* activities

falling under the GIZ-funded program. The total contribution of GIZ for this team is estimated to be 300,000 USD.

The source of funding for BB-5 budget, for consultation of stakeholders, public awareness activities, and “MRV and MBI Working Team” is provided below:

Source of Funding BB-5 Activities and Needs	Budget (USD)
National Government	500,000 USD
Others (GIZ)	300,000 USD
PMR	1,000,000 USD
TOTAL	1,800,000 USD

Building Block-6: Summary of Activities, Timeline and Budget

In summary, this MRP identifies Turkey’s needs for market readiness in two categories:

- Implementation of existing MRV Regulation – *iMRV* and,
- Preparation for an informed decision making process on the use of market based instrument(s) – *DoMBI(s)*

BB-6 provides all activities for the fulfilment of needs under these categories, associated budget, and the corresponding source of funding. The overall timeline of the MRP implementation is estimated to be about 3 years through the end of 2016.

Table below provides summary of the activities and source of funding for activities identified in this MRP:

BB	Activity	Total Cost of Activities	Source of Funding (x1000 USD)		
			PMR Funding Request	National Government	Other (GIZ)
BB-3	Implementation of MRV Regulation (<i>iMRV</i>)	4,100	700	450	2,950
BB-4	Informed Decision on Implementation of MBI(s) - (<i>DoMBI(s)</i>)	3,000	1,300	1,700	0
BB-5	Stakeholder Consultation/Engagement and Public Awareness Activities	500	500	0	0
BB-5	Establishment of "MRV and MBI Working Team"	1,300	500	500	300
	TOTAL	8,900	3,000	2,650	3,250

2 Building Block 1: The Big Picture: Country Context

2.1 Climate change mitigation and low emission development policy objectives

Being a party to the UNFCCC and its Kyoto Protocol (KP), climate change mitigation and low energy and emission intensive development policies are already one of the most essential parts of the development strategies of Turkey.

Although Turkey has no emission reduction target within the scope of KP, she has been conducting intense mitigation activities in areas such as energy efficiency, renewable energy generation, transport and waste management. Additionally, Turkey displays an active commitment in the development of a voluntary emission market with its integration to compliance markets and conducts projects regarding the determination of emission reduction potential.

Turkey is a candidate to EU and aiming to complete all the obligations for accession. As part of the environmental *acquis*, Turkey is taking necessary steps to fully implement the EU-ETS directive. At the moment the full transposition of the EU-ETS Directive is planned to be completed in 2019 as stated in the EU position paper, and the implementation will begin upon being granted a full membership status.

In order to determine the policies to be followed, measures to be taken and activities to be conducted by Turkey in the field of climate change, the *Coordination Board on Climate Change (CBCC)* was established in 2001. The CBCC involves ten ministries and two biggest private sector chambers, and acts as the main governing body for climate change issues.

The National Climate Change Strategy Document (NCCS), the main policy document for climate change, was prepared via the participation of stakeholders from the CBCC, related private sector participants, NGOs, and was approved by the Higher Planning Council in May 2010¹. In NCCS national climate change vision is defined as follows:

“Turkey’s national vision within the scope of “climate change” is to become a country fully integrating climate change-related objectives into its development policies, disseminating energy efficiency, increasing the use of clean and renewable energy resources, actively participating in the efforts for tackling climate change within its “special circumstances”, and providing its citizens with a high quality of life and welfare with low-carbon intensity.”

NCCS also sets some targets and strategies to achieve the climate change vision. The most essential strategy for the implementation of climate change policies and achievement of targets is the National Climate Change Action Plan (NCCAP)².

¹ Republic of Turkey, National Climate Change Strategy (2010-2020): <http://iklim.cob.gov.tr/iklim/Files/Stratejiler/National%20Strategy.pdf>

² Republic of Turkey, Climate Change Action Plan (2011-2023): http://iklim.cob.gov.tr/iklim/Files/IDEP/%C4%B0DEP_ENG.pdf

National Climate Change Action Plan (NCCAP):

NCCAP is the essential roadmap of Turkey for implementation of the National Climate Change Strategy. Prepared through extensive stakeholder consultation process, NCCAP sets clear objectives for both mitigation and adaptation aspects of climate change.

NCCAP, approved by Coordination Board on Climate Change (CBCC)³ in 2011, sets clear purposes and objectives for mitigation activities for seven main sectors. A complete set of defined sectoral purposes are given in Annex-1 and a short list provided in BB-2. Objectives for sectoral crosscutting issues of NCCAP are given below:

- Crosscutting Issues:
 - Monitoring and reporting of greenhouse gas emissions from key sources using at least Tier 2 methodologies as of the beginning of 2016
 - Carrying out negotiations to ensure Turkey's participation in the most advantageous way into the existing and new global and regional carbon markets until 2013
 - Carrying out studies to establish the carbon market in Turkey by 2015
 - Making necessary arrangements in the education programmes until the end of 2012 so as to develop climate-friendly consumption patterns
 - Organizing public awareness raising campaigns for combating climate change until 2014

2.2 Consideration of Market Based Mechanisms in NCCAP:

In section Cross Cutting Issues of NCCAP, market based mechanisms are considered as objectives to achieve the purpose of *“Optimum usage of emission trading mechanisms that contribute to cost-effective limitation of greenhouse gas emissions”*.

Some of actions identified in NCCAP for market based mechanism related objectives are as follows:

Y4.1.1.1. Carrying out negotiations for Turkey's participation in the new mechanisms in the most advantageous way (as host country) after 2012, exploring opportunities for bilateral cooperation agreements with countries

Y4.1.1.2. Developing the NAMA portfolio for Turkey that will be benefiting from carbon markets

Y4.2.1.1. Identifying key sectors for the carbon markets, identifying the greenhouse gas emission reduction potential in these sectors

Y4.2.1.2. Making legislative arrangements to enable public institutions regulatory and supervisory role in the emission trading system

Y4.2.1.3. Developing the existing structure and building new structures to enable carbon assets to be traded with maximum economic value and have their values increased

Y4.2.1.4 Beginning infrastructure development for establishment of the National Emission Trading System

³ Please refer to BB-2 for further information on CBCC.

Y4.2.2.1. Carrying out activities to increase awareness in carbon markets in Turkey

Y4.2.2.2. Providing support to stakeholders necessary to identify, develop, market and manage carbon projects

Considering the above mentioned objectives for market based mechanisms, in addition to Turkey's own sources and other international financial supports, the PMR program will help Turkey to fulfil the following objectives:

- Developing the NAMA portfolio
- Identification of key sectors and GHG reduction potentials of those sectors for carbon markets
- Establishment of legal, technical, institutional arrangements and infrastructure for a national ETS
- Increasing awareness for carbon markets

To this date, Turkey's sole experience in the carbon markets has been project-based participation within the voluntary carbon market. As such, the above-mentioned objectives were developed in order to regulate the voluntary projects, increase their economic value, and support sectors other than electricity (especially industry) to develop emission reduction certification for their GHG emission reduction projects.

The PMR support will be essential in helping Turkey move from solely participating in the voluntary carbon markets to elaborate implementing its own market-based instrument(s).

For any kind of market based mechanism, one of the most essential issues is measuring and monitoring the emissions in a reliable and credible way. Turkey has vast experience in preparing GHG inventories according to IPCC Guidelines and regularly submits National Inventory Reports to UNFCCC since 2007⁴.

Additionally, Turkey adopted a stringent monitoring, reporting and verification (MRV) regulation in April 2012, covering installations in the energy and industry sectors. Installations with a capacity over a certain limit will be required to submit their GHG emission reports by 2016. First monitoring year of compliance is 2015 and obligated entities need to prepare their monitoring plan and submit to the Ministry of Environment and Urbanization (MoEU) by June 2014. More information on the MRV system is provided in Building Block 3.

While the 2012-enacted MRV regulation provides the basic framework, more needs to be done to prepare Turkey for a market-based mechanism, including, among others, secondary legislation on MRV, particular data management systems to be adopted to implement the regulation, studies on additional sectors (other than energy and industry) to be covered by the regulation, and the most suitable market-based mechanism for Turkey that will be built upon the implemented MRV system. Although Turkey has allocated some of its national budget for these goals, additional funding is needed. PMR support is highly significant in this respect.

⁴ Further information on current GHG inventory system and MRV regulation to be implemented is provided in BB-3.

2.3 Assessment of historic and projected emissions trends, and key drivers of the Turkey's GHG emissions.

Historic Emission Trends and Key Drivers

With implementing more liberal policies, Turkey's economy has experienced a great transformation and growth since two decades. GDP has increased more than two and a half times from 266 Billion USD in 1990 to 735 Billion USD in 2010 (Figure 1).

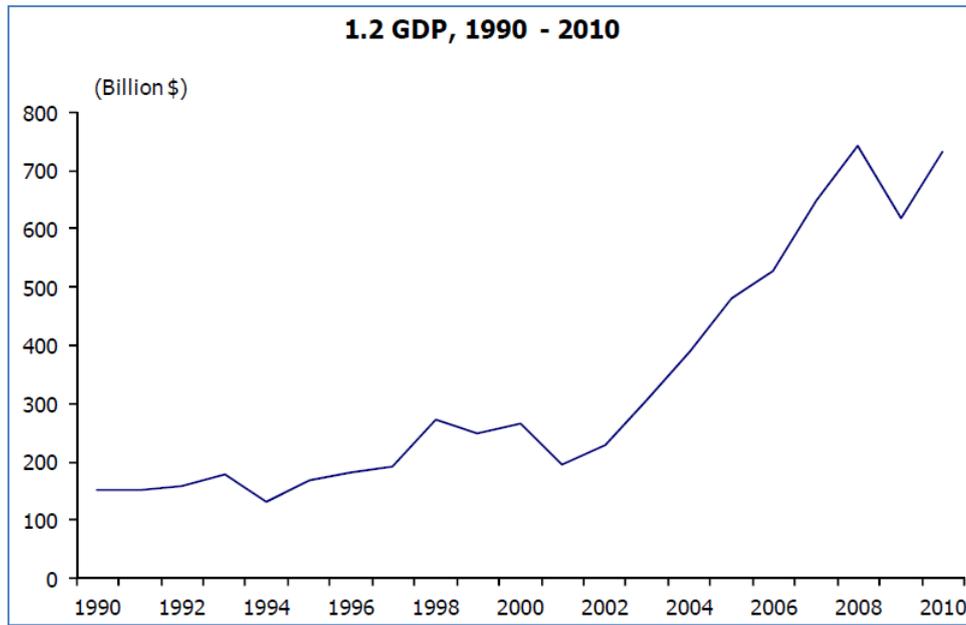


Figure 1 GDP development, 1990-2012

Main driver of economic growth of Turkey has been industrialization, which also leads to rapid increase in share of population living in urban areas. Share of population living in province/district centers has increased from 59% in 1990 to 76.3% in 2010⁵. Due to significant urbanization rate and increase in population, total living area has increased more than 130% in the same period (Figure 2).

⁵ TurkStat: <http://www.turkstat.gov.tr/Gosterge.do?id=3615&metod=IlgiliGosterge>

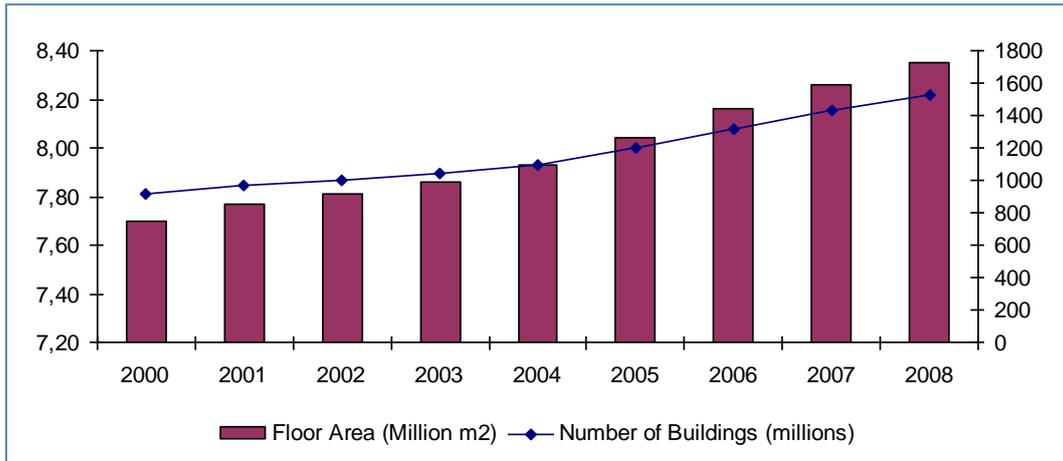


Figure 2 Number of the Buildings and Changes in Surface Area⁶

While the population of Turkey was 56.47 million in year 1990, it reached 73.72 million in 2010, with an annual increase rate of approximately 1.5% during 2005-2010 period (Figure 3). It is anticipated that the population will reach 85.41 million in the year 2025 with an approximate annual increase rate of 1% during the period between 2011 and 2025. Despite the increase in population experienced since 1990, a significant decrease was observed in population growth rate for the 1990-2010 period, and this trend is estimated to continue, as shown in Table 1.

Table 1 Turkey's Population Profile⁷

	1990	2000	2007	2008	2009	2010	2015	2020	2025
Population (millions)	56.47	67.80	70.59	71.52	72.56	73.72	77.60	81.78	85.41
Annual population growth rate (%)	2.17	1.83	-	1.31	1.45	1.59	1.14	0.97	0.77

⁶ National Climate Change Action Plan (NCCAP), 2011.

⁷ TurkStat, 2011. News: Address-based Population Registration System 2010 Results, Issue: 19, 28 Jan 2011

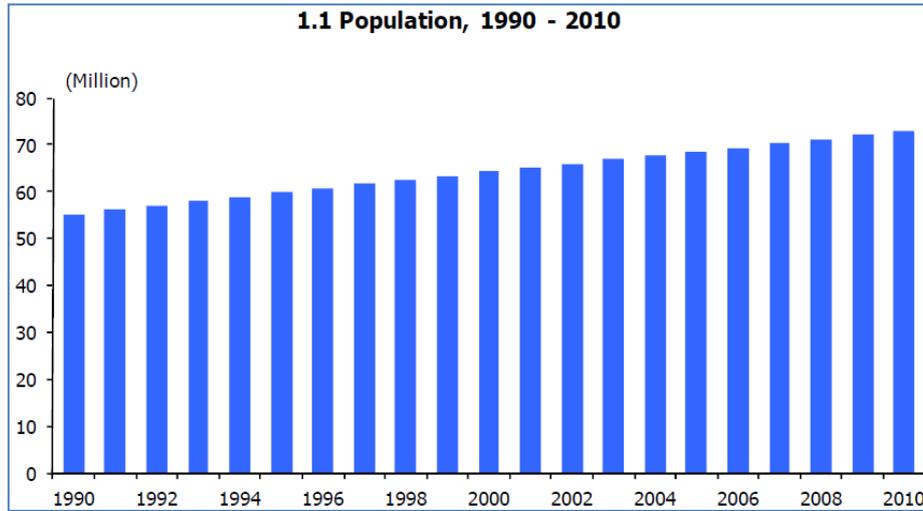


Figure 3 Number of Population by years

Turkey's economic growth has been accompanied with a significant increase in GHG emissions in the same period. According to the National Inventory Report submitted to UNFCCC secretariat in April 2012⁸, total GHG emissions in Turkey was 401.9 million tons tCO₂e in 2010 (excluding LULUCF), a 114.90% increase compared to the emissions in 1990. Considering the changes of greenhouse gas emission over the years, it is seen that the greenhouse emissions have increased constantly except during periods of global economic crisis in 2008 and 2009. GHG emission trend for the period of 1990-2010 is shown in Figure 4. CO₂ emissions have the largest share of GHG emissions with 81% in 2010.

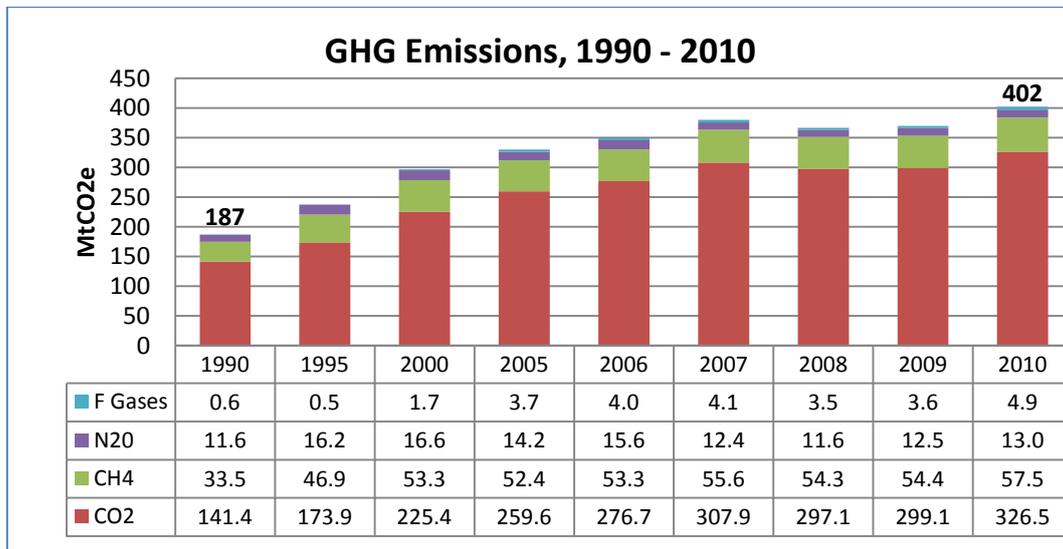


Figure 4 GHG emissions by gases, 1990-2010⁹

⁸ Ref: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php

⁹ TurkStat: <http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=10829>

Turkey – Market Readiness Proposal – (03.05.13)

Turkish economy can be considered to be energy intensive when compared with developed countries. Statistics from the International Energy Agency (IEA) indicates that energy density of Turkey is 0.27 toe/thousand 2000 USD in 2009 whereas for the same year, energy density of OECD countries is equal to 0.18 toe/thousand 2000 USD. This means that Turkey consumes more energy to generate USD 1,000 of GDP (in 2000 USD) compared with the OECD countries. According to the Figure 5 shown below, Turkey’s energy intensity is higher than the energy intensity of both EU-27 and world average, which also indicates that a significant potential regarding energy efficiency improvements, is present in Turkey.

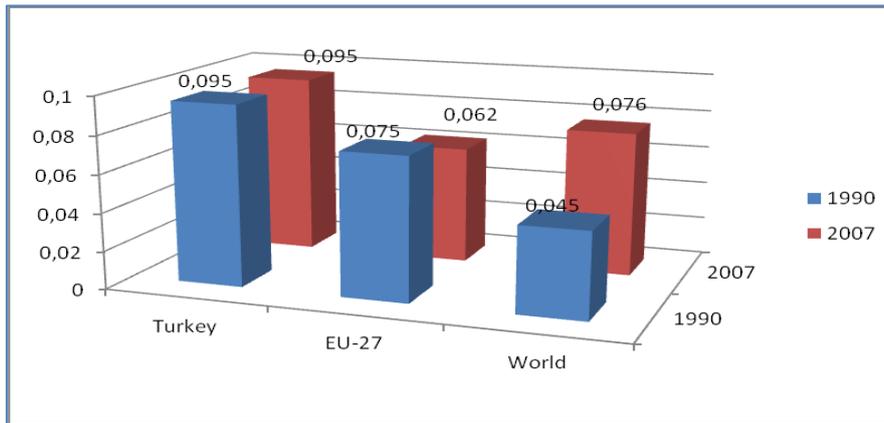


Figure 5 Energy intensity in Turkey, EU-27 and the World for the period of 1990-2007¹⁰

According to the Figure 6 shown below, while Turkey’s GDP at current prices reached 734.93 billion USD at the year 2010 with a 63.9% increase compared to the values at the year 2000, for the same period, CO₂e emissions increased only 26.1%. This indicates that the development of economy in Turkey becomes to be based on activities producing less GHG emissions to tackle with the climate change problems.

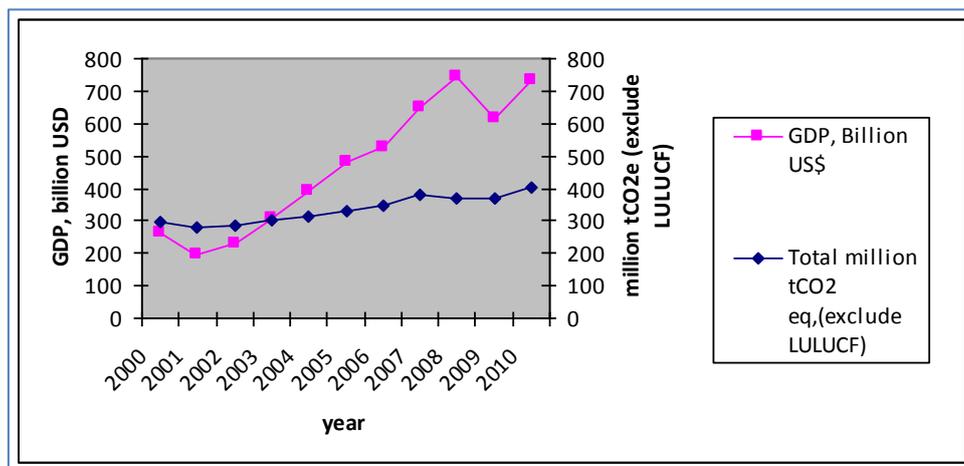


Figure 6 Turkey’s GDP and CO₂ (eq) emission growth¹¹

¹⁰ Toe per thousand USD at 2000 prices and purchasing power parities, PPP. Second National Communication Report of Turkey.

¹¹ National GHG Inventory Report, 1990-2010 & The Ministry of Development, 2011

Main sectors contributing to the largest share of GHG emissions are energy and industry sectors. According to the Figure 7, shown below, energy sector related emissions (electricity generation, manufacturing, transport, residential etc.) has largest share with 70.9% of total GHG emissions in 2010¹². Industrial process related emissions has second largest share with 13.4% in the same year. Share of agriculture and waste sector related emissions are 8.9% and 6.7% respectively.

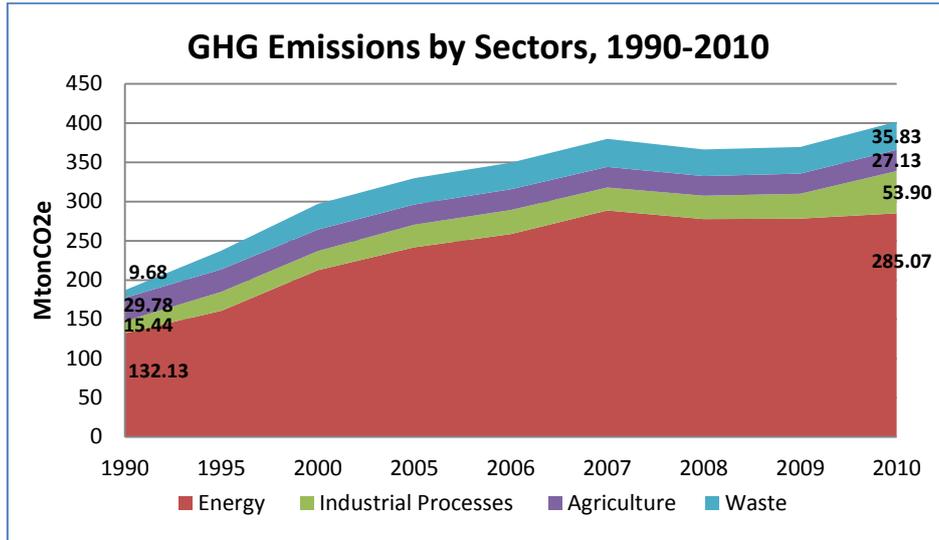


Figure 7 Distribution of GHG emissions to the sectors

Figure 8 shows distribution of CO₂ emissions from energy sector to sub-sectors. Energy related emissions originate mainly from four sub-sectors, which are given below with their corresponding shares in total CO₂ emissions in 2010 from energy sector:

- Electricity and Heat Production – 39.5%
- Manufacturing Industries and Construction – 20.5%
- Transport – 16.0%
- Residential -18.2%

¹² TurkStat: <http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=10829>

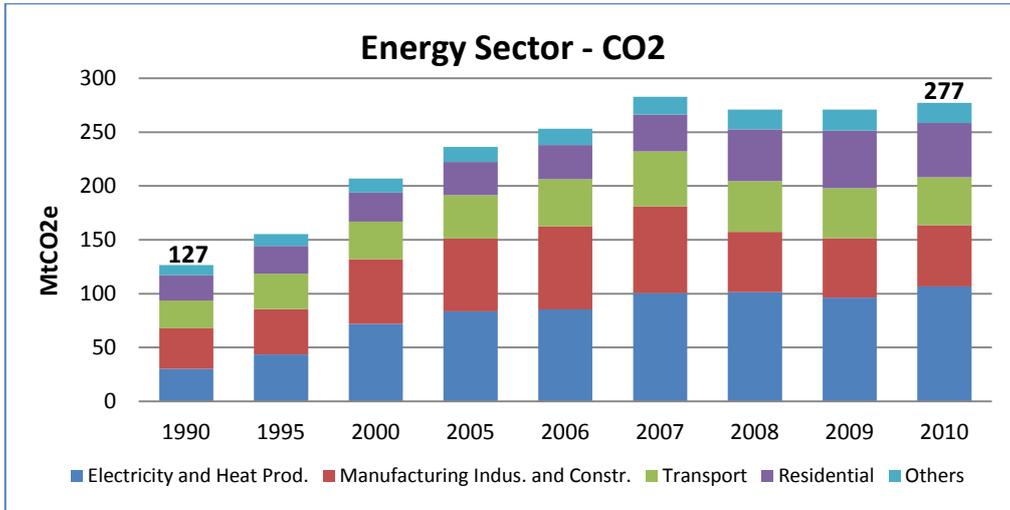


Figure 8 Energy Sector CO2 Emissions by Sub-Sectors

In 2010, 32.7% of total CO2 emissions and 26.6% of all GHG emissions were from the electricity generation. Having the largest share in GHG emissions, electricity sector is one of the key sectors for climate change context of Turkey. Development of electricity generation of Turkey is given in Figure 9¹³. It can be seen that share of natural gas in electricity generation portfolio started to increase by 2000s and reached around 45% in 2011. Total share of fossil fuel based electricity generation (coal, lignite, natural gas, oil etc.) is 74.6% in the same year, which demonstrates highly dependency of the country to fossil fuels for electricity generation.

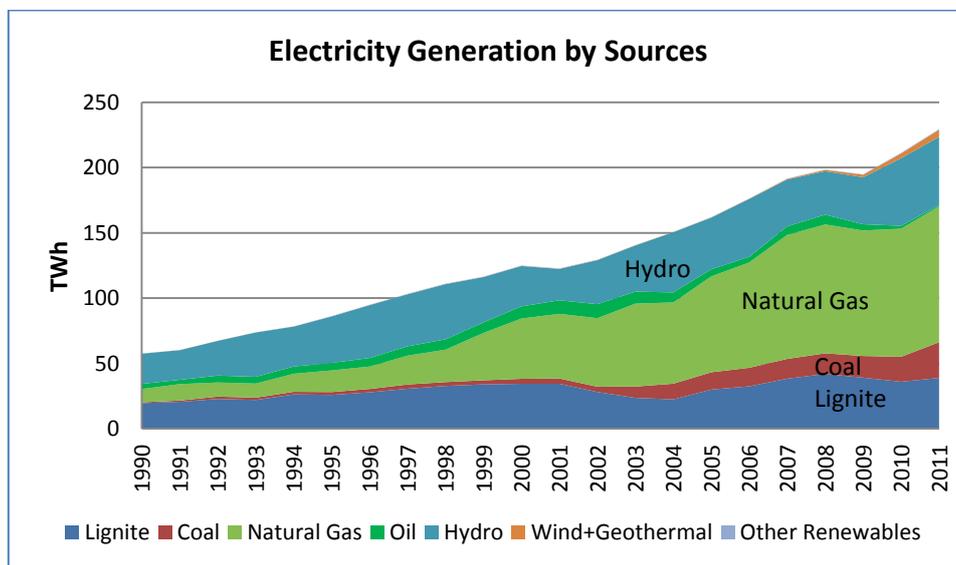


Figure 9 Development of Electricity Generation by Sources

Above figures and data show that, key drivers for emissions are industrialization and urbanization. In addition to the emissions from energy and industry sectors, these parameters are directly affecting

¹³ See National Electricity Transmission Co (TEIAS):
[http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/uretim%20tuketim\(22-45\)/35\(75-11\).xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/uretim%20tuketim(22-45)/35(75-11).xls)

emissions from residential buildings and transport. Increasing population and purchase power of people are also fuelling demand to all sectoral products and services, which make them other important factors for continuation of GHG emission increase, at least for the middle term.

GHG Emission Projections

Although Turkey’s GHG emission inventory is sufficient to easily track the trends, up to now no credible and comprehensive study has been performed for emission projections. However, a project developed by MoEU, which has recently been approved by the Ministry of Development, includes the preparation of sectoral emission projections.

This “Project on Preparation of UNFCCC Declarations” includes the following studies and outputs on emission projections:

- Data collection for sectoral projections and building of a database for updating of the data
- Selection of best modelling method for projection in the light of collected data and information
- Training of ministerial staff for database system and modelling for projection
- Preparation of sectoral GHG emission projections

Estimated cost of these outputs, which will be covered by national budget, are listed below:

Table 2 Budgeting and Outcomes of the MoEU Project on Emission Projections

OUTCOMES	BREAKDOWN of COSTS to the YEARS (TL)			BREAKDOWN of COSTS to the OUTCOMES (2013-2015) (TL)
	2013	2014	2015	
1. Preparation of National Communication (to be submitted to UNFCCC)	250,000	600,000	0	850,000
2. Preparation of biannual report required by UNFCCC	50,000	100,000	0	150,000
3. Preparation of sectoral emission projections and foundation of a database system	500,000	700,000	800,000	2,000,000
TOTAL	800,000	1,400,000	800,000	3,000,000 (1.7 Million USD)

Even though not directly related with emission projections, electricity generation projections prepared by the Turkish Electricity Transmission Company (TEIAS) provides valuable insight for outlook of electricity generation mix of Turkey in the middle term and the corresponding emission density of the electrical system.

According to the projection by TEIAS (for 2012-2021 period)¹⁴, fossil fuel based power plants will continue to have a larger share of generation mix with 66% share in 2021 (Figure 10). The first nuclear power plant, which is expected to be in operation in 2019, will have a 5% share of electricity

¹⁴ See TEIAS: <http://www.teias.gov.tr/KapasiteProjeksiyonuARALIK2012.doc> (page 51, Table 25)

generation in 2021. This projection includes power plants in operation and under construction as well as projects that have secured license with deliberate construction duration. Thus, it does not include non-deployed generation types, such as solar power energy, and new projects to be developed in the coming years.

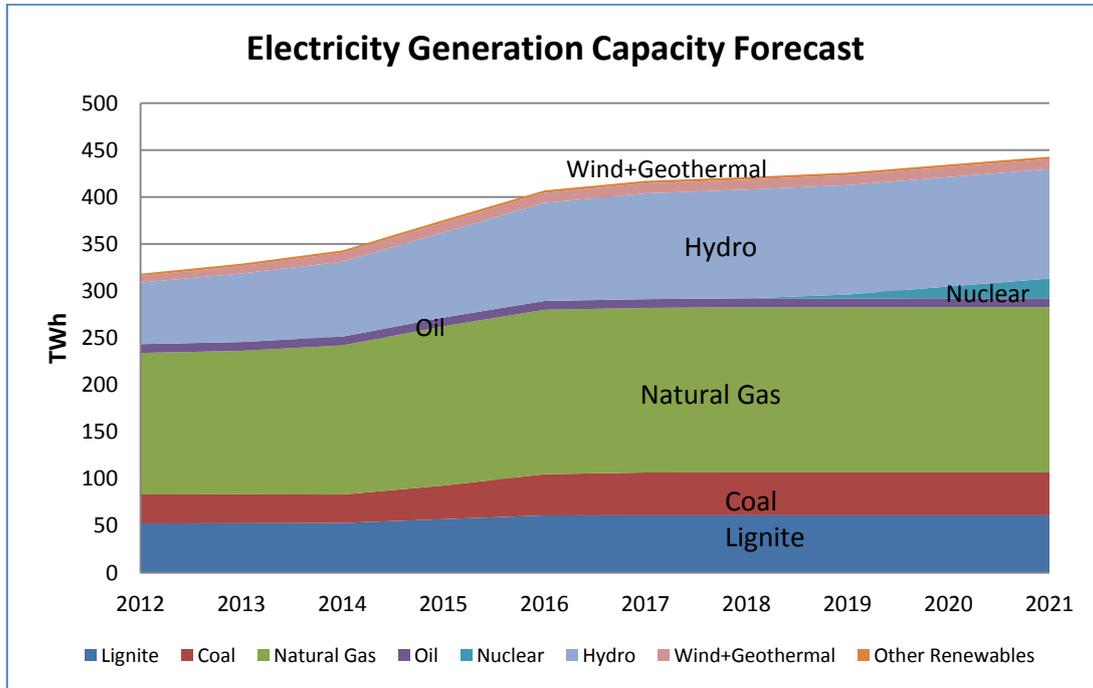


Figure 10 Projection of Electricity Generation Amount by Sources

Figure 10 clearly shows that, fossil fuel will continue to dominate Turkey’s electricity generation at least for the middle term. Utilizing the renewable power potential not only will decrease emissions from electricity generation, but also help decreasing its dependency on imported natural gas and imported coal, and by this will help ensuring energy security.

2.4 Pledged mitigation actions and its plan for their implementation

Turkey has not pledged any specific mitigation actions in the UNFCCC process. Since Turkey is an Annex-1 country, availability of NAMA financing mechanisms in the post-2012 period for Turkey has not been clarified yet, either. However, negotiations regarding Turkey’s status are ongoing and Turkey declared during the UNFCCC negotiations that it will be implementing NAMAs as mitigation actions. These cover a variety of sectors including Energy, Transport, Industry, Buildings, Waste, Agriculture, Land-Use, and Forestry. In addition, within the scope of NCCP, for the period of 2012-2014, the NAMA potentials on a sub-sector basis are to be identified and an economic analysis is to be conducted to identify energy efficiency potential in sub sectors and to reduce energy intensity. The most important ones stated in NCCAP are ‘Y4.1.1: Conducting necessary analyses for integration into carbon markets’ and ‘Y4.1.1.2. Developing the NAMA portfolio for Turkey that will be benefiting from carbon markets’, the NAMA portfolio for Turkey that will be benefiting from carbon markets are to be developed for the period of 2011-2015.

Turkey will carry out negotiations for its participation in the new mechanisms in the most advantageous way (as a host country) by 2015, exploring opportunities for bilateral cooperation agreements with other countries.

Although Turkey has no mitigation pledge under UNFCCC, Turkey has already taken many measures to incentivize low/no carbon technologies and, by this way, mitigate emission reductions¹⁵. Among them, the most important measure is the feed-in-tariff opportunity for renewable energy projects. Providing a feed-in-tariff for renewable power projects has led to great success, whereby the share of electricity generation from non-hydro renewables increased from 0.2% in 2006 to 2.4% in 2011¹⁶. Figure 11, below, shows development of electricity generation from non-hydro renewable sources by year. The share of renewable energy is expected to increase with addition of new capacities based on wind, hydro, and geothermal energies and deploying new sources like solar power.

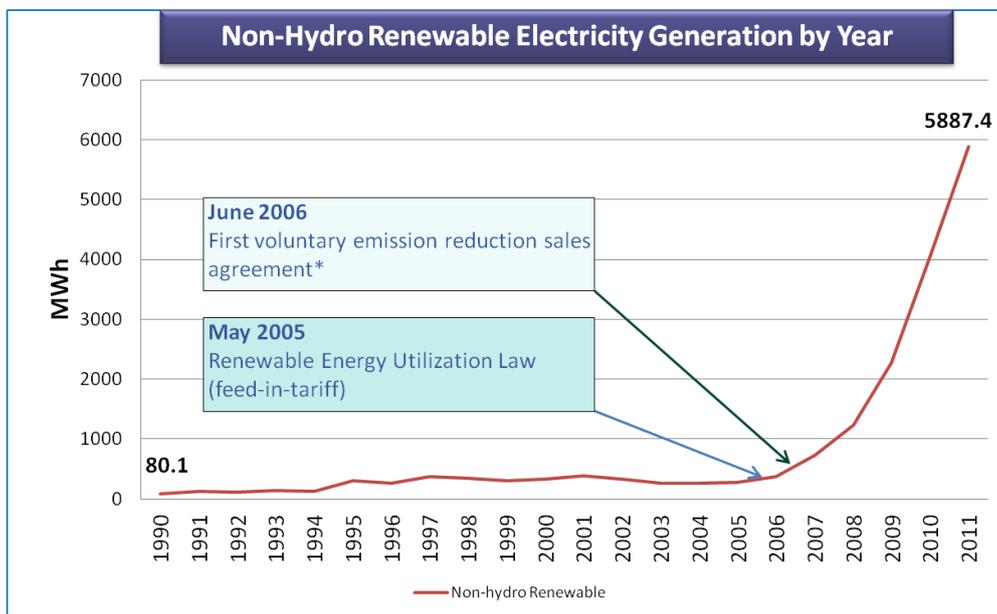


Figure 11 Development of Electricity Generation from Non-Hydro Renewables by Years

2.5 Carbon market experience

In the period 2008-2012, participation in the Voluntary Carbon Markets (VCMs) has been the only market tool for Turkey. Approximately 218 VCM projects were developed and/or implemented in Turkey in that period. Majority of these projects focus on renewable energy sources such as hydroelectricity, wind, and geothermal, yet there are also other projects focusing on industrial energy efficiency projects, power generation from waste and biomass. The number of projects in Turkey and their respective emission reduction estimations are shown in the table below.

¹⁵ For further information on ongoing mitigation measures in Turkey, please refer to BB-2

¹⁶ TEIAS: [http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/uretim%20tuketim\(22-45\)/36.xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/uretim%20tuketim(22-45)/36.xls)

Table 3 Number of VCM Projects and their respective emission reduction values¹⁷

Project Type	Number of Projects	Annual GHG Reduction Potential (tCO ₂ e)
Hydropower	124	7,181,723
Wind power	64	5,603,468
Bio-gas	6	514,789
Geothermal	6	405,309
Energy Efficiency	5	151,432
Landfill Gas	13	2,473,093
TOTAL	218	16,329,814

Circular on the Registry of Projects for Greenhouse Gas Mitigation by the MoEU was prepared to ensure a more effective functioning of voluntary carbon markets and to provide guidance to project developers.

This circular took effect following its publication in the Official Gazette No. 27665 on 07.08.2010. The main objective behind registering these projects is to increase the credibility of carbon certificates that are developed in Turkey. Diagram below shows the functioning of the registry (Figure 12).

VCM and Future Market Based Mechanisms

The VCM has played a critical role in helping with the realization of emission reduction projects and increasing climate change related awareness in Turkey.

Project based market mechanisms (especially CDM-PoA) are important for formulating NAMA activities and establishment of national/international crediting mechanisms. Current project based experiences in VCM will be helpful for Turkey on structuring any possible sectoral/national/international crediting mechanisms in the future.

If possible, Turkey would like to link current VCM projects with any future market based mechanisms in order to let emission reduction project continue to benefit from new market(s).

¹⁷ Gold Standard and VCS, 2012

Turkey – Market Readiness Proposal – (03.05.13)

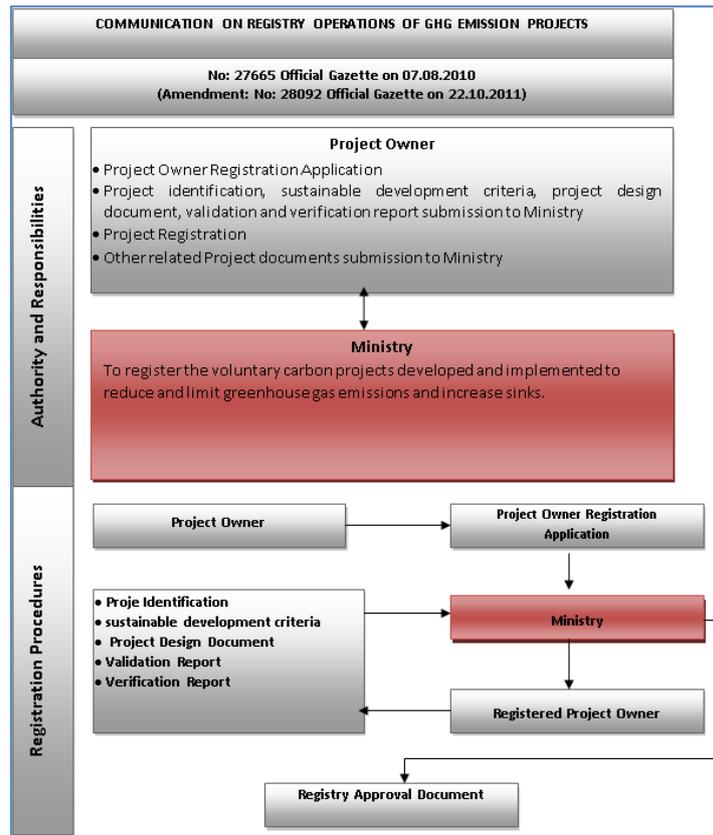


Figure 12 Diagram of VCM Project Registration

3 Building Block 2: Policy Landscape, Objectives and Preparatory Work to Support and Inform Policy Decisions

3.1 Policy-mapping to develop a comprehensive picture of inter-dependent policies and issues affecting climate policy objectives

3.1.1 Mapping of Existing Domestic Climate Policies

As Turkey's main socio-economic policy document, the Development Plan, prepared under the supervision of the Ministry of Development and to be approved by the Turkish Grand National Assembly (Grand Assembly), covers all pertinent aspects of development. The Ninth Development Plan (Plan), the latest plan that was approved by the Grand Assembly, covers the period of 2007-2013, and states the country's vision as follows: *"Turkey, a country of information society, growing in stability, sharing more equitably, globally competitive and fully completed her coherence with the European Union"*¹⁸

To sustain stable economic growth and social development during the Ninth Development Plan period and to realize the vision stated in the Plan, the following strategic objectives have been determined as development axes:

- Increasing Competitiveness,
- Increasing Employment,
- Strengthening Human Development and Social Solidarity,
- Ensuring Regional Development,
- Increasing Quality and Effectiveness in Public Services.

The issue of climate change is considered under the *Protecting the Environment and Improving the Urban Infrastructure* objective of 'Increasing Competitiveness' axis within the Plan with the following target:

"In the framework of the conditions of Turkey, and with the participation of the relevant parties, a National Action Plan that sets forth the policies and measures for reducing greenhouse gas emissions will be prepared. Thus, responsibilities concerning UN Framework Convention on Climate Change will be fulfilled".

Both the Plan and the NCCS aim at preparing the National Climate Change Action Plan (NCCAP), which shall set forth the policies and measures for reducing greenhouse gas emissions. Governed by the main policy documents, the NCCAP becomes the essential roadmap for climate change related policies including the targets for mitigation measures and the adaptation activities.

NCCAP considers market-based mechanisms as an instrument for fulfilling the objective of *"optimum usage of emission trading mechanisms that contribute to cost-effective limitation of greenhouse gas*

¹⁸ Ministry of Development: <http://www.mod.gov.tr/en/publications/Ninth%20Development%20Plan%202007-2013.pdf>

emissions”. PMR funding will support Turkey, to study national ETS and other MBIs in different sectors.

Environment Law¹⁹ includes a provision about using carbon trading as a market instrument to promote clean technologies. Article-3, sub-article (h) of the Law states: *“For the purposes of protection of the environment, prevention and mitigation of environmental pollution, besides compulsory standards, market based mechanisms, economic instruments and incentives such as taxation, fee and contribution payment, promotion of renewable energy and clean technologies, emission fee and pollution charge and carbon trading shall be used.”*

The most significant development regarding climate change policies has been the introduction of the MRV Regulation as explained in BB-1. Further information on MRV regulation is provided in BB-3.

Energy Efficiency Strategy Paper for 2012-2023²⁰ (EESP), prepared by the Ministry of Energy and Natural Resources (MoENR), was approved by the Higher Planning Council in February 2012. The main objective of this strategy is to reduce the ratio of energy consumption per GDP by minimum 20 per cent relative to 2011, by the year 2023. The Energy Efficiency Strategy Paper (EESP) also includes an activity for establishment of market-based instrument for GHG emission mitigation activities. According to the activity code no. SP-07/ST-05/A-01, a strategy paper for the establishment of the carbon stock market shall be prepared within the 18 months following several workshops to be organized with active participation of stakeholders.

Furthermore, “Istanbul International Financial Center Strategy and Action Plan” was approved for 2012-2015. The strategy aims to establish the carbon stock market, commence the trading of carbon and GHG emissions, and develop derivatives based on these instruments. The Plan does not include activities for creating demand for carbon products to be traded in the stock market. During the design phase of the action plan, the carbon market is envisioned as an exchange platform for emission reduction certificates (CERs, VERs, ERUs etc.)

Energy Efficiency Law and Renewable Energy Law, though not directly related with the climate policy, are the most important legislations to promote mitigation activities and low/zero carbon technologies. The Energy Efficiency Law and its secondary legislation entitled the “National Energy Efficiency Movement”, which were put into force in 2007 and 2008 respectively, provide the legal basis and the appropriate measures to promote and support energy efficiency. The two missions established by the Energy Efficiency Law is to make Turkey a country with low energy intensity and to maximize the benefits from energy²¹.

The Renewable Energy Law was enacted in 2005 to enhance the attractiveness of the Turkish electricity market for renewable energy generators and increase the use of the renewable energy

¹⁹ Environment Law : <http://www.mevzuat.adalet.gov.tr/html/631.html> (in Turkish, Article-3, sub-article (h))

²⁰ See: http://www.eie.gov.tr/eie-web/duyurular/EV/EV-Strateji_Belgesi/Energy_Efficiency_Strategy_Paper_2012.pdf (page 18)

²¹ Ref: <http://www.emra.org.tr/documents/electricity/legislation/EnergyEfficiencyLaw.doc>

potential. An amendment recently approved in the Grand Assembly differentiates between sources in providing incentives on the bases of cost to enhance their efficiency²².

3.1.2 Experience with the use of market and non-market based approaches

Turkish Environment Law has a provision related to the use of market-based instruments, such as carbon trading, and non-market instruments, such as taxation and pollution charge to fulfil environmental objectives (see 3.1.1).

In practice, Turkey has limited experience on the implementation of market-based instruments to meet its policy objectives. For some of these objectives, such as increasing the share of renewable energy sources in its electricity generation portfolio or the promotion of energy efficiency measures in industrial facilities, Turkey has preferred to use regulative (non-market) instruments in order to obtain financial support. Among these regulative instruments is the long-term purchasing guarantee with fixed prices. Although in some cases, such as the renewable energy incentives, the associated supporting costs are distributed to other market participants based on their volume of trade for electricity, cost distribution is (generally/ordinarily) being performed directly by the system operator without the involvement of any other participants.

The NCCAP and the EESP both propose planned activities for the establishment of a carbon market mechanism(s) for the purpose of creating financing opportunities for GHG emission mitigation.

The voluntary carbon market, while not being regulated under any official legislation, has played an important role in helping Turkey achieve its ambitious target of utilizing renewable energy sources at an utmost level, with providing additional financial support to such projects.

3.1.3 Consideration of non-market instruments in NCCAP and EESP

The NCCAP also considers non-carbon market instruments, such as taxation and incentive mechanisms, to support mitigation activities and low carbon technologies. Taxation is mostly considered for the transport sector to limit greenhouse gas emissions from motor vehicles or supporting cabotage transport. Incentive mechanisms are rather considered for supporting energy efficiency and renewable energy utilization activities.

Another non-market instrument, considered in the EESP, is the use of administrative sanctions for buildings exceeding the minimum amount of CO₂ emissions established within the pertinent legislation by the year 2017²³.

3.2 Institutional Framework for Climate Policy Making

²² Ref : <http://www.emra.org.tr/documents/electricity/legislation/ElectricityMarketLaw.doc>

²³ Ref: http://www.eie.gov.tr/eie-web/duyurular/EV/EV-Strateji_Belgesi/Energy_Efficiency_Strategy_Paper_2012.pdf (page 10)

The Coordination Board on Climate Change (CBCC) is the main policy making body on climate change related issues in Turkey. CBCC is responsible for taking the necessary precautions to mitigate the negative effects of climate change, increasing the efficiency of studies conducted in the area of climate change, ensuring the coordination and distribution of responsibilities among public and private sectors, and designing national and international climate change policies by taking into consideration the national circumstances of Turkey.

CBCC was established by the Prime Ministerial Circular No. 2001/2 and was restructured in 2004, following Turkey's accession to the UNFCCC. In 2010 CBCC's remit was expanded with the participation of new members. Under the coordination and chairmanship of the Ministry of Environment and Urbanization, the members of the CBCC involves Ministry of Foreign Affairs, Ministry of Energy and Natural Resources, Ministry of Science Industry and Technology, Ministry of Food Agriculture and Livestock, Ministry of Transport, Maritime Affairs and Communications, Ministry of Finance, Ministry of Economy, Ministry of Health, Ministry of Development, Undersecretary of Treasury, Union of Chambers and Commodity Exchanges of Turkey (TOBB) and Turkish Industrialists' and Businessmen's Association (TÜSİAD).

Eleven (11) Technical Working Groups have been designated within the scope of CBCC in order to implement sectoral analysis and projects (Figure 13). These working groups are responsible to prepare national studies and policies based on their designated subject areas. In order to improve their efficiency, the technical working groups, have been undergoing structural reorganization. CBCC also consults with a group of independent experts from Non-Governmental Organizations (NGO's), universities and private sector representatives during both decision-making and technical working processes.

Climate Change and Air Management Department (CCAMD) under the MoEU is responsible for the development of climate change mitigation and adaptation strategies and policies. The Department develops climate change related regulations. The organizational of Chart of the CCAMD is given in Figure 14.

Turkey – Market Readiness Proposal – (03.05.13)



Figure 13 CBCC and Technical Working Groups

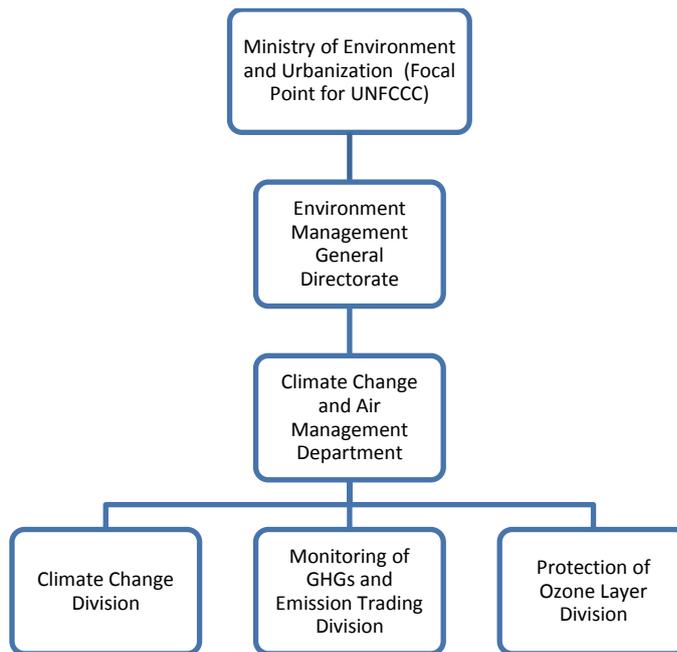


Figure 14 Organization Chart of Climate Change and Air Management and Department and its Climate Change Related Divisions

3.3 Sectoral Policy Mapping with Relation to the Climate Policy Objectives

For sectoral policy mapping analysis, strategy papers of related sectors, the NCCAP and the EESP, are evaluated as these strategy papers constitute the most essential documents considering the current conditions along with projections for the sectors, and defining future targets. The NCCAP and EESP provide essential roadmaps for sectors with drawing a framework for the climate change policies.

3.3.1 Strategy Papers of Sectors

Performing a policy mapping assessment for all sectors can be exhaustive and probably not as efficient as desired. To be pragmatic, assessment is limited to the sectors that largely contribute to the GHG emission inventory of Turkey.

Strategy papers for electricity, industry, agriculture and transport sectors are analyzed for policy mapping assessment. Residential sector, one of the most important GHG emission source, does not have a separate strategy paper but it is covered to a great extent within the NCCAP and the EESP (as Building Sector), which are elaborated in following sections.

Table 4 summarizes the objectives defined each strategy paper and an assessment with relevance to MRP.

Table 4 Assessment of Sectoral Strategy Papers for Policy Mapping

Sector	Principles and Objectives Defined in Strategy Papers	Assessment of Objectives and Relevance to MRP
Electricity ²⁴	<p>Specific targets for 2023:</p> <ul style="list-style-type: none"> Share of Natural gas shall be decreased to 30% (around 50% by the end of 2012) Share of renewable energy sources shall be at least 30% (subject to revision based on developments in technology, market and resource potential) Wind capacity shall be increased to 20,000 MW (2,300 MW by the end of 2012) Geothermal capacity shall be increased to 600 MW (160 MW by the end of 2012) All economically feasible hydropower capacity shall be utilized Domestic lignite, hard coal and solar energy shall be utilized as much as possible. <p>Overall objectives:</p> <p>E.1 Creation of market structure in a way to ensure supply security</p> <p>E.2 Targeting of creating a sustainable electricity energy market, taking into consideration <i>climate change</i> and environmental impacts in activities in all areas of the sector</p> <p>E.3 Minimizing losses in all parts of electrical system and ensuring competitive price to end-users within a competitive market</p> <p>E.4 Encouraging new technologies, ensuring diversity of resources and maximum usage of domestic and renewable resources to reduce external dependency in energy supply</p>	<p>The main target for the Electricity sector is to decrease external dependency to energy sources (natural gas, coal, oil) and increase the share of domestic sources (<i>including lignite and other fossil fuels</i>) in the utmost manner. Any carbon pricing mechanism which includes capping and trading of GHG emissions within the energy sector might be considered as a barrier for implementation of this objective. On the other hand, for the objectives of increasing efficiency in the electricity sector (increasing efficiency of existing power plants and decreasing distribution losses) and share of renewables in the generation mix, market based mechanisms (like crediting NAMA) can well be accepted by the sector.</p>

²⁴ Ref: http://www.enerji.gov.tr/yayinlar_raporlar_EN/Arz_Guvenligi_Strateji_Belgesi_EN.pdf

	<p>E.5 Increasing the share of domestic contribution in investments to be made in the sector</p>	
<p>Industry²⁵</p>	<p>Vision of the Industry:</p> <hr/> <p><i>Increasing the competitiveness and efficiency of Turkish Industry and expediting the transformation to an industry structure which has more share in world exports, where mainly high-tech products with high added value are produced, which are produced by qualified labour and are sensitive to the environment and the society</i></p> <hr/> <p>Climate Change Related Objectives:</p> <hr/> <p>I1. The possible effects of the climate change and relevant international agreements and protocols will be identified, the harmonization process of Turkish Industry with international negotiation processes regarding post-2012 climate regime will be monitored, and a position suitable for Turkey's conditions will be determined.</p> <hr/> <p>I2. Transition to a energy efficient and clean production processes in the industry will be promoted; informational activities will be planned. For this purpose, the industry will be moved to production zones enabling it to produce with organized infrastructure facilities; the greenhouse gas emissions will be controlled, monitored and reported.</p> <hr/> <p>I3. Eco-efficiency programs that comply with clean production, focus on business excellence and environmental excellence together with sustainable development, economic growth and environmental performance , and also increased competitiveness of enterprises by producing high quality products and services in accordance with the adoption of efficient use of resources and environment-friendly production principles, will be implemented throughout the country.</p> <hr/> <p>I4. Industrial Policies will be carried out in accordance with National Climate Change Strategy Document (2010-2020), EU Integrated Environmental Approximation Strategy (2007-2023), National Action Program on Combating Desertification and National Biodiversity Strategy documents.</p>	<p>Having a high-tech industry vision with sensitivity to the environment, the Strategy Paper for the Industry sector includes measures for transitioning to low energy and carbon intensive technologies, including the MRV of GHG emissions. No emission trading system is foreseen for the sector. However, a possibility of harmonization of Turkish industry system to post-2012 climate regime and adaptation of industrial policies to NCCS and EU-Environmental Approximation Strategy, gives room for consideration of market based mechanisms for GHG mitigation. Any kind of planned climate policy affecting the industry sector shall be assessed in detail and be prepared with consultation of broad representatives of the sector. The industry sector attributes great importance to international competitiveness; hence any kind of carbon pricing instrument shall be structured in a way that will not hinder international competitiveness of the sector.</p>
<p>Agriculture²⁶</p>	<p>A.1 Guide agricultural production and provide security of supply</p> <hr/> <p>A.2 Develop agricultural infrastructure, protect and improve environment and natural resources, enable sustainability and take measures to reduce the effect of natural disasters</p> <hr/> <p>A.3 Provide high quality supply of food and feed,</p>	<p>In the Agriculture Strategy Document, the climate change issue is considered within an adaptation context. It does not include any specific mitigation activities and any carbon pricing instrument(s) for GHG emission reduction.</p>

²⁵ Ref: <http://www.sanayi.gov.tr/Files/Documents/TurkiyeSanayiStratejisiIngilizce.pdf>

²⁶ Ref: <http://www.tarim.gov.tr/tr/bakanlik/stratejik-plan.html> (in Turkish). A list of objectives in English can be seen here: <http://www.tarim.gov.tr/en/ministry/strategic-plan.html>

	<p>A.4 Eradicate the diseases and pests, prevent product losses and protect public health,</p> <p>A.5 Develop agricultural infrastructure services, human resources and organization level in rural area, provide market integration, diversify the income of rural population, increase local development capacity and quality of life</p> <p>A.6 Provide perfect managerial and institutional capacity to offer efficient and qualified services.</p>	
Transport ²⁷	<p>T.1 Increasing the share of railways in freight transport (which was 5% in 2009) to 15% and in passenger transport (which was 2% in 2009) to 10% by 2023</p> <p>T.2 Decreasing the share of roads in freight transport (which was 80.63% in ton-km in 2009) below 60%, and in passenger transport (which was 89.59 in passenger-km in 2009) to 72% as of 2023</p> <p>T.3 Increasing the share of maritime in freight transport (which was 2.66% in 2009) to 10% and in passenger transport (which was 0.37% in 2009) to 4% by 2023</p> <p>T.4 Increasing the share of aviation in freight transport (which was 0.44% in 2009) to 1% and in passenger transport (which was 7.82% in 2009) to 14% by 2023</p>	<p>Transport strategy includes clear and quantified targets for share of each transport modes in 2023. Having ambitious target for aviation (doubling share in passenger transportation in 2023), national and/or international market based instruments might be considered as a barrier for fulfilment of this objective. On the other hand, NCCAP already includes consideration of some non-market instruments (like taxation) to promote maritime transport and to reduce emissions from motor vehicles.</p>

3.3.2 National Climate Change Action Plan (NCCAP)

NCCAP defines sectoral activities needed to be implemented to meet identified objectives of the action plan. Carbon market related objectives of NCCAP are provided in BB-1 and the complete set of objectives is provided in Annex-1²⁸. Setting clear targets for many sectors for mitigation activities, some of sectoral objectives of the plan are given below: NCCAP.

- Energy:
 - Reduce primary energy intensity by 10% compared to 2008 by 2015,
 - Ensure that the share of renewable energy in electricity production is increased,
 - Reduce nationwide electricity distribution losses to 8% by 2023.
- Building:
 - Decrease annual energy consumption in the buildings and premises of public institutions by 10% until 2015 and by 20% until 2023
 - At least 20% of the annual energy demand of new buildings are met via renewable energy resources as of 2017
- Industry:
 - Limiting the GHG emissions originating from energy usage (including electrical energy share) in the industry sector

²⁷ Ref: <http://www.sp.gov.tr/upload/xSPTemelBelge/files/93C5Y+Turkiye+Ulasim+velletisim+Stratejisi.pdf> (in Turkish)

²⁸ Complete set of actions, activities and plans can be seen here: http://iklim.cob.gov.tr/iklim/Files/IDEP/%C4%B0DEP_ENG.pdf

- Develop and use new technologies for limitation of GHG emissions in the industry sector until 2023
- Transport:
 - Increasing the share of railways in freight transportation (which was 5% in 2009) to 15% and in passenger transport (which was 2% in 2009) to 10% by 2023
 - Decreasing the share of roads in freight transport (which was 80.63% in ton-km in 2009) below 60%, and in passenger transport (which was 89.59 in passenger-km in 2009) to 72% as of 2023.
- Waste:
 - Reduce the quantity of biodegradable wastes admitted to landfill sites, taking year 2005 as a basis, by 75% in weight till 2015, by 50% till 2018 and by 35% till 2025
 - Establish integrated solid waste disposal facilities across the country, and dispose 100% of municipal wastes in these facilities, until the end of 2023
- Agriculture:
 - Determine and increase the quantity of carbon stock captured in the soil
 - Decrease the increase rate of GHG emissions originating from vegetal and animal production
- Land Use and Forestry:
 - Increase the amount of carbon sequestered in forests by 15% of the 2007 value by 2020 (14,500 Gg in 2007, 16,700 Gg in 2020)
 - Reduce deforestation and forest damage by 20% of the 2007 values by 2020
 - Increase the amount of sequestered carbon as a result of agricultural forestry activities by 10% of the 2007 values by 2020

3.3.3 Energy Efficiency Strategy Paper (EESP)

Overall aim of Energy Efficiency Strategy Paper (EESP) is to reduce the ratio of energy consumed per GDP (defined as energy intensity) at least 20% by 2023 compared with the 2011 levels. EESP has identified 7 strategic purposes (objectives) and related measures for the industry, electricity system, private/public buildings, electrical products, and transport. They are given below:

SP-01 : To reduce energy intensity and energy losses in industry and services sectors:

- 1) *The reduced energy intensities in each industry sub sector shall be decreased in the rates determined with the sector collaborations, but shall be at least 10% for each sub sector, within the 10 years after the publication of the Document.*

SP-02 : To decrease energy demand and carbon emissions of the buildings; to promote sustainable environment friendly buildings using renewable energy sources:

- 1) *All commercial and service buildings having total usage area of more than 10,000 m² shall have heat insulation and energy efficient heating systems by 2023.*
- 2) *At least one fourth of (1/4) building stock in 2010 shall be made as sustainable buildings by the year 2023.*

SP-03 : To provide market transformation of energy efficient products:

- 1) *The market transformation of lamps, refrigerators and electrical motors over the minimal energy efficiency classes shall be completed until the end of 2012, however, market*

transformation of heating/cooling systems and other energy efficient products shall be accomplished in parallel to the EU implementations.

SP-04 : To increase efficiency in production, transmission and distribution of electricity, and to decrease energy losses and harmful environment emissions:

- 1) *The total average cycle efficiency of the coal thermal power plants including waste heat recovery installations shall be increased over forty-five percent (45%) by the year 2023.*
- 2) *Some demand side management measures shall be developed for decreasing the electrical energy intensity at least 20% until 2023.*

SP-05 : To reduce unit fossil fuel consumption of motorized vehicles, to increase share of public transport in road, maritime and rail transport and to prevent unnecessary fuel consumption in urban transport:

- 1) *The small vehicles carrying passenger and load (M1/N1 category) shall meet the provisions of secondary legislation which would be designed in the direction of the EU legislation related to CO2 emissions and transport master plans in metropolitan cities shall be prepared and put into force.*
- 2) *The use of bio-fuels obtained from biomass sources or synthetic fuels in transport shall be promoted.*

SP-06 : To use energy effectively and efficiently in public sector:

- 1) *Annual energy consumption in the public buildings and facilities shall be decreased 10% by 2015 and 20% by 2023.*

SP-07 : To strengthen institutional capacities and collaborations, to increase use of state-of-art technology and awareness activities, and to develop financial mechanisms except public financial institutions:

- 1) *The institutional structure, capacity and mutual cooperation of implementing organizations shall be strengthened until the end of 2012.*
- 2) *The number of certified energy managers shall be increased up to at least 5,000 persons and the number of energy efficiency consultancy companies with specific sectoral experiences shall be increased up to 50 companies by end of 2015.*
- 3) *The number of original design and/or product, which would be commenced to be manufactured based on domestic R&D results, shall be at least 50 by 2023 in the areas of energy efficiency and renewable energy resources.*
- 4) *The awareness and encouragement activities carried on as part of the “National Energy Efficiency Movement” shall be promoted with the collaboration of public sector, private sector and NGOs.*
- 5) *In the context of creating sustainable financing mechanisms for energy efficiency and renewable energy projects besides existing public support, activities for establishment of carbon trading and carbon market infrastructure shall be completed within eighteen (18) months as of the publication date of the document.*

3.4 Assessment of Policy Mapping Analysis for Establishment of a Future MBIs

Based on the policy mapping analysis provided above, the following outcomes can be derived with regard to the consideration of establishment of a market-based instrument in the future:

- Turkey currently has limited experience on market-based approaches to meet its policy objectives. However, Environmental Law includes a provision that allows for the use of market-based instruments in order to meet Turkey’s environmental objectives.
- All of the strategy papers and roadmaps include clear objectives for transition to low energy and carbon intensive technologies, in that sense promotion of improvement for energy efficiency measures and utilization of renewable energy sources.
- The main sectors, having policy objectives that might be mostly affected with any future market-based carbon pricing instrument, are energy (mainly electricity), industry and transport sectors.
 - *For the energy sector*, the main objective is to decrease external fuel dependency to a reasonable and manageable level. Currently, around 60% of electricity generation is based on imported natural gas and coal. Increasing the share of exported fuel in electricity generation portfolio makes it one of most critical national security issue. Turkey aims to deploy all domestic sources (including renewable energy sources, such as wind, solar, hydro, biomass and geothermal energy, as well as fossil fuels, such as lignite and hard coal) to meet this objective. Market-based carbon pricing instruments can be used to decrease the demand for fossil fuel based electricity generation technologies and/or promote low/zero carbon technologies to help meeting this objective. On the other hand, any carbon pricing instrument shall be structured in a way that shall not be considered as a barrier for utilization of *domestic* fossil fuel based sources for electricity generation until decreasing the share of export fuel to a reasonable level, to be determined by policy makers.
 - *Industry sector* investigates the ways for transition to a low energy intensity.. Increasing energy prices, international competitiveness and change in customer behaviours towards sustainable products are the main drivers for the sector in leading into a low energy and carbon intensive and more efficient economy. The main target of the sector is to increase the international competitiveness of the sector participants and with this, to increase the share of the Turkish industry in the world’s export. Turkey has an ambitious export target for 2023 that aims at reaching to 500 Billion USD export volume from 135 Billion USD in 2011 and becoming one of the largest ten countries²⁹. Hence, any future market instrument for reducing GHG emissions shall be designed in a way that shall not hinder international competitiveness of the sector. Working in a highly competitive global market, this issue is especially important for the sectors with a risk of leakage.
 - *The transport sector* has ambitious targets of decreasing the share of road transport and increasing the share of railways, maritime travel and aviation in freight and passenger transport in the middle term. Any future market-based carbon pricing instrument shall facilitate this transition. Considerations of introducing a global/regional carbon pricing instruments for maritime and aviation and Turkey’s decision on participation to these instruments would also draw a framework for possible domestic market-based mechanism(s).

²⁹ The Export Strategy of Turkey for 2023: <http://www.economy.gov.tr/upload/strategy/strategy2023.pdf>

- NCCAP and EESP are climate change and energy efficiency oriented multi-sectoral policy documents, including long-term quantitative/qualitative objectives and monitoring mechanisms for defined objectives. Both of the documents include planned activities for consideration of establishment of a carbon market mechanism(s), for the purpose of creating financing opportunities for the GHG emission mitigation activities.

4 Building Block 3: Core Technical and Institutional/Regulatory Market Readiness Components

4.1 Data Management Systems for GHG Emission

For any market instrument, reliable and comprehensive data on GHG emissions constitutes an essential foundation to ensure environmental integrity. Currently, the most reliable and comprehensive data source in Turkey for GHG emissions is national inventories that have been periodically prepared and submitted under the United Nations Framework Convention on Climate Change (UNFCCC)

As an Annex I party to the UNFCCC., Turkey is required to develop, and submit to the UNFCCC Secretariat, annual inventories on emissions and removals of greenhouse gases, not controlled by the Montreal Protocol, using the Intergovernmental Panel on Climate Change (IPCC) methodology and IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.

Additionally, in April 2012, Turkey adopted a framework regulation for the monitoring, reporting, and verification (MRV) of GHG emissions from facilities within the industry and energy sectors. Accordingly, installations with a capacity over a certain limit will be required to submit their GHG emissions by 2016. The first monitoring year of compliance is 2015, and obligated entities need to prepare their monitoring plans and submit them to the MoEU by June 2014.

Detailed information on current GHG Inventory system and the MRV regulation for industry and energy sectors are provided in following sections.

4.1.1 Current GHG Inventory System of Turkey

Turkey prepared its first national inventory report (NIR) and common reporting format (CRF) tables for the period 1990 – 2004 and submitted to the UNFCCC Secretariat in 2006. The NIR and CRF tables are prepared by the Turkish Statistical Institute (TurkStat) and sent to the UNFCCC Secretariat by TurkStat as the focal point of Turkish National Emission Inventory. By 2012, Turkey submitted its seventh NIR to the UNFCCC for the period of 1990 - 2010³⁰. This inventory covers all emissions and removal sources described in the IPCC Guidelines.

Covered within the NIR are direct greenhouse gases, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), sulphur hexafluoride (SF₆), perfluorocarbon (PFC) and indirect greenhouse gases, including nitrogen oxides (NO_x), carbon monoxide (CO), non-methane volatile organic compounds (NMVOC), and sulphur dioxide (SO₂).

TurkStat is responsible for the national inventory of greenhouse gases in Turkey as per the Official Statistical Programme designed by the Statistics Law #5429 and CBCC decision dating March 25, 2009. The inventory is prepared as a joint work by TurkStat, Ministry of Food, Agriculture and

³⁰ GHG Inventory submissions of Turkey are available in UNFCCC website:
http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php

Husbandry, MoEU, MoTMAC, Ministry of Forest and Water Affairs and MENR. Each sub-source category is prepared by the responsible organization, and the findings are compiled by TurkStat. Figure 14 shows Turkish GHG Inventory system.

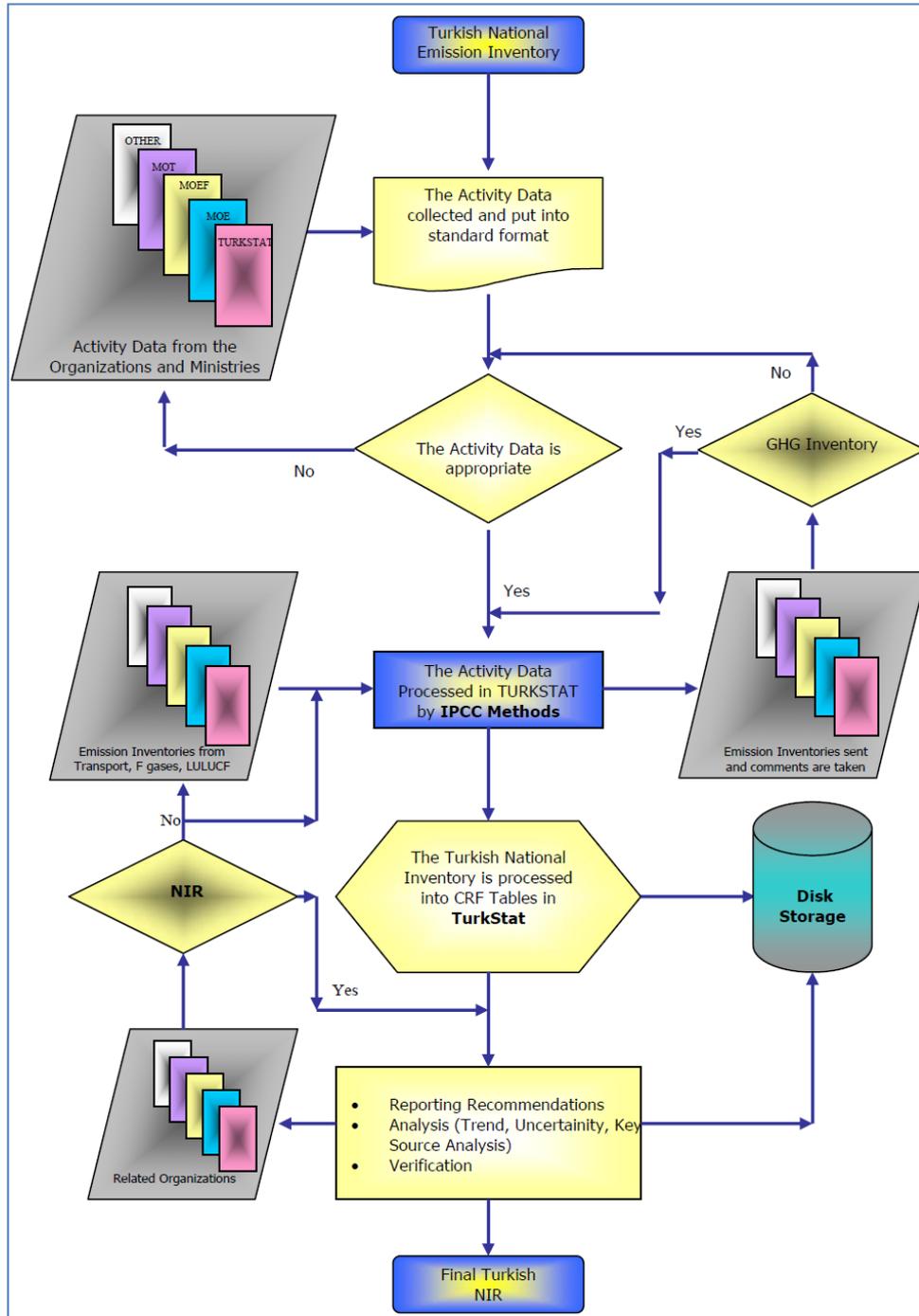


Figure 15 National GHG Emission Inventory System of Turkey

Table 3 shows the institutions responsible for preparing and overseeing the activity data, as well as the institutions responsible for calculations by IPCC inventory sectors. TurkStat is responsible for

coordinating the activities of all institutions involved in the inventory preparation process of each sector.

Table 5 Relevant institutions responsible for the activity data, methods and calculations

Source / Sink Category	Activity Data Collection	Methods and emission factors selection	Calculations
Energy	MENR	TurkStat	TurkStat
Public Heat and Electricity Production	MENR	MENR	MENR
Transport	MENR, MoTMAC	MoTMAC	MoTMAC
Industrial Processes	TurkStat	TurkStat	TurkStat
Industrial Processes – - Cement	Turkish Cement Manufacturer's Association	TurkStat	TurkStat
Industrial Processes – - Lime	Turkish Lime Association	TurkStat	TurkStat
Industrial Processes – Primary Aluminum Production	Seydişehir Aluminum Plant	TurkStat	TurkStat
Industrial Processes – 2.F	Ministry of Customs and Trade, TurkStat	MoEU	MoEU
Solvents – 3.A.	Automotive Manufacturer's Association	TurkStat	TurkStat
Solvents	TurkStat	TurkStat	TurkStat
Agriculture	TurkStat	TurkStat	TurkStat
LULUCF	Ministry of Forestry and Water Works; Ministry of Food, Agriculture and Livestock	Ministry of Forestry and Water Works; Ministry of Food, Agriculture and Livestock	Ministry of Forestry and Water Works; Ministry of Food, Agriculture and Livestock
Waste	TurkStat	TurkStat	TurkStat

4.1.1.1 Energy Balance Tables and GHG Emission Inventory Calculation for Energy Sector

According to the IPCC, emissions from the energy sector are released mainly from the fuel combustion. Approximately 90% of the total CO₂ emissions are from fuel consumption. As is the case for almost all countries, the energy sector is the largest GHG emitter in Turkey.

The Ministry of Energy and Natural Resources is the responsible body for collecting, analyzing, and publishing the data on overall energy statistics.

The data related to energy activities is collected from all existing energy industries within access. The sectoral and reference approach calculations are based on this data, and for the basis for the spreadsheets and balance sheets, each providing information on a certain fuel type or a main sector. Those tables are, then, used to create the main balance sheet which represents the whole energy sector, constituting the main data source for energy related GHG emission calculations.

The Balance Tables provide detailed information on sectoral fuel consumption. End users are described as Industrial Sector, Transport Sector, Residential Sector, Agriculture Sector and Non-Energy uses.

4.1.2 MRV Regulation

On 25 April 2012, Turkey adopted the Regulation on Monitoring of Greenhouse Gas Emissions [hereinafter “Regulation”]. The objective of this legislation is to regulate the principles and procedures concerning the monitoring, verification, and reporting of the greenhouse gas emissions originating from the activities listed in Annex-1 of the Regulation.

Regulation further describes the duties and responsibilities of competent authorities and the responsibilities of enterprises, operators, and verifiers authorized by the MoEU.

Activities that are included in Annex-I are listed below:

- Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
- Refining of mineral oil
- Production of coke
- Metal ore (including sulphide ore) roasting or sintering, including pelletisation
- Production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2.5 tonnes per hour
- Production or processing of ferrous metals (including ferro-alloys) where combustion units with a total rated thermal input exceeding 20 MW is operated. Processing includes, inter alia, rolling mills, re-heaters, annealing furnaces, smithereens, foundries, coating and pickling
- Production of primary aluminium
- Production of secondary aluminium where combustion units with a total rated thermal input exceeding 20 MW are operated
- Production or processing of non-ferrous metals, including production of alloys, refining, foundry casting, etc., where combustion units with a total rated thermal input (including fuels used as reducing agents) exceeding 20 MW are operated
- Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
- Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day
- Manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day
- Manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day
- Manufacture of mineral wool insulation material using glass, rock or slag with a melting capacity exceeding 20 tonnes per day

- Drying or calcination of gypsum or production of plaster boards and other gypsum products, where combustion units with a total rated thermal input exceeding 20 MW are operated
- Production of pulp from timber or other fibrous materials
- Production of paper or cardboard with a production capacity exceeding 20 tonnes per day
- Production of carbon black involving the carbonisation of organic substances such as oils, tars, cracker and distillation residues, where combustion units with a total rated thermal input exceeding 20 MW are operated
- Production of nitric acid
- Production of adipic acid
- Production of glyoxal and glyoxylic acid
- Production of ammonia
- Production of bulk organic chemicals by cracking, reforming, partial or full oxidation or by similar processes, with a production capacity exceeding 100 tonnes per day
- Production of hydrogen (H₂) and synthesis gas by reforming or partial oxidation with a production capacity exceeding 25 tonnes per day
- Production of soda ash (Na₂CO₃) and sodium bicarbonate (NaHCO₃)

Greenhouse gas emissions will be monitored within the framework of the principles set by the MoEU. Monitoring of GHG emissions can be done either by calculation or measurement.

Operators are obliged to prepare a greenhouse gas emission monitoring plan for each installation and shall monitor greenhouse gas emissions as per the monitoring plan and the procedures and rules to be established by the Ministry. Monitoring plans will be submitted to the Ministry for its approval at least six months before the first date of the monitoring year (starting 2015). Monitoring plans will be valid for a fixed period, which will be determined by the Ministry.

It is mandatory that the monitoring plan and the greenhouse gas emission report for greenhouse gas emissions from operators executing the activities listed in Annex-1 be verified before being submitted to the Ministry.

The verification activities for the greenhouse gas emissions shall be carried out by the verifiers authorized by the Ministry. The entities willing to perform verification activity under this Regulation shall apply to the Ministry. Ministry provides the authorization to perform verification activities to the verifiers satisfying the required conditions. MoEU will authorize verifiers being accredited by the Turkish Accreditation Agency (TÜRKAK) for verification activity.

The verifiers to perform verification activities under this Regulation must be accredited in accordance with the ISO 14065 Standard, with due regard to relevant scope by TÜRKAK. Entities not accredited by TÜRKAK cannot apply to obtain an authorization certificate from MoEU.

Figure 16 below shows a framework scheme of the regulation on monitoring of GHG emissions.

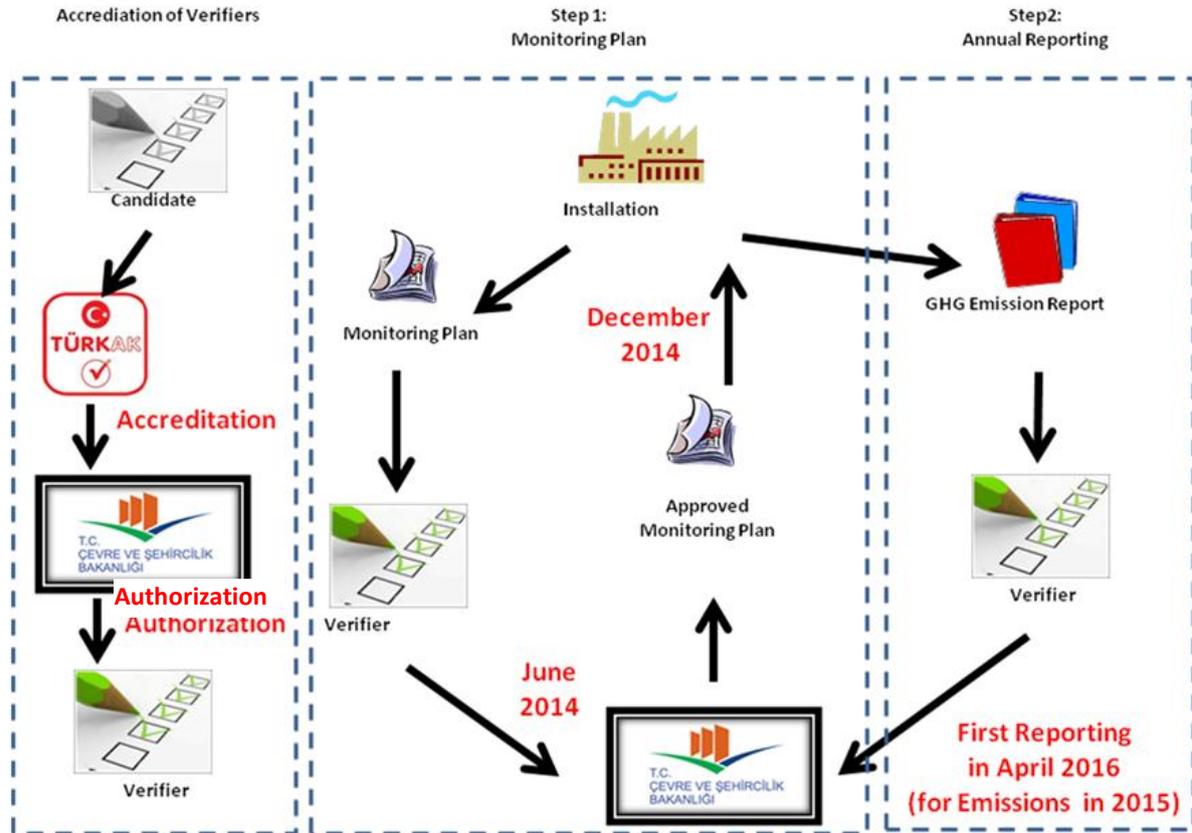


Figure 16 Framework Scheme for MRV Regulation

4.2 Assessment of Market Readiness for Data Management System

Putting an EU-ETS based MRV regulation into force was an important step for Turkey to start designing the essential part of any MBI, which is having a reliable data system for GHG emissions. Turkey, now, needs to accomplish other requirements to make this regulation functional. This section provides a needs assessment and to-do-list with budget and timeline, for the full implementation of MRV Regulation (*iMRV*) and studying the MRV system for sectors not covered within the existing MRV regulation.

4.2.1 Additional Legislation Needs for *iMRV*

MRV Regulation is a framework legislation defining the general principles and requirements of GHG emission monitoring, reporting, and verification activities for installations in the energy and industry sectors. It also regulates the conditions for becoming an accredited verifier and specifies the timeline for activities for MRV. Thanks to its robust verification requirement, the MRV regulation of Turkey will provide high quality and reliable data from covered entities.

MoEU is currently preparing an EU-ETS compatible secondary legislation (under the technical partnership between Turkey and Germany) that will provide detailed principles and procedures on

several issues, as described below, and aiming for the completion of such secondary legislation by the end of 2013:

1) *Monitoring and Reporting Guidelines*: Defining detailed procedures of monitoring and reporting requirements for each activity category in Annex-1 of the regulation, including Tier approaches to be used for each activity level/category, QA/QC procedures, uncertainty calculation, calibration rules; and information to be included in monitoring reports, etc.

2) *Verification and Accreditation Guidelines*: Defining the rules and requirements for verifiers for accreditation and authorization, and principles for verification of monitoring plans/reports, including conflict of interest, penalties for violation of principles, etc.

Additional legislation necessities shall be identified and prepared in order to ease the implementation of the regulation. This shall include the necessary amendments in existing legislation (especially on the environment law and secondary legislation) to incorporate requirements of the MRV regulation.

During the preparation of secondary legislation and other legal instruments, the necessary data and information requirements (like output data, including historical data and projections) from entities/facilities for implementation of possible market based instruments will be considered. For this purpose, data requirements for emission trading systems in other countries will be analyzed.

As it was the case for the preparation process of the Regulation on Monitoring of GHG Emissions, all legislation preparation activities will involve an intensive consultation with stakeholders from sector representatives, institutions, NGOs, etc.

4.2.2 Technical and Infrastructural Needs for Data Management System

A good data management and registry system, which Turkey currently lacks, is also essential for the effective functioning of an MRV system and controlling the GHG emissions from related sectors. Such data management system shall be designed in a way to integrate and harmonize data requirement of other institutions for relevant purposes (taxation, statistic, GHG Inventory, etc.), in an utmost manner. Extensive and duplicative data requirements from entities may create high operational cost, and thus, may significantly decrease the willingness for effective participation within an MRV system and/or market based mechanism for GHG emission reduction.

MRV regulation does not cover sectors other than industry and energy, nor does it cover installations under a certain capacity. For uncovered sectors like housing, agriculture, transport, and waste, a different MRV system may be established, taking into account the complexity of these sectors.

For the purpose of integrating or linking existing voluntary carbon market to a future market based mechanism, database and registry systems shall be designed in a way to include data from voluntary projects, including emission reduction potentials, co-benefits with sustainable development perspectives (environmental, socio-economic, technological), amount of issued and retired credits, etc.

Database management and registry system (including a document exchange system) shall utilize web-based user friendly technologies in the best way in order to ensure robustness and effectiveness of the system.

4.2.3 Institutional and Organizational Needs for Data Management System

Existing MRV Regulation aims at high quality data on information for GHG emissions from entities/installations covered. Thus, it includes strict requirements for both operators and verifiers during all of the steps of the MRV process.

It is estimated that thousands of installations will be covered by the MRV regulation. Hence significant amount of accredited and authorized verifiers will be needed for the verification of the monitoring plans/reports. Considering the tight timeline for the implementation of the MRV regulation, a condensed and intensive campaign on capacity building of relevant stakeholders and accreditation and authorization of verifiers shall be implemented to prevent any delay with respect to the established timeline for the first implementation and reporting year of the regulation.

The capacity of MoEU and other CBCC members shall be increased in order to organize and implement the above-mentioned necessities, including the establishment of a competent and robust data management and registry system, authorization of verifiers, and organizing training activities for relevant sector participants.

Training and capacity building activities shall include sectors not covered within the existing MRV regulation with a perspective of developing an appropriate MRV system for these sectors, which might be the basis for the implementation of a future market based instrument.

In addition to the verifiers, operators covered by the regulation shall be trained to ensure smooth implementation of the monitoring and reporting requirements of the regulation. For this purpose, a technical support team will conduct site visits to selected installations from the energy and industry sectors, as those sectors have the highest GHG emissions in Turkey. The sectors to be visited are as follows:

- Public Electricity and Heat Production
- Petroleum Refining
- Iron and Steel
- Chemicals
- Cement production
- Other

An appropriate mix of the fuels and technology commonly used in Turkey has to be ensured for the selection of the sites.

The purpose of the site visits is to fill in the gaps and check for the quality of the applied emission factors and the reported Activity Data (AD). If gaps are detected in ADs and/or calculation factors,

proposals will be presented to rectify. Additionally, proposals for improvement, in line with the MRV guidance, will be provided.

During the support process, a periodic, technical assessment of progress will be made by the experts with an emphasis on:

- Activity data collection
- Gap filling and adjustments
- Application of emission factors
- Preparation of necessary data for the MRV
- QC checks
- Uncertainty analysis.

To ensure the smooth and timely implementation of the MRV regulation and prepare a better MRV system, a pilot MRV shall be implemented for facilities that volunteer to participate in such piloting. This pilot program will include activities for the preparation of monitoring plans and reports, and their verification, one year before the compliance year as per the regulation. It shall also include reporting to the MoEU.

4.3 List of Needs for *iMRV* and Data Requirements for Other Sectors

For a full implementation of MRV regulation (*iMRV*), the following are the main additional needs:

1. Preparation of secondary and complementary legislations for *iMRV*
2. Establishment of a robust web-based database and registry system
3. Training and capacity building activities for stakeholders on *iMRV*, including a piloting of the MRV regulation.

The total budget for these activities is estimated at US\$4,100,000 (see section 4.5 below for detailed breakdown).

Needs assessment for data requirements and MRV system for the sectors not covered under the existing MRV Regulation, will be considered under BB-4, in the report on *Recommendations for Selection of Market Based Instruments and Sectors for Modelling*.

4.3.1 To-do-list for *iMRV*

Turkey-Germany Technical Partnership for Capacity Building on MRV

Turkey and Germany has initiated a partnership on MRV. The objective of this technical partnership is to develop and enhance the capacity of Turkey in order to implement the installation level MRV system in accordance with the national legislation. For that purpose, Turkey and Germany decided to include the below-mentioned activities to the existing project on the implementation of joint projects for environmental protection in Turkey, enacted in October 2006:

Planned timeline for the project implementation:

2013/Q3 – 2015/Q1

Estimated budget:

2,500,000 EUR (3,250,000 USD)

Project Activities:

1. Development of an MRV implementation system
 - a. Selection of the software
 - b. Technical support for a web based reporting and verification system
 - c. Training of the trainers for the system
 - d. Piloting the data management system
 - e. Technical consultancy to establish a national registry system
2. Development of Sector Specific Guidelines and other legislative requirements for Monitoring and Reporting of Emissions (for all the activities listed in Annex 1 of the Regulation)
 - a. Technical consultancy to develop monitoring and reporting guidelines
 - b. Technical support to develop verification guidelines
3. Training and Capacity Building Activities for all shareholders
 - a. Training of Trainers:
 - i. For operators of the installations
 - ii. For carbon consultants
 - iii. For verifiers
 - iv. For Turkish Accreditation Agency (TURKAK)
 - v. For government representatives (for instance: MoEU, Ministry of Energy and Natural Resources, Ministry of Science Industry and Trade, etc.)
 - vi. For Sectoral Unions and Organizations (for instance: Turkish Industry and Business Association, The Union of Chambers and Commodity Exchanges of Turkey, Turkish Cement Manufacturers' Association, etc.)
 - b. Establishment of an MRV Training Centre, under the authority of MoEU, to certify and train the experts, trainers and other persons that will carry out the services as specified in the MRV Regulation, development of the training materials
4. Development of a proposal for legislative requirements to implement MRV
 - a. Translation of German legislation on MRV
 - b. Analysis on the inclusion of new sectors into the scope of the Regulation (for example waste and aviation sectors)
 - c. Preparation of a proposal for legislative requirements
 - d. Workshops and meetings

Other needs

As can be seen from the list of the Turkey-Germany Technical Partnership activities on MRV, to be funded and coordinated by GIZ, most of the needs for *iMRV* can be covered by that project.

An additional activity that is needed as part of the *iMRV* but not covered under the Turkey-Germany technical partnership is the piloting of MRV regulation. The piloting will enhance the capacity building of operators and other relevant parties with respect to the requirements of the MRV regulation. Piloting will include the preparation of monitoring plans, monitoring reports, and verification of GHG emissions for the facilities that voluntarily participate in the piloting program.

Electricity sector have already expressed an interest in participating in the piloting. During the PMR implementation phase, other willing sectors/facilities covered by the MRV regulation may be included in the piloting.

The cost of the MRV piloting, in total for 3 years of implementation, is estimated to be 700,000 USD. This amount is being requested from the PMR. This fund may also supplement GIZ fund, during the implementation of the activities identified for *iMRV*.

During the implementation phase, at least 5 staff from related divisions of MoEU will devote significant time to *iMRV* activities for about 3 years. The corresponding amount of that contribution for *iMRV* activities is estimated to be 450,000 USD, which constitutes almost half of the total contribution of 5 staff for all of the activities identified in this MRP (950,000 USD in total), as provided in BB-6.

The estimated timeline for the implementation of the above-listed activities and corresponding budget are provided in section 4.5

4.4 Target/Goal setting for market instruments

Turkey does not currently have any identified targets for market-based instruments. The background studies, which are explained and listed in BB-4 Part-II, will be presented to the decision makers for their consideration on implementation of market based instrument(s), including goal setting by implementation.

4.5 ToR(s) and Proposed Budget

Objective	Rationale
1. Preparation of secondary and complementary legislations for <i>iMRV</i>	In order to ensure successful implementation of MRV regulation, complementary regulations and guidelines shall be prepared.
2. Establishment of robust web-based database and registry system	A robust web-based database and registry system is the essential part of any MRV system
3. Training and capacity building activities for stakeholders on <i>iMRV</i> , including a piloting of the MRV regulation.	Public/private stakeholder trainings and capacity building activities are the key issue for success of MRV system.

Deliverables

Deliverable(s)	Description	Party Responsible for Ensuring Action
a) Guidelines for monitoring, reporting and verification b) Amendments of existing legislations, and enforcement of new complementary regulations	Supporting legislative works for <i>iMRV</i>	GIZ and MoEU
MRV Database and Registry System	A web-based robust system shall be established for data management system of MRV regulation	MoEU

Budget

Source of Funding BB-3 Activities and Needs	Budget (USD)
National Government	450,000 USD
Others (GIZ)	2, 950,000 USD
PMR	700,000 USD
TOTAL	4,100,000 USD

Breakdown of the cost to the activities and years are given in below table:

Table 6 Timeline and Budget for Implementation of Activities identified under BB-3

Activities	Timeline										Budget (x1000 USD)			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Y1	Y2	Y3	Total
<i>iMRV</i>											2,500	1,300	300	4,100
1. Preparation of Additional Legislations for <i>iMRV</i>														300
a. Technical consultancy to develop monitoring, reporting and verification guidelines											200			200
b. Other legislative works for <i>iMRV</i>											100			100
2. Establishment of Robust Web-based Database and Registry System														2,500
a. Selection of the software											100			100
b. Technical support for a web based reporting and verification system											100			100
c. Training of the trainers for this system											100			100
d. Piloting the data management system											100			100
e. Technical consultancy to establish a national registry system											100			100
f. Procurement of Software and Establishment of the System											1,000	1,000	0	2,000
3. Training and Capacity Building Activities for Stakeholders on <i>iMRV</i>														1,300
a. Training of Trainers (gov. and business representatives, operators, verifiers, consultants, etc.)											300			300
b. Establishment of an MRV Training Centre											100	100	100	300
c. MRV Piloting											300	200	200	700

5 Building Block 4: Planning for a Market-based Instrument

Turkey is now in a “pre-decision” phase and wants to explore options for market-based instruments. Given Turkey’s circumstances, the objective for BB-4 is to identify market-based options and share these options with relevant government decision-makers to facilitate a decision on a market instrument.

Exploration of activities for identification of options for market based-instruments shall include preparation of sectoral analyses, projections, and assessments on possible implications of implementation of different kind of market-based instruments, based on these sectors’ and long-term macro-level targets of Turkey.

Part-I of BB-4, provides an assessment for market readiness perspective including a SWOT and policy-mapping analysis. Part-II provides needs assessment for facilitation decision on implementation of market based instrument(s) (*DoMBI(s)*).

5.1 PART I - Assessment for Market Readiness

The policy mapping analysis provided in BB-2 reveals ambitious targets for the relevant institutions and sectors with respect to Turkey’s transition towards low energy intensity economy. Turkey has already accomplished significant achievements in increasing the capacity of renewable energy and promoting energy efficiency activities, which are significantly contributing to this target. All these steps demonstrate that both public and private entities have already gained momentum towards making the low carbon principle one of their essential strategic objectives.

One of the most important strengths of Turkey regarding any possible market-based mechanism is having a stringent regulation on MRV of GHG emissions covering facilities in major sectors (energy and industry). Having a reliable GHG monitoring system for installations is the essence of any market-based instrument. Thus, in the case of a decision for implementation of a piloting system for a market-based mechanism(s) after a detailed assessment, Turkey will be able to structure/integrate the mechanism over MRV system and apply it smoothly to the related sectors.

Policy mapping assessment also reveals that the momentum created up to now for the transition to low energy intensive economy is mostly due to non-market mechanisms and instruments. The main driver of this momentum is the public support (as in the case of the feed-in-tariff or the tax reduction) or legal instruments, such as penalty or high taxation. The lack of a market-based experience might be a disadvantage in the eyes of the participants of planned market mechanisms in the future. Also without performing the necessary analysis, modelling, and impact assessments, and most importantly, an intensive and inclusive stakeholder consultation process, consideration of the implementation of market-based mechanism(s) (such as the piloting in selected sectors) might not be as successful as desired.

Therefore, the preparation phase for structuring a market-based instrument(s) to meet the GHG emission reduction objective shall start with the education and capacity building activities for the public/private stakeholders with respect to the functioning of such market instruments. It shall also include an assessment of the pros and cons of these instruments compared to the non-market instruments.

Based on the foregoing discussion and the policy mapping assessment, the SWOT analysis for the establishment of market-based mechanism(s) for reduction of GHG emissions in Turkey is provided below:

Table 7 SWOT Analysis for Establishment of Market Based Mechanism(s) in Turkey

<p><u>Strengths:</u></p> <ol style="list-style-type: none"> 1. Already applying a strong strategy towards a more efficient industry and a low energy intensive economy 2. Having a strong MRV regulation covering major sectors (energy and industry) 3. Having a strategy paper and an action plan on climate change, covering all emitting sectors 4. Having established a high level coordination body on climate change (CBCC) 5. EU Membership Process (declaration of the harmonization of legislations under the Environmental chapter) 6. Provision for utilization of market-based instruments in Environment Law 7. Increasing awareness between corporation on sustainability (including carbon footprinting/inventory, carbon-neutrality) 8. Experiences from GHG Inventory Preparation and voluntary emission reduction market. 	<p><u>Weaknesses:</u></p> <ol style="list-style-type: none"> 1. Limited experience in using market-based instruments to meet policy objectives 2. Uncertainties in international negotiations under UNFCCC for new market mechanisms and various approaches. 3. Lacking essential analysis/models for implementation of market-based instruments 4. Lack of legal, technical and institutional infrastructure for a market-based instrument(s) 5. Lack of knowledge between sector participants on possible market-based mechanisms 6. Limited public awareness towards climate friendly products/services 7. High energy costs (oil, natural gas) 8. Manufacturing based economy (GHG intensive)
<p><u>Opportunities:</u></p> <ol style="list-style-type: none"> 1. High economic development potential 2. Increasing awareness towards market mechanisms with implementation of MRV regulation 3. Establishment of an increasing number of new markets in other countries/regions 4. Favourable developments in international negotiations 5. Increasing the public demand for climate friendly products/services 6. Bilateral agreements with other countries for GHG emission trading 	<p><u>Threats:</u></p> <ol style="list-style-type: none"> 1. Strong objections from sector participants 2. Failure or ineffectiveness of market based mechanisms in other countries 3. Nationwide or global economic recessions 4. Increased dependency on fossil fuels or energy supply disruptions 5. Competition loss risk for the industry

The SWOT analysis provided above demonstrates that the establishment of any possible market based instrument(s) in Turkey needs detailed analyses and assessments on both domestic and international policies while taking into account socio-economic conditions, long term projections, and sectoral targets of Turkey.

The main dimensions that would determine the framework of a possible market based instrument(s) are given in Figure 17.

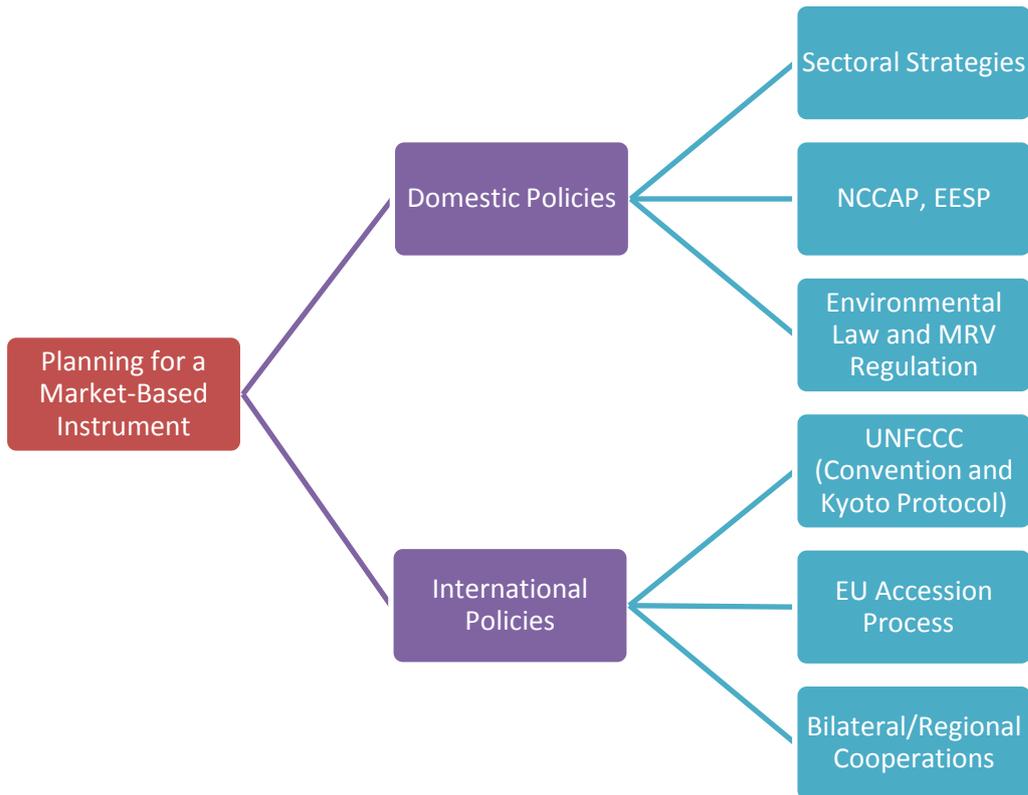


Figure 17 Dimensions for Planning Market-based Instrument(s) for Turkey

Based on the above figure, it can be concluded that the planning for *DoMBI(s)* shall consider:

- fulfilment of Turkey’s existing objectives/targets defined under environmental law, sectoral strategies, climate change action plans, and related strategies (NCCAP, EESP),
- Turkey’s ongoing international negotiations for market based instrument(s) under UNFCCC, EU Accession Process, and Bilateral Agreements.

5.2 PART II - Needs Assessment for *DoMBI(s)*

Based on above market readiness assessment provided in Part-I, the following analytical and modelling works, at the very least, are identified as necessary for the relevant *DoMBI(s)* in the sectors covered and not covered by MRV regulation:

- A comprehensive long term GHG emission projections and Marginal abatement cost curves (MACCs) shall be prepared for each sector/sub-sector contributing to the GHG inventory of Turkey. These projections shall include forecasting of GHG emission inventory of Turkey in the mid- and long-term, based on different scenarios and assumptions for socio-economic, technological, and political factors. Projections shall be based on high quality data to be gathered from most of the sector participants and shall be regularly updatable (**Report on GHG Emission Projections and Sectoral MACCs (cost to be covered from the national budget)**)
- For the electricity sector covered by the MRV regulation, an analysis on different emission trading systems that are being implemented in EU and other countries/regions shall be performed. This study shall take into account the national and sectoral strategies and various models for cap setting, benchmarking, and allocation of allowances (including grandfathering and auctioning). In this context, it would be crucial to set key design criteria in alignment with the governmental objectives that could facilitate the process of designing elements for the selection of a proper ETS for MRV sectors. The study shall also include an analysis for the design of an ETS considering a future linkage to the other ETS schemes including EU-ETS (**Report on Consideration of ETS for the Electricity Sector**)
- For the sectors covered and not covered by MRV regulation, decision on selection of appropriate mechanism(s), such as accrediting NAMAs and new market mechanisms considered under the UNFCCC shall be prepared, including a needs assessment for technical (MRV system), legal, human capacity, infrastructure, and organizational framework for building the market(s) and the evaluation of their strengths and weaknesses. This report shall also consider a demand assessment for credits and possible linkage to other similar markets. (**Report on Recommendations for Selection of Market Based Instruments and Sectors for Modelling**)
- After the selection of mechanism(s) and sector(s)/subsector(s), the modelling and simulation works, based on different scenarios and with a sensitivity analysis, shall be performed in order to assess the implications of implementing ETS types for the electricity sector covered by the MRV regulation (including EU-ETS) and selected MBIs for the sectors covered and not covered within the MRV regulation, including a comparison of model results with other non-market or legal instruments. (**Report on GHG Market Modelling and Outcomes for Selected Sectors**)

- A general policy options and recommendation document shall be prepared, based on the outcomes of all foregoing analysis and modelling. Such document shall be the essential document for policy makers for *DoMBI(s)* in selected sectors for a defined period. A plan for the implementation of market instrument(s) shall include a piloting period for the selected sector in order to establish the necessary organizational and infrastructural necessities appropriately. (***MBIs for GHG Emission Reduction Objective – Policy Options and Recommendations Report***)
- Trainings of relevant stakeholders on ETS and other MBIs to be studied.

Electricity sector, which is one of the main sectors contributing to the GHG emissions in Turkey, already indicated its interest and willingness for an assessment of ETS for their sector. Such willingness is crucial for the comprehensiveness and high quality of the analysis, which are essential factors for a successful implementation of any market based instrument. This is also important to create awareness for such assessments for other sectors covered by MRV regulation and sectors not covered by the regulation.

Above-mentioned analytical studies and impact assessments will provide the basis for the decision makers for the implementation of appropriate MBIs in the relevant sectors.

Timeline and Budget

Timeline and budget for the deliverables and activities identified under BB-4 are provided in section 5.1

As explained in BB-1 above, the cost of the “Report on GHG Emission Projections and Sectoral MACCs” will be covered from the national budget.

The cost of other deliverables and training to be provided to stakeholders will be requested from PMR, considering that they constitute the core of the market readiness assessment. The total of cost of these deliverables and activities are estimated to be 1,300,000 USD.

5.3 ToR(s) and Proposed Budget

Objectives and Rationale

The objective and rationale for activities, analysis, and reports identified in BB-4 involve ensuring that the necessary analytical studies and impact assessments are performed in a successful manner in order to create the basis for the implementation of appropriate MBIs in associated sectors.

Deliverables

Deliverable(s)	Description	Party Responsible for Ensuring Action
Report on Consideration of ETS for the Electricity Sector	Analysis on different ETS being implemented in EU and other countries/regions shall be prepared for the electricity sector.	Carbon Market Technical Working Group under CBCC and MoEU
Report on Recommendations for Selection of MBIs and Sectors for Modelling	Analysis of crediting NAMA and new market mechanisms considered under UNFCCC shall for the sectors covered and not covered by MRV regulation.	Carbon Market Technical Working Group under CBCC and MoEU
Report on GHG Market Modelling and Outcomes for Selected Sectors	Report on outcomes of modelling and simulation works based on different scenarios, assessing the implications of implementing market mechanism(s) for relevant sector(s), and comparison of model results with other non-market or legal instruments.	Carbon Market Technical Working Group under CBCC and MoEU
Market Based Instruments for GHG Emission Reduction Objective – Policy Options and Recommendations Report	A general policy options and recommendation report to be prepared for decision makers, based on outcomes of all above analysis and modelling works.	Carbon Market Technical Working Group under CBCC and MoEU

Budget

Source of Funding BB-4 Activities and Needs	Budget (USD)
National Government	1,700,000 USD
Others	0
PMR	1,300,000 USD
TOTAL	3,000,000 USD

Breakdown of the costs to the activities and years are given in below table:

Table 8 Timeline and Budget for Implementation of Activities identified under BB-4

Activities	Timeline										Budget (x1000 USD)			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Y1	Y2	Y3	Total
<i>DoMBI(s)</i>											650	1,350	1,000	3,000
a. Report on GHG Emission Projections and Sectoral MACCs											450	800	450	1,700
b. Report on Consideration of ETS for the Electricity Sector												400		400
c. Report on Recommendations for Selection of MBIs and Modelling												150		150
d. Report on GHG Market Modelling Outcomes for Selected Sectors													350	350
e. MBIs for GHG Emission Reduction Objective – Policy Options and Recommendations Report													200	200
f. Training of Stakeholders (gov. and business representatives, operators, verifiers consultants, etc.)											200			200

6 Building Block 5: Organization, Communication, Consultation and Engagement

6.1 Organizational framework for MRP activities and decision making process

As explained in BB-3 and BB-4, Turkey's necessities for consideration of implementation of any market based instrument(s) are categorized in two aspects:

- Implementation of existing MRV Regulation – *iMRV* and,
- Preparation for an informed decision making process on the use of market based instrument(s) – *DoMBI(s)*

The main implementing unit for MRP activities will be “Monitoring of GHGs and Emission Trading Division” (Division) of the Climate Change and Air Management Department (CCMAD) at the MoEU. This division currently has 5 staff. All of the staff will commit most of their time to the implementation of MRP activities. However, the capacity of the Ministry and its related division shall be increased and supported with experts on MRV and MBIs, to have a better implementation of MRP activities. For that purpose, a “MRV and MBI Working Team” will be established under the CCMAD of the MoEU. In addition to the 5 staff from the division, the team is expected to have 4 new technical experts, among whom one will be responsible for *iMRV* activities to be funded by GIZ.

Responsibilities of “MRV and MBI Working Team” are given below:

- 1) Coordination and implementation of activities/deliverables for *iMRV*
- 2) Coordination and implementation of activities/deliverables for *DoMBI(s)*
- 3) Coordination of stakeholder consultations, trainings for *iMRV* and *DoMBI(s)* and public awareness activities
- 4) Overall daily management of the PMR project and other responsibilities to be defined by CBCC, CMTWG and CCAMD.

Carbon Market Technical Working Group (CMTWG - coordinated by MoEU) and Climate Change and Air Management Department (CCMAD) under the MoEU, will be the main responsible bodies for the implementation of MRP activities and will submit the progress reports to the CBCC members regularly (monthly or several times a year, to be defined). CMTWG will work closely with other Technical Working Groups under CBCC in all stages of the PMR implementing phase.

During the implementation phase of the MRP activities, the responsibility of CBCC will be as follows:

- Overall responsibility for the implementation of activities identified for *iMRV* and *DoMBI(s)*.
- Decision making for selection of appropriate market based instrument(s) for relevant sector(s) not covered by MRV regulation for modelling.

- Decision making for implementation of market instrument(s) for decided sector(s) for a defined period, including a piloting term, and submission to Council of Ministries for consideration.

Organizational chart for decision making and implementation of MRP activities is given below:

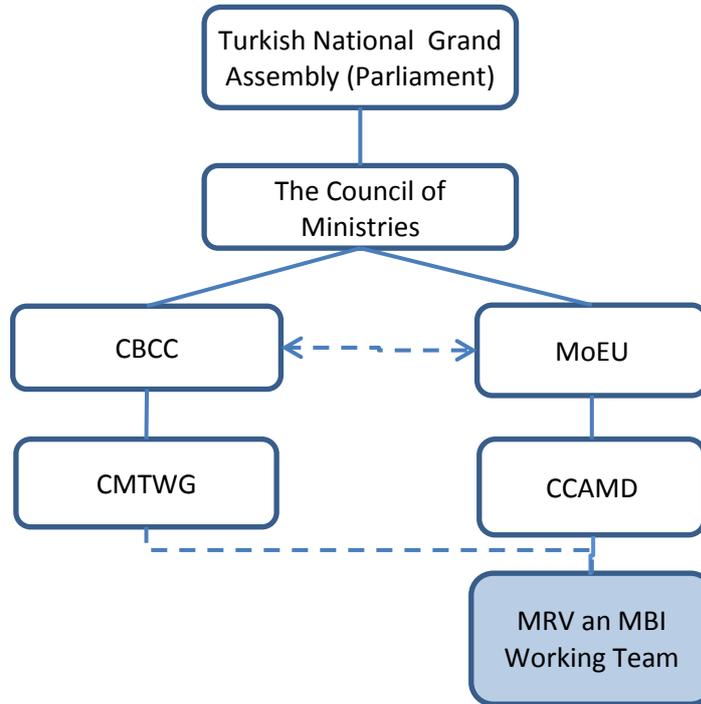


Figure 18 Organizational Chart of MRP Implementation

In above organization:

Turkish National Grand Assembly (Parliament): is the organization who adopts laws/amendment of laws with regard to implementation of climate change related issues.

The Council of Ministries: is the organization who prepares proposal for laws/amendments of law and submit to the Parliament for adoption.

CBCC: is the main organization body which is responsible to establishes strategies and plans for climate change related issues (detail information is provided in BB-2 and below).

CMTWG: is the technical working group responsible from consideration and assessment of market based instruments for GHG reduction activities.

CCAMD: is responsible for implementation of climate change strategies and operational activities

MoEU: is responsible for all environmental related issues including protection and prevention of pollution.

6.2 Stakeholder Consultation, Communication and Engagement

CBCC and CCAMD have involved stakeholders from very broad areas during the preparation and implementation of existing strategy documents. As an evidence to this approach, NCCAP has identified responsible organizations and stakeholders for implementation of each action tables defined under the Plan³¹, which demonstrates active involvement of different interest groups, not only for preparation of the strategies but also implementation of related climate change activities.

This pro-active stakeholder engagement process will continue during the implementation of MRP activities, including trainings and capacity building activities for related groups.

A broader stakeholder group, including the following actors, will play a crucial role in both the decision-making and public awareness processes for MRP activities:

Sector Groups: Involvement of representatives from key industries and facilities across all relevant sectors and subsectors that potentially would take a part in the selected market mechanism shall be aimed. Strong engagement with these sectors through their high level representatives will be essential in terms of facilitating the decision making process while particularly involvement with their technical staff, who could contribute by providing detailed and technical inputs, will also be crucial.

Non-governmental and academic groups: Civil society, including environmental non-governmental organizations (NGOs), is also critical for the process by means of applying participatory approach. Consultation with NGOs while raising their understanding of market instruments would be important for overcoming a strongly polarized national landscape on market mechanisms, as their involvement in the process could ensure broad support for the project as well as for larger level of public engagement.

Research organizations and academia are also considered as important players of the process, with the ability to influence the process by providing technical inputs and comments while promoting respective capacity building and research activities within their organizations. Consulting with professors and researchers in thie appropriate fields would ensure more valued discussions over policy implications.

Media groups: Educating multi-media by ensuring their involvement in the respective phases of the projects is also vital for a successful public education and engagement campaign, which shall ensure a consistent and transparent flow of information to a larger group of stakeholders.

6.2.1 Preliminary List of Stakeholders Identified for Implementation of MRP Activities

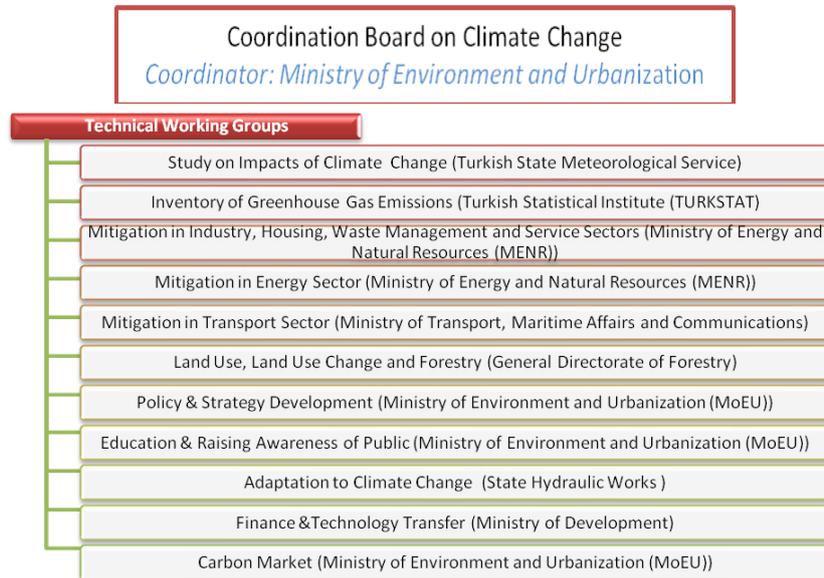
³¹ NCCAP (action Tables from page 76 to 171):

http://www.cem.gov.tr/erozyon/Files/faaliyetler/dis_iliskiler/iklim_degisikligi_cerceve_sozlesmesi/Cevre_Bak_Ulusal_Eylem_Planı_ing_2011_2023_2_.pdf

Based on this assessment, stakeholder groups identified for consultation, communication, and engagement (including training activities) for MRP activities are provided below. These groups are open to be extended during the implementation of the activities.

Public Institutions:

a) Members of CBCCC and Technical Working Groups under CBCC



b) Other Public Institutions

Turkey – Market Readiness Proposal – (03.05.13)

Other Public Institutions

- Turkish Accreditation Institution
- Turkish Statistical Institution
- Ministry of National Education
- Ministry of Culture and Tourism
- Ministry for European Union Affairs
- Ministry of Internal Affairs
- Municipalities
- Capital Markets Board of Turkey
- Istanbul Stock Exchange
- Istanbul Gold Exchange
- Energy Efficiency Coordination Board
- Energy Market Regulatory Authority

b) Non-Gouvernemental/Non-Profit Organisations/Groups :

Non-Profit/Non-
Governmental
Stakeholders

- Universities
- Media Groups
- DOEs/Carbon Management Consultants
- Business and industry NGOs,
- Environmental NGOs (ENGO),
- Workers Union/Confederations
- Local government and municipal authorities,
- Research and independent NGOs (RINGO),
- Trade union NGOs(TUNGO),
- Farmers NGOs
- Women and gender NGOs (Women and Gender),
- Youth NGOs (YOUNGO)
- Others

6.3 ToR(s) and Proposed Budget

Objective	Rationale
Establishment of MRV and MBI Working Team	Establishment a team for smooth implementation of activities and works identified within this MRP.
Conferences and Workshops on <i>iMRV</i> and <i>DoMBI(s)</i>	Perform capacity building activities especially to related public institutions and sector representatives and other stakeholders to be identified; through, conferences, workshops, study visits, trainings, etc. (to be coordinated by MRV and MBI Working Team)
Meetings with related stakeholders for consultation of <i>iMRV</i> and <i>DoMBI(s)</i>	Holding sufficient amount of meetings with private sector representatives and public institutions in order to ensure successful implementation of <i>iMRV</i> and preparation of appropriate analysis/reports for <i>DoMBI(s)</i> .
Public Awareness Activities (Media activities, high level public/private meetings etc.)	Conduct consultations with identified stakeholders and public awareness activities (to be performed by MRV and MBI Working Team)

Deliverables

N/A

Budget

It is estimated that the cost of staff time to be devoted to MRP activities will be around 950,000 USD for 3 years, the estimated implementation duration. 500,000 USD of this amount is allocated as contribution for the MRV and MBI Working Team from the national budget.

For that purpose, a “MRV and MBI Working Team” will be established under CCAMD of MoEU. In addition to the 5 staff from the division, the team is expected to have 4 new technical experts. Total contribution of GIZ for the team is estimated to be 300,000 USD.

Source of Funding BB-5 Activities and Needs	Budget (USD)
National Government	500,000 USD
Others (GIZ)	300,000 USD
PMR	1,000,000 USD
TOTAL	1,800,000 USD

Breakdown of the costs to the activities and years are given in below table:

Table 9 Timeline and Budget for Implementation of Activities identified under BB-5

Activities	Timeline										Budget (x1000 USD)			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Y1	Y2	Y3	Total
<i>Stakeholder Consultation/Engagement and Public Awareness Activities</i>											200	150	150	500
a. Conferences and Workshops on <i>iMRV</i> and <i>DoMBI(s)</i>											100	50	50	200
b. Meeting with related stakeholders for consultation of <i>iMRV</i> and <i>DoMBI(s)</i>											50	50	50	150
c. Public Awareness Activities (Media activities, high level public/private meetings etc.)											50	50	50	150
<i>Establishment of "MRV and MBI Working Team"</i>											500	500	300	1,300
TOTAL											700	650	450	1,800

7 Building Block 6: Summary of Activities, Timeline and Budget

The overall timeline of the MRP implementation is estimated to be about 3 years through the end of 2016.

Table 10 below, provides combination of activities, deliverables, timeline and budget identified in BB-3, BB-4 and BB-5 and Table 11 provides distribution of all MRP activities to the source of funding with PMR request.

Table 10 Timeline and Budget for Implementation of Activities identified under BB-3, BB-4 and BB-5

	Activity	Timeline										Budget (x1000 USD)			
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Y1	Y2	Y3	Total
BB-3	<i>iMRV</i>											2,500	1,300	300	4,100
	1. Preparation of Additional Legislations for <i>iMRV</i>														300
	a. Technical consultancy to develop MRV guidelines											200			200
	b. Other legislative works for <i>iMRV</i>											100			100
	2. Establishment of Robust Web-based Database and Registry System														2,500
	a. Selection of the software											100			100
	b. Technical support for a web based reporting and verification system											100			100
	c. Training of the trainers for this system											100			100
	d. Piloting the data management system											100			100
	e. Technical consultancy to establish a national registry system											100			100
	f. Procurement of Software and Establishment of the System											1,000	1,000	0	2,000
	3. Training and Capacity Building Activities for Stakeholders on <i>iMRV</i>														1,300
	a. Training of Trainers (gov. and business representatives, operators, verifiers consultants, etc.)											300			300
	b. Establishment of an MRV Training Centre											100	100	100	300
c. MRV Piloting											300	200	200	700	

BB-4	DoMBI(s)										650	1,350	1,000	3,000
	a. Report on GHG Emission Projections and Sectoral MACCs										450	800	450	1,700
	b. Report on Consideration of ETS for the Electricity Sector											400		400
	c. Report on Recommendations for Selection of MBIs and Modelling											150		150
	d. Report on GHG Market Modelling Outcomes for Selected Sectors												350	350
	e. MBIs for GHG Emission Reduction Objective – Policy Options and Recommendations Report												200	200
	f. Training of Stakeholders (gov. and business representatives, operators, verifiers consultants, etc.)										200			200
BB-5	Stakeholder Consultation/Engagement and Public Awareness Activities										200	150	150	500
	a. Conferences and Workshops on <i>iMRV</i> and <i>DoMBI(s)</i>										100	50	50	200
	b. Meeting with related stakeholders for consultation of <i>iMRV</i> and <i>DoMBI(s)</i>										50	50	50	150
	c. Public Awareness Activities (Media activities, high level public/private meetings etc.)										50	50	50	150
	Establishment of "MRV and MBI Working Team"										500	500	300	1,300
TOTAL											3,850	3,300	1,750	8,900

Table 11 Budget of MRP Activities and Source of Funding with PMR Request

BB	Activity	Total Cost of Activities	Source of Funding (x1000 USD)		
			PMR Funding Request	National Government	Other (GIZ)
BB-3	Implementation of MRV Regulation (<i>iMRV</i>)	4,100	700	450	2,950
BB-4	Informed Decision on Implementation of MBI(s) - (<i>DoMBI(s)</i>)	3,000	1,300	1,700	0
BB-5	Stakeholder Consultation/Engagement and Public Awareness Activities	500	500	0	0
BB-5	Establishment of "MRV and MBI Working Team"	1,300	500	500	300
	TOTAL	8,900	3,000	2,650	3,250

Annex-1 Complete Set of Objectives in NCCAP

ENERGY

PURPOSE	OBJECTIVE
PURPOSE E1. Reducing energy intensity	OBJECTIVE E1.1. Reduce primary energy intensity by 10% compared to 2008 by 2015 as a result of implemented and planned policies and measures
	OBJECTIVE E1.2. Develop the capacity for energy efficiency by 2015
	OBJECTIVE E1.3. Support R&D activities on energy efficiency
	OBJECTIVE E1.4. Increase the amount of incentives given by MENR for energy efficiency applications by 100% until 2015
PURPOSE E2. Increase the share of clean energy in energy production and use	OBJECTIVE E2.1. Ensure that the share of renewable energy in electricity production is increased
	OBJECTIVE E2.2. Develop capacity by 2015 so as to increase utilization of renewable energy resources
	OBJECTIVE E2.3. Ensure technological development by 2020 for energy production from renewable energy resources
PURPOSE E3. Limit GHG emissions originating from use of coal in electricity production, by using clean coal technologies and taking efficiency-increasing measures	OBJECTIVE E3.1. Increase the average cycle efficiencies of existing coal-fired thermal power plants until 2023
PURPOSE E4. Reduce losses and illicit use in electricity distribution	OBJECTIVE E4.1. Reduce nationwide electricity distribution losses to 8% by 2023

BUILDING

PURPOSE	OBJECTIVE
PURPOSE B1. Increase energy efficiency in buildings	OBJECTIVE B1.1. Establish heat insulation and energy-efficient systems meeting standards in commercial and public buildings with usable areas larger than 10 thousand square meters and in at least 1 million residential buildings by 2023
	OBJECTIVE B1.2. Effective implementation of the Regulation on Energy Performance in Buildings (EPB) and other energy efficiency regulations until 2017
	OBJECTIVE B1.3. Develop instruments that will provide the necessary financial support with regard to energy efficiency, renewable energy and EPB until the end of 2013
	OBJECTIVE B1.4. Issuing “Energy Performance Certificates” to all buildings until 2017
	OBJECTIVE B1.5. Decrease annual energy consumption in the buildings and premises of public institutions by 10% until 2015 and by 20% until 2023
PURPOSE B2. Increase renewable energy use in buildings	OBJECTIVE B2.1. At least 20% of the annual energy demand of new buildings met via renewable energy resources as of 2017

PURPOSE B3. Limit greenhouse gas emissions originating from settlements	OBJECTIVE B3.1. Reduce greenhouse gas emissions in new settlements by at least 10% per settlement in comparison to existing settlements (which are selected as pilot and the greenhouse gas emissions of which are identified until 2015) until 2023
---	--

INDUSTRY

PURPOSE	OBJECTIVE
PURPOSE S1. Increase energy efficiency in the industry sector	OBJECTIVE S1.1. Making legal arrangements for energy efficiency and limitation of greenhouse gas emissions
	OBJECTIVE S1.2. Limiting GHG emissions originating from energy usage (including electrical energy share) in the industry sector
PURPOSE S2. Decrease the CO2 equivalent intensity per GDP produced in the industrial sector until 2023	OBJECTIVE S2.1. Developing the financial and technical infrastructure for limitation of GHG emissions
	OBJECTIVE S2.2. Develop and use new technologies for limitation of GHG emissions in the industry sector until 2023
PURPOSE S3. Strengthen the capacity of the industry sector for combating climate change	OBJECTIVE S3.1. Building the information infrastructure for limitation of GHG emissions in the industry sector until 2015

TRANSPORTATION

PURPOSE	OBJECTIVE
PURPOSE U1. Developing an intermodal transport system and ensuring balanced utilization of transport modes in freight and passenger transport	OBJECTIVE U1.1. Increasing the share of railways in freight transport (which was 5% in 2009) to 15% and in passenger transport (which was 2% in 2009) to 10% by 2023
	OBJECTIVE U1.2. Increasing the share of maritime transport in cabotage freight transport (which was 2.66% in ton-km in 2009) to 10%, and in passenger transport (which was 0.37% in passenger-km in 2009) to 4% as of 2023
	OBJECTIVE U1.3. Decreasing the share of road transport in freight transport (which was 80.63% in ton-km in 2009) below 60%, and in passenger transport (which was 89.59 in passenger-km in 2009) to 72% as of 2023
	OBJECTIVE U1.4. Preparing and putting in practice the “Transport Master Plan” until 2023
PURPOSE U2. Restructuring urban transport in line with sustainable transport principles	OBJECTIVE U2.1. Limiting emission increase rate of individual vehicles in intercity transport
	OBJECTIVE U2.2. Developing the necessary legislation, institutional structure and guidance documents until the end of 2023 for implementation of sustainable transport planning in cities
PURPOSE U3. Dissemination of the use of alternative fuels and clean vehicle technologies in the transport sector	OBJECTIVE U3.1. Making legal arrangements and building capacity to increase use of alternative fuels and clean vehicles until 2023
	OBJECTIVE U3.2. Taking local measures to encourage use of alternative fuel and clean vehicles in urban transport until 2023

PURPOSE U4. Increasing efficiency in energy consumption of transport sector	OBJECTIVE U4.1. Limiting the energy consumption in transport until 2023
---	---

WASTE

PURPOSE	OBJECTIVE
PURPOSE A1. Ensure Effective Waste Management	OBJECTIVE A1.1. Reduce the quantity of biodegradable wastes admitted to landfill sites, taking year 2005 as a basis, by 75% in weight till 2015, by 50% till 2018 and by 35% till 2025
	OBJECTIVE A1.2. Establish integrated solid waste disposal facilities across the country, and dispose 100% of municipal wastes in these facilities, until the end of 2023
	OBJECTIVE A1.3. Finalize Packaging Waste Management Plans
	OBJECTIVE A1.4. Establish the recycling facilities foreseen within the scope of the Solid Waste Master Plan with the EU-aligned Integrated Waste Management approach
	OBJECTIVE A1.5. Termination of uncontrolled disposal of wastes 100% by 2023

AGRICULTURE

PURPOSE	OBJECTIVE
PURPOSE T1. Increase the sink capacity of the agriculture sector	OBJECTIVE T1.1. Determine and increase the quantity of carbon stock captured in the soil
	OBJECTIVE T1.2. Identifying and increasing topsoil and subsoil biomass
PURPOSE T2. Limitation of greenhouse gas emissions from agriculture sector	OBJECTIVE T2.1. Identify the potential GHG emissions limitation in agriculture sector
	OBJECTIVE T2.2. Decrease the increase rate of GHG emissions originating from vegetal and animal production
PURPOSE T3. Develop information infrastructure and capacity in the agriculture sector	OBJECTIVE T3.1. Build the information infrastructure that will meet the needs of the agriculture sector in adapting to and combating climate change

LAND USE AND FORESTRY

PURPOSE	OBJECTIVE
PURPOSE O1. Increase the amount of carbon sequestered in forests	OBJECTIVE O1.1. Increase the amount of carbon sequestered in forests by 15% of the 2007 value by 2020 (14,500 Gg in 2007, 16,700 Gg in 2020)
PURPOSE O2. Reduce deforestation and forest damage	OBJECTIVE O2.1. Reduce deforestation and forest damage by 20% of the 2007 values by 2020
PURPOSE T3. Develop information infrastructure and capacity in the agriculture sector	OBJECTIVE T3.1. Build the information infrastructure that will meet the needs of the agriculture sector in adapting to and combating climate change
PURPOSE O3. Limit the negative impact of land uses and changes such as forests, pastures, agriculture and settlements on climate change	OBJECTIVE O3.1. Integrate the climate change factor in land use and land use changes management strategies by 2015
	OBJECTIVE O3.2. Increase the amount of sequestered carbon as a result of agricultural forestry activities by 10% of the

	2007 values by 2020
	OBJECTIVE O3.3. Identify the amount of sequestered carbon in pastures and meadows in 2012, and increase carbon stock 3% by 2020
	OBJECTIVE O3.4. Identify the existing carbon stock in wetlands in 2012, and maintain the level until 2020
	OBJECTIVE O3.5. Identify the quantity of carbon stored in settlement areas in 2012, and increase stored carbon 3% by 2020 through green planting
PURPOSE O4. Strengthen legal and institutional structure for combating climate change with regard to land use and forestry	OBJECTIVE O4.1. Make necessary legal arrangements for combating climate change with regard to land use and forestry by the end of 2013
	OBJECTIVE O4.2. Strengthen institutional capacity in institutions involved in land use and forestry on climate change by 2014

CROSS CUTTING ISSUES

PURPOSE	OBJECTIVE
PURPOSE Y1. Establish necessary infrastructure for a robust emission inventory	OBJECTIVE Y1.1. Monitoring and reporting of greenhouse gas emissions from key sources using at least Tier 2 methodologies as of the beginning of 2016
PURPOSE Y2. Develop policy for environmental protection, and strengthening implementation capacity in consideration of climate change and within the framework of sustainable development principles	OBJECTIVE Y2.1. Strengthening the existing information base for low-carbon development on the basis of sustainable development principles as of 2015
PURPOSE Y3. More effective utilization of financial resources for combating and adaptation to climate change	OBJECTIVE Y3.1. Strengthening the capacity to access financial resources for combating and adaptation to climate change until the end of 2013, ensuring more effective use of new funding resources until 2020
PURPOSE Y4. Optimum usage of emission trading mechanisms that contribute to cost-effective limitation of greenhouse gas emissions	OBJECTIVE Y4.1. Carrying out negotiations to ensure Turkey's participation in the most advantageous way into the existing and new global and regional carbon markets until 2013
	OBJECTIVE Y4.2. Carry out studies to establish the carbon market in Turkey by 2015
PURPOSE Y5. Ensuring coordination in climate change combating and adaptation activities to increase effectiveness	OBJECTIVE Y5.1. Finalize legal arrangements on combating and adaptation to climate change until 2014
	OBJECTIVE Y5.2. Strengthen the institutional capacities of CBCC members with regard to combating climate change and adaptation until 2014
PURPOSE Y6. Carrying out Turkey's regional climate modelling studies and analyzing the effects of climate change	OBJECTIVE Y6.1. Developing analysis and impact assessment capacities until 2016 through climate observation, forecasting, and regional climate model studies

PURPOSE Y7. Develop R&D and innovation capacity for eco-efficiency with regard to combating climate change and adaptation	OBJECTIVE Y7.1. Strengthen R&D and Innovation capacity for clean production until 2014
PURPOSE Y8. Improve human resources with regard to combating climate change and adaptation to climate change	OBJECTIVE Y8.1. Inclusion of combating and adaptation to climate change in the academic programmes of universities as of end of 2012
PURPOSE Y9. Increase public awareness to change consumption patterns into climate friendly manner	OBJECTIVE Y9.1. Make necessary arrangements in the education programmes until the end of 2012 so as to develop climate-friendly consumption patterns
	OBJECTIVE Y9.2. Organize public awareness raising campaigns for combating climate change until 2014

Annex-2 Sectoral GHG Emission Analysis

Main sectors and subsectors, largely contributing to the GHG Emissions of Turkey are provided below:

- Energy
 - Energy Industries
 - Manufacturing Industries and Construction
 - Transport
 - Other Sectors (Residential and others)
- Agriculture
- Waste

A-2.1 Energy

As shown in Figure 7 in BB-1, the energy sector has the largest share in the overall GHG emissions between the year 1990 and 2010.

Within the energy sector, the highest CO₂ emission increase is observed in energy industries sub-sector with 230% increase in 2010 comparing to 1990. It is followed by residential sector with 115% increase, and by transport sector with 71% increase. The total CO₂ increase in fuel combustion activities in 2010 compared to 1990 is 116%. Table 12 presents amount and shares of GHG emissions of energy sub-sectors in 2010 and 1990.

Table 12 GHG emissions from energy sub- sectors for 2010 and 1990³²

Energy Sub-sectors	GHG Emissions (MtCO ₂ e) 2010	Share of Sub-sectors in 2010	GHG Emissions (MtCO ₂ e) 1990	Change with respect to 1990
A. Fuel Combustion (Sectoral Approach)	282.6	99.1%	130.7	116.2%
1. Energy Industries	113	39.6%	34.14	231.0%
2. Manufacturing Industries and Construction	57.1	20.0%	37.73	51.3%
3. Transport	45.1	15.8%	26.3	71.5%
4. Other Sectors	63.6	22.4%	29.3	117%
4.1 Residential	50.6	17.8%	23.5	115.3%
4.2 Others	13.1	4.6%	5.8	125.9%
B. Fugitive Emissions from fuels	2.46	0.9%	1.43	72.0%

Given the distribution of total CO₂ emissions caused by each energy sub-sectors, the greatest emissions from the energy sector is originated from the fuel combustion. Emissions from energy industries is the largest share with 39.6%, the second largest one is manufacturing and construction with 20%, residential with 17.8% and transport with 15.8%. **Error! Reference source not found.** Figure 19 represents share of each sub-sector in 2010.

³² National GHG Inventory Report, 1990-2010

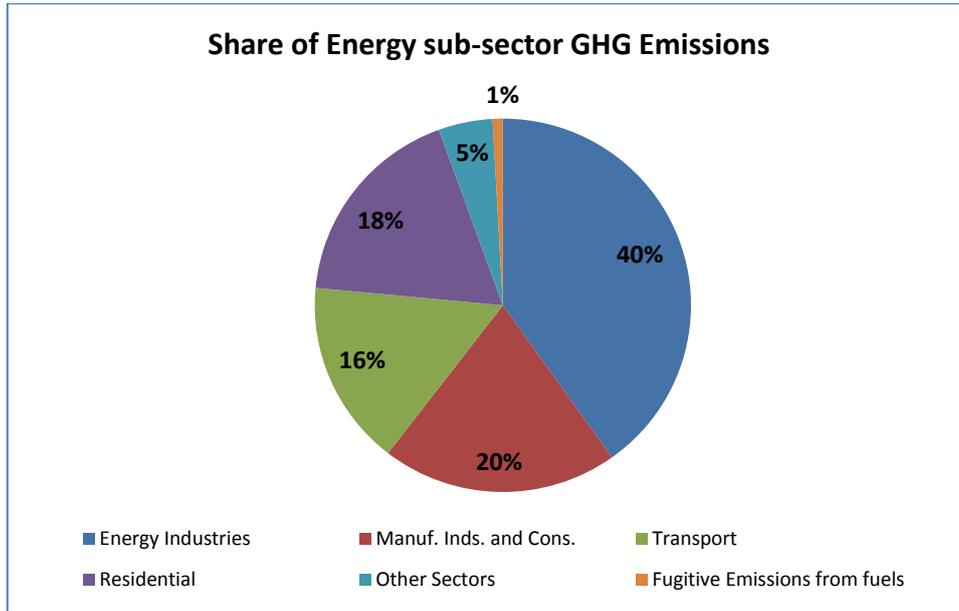


Figure 19 Share of GHG Emission for Energy Sub-Sectors in 2010

A-2.1.1 Energy Industries

Energy Industries sub-sector includes fuel combustion emissions from electricity generation facilities, petroleum refineries and hard coal production facilities. 94% of emissions from energy industries are originated from the electricity and heat production, 6% from the petroleum refineries in 2009.

Although, the reduction of emissions was observed in the last three years (2007, 2008, 2009) as a general average; annual increase of emissions in energy industry is around 3.8 Mton CO₂e between 1990-2009. It is the sector where highest increase in emission is observed with a rate of 201.1% in 2009 compared to 1990. The most important reason for the increase in electricity production is due to the increasing energy demand. Total primary energy supply increased by 100.31% between 1990-2009 and reached 106.14 Mtoe in 2009³³. Total electricity production in the period 1990-2009 is increased by 238.5%.

In the year 1990 Turkey's electricity demands were mainly provided from thermal and hydro sources whereas in recent years the share renewable energy utilization began to increase. The installed capacity of renewable energy in 1990 was 16,318 MW and it reached to 38,844 MW in the year 2005 and 44,761 MW in the year 2009.

The last 10 years, there has been a rapid growth in electricity generation and capacity of power plants increased steadily. In 1990 the share of total installed capacity of thermal sources reached 60%, (18% natural gas, 35% coal and lignite, 7% fuel oil) and of the remaining 40% is provided from hydraulics power sources. In the period of review, while the share of coal in electricity generation coming down to 29% from 35%, natural gas increased from 18% to 49%.

³³ MENR, Energy Balance Table for the year 2009:

http://www.enerji.gov.tr/EKLENTI_VIEW/index.php/raporlar/raporVeriGir/49100/2

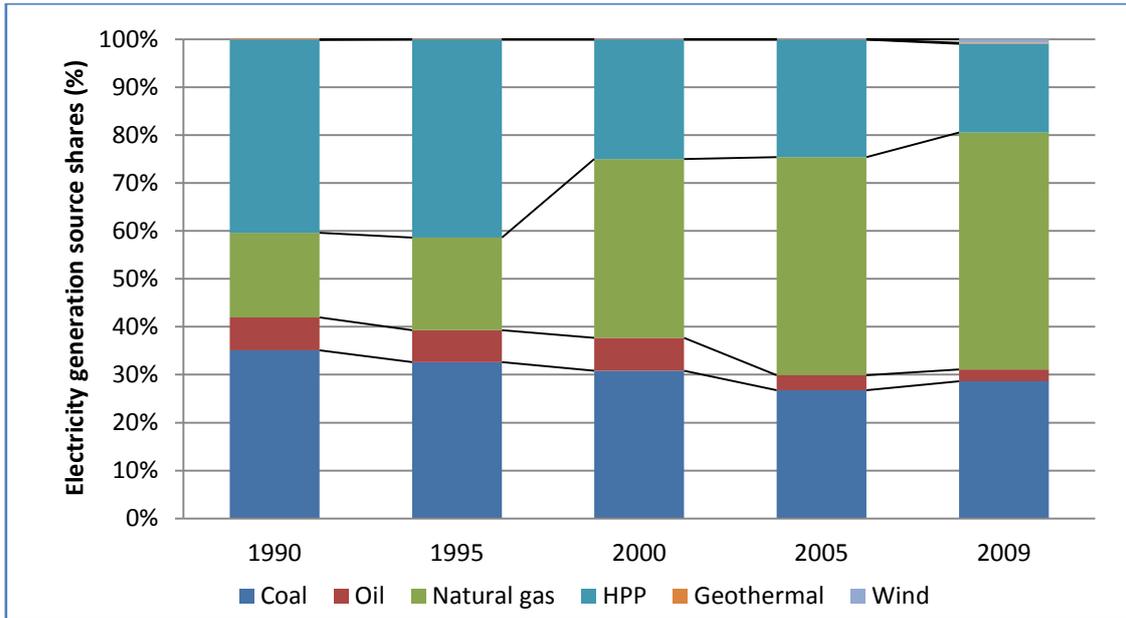


Figure 20 Share of sources in electricity generation³⁴

A-2.1.2 Manufacturing Industry

Manufacturing industries and construction sub-sector emissions are accounted 19.9% of total energy sector's emissions. Within this sector, iron and steel industry contributes 23% of emissions, the cement sector contributes 28% and the rest contributes to 49%, which are originated from the sugar, fertilizer and other industries.

The observed annual increase in greenhouse gas emissions by manufacturing industry sector between the years 1990-2009 was approximately 1.78 Mton CO₂e per year which corresponds 47% increase in total by 2009. During the periods of economic crisis at the years 1994, 2001 and 2008, the most significant emission reduction is observed in the manufacturing industry and construction sector (See Figure 3.5).

According to the Ministry of Energy and Natural Resources data for the year 2009, the share of industrial facilities for the use of energy in Turkey is 32 % (Figure 21). In Turkey, for many years the largest proportion of final electricity consumption was belong to the industrial sector. Due to the reduction of production during the economic crisis, electricity consumption were decreased 3% and 7% for the years 1990 and 2005 respectively, compared to year 1990.

³⁴ Source: NIR, 2009.

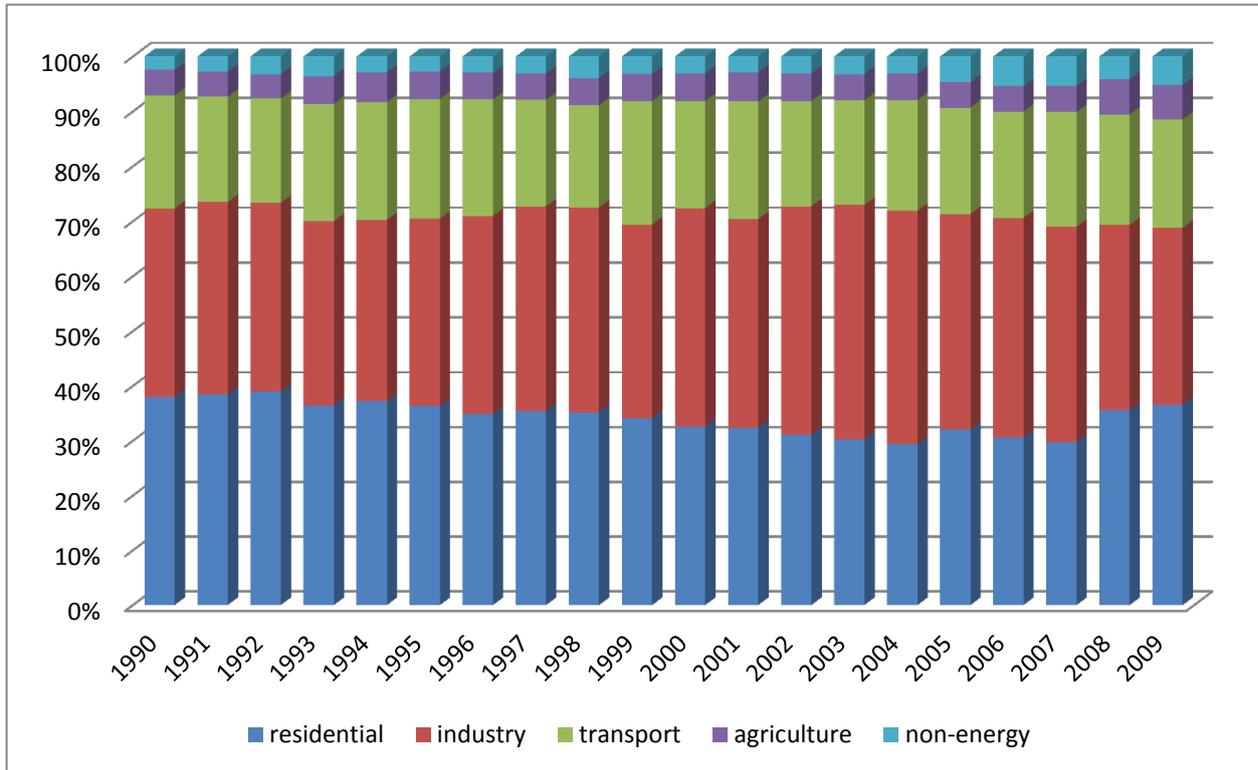


Figure 21 Distribution of energy consumption by sectors (MENR, 2011)

A-2.1.3 Transport

The amount of total greenhouse gas emissions from transport sector is 47.4 Mton CO₂-equivalent. Contribution of transport sector GHG emissions to energy sector is 17.04%, its share in national total GHG emissions is around 12.83 %. Within whole energy sector, transport sector is the main emission source of N₂O, NO_x, CO and NMVOC gases.

Road transport is the major greenhouse gas emissions source with 85% shares of the emission of the sector (Figure 22). The share of road transport related carbon dioxide equivalent emissions within total transport sector was 93% in 1990 but decreased to 85% in 2009. Within the same period aviation emissions increased from 3% to 11%.

Greenhouse gas emissions from transport sector in Turkey have increased by 80.47% between the period of 1990-2009. The observed tendency of the average annual increase in the transport sector, with 1.2 Mton CO₂e, was lower than the observed trend in energy and manufacturing industry (3.8 and 1.8 Mton CO₂e respectively). The main reasons for this are new vehicle and engine technologies, slight increase in the use of alternative fuels, and encouragement of withdrawal of 1985 and older model, minibus, van, bus, truck, tank from the market according to notifications number 62 and 63 between by General Directorate of Road Transport in the years 2003-2009. Between 2003-2004 with the joint efforts of Ministry of Transport, Maritime Affairs and Communications; 320,000 old vehicles are withdrawn from the market by providing tax incentives and hence 4.87 % reduction in the CO₂ emissions from transport sector is realized (the data of Ministry of Transport, Maritime Affairs and Communications).

Variations of fuel consumption by road vehicle fuel type in the period between 1990 and 2009 are given in **Error! Reference source not found.**. The use of gasoline increased in the period 1990-1996, and has started to decline after 1999. This decline could be attributed to reduction in the use of oil as a result of rise in gasoline prices, widespread public transport systems, use of vehicles with lower fuel consumption and smaller engines. Generally there is an increasing trend in the use of diesel fuel although it is not continuous. Fluctuations in the use of diesel fuel correspond to periods of economic crises. Increasing fuel prices, since 2000, initiated the use of LPG vehicles, LPG consumption rate of the roads in 2009 reached 37%³⁵.

Between the years of 1990-2009, greenhouse gas emissions from rail transport do not show a significant trend and emission levels are very low. Rail network increased rapidly according to government policy until 1946, and then it entered a steady stage which lasted until 2003. After 2003, as a result of restructuring of transport system and privatization, a new era has begun in the sector. During this period, large part of railways that is 11 thousand km in total is renovated, high-speed train lines between Ankara-Eskisehir and Ankara-Konya were completed, and Sivas-Ankara, Ankara-Istanbul lines are under construction. Additionally, light train systems in urban transport have started to be widespread. Railway projects that will connect Asia to Europe sides of the Istanbul are also under construction. With these projects, the share of railways in freight transport is expected to increase 13%, and the share of passenger transport will reach 7%³⁶. Increasing share of railway passengers and freight transport is important in terms of reduction in transport-related greenhouse gas emissions.

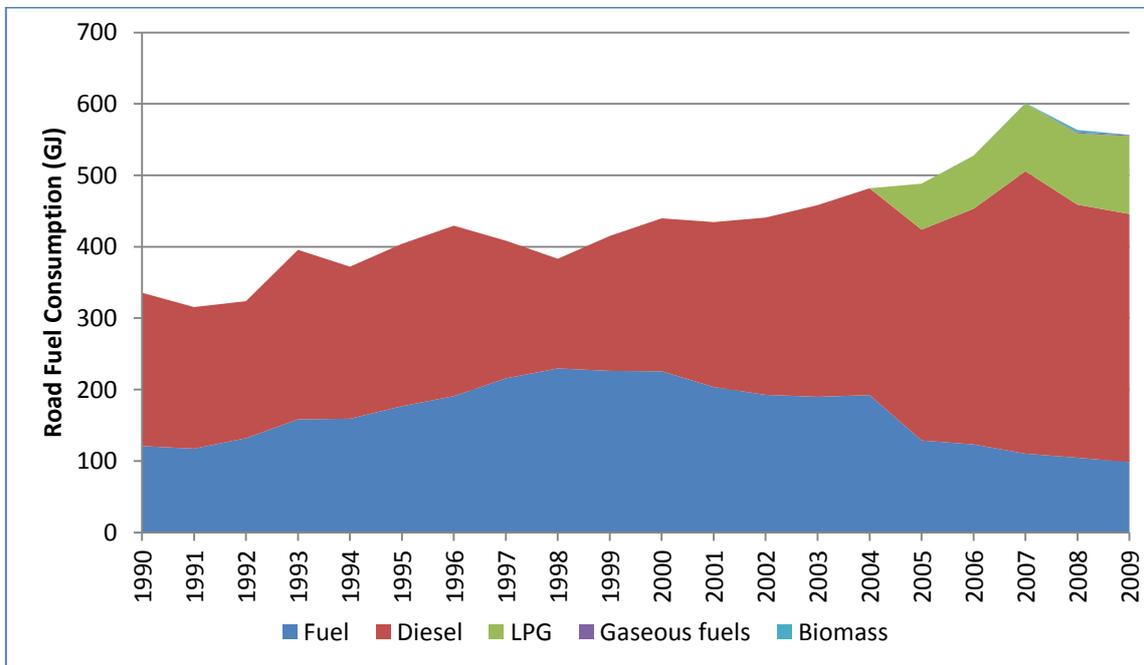


Figure 22 Fuel consumption of road traffic during 1990-2009 (GJ)³⁷

³⁵ TurkSTAT, 2011.

³⁶ Babalik-Sutcliffe, 2007

³⁷ National Greenhouse Gas Emission Inventory for the year 2009.

A-2.1.4 Aviation and Maritime Transport

Inventory of GHG emissions from international bunker fuels has been calculated only for the years 2008 and 2009. At those years, 62.4% of the fuel consumption related emissions of maritime and 81.2% of aviation emission are due to domestic transport. Emissions from international bunker were just over 2.03 million tonnes of carbon dioxide equivalent in 2009. In 2009, due to the global economic crisis, aviation and maritime emissions decreased in total by 17.3% compared to 2008. For the years 2008 and 2009, 55% of aviation emissions are originated from freight transport and approximately 45% from maritime transport.

Carbon dioxide emissions account for 99% of international transport emissions. Emissions of methane and nitrous oxide from transport are representing only 1% of the sector's emissions.

A-2.1.4 Other Sectors

'Other Sectors' sub-sector includes emissions from commercial, residential and agriculture sectors. In the year 2009, this sector composes 25.4% of total energy emissions. The shares of emissions from these subsectors are follows: fuel combustion in residential is 81% and fuel combustion in agricultural/forestry/ fishing activities is 19%.

Emissions from combustion of fuel in residential and agricultural sectors increased by 117% in the year 2009 compared to 1990. One of the main reasons for this increase could be attributed to the increasing number of buildings and despite the economic crisis increasing demand on the high surface area houses (Figure 23). According to the building census of TurkStat (TurkStat, 2000); the number of buildings was 4.4 million in 1984 and it is increased to 7.8 million in 2000 with 78 % increase, number of houses in the same year reached to 16.2 million with 129% increase. Between the years 2000-2008, according to the construction permits, the surface area of residential, commercial and public buildings reach 1.524 million m² with an increase by 56 %, on the other hand the number of building only increased by 7 % (see Figure 2 in section BB-1).

Since the financial needs for insulation and other methods necessary for energy savings in the housing sector is higher in developing countries, intensity of heating is also higher. Energy consumption of residential and services sector, which was 15.36 Mtoe in 1990 is significantly increase and reached to 29.47 Mtoe in 2009 (ETKB, 2011).

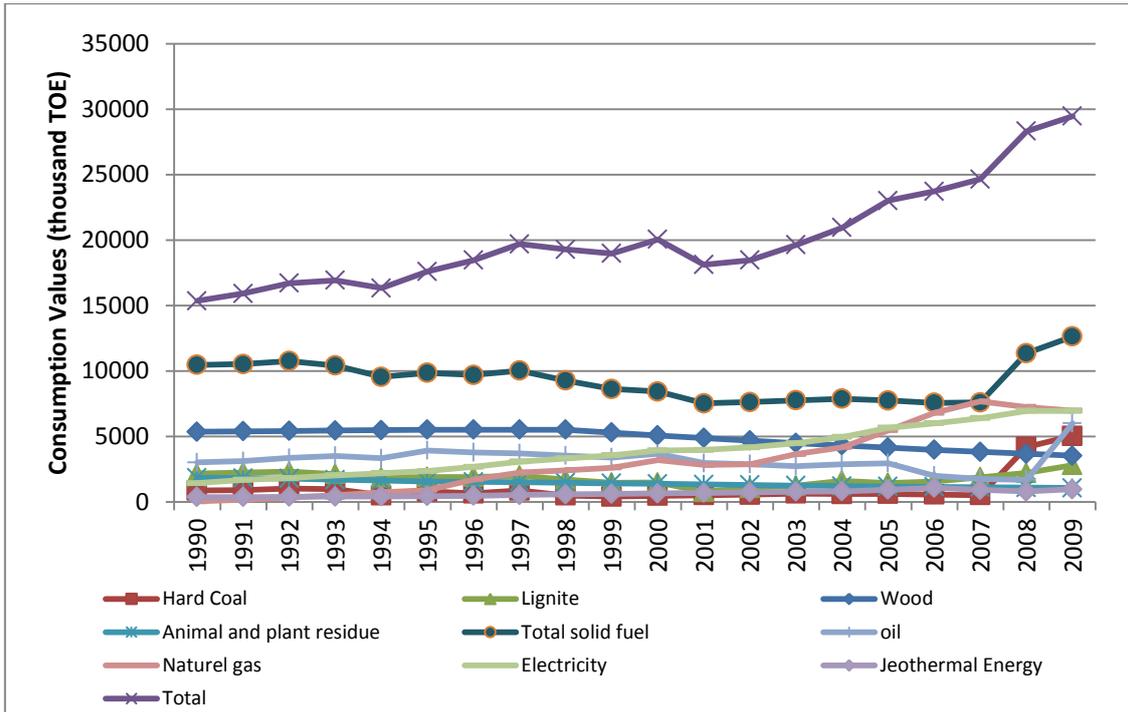


Figure 23 Consumption figures by energy type in the residential and service sector

A-2.1.5 Fugitive emissions from fuels

Fugitive emissions from fuels accounted for 0.72% of energy sector emissions. Fugitive emissions increased by 40% from 1990 to 2009. This increase could be explained mainly with the boost of coal mining production realized in this period.

A-2.2 Agriculture

Agriculture sector is one of the important sectors containing activities that cause greenhouse gas emissions. In Turkey, greenhouse gas emissions from agricultural activities, is being originated from manufacturing and processing of agricultural products, livestock (enteric fermentation, fertilizer management), rice production, open burning of agricultural wastes and agricultural land.

According to 2009 data of GHG emissions inventory of Turkey, agricultural activities, represent 7% of total greenhouse emissions. In addition to this, when the development of greenhouse gas by sector were analyzed, it can be seen that, despite significant increases of GHG emissions for all other sectors, there is a reduction only for GHG emissions from agricultural activities during the period of 1990-2009 (Figure 24).The GHG emissions originated from agricultural activities, have decreased from 29.78 Mton CO₂e in 1990 to 25.70 Mton CO₂e in 2009, with an average annual rate of 14% (Table 13).

According to the 2009 GHG emissions inventory data, 58% of animal enteric fermentation emission was originated from agricultural activities, 27% from agricultural lands, 13% from fertilizer management and remaining part, 2% from rice production and open burning of agricultural wastes.

Table 13 Greenhouse gas emission and total emission shares from agricultural sector in the year 2009

Sub-sectors of industrial processes	Greenhouse gas emissions (Gg CO ₂ eq.)	Total Agriculture Emissions Shares (%)	National Total Emission Share (%)
A. Enteric fermentation	14,859.21	57.83	4.02
B. Fertilizer management	3,394.29	13.21	0.92
C. Rice production	203.18	0.79	0.05
D. Agricultural land	6,989.93	27.20	1.89
E. Savanna fires	NA	-	-
F. Field Burning of Agricultural Residues	249.32	0.97	0.07
G. Other	NA	-	-
Total agriculture	25,695.93	100.00	6.95
National GHG Emissions Total (excluded LULUCF)	369,647.82		

NA: Not available

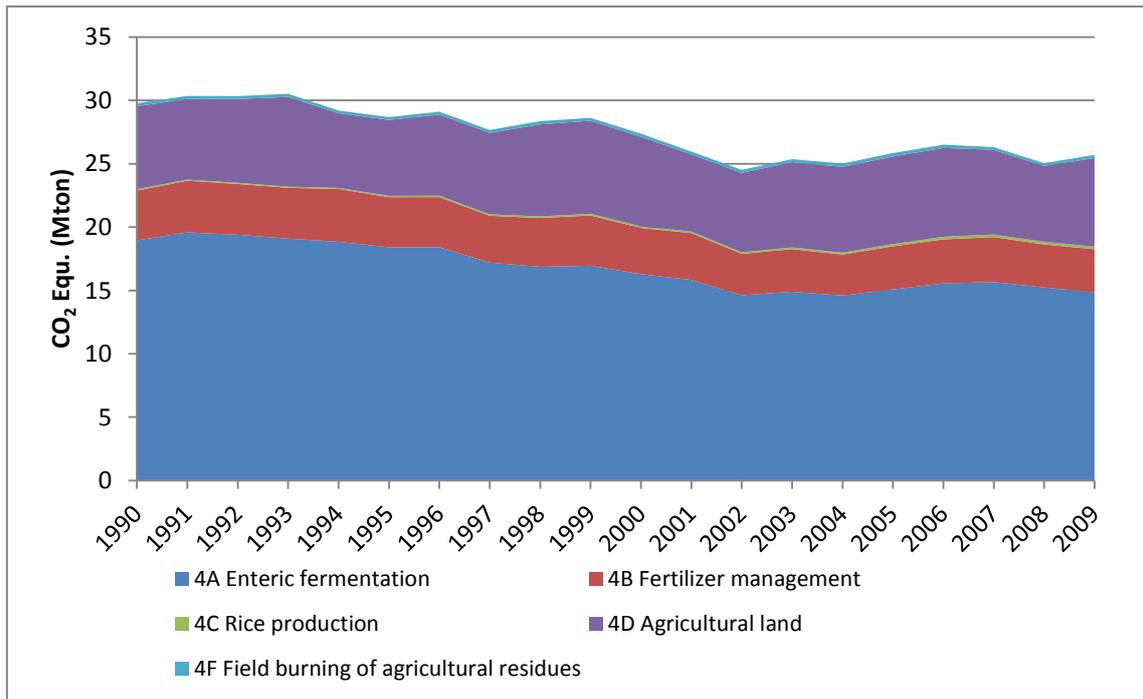


Figure 24 CO₂e emissions from total agriculture sector during 1990 and 2009 (Mton)

Comparing to 1990, there is a 22% decrease for emissions from enteric fermentation and 7% increase for emissions from agricultural lands (Figure 25). In total emissions from agriculture sector, 64% of emission is from CH₄, and 36% is from N₂O gases.

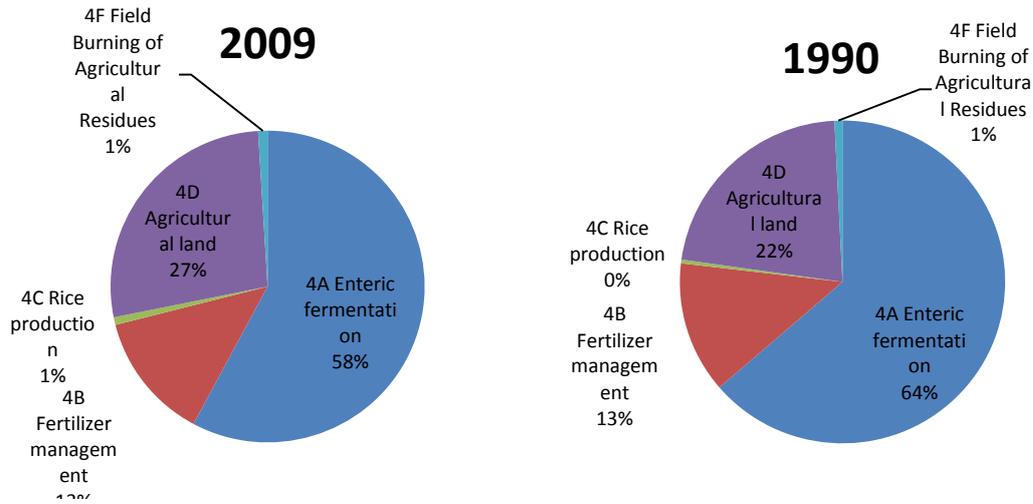


Figure 25 Distribution of GHG emissions from agriculture sector for the years of 1990 and 2009

Between the years of 1990 and 2009, in average, 0.301 Mton CO₂e annual reduction is observed in the agricultural sector. The main reasons of this reduction, as shown in Figure 26, are the decrease of the emissions of enteric fermentation and manure management, resulted by declining the domestic livestock activities for cattle, sheep and goats. According to the statistics of TurkStat, between 1990-2009, the number of cattle in the country was decreased by 7%, sheep by 46% and goat by 53% (TurkStat, 2011). Within the same period, 6% of total GHG emissions reduction was originated from enteric fermentation from livestock sector.

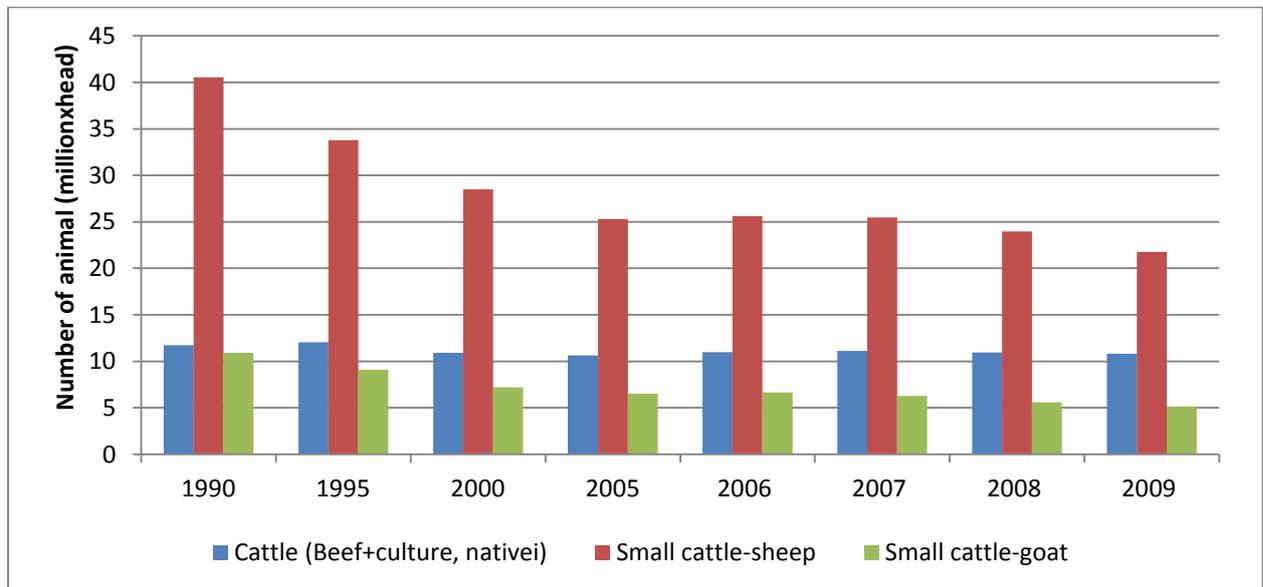


Figure 26 Variation of animal population in Turkey between 1991 and 2009 (TurkStat)

The share of agricultural sector within GDP, in its first year of the Republic in 1923, was 42.8%, and continued to decline continuously become 25% in 1980, 16% in 1990, 10.1% in 2000, 7.6% in 2008. After long time it increased to 8.3% in 2009 (Figure 27). The main reason for continuously decrease

for share of agriculture sector in the GDP, which might be the case for all other developing countries, is high growth rate in industry and service sectors and urbanization. Although importance of agriculture in Turkey's economy is relatively reduced, still is of great importance in terms of employment opportunities created.

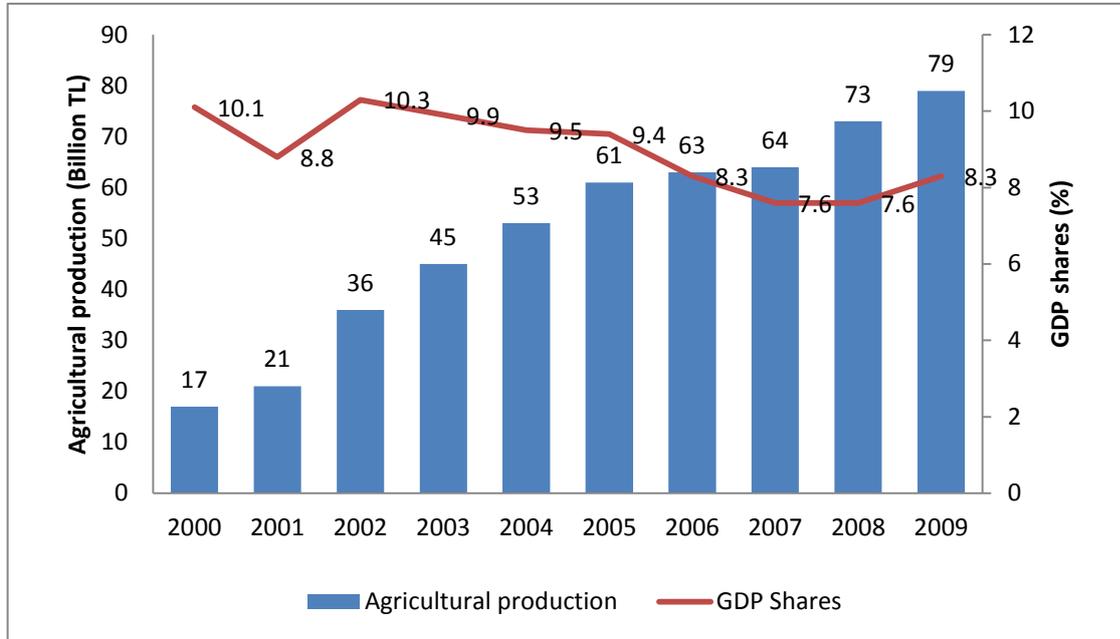


Figure 27 Shares from GDP and agricultural production between 1990-2009 (TurkStat, 2011)

41% of Turkey's total 79.6 million hectares of land, which corresponds 33 million hectares, is agricultural land (CORINE, 2006). Treated soil area (appropriate for agricultural activities) in 1990 was 24.8 million hectares; but it decreased to 21.4 million hectares in 2009. Irrigated farming is made on approximately 17% of total agricultural land and dry farming is made at the rest 83%. Because of increase on fertilizer prices (up to 150%) and due to the drought in the year of 2007 and 2008, annual fertilizer consumption is decreased to 4.1 million tons from 5 million tonnes. As a result, in the year 2008, GHG emissions from Agricultural lands decreased by 17% comparing to 2006. But with rainy period in 2009, fertilizer consumption reached 5 million tonnes again and greenhouse gases have also increased in parallel.

The continuous decrease in agriculture sector greenhouse gas emissions as a result of best practices provided by Food, Agriculture and Livestock Ministry has been expected also for following years. Best practices include:

- The improvement of low processed or non-processed agriculture practice supplemented with proper mechanical support by the government, and also providing less energy consumption by the combined use of devices,
- GHG emission decrease by use of biomass energy for covering self-consumption need instead of burning openly,
- The encouragement of orcharding at empty lands with certified seedling and fruit processing facilities.

A-2.3 Waste

GHG emissions from waste sector contain emissions from municipal solid wastes, management and treatment of hazardous and medical wastes, and sewage sludge and its treatment process.

Waste sector, which is one of the main sources of methane (CH₄) and diazotmonoksit (N₂O) emissions, plays an important role in climate change. On a global scale, it is estimated that 3% of total anthropogenic GHG emissions in 2004 was due to the waste sector (IPCC, 2007). Turkey's total greenhouse gas emissions and its shares by waste sub-sectors are given in Table 14. As shown in this Table, by the year 2009, share of total GHG emissions of waste sector in Turkey is 33.93 Mton CO₂e (~ 9.18%), and in case of LULUCF is not included, it became 2nd emission source after energy sector. In Turkey, 89% of greenhouse gas emissions are from waste sector, originate from regular and irregular (uncontrolled) landfill, and the remaining from domestic waste water operations which is estimated to be 3.76 Mton CO₂e in 2009. In 2009 GHG emissions inventory, emissions from wastewater treatment of industrial facilities are not included.

Table 14 GHG Emissions and total emissions shares from waste sector in 2009

Waste Sector	GHG Emissions (Gg CO ₂ eq.)	Share in Waste Sector (%)	Share in total GHG Inventory (%)
A. Solid Waste (Landfill)	30,169.77	88.91	8.16
B. Waste water treatment	3,764.32	11.09	1.02
C. Waste incineration	NA	-	-
D. Other	NA	-	-
Waste Sector Total	33,934.08	100.00	9.18
National GHG Emissions Total (LULUCF excluded)	369,647.82		

*NA:Not Available

During 1990-2009 period, the development of Turkey's GHG emissions from waste sector is given in Figure 28. Waste sector related GHG emissions increased with 250% in 2009 compared to the year 1990.

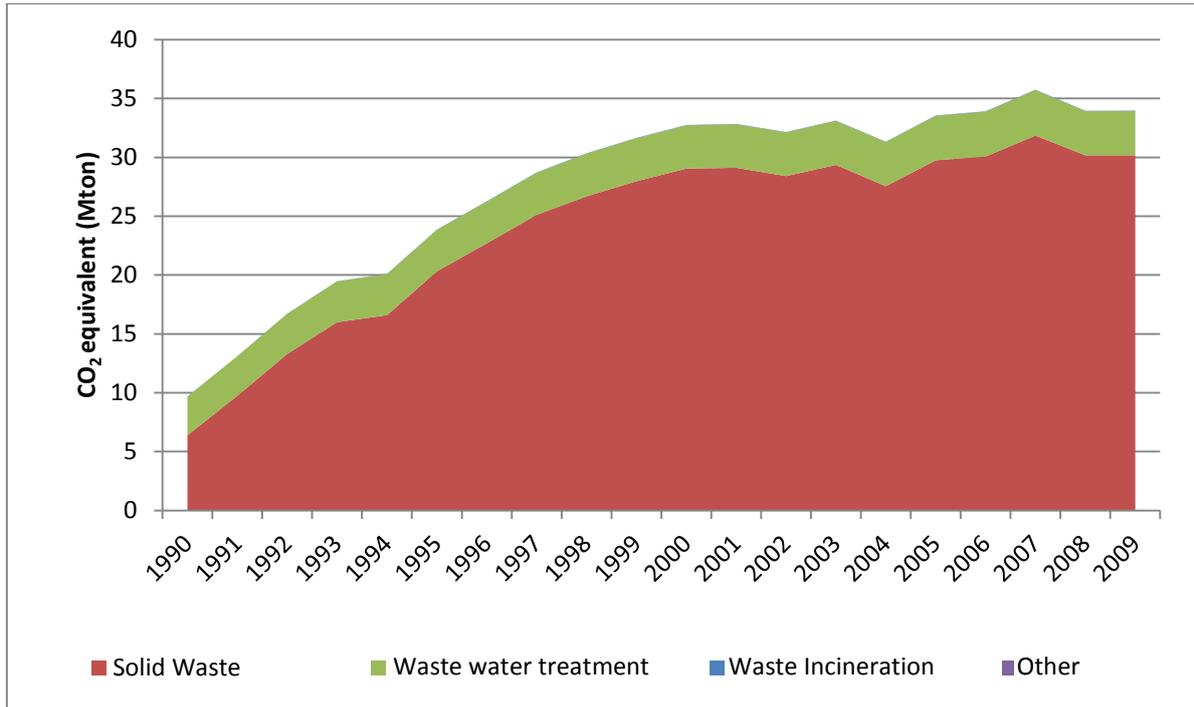


Figure 28 CO₂e emissions from waste sector during 1990 and 2009 (Gg/year)

As it can be seen in Figure 29, in 2009, 95% of GHG emissions from waste sector was due to CH₄, and 5% from N₂O. Methane gas emission is caused by solid wastes and waste water treatment plants, but nitrous oxide emission is caused by only wastewater treatment plants. Hazardous waste and waste incineration plant emissions are not included in the inventory of 2009.

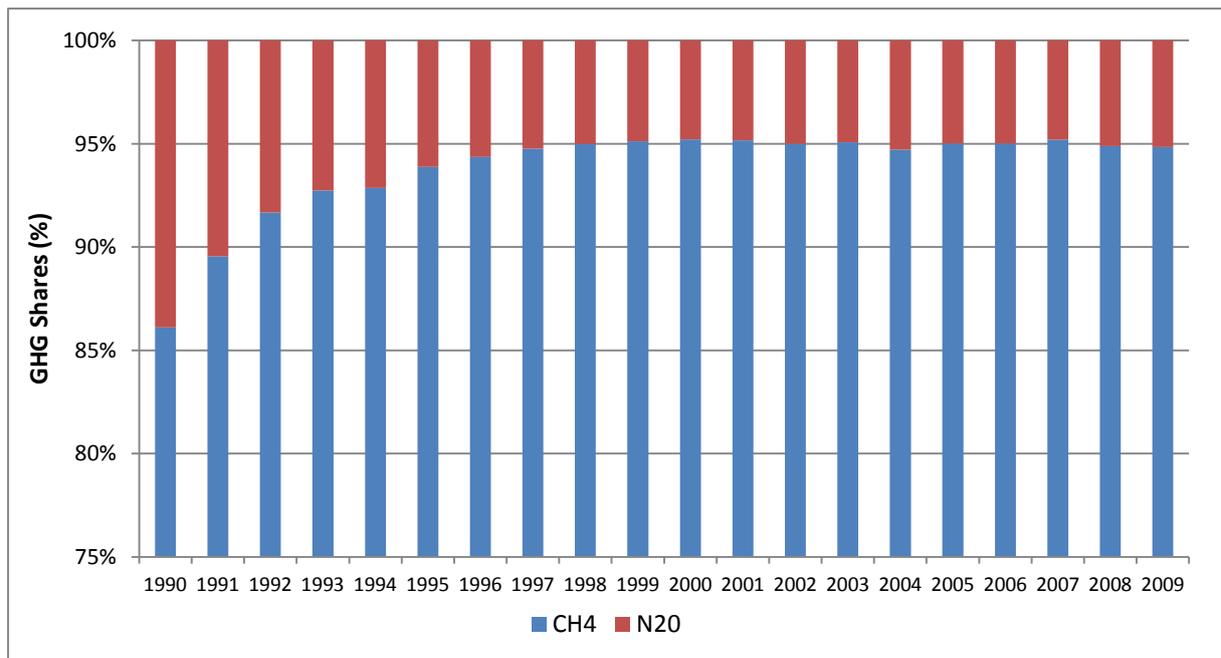


Figure 29 Variation of GHG Emissions shares from waste sector by years

According to the recent solid waste inventory data prepared by TurkStat, as of 2008, urban solid waste was around 24.4 Mton/year (1.15 kg/person/day, 420 kg/person/year), and around 82% of total population and 99% of the city population uses waste collection services. 46% of the waste collected by municipalities is handled by using waste management methods such as storing and decomposing. While 46% of the city population used such methods, 54% of the waste was managed with some other uncontrolled storage techniques and methods. Waste management industry is one of the fastest growing industries after 2004, with starting of European harmonization process. It is expected that greenhouse gas emission will decrease dramatically once the regular storage plants are built in regional scales.

'Landfill Gas Energy' projects have been operated in around 13 landfill sites. In addition to the GHG emission reduction benefits, these projects also generate energy (electricity and heat) by utilization of methane emissions in landfill sites.