Roadmap for the consideration of establishment and operation of a Greenhouse Gas Emissions Trading System in Turkey
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FOREWORD

Last year, with the Paris Agreement, more than 180 countries pledged their intended nationally determined contributions (INDCs), which is considered an important milestone in the fight against climate change. In this direction, the issue of using carbon pricing mechanisms effectively has come to the fore. At present, many countries are working on carbon pricing. In this way, countries are taking concrete steps to pass the INDCs to life.

Climate change increasingly cost us more with each passing day. It is quite imperative to take urgent measures, to strengthen the cooperation and to work quite hard to increase awareness in each and every segment of community. Turkey is a country with the least historical responsibility in respect of climate change and pollution existing in the world. Despite the fact, our country has used its best efforts beyond the call of its duty with certain decisiveness in fighting with climate change.

Turkey carries out many projects in order to fulfill its duties and continues to work with the international community with determination. In that regard, The Partnership for Market Readiness (PMR) Project, carried out by our Ministry, has an important place. Turkey is one of the most successful implementing countries within the PMR Program, which consists of 20 implementing countries. The Partnership for Market Readiness (PMR) is one of the prime initiatives to support countries in understanding and testing the use of carbon pricing to achieve their climate change mitigation objectives, therefore helping create the foundation for carbon markets.

In this context, emission trading schemes have an important role in carbon pricing and there are many implementations in the world. For this purpose, we have started our studies under PMR Turkey Project in order to assess the suitability of ETS to Turkey and to be prepared for a possible implementation in the future. While there is general knowledge of emission trading systems in our country, there is limited information on ETS implementation, legal and institutional infrastructure. To overcome these challenges, we have launched “Roadmap for the consideration of establishment and operation of a Greenhouse Gas Emissions Trading System” component to conduct comprehensive study on ETS, to evaluate suitability for Turkey with interactive workshops and to make legal and institutional analysis.

Eight workshops were organized with the participation of public and private sector representatives to convey information on ETS in 2016. In these workshops, it was aimed to provide capacity building on ETS and to make analyzes on whether ETS could provide an effective emission mitigation tool for Turkey. Detailed information was provided to public and private sector representatives and feedbacks related to the ETS were obtained. Furthermore, several consultation meetings have also been made with the relevant public institutions in order to determine the legal infrastructure and assess the suitability of existing laws/regulations for emission trading.

As a result of this comprehensive work, we are pleased to share with you the report on Roadmap for the Preparation and Operation of a Greenhouse Gas Emissions Trading System in Turkey. The report focuses on discussion of the key technical design elements of an ETS. Moreover it includes detailed assessment of existing institutional and legislative structure in Turkey compared to that of the European Union Emissions Trading System (EU ETS). The gap in the institutional and legislative
requirements needed to achieve a well-functioning ETS is determined and recommendations to fill the gap are provided.

In this respect, the Ministry is pleased to announce the Roadmap for the Preparation and Operation of a Greenhouse Gas Emissions Trading System in Turkey Report, which is prepared with great dedication. It will provide a visionary contribution to the future of our country and we would like to extend our sincere thanks first to our staff and to that of all the related institutions and organizations who contributed.

Republic of Turkey

Ministry of Environment and Urbanization
Summary for high level policy makers

Introduction
The 2015 Paris Agreement and its recent entry into marks a pivotal step in combating climate change. For the first time in history, all Parties to the United Nations Framework Convention on climate Change (UNFCCC) have been able to reach a common goal in limiting global warming.

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Turkey submitted its intended national determined contribution (INDC) in the run-up to the Paris conference pledging intended greenhouse gas (GHG) emissions reductions of up to 21% in 2030 as compared to a business as usual scenario. Among other options, Turkey is considering the use of market based instruments such as carbon pricing to reach its climate change mitigation targets.

Carbon pricing is increasingly used globally as a cost-effective way to mitigate climate changes, by making the costs of emission part of the economic rationale of decision makers. To support the political decision making process on market based instruments for GHG emissions reductions, Turkey received a grant from the World Bank Partnership for Market Readiness (PMR) with as core objective to produce robust analytical reports to support the decision-making process in Turkey around market based policy instruments to combat climate change. This report developing a roadmap on the consideration of establishment and operation of an emissions trading scheme (ETS) for Turkey is the first of these analytical reports, prepared under a contract that was executed between November 2015 and December 2016. This report was prepared by a consortium led by Ecofys, including also FutureCamp and LifeEnerji, further supported by Özlem Döğerlioğlu, attorney at Law for Turkish ministry of Environment and Urbanization. The development of the roadmap benefited from intense stakeholder interaction during public and private sector workshops organized in February, March and October 2016 as well as further bilateral meetings between the ministry and several stakeholders.

"Among other options, Turkey is considering the use of market based instruments such as carbon pricing to reach its climate change mitigation targets."

Why emissions trading
Moving to a low carbon future requires action on multiple, if not all fronts. The global energy needs to change from being predominantly fossil fuel based to an energy system based on renewable energy, energy needs to be used more efficiently throughout the economy and electrification of energy use will be needed to increase the use of non-fossil electricity production at the expense of fossil fuel use. Increasingly, jurisdictions embrace carbon pricing as a way to drive this decarbonisation. Carbon pricing internalizes the cost of the GHG emissions externality into the economic system.
Putting a price on GHG emissions makes activities not emitting GHG emissions more profitable as compared to those emitting GHG emissions and can help channeling investments and innovations towards low carbon development.

"Putting a price on GHG emissions makes activities not emitting GHG emissions more profitable as compared to those emitting GHG emissions and can help channeling investments and innovations towards low carbon development."

Two policies can be distinguished that deliver an explicit price on GHG emissions: a tax on GHG emissions and emissions trading. In a carbon tax system, the government sets the price that has to be paid for each tonne of GHG emissions that is covered by the tax. Market dynamics will ultimately determine the quantity of emissions that correspond to this tax level. Economic theory tells us that at least in theory all measures that have abatement cost lower than the tax will be taken. An emissions trading system (ETS) on the other hand, sets a limit (or cap) on greenhouse gas (GHG) emissions from installations covered by the system. Installations covered under the ETS need to surrender emissions allowance to cover the total volume of GHG emitted. Allowances matching the cap are initially allocated through free allocation or via an auction process.

Installations covered under the ETS need to surrender emissions allowance to cover the total volume of GHG emitted. Allowances matching the cap are initially allocated through free allocation or via an auction process.

Allowances can also be obtained through trade between installations and other third parties. The auctions and trade between installations establishes the market price for allowances. If the cap is set well, the number of allowances is lower than the need for allowances under a scenario without GHG abatement, thereby creating scarcity in the market. The allowances thus get a price and there is an incentive to abate emissions. The economic theory behind emissions trading (as opposed to more command and control emissions reduction policies) is that in this way the lowest cost options for emissions abatement will be found by the market that corresponds to the fixed environmental outcome that is set by the cap.

Emissions Trading in nine design steps

"The economic theory behind emissions trading (as opposed to more command and control emissions reduction policies) is that in this way the lowest cost options for emissions abatement will be found"
recent handbook on ETS developed by the PMR and the International Carbon Action Partnership (ICAP), the eight design decisions policy makers need to make are to:

1. **Decide on the scope**, i.e. what companies and installations are included in the ETS.
2. **Set the cap**, i.e. determine the amount of emissions allowed by the installations in the ETS.
3. **Distribute the allowances**, i.e. determine the way the emission allowances are distributed to the participants.
4. **Consider the use of offsets**, i.e. whether or not to allow emission reductions from projects outside the scope of an ETS to comply with the obligations under the ETS.
5. **Decide on temporal flexibility**, i.e. give options to participants to be flexible in the moment emission reductions are taken.
6. **Address price predictability and cost containment**, i.e. measures that intervene in the ETS by controlling either directly or indirectly the price of allowances.
7. **Ensure oversight and compliance**, i.e. making sure that everyone complies with the modalities and procedures in the ETS and that the market functions well.
8. **Consider linking**, i.e. allowing units (offsets or allowances) from other systems for compliance under the ETS.

In addition to these eight design steps, policy makers also need to decide on how to engage with stakeholders, communicate on the design and build the necessary capacity both within the government and at the side of the participating companies.

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**Policy mapping and policy interaction**

The study then zooms in on the policy context in Turkey. If an ETS would be introduced, it would become part of an already existing energy and climate change policy mix. According to policy theory, to optimise the cost-effectiveness of an ETS, the scope of the ETS should be as wide as possible. The ETS as cornerstone policy to reduce emissions should ideally be complemented by policy support policies to reduce costs for emission reduction technologies that are needed for longer term abatement and by policies aiming to remove non-economic barriers that hamper the update of otherwise cost-effective energy efficiency and other policies. Applied to the Turkish context, this means that an ETS, if introduced, would need to be aligned with the existing energy and climate change related policy mix. In practice the means that careful consideration need to be given to possible interactions of an ETS with e.g. the renewable energy and energy efficiency legislation in Turkey. This study recommends to make this alignment of the ETS with the existing policy mix in Turkey an explicit point of attention in the further policy preparation.
It identifies three areas that require specific attention:

- The alignment of an ETS with existing energy efficiency policies, e.g. by re-considering specific energy efficiency targets for sectors under the ETS and by focusing energy efficiency policies on removing non-financial barriers that hamper the uptake of cost-effective energy efficiency options.
- The development of a holistic policy package for the power sector balancing multiple policy objectives by making a decision on the envisioned role of carbon pricing in the power market, on the need for additional technology support policies and on measures to avoid unwanted effects on electricity prices.
- The future of the existing voluntary offset market in Turkey given that the voluntary market has so far been dominated by renewable electricity projects that have a direct impact on the emissions that will likely be covered by a possible Turkish ETS. It is recommended not to allow new voluntary projects to start in these sectors and to find a transitional solution for existing projects that continue to generate credits.

Legal and institutional set-up

This study then provides background on the legal and institutional requirements for the set-up of an ETS, e.g. by summarizing the legal and institutional structure of the EU ETS and other existing global ETSs. The legal and institutional requirements to set up an ETS are compared with existing legislation and policy papers in Turkey, such as the National Climate Change Action Plan, the National Climate Change Strategy Document and the Environmental Law. Although the existing environmental law does already make a reference to carbon markets and could therefore in theory be the legal for an ETS in Turkey, the study concludes that new primary legislation would be needed to establish an ETS in Turkey.

"Although the existing environmental law does already make a reference to carbon markets, the study concludes that new primary legislation would be needed to establish an ETS in Turkey".

This new legislation should in itself refer to Turkey’s wider economy-wide emission reduction targets and climate change strategy as laid down in e.g. the INDC. The new primary legislation should define key design elements such as the cap-setting, the allowance allocation as well as the overall process of monitoring, reporting and verification of emissions, i.e. the compliance cycle.

"The law and secondary legislation to implement the law would be developed as part of the mandate of the Ministry of Environment and Urbanization". The implementation could be overseen by the establishment of a new department or institute overseeing the ETS in Turkey, similar to the role of the Competent Authorities in the EU ETS.

“This study recommends to make this alignment of the ETS with the existing policy mix in Turkey an explicit point of attention in the further policy preparation.”
In addition to new primary legislation, the study concludes that existing legislation under the mandate of other ministries, e.g. under the Ministry of Finance would need to be adapted to accommodate the new to be established carbon market, e.g. related to the set-up of an emissions exchange and the possible classification of emission allowances as financial products.

**Design of a possible ETS pilot in Turkey**

Using the above context as basis, the study provides an evaluation of possible design options for an ETS pilot in Turkey using the following criteria:

- Data availability;
- Manageability of the design;
- Learning effects;
- Fitness with other design elements and other policy instruments;
- Acceptance by stakeholders/costs for operators;
- Environmental integrity;
- Perspectives for linking.

Based on an evaluation using the criteria, the study concludes with a pilot ETS design that could fit the Turkish context. The proposed ETS pilot design aims to create a reference point for discussions in case Turkey politically decides to implement an ETS in future while making use of the experience gained in the MRV scheme in Turkey. The pilot scenario tries to limit the complexity and build the capacity of the administrator and participants in preparation for a further develop ETS beyond the pilot phase, but, requires further discussions and reconciliation among several different stakeholders.

The study recommends a possible Turkish pilot ETS to run for a period of two to three years, based on the following design options:

- **A scope** of the ETS identical to the already established MRV scheme.
- An **absolute cap with a dynamic reserve to allow for growth** with a fixed part of the cap reserved for existing installations with their current production levels and a dynamic part of the cap reserved for growth.
- Grandfathering based **allowance allocation** for existing installations with a certain share of auctioning, with benchmarks applied to new installations.
- Limited **domestic offset use** from existing emission reduction projects in Turkey that are registered under existing voluntary standards up to a certain % of the compliance obligation.
- Unlimited **banking and borrowing** within the pilot phase.
• **Access to trading** for operators of installations covered by the pilot ETS as well as by domestic financial institutions, with **no financial derivatives** allowed in the market, only spot and forward trading of allowances.

• **Sanctions** to be applied to ensure compliance.

• **No linking** of the pilot ETS with other emission trading schemes in the world.

In order to implement the pilot ETS, this study provides an action plan focused on further preparatory analyses, rule-making actions as well as further implementation steps. These steps include a high level decision to proceed with the further preparations of an ETS in Turkey, further modelling work to study to potential economic and other impacts, the drafting of an ETS law and further preparatory steps for the more technical design elements.
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   2.5.1 Definition
   2.5.2 Analysis of design options and choices
   2.5.3 International examples
   2.5.4 Links to other design elements and miscellaneous issues
   2.5.5 Design checklist

2.6 Decide on temporal flexibility
   2.6.1 Definition
   2.6.2 Analysis of design options and choices
   2.6.3 Selection of international examples
   2.6.4 Links to other design elements and miscellaneous issues
   2.6.5 Design checklist

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6 Concluding remarks
1 Introduction

The 2015 Paris Agreement and its entry into force within a year marks a pivotal step in combating climate change. For the first time in history, all Parties to the United Nations Framework Convention on climate Change (UNFCCC) have been able to reach a common goal in limiting global warming. Turkey submitted its intended national determined contribution (INDC) in the run-up to the Paris conference and is the process of ratifying the Paris Agreement. In the INDC Turkey pledged a greenhouse gas (GHG) emissions reduction of up to 21% in 2030 as compared to a business as usual scenario. With the Paris Agreement having entered into force, the global attention now shifts to implementation. This is true also for Turkey.

Among other options, Turkey is considering the use of market based instruments such as carbon pricing. Increasingly, jurisdictions are embracing carbon pricing instruments, which require GHG emitters to pay for each tonne of GHG released. On the latest count, about 40 national jurisdictions and over 20 carbon pricing instruments are putting a price on carbon and the emissions covered by carbon pricing has increased threefold over the past decade\(^1\). One of the key reasons why jurisdictions are implementing carbon pricing instruments is that it internalizes the cost of the GHG emissions into the economic system and makes it part of the economic rationale of decision makers. Activities not emitting GHG emissions become more profitable as compared to those emitting GHG emissions, leading to cost-effective GHG emission reduction.

To support the formulation of Turkey’s low carbon development policies, Turkey received a grant from the World Bank Partnership for Market Readiness (PMR). The PMR is a grant-based fund administered by the World Bank that provides funding and technical assistance to study and pilot market based policy instruments for climate change mitigation. The PMR projects in Turkey are implemented by the Ministry of Environment and Urbanization (MoEU) through the Climate Change Department (CCD).

A core objective of the PMR work in Turkey is to produce robust analytical reports to support the decision-making process in Turkey around market based policy instruments to combat climate change. This report on the consideration of establishment and operation of an emissions trading scheme (ETS) for Turkey is the first of these analytical reports, prepared under a project that was executed between November 2015 and December 2016. An ETS sets a cap on the emissions permitted by the entities that are covered under it and allows the entities to trade emissions allowances.

The report starts with a discussion of the key technical design elements of an ETS in Chapter 2 and after answer the question why jurisdictions typically choose ETS as a policy instrument. The design elements covered are the scope of the ETS, the cap-setting, approaches to the allocation of emissions allowances, the use of offsets, flexibility and market stability mechanisms, compliance and oversight measures and possible linkages between ETSs.

For each of the design elements, the different design choices are assessed, the advantages and disadvantages of these choices are presented and a checklist is provided for policy makers to consider when designing an ETS. The checklist aims to summarise the key decisions policy makers should make when designing an ETS and the key considerations they should keep in mind when making these decisions.

An ETS, once introduced, will interact with policies that are already in place. Chapter 3 provides theoretical background on the role of an ETS in the wider energy and climate change policy mix and the interactions of an ETS with other policies. It summarises existing and planned policies in Turkey that affect domestic GHG emissions and, using the theoretical background, it provides recommendations on ways to deal observed interactions between an ETS and other policies in Turkey.

Next, the report assesses the institutional and legislative structure that is required for a well-functioning ETS in Chapter 4. Using the structure European Union Emissions Trading Scheme (EU ETS) and ETSs in other jurisdictions as basis, gaps in existing institutions and legislation in Turkey are determined and recommendations to fill these gaps are provided.

Using the background provided by these first Chapters, Chapter 5 discusses possible design options for a possible ETS in Turkey. It answers the question which design options could best fit Turkey's national circumstances. An evaluation of these design options using clear criteria yields a recommended design for a pilot ETS in Turkey. A guidance and an action plan for the possible implementation of this pilot ETS are also presented. The report ends with short concluding remark.

This report was prepared by a consortium led by Ecofys, including also FutureCamp and LifeEnerji, further supported by Özlem Döğerlioğlu, attorney at Law. Ecofys has been in charge of the work presented in Chapter 2 as well as the theoretical background to policy interaction presented in Chapter 3. LifeEnerji has been the leading in the policy mapping and evaluation of the policy interaction in Chapter 3 as well as the preparation of Chapter 4, supported by Özlem Döğerlioğlu. FutureCamp was leading the work on the possible design of a pilot ETS in Turkey in Chapter 5.

The report benefited from intense stakeholder interaction throughout the project. In February, March, and October 2016, three two-day workshops were organized for both public and private sector stakeholders (six workshops in total). These workshops focused on the ETS design elements (February workshop), possible ETS scenarios for Turkey (March) and the institutional and legal set-up as well as the recommended pilot ETS (October). In addition, the MoEU organized further stakeholder meetings throughout the project. Other deliverables of the project include an ETS guide for plant operators as well as on-line published bulletins with news items on carbon pricing worldwide.
2 Emissions trading design elements – an introduction

This chapter provides background on the various design elements of an ETS. Starting with an introduction on the reasons why an ETS is typically chosen as a policy instrument to mitigate emissions (Chapter 2.1), the chapter aims to answer the following questions:

- What are the key design elements of an ETS?
- Looking at other jurisdictions that have implemented ETS, what are the various design options for each of these elements and what are the advantages and disadvantages for each of these options?

For each of the design elements discussed in Sections 2.2 to 2.9, we end with an overview of the key considerations to consider for the design element and a design checklist for policy makers.

2.1 Why emissions trading?

Moving to a low carbon future requires action on multiple, if not all fronts. The global energy needs to change from being predominantly fossil fuel based to an energy system based on renewable energy, energy needs to be used more efficiently throughout the economy and electrification of energy use will be needed to increase the use of non-fossil electricity production at the expense of fossil fuel use.

Increasingly, jurisdictions embrace carbon pricing as a way to drive this decarbonisation. Carbon pricing internalizes the cost of the GHG emissions externality into the economic system. Putting a price on GHG emissions makes activities not emitting GHG emissions more profitable as compared to those emitting GHG emissions and can help channelling investments and innovations towards low carbon development. As elegantly put in the recently published handbook on the design and implementation of emissions trading by the PMR and ICAP:

"carbon pricing by itself cannot address all of the complex drivers of climate change; some combination of regulation, standards, incentives, educational programs, and other measures will also be required. However, as part of an integrated policy package, carbon pricing can harness markets to drive down emissions and help build the ambition needed to sustain a safer climate". It is generally acknowledged that carbon pricing can help to reach climate change ambitions in a cost-effective way, because via the internalization of the GHG emissions costs, markets will find the most cost-effective ways to reduce GHG emissions.

As show in Figure 1, carbon pricing has been implemented round the world at either a regional level, e.g. the European Union, at a national level, e.g. South Korea and at a subnational level, for example the seven Chinese Pilot ETSs and several provinces and states in the US and Canada.

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2 For ease of reading we use the term "carbon" pricing for policies pricing GHG emissions, despite not all GHG emissions containing carbon.
Two policies can be distinguished that deliver an explicit price on GHG emissions: a tax on GHG emissions and emissions trading. In a carbon tax system, the government sets the price that has to be paid for each tonne of GHG emissions that is covered by the tax. Market dynamics will ultimately determine the quantity of emissions that correspond to this tax level. Economic theory tells us that at least in theory all measures that have abatement cost lower than the tax will be taken.

An emissions trading system (ETS) on the other hand, sets a limit (or cap) on greenhouse gas (GHG) emissions from installations covered by the system. Installations covered under the ETS need to surrender emissions allowance to cover the total volume of GHG emitted. Allowances matching the cap are initially allocated through free allocation or via an auction process. Allowances can also be obtained through trade between installations and other third parties. The auctions and trade between installations establishes the market price for allowances.

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*Figure 1: Overview of existing, emerging, and potential regional, national and subnational carbon pricing instruments (ETS and tax)*

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If the cap is set well, the number of allowances is lower than the need for allowances under a scenario without GHG abatement, thereby creating scarcity in the market.

The allowances thus get a price and there is an incentive to abate emissions. The economic theory behind emissions trading (as opposed to more command and control emissions reduction policies) is that in this way the lowest cost options for emissions abatement will be found by the market that corresponds to the fixed environmental outcome that is set by the cap. This is because each installation has the choice to either abate emissions (if the allowance price is higher than the costs to abate emissions) or to buy allowances in the market (if the allowance price is lower than the costs to abate emissions). As the cap directly limits the GHG emissions, an ETS gives policymakers certainty on the quantity of emissions over a period of time. This, together with the characteristics as a policy instrument yielding lowest costs and being technology neutral makes emissions trading a popular policy choice.

Box 1: Marginal abatement cost curves and the economic theory behind emissions trading versus a carbon tax

Abatement options come with different costs per unit of abatement realized. Different carbon prices are thus needed to make them profitable. A way of representing these different abatement costs is via a marginal abatement cost curve (a MAC curve or simply a MACC). In such a curve, the potential reductions from certain abatement options are given from left to right, starting with the lowest cost options on the left, followed by the more expensive options. The example given below is a MAC curve for the EU-27 in 2030.

Figure 2: Marginal Abatement Cost Curve: example for Europe 2030

In an ETS, the government enforces a certain degree of abatement and economic theory tells that the market will find the lowest cost options needed with the CO2 price being equal to the marginal cost of the most expensive abatement option needed to remain within the emissions limit. In contrast, a tax just sets the CO2 price. All measures having marginal costs up to that price level will then, at least in theory, be taken. In practice, the cost and exact potential of all emission reduction options in covered sectors are difficult to estimate and MAC curves therefore by definition come with significant uncertainties. While in theory a tax can thus be set at a level which guarantees a certain environmental outcome (assuming one has perfect insight in all abatement options and

Footnote: Figure from Ecofys (2009): Sectoral emissions reduction potentials and economic costs for climate change, summary report.
In practice, an ETS and a carbon tax deliver a different type of certainty. With an emissions trading scheme, the environmental outcome is guaranteed, but the exact CO₂ price and costs are uncertain as a result of the inherent uncertainties in estimating potentials and costs of reductions. With a carbon tax, on the other hand, the CO₂ price is a given, but the environmental outcome is uncertain. Economists disagree on whether a tax or an emissions trading scheme is the better policy instrument, but agree on the fact that a price on GHG emissions is essential for a cost-effective abatement of emissions. We refer to the “Before you begin” section of the PMR/ICAP handbook for a more detailed explanation on the economic theory behind emissions trading versus a tax.

In this chapter, we discuss the design elements of an ETS. The chapter builds on and follows the structure of the recently published guide developed as a collaborative effort of the World Bank’s PMR and the International Carbon Action Partnership (ICAP): emissions trading in practice: a handbook on design and implementation. For the ease of reading, we use the PMR/ICAP handbook throughout this chapter without providing the reference in a footnote each time the guide is referred to. Exceptions are cases where we use direct citations, where we give the page number of the quoted section in the handbook. In line with handbook, we distinguish the following ten ETS design steps:

**Figure 3: ETS design in ten steps (Figure taken from PMR/ICAP handbook)**

**Step 1: Decide on the scope:** The scope of an ETS defines the boundary of the policy, and refers to the geographic area, sectors, emissions sources, and GHGs for which allowances will have to be surrendered, as well as which entities will have to surrender them.

**Step 2: Set the cap:** The ETS cap sets a limit on the number of allowances issued over a specified time period which then constrains the total amount of emissions produced by the regulated entities.

**Step 3: Distribute the allowances:** The distribution of allowances refers to the way emission allowances are initially distributed to the participants. Allowances can be handed out for free or can be distributed to the market via auctions where participants can buy allowances.
Step 4: Consider the use of offsets: An ETS can allow the use of offsets. Offsets are credits for emissions reductions in uncovered sources and sector that can be used by covered entities to meet compliance obligations under the cap.

Step 5: Decide on temporal flexibility: The emissions cap is normally set for a given cap setting period and within this period one or more compliance periods are set (i.e. the moment the participant need to surrender allowances in line with their emissions). Temporal flexibility refers to the extent to which participants are allowed to bank or borrow allowances across cap setting and compliance periods.

Step 6: Address price predictability and cost containment (market stability): Just as in many commodity markets, it may be hard to predict longer-term ETS prices accurately, because they depend on variations in many parameters. To address these inherent uncertainties, market stability measures can be taken within an ETS to keep the allowance price in an ETS within the range that is seen as needed to stimulate abatement.

Step 7: Ensure compliance and oversight: This design element refers to the systems to monitor, report and verify emissions, the ETS registry, the approach to enforce compliance, the trading products allowed in the ETS and the procedures to oversee and regulate the market where allowances are traded.

Step 8: Engage stakeholders, communicate and build capacities: Developing a successful ETS requires both enduring public and political support and practical collaboration across government and market players based on shared understanding, trust, and capability.

Step 9: Consider linking: Linking occurs when an ETS allows regulated entities to use units (allowances or credits) issued under another jurisdiction’s system as a valid currency for compliance, with or without restrictions.

Step 10: Implement, evaluate, and improve: This step refers to the step from the design to the implementation of an ETS, as well as the processes to evaluate the ETS and improve the ETS based on such evaluations.

In the sections below, we discuss various design options for each of these steps with the advantages and disadvantages for each of these choices. To support the analysis and argumentation, we give a selection of international examples aiming to clarify the reasoning behind certain design choices and to show the potential impact. We focus in this chapter on the more technical design elements of emissions trading, i.e. step one to seven and step nine. Stakeholder engagement (step 8) gets attention throughout this report. A timeline for implementation, evaluation and improvement of an emissions trading scheme (step 9) is the subject of Chapter 4.2 of this report.

To support the readability of this report, we have chosen to provide in this study only concise introductions to the various design steps in which we on purpose build on the already mentioned PMR/ICAP handbook. At appropriate places, we refer to more detailed elaboration and descriptions in this handbook and other more detailed guides and overviews on emissions trading such as:

- The online course on emissions trading offered by the European Commission;\(^6\)
- The emissions trading guides by jurisdiction published by the international emissions trading association (IETA) and the Environmental Defense Fund (EDF);\(^7\)

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\(^6\) https://ec.europa.eu/clima/policies/ets/ets-summer-university/content/ets-e-learning-online-course
\(^7\) https://www.edf.org/climate/worlds-carbon-markets
We start each of the discussions with a short summary, followed by a more detailed discussion. In the annex to this report, we give a brief summary on how each of these eight design elements are treated in currently existing emissions trading schemes.

2.2 Decide on the scope

2.2.1 Definition

The PMR and ICAP guide give the following definition on the ETS scope:

"The scope of an ETS refers to the geographic area, sectors, emissions sources, and GHGs for which allowances will have to be surrendered, as well as which entities will have to surrender them. The ETS scope defines the boundaries of the policy. It therefore has implications for the number of regulated entities, the share of emissions facing a carbon price, and effort sharing between the covered and uncovered sectors to meet economy-wide emissions reduction targets.”

As the scope determines the number and type of participants in the ETS as well as the type of GHGs covered, it shapes the complexity of the system.

2.2.2 Analysis of design options and choices

In line with the PMR/ICAP hand book, we distinguish three key decisions on the scope that have to be taken when designing an ETS:

1. The sectors and gases to be included, including thresholds.
2. The point at which regulation should be introduced, i.e. either upstream or downstream, especially with respect to emissions from combustion.
3. The entity where the reporting obligation should take place, i.e. the company or installation level.

Sectors, gases and thresholds

1. Sectors

The sectoral scope of an ETS refers to the sectors which are required to participate in an ETS. It determines the size of the ETS and the mitigation activities targeted. In theory, a large sectoral coverage is desirable as this opens up more abatement opportunities and therefore can deliver more cost-effective mitigation. Thus, ETS sectors that account for a large share of a jurisdiction’s emissions should ideally be covered – typically this is the power and industry sectors in industrialised countries. To maximise the cost-efficiency of an ETS, it is also crucial to cover sectors that have significant opportunities for low-cost mitigation.

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Furthermore, the larger the sectoral coverage the smaller the risk of carbon leakage between sectors that are subject to a carbon price and sectors which do not pay for their GHG emissions. Policy makers must balance the benefits of having a broad scope with several arguments against such a broad coverage.

Transaction costs and the administrative burden may be too high for sectors that are characterised by a large number of small emitters. As such, existing ETSs often made the choice to include only sectors that are characterised by a small number of large emitters to ensure that the administrative cost per unit of emissions covered is limited. For example, downstream transport sector emissions should not be covered in an ETS as tracking emissions from each vehicle is not feasible, although an alternative can be to include transport emissions more upstream at the point where fuels are delivered to the market as is discussed below. Furthermore, other sectors should be excluded as emission sources may be difficult to monitor. Some agricultural emissions related to emissions from soils etc. are for example difficult to monitor. There are also sectors where emissions costs would only represent a small fraction of production costs and as result, there will be limited response to the price signal delivered by the carbon price. For example, there is a weak behavioural response of drivers to changes in fuel prices when they use their vehicle for essential transport. One of the major factors to the behavioural response of these drivers is the availability of alternatives such as public transport or low emissions vehicles.

When designing the sectoral scope, it is also important to consider possible interactions with existing policies and measures. Some sectors may be excluded from an ETS as other policies might be more successful or existing policies are so well accepted that it would be unwise to replace them. For example, passenger vehicle emissions standards, high fuel taxes and other regulations may be considered to be superior to an ETS in reducing emissions from private motor vehicle transport in some jurisdictions. A further consideration is to include directly competing activities in an ETS to avoid undue competitive distortions between competing sectors. Examples include competing industrial sectors such as cement versus steel etc. If one sector would be included and thus starts facing carbon costs, whereas a competing sector is not, the competitive position will be distorted which could be undesired. Last but not least, if certain jurisdictions do regulate emissions but others don’t there is a risk of relocation of industrial production to jurisdictions without regulation. This issue, discussed in more detail in the section on allocation, is often referred to as carbon leakage. Options exist to deal with it (e.g. allocating allowances for free to reduce the cost burden for those sectors), but an option is also to exclude those sectors most vulnerable for carbon leakage from the list altogether.

2. Gases

The decision to include or exclude certain greenhouse gases also affects the coverage of an ETS. Similar to the sectoral scope, the selection of greenhouse gases included in an ETS should maximise the coverage, while taking into account administrative costs, in order to maximise the possibilities for cost-effective mitigation. CO₂ is included in all ETSs currently operating, as it accounts for the largest share of GHG emissions, whereas other gases are included in some ETSs as well as we outline below. In order to make all greenhouse gases comparable, the mass of gases other than CO₂ needs to be expressed in terms of carbon dioxide equivalent (CO₂e), by applying the appropriate global warming potential factor.
3. Thresholds

Within the sectors included under the ETS, the choice is often made to include only a subset of entities in the sector in the ETS. This intra-sector coverage is usually designed based on a threshold, for example, GHG emissions, energy consumption, production or capacity threshold. A threshold is especially important for ETSs with a downstream point of regulation as discussed below, as this needs to exclude smaller operators, and thereby reduce overall administrative costs. However, the ideal threshold level depends on sector specific characteristics as well as mitigation objectives. If a sector is characterised by many small sources, the threshold needs to be set at a relatively low threshold to ensure that a substantial share of the sector’s emissions is covered. On the other hand, where a sector is characterised by small firms with limited financial and human capabilities to participate in emissions trading, then a higher threshold may be necessary.

It is also important to set a threshold value which reduces the risk of competitive and market distortions within sectors. The threshold effectively divides the sector into two groups: ETS and non-ETS firms, which may distort competition between the two groups. To reduce the risk of this competitive distortion, the threshold should be set at a level that is consistent with the sector’s competitive dynamics, i.e. set at a level where there is usually little competition between the two groups. In addition, a threshold value incentivises the splitting up of existing facilities such that the newly created individual facilities are below the threshold. It may also provide an incentive for firms to reduce their growth to remain below the coverage threshold. The design of intra-sector coverage criteria should thus be given ample attention.

In summary, the advantages of a larger sectoral/gas coverage are that this increases the low cost mitigation potential, the risk of carbon leakage between sectors is avoided and this provides policy makers with greater control in achieving an overall economy-wide emission reduction target. However, this needs to be balanced with the administrative effort related to such broader coverage, practicalities such as the MRV-ability and as well as the existence of other policy instruments.

Considering threshold levels, a low threshold level increases the coverage and therefore increases the cost efficiency of the ETS. It also reduces the risk of market distortions between firms above and below the threshold level. On the other hand, a high threshold level reduces administrative costs and relieves smaller firms of prohibitive administrative and transaction cost burdens.

The point of regulation

The point of regulation in an ETS is the point at which emissions are monitored and compliance is enforced. For emissions related to combustion of fuels, the point of regulation can be either upstream (where fuels enter the market) or more downstream (where the emissions take place).

The upstream point of regulation is where the emissions source enters the domestic market, e.g. a fossil fuel extraction point, refinery or fossil fuel importer and to base the obligation on the emissions embodied in the fuels delivered to the market. The upstream operator’s carbon costs can be passed on to downstream consumers through higher prices. Upstream regulation has lower administrative costs than downstream regulation, as there are usually substantially fewer upstream operators compared to downstream entities. In addition, upstream regulation enables a higher coverage and intra-sector coverage thresholds can be avoided.
The downstream point of regulation is where the emissions are actually released into the atmosphere, for example, a cement kiln. Downstream regulation may be favourable in jurisdictions where data and MRV mechanisms already exist at this level. In addition, a downstream point of regulation could provide stronger incentives to decarbonise than upstream regulation in industries where upstream carbon cost pass through is limited. Also, a downstream point of regulation may be more effective in driving emission reductions, as studies have suggested that regulation at the point of GHG emissions may provide a stronger incentive for behavioural change than from the pass through of upstream carbon costs. Furthermore, a downstream point of obligation may be preferred if free allocation of allowances, in particular through the grandfathering approach, requires downstream data.

The point of regulation is particularly relevant for the electricity sector. There are three possible points of regulation in the electricity supply chain: at the fuel source, at the generator side and at the side of electricity consumers. All of these approaches or combinations of such approaches have been applied so far in existing ETSs as we will explain below in the section on international examples. The choice which approach is most suitable depends on the regulatory framework for the electricity market. In case of liberalised electricity markets, where generators can pass on the costs to consumers, putting the point of obligation at the fuel source or at the generator will ensure mitigation is incentivised throughout the supply chain. However, in certain regulatory framework, electricity prices are regulated and costs cannot be passed through. To preserve the incentive for reducing the overall consumption of electricity, it can in such cases be an option to put the point of obligation at the consumer side, possibly in combination with an obligation also at the generator side (in order to keep the incentive also there).

In summary, the advantages of an upstream point of regulation are reduced administrative costs and monitoring needs, higher coverage of GHG emissions compared to the number of points of regulation and the risk of carbon leakage between and within sectors is removed. On the other hand, a downstream point of regulation may be preferable where it builds on existing regulatory frameworks at this level. For electricity, a downstream point of regulation can provide incentives to electricity users in systems with regulated prices. More in general there is some evidence that there is a stronger behavioural response to regulation at the point of emissions.

The reporting entity
A decision also needs to be made on whether the point of regulation is at a company or installation level. Company level regulation can reduce the transactions costs for participants, as a company with multiple sources of emissions has fewer points of obligation and data is usually already available at a company level. The administrative costs to the regulator is also lower as it reduces the number of ETS participants. Clear regulations are required in the case of company regulation, e.g. on treatment of mergers and acquisitions. The link to activities covered under an ETS can become less clear in the case of large companies with multiple activities (of which part fall within and parts outside the scope of the ETS). Installation level regulation avoids this problem, as there is often a very clear definition of the activities included that are linked to specific production sites. However, the disadvantages of installation level regulation include a higher MRV burden and increased transaction costs for participating companies, compared to a company level regulatory approach.
In summary, the installation level of reporting obligation may be preferred where several companies are operating at the same installation. Installation level reporting obligations also reduce the administrative complexity where there is a transfer of ownership of an installation between companies. On the other hand, a company level of reporting obligation lowers administrative costs as it reduces the number of participants in an ETS; it also reduces transaction costs for companies as it does not need to report data for each installation.

2.2.3 Selection of international examples

In this section, we provide a selection of international examples of ETS scope decisions which may be relevant to the design of an ETS in Turkey. Of the ETSs currently in operation, the sectoral scope and scope in terms of gases is summarised in Figure 4 and Table 1.
Figure 4: Sector coverage in existing ETSs

Table 1: Gas coverage in existing ETSs

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<th>CO₂</th>
<th>CH₄</th>
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<th>PFCs</th>
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Below, some sector specific reflections are given on the sector by sector coverage of existing ETSs:

- **Industry:** Except for the Regional Greenhouse Gas Initiative, all ETSs also cover industrial emissions, which can come from stationary energy use and process emissions. These process emissions are a result of physical or chemical processes such as calcination in cement production. The main sectors included in industrial processes are cement, steel and aluminium.

- **Electricity:** almost all ETSs include emissions from the electricity sector, a sector characterised by a relatively small number of large fossil emitters. As discussed, jurisdictions with liberated electricity markets typically include the electricity sector upstream at the level of the generator (e.g. the EU ETS) where jurisdictions like Korea and the Chinese pilots set an obligation for surrendering allowances at more than one point in the supply chain, i.e. at the point of the direct emissions (i.e. the generator) as well as the downstream consumer. In this system, it is important to design the cap such that it accommodates the obligation to surrender two allowances for each tonne of CO₂ generated. Government regulation is needed to prevent the pass through of carbon costs so that all actors in the supply chain face the same carbon price signal.

- **Buildings:** Some ETSs also include emissions from larger buildings either directly at the point of emissions or (California, Quebec, New Zealand) via upstream coverage of the fuels delivered to this sector.

- **Transport:** Most ETSs do not cover the transport sector, primarily due to the behavioural response to price signals in this sector, and also due to the existence of other policies as described above. Domestic aviation is included in the EU, New Zealand, the Republic of Korea.

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and Shanghai as a sector that is relatively easy to monitor and represents a significant share of the emissions that are often not regulated by other policies.

- **Waste:** The waste sector is not commonly covered by ETSs as it contributes to a relatively small share of emissions in jurisdictions with ETSs, there are limited mitigation options and this sector is characterised by a large number of small sources. The administrative costs per unit of emissions in the waste sector in an ETS would therefore be substantial.

- **Forestry, agriculture and other land-use related activities:** Most ETSs do not cover emissions from land-use related activities, including forestry and agriculture. Due to the relatively low emission reduction potential of the forestry sector in most jurisdictions with ETSs and the administrative complexity of including the forestry sector in an ETS, most jurisdictions do not cover the forestry sector and leave this sector as a potential generator of offsets (see Section 2.5). Emissions from agriculture have generally been excluded from the scope of ETSs currently implemented due to the small contribution of this sector to total emissions in these jurisdictions, MRV would be logistically difficult and mitigation actions may be limited and/or poorly understood. Also, in the agricultural sector, some jurisdictions have policies of growing output, which may conflict with the objectives of emissions trading.

Out of the above overview the following pattern emerges. Jurisdictions with a purely downstream point of obligation focused on the bigger emitters typically cover up to a most 60% of the domestic emissions with their ETS. The remaining 40% of the national emissions it typically emitted in smaller, more dispersed point sources that can only be covered if a more upstream point of obligation is used. California, Quebec and New Zealand are examples of jurisdictions using such an upstream point of obligation, resulting in a coverage up to 90% (Figure 4).

We discuss the case of the Californian ETS with its upstream coverage of emission sources and the inclusion of imported electricity in more detail in Box 2.

### Box 2: California ETS: Upstream point of obligation and inclusion of imported electricity

In the California ETS, the point of regulation for the transport fuel sector is upstream, where fossil fuels are commercialized by extractors, refiners, or importers. These facilities are required to surrender allowances for compliance, and they pass on their costs to the downstream consumer through higher fuel product prices.

In the case of electricity generation, the Californian ETS regulates at the level of electricity generators as well as importers as the jurisdiction imports a high share from other states that it cannot regulate. The regulations require the producers of electricity in California and importers of electricity to account for the emissions associated with the electricity generation – at least for the quantity consumed in this state. When the emissions associated with imported electricity is unknown, importers may use a default emissions factor which is comparable to the emissions intensity of older gas-fired electricity generation.

#### 2.2.4 Links to other design elements and miscellaneous issues

The scope of an ETS is inherently linked to other design elements. A clear link exists between the decision on the scope and setting the cap, as the scope determines the amount of emissions covered by the ETS. In general, it is preferable to decide on the scope before setting the cap, and as such, the cap should be set in line with the scope of the ETS.

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Cap setting is discussed in further detail in Section 2.3. Another clear link exists between deciding on the scope and allocation. For each entity a decision on allocation is needed; this will be based on an installation or company level, depending on the point of regulation chosen. Allocation options will be examined in Section 2.4.

2.2.5 Design checklist

A summary overview of the key relevant criteria/Issues as well as a checklist on key decisions to be taken in the design on an emissions trading scheme with respect to coverage and general design elements is given in Table 2.

Table 2: Deciding on the scope - key considerations and design checklist

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Design checklist</th>
</tr>
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<tbody>
<tr>
<td>- The ultimate goal of an emissions trading scheme is to meet a certain emission reduction at lowest overall costs. A large coverage is in theory to be preferred since it optimises the cost-efficiency of the overall system.</td>
<td>- Decide which sectors to cover and decide on thresholds to apply within sectors;</td>
</tr>
<tr>
<td>- The wish to have a broad coverage needs to be balanced with other criteria such as administrative complexity (and associated costs), the possible existence of other policies and measures, and the occurrence of unwanted effects on e.g. competitiveness of included sectors.</td>
<td>- Decide which gases to cover;</td>
</tr>
<tr>
<td>- The coverage of the trading scheme should be unambiguously defined, based on clear and undisputable inclusion criteria.</td>
<td>- Determine the point of obligation i.e. upstream or downstream level, and at company or installation level.</td>
</tr>
<tr>
<td>- The requires choices on the sectors and gases to be included, setting possible inclusion thresholds within sector and deciding on the point of obligation.</td>
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2.3 Set the cap

2.3.1 Definition

The PMR and ICAP guide give the following definition of the ETS cap14:

"The ETS cap is the maximum quantity of allowances issued by the government over a defined period of time, which in turn limits how much covered sources can add to global emissions. An “allowance,” supplied by the government, allows the holder to emit one tonne (= one metric ton) of emissions under the cap in compliance with the rules established by the program.

Because the ETS limits the total number of allowances and establishes a trading market, each allowance has value (the so-called “carbon” price). The “tighter” or “more ambitious” the cap—that is, the lower the absolute number of allowances issued—the greater is the scarcity of allowances and, thus, the higher will be their price, all else being equal."

Arguably, the cap is therefore the single most important design element in an ETS. It sets the environmental outcome of the ETS. This ultimately determines the allowance price, the system costs and the trading patterns under the ETS.

2.3.2 Analysis of design options and choices

In line with the PMR/ICAP hand book, we distinguish four key decisions on cap-setting that have to be taken when designing an ETS:

1. The cap ambition level.
2. The type of cap-setting approach: absolute or intensity-based.
3. The data that will be used for setting the cap.
4. The time period for which the cap is set.

The cap ambition level
A jurisdiction’s emissions reduction ambition underlies the cap that is set for an ETS in that jurisdiction. As identified by PMR and ICAP, there are four issues that should be considered when setting the ambition level of the ETS cap:

1. Trade-off between emissions reduction ambition and system costs
   Ambitious cap setting results, via higher allowance prices, in higher costs on ETS participants compared to a less ambitious cap. Two metrics can thus be used to judge how ambitious a cap is. One metric that can be used is the speed an overall quantity of the emission reductions, i.e. the environmental ambition level. The other metrics that can be used are related to the allowance price (in theory being equal to the marginal costs of abating emissions up to desired level) and the total costs related to achieving the cap, i.e. the ambition level in terms of system costs. For political acceptability, it is important that stakeholders perceive the trade-off between an environmentally credible cap and the economic costs that result from this to be balanced. In this trade-off, issues related to industrial competitiveness (can the local industry bear the costs), national income and welfare for certain groups in society play a role and the decisions on such trade-offs might also be changing over time. Also the way possible revenues from the ETS are used by the government play a role in the perceived fairness of the cap set. Ambitious cap setting resulting in high CO₂ costs right from the start is in many cases politically not acceptable. Instead it may be better to prioritise in the early stages of an ETS the functioning of the basic ETS architecture (MRVA, registry, trading platforms etc.) rather than focusing on an environmentally ambitious cap fright from the start of an ETS.

2. Aligning the ETS cap ambition with the economy-wide ambitions level
   For many jurisdictions, an ETS is one of the main policy instruments to reach an overarching, economy-wide emission reduction goal. Setting a cap in line with this overarching target could increase the political acceptability of the ETS. It is thus important to approach the cap setting in an ETS in close relation to the overall economy-wise reduction target if there is such a target. In the communication on the cap-setting approach, the cap can then be linked
to the overall target and the share of different sectors in achieving the target (see the next point).

3. **Share of mitigation responsibility borne by capped and uncapped sectors**

In jurisdictions where there is indeed an economy-wide emission reduction target, the cap set for the sectors under the ETS determines also the emission reduction ambition of the sectors not covered by the ETS. Therefore, when determining the cap, policy makers need to take into account the capacity of capped and uncapped sectors to reduce emissions and need to balance costs for both the capped and uncapped sectors. This requires consideration on the equity (which sectors can handle which costs) and efficiency of reaching the overall reduction ambitions. In case the reduction costs are relatively low in the sectors that are not included in the ETS, the capped and uncapped sectors can be linked via domestic off-sets allowing the capped sectors to use emission reductions achieved in the un-capped sectors. This can reduce the overall costs of reaching certain domestic goals. Off-sets are discussed in more detail in Section 2.5.

4. **Intended share of domestic emissions abatement efforts**

The government should consider to what extent it wants to reduce domestic emissions only or whether it would like to open the ETS also for offsets generated outside the jurisdiction of the ETS. For different economic and political reasons, some jurisdictions aim for (partial) emission abatement efforts outside its geographical territory, e.g. because emission reductions are cheaper if realised internationally or because the jurisdiction would like to stimulate technology transfer. The pros and cons of using international offsets, as those of using domestic offsets are discussed in more in Section 2.5.

**The type of cap-setting approach: absolute or intensity based**

Two cap setting approaches can be used: an absolute cap or an intensity based cap. We refer to an absolute cap as a cap that is defined in terms of an absolute emission development in the cap-setting period. We refer to an intensity based cap if the cap is defined in terms of an intensity development (expressed as emissions per unit of output)\(^{15}\) in the cap period. Alignment between the way the overall economy-wide target is defined and the way the cap under the ETS is defined helps in the communication to stakeholders on how the ETS contributes the economy-wide targets. In principle, an intensity based cap corresponds better with an economy-wide intensity target and an absolute cap corresponds more easily with a target that is defined in absolute terms. Although both absolute and intensity based caps can be defined in ambitious and non-ambitious ways, intensity based caps are better capable to cope with the situation in which the economic output develops differently as compared to projections, depending on the exact way changes in economic output are taken into account. As the PMR/ICAP handbook puts it:

"If output is higher than projected, then an absolute cap will achieve more mitigation (and correspondingly higher total costs) than an intensity cap, which will allow emissions to rise. As a result, if output grows faster than expected, absolute caps place the risk on compliance costs while intensity caps place the risk on emissions outcomes. By contrast, if output is lower than projected, an intensity cap will force more mitigation at higher costs than an absolute cap, and an absolute cap with relatively less binding on emissions".

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\(^{15}\) The choice of intensity metric(s) will depend on the sector covered by the ETS and can involve a mix of physical metrics (tonnages of steel, cement, kWh of electricity) and economic metric (Value Added or GDP).
Intensity based cap-setting comes with challenges related to the data requirements. It imposes a choice for appropriate intensity metrics. Choosing an indicator at a very aggregated level (e.g. emissions per unit of GDP) as basis for cap-setting has the drawback that there is often only a limited correlation between emissions and output at this aggregated level. Choosing many disaggregated sector-specific indicators that are summed up to arrive at an overall cap results in the need to monitor and verify all output parameters that are used in the cap-setting. Also, while the ability to cope better with changes in output is one of the advantages of an intensity-based cap setting approach, it also may unwantedly also correct for output changes that ideally would be incentivised by the ETS. An example of this is material substitution from a material that is produced with high emissions to another material with lower emissions. A final consideration that should be taken into account when deciding on the cap structure is the link to other ETSs (discussed in more detail in Section 2.9 and in Section 2.3.4). As a general rule, linking is more easy between two ETSs that have a similar cap setting structure.

The data that will be used for setting the cap
A range of data can help policy makers make informed decisions on the type and ambition of the cap. The PMR/ICAP handbook distinguishes the following four data types that should play a role in the cap-setting:

- **Historical emissions data** at both national and also at ETS participant level provides an important basis for any cap-setting approach. A distinction can be made between data that is available from national emission inventories or other existing country statistics and data that is bottom-up collected from the entities that will be covered by the to be established ETS. These latter data might be available if e.g. the MRVA system is rolled out before the actual introduction of the ETS. If accurate historical data is not available, a cap can still be set, but this does come by definition with specific challenges related to data quality and accurateness of the resulting cap.

- **Projections for emissions under a baseline** is a second type of information that is needed for adequate cap-setting. Such a baseline is need to understand how would emissions evolve over time in the absence of the ETS. Based on previous PMR work, the PMR/ICAP handbook distinguishes a number of methods for emissions forecasting ranging from simple trend extrapolation to a detailed bottom-up assessment starting at a detailed sector or sub-sector level. Given the uncertainties in forecasting emissions it is advisable to develop a range of baseline scenarios allowing to assess the potential impact of an ETS in detail.

- **Data on the technical and economic potential to reduce emissions in capped sectors.** The technical mitigation potential is the emission reduction that can be achieved by taking all possible mitigation measures that are available. The economic mitigation potential can be defined as the emission reductions that can be achieved at a particular carbon price, under specific assumptions regarding e.g. the discount rates. Marginal abatement cost curves (MACC) can be developed to understand the economic cost of reaching certain emission reduction targets. A certain degree of understanding on potentials and costs is needed to ensure the cap is set realistically. This plays an important role in the trade-off between ambition level and system costs as explained above. It is important to stress though that emissions trading as instrument will ultimately result in the lowest cost mitigation options being taken with the resulting price being, at least in theory, the marginal cost related to the set ambition level. It is a such not needed that policy makers know these costs in advance.
Information on **other policies**. Other policies could enhance, duplicate, or negate the effect of the ETS. It is therefore important to understand these interaction effects prior to cap setting and to make use, where available of information on the impact and functioning of other policy instruments.

Depending on the availability and accurateness of the available data and the existence of an overall economy-wide target, the PMR/ICAP handbook distinguished three approaches which can be used to calculate the cap:

**A top-down approach** where the cap is based on the overall economy-wide emission target and the share of the capped sectors in the total emissions. The advantage of this approach is that it is relatively simple to align the ambition of the ETS with broader mitigation goals and other policies and measures. Another advantage is that relatively limited data is needed to set the cap. This approach can, however, not be used when a jurisdiction does not have an economy-wide target and due to the fact that no detailed information on the costs and potentials of the emission reductions is used in the cap-setting, it is difficult to predict the allowance price and systems costs that will result from the cap.

**A bottom-up approach** where the cap is based on a more detailed assessment of the emission reduction potential for each ETS sector, subsector, or participant. The cap is determined by aggregating the emissions reduction potentials and a deliberate choice regarding the trade-off between emission reductions and system costs. The advantage of this approach is that it takes into account the specific circumstances of participants and sectors and that, provided good quality data is available, there is some certainty on the resulting allowance price and system costs. However, this approach requires high-quality data, and may not capture macro-economic considerations, and there may be misalignment between the ETS cap ambition and the jurisdiction’s broader mitigation target.

**A hybrid approach** where the cap is based on a combination of the top-down and bottom-up approaches. Bottom-up data and analysis might be used as a basis for the cap, which is then adjusted to reflect interaction effects between sectors, and the intended contribution of the capped sectors to top-down mitigation objectives.

**The length of the cap-setting phase**
The length of an ETS phase (i.e. the length of the commitment period for which a cap is set) needs to be set such that it provides policy certainty and investor confidence, while at the same time giving sufficient flexibility for policy makers to implement design changes. In line with the PMR/ICAP handbook, we define the cap period as *"the number of years for which the cap is fixed in advance under a given set of parameters. This will usually correspond to a commitment period or ETS phase under which other program design features are also specified"*²⁶. Short cap periods provide policy makers with flexibility to adjust the design of the ETS to incorporate lessons learned, and supply can be controlled through cap adjustments more rapidly than with longer phases. On the other hand, longer cap periods provide policy stability and clarity. However, there are a risk with long phases that non-working design elements are locked in or that the design of the ETS cannot be modified to respond to unexpected political or economic developments.

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Enabling periodic cap adjustments can create uncertainty among market participants about the possible long-term trajectory of the cap and the resulting price signal. This may undermine one of the main benefits of an ETS, i.e. to provide a price signal that will incentivize low-carbon investments. This may be overcome by short cap periods that are at the same time embedded in a long-term emissions trajectory that is put forward as guiding for future decision making, including clear rules on the procedure that will be followed in the future cap setting.

2.3.3 Selection of international examples

In this section, we give a selection of international examples related to cap-setting that might be of relevance to the situation in Turkey.

As described above, the cap ambition level is ideally set in line with the overarching, economy wide emission reduction target. Table 3 provides a factual summarising overview of international examples of ETS system in jurisdictions having also an economy-wide target, including also the coverage of the ETS sectors as % of the economy.

Table 3: International examples of the relation between ETS caps and overarching emission reduction targets

<table>
<thead>
<tr>
<th>ETS system</th>
<th>Economy-wide targets for jurisdiction/ETS coverage of jurisdiction’s GHG emissions (as of 2015)</th>
<th>ETS cap (in millions of allowances)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU ETS Phase I (2005–07)</td>
<td>Reduce emissions to levels 8% below 1990 levels over 2008–12</td>
<td>Cap based on aggregation of National Allocation Plans of each EU Member State</td>
</tr>
<tr>
<td>Phase II (2008–12)</td>
<td></td>
<td>Same as above</td>
</tr>
<tr>
<td>Phase III (2013–20)</td>
<td>Reduce emissions to levels 20% below 1990 levels by 2020 ETS coverage: 45%</td>
<td>Single, EU-wide cap for stationary sources 2013: 2,084, cap for stationary sources, declines 1.74%/year, expanded to cover CCS installations, production of petrochemicals, ammonia, nonferrous metals, gypsum and aluminium, nitric, adipic and glyoxylic acid; aviation sector cap: 210</td>
</tr>
<tr>
<td>Phase IV (2021–30)</td>
<td>Reduce emissions to levels 40% below 1990 levels by 2030</td>
<td>European Commission proposes to decline the cap for stationary sources by 2.2% annually</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Reduce emissions to 1990 levels over 2008–12 Reduce emissions by 5% relative to 1990 levels by 2020 (unconditional), 11% by 2030</td>
<td>2008–15: operated under the Kyoto cap with no domestic ETS cap</td>
</tr>
</tbody>
</table>

17 Taken from PMR and ICAP (2016). Emissions Trading in Practice: A Handbook on Design and Implementation, page 50. For sources used, we refer to the Handbook.
<table>
<thead>
<tr>
<th>ETS system</th>
<th>Economy-wide targets for jurisdiction/ETS coverage of jurisdiction’s GHG emissions (as of 2015)</th>
<th>ETS cap (in millions of allowances)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGGI</td>
<td>(conditional), and 50% by 2050 (unconditional)</td>
<td>2009: originally stabilized at 149.7 (165 M short tons)</td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 52%</td>
<td>2014: 82.6 (91 M short tons), the cap was amended in the 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>program reform; cap declines linearly by 2.5%. To account for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>banked allowances, RGGI has a total interim adjustment for 2014–</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 of 139.5 million CO₂ allowances.</td>
</tr>
<tr>
<td>Tokyo</td>
<td>Economy wide target not applicable</td>
<td>Reduce emissions by 25% relative to 2000 levels by 2020, 30%</td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 5.5% of U.S. emissions</td>
<td>reduction relative to 2000 levels by 2030.</td>
</tr>
<tr>
<td></td>
<td>45% reduction in CO₂ from covered sources below 2005 levels by 2020</td>
<td>2010–14: cap is set at the facility level and aggregated to a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tokyo-wide cap that reduces emissions by 6–8%/fiscal year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>below base year (average of any 3-year period from 2002–07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015–19: 15–17% below base year</td>
</tr>
<tr>
<td>Saitama</td>
<td>Reduce emissions by 25% relative to 1990 levels by 2020</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 18%</td>
<td>2011–14: cap is set at the facility level and aggregated to a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saitama-wide cap that reduces emissions 6–8% below base year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(average of 3 years from 2002–07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015–19: 15–20% below base year</td>
</tr>
<tr>
<td>California</td>
<td>Reach 1990 level emissions by 2020</td>
<td>2013: 162.8</td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 85%</td>
<td>2014: 159.7, cap declined linearly approx. 2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015: 394.5, expanded to distributors of transportation,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>natural gas and other fuels; cap declines linearly approx. 3%/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>year from 2015 to 2020</td>
</tr>
<tr>
<td>Québec</td>
<td>Reduce emissions by 20% relative to 1990 levels by 2020</td>
<td>2013-2014: 23.2 (per year)</td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 85%</td>
<td>2015: 65.3, expanded to distribution and importation of fuels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in the transport and building sectors, cap declines linearly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>at 3.2% through 2020</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Reduce emissions by 15% relative to 1990 levels by 2020 and 25% relative to 1990 by</td>
<td>2013: 147.2, plus a reserve of 20.6</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>2014: 155.4</td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 50%</td>
<td>2015: 153</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Reduce emissions by 20% relative to 1990 levels by 2020, 35% by 2025, 50% by 2030,</td>
<td>2013: 5.63, cap declines linearly by 1.74% a year through 2020</td>
</tr>
<tr>
<td></td>
<td>70-85% by 2050 (targets for 2025 and)</td>
<td>2015: 5.44</td>
</tr>
</tbody>
</table>
### Table: ETS System, Economy-Wide Targets, and ETS Cap (as of 2015)

<table>
<thead>
<tr>
<th>ETS system</th>
<th>Economy-wide targets for jurisdiction/ETS coverage of jurisdiction’s GHG emissions (as of 2015)</th>
<th>ETS cap (in millions of allowances)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Korea</td>
<td>2030 are subject to approval by parliament, target for 2050 is an indicative goal. ETS coverage: 11%</td>
<td>2015: 573, the cap declines by about 2% through 2017</td>
</tr>
<tr>
<td></td>
<td>Reduce emissions by 30% relative to modelled BAU by 2020 (4% below 2005 levels).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduce emissions 37% below BAU (22% below 2012 levels) by 2030.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETS coverage: 66%</td>
<td></td>
</tr>
</tbody>
</table>

In **terms of cap-setting approach**, it is interesting to note that experience with intensity-based cap-setting has so far been limited, which might be an indication for the difficulties in implementing it. The PMR/ICAP handbook provides examples on the UK Climate Change Agreement (CCA) and the US Clean Power Plan. In the CCA, companies could commit to an intensity based target which implicitly implied an overall intensity target for the group as whole. Under the US Clean Power Plan, US states could either choose a mass or rate-based emission reduction target approach, equivalent to an absolute and an intensity based approach. Emissions trading was proposed as an option for both, however trading would not be allowed between rate-based and mass-based participants. The mass-based approach could potentially be suitable for linking trading under the Clean Power Plan with other ETSs. Also the cap-setting in some of the Chinese ETS pilots has characteristics of being intensity-based, although it is difficult to find precise and conclusive information on how the cap-setting was done and the links to the overall intensity-based targets for the various of the regions. In many of the Chinese ETS pilots, an initial cap on an intensity basis has been combined with ex-post adjustments based on the actual output of enterprises.  

The EU ETS provides good historical insights in the development of cap-setting approach in terms of the **data that is used for the cap**. The EU ETS cap-setting approach changed from a decentralised method to a centralised EU-level approach. In the first two phases of the EU ETS, the EU cap was set in a bottom up manner with each of the EU’s 27 Member States submitting National Allocation Plans which stated how many allowances would be to each EU ETS installation. However, these estimates were based on incomplete data, inconsistent emissions calculation methodologies, and the data collection allowed for the opt-out of certain years. As a result, most member states had set overly generous caps and allocated too many allowances. This led to the price of allowances falling to zero, and a low incentive for participants to reduce their GHG emissions. In Phase III of the EU ETS, the approach changed to a single EU-level wide cap, which was determined centrally to ensure that the sectors covered under the ETS would contribute to meeting the EU’s 2020 20% GHG emission reduction target compared to 1990 levels. The data basis for these estimates was significantly better due to the availability of the bottom-up collected emissions data from the EU ETS itself. The phase IV proposal in the EU aligns the EU ETS to the EU’s 2030 mitigation ambition.

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18 A possible approach for an intensity based cap-setting and allowance allocation approach for the Chinese national ETS can be found here: [http://www.ecofys.com/nl/blog/22/](http://www.ecofys.com/nl/blog/22/)
The EU is a good example of a jurisdiction where the ETS is carefully embedded in an overall economy-wide ambition, translated towards 2030 into the following targets:

- At least a 40% cut in GHG emission from 1990 levels;
- At least a share of 27% of renewable energy;
- At least a 27% improvements in energy efficiency.

The GHG emission reduction goal is carefully split into a part to be delivered by the ETS (a 43% reduction as compared to 2005) and a part to be delivered by the non-ETS sectors (30% as compared to 2005)\(^1\).

Other jurisdictions have similar cap-setting methods to the EU ETS with bottom-up methods to set the cap based on an aggregation of emissions from covered entities reduced with a certain % being often used in jurisdictions starting with an ETS in the absence of good and reliable data on economy wide emissions and the share of the ETS sectors in those emissions.

Regarding the **cap period**, an overview is provided on for existing ETSs in Box 3:

**Box 3: Cap periods in existing ETSs**\(^2\)

- In RGGI, caps were initially set upfront for two periods (2009–2014 and 2015–2020), with a cap review and adjustment in 2012.
- The Waxman-Markey Bill, which was passed by the U.S. House of Representatives in 2009 but not by the Senate, would have established annual caps from 2012 through 2050.
- Most Chinese pilots combined an initial cap on an intensity basis with annual ex post adjustment based on the actual outputs/business volumes of the enterprises.
- The Australian ETS proposed to set five years of caps initially and to set the next annual cap on a rolling basis each year so that caps were always set five years in advance.

Most jurisdictions have an initial cap-setting period that is limited in number of years to allow for sufficient flexibility for policy makers to implement changes. The EU ETS and RGGI are the only ETS that run long enough to give sufficient insight on the robustness of the cap-setting over longer periods of time. Within RGGI, the cap was amended in the 2012 reform to accommodate the faster than foreseen reduction in emissions. In the EU ETS, the economic crises in 2009/2010 resulting in a surplus of allowances. Due to a lack of a mechanism to adapt the cap for such system shocks, this surplus persists to date resulting in low allowance prices. Both examples show the need for periodic cap review mechanisms.

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\(^1\) For more detailed information on the EU Energy and Climate Change package, see [http://ec.europa.eu/clima/policies/strategies/2030/index_en.htm](http://ec.europa.eu/clima/policies/strategies/2030/index_en.htm)

Especially the EU ETS example for phase II and III provides a clear argument for not setting a fixed cap for longer periods of time without market stability measures (discussed in more detail in Section 2.6) or without possibilities for cap adjustments during that cap period.

2.3.4 Links to other design elements and other key issues

Cap-setting cannot be seen in isolation from other key design elements. There is a clear link between cap setting and allocation (which is discussed in more detail in Section 2.4). The ambition of the ETS as reflected in the cap has implications for the allocation of allowances. In general, it is preferable to set the cap before deciding on allocation methods. However, due to political and administrative pressures, these two decisions may become interlinked and iterative in practice. This can happen especially in systems with a majority of allowance distributed for free. The free allocation foreseen should in such cases be in line with the total cap. The current situation in the EU ETS, where the total amount of free allocation is capped and the bottom-up calculated free allocation exceeds this cap resulting in the need for allocation correction factors, shows that this can result in complex discussions.

Cap setting is also directly related to linking (discussed in more detail in Section 2.9). Linking of ETSs occurs where one ETS permits allowances or credits issued from another system for compliance. Links can be one way, where units from one ETS are recognised in the other, but not vice versa, or two-way, where units from both ETSs accept the use of units issued from the other system. ETSs can also be indirectly linked when two or more ETSs accept offsets from the same programme. Linking between ETSs is facilitated more easily if they have the same cap structure. Where linked ETSs are not based on the same structure, i.e. one ETS has a dynamic cap and the other has an absolute cap, there may be an increase in overall emissions relative to the case without linking. The possibility to link is thus influenced by the initial choice for the cap-setting approach.

There is also a clear link to offsets (discussed in Section 2.5). The use of offsets in an ETS effectively expands the mitigation options that can be used under the cap by including emissions reductions outside the capped sectors. It can therefore ease high market prices and reduce compliance costs. Offsets usage rules should be designed to ensure the environmental integrity of the ETS (i.e. offsets need to represent real and additional emission reductions) and cost efficiency and are an integral part in the considerations on the trade-off between ambition level and systems costs that are essential to the cap-setting process.

The cap-setting process should also accommodate and include procedures for inclusion of new entrants during the cap period. Rules are needed to ensure that their emissions can be incorporated into the cap, and to provide the appropriate amount of initial allocation of allowances. For example, new entrants in the EU ETS are considered to be either a new installation, an installation re-entering the EU ETS or an existing installation with significant capacity extension. 5% of the total allowances over 2013–2020 (i.e. 5% of the emissions cap) is set aside for new entrants. Free allocation for these new installations is calculated by taking the initial capacity multiplied by a utilisation factor. Other ETSs have similar rules for new entrants.
There might also be reasons to change the cap during the cap period in case of system shocks (e.g. a rapidly changing economic situation or other changes that cannot be managed by flexibility mechanisms between cap period (discussed in Section 2.6) and market stability measures (Section 2.7). This could result in an adjustment of the cap. It is, in view of the confidence of the market participants important that the triggers for such adjustments (which could be based on either allowance prices or based on allowance supply or demand considerations) are clearly defined in the ETS rules.

2.3.5 Design checklist

A summary of the key considerations and an ETS design checklist for cap-setting are given in Table 4.

Table 4: Cap setting – key considerations and design checklist

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Design checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The cap ambition level needs to be consistent with existing economy-wide GHG mitigation objectives. The ambition levels should be balanced with ETS costs.</td>
<td>• Create a data foundation on the current emissions, the mitigation potential, and the expected growth in the sectors covered as basis to determine the cap.</td>
</tr>
<tr>
<td>• Alignment between the way an economy-wide target is defined and the way the ETS cap is defined helps in the communication to stakeholders on how the ETS contributes to the economy-wide target.</td>
<td>• Choose the time period for cap-setting, based on a longer term emissions trajectory.</td>
</tr>
<tr>
<td>• Cap-setting should be based on the best possible data on current and future emissions, emission potentials and mitigation costs.</td>
<td>• Decide on the type of cap-setting approach, i.e. an absolute or intensity based approach.</td>
</tr>
<tr>
<td>• The cap setting period should balance the need for policy certainty and investor confidence and the desire to be flexible in making ETS changes at regular intervals. Embedding the cap-setting in a longer term emissions trajectory can help to provide a longer term confidence in the ETS price signal.</td>
<td>• Decide on the ambition level of the cap and on the use of emissions off-sets.</td>
</tr>
</tbody>
</table>

2.4 Distribute the allowances

2.4.1 Definition

We refer to distribution of allowances as the methodology to initially distribute the available allowances under the cap to the market. It is also often referred to as allowance allocation. It is an important factor in distributing the costs of the ETS among the ETS participants. The scarcity in the market will ultimately result in costs for the participants in an ETS. How these costs will be distributed over the participants depends, among other on how the allowances are initially distributed to the market. The allocation method can also influence the efficiency of the system as it affects how companies will deal with the ETS in terms of deciding on production volumes, locations for new investments, and cost pass-through to consumers.
2.4.2 Analysis of design options and choices

When policy-makers decide on the allocation method, decisions are needed on three levels:

1. The policy objectives the allocation should serve.
2. The allocation methodology for each of the participants in the scheme.
3. The treatment of new entrants, closures and removals.

These decisions are analysed below.

Policy objectives

In distributing the allowances to the market, policy makers first and foremost should try to preserve the incentives for cost-effective abatement which is the principle reason to choose an ETS as the policy instrument. The simplest way to ensure that such incentives are preserved is to sell allowances to the markets via auction rather than handing out allowances for free, which can be distinguished as the two main basic allocation methodologies that exist as explained below. In doing so, the incentives to change to low carbon producers, the incentive to reduce emissions and the incentive to change to lower carbon products are all preserved. An additional advantage is that significant amounts of revenue are generated. The wish to auction allowances should be balanced with other policy objectives, such as the wish to have a smooth transition to an ETS and the wish to avoid carbon leakage. Each of these three policy objectives are discussed below in line with PMR/ICAP handbook:

1. Managing the transition to an ETS

Allocation addresses the key distributional impacts of an ETS. Free allocation may compensate for lower valuations and rising operating costs for emissions intensive assets but might insufficiently recognise action taken before the ETS started, i.e. in case the allocation is based on historical emissions. In the transition to an ETS, other issues could arise, including the low initial capacity to take directly part in a lot of trading. To alleviate these concerns, free allocation would reduce the need for auction participation and trading in order to meet compliance obligations. The mix of issues related to the transitioning to an ETS results, in most cases as we will show below, in jurisdictions choosing free allocation as the key allocation methodology in the first phases of an ETS with auctioning only be used to a more significant extent in later phases.

2. Carbon leakage

Carbon leakage occurs when "differences in emissions costs lead to the relocation of carbon-intensive activities and related emissions from jurisdictions with stringent climate policies (including a high price on carbon) to jurisdictions with less stringent climate policies (low or no price on carbon), resulting in higher emissions at the latter jurisdictions"21.

Policy makers have used two key indicators either in a combination or in isolation to determine exposure to carbon leakage risk: carbon intensity and trade exposure. Carbon intensity is indicative of the impact that carbon pricing has on a firm or a sector, and can be measured in various ways, for example, through evaluating the volume GHG of emissions per

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unit of value added, output or profit. Trade exposure is indicative of the ability of a firm or sector to pass through carbon costs to the consumers without significant losing market share. As highlighted by the PMR and ICAP Handbook, some academic literature has argued that carbon leakage risk is driven by both trade exposure and carbon intensity, and that these indicators in isolation do not drive carbon leakage. In addition, when designing a carbon intensity indicator, it is important to take into account both direct and indirect emissions, i.e. emissions from electricity generation. Electricity generators pass on their carbon costs resulting in increased electricity prices, which may affect the competitiveness of energy-intensive industries.

To avoid carbon leakage, free allocation is the most commonly used risk mitigation measure in ETSs. A good example in the EU ETS. In the third phase of the EU ETS (2013-2020), there are two groups of sectors distinguished: those that are at risk of carbon leakage and those that are not. Whether a sector or subsector is set to be at carbon leakage risk is defined by the sector’s trade intensity and the carbon costs as proportion of the gross value added of that specific sector. If either of the indicators is higher than 30%, than a sector or subsector is determined to be suffering from carbon leakage. Alternatively, if the trade intensity is above 10% and the cost ratio above 5%, it is also at risk of carbon leakage. Under the proposal from the European Commission for the fourth phase of the EU ETS (2021-2030), a new approach is proposed, where the carbon leakage factor is calculated by multiplying the emissions intensity and trade intensity. Should this number exceed 0.2, then a sector would receive 100% free allocation. Alternatively, a sector receives 30%. In Europe, a cross-sectoral correction factor is used to ensure the bottom-up free allocation remains within the limit set by the cap.

To determine the risk of carbon leakage and the exposure of a specific sector to this risk is a difficult issue and universal methodologies suitable for all countries (taking into account their varying levels of development and dependence on imports or exports) or all sectors are not existing. This is one of the reasons to introduce an ETS stepwise to ensure that the introduction of an ETS does not come as a shock, but starts with a design that limits the cost burden to companies at the start, while keeping incentives to reduce emissions.

Separate from free allocation, there are other methodologies to protect industry against undue competitive distortions. A report for the UK government by Vivid Economics and Ecofys discusses, for example, the option to exempt certain sectors that are at risk of carbon leakage due to ETS participation, directly provide financial compensation to affected sectors or to apply border carbon adjustments. In the EU ETS, financial compensation is used to compensate industries for the higher costs related to electricity price increases and in California, imported electricity must comply with the California-Cap-and-Trade Program, which bears some resemblance to a border carbon adjustment.

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A border carbon adjustment for cement has been studied in California as well and is also being discussed in the discussion on the EU ETS phase IV.

3. Raising revenue
As will be discussed in more detail below, the main two methods of allowance distribution are free allocation and auctioning. The latter allows the government to generate revenue from the ETS. The most optimal use of using revenues is a somewhat unexplored issue, but typically the revenues can be used for stimulating climate action or other non-climate related purposes or to protect vulnerable groups in society such as low-income households. Raising revenue through the sales of allowances in auctions should be balanced with policy objectives that speak for the use of free allocation (e.g. to protect against leakage or to ease the transition towards and ETS.

Allocation methods
Free allocation and auctioning are the two primary means of distributing allowances to the market and as such, an important design element of any ETS. Many ETSs utilise a hybrid approach where firms in selected sectors receive (some) free allowances, while other firms in other sectors have to buy allowances at auctions or on an allowance exchange. In general, one could say that certain allocation methodologies are more suitable for some sectors as compared to others and that there is no one size fits all approach for all sectors.

Four different allocation methods are discussed in further detail below.

1. Free allocation – grandfathering
Under grandfathering, firms receive free allowances based on their historical emissions. Over time this baseline is typically reduced by some percentage to reflect the ambition to achieve emission reductions and/or increased to reflect expected growth. The amount of free allocation received under this approach is during the trading period in principle independent of the actual changes in production output, depending on the exact rules with respect to closures of installations.

The grandfathering approach is attractive as it reduces the likelihood of initial resistance from firms under the ETS, since all installations receive a free allocation that can be expected to be close to their actual emissions, limiting initial costs and the need to trade a lot in the initial years of an ETS. Also, compared to benchmarking or output based allocation, which are discussed below, the administrative costs are lower and, at least when emissions already monitored in the period on which the allocation is based, and the data for the allocation is available. Free allocation through grandfathering maintains the incentive to abate, as firms that reduce emissions can sell their surplus allowances, while firms that increase their emissions higher than their historical baseline level must pay for these emissions. Also, as firms receive an amount of free allocation that is equivalent to a financial lump sum that is independent of actual production output, a firms’ response to an ETS will be the same as if they had not received free allowances. This means that firms that are not operating in trade exposed sectors will pass on their carbon costs, thereby incentivizing also abatement via product substitution because emission intensive products will become more expensive.
However, grandfathering could potentially provide an incentive for firms to ramp up their emissions in order to receive a higher future free allocation. It is therefore important that the baseline period is sufficiently early, taking into account the constraint that historical data may not be available or may be incomplete. Another drawback is that repeated grandfathering over several ETS phases penalises early action as firms that improve their emissions intensity will receive a fewer free allowances in the future (Box 4).

Box 4: Rewarding early action in an ETS

Early action can broadly be defined as those GHG emissions reductions (activities or projects) that are undertaken by entities before the ETS starts. Among the numerous issues regarding designing of an ETS the early actions are one of the issues often and intensively discussed, in particular from stakeholders of energy and industry sectors. There is wide range of activities that could potentially be considered as early action such as energy efficiency and fuel switch projects. Options for addressing early action in the allocation include awarding additional allowances that are set-aside for this purpose to entities that can proof such early action or awarding additional allowances on top of the pre-determined cap. Such provisions are especially needed in case grandfathering is used as allocation method. With auctioning or benchmark-based allocation, such provisions are not needed because entities automatically benefit from their early action by having to buy less allowances.

Also, grandfathering offers weaker carbon leakage protection than the output based allocation discussed below, as the allocation per unit of output will decrease with expanded output and can therefore be seen as penalising growth and lowering the competitiveness of growing installations. Furthermore, grandfathering may result in windfall profits, as some historically high emitting firms may have low-cost mitigation options. When these mitigation options are exploited, these firms will have a lower compliance obligation but the level of free allocation is unchanged, thereby resulting in windfall profits. Windfall profits will also occur if sectors can pass on the costs of allowances because they have limited competition. Finally, early mitigation actions may be penalized if these occurred before the baseline period used to determine free allocation.

2. Free allocation – fixed sector benchmarking

The fixed sector benchmarking approach distributes free allowances based on the performance of an emitter compared to a given benchmark level of emissions intensity and the historical activity level, e.g. output, throughput or input. The main attraction of benchmarking is that it rewards early action and does not delay abatement activities, as firms with a lower emissions intensity receive a larger share of their emissions in the form of free allowances. When defining benchmarks, ideally the same benchmarks should apply for comparable products (i.e. the benchmarks should not be differentiated by technology) in order not to provide a disincentive for cleaner technologies. However, for a transition phase or in cases where production processes differ widely in GHG emission intensity, e.g. due to the raw material availability or for other reasons (e.g. gas versus coal based power

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production, primary versus secondary steel production), differentiated benchmarks might be more suitable). Using historical activity levels guaranteed to some extent that firms may have an incentive to decrease output in order to meet emission targets. Firms or sectors that are not significantly trade exposed may thus raise prices leading to lower demand and stimulate abatement via lower production.

A disadvantage of the benchmarking approach is that alternatively price increases by firms that are not exposed to international competition may lead to windfall profits. Another disadvantage is the substantial data requirements that are needed in defining the appropriate benchmark. In addition, as allocation is based on a historical activity level, the fixed sector benchmarking provides weaker leakage protection than output based allocation. Also, price signal distortions may arise if benchmarks are not based upon sector or product outputs but rather reflect inputs such as fuel use. Lastly, the transition into the ETS is more challenging under this approach than grandfathering, as firms with relatively high emissions intensity will face a very significant carbon costs right from the start of the ETS.

3. **Free allocation – output based allocation**

Output based allocation is similar to fixed sector benchmarking, except that the amount of free allocation is based on a firm’s current activity level rather than the historical activity level. Output based allocation provides the strongest leakage protection as free allocation levels will increase with expanded output. At the same time incentives to reduce emissions are preserved as decreasing emission liabilities does not reduce the amount of free allowances.

The main disadvantage of output based allocation is that it could lead to a situation where the free allocation increases the size of the overall cap over time (if there are no limits to the amount of free allocation that is given out), and therefore reducing certainty on the environmental outcome of the ETS. Where the output is designed such that free allocation remains within the cap, the level of free allocation to firms will be uncertain and/or volumes of allowances that will be auctioned are uncertain. An output based allocation thus needs to be very carefully designed with a close link to the cap setting. Another disadvantage is that output based allocation may decrease demand-side abatement incentives as firms are incentivized to maintain or even increase their output. Product prices do not reflect the carbon price as much as other allocation methods (explaining also why output based allocation is a good protection against leakage) and as such, product substitution is no longer directly incentivised. Lastly, the administrative effort under an output based approach is substantial as benchmarks need to be determined and outputs need to be defined.

4. **Auctioning**

Auctioning is the process of distributing allowances where an auction is used to determine the price the allowances should have. It is a relatively simple and transparent mechanism. Auctioning allows for good price discovery in the ETS and delivers a strong incentive for mitigation, as participants must pay for their allowances. There is also no potential for windfall gains under auctioning, because all allowances a firm use for compliance have to be bought and thus represent actual carbon costs. Furthermore, allowance auctions raise revenue for the government which can be used to cut distortionary taxes in other parts of the economy, provide compensation to disadvantage households that are adversely impacted by
the ETS or fund other projects such as emission reduction activities. Also, as the approach is relatively simple, it is less sensitive to lobbying by sectors with the aim to support associated firms. As early movers will have to buy less allowances at the auction, they are rewarded for any early action to reduce emissions. The main disadvantage is that auctioning does not provide protection against carbon leakage and, if introduced at the start, might not support an easy transition into an ETS resulting in significant opposition. Sectors exposed to international competition may have the incentive to relocate their activities to jurisdictions without emission limits. Also, there may be concerns on the ability of small firms to access auctions.

A summary of the features of these allocation methods, the extent to which they fulfil the various policy objectives related to the allocation and an overview of data requirements is provided in Table 5.

Table 5: Summary of allocation methods

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Grandfathering</th>
<th>Fixed sector benchmarking</th>
<th>Output-based allocation</th>
<th>Auctioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing transition to ETS</td>
<td>Partial</td>
<td>Partial</td>
<td>Partial</td>
<td>No</td>
</tr>
<tr>
<td>Reducing risk of carbon leakage</td>
<td>Partial</td>
<td>Partial</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Raising revenue</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Preserving incentives for cost-effective abatement</td>
<td>Partial</td>
<td>Partial</td>
<td>Partial</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data requirements</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical emissions</td>
<td>Yes</td>
<td>Maybe</td>
<td>Maybe</td>
<td>No</td>
</tr>
<tr>
<td>Historical output</td>
<td>Maybe</td>
<td>Yes</td>
<td>Maybe</td>
<td>No</td>
</tr>
<tr>
<td>Emissions benchmark</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Actual output</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

New entrants, increase in output levels and closures

In the design of an allocation methodology, the treatment of new entrants and increases in output levels, closures need to be considered. Treatment of new installations and capacity extensions within the allocation (and also the cap-setting) is an important issue especially for countries with emerging economies and growing energy demand such as Turkey. On the one hand, investments in new and necessary capacities need to be encouraged and should not be faced with unnecessary barriers. On the other hand, new installations should be as GHG efficient as possible and the allocation rules for new capacities ideally incentivize this.

The treatment of new entrants as well as closures is relatively simple under auctioning or benchmarking approaches. Auctioning automatically accommodates new entrants as they are treated like other existing firms under the ETS. Closure rules and allocation for firms expanding production levels are not needed under an auctioning approach.

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Under an output based allocation approach, free allocation follows output directly and output expansions are automatically accommodated. Also, new entrants are treated in a similar manner to existing sources that increase production levels. Similarly, due to the link between free allocation and output, specific closure rules under output based allocation are not necessary.

With grandfathering and a fixed sector benchmarking approach, these issues are more complex and rules are required for the treatment of closures of installations or installations that significantly reduce or increase production compared to the production on which the allocation was based. Often this is done in the form of a new entrants reserves out of which additional allocation can be given. In the case of benchmarking, the allocation for new entrants can be based on the benchmark in combination with the expected production (in turn based on capacity and an assumed capacity utilisation factor). In the case of grandfathering, the actual expected emissions can be part of the allocation calculation for new entrants. In most ETSs with a grandfathering or fixed sector benchmarking approach, allowances are no longer freely allocated to plants that have closed.

### 2.4.3 Selection of international examples

In this section, we give a selection of international examples related to allowance allocation that might be of relevance to the situation in Turkey.

Table 6 provides an overview of ETSs around the world and the method of allowance allocation that they use. It can be observed that most systems use a form of free allocation, while a small number uses a combination of free allocation and auctioning. Only RGGI uses 100% auctioning to distribute allowances.

**Table 6: Allowance allocation in practice**

<table>
<thead>
<tr>
<th>ETS</th>
<th>Free allocation versus auction</th>
<th>Free allocation recipients</th>
<th>Free allocation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU (phase I and II)</td>
<td>Mixed, minor share auctioned</td>
<td>Power generators, manufacturing industry</td>
<td>Mixed, large share of grandfathering, increasing share of benchmarking</td>
</tr>
<tr>
<td>EU (phase III and beyond)</td>
<td>Mixed, large and increasing percentage auctioned</td>
<td>Manufacturing Industry and aviation</td>
<td>Fixed sector benchmarking</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Mixed, few freely allocated. No auctioning has yet taken place</td>
<td>Emissions-intensive trade exposed (EITE) activities</td>
<td>Output-based; some grandfathering, now ended</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Mixed</td>
<td>Manufacturing Industry</td>
<td>Fixed sector benchmarking</td>
</tr>
<tr>
<td>RGGI</td>
<td>100% auction</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>Tokyo</td>
<td>100% free allocation</td>
<td>All</td>
<td>Grandfathering based on entity-specific baseline set on any consecutive three years in the period 2002–07.</td>
</tr>
<tr>
<td>Saitama</td>
<td>100% free allocation</td>
<td>All</td>
<td>Grandfathering based on entity-specific baseline set on any consecutive three years in the period 2002–07.</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>ETS</th>
<th>Free allocation versus auction</th>
<th>Free allocation recipients</th>
<th>Free allocation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Mixed, increasing percentage auctioned</td>
<td>Electric distribution utilities and natural gas suppliers on behalf of ratepayers; emissions-intensive and trade-exposed industrial activities</td>
<td>OBA—with output and sector-specific emissions-intensity benchmarks, some grandfathering, very few sectors (industry); based on long-term procurement plans (electricity); historical data (natural gas)</td>
</tr>
<tr>
<td>Québec</td>
<td>Mixed, most auctioned—increasing with time</td>
<td>Emissions-intensive trade exposed (EITE) activities</td>
<td>Output-based benchmarking</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>100% free allocation</td>
<td>All</td>
<td>Grandfathering</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>100% free allocation</td>
<td>All</td>
<td>Grandfathering (for most sectors), benchmarking (for cement, refinery, domestic aviation).</td>
</tr>
</tbody>
</table>

The basic rationale for the choice of allocation method comes back in the table. Most starting ETSs start with free allocation to allow for easy transitioning into the ETS with increasing shares of auctioning over time (e.g. the EU, California, Quebec). The EU and also RGGI apply full auctioning to the electricity sector, which is a sector not exposed to international competition.

In the boxes below we give some further detailed examples on allocation methodologies in jurisdictions with existing ETSs:

Box 4: The history of allocation in the EU ETS
Box 5: The use of auction revenues in the EU, California and Quebec

**Box 5: History of allocation in the EU ETS**

During the first two phases, most of the allowances in the EU ETS were freely allocated based on historical GHG emissions. While Member States could auction up to 5% of their cap during the first phase and up to 10% in Phase II, this option was not widely used: in phase II, only 4% of allowances were auctioned. This allocation approach faced a lot of opposition. Installation felt they were not awarded for action already taken, the differences between Member States were regarded as distorting competition and the power sector was accused of gaining windfall profits by passing on carbon costs despite having received the allowances for free (windfall profits. As a result, the allocation methodology for phase III changed radically. The power sector does not receive free allocation anymore in phase III, meaning that about of the allowances in the EU ETS will be auctioned in phase III. Free allocation in Phase III continues to be used for industrial sectors but this approach follows harmonised EU rules based on benchmarks and historical production levels. Most free allocation is on the basis of product benchmarks, which for each product represents a value equivalent to the average emissions performance of the best 10% performing installations in the EU. The benchmarks have been developed in 2007-2009 via a series of preparatory studies, first outlining key benchmarking principles (e.g.

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30 The study on benchmarking principles referred to as well as the sector by sector benchmark studies can be found here: [http://ec.europa.eu/clima/policies/ets/allowances/studies_en.htm](http://ec.europa.eu/clima/policies/ets/allowances/studies_en.htm)
the “one product – one benchmark” principle) followed by detailed sectors studies. For sectors not covered by a product benchmark, fall back approaches based on heat, fuel or process emission benchmarks are used to determine free allocation. Sectors on the carbon leakage list (covering over 90% of the industrial emissions) receive free allocation of up to 100% of the benchmarks, whereas sectors not on the leakage list receive a declining share of free allocation over time.

On January 1 2014 California and Québec linked their ETS. The linked system incorporates an increased percentage of allowances being jointly auctioned. Although they are linked, California and Québec use revenues for different purposes. In California any revenues from the ETS go into the Greenhouse Gas Reduction Fund, which as the name prescribes it meant to fund activities reducing GHG-emissions. Simultaneously it aims to work toward non-GHG-related goals including creating jobs, improving air quality, and improving public health. Furthermore, by law it is specified that 25 percent of auction revenues are to be used to benefit disadvantaged communities. In Québec, the revenue streams are meant to go to the Québec Green Fund, which is aimed at fighting climate change. In the EU ETS the Directive sets guidelines on how the auction revenues are distributed. It states that 88 percent of the revenue should be distributed amongst Member States in accordance with their relative share of emissions. 10 percent of the revenue is targeted toward the benefit of certain Member States out of solidarity and growth reasons. The remaining 2 percent is distributed amongst Member States that have achieved emission reductions beyond their targets, i.e. 20 percent below emissions in the base year. Although there is no legally binding provision on what the auction revenues should be used for, the Directive states that half of the income from auction revenues should be dedicated toward climate policies.

2.4.4 Links to other design elements and miscellaneous issues

The amount of allowances to be allocated depends on the level of the cap, which is discussed in Section 2.3. As previously identified, it is preferable to establish the cap level before deciding on levels of free allocation, however, in practice, these two decisions are closely linked therefore made in an iterative manner.

2.4.5 Design checklist

A summary of the key considerations and an ETS design checklist for allocation are given in Table 7.

<table>
<thead>
<tr>
<th>Table 7: Design checklist for allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key considerations</strong></td>
</tr>
<tr>
<td>Allocation of allowances via auctioning is transparent, directly delivers the carbon price signal and prevent windfall profits among participants. Auctioning is therefore the preferred allocation methodology in theory and should be seen as the default methodology for allowance distribution.</td>
</tr>
<tr>
<td>Free allocation could be used to increase the acceptability and ease the transitioning into an ETS by limiting absolute costs.</td>
</tr>
<tr>
<td>Free allocation can also be used to protect</td>
</tr>
</tbody>
</table>
2.5 Consider the use of offsets

2.5.1 Definition

According to IETA, “an offset represents the reduction, removal or avoidance of greenhouse gas emissions, measured in tonnes of CO₂-equivalent (tCO₂e). Offsets are important not only in environmental terms, but also in providing improved prospects for linking of emissions trading systems in the future. Offsets provide a vital cost-containment tool or safety valve for each system - and each system can implement the filters it deems necessary, according to predefined criteria”\(^{31}\).
Thus, the use of offsets may reduce the overall mitigation costs within an ETS and provide an abatement incentive for sectors outside the scope of the ETS (see Figure 5). Offsets can be sourced from either a domestic level programme or international programmes such as the Clean Development Mechanism or new to be formed market mechanisms under the Paris agreement (Article 6). In line with PMR/ICAP handbook, we distinguish two types of off-set programs:

**Domestic Offset Program:**
A domestic offset program that is set and administered at the national or subnational level by a domestic body. The underlying rules of the program are specific to the jurisdiction and developed by the involved domestic authority. However, emission reductions could take place domestically or internationally.

**International Offset Program:**
An international offset program is usually administered by an institution that is recognized by multiple jurisdictions and may be directly embedded in or linked to an international organization or non-profit organization. The underlying rules are clearly defined and have to be applied by all participating countries. Credits are sourced from multiple countries and could be sold on the international market.

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32 Ibid: page 82.
2.5.2 Analysis of design options and choices

As indicated above, there are different ways to design an approach that allows using offsets within an ETS. In this regard, in line with PMR/ICAP handbook, policy makers have to:

- Decide on the overall acceptance of off-sets in the system;
- Choose eligible sectors, gases and activities and decide on the use of limits to off-set use;
- Weight costs of developing a new off-set program against the use of existing off-set programs;
- Establish a system for monitoring and governance of the off-set program.

In general, it is a perquisite that offsets used for ETS compliance should represent real, permanent emission reductions, i.e. emission reductions that would not have taken place without the incentive provided by the offset programme. This is normally done by defining a baseline scenario, which is often a difficult task. It is therefore important that the emission reductions are verified by independent third parties. Rules should be in place to avoid double counting of emission reductions, which would e.g. take place if the emission reductions are themselves also under an emissions cap of an ETS.

Introducing offsets into an ETS typically lowers the compliance cost and therefore reduces the carbon price signal. To maintain an appropriate level of allowance supply in the ETS to ensure sufficient domestic abatement, quantitative limitations of offset usage can be implemented. On the other hand, especially regarding domestic offsets, allowing offsets under an ETS also delivers incentives for sectors not covered and not incentivized by other instruments. It also can be very helpful to detect emission reduction potentials in sectors outside the scheme and even "outreach" the incentives of an ETS in general.

Underlying criteria for the scope definition should be, as highlighted by the PMR/ICAP handbook:

- Avoiding double counting (allow only emission reduction not covered by any cap);
- Matching potential supply to expected offset demand;
- Ensuring compatibility with international systems (consider future linking);
- Supporting policy priorities (e.g. cost containment, rewarding early action, and promoting co-benefits as well as activities in specific sectors or regions).

Design options to be considered during design phase of an offset program

Table 8, based on the PMR/ICAP handbook provides an overview on design options that have to be taken into account during the design phase of an offset program. It shows initial considerations policy makers should make before setting up the rules for the envisaged program.

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33 Ibid: page 85.
### Table 8: Design options to be considered during design phase of an offset program

<table>
<thead>
<tr>
<th>Design option</th>
<th>Design choices and criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Envisaged geographic coverage</td>
<td><strong>Limit the use of offsets only on credits sourced locally</strong>&lt;br&gt;- Option is preferable if domestic actions are a key priority and enough low cost mitigation potential is available.&lt;br&gt;- Potential key benefits could be realized within the own jurisdiction.</td>
</tr>
<tr>
<td></td>
<td><strong>Allow the use of offsets from outside jurisdiction</strong>&lt;br&gt;- Option increases the availability of potential sources and, thus, the low-cost mitigation potential. Policy makers therefore have to assess the trade-off between decreased mitigation costs and attainment of specific policy objectives.</td>
</tr>
<tr>
<td>Choosing gases, sectors and activities to cover</td>
<td>Underlying criteria for the decision on the scope of the offset program are usually:&lt;br&gt;- Realizable mitigation potentials;&lt;br&gt;- Assumed mitigation costs;&lt;br&gt;- Low transaction costs;&lt;br&gt;- Low potential for non-additionality and leakage (ensuring environmental integrity);&lt;br&gt;- Potential environmental and social co-benefits;&lt;br&gt;- Potential to drive investments in new technologies. Policy makers may decide to allow only use of specific types of offsets or to impose qualitative (e.g. via positive lists) and quantitative limits of offset use within an ETS to give effect to the above mentioned criteria. Such limits could drive investments into activities that are seen as most preferable by policy makers.</td>
</tr>
<tr>
<td>Quantitative limitations on offset use</td>
<td>The establishment of quantitative limitations on offset use has to be seen in the overarching policy objective of the ETS. If a regulator wants to incentivize GHG mitigation (e.g. by investments in low-carbon technology) in ETS sectors, a qualitative limit should be considered. If cost containment is on top of the priority list, a relaxed or even no use limit can be integrated in the ETS design.</td>
</tr>
<tr>
<td>Determination of appropriate offset methodologies</td>
<td>Regulators need to decide on approaches to generate offsets and how to safeguard environmental integrity. As mentioned this can be done by defining robust methodologies and MRV requirements, that set baselines against which reductions are credited and assess additionality. In this regard, regulators could make use of already existing international offset programs (such as the Clean Development Mechanism) or to establish a domestic offset program (for further information see below).</td>
</tr>
</tbody>
</table>

**Using existing international off-set programs versus creating a new offset scheme**
The following subsection gives an overview on which options are available in the context of using international offset programs and which design options could be applied when establishing a domestic offset program. Furthermore, it is indicated which aspects policy maker should consider when deciding for one of the two options.
### Table 9: Aspects to be considered while establishing an offset program

<table>
<thead>
<tr>
<th>Aspect to be considered</th>
<th>Arguments to prefer the use of existing international offset programs</th>
<th>Arguments to prefer the establishment of a domestic offset program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term objectives of the program</td>
<td>Cost containment</td>
<td>Preparation for international carbon market</td>
</tr>
<tr>
<td>Long-term objectives</td>
<td>To maximize low cost abatement options (Linking), attract both, international and foreign investments</td>
<td>Stimulate investments in sectors of priority</td>
</tr>
<tr>
<td>Current situation of domestic institutions with regard to administrative, technical, regulatory and operational functions and responsibilities</td>
<td>If there is concern about domestic capabilities, using an international offset scheme might be preferable</td>
<td>If there are already strong domestic institutions or the objective to develop such domestic capacities, the establishment of a domestic program might be preferable</td>
</tr>
<tr>
<td>How aligned are international offset programs with domestic priorities?</td>
<td>If existing programs are considered to be strongly aligned with national priorities</td>
<td>If own priorities were not or only somewhat reflected by already existing programs</td>
</tr>
<tr>
<td>Expected level of control over administrative processes within registration, approval and issuance</td>
<td>Level of control will be limited</td>
<td>If the domestic regulator should hold a strong level of control</td>
</tr>
<tr>
<td>How important is a quick delivery of offsets</td>
<td>The generation of offsets might be more quickly if existing programs were used.</td>
<td>Developing the program and thus, generating first credits will take time</td>
</tr>
<tr>
<td>What financial resources are available for establishment of an offset program?</td>
<td></td>
<td>The development of a domestic offset program will be more expensive than options that make greater use of international programs</td>
</tr>
</tbody>
</table>

#### 2.5.2.1 Implementing and Governing an Offset Program

Essential aspects of an offset program are to define processes for getting projects into the pipeline (registration and approval), administering and supervising the credit issuance process and handling of buyer and seller reliability as well as for determining liability for reversals. Figure 6 shows a generic but quite typical process map from project design, over validation and checks by third party auditors to credit issuance.
With respect to the issuance of credits it is necessary to clearly define procedures if retrospectively could be shown that issued credits did not meet required quality standards or fraudulent activities have been involved. In such cases, the seller of the offsets could be made liable (seller liability) and forced to reimburse the regulator. On the other hand, also buyer liability is conceivable, making the purchaser responsible for ensuring that all relevant criteria were met.

**Figure 6:** Generic process map for project registration to offset credit issuance

**International examples**

In all ETSs currently operating, offsets are accepted for compliance, subject to qualitative or quantitative restrictions. Table 10 shows how ETS designed the use of offsets.

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34 Ibid: page 91.
Table 10: Examples of use of offsets globally

<table>
<thead>
<tr>
<th>ETS</th>
<th>Type of Offset</th>
<th>Limits</th>
</tr>
</thead>
</table>
| California | • Compliance Offsets Credits issued by California Air Resources Board (ARB) from a project in the United States or its Territories, Canada, or Mexico, and developed according to a compliance offset protocol approved by ARB.  
• Compliance Offset Credits issued by linked regulatory programs (i.e., Québec).  
• Sector-Based Offset Credits from crediting programs (including REDD) in an eligible developing country or some of its jurisdictions. This will, however, be subject to further regulation. | Offsets limited overall to 8 percent of an entity's compliance. Sector-Based Offset Credits are subject to a sublimit of 2 percent of compliance obligations through 2017, and up to 4 percent between 2018 and 2020. |
| EU | No offset eligible | N/A |
| Phase I (2005–07) | JI (ERUs) and CDM projects (CERs) | Qualitative limits vary across member states. No credits from land use, land use change and forestry, and nuclear power sectors. Restrictions on hydro projects > 20 MW. Credits can account for a certain percentage of each country’s allocations. Unused credits transferred to Phase III. |
| Phase II (2008–12) | JI (ERUs) and CDM projects (CERs) | Qualitative restrictions from Phase II apply. Post-2012 credits restricted to those originating in Least Developed Countries. Credits from industrial gas projects not allowed. Credits issued for emissions reductions in 1st commitment period of Kyoto Protocol only accepted until March 2015. Use of credits in Phase II and III is restricted to 50 percent of overall emissions reductions from 2008—20 (1.6 billion tonnes of CO₂). |
| Phase III (2013–20) | JI (ERUs) and CDM projects (CERs) | Proposal to exclude all international credits is under consideration. |
| Phase IV (2021–28) | TBD | Proposal to exclude all international credits is under consideration. |

<table>
<thead>
<tr>
<th>ETS</th>
<th>Type of Offset</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazakhstan</td>
<td>Domestic offsets</td>
<td>No offset program established to date.</td>
</tr>
<tr>
<td>New Zealand</td>
<td>JI (ERUs), Kyoto Removal Unit (RMUs), CDM (CERs), domestic removal units</td>
<td>Not allowed: CERs and ERUs from nuclear projects; long-term CERs; temporary CERs; CERs and ERUs from HFC-23 and N20 destruction; CERs and ERUs from large-scale hydroelectricity (if in compliance with the World Dam Commission guidelines).</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Post 31 May 2015: Only Primary CER units from second commitment period</td>
<td>ERUs, RMUs, CERs from 1st commitment period only accepted until 31 May 2015.</td>
</tr>
<tr>
<td>Québec</td>
<td>Domestic (North American: Canada and United States)</td>
<td>Offsets (domestic and international) limited to 8 percent of entity’s compliance.</td>
</tr>
<tr>
<td>RGGI</td>
<td>Domestic (projects located in RGGI states and select others)</td>
<td>Up to 3.3 percent of each entity’s compliance obligation, although no offsets have been generated by this program to date.</td>
</tr>
<tr>
<td>Saitama (Japan)</td>
<td>Domestic and national</td>
<td>Unlimited use of offset credits in general. Credits from projects outside Saitama can be used for up to one third (offices) or one half (factories) of a facility’s reduction target.</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Domestic (including domestic CERs)</td>
<td>Limited to activities implemented after April 14, 2010. Limited to 10 percent of each entity’s compliance obligation.</td>
</tr>
<tr>
<td>Phase III (2021-25)</td>
<td>Domestic and International</td>
<td>Up to 50 percent of offsets in the ETS can be international.</td>
</tr>
<tr>
<td>Switzerland</td>
<td>International, from CDM (CERs) and JI (ERUs)</td>
<td>Limited to credits originating in Least Developed Countries or other countries if CDM projects were registered before January 1, 2013, or credits from JI projects for emissions reductions achieved before January 1, 2013. In addition to these criteria, only projects in the following sectors/activities are eligible: use of renewable energy (for hydropower plants only those with an installed production capacity of no more than 20 MW), end user’s improved energy efficiency, methane flaring and avoidance of methane emissions at landfills, municipal waste recycling or waste incineration</td>
</tr>
<tr>
<td>ETS</td>
<td>Type of Offset</td>
<td>Limits</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Tokyo (Japan)</td>
<td>Domestic and national</td>
<td>Unlimited use of offset credits in general. Credits from projects outside Tokyo can be used for up to one third of a facility’s reduction obligations.</td>
</tr>
</tbody>
</table>

In the NZ ETS, an unlimited number of international offsets from CDM or JI projects were permitted for compliance until 1 June 2015 in order to provide a very high degree of flexibility to covered entities. However, credits from HFC-23 and N₂O gas destruction and large hydropower projects which did not comply with the World Commission on Dams’ guidelines were not permitted in the NZ ETS.

Under the California Cap-and-Trade Program, there is an 8% quantitative usage limit. The types of offsets which can be used include early action offsets (generated from voluntary emission reduction projects over 2005–2014 in the US), international sector-based offsets (so far only REDD) and ARB offset credits (credits from emission reduction projects undertaken using an ARB approved protocol).

In the EU ETS, international credits from the Clean Development Mechanism (CDM) or Joint Implementation (JI) currently can be used for compliance, except for credits originating from the following type of projects: land-use, land-use change and forestry (LULUCF), nuclear, large hydropower, HFC-23 destruction and N₂O destruction. In Phase III of the EU ETS, the maximum quantity of eligible international credits which an installation can use for compliance over 2008–2020 is up to 11% of its allocation for 2008–2012.

Within many member states of the EU also domestic JI-projects were possible. An example is Germany the “Act Implementing the Project-Based Mechanisms of the Kyoto Protocol” (ProMechG) sets the legislative foundation for the use of the JI-mechanism in Germany. It clearly defines that emission reductions must be generated in sectors outside the EU-ETS (ruling out double counting) and no public subsidies (such as from the renewable energy law) may be involved (ruling out of double promotion). The crediting period has been restricted to 2008-2012. All in all, the JI-mechanism created net mitigation benefits in Germany in order of 5-8 Mio tCO₂e (2008-12).
A specific issue that is particularly relevant for the Turkish situation is the existence of existing off-set scheme when an ETS is introduced. With more and countries that took part in the CDM (e.g. China) considering to start an ETS, this becomes an increasingly relevant question. Many of the projects existing in many countries – be it under the CDM or like in Turkey under other standards used e.g. in the "voluntary market" are renewable electricity projects. If those are eligible to deliver offsets into an ETS, this goes along with a risk double counting of emission reductions within the power sector given that the projects reduce emissions that are themselves under the ETS cap. To avoid such double counting and double incentives it can be recommended not to allow new offset projects in sectors covered by an ETS once the ETS introduced. However, that still raises the question what to do with existing projects under the offsetting schemes. The EU ETS provides a good example of how this can be dealt with. Offsets from existing schemes can be tackled by taking this into account when defining the cap. Within the EU, based on a specific clause within the ETS directive, renewable electricity projects registered under JI in eastern European member states were allowed to continue to deliver units (in that case ERUs) in 2008-12. But the member states issuing the ERUs did so out of a specific reserve within the allocation plan that was fed by a deduction of (free) allocation to the power sector, thereby avoiding the double counting of the emission reductions.

It should further be noted that in many EU Member states, e.g. Germany, renewable electricity production is promoted via specific quotas or feed-in-tariffs, what is also the case meanwhile in Turkey. Therefore, the need for additional incentives via offset generation can be challenged. On the other hand, the promotion of renewables is very important for many countries for several reasons beyond emission reduction targets. Therefore, it might be justified not to rule out even new renewable electricity projects from delivering offsets completely but to define specific criteria for those projects, e.g. taking into account the Internal Rate of Return of projects and to adopt appropriate rules to rule out double counting of emissions reductions as it was done e.g. within the EU 2008-12. The lessons learnt with Joint Implementation in the EU can be useful to set-up a domestic offset system in Turkey that would avoid double counting, we address this further in Chapters 3 and 5.

2.5.4 Links to other design elements and miscellaneous issues

As indicated above, allowing the use of offsets for compliance has strong implications on the number of allowances/credits available in the market. Thus, those implications have to be studied in detail and be considered during overall allocation planning process (Section 2.4) and the cap setting (Section 2.3). Furthermore, the establishment of an offset program offers one more option for linking with other ETSs directly or indirectly via offset programs (Section 2.9). Another important aspect is the easy traceability of credit generation and issuance (like under the CDM registry). In addition, the use of offsets within an ETS should be traceable as well, and thus, being considered during design phase of the registry (discussed in more detail in Section 2.8).

2.5.5 Design checklist

A summary of the key considerations and an ETS design checklist for off-sets is given in Table 11.
Table 11: Design checklist for off-sets

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Decision checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The use of offsets may reduce the overall mitigation costs within an ETS and provide an abatement incentive for sectors outside the scope of the ETS.</td>
<td>• Decide on the overall acceptance of off-sets in the system.</td>
</tr>
<tr>
<td>• Offsets can be sourced from either a domestic level programme or international programmes.</td>
<td>• Choose eligible sectors, gases and activities and decide on the use of limits to off-set use.</td>
</tr>
<tr>
<td>• It is a pre-requisite that offsets used for ETS compliance should represent real, permanent emission reductions, i.e. emission reductions that would not have taken place without the incentive provided by the offset programme.</td>
<td>• Weight costs of developing a new off-set program against the use of existing off-set programs.</td>
</tr>
<tr>
<td>• Quantitative (i.e. limiting the amount of offsets) and qualitative (e.g. limiting the type of offsets) limits on offset use can be used to balance the advantages and disadvantages of offset use in an ETS.</td>
<td>• Establish a system for monitoring and governance of the off-set program.</td>
</tr>
</tbody>
</table>

2.6 Decide on temporal flexibility

2.6.1 Definition

We refer to temporal flexibility as the flexibility that is given to participants in the scheme to when emission reductions are achieved.

In line with the PMR/ICAP guide on emissions trading, we distinguish two main reasons why policy makers may decide to include temporal flexibility in an ETS. Firstly, temporal flexibility provides an opportunity for ETS participants to lower costs as they can optimize the timing of their investments in emission reduction activities. The regulator's timing for emission reductions may not be in line with the cost-effective path of a specific ETS participant. Allowing these emission reductions to take place either earlier or later than planned by the regulator enables the individual entity to align investments in abatement activities with the lifetime of its existing capital and infrastructure. Furthermore, by providing temporal flexibility, the regulator facilitates long-term R&D investments in low-carbon technology from ETS participants.

Second, temporal flexibility can reduce price volatility. Temporal flexibility allows ETS participants to buy allowances or hold allowances when prices are low for later use when allowance prices could be higher. This higher demand for allowances increases prices. Conversely, temporal flexibility allows ETS participants to profit by selling allowances when allowance prices are high. Also, if ETS participants are allowed to fulfill a compliance shortfall later, they could choose to delay the purchase of allowances during periods of high prices. This would decrease demand for allowances, resulting in a fall in prices. The outcome of these dynamics is a less volatile price trajectory than that of an ETS without temporal flexibility.
2.6.2 Analysis of design options and choices

In line with the PMR/ICAP handbook, we distinguish three key decisions on temporal flexibility that policy makers need to make:

1. Set the length of the reporting and compliance period.
2. Establishing rules for banking allowances.

The main considerations to be taken into account for these decisions are described below.

Length of the reporting and compliance period

The compliance period is the period of time over which emissions are reported and allowances must be surrendered to cover these emissions. Within a compliance period, ETS participants can effectively decide themselves on the timing of abatement and trading activities. The length of the compliance period in an ETS therefore thus establishes the default temporal flexibility provided by an ETS. Longer compliance periods provide liable entities with the more flexibility to optimise the timing of abatement activities and reduces transaction and administrative costs. In an ETS with a longer compliance period, partial compliance on a more frequent basis may be used to ensure that ETS participants are on track to meet their compliance obligations. Also, partial compliance may be used in order to align ETS compliance with other annual compliance activities, for example taxation and other environmental regulations.

Banking and borrowing

Banking (allowances from one vintage year that are saved for use in future compliance years) and borrowing (allowances that ETS participants will receive in future years being used for an earlier compliance period) are flexibility measures which contribute to cost effectiveness and price stability in the ETS by providing temporal flexibility beyond the reporting and compliance period.

Banking is important to prevent carbon prices of the current vintage year (or phase) becoming worthless at the end of the compliance year (or ETS phase). Furthermore, banking reduces price volatility as it facilitates the purchase of allowances for future use when prices are low, or acts as a source of allowances when prices are high, as discussed above. In this way, banking allows firms to buffer against higher prices in the future. Banking also could provide an incentive for ETS participants to make emission reductions earlier since the allowances not needed still keep their value for future years. In addition, firms with banked allowances are more likely to support the long term continuation of the ETS and increased stringency as this increases the financial value of their banked allowances. One complication of unlimited banking is that a surplus of allowances in one ETS period will be transferred to a future period, thereby potentially continuing the market imbalance.

Similar to banking, borrowing also provides firms with temporal flexibility on their abatement and compliance activities. Borrowing also contributes to market liquidity, especially important when there is a shortage of allowances and high prices. However, borrowing provides an incentive for ETS participants to delay mitigation actions, or attempt to weaken or remove the ETS in the future in order to lower their allowance debts. Another complication of borrowing is that the creditworthiness of ETS participants borrowing allowances may be difficult to assess, and typically the participants that are most likely to borrow allowances are those that are least solvent.
Thus administrative costs and transaction costs of borrowing could be high. Finally, borrowing may result in uncertainty on meeting the emission reduction target, especially when the borrowing period is long.

2.6.3 Selection of international examples

In this section, we give a selection of international examples related to temporal flexibility that might be of relevance to the situation in Turkey. Table 12 provides an overview of ETSs around the world. It shows that most ETSs have incorporated unlimited banking, but exclude borrowing for the reasons as given above. The EU ETS banking provision history provides an interesting example on the effect banking has on prices. In the first phase of the EU ETS (2005-2007), banking towards the 2nd phase (2008-2012) was not allowed. Due to the cap-setting an allocation process, the number of allowances in the market in exceeded the level of emissions in this first phase. Since these allowances could not be used beyond the first phase, the prices in the EU ETS rapidly dropped to zero. As a result of the economic crisis, also in the currently running 3rd phase of the EU ETS (2013-2020) there is in the currently running phase again a significant surplus of allowances. However, as a result of the unlimited banking within and beyond the long phase III trading phase, the allowances keep on having a value (Figure 7).

An interesting example of an ETS with a longer compliance period that uses full compliance only over the full cap period but partial compliance on a more frequent basis is California. We discuss this example in Box 6.

Table 12: Temporal flexibility in existing ETSs

<table>
<thead>
<tr>
<th>ETS</th>
<th>Length of commitment period/Phases</th>
<th>Compliance periods</th>
<th>Banking</th>
<th>Borrowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>1-year period</td>
<td>Annual</td>
<td>Unlimited</td>
<td>No</td>
</tr>
<tr>
<td>RGGI</td>
<td>2009–11 2012–14 2015–17</td>
<td>Three years, aligns with phases</td>
<td>Unlimited</td>
<td>No</td>
</tr>
<tr>
<td>Tokyo (Japan)</td>
<td>2010–14 2015–19</td>
<td>Five years, aligns with phases</td>
<td>Unlimited across two phases but not multiple phases</td>
<td>No</td>
</tr>
<tr>
<td>Waxman-Markey (proposed U.S. Federal)</td>
<td>1-year period</td>
<td>Annual</td>
<td>Unlimited</td>
<td>Unlimited one year; limited up to five years, with interest.</td>
</tr>
<tr>
<td>California</td>
<td>2013–14 2015–17 2018–20</td>
<td>Aligns with phases + 30 percent annual surrender</td>
<td>Unlimited, with emitter subject to a general holding limit</td>
<td>Limited: In the case of true-up of product-based allocation to match actual</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ETS</th>
<th>Length of commitment period/Phases</th>
<th>Compliance periods</th>
<th>Banking</th>
<th>Borrowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazakhstan</td>
<td>2013</td>
<td>Annual</td>
<td>Unlimited, beginning in phase 2</td>
<td>Currently not addressed in the regulation.</td>
</tr>
<tr>
<td></td>
<td>2014–15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016–20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Québec</td>
<td>2013–14</td>
<td>Two to three years, aligns with phases</td>
<td>Unlimited, with emitter subject to a general holding limit</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>2015–17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2018–20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia J</td>
<td>1-year period</td>
<td>Annual</td>
<td>Unlimited</td>
<td>&lt; 5 percent of compliance obligation</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>2015–17</td>
<td>Annual</td>
<td>Unlimited</td>
<td>&lt; 10 percent within phases</td>
</tr>
<tr>
<td></td>
<td>2018–20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2021–25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 7:** The effect of banking on price – zero prices in the EU ETS phase I and above zero prices in EU ETS phase III despite a surplus of allowances

Source: Point Carbon, ECO/JOE, FutureCamp. 9 December 2015
In the California ETS, there is an annual compliance obligation as well as a compliance obligation at the end of each trading period. In the annual compliance obligation, participants need to surrender allowances equivalent to at least 30% of its emissions from the previous year. After the end of each compliance period, there is a true-up where an allowance must be surrendered for each tonne of emissions in the compliance period not already accounted for in the annual compliance obligation. Failure to comply at the end of the period results in an obligation to forfeit four allowances per allowance of the shortfall.

The California ETS regulations imposes also quantitative limits on the number of allowance that can be held by a participant. In addition, there is also a limit on the number of allowances that can be purchased at an auction: covered entities can purchase up to 25% of allowances auctioned, while non-covered entities can purchase up to 4% of auctioned allowances.

2.6.4 Links to other design elements and miscellaneous issues

As the Californian example of partial compliance within the cap period and the EU example show there is clear link between the temporal flexibility provided by the compliance period and the cap period or ETS phases that were discussed in Section 2.3. Temporal flexibility is also an important factor towards price predictability and cost containment given that temporal flexibility provides an opportunity for ETS participants to lower costs and reduce price volatility in the allowance market. This will be analysed further in section 2.7.

2.6.5 Design checklist

A summary of the key considerations and an ETS design checklist for providing temporal flexibility is given in Table 13.

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Design checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal flexibility contributes to reducing price volatility and allows cost optimization over time to the participants in the ETS.</td>
<td>Set the length of the reporting and compliance periods.</td>
</tr>
<tr>
<td>Temporal flexibility can be provided via the choice of the reporting and compliance period and by allowing banking and borrowing of allowances.</td>
<td>Set rules for banking of allowances.</td>
</tr>
</tbody>
</table>

2.7 Address price predictability and cost containment

2.7.1 Definition

We refer to price predictability and cost containment measures as measures that intervene into the by controlling either directly or indirectly the allowance price in the ETS.

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Price formation and price fluctuations are a desirable result of choosing ETS as a policy instrument and are inherent to the market finding the lowest cost abatement. However, due to exogenous shocks, regulatory uncertainty and market imperfections, might result in unwanted price variability. Whether or not such variability warrants intervention by policy makers depends on many factors including the policy objective the ETS has and the risk associated with the market intervention.

2.7.2 Analysis of design options and choices

We distinguish two decision points for policy maker when addressing price predictability and cost containment:

- Decide on the rationale for and risks associated with market intervention;
- Choosing the trigger points for market interventions (low prices, high prices, both), the appropriate instrument and the governance framework.

Decide on rationale

To understand price formation in an ETS, it is important to first highlight how supply and demand take shape. There are various factors affecting the total supply of units in an ETS, including the level of the cap and the corresponding allowances, the availability of offsets, the option to use allowances from previous commitment periods (banking) or future periods (borrowing), and units from linked systems. In contrast, demand is not directly linked to the design of the ETS, but more to how market participants behave and interact. Their behaviour can depend on e.g. abatement costs, outcomes of complementary policies, expectations on future allowance prices, and technological change.

In theory, in an ETS price fluctuations are simply a reflection of supply and demand forces. However, in practice there might be other forces at play that increase or decrease price volatility. In line with the PMR/ICAP handbook, we distinguish exogenous shocks, regulatory uncertainty, and market imperfections.

1. **Exogenous shocks**: Significant changes in economic activity and the associated level of emissions leading to increased price volatility. For smaller jurisdictions, this could also involve unexpected closure or start-up of big emitters.
2. **Regulatory uncertainty**: Changes to the ETS design by policy makers, or the anticipation thereof, can significantly alter prices in the allowance market.
3. **Market imperfections**: The inability of the market to act rationally according to incentives given by the ETS. For example, in a market where allowances are relatively cheap and the banking as permitted, rational actors should buy allowances to sell them later at a higher price, ultimately restoring the allowance price to a "normal" level. It is considered a market imperfection when actors do not make use of this opportunity due e.g. regulatory uncertainty, suboptimal discount rates, and lack of know-how.

These three factors may cause undesirable price volatility and they can be a motivation for policy makers to consider market interventions. In doing so, they will need to balance the benefits of intervening in the market with the risks.

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38 The PMR/ICAP handbook separately discusses the trigger points, the instruments and the governance. For ease of reading, we combine those into one decision point.
A main benefit is that a less volatile allowance price leads to a more predictable climate for investment by market participants. As such, these participants will have a greater incentive to invest in R&D and implement low-carbon technologies. Another benefit is that cost containment contributes to maintaining political viability, which is needed to operate the ETS. An associated risk with market interventions is that they can create market distortions. Also, the possibility of market interventions can increase regulatory uncertainty, ultimately leading to greater price volatility.

**Decide on the timing and mechanism for market intervention**

There are several policy options available to policy makers to reduce price volatility. Interventions to address low prices include an auction reserve price that could be implemented as a market stabilisation measure. Such a measure would not create uncertainties on the environmental outcome of the ETS. Alternatively, a hard or soft price floor could be applied; governments may need to buy back as many allowances as needed in order to prevent the market price of allowances dropping below a certain level. Such a market intervention could be costly to the government. The emissions price could also be managed through a top up fee or surrender charge, where liable entities must, in addition to surrendering an allowance, pay the difference between a government set emissions price and the market price.

Policymakers can respond to higher prices by using a variety of market stability measures, such as allowing ETS participants to use a greater amount or more types of offsets. Similarly, policy-makers could introduce additional offset volumes from reserves to increase the supply of units. By allowing more offsets, and thus increasing the options available to ETS participants to meet their emission targets, higher cost-efficiency is achieved. Furthermore, policy-makers can contain costs by setting up an auction reserve with allowances that were initially not distributed or sold during the auction. These allowances should be part of the overall cap to retain the environmental integrity of the ETS.

Another option would be to introduce a hard price cap that would set an absolute limit on the allowance price. As the regulator would have to supply as many allowances as demanded at the ceiling price, this option has the clear disadvantage that there is a risk allowing emissions above the cap. Hence it could jeopardize the environmental integrity of the ETS.

If policy makers wish to address low and high prices simultaneously, they could decide to implement a price corridor. Alternatively, a quantity-based mechanism can be implemented. Assuming a fixed cap under the ETS, an allowance reserve could extract allowances from the market if prices are too low. Similarly, the reserve could release allowances to the market if prices are too high. Lastly, policy makers could decide to delegate the responsibility of maintaining a vital allowance market to an independent carbon authority.

A summary of the benefits and drawback of these market management approaches is provided in Table 14.
<table>
<thead>
<tr>
<th>Approach to manage market</th>
<th>Definition</th>
<th>Benefits</th>
<th>Drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auction floor price (“reserve price”)</td>
<td>The threshold that must be met for allowances to be sold during auctioning. If the auction price is below the reserve price, allowances are held back from being sold.</td>
<td>Relatively simple to implement; reduces investment uncertainty; ensures positive price and government revenue even if emissions demand below cap; can tighten cap depending on reintroduction of unsold volumes.</td>
<td>Does not guarantee minimum price in market if there is no demand for auctions.</td>
</tr>
<tr>
<td>Allowance reserve (soft price cap through limited supply from unit reserve)</td>
<td>A reserve that is created from allowances that are initially withheld from distribution or are not sold during auctioning.</td>
<td>Provides greater certainty on prices while limiting uncertainty on emissions (since emissions cannot increase by more than limited amount of units released from reserve); release can fail to increase in emissions if reserve is filled with offsets or external units.</td>
<td>Price ceiling only partially guaranteed; potential incentives for market manipulation.</td>
</tr>
<tr>
<td>Top-up fees</td>
<td>The difference between the market price for allowances and a given set price by the regulator.</td>
<td>Simple to implement if fee does not fluctuate with price; provides hard floor on carbon price faced by entities subject to fee.</td>
<td>Difficult to implement if fee adjusts with price; inhibits efficiency of system as a whole if implemented only partially.</td>
</tr>
<tr>
<td>Offset limit relaxation/tightening</td>
<td>In case of undesirable high prices, the regulator can open the way for increased use of offsets (either quantity or quality based). Alternatively, regulators could tighten the use of offsets to maintain the price signal in case too many offsets are used in an ETS.</td>
<td>Relatively simple to implement, no financial burden for regulator; does not compromise environmental integrity globally (assuming high-quality offsets).</td>
<td>Price bounds not guaranteed; affects emissions limit within capped sector or system (in case of international units); can lead to abrupt price changes if not anticipated.</td>
</tr>
<tr>
<td>Government purchases units from market to maintain floor</td>
<td>The government buying allowances when there is an excessive amount of allowances on the market.</td>
<td>Relatively simple to implement; can tighten cap if volumes not reintroduced.</td>
<td>Financial burden to regulator; budget may be insufficient to guarantee price ceiling.</td>
</tr>
<tr>
<td>Hard price cap through unlimited supply at fixed price</td>
<td>An absolute limit on the price that entities pay when buying allowances</td>
<td>Guarantees price ceiling for market participants; relatively simple to implement.</td>
<td>Environmental target can be compromised without limit; potential incentives for market manipulation.</td>
</tr>
<tr>
<td>Price corridor</td>
<td>Combination of a hard or soft price ceiling and floor</td>
<td>Relatively simple to implement; guaranteed price floor and ceiling.</td>
<td>Combined cons of price ceiling and floor.</td>
</tr>
</tbody>
</table>

---

### Approach to manage market

<table>
<thead>
<tr>
<th>Definition</th>
<th>Benefits</th>
<th>Drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanism to manage the number of allowances on the market</td>
<td>Avoids political debates on where the price should be set.</td>
<td>May increase policy complexity and uncertainty.</td>
</tr>
<tr>
<td>Responsibility shift from governments regulating allowance markets to an independent carbon authority or carbon central bank.</td>
<td>Could enhance compatibility of ETS with other energy and climate policies, monitor the interactions with international markets, and allow flexibility to balance ensuring target quantities with allowance prices.</td>
<td>May be politically challenging to implement and lack democratic legitimacy.</td>
</tr>
</tbody>
</table>

#### Delegation

Responsibility shift from governments regulating allowance markets to an independent carbon authority or carbon central bank.

- Could enhance compatibility of ETS with other energy and climate policies, monitor the interactions with international markets, and allow flexibility to balance ensuring target quantities with allowance prices.
- May be politically challenging to implement and lack democratic legitimacy.

### 2.7.3 Selection of international examples

The examples below are taken from the PRM/ICAP handbook to which we refer for more detailed elaborations. Within the EU ETS, a surplus of emission allowances built up due to the economic crisis, which reduced emissions more than anticipated, and due to the full use of international credits that were allowed in the scheme. This resulted in lower than expected prices in the EU ETS (Figure 7), a logical result of the supply demand balance in the EU ETS. Back-loading was introduced as a short term measure, which entails the postponement of auctioning of 900 million allowances over 2014–2016, a volume measure. Originally, these back loaded allowances were to re-enter the market in 2019–2020. However, following the approval of the Market Stability Reserve (MSR), these allowances will directly enter the MSR and only re-enter the market on certain conditions. The MSR will start in 2019 and will adjust annual auction volumes in situations where the total number of allowances in circulation is outside a certain predefined range. The EU deliberately has chosen to base the market interventions on volumes (the MSR is for example triggered by the surplus of allowances exceeding a certain amount) and not directly on price.

Market stability measures triggered by a price threshold are in place in the California Cap-and-Trade program and RGGI. In the California Cap-and-Trade program, an Allowance Price Containment Reserve collects a portion of allowance from each year and releases them if certain pre-determined trigger prices are reached. Similarly, in RGGI there is a Cost Containment Reserve (CCR) which consists of a fixed quantity of allowances that are held in reserve (and above the cap). When auction bids exceed the CCR trigger price, the CCR allowances are released and sold at a pre-determined price. The allowances in the CCR are replenished at the start of each calendar year. The Californian Cap-and-Trade program also operates with a reserve price at allowance auctions which is effectively a price floor under which allowances are not brought to the market.

In Korea, an allowance reserve mechanism was set up to manage price volatility, new entrants and firms that have taken early action in reducing their emissions. The Allocation Committee is allowed to intervene in the market when specific conditions are met, such as a high market price level. In the case that at least one of the conditions is met, the Committee is allowed to allocate more allowances, set a limit on allowance banking, increase or decrease the limit on borrowing and/or the use of offsets, or temporarily set a price ceiling or floor.
2.7.4 Links to other design elements and miscellaneous issues

The need for price predictability and cost containment clearly linked to the choices made on temporal flexibility rules as described in Section 2.6 and the choices related to the cap period and the cap-setting approach (Section 2.3). As such it is integral part of the basic design of the ETS.

2.7.5 Design checklist

A summary of the key considerations and an ETS design checklist for price predictability and cost containment are given in Table 15.

Table 15: Address price predictability and cost containment

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Design checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Exogenous shocks, regulatory uncertainty and market imperfections, might result in unwanted price variability in an ETS.</td>
<td>• Decide on the rationale for and risks associated with market intervention.</td>
</tr>
<tr>
<td>• Such variability might warrant intervention by policy makers depending on factors such as the policy objective the ETS has and the risk associated with the market intervention.</td>
<td>• Choosing the trigger points for market interventions (low prices, high prices, both), the appropriate instrument and the governance framework.</td>
</tr>
<tr>
<td>• Market intervention mechanisms come in the form of direct price interventions or by interventions controlling the volume of allowances in the market.</td>
<td></td>
</tr>
</tbody>
</table>

2.8 Ensure oversight and compliance

2.8.1 Definition

Oversight over the carbon market and compliance with the modalities and procedures is key to a well-functioning ETS. As IETA states: "at the end of the compliance cycle (e.g. calendar year or financial year), regulated entities covered by the cap-and-trade program must submit a verified emissions report, developed by independent third parties. Companies will then have to surrender emissions units - allowances or, if permitted, offsets - equal to their emissions; by acting to reduce their emissions, regulated entities can reduce their carbon liability."

In this context, different essential design elements of an ETS interact and establish the prerequisites for effective compliance of all regulated entities and the transparent administration of the ETS in terms of allowance recording and management as well as of trading activities between the different market actors. A well designed and appropriate monitoring, reporting, verification and accreditation (MRVA) system, including the legal basis of it, is key to the functioning and robustness of an ETS.

The respective operational and organizational structure of the MRVA system, including inter alia the methodological and technical requirements defined in the monitoring legislation and the administrative structure within the reporting cycle must ensure a transparent, accurate and complete
reporting (in line with the defined scopes of the ETS) at the end of each reporting period. In the long term, it must ensure consistent and comparable data, thus ensuring environmental integrity of the system. Strong mechanisms for sanctioning and compliance enforcement should complement the methodological and technical requirements for monitoring in order to establish reliable basis of the ETS. An ETS registry is needed to ensure a transparent, reliable and secure platform that eases the administration of the ETS. Sufficient trading possibilities (in terms of available financial products, trading platforms, and market actors) are other key elements for a liquid market with a true price signal, i.e. for a well-functioning ETS.

2.8.2 Analysis of design options and choices

In line with the PMR/ICAP handbook, we distinguish six essential elements that have to be designed and implemented in order to establish a sound compliance and oversight approach in an ETS:

1. Identify the entities being subject to the regulation.
2. Manage emissions reporting by regulated entities.
3. Approve and manage the performance of verifiers.
4. Establish and oversee the ETS registry.
5. Design and implement the sanctioning and enforcement mechanisms.
6. Regulate and oversee the market for emission units.

Identification and management of liable legal entities

A robust monitoring regulation minimizes inherent risks within the monitoring and reporting process, such as weak implementation, double counting and loopholes to transfer emissions out of the system.

Especially with regard to the latter aspect, centrepiece of each monitoring system is, however, a clear definition of the term “covered installation” that clarifies under which conditions an installation is covered and how the physical boundaries of it have to be set. In this regard, as international examples such as the EU-ETS or California show, local authorities that are familiar with the setting of potentially covered installations in their region might be helpful. Irrespective of this, the legislation that deals with the categorisation of installations should ideally be derived from already adopted and implemented legislation in order to create synergies and harmonized procedures.

By clearly defining respective tasks and responsibilities of operators and the regulator in an unambiguous way and by establishing comprehensive guidance documents operators gain additional certainty during the monitoring and reporting process.

It is important that sufficient sector specific knowledge is available in order to give guidance and to understand and evaluate specific aspects within the respective monitoring process (check and approval of monitoring plans, check of emissions reports and inquiries in the context of deviation from monitoring regulation). As done now in Turkey but also in Australia, California, South Korea and the United States, the setting up of a pure monitoring scheme before introducing an ETS is very helpful to collect adequate data, to build capacity on operator and regulator level and to identify the need for adaptation and improvement.

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With regard to the adequate and target-oriented provision of guidance it should be decided which channels could be used in order to reach the majority of operators (sector specific) and to be able to flexibly respond to questions.

**Managing the reporting cycle**

At the heart of each ETS, an effective and appropriate monitoring, reporting and verification (MRV) scheme is necessary, as it constitutes the basis for the generation of reliable emissions data. In general, the monitoring requirements defined in an ETS deliver specifications on emissions calculation or direct measurement approaches. Thus, they represent the technical and methodical foundation for the derivation of the annual emissions of a covered entity that have to be included in an annual emissions report which is subject to verification by an independent third party. Figure 8 depicts essential steps within the compliance cycle in the EU-ETS relevant for the regulated entity, the regulator and the verifier.

**Figure 8: Compliance cycle in the EU-ETS**

A well designed and appropriate MRV system, including the legal basis of it, is key to the functioning and robustness of an ETS. Regulators must therefore provide, in line with the scope of the ETS and already existing legislative regimes, comprehensive:

- Methodologies for accounting and quantification of relevant data;
- Guidance on those methodologies;
- Suitable templates for reporting;
- Rules on verification processes;
- Details on the exchange and management of data.

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The respective operational and organizational structure of the MRVA system, including inter alia the methodological and technical requirements defined in the monitoring legislation and the administrative structure within the reporting cycle must ensure a transparent, accurate and complete reporting (in line with the defined scopes of the ETS) at the end of each reporting period. In the long term, it must ensure the transparent generation of consistent, complete and comparable data that is derived under inclusion of defined accuracy requirements and thus ensuring environmental integrity of the system. Strong mechanisms for sanctioning and compliance enforcement should complement the methodological and technical requirements for monitoring in order to establish reliable basis of the ETS.

**Definition of monitoring requirements**

A well designed and, in terms of the qualitative and quantitative requirements, appropriate monitoring system is the fundament of a properly functioning ETS. The respective legislation defined by the regulator sets a framework for operators for performing the regular monitoring activities. In this regard it is of utmost importance that the established regulation fits the envisaged scope of the ETS by establishing transparent and unambiguous monitoring requirements for all gases and activities covered by the ETS. All requirements need to be defined in a transparent and comprehensible way that at the end “a tonne is a tonne” for operators as well as for the regulator.

In general, monitoring covers all methodological and technical aspects of the regular evaluation of an entities emission, including applicable methodologies to determine emissions, quantitative accuracy requirements, e.g. for metering devices as well as qualitative requirements such as analysis standards, adequate options for treatment of data gaps and data management and control requirements. It thus defines the pathway for operators to determine the annual emissions that are subject for reporting and the fundament for the annual compliance obligation.

In practice, numerous approaches to monitoring are available and used in ETS and monitoring schemes across the globe. There is a range from application of conservative default methods that are easy to handle for operators and to verify at the end of the reporting period to more complex measurement and calculation methods that incorporate inter alia sampling and analysis standards, qualitative requirements (application of specific standards such as ISO 14181) and accuracy requirements for metering devices.

Figure 9 depicts a simplified example for the annual emissions monitoring (calculation approach) on a generic basis.
Regulators should incorporate different aspects in their decision making when establishing a monitoring legislation, as inter alia:

- Scope of the ETS in terms of sectors/activities and GHGs covered;
- Emissions profile among covered entities in order to balance efforts and additional accuracy gains especially for smaller sources;
- Availability of adequate conservative default values;
- Minimizing inherent monitoring risks and potential for gaming.

Especially in the beginning of a compliance period operators need comprehensive guidance while establishing internal monitoring processes according to the respective legislation. The regulator should therefore provide guideline documents (and specific workshops) for each sector covered that display the essential monitoring requirements, the data needed for derivation of annual emissions and a description of suitable approaches to implement a respective monitoring system. Such guidelines could in a first step be taken from already operating ETS and be adapted to the specific needs of the Turkish industry.

**Definition of reporting requirements**

Each regulated entity needs to report its annual emissions according to the scope of the ETS via an annual emission report. The emissions report is the basis for the determination of the compliance obligation on entity level. Thus, reporting deadlines should be aligned with compliance time frames (see Figure 8), typically providing sufficient time after the end of the compliance period for reports to be prepared (and verified). While within the EU-ETS a verified emissions report has to be submitted annually before 31 March, operators covered by the Californian Cap-and-Trade Program need to submit the emissions report until 10 April and the respective verification statement until 1 September (Quebec until 1 June). However, in any case, deadlines for delivering the reports need to fit to the deadline for delivering allowances under an ETS. There should be enough time to enter reported and verified emissions in a registry in order to determine the number of allowances that has to be delivered by the entities covered.

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EU Commission adapted by FutureCamp.
The annual emissions report clearly states the amount of allowances an installation has to transfer to the regulator. Moreover, the emissions report shows whether a consistent and comparable approach was used to determine the emissions by stating deviations from the monitoring plan. The regulator needs to establish clear requirements for the content and form of the report that suits already established reporting requirements in other areas (e.g. taxation) and is appropriate for administering the ETS. In this regard it must be decided which data and information should be included in order to get a holistic picture of the emissions profile of an entity (energy data, parameters used for calculation, need for deviation from monitoring plan, etc.). Moreover, the regulator should provide appropriate templates or online-applications that mandatorily have to be used for reporting and that are sufficient to transparently display even complex situations within an installation. As in California (Cal e-GRRT), Australia (EERS) or Germany (Formular Management System) online data management tools could be used.

However, especially in the first monitoring periods also standardized templates, such as in the EU-ETS, could be introduced in order to get a starting point, make ETS specific experiences and identify the need for adaptation. Independently from the format chosen for reporting it is of utmost importance that a secure transmission of emissions reports from operator to regulator and vice versa is guaranteed in order to address sensitivity of the respective data.

**Definition of verification requirements**
Implementing a system of quality assurance processes with regard to the data reported by covered entities is an indispensable step in the context of ETS design phase. Operators have an inherent incentive to underreport total emissions in order to pay less for compliance (or to over-report in the context of allocation procedures)\(^ {44}\). In addition to robust monitoring and reporting requirements it is therefore advisable to introduce processes that aim on assessing the accuracy of data reported by involving independent third party reviewers. Such processes could be those given in Table 16.

**Table 16: Quality assurance options**\(^ {45} \)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-certification</td>
<td>Formal assertion by the reporting entity of the accuracy of regulated entity’s emissions report.</td>
</tr>
<tr>
<td>Review by program administrators</td>
<td>External review undertaken by the program administrator.</td>
</tr>
<tr>
<td>Third-party verification</td>
<td>Reviewed by a qualified third party.</td>
</tr>
</tbody>
</table>

Having in mind the above mentioned options, regulators should take inter alia the following aspects into account during decision making processes:
- Respective administrative costs for the regulator and the regulated entities;
- Internal capacities of the regulator (sector specific knowledge, capacities to conduct site visits, enough manpower);
- Availability and capacities of verification bodies.

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\(^ {45} \) Ibid: page 127.
As the PMR/ICAP handbook highlights, “many jurisdictions use more than one or all of these quality assurance approaches. When there is a strong culture of regulatory compliance, it may be possible to rely on self-certification with spot-checking by regulators. However, most ETSs require third-party verification, which provides higher levels of confidence in reported data. Given the complexity and site-specificity of many emissions reports, some jurisdictions (including California, Québec, and the Republic of Korea) extend the need for verification to the monitoring plans that lay down the site- or company-specific methodologies for measuring, calculating, and reporting data, and are subject to approval by the regulatory authority.”

Third party verification shall provide an independent, impartial, transparent and authentic verification report including the final number of verified emissions. Especially in case the regulator or other administrative bodies, such as local authorities, do not have the capacities to perform site visits in order to evaluate the installation specific situation within a monitoring period, site visits should be included in the verification process on a mandatory basis. However, it must be clearly defined which tasks and responsibilities, such as approval of monitoring plans, compliance checks, check of annual emission reports, are assigned to the regulator and which are part of the verification process. Moreover, for the overall acceptance of the scheme it is important to define appropriate limits for the verification process, such as maximal duration of site visits, time needed for strategic analysis etc.

In light of the introduction of an ETS a few fundamental aspects must be decided or rather assured that influence the overall costs of compliance for operators and might increase the reliability of verification services:

- Is a verification mandatory for all covered installation regardless their annual emissions, as it is implemented in the EU ETS? Australia for example used to set a verification threshold under the Carbon Pricing Mechanism (repealed in June 2014), requiring a verification statement only if the installation emitted more than 125,000tCO₂e per annum (95% of the covered emissions were verified under this regulation). All other emission reports were checked by the authority.
- Is it advantageous and with regard to the financial implications that the regulator commissions and pays the verifier in order to further increase independency of verification services?
- How could be guaranteed that, especially in the beginning of the mandatory monitoring for operators and before the first reporting deadlines, an appropriate number of verification bodies and sector specialists is available and could transitional rules be helpful in this regard?
- Which requirements should be defined to increase independency of verifiers? In California requirements for example include mandatory proof that no consultancy has been provided by the verification body to the company (and its subsidiaries) to be verified in the last five years (even not with regard to other issues outside of the ETS), the obligation that operators have to change their verification bodies every six year and the obligation to ensure that between two hires there is at least three years.

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**Definition of accreditation requirements for verification bodies**

As mentioned above, most jurisdictions decided to include third party verification services as a qualitative element in the emissions data assessment process. A well-designed accreditation scheme adds a further qualitative aspect to the entire reporting process by setting clear and unambiguous requirements verification bodies have to fulfil in order to be able to perform verification services. A successful accreditation underlines the professional competencies of a verifier as well as his knowledge of the relevant regulation. The need for accreditation can further foster the sector specific specialisation of verifiers if it incorporates sector specific aspects and requirements. In order to establish a transparent accreditation scheme internationally recognized standards, such as ISO 14064-3, 14065 as well as ISO 17011 could be used by regulators as a framework or basis for country specific requirements.

However, if it is envisaged to integrate an accreditation scheme as one design element into the ETS it was advisable to check whether already existing accreditation procedures from other legislative regimes could be used or adapted in order to decrease administrative costs and to take advantage of already existing capacities. The accreditation body in charge - that also should be acting in accordance with transparent standards (such as ISO 17011) - should provide and request regular training activities that incorporate experiences made in the first reporting periods, especially with respect to the performance of verification bodies and individual verifiers. Moreover, the need for a regular reaccreditation of verification bodies as well as the conduction of witnessing processes contribute to safeguarding quality within verification activities.

**Developing an ETS registry**

As the PMR/ICAP handbook underlines “Regulators must ensure that covered entities surrender the correct amount of eligible units by the relevant compliance date. To keep track of transactions in the market and the units that have been surrendered, an ETS requires a registry where transfers of units are recorded and monitored. At the end of each compliance period, regulated entities can then transfer (or surrender) units via the registry to the ETS regulator to meet their emissions liability for the period”.

ETS registries are usually IT based and assign and track a unique serial number to each emission unit available in the market. Furthermore, registries could be used to generate information on:

- Who has been issuing allowances;
- Who holds respective allowances;
- Annual emission numbers of covered entities;
- The allowances that have been surrendered and cancelled;
- Use of offsets.

Hence, registries function as a transparent platform that eases the administration of the ETS.

According to the PMR/ICAP handbook, the following steps should be taken into account during the design and implementation of an ETS registry:

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Table 17: Essential steps and relevant aspects for establishing a registry

<table>
<thead>
<tr>
<th>Step</th>
<th>Relevant aspects</th>
</tr>
</thead>
</table>
| Creating the legal framework for a registry | • The envisaged registry should reflect the nature, scope, and scale of the proposed ETS;  
• Timelines for drafting, conducting consultations on, and implementing of the framework respecting the registry have to be established;  
• Any interactions that may appear with other areas of law—such as property, tax and accounting, insolvency, and financial legislation should be indicated and addressed with the bodies responsible for those laws;  
• If necessary, external expertise and support should be brought in;  
• IMPORTANT AND MOSTLY CHALLENGING: clarify the legal nature of the allowances and the allocation of responsibilities to all the bodies involved at a very early stage to avoid later disputes. |
| Setting up the institutional framework for administering a registry | • All relevant responsibilities of the registry administrator should be listed;  
• Terms of use and fees for registry users as well as the size and structure of the budget for registry administration have to be clarified;  
• On this basis, it should be decided which entity is best placed to assume this role;  
• Stringent cooperation procedures between the registry administrator and relevant authorities (e.g., market oversight and regulation, justice, etc.) should be established. |
| Specifying the functional and technical requirements of a registry | • Procurement of the relevant IT systems should be planned and executed. Thereby:  
  o Respective security issues and options should be identified and addressed in the procurement process;  
  o Data to be managed should be defined;  
  o Volume of data and number of transactions to be processed has to be estimated;  
  o Traceability procedures including audit logs, notifications, and messages must be established;  
  o Main business rules and alerts should be formulated;  
  o The main reports to be produced by the registry must be specified. |

In general, a registry must function reliable in terms of availability and manageability and provide a high degree of data security as well as of administrative ease. In this regard the establishment of stakeholder specific accounts, depending on the participants allowed (EU: operator holding account, aircraft operator accounts, person accounts, trading accounts), is of importance in order to grant access to all relevant stakeholders and to ensure an suitable environment for transactions of allowances. In this context, a balance between a high level of security (prevention of phishing attacks designation of unique serial numbers for each allowance) and reasonable quick transactions (EU: trusted account lists, additional authorized persons, time delay between date of transfer and actual transaction in order to give time for denials of the transfer) must be elaborated.

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48 As defined in the PMR and ICAP (2016) Handbook, page 130, phishing refers to fraudsters impersonating a legitimate and trusted entity to make participants provide access to sensitive data.
In light of the introduction of an ETS the following aspects should be considered since they have concrete implications for the functioning of the scheme:

- A registry has to be functional at the start of the first compliance period of the ETS;
- It must be decided whether the registry is governed by a public entity/authority or whether this is done by another organisation on behalf of the government.

**Establishment of robust sanctioning and enforcement mechanisms**

The enforcement of the ETS regulation by the regulator in combination with appropriate sanctioning mechanisms is a key aspect of the MRV scheme to be implemented and the backbone of a robust monitoring (and allowance application phase). Only if the regulator (or an equivalent stakeholder) has the authority, willingness and competence to sanction non-compliance, the ETS will reach the intended targets. In this regard it is of utmost importance that reasons for sanctions on the one hand and the respective catalogue of sanctions that could be applied are clearly defined and transparently documented. In addition, it should be clarified who could be made responsible in case of non-compliance, e.g. the company itself, the board or other representatives responsible for ETS issues. Under the US Greenhouse Gas Reporting Program (US GHGRP) for example “Authorized Account Representatives” have to submit a self-certification within the reporting process and are thus personally responsible for the data submitted and potentially subject for sanctioning.

Sanctions should be defined in a way that non-compliance is unattractive for operators and it has to be assured that all operators are treated equally, in e.g. the case of:

- Untimely submission of reports;
- Material misstatements;
- Non-compliance with regard to data management and control.

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**Figure 10**: Purposes a registry needs to serve

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Especially the latter aspect is essential in order to increase the acceptance of an ETS by underpinning fairness and similar requirements for competitors.

**Oversight of the market for liable entities – requirements to enable sufficient trading**

In parallel to appropriate and robust monitoring, reporting and verification requirements it is essential to introduce a transparent market oversight system in order to create a regulated framework for the stakeholders allowed to participate in the market. In this regard, it is important that the respective regulation clarifies the following aspects, as highlighted in the PMR/ICAP handbook:50:

- Which actors are allowed to participate in the market?
- Which institution is responsible for market oversight?
- Which trading products are available in the market?
- Where could transactions take place?
- All other rules that affect the market’s safety, volatility, and vulnerability to fraud, including those related to oversight of other financial and commodity markets.

The market oversight system to be implemented should encompass the primary market (i.e. at the point of initial distribution of units) as well as the secondary market (i.e. any subsequent transactions of units via “over-the-counter” [OTC] or exchanges and trades of derivatives). However, it is essential to find a compromise between high degree of regulation in order to prevent fraud and manipulation and overregulation that may lead to high transaction costs for all market actors. As suitable options applicable on various levels the PMR/ICAP handbook highlights several measures that minimize the risk of market misconduct, prevent systemic risk and safeguard against manipulation (Table 18).

**Table 18: Potential measures to minimize the risk of market misconduct, prevent systemic risk and safeguard against manipulation**51

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description and essential attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OTC versus exchange trading</strong></td>
<td>Transactions on OTC markets are less transparent than those on exchanges and thereby lead to a degree of systemic risk. For example, if a single buyer and counterparty amass a very large share of transactions and either is incapable of fulfilling contractual obligations, the result may be a complete market failure. Exchanges may play a regulatory role with their own procedures in case of violations, such as membership suspension. They may also be useful in providing information on prices, volume, open interests, and opening and closing ranges.</td>
</tr>
<tr>
<td><strong>Clearing and margin requirements</strong></td>
<td>While trading on exchanges is always cleared (i.e., there is a clearing house that becomes the central counterparty to the trade), this is not necessarily the case with OTC trading. Regulators are increasingly requiring OTC clearing of standardized contracts. As clearinghouses require a deposit as collateral to cover the credit risk until a position is closed (also called a “margin”), this greatly reduces not only systemic, but also counterparty risk.</td>
</tr>
</tbody>
</table>

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50 Ibid: page 133.
51 Ibid.
<table>
<thead>
<tr>
<th>Measure</th>
<th>Description and essential attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting and Disclosure</td>
<td>In absence of mandatory clearing or exchange trading, trade repositories or a central limit order book (CLOB) can function as a registry for market orders and an archive of trades, to provide regulators with information on market movements.</td>
</tr>
<tr>
<td>Position limits</td>
<td>A position limit imposes a restriction on the total number of units or derivatives that may be held by a market participant or a group of market participants with business relationships to prevent the possibility that they seek to distort the market. Position limits can be enforced through transparency at the registry level, the central clearinghouse level, or by an exchange.</td>
</tr>
<tr>
<td>Participation, registry accounts and licensing requirements</td>
<td>Regulators have the option to impose restrictions on who can open an account with the registry and who can trade on what markets, and decide whether licenses for these activities are required. They can also introduce capital requirements to reduce systemic risk and disclosure rules covering business relationships with participants registered in the system. Generally, having more market participants will create a more liquid market, which is desirable. However, verification of identities and previous records for all market participants is important to reduce the risk of manipulation and fraud.</td>
</tr>
</tbody>
</table>

Sufficient trading possibilities (in terms of available financial products, trading platforms, and market actors) are other key elements for a liquid market with a true price signal, i.e. for a well-functioning ETS. Different trading products (such as spot products or forwards – see Figure 11 and Figure 12 shall serve the needs of the different actors in the market and thus, increase economic efficiency and functioning of the market.

![Figure 11: Example for forward trading](#)

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52 FutureCamp 2016.
Spot products are mainly used by smaller entities that want to buy once a year for compliance. Big emitters as utilities or more trading focused actors usually prefer forward trading in order to hedge their production/price risks, sometimes combined with transaction types such as swaps and derivatives such as options. Depending on the off-set rules, allowance units and off-sets unit are typically available.

For a good description of typical products in the secondary market (i.e. all transactions with allowances after the allowance are first sold or distributed to participants), we refer to a short overview by the Center for Climate and Energy Solutions. The type of trading products allowed on the market also has an impact on how trading products are legally defined (i.e. as commodity or as financial product). This in turn has an impact on the extent to which certain regulations for the financial sector apply to trade in allowances. For more info, we refer to work by the International Carbon Action Partnership.

The "design" of the market in terms of trading partners allowed must fit the needs of the market: easy trading for operators, appropriate liquidity in the market and security of trading processes. Entities covered are typically allowed to the market as, in many ETS systems, financial institutes, and traders, although some jurisdictions (e.g. Korea) limit market access to certain players to avoid speculation.

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53 FutureCamp 2016.
All jurisdictions with an ETS allow for spot trades and most ETS systems make use of exchanges and additional transaction types and trading products. Typically, jurisdictions apply rules that are specific to the respective legal environment and existing rules. The decision which trading platforms will be allowed for performing transactions of eligible allowances depends on the trading partners allowed in the market (such as operators and if applicable financial institutions etc.) as well as on the specific needs of the respective trading parties (ensure liquidity, addressing trading affinity of operators etc.). In any case, sufficient trading platforms must be available from the beginning of the first compliance period in order to guarantee access to allowances and to establish a functioning market especially with regard to the determination of a market price.

### 2.8.3 Selection of international examples

Table 19 gives a brief overview on how jurisdictions designed their ETS with regard to monitoring, reporting, verification and accreditation. There are manifold differences between the selected ETS that show that regulators establish an ETS framework according to the specific economic and political targets addressed by the introduction of an ETS. However, at the end, especially monitoring and reporting requirements have to fit the scope of the ETS.

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56 FutureCamp 2016.
Table 19: Selection of international examples on the application of specific monitoring, reporting, verification, and accreditation requirements

<table>
<thead>
<tr>
<th>ETS</th>
<th>Applicability requirements</th>
<th>Monitoring</th>
<th>Reporting</th>
<th>Verification</th>
<th>Accreditation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU-ETS</td>
<td>Threshold: capacity threshold for combustion activities: rated thermal input &gt; 20MW. Emissions threshold for aviation, excluding air transport operators that operate flights with annual emissions below 10,000tCO₂.</td>
<td>For CO₂: Calculation and direct measurement (also in combination) allowed</td>
<td>Reporting deadline (verified) 31 March each year, verification of emissions reports mandatory. Reporting could be done via specific excel-templates provided by European Commission(^57). In some member states, as in Germany (FMS)(^58), web-based tools have to be used for reporting, establishing monitoring plans, applications for free allowances etc.</td>
<td>Verification of the emissions report (ER) is mandatory for all covered entities. Verifier checks compliance against the monitoring plan (MP). MP is approved by the respective national authorities. Materiality level: 2% for installations &gt; 500,000 tCO₂/a; 5% for installations &lt; 500,000 tCO₂/a. Level of assurance: reasonable. Verification based on results of strategic and risk analysis.</td>
<td>Accreditation body and competent authority are different entities (in each member state) Accreditation standard: International standard ISO 14065 + Accreditation and Verification Regulation Witnessing activities by accreditation body in order to keep up accreditation for verifiers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ETS</th>
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<tbody>
<tr>
<td>California Cap-and-Trade</td>
<td>Emissions threshold: All facilities with annual emissions $\geq$ 25,000 t CO$_2$e. Source categories: Some source categories irrespective of emissions levels (e.g., cement production, lime manufacturing, petroleum refineries). Embedded emissions: Suppliers of petroleum products, natural gas and natural gas liquids, and CO$_2$, if annual emissions that would result from consumption of products produced and sold are $\geq$10,000 t CO$_2$e.</td>
<td>Both calculation and measurement may be used. Direct measurement is required for certain activities (e.g. if mandatory under acid rain program). Tier-system (referring on thermal rated heat input) only established for combustion processes.</td>
<td>Reporting deadline for operators is 10 April, the respective verification statement has to be submitted until 1 September, reporting is done via online-tool “Cal-eGRRT”(^{59})</td>
<td>Verification of ER and MP mandatory; Authority takes care to avoid double counting between up- and downstream reporters; Materiality level: 5% Level of assurance: reasonable Each verification engagement is approved by CA regarding conflict of interest Triennial verification (with exceptions).</td>
<td>Accreditation body and competent authority are the same entity (California Air Resource Board [ARB]) Accreditation standard: individual standard similar to ISO 14065; Accreditation of natural persons and verification bodies (each auditor needs individual appointment by ARB) Annual mandatory training of auditors and witnessing activities by CA/accreditor.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>ETS</th>
<th>Applicability requirements</th>
<th>Monitoring</th>
<th>Reporting</th>
<th>Verification</th>
<th>Accreditation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea ETS</td>
<td>Emissions threshold: On installation level &gt; 25,000 tCO₂e per year. On entity level &gt; 125,000 tCO₂e per year. Installations with 15,000–25,000 tCO₂e per year remain under Target Management Scheme.</td>
<td>Calculation based approach with different data and uncertainty requirements to be applied according to a Tier-system. Direct measurement is allowed as well and mandatory for some specific activities.</td>
<td>Reporting deadline (verified) 31 March each year, verification of emissions reports mandatory. Reporting has to be done via National Greenhouse Gas Management System (NGMS)</td>
<td>Annual verification of MP and ER mandatory. VB have to apply at the National Institute of Environmental Research (NIER) to perform verification services. After approval of NIER, the verification agency is designated and examined by the Minister of Environment.</td>
<td>Accreditation body and competent authority are the same entity (Ministry). A provisional verifier needs to have attended a course (&gt;80h) set by the MOE. To become a verifier one has to participate in three or five verification processes within two years, depending on the sector. The verifiers have to complete a refresher course (&gt;24h) every two years.</td>
</tr>
</tbody>
</table>
2.8.4 Links to other design elements and miscellaneous issues

As MRVA is a decisive cornerstone, compliance with its rules needs to be ensured, otherwise acceptance of all market actors might get lost and also linking with other schemes might become difficult or even impossible.

Trading is not an end in itself. But proper use of market is important for the entities covered to make use of and ensure financial incentives also for the sake of (co-)financing investments leading to emission reductions – the main target of an ETS.

In order to ensure this function, clear rules also are important on taxation of revenues created from e.g. sale of allowances and on valuation e.g. of free allocation received within balances.

2.8.5 Design checklist

A summary of the key considerations and an ETS design checklist for price predictability and cost containment are given in Table 20.

Table 20: Oversight and compliance - design checklist

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Design checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>• An ETS must be governed by a rigorous and robust system for market oversight and</td>
<td>• Identify the entities being subject to the regulation.</td>
</tr>
<tr>
<td>enforcement.</td>
<td>• Manage emissions reporting by regulated entities.</td>
</tr>
<tr>
<td>• A prerequisite for effective compliance is an unambiguous identification of all</td>
<td>• Approve and manage the performance of verifiers.</td>
</tr>
<tr>
<td>covered entities and an effective system for the monitoring, reporting and verification (MRV)</td>
<td>• Establish and oversee the ETS registry.</td>
</tr>
<tr>
<td>• A well-functioning registry is needed to track all units within a system.</td>
<td>• Design and implement the sanctioning and enforcement mechanisms.</td>
</tr>
<tr>
<td>• Full compliance must be assured through a credible enforcement regime, with</td>
<td>• Regulate and oversee the market for emission units.</td>
</tr>
<tr>
<td>appropriate penalties.</td>
<td></td>
</tr>
<tr>
<td>• Last but not least, market regulation is needed that determines trading products,</td>
<td></td>
</tr>
<tr>
<td>who is allowed to trade and avoids fraud or manipulation.</td>
<td></td>
</tr>
</tbody>
</table>
2.9 Consider linking

2.9.1 Definition

In line with the PMR/ICAP handbook, we define linking in the following way: "Linking occurs when an ETS allows regulated entities to sue units (allowances or credits) issues in one or more other systems for compliance purposes." ⁶⁰

Links can be one way, where units from one ETS are recognised in the other, but not vice versa, or two-way, where units from both ETSs accept the use of units issued from the other system. ETSs can also be indirectly linked when two or more ETSs accept offsets from the same programme.

2.9.2 Analysis of design options and choices

Related to linking, policy makers need to a decision on:

- The linking objective and strategy;
- The type of link and the linking partners;
- The necessary alignment of design options to establish the link.

A decision needs to be made on the linking objective and strategy and another decision needs to be made on the type of linking. The key issues related to these decisions are analysed below.

Linking objective and strategy

Linking ETSs has a variety of advantages. One of the main reasons for policy makers to consider linking is that it has the potential to significantly increase cost-efficiency. This is the case when allowance prices in one market would be relatively higher compared to another market. Net buyers would be able to acquire cheaper allowances to meet their targets, while net sellers would be able to sell more allowances by exporting. As linking can increase the sustainability of ETSs, it can also increase the political support for an ETS.

Furthermore, linking can benefit the system by increasing market liquidity (the ease with which allowances can be bought and sold) and market depth (the number and volume of orders at a given price). A greater liquidity and depth can increase the effectiveness of the market by improving the ability of the market to form prices, decreasing the risk of market manipulation by majority sellers or buyers, and facilitating trades. Also, a greater market liquidity and depth can improve price predictability, as exogenous shocks are absorbed in a significantly larger system.

Another advantage is that linking can reduce the risk of carbon leakage. If two systems are linked, then prices converge to one level, thereby removing the incentive for ETS participants to shift production and emissions to other jurisdictions due to different carbon prices. Lastly, linking can increase administrative efficiencies and cost savings from joint market operations.

Although linking ETSs has clear benefits, there are also disadvantages that should be taken into account. While price convergence reduces the risk of carbon leakage, it can also undermine the environmental integrity of the system. A jurisdiction with relatively high allowance prices would – by linking with a jurisdiction having lower prices on the market – see prices fall. This could conflict with the jurisdiction’s ambition level, as ETS participants in that jurisdiction might lose the incentive to reduce emissions. Alternatively, a jurisdiction with relatively low prices could experience political challenges by linking with a jurisdiction with high prices, as costs could turn out to be significantly higher. Although this concern could partially be compensated by increased revenues for net sellers in that jurisdiction, linking could also have negative distributional (e.g. rising energy costs for households) and competitiveness implications (e.g. higher production costs for industries).

Another disadvantage is that linking can lead to price shocks being imported from one jurisdiction to another. Therefore, although linking has the potential to stabilize prices, it may lead to greater exogenous shocks and thus amplify price movements. This is in particular a risk for smaller jurisdictions that are linked to a larger system.

Lastly, formal linking between ETSs requires consistency in design features among the ETSs. Some design elements need to be aligned in order to successfully link ETSs, while other design elements do not necessarily need to aligned per se as will be discussed below. This alignment be a lengthy and costly process, and might lead to compromises that jeopardize the environmental integrity of the ETS as foreseen by one or more jurisdictions.

**Type of links**

There are different ways of linking ETSs as shown in Figure 14. Two-way linking, also referred to as bilateral or multilateral linking, is an approach where units from both ETSs accept the use of units issued from the other system. Without any restrictions or quantitative limits in place, this would result in a unified market. Alternatively, links can be one-way, where units from one ETS are recognised in the other, but not vice versa. One-way links could also be implemented with the view of setting up a two-way link at a later stage. ETSs can also be indirectly linked when two or more ETSs accept units from a third system, e.g. two systems using off-sets generated from an international offset program. In addition to formal linking, policy makers may wish to set up collaboration among different systems with the aim of realizing formal linking at a later stage or share experiences regarding ETSs.
Alignment of key design elements

Linking of ETSs requires a certain level of consistency between the design of the ETSs that are linked. A distinction can be made between design elements that absolutely need to be aligned before a link can be established and design elements where alignment is more optional (Table 21).

Table 21: Importance of alignment of design elements between linked systems

<table>
<thead>
<tr>
<th>Step</th>
<th>Feature</th>
<th>Importance of aligning (+ and ++ reflect level of emphasis among analysts)</th>
<th>Alignment could be desirable to address environmental integrity, market operations, or political and competitiveness issues</th>
<th>Environmental integrity</th>
<th>Market operations</th>
<th>Competitiveness/perception of fairness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Scope</td>
<td>Sector and gas coverage (including opt-in/opt-out provisions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Feature</th>
<th>Importance of aligning (+ and ++ reflect level of emphasis among analysts)</th>
<th>Alignment could be desirable to address environmental integrity, market operations, or political and competitiveness issues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Environmental integrity</td>
<td>Market operations</td>
</tr>
<tr>
<td>2. Cap</td>
<td>Nature of cap (absolute/intensity, mandatory/voluntary)</td>
<td>++</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Acceptable stringency of cap</td>
<td>++</td>
<td>✓</td>
</tr>
<tr>
<td>3. Allocation</td>
<td>Auctioning vs. free allocation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allocations rules (including for new entrants and closures and for trade-exposed industries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Offsets</td>
<td>Offset provisions (quantity and quality)</td>
<td>++</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Commitment periods</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>5. Timeframe</td>
<td>Compliance periods</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Banking and borrowing</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>Step</td>
<td>Feature</td>
<td>Importance of aligning (+ and ++ reflect level of emphasis among analysts)</td>
<td>Environmental integrity</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>6. Market Stability</td>
<td>Stability mechanisms (e.g., price floors/ceilings, reserves)</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>7. Oversight and compliance</td>
<td>Market oversight (including public disclosure of information)</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Robustness of MRV</td>
<td>++</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Stringency of enforcement</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Registry design and allowance tracking</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

From this table, four key design elements can be distinguished where alignment is essential. Firstly, alignment on cap stringency is necessary to prevent any political difficulties that may arise in the case of extensive asymmetries. A jurisdiction with a very ambitious cap might worry about domestic abatement incentives if its ETS were linked to a system with a relatively low ambition, resulting in lower overall allowance prices. Similarly, the jurisdiction with a relatively large cap might worry about rising prices of allowances and thus total costs of the ETS.

Secondly, alignment on the quantity and quality of offsets is needed. Alignment on quantity is particularly important, as a lenient limit on the use of offsets in one ETS can undermine the strict limit on offsets in another ETS. It is not necessary to fully align on quality standards of offsets between two ETSs. However, it is recommended for both jurisdictions to be aware of the quality of offsets eligible under the ETS.

Thirdly, alignment on the cap type is desirable. For example, one jurisdiction may have an absolute cap while another has an intensity-based cap. Linking the ETSs of these two jurisdictions would theoretically be possible, but in practice intensity targets are often perceived as being less ambitious than an absolute cap. This could lead to diverging stringency and misaligned ambitions for both ETSs.

Fourthly, alignment on mandatory versus voluntary participation is needed.
Linking a mandatory-based ETS with a voluntary-based ETS would lead to problems with cap-setting and could significantly increase exogenous shocks to the joint system.

Besides these four key design elements, alignment is needed regarding the infrastructure of ETSs. MRV systems need to be robust to ensure compatibility in terms of environmental integrity of units. Also, both systems need to have a similar level of enforcement. If not, there is the risk of losing environmental integrity of the joint system when non-compliance is not penalized in one jurisdiction. Lastly, compatible registry systems can be beneficial for the establishment of a linked market.

**Alignment on other design elements**

In line with the PMR/ICAP guide, we distinguish five design elements that do not necessarily need to be aligned, but where alignment might be beneficial for enhancing environmental integrity and solving competitiveness concerns.

Firstly, the scope of linked ETSs can be aligned to prevent carbon leakage between the two jurisdictions that link their ETSs. Secondly, alignment might be needed concerning the point of regulation. Accounting adjustments might be needed in case of non-alignment. Thirdly, although a difference in allocation method does not jeopardize the operation of a linked ETS, it could raise problems if sectors in a jurisdiction with auctioning have to compete with sectors in another jurisdiction with free allocation. Fourthly, alignment on commitment periods is recommended to prevent unnecessary regulatory uncertainty and maintain market stability. Finally, aligning on compliance periods could reduce administrative costs. However, not aligning on this design element could improve market liquidity.

Other design features that may be aligned when policy makers consider linking include borrowing, banking, and addressing price predictability and cost containment measures. If one jurisdiction allows more borrowing than another, and if prices increase in the joint market, then ETS participants in the former jurisdiction have the incentive to increase its borrowing rate and sell it in the joint market. This creates market distortions that would could harm ETS participants in the jurisdiction where less borrowing is allowed. Similarly, alignment with regard to banking units may be needed, as distortions may arise if one jurisdiction allows more banking than another. Lastly, market stability measures might not be needed after linking, as in theory, the market would be better able to manage price volatility.

**2.9.3 Selection of international examples**

In this section, we give a selection of international examples related to linking that might be of relevance to the situation in Turkey. Table 12 provides an overview of linked ETS. It shows that most linkages are two-way.
Table 22: Linking in existing ETSs

<table>
<thead>
<tr>
<th>Systems involved</th>
<th>Type of link</th>
<th>Degree of linking</th>
</tr>
</thead>
</table>
| California and Québec (Ontario and Manitoba intend to join the system) | Two-way | • Separate caps  
• Similar design features  
• Joint auction and registry system |
| RGGI | Multilateral link among participating states | • Common cap  
• Similar design features  
• Joint auctions  
• Same registry systems |
| Tokyo and Saitama | Two-way | • Separate caps  
• Similar design features  
• Separate allocation mechanisms and registry system |
| EU and Norway | Two-way (began with one-way link with Norway as buyer) | • Common cap  
• Similar design features  
• Separate auctions and registry systems |
| Intended link between Australia and EU | Intended to be one-way (with Australia as buyer) during first phase, evolving to a two-way link | • Separate caps  
• Some design features were in process of alignment |
| EU and Switzerland (not entered into force yet) | Two-way | • Separate caps  
• Similar design features |

The California and Québec Cap-and-Trade Programs formally linked in January 2014. The linkage of the two ETSs was a result of their common development route under the Western Climate Initiative. As a result of the linkage, both programs use a common registry, hold joint auctions and emissions allowances are mutually recognised.

Following five years of negotiations, technical negotiations for the linkage between the Swiss and EU ETSs concluded in January 2016 with an initialled agreement. However, for the linkage to enter into force, the agreement must be signed and ratified by both sides; the schedule for this to take place has not been defined. Under the linkage, emissions allowances from each scheme will be mutually recognised. Switzerland has stated that linkage is advantageous due to the abatement cost reduction potential in a larger market, as well as improved market liquidity. Indirect linkage includes the acceptance of international offsets in the EU ETS and prior to 1 June, 2015, in the NZ ETS.

2.9.4 Links to other design elements and miscellaneous issues

As discussed earlier, the linkage of ETSs is connected to many other design elements, as linkage requires alignment on some of the key design elements between two ETSs such as cap-setting and offsets.

2.9.5 Design checklist

A summary of the key considerations and an ETS design checklist for linking are given in Table 23.

Table 23: Linking - design checklist

<table>
<thead>
<tr>
<th>Key considerations</th>
<th>Design checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decisions to link with other ETSs should consider whether the linking can provide</td>
<td>A decision on the linking objective and strategy.</td>
</tr>
<tr>
<td>cost savings and improve market liquidity, while at the same time maintaining</td>
<td>A decision on the linking partners and the type of link.</td>
</tr>
<tr>
<td>domestic abatement incentives and the environmental integrity of the scheme.</td>
<td>Decision on the necessary alignment of design options to establish the link.</td>
</tr>
<tr>
<td>For linkages to work, design elements need to be aligned at a sufficient level.</td>
<td></td>
</tr>
<tr>
<td>To address disadvantages, a careful choice of trading partners and safeguards in</td>
<td></td>
</tr>
<tr>
<td>terms of the extent linking is allowed might be needed.</td>
<td></td>
</tr>
</tbody>
</table>

80
3 Policy mapping and policy interactions

Turkey has already policies in place that affect domestic greenhouse gas emissions levels. With the introduction of an ETS as a policy instrument aiming for cost-effective abatement of GHG emissions (Chapter 1 and 2) the question needs be answered how the ETS interacts with these other policies. These interactions can be positive (mutually enhancing cost-effective abatement) or negative (i.e. working in opposite directions). This chapter begins with a theoretical background on the role of an ETS in a wider policy mix to stimulate GHG emission abatement and the positive and negative interaction and overlaps of an ETS with other policies. We also give an international example of the interaction of an emissions trading scheme with other policies, i.e. the EU ETS where the ETS is part of a wider policy mix including also renewable energy and energy efficiency policies (Section 3.1). Next we give an overview of Turkey’s existing and planned policies (Section 3.2). We then provide an overview of how an introduced ETS would interact with existing policies and the best ways to deal with those interactions going forward (Section 3.3). The conclusions of this section are presented in Section 3.4.

In summary, this chapter aims to answer the following questions:
1. What is the theory behind the introduction of an ETS in an existing energy and climate change policy mix and the interaction between an ETS and other policies?
2. What are the existing and planned policies in Turkey which could interact with an ETS?
3. How could policy interaction in Turkey be handled?

It is important to note that the overview of the existing policies in Turkey provided in this chapter focuses on the policy goals and objectives of the various policy. In Chapter 4, some of the policies will be discussed more from a legal and institutional angle, i.e. what role can they play in the legal and institutional set-up of a possible ETS in Turkey.

3.1 Theory on policy interaction when introducing an ETS

To optimize the cost-effectiveness of an ETS, the sectoral scope should in theory be as wide as possible as described previously in Section 2.2. Only then, a cost-effective mitigation outcome will be achieved from a wide variety of emissions abatement options in different sectors. Emissions mitigation is thus incentivized by an ETS across many sectors of the economy such as power and industry, depending on the exact sectoral scope chosen. However, the emissions in many sectors of Turkey’s economy are already being influenced through international commitments, national cross-cutting policies and sectoral policies (see the next section for a mapping of Turkey’s policy mix). As a result, there is a high likelihood that the ETS will overlap with other, already existing policies in several sectors, meaning that the newly ETS interacts with other existing policies.

Such interactions could have negative outcomes, for example, if the interacting policy actually increases emissions, the emissions reductions that can be achieved through the ETS will be lower. However, interactions could also be positive, for example, if the interacting policy is targeted at low-cost abatement options which cannot be stimulated by the carbon price signal, the cost-effectiveness of emissions reductions is increased.
Analysis of the possible interactions of an ETS with the existing and planned policy mix is therefore vital to realizing the main objective of an ETS to facilitate the adoption of least-cost mitigation options. This section presents the theory on the role of an ETS in the wider policy mix and the resulting interactions with other policies. The chapter is mainly based on leading work by the International Energy Agency’s in this area, most notably the publication *Summing up the Parts: Combining Policy Instruments for Least-Cost Mitigation Strategies* (2011) and *Managing Interactions between carbon pricing and existing energy policies* (2013). We provide, as an example, the policy interaction effects which have arisen in the EU ETS.

### 3.1.1 Emissions trading as part of a wider policy mix

A carbon price is generally introduced in a jurisdiction for enabling least-cost emissions reductions. It is typically, for the sectors covered under the ETS, seen as the cornerstone element of climate change and energy policy package\(^{64}\). However, due to market barriers and imperfections, carbon pricing needs to be supplemented by other policies to fully realize the cost-efficient mitigation potential. In addition to a carbon pricing policy, there are two complementary policies that together with the carbon pricing policy form the core policy package for cost-efficient abatement (Figure 15):

- Energy efficiency policies to unlock cost-effective energy efficiency potential that is blocked by non-economic barrier;
- Technology support policies to reduce costs for long-term decarbonisation.

![Figure 15: The core policy package: carbon pricing, energy efficiency and technology policies\(^{65}\)](image)

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\(^{65}\) Ibid.
Energy efficiency policies are needed to unlock the mitigation potential that is otherwise not stimulated by the carbon price signal due to market failures such as lack of information, split incentives and behavioural failures. This holds for certain energy efficiency options related to fuel use in sectors directly covered by an ETS, but also for energy efficiency options related to electricity use, which are (assuming electricity production is in the ETS) indirectly covered by the ETS. If such cost-effective energy efficiency abatement options are not realised, a higher carbon price is required to deliver the same level of emissions reductions, thereby increasing the cost of meeting the emissions reductions target (Figure 16). Conversely stated, supporting energy efficiency policies reduce the carbon price needed to deliver the required level of emissions reductions and such energy efficiency policies are therefore typically seen as a vital part of a climate change mitigation policy mix.

![Figure 16: Ignoring energy efficiency potential can lead to higher carbon prices for the same level of overall abatement](image)

In addition, policies to support R&D in new technologies are needed. While these policies will increase the policy cost in the short-term, in the long term, technology policies should reduce the costs of low-carbon technology that are needed for decarbonisation.

Beyond the core policy package, other supplementary policies may well be justified beyond this core set. These policies could address further policy goals such as addressing areas not covered by the carbon pricing policies, preventing technology lock-in, overcoming barriers to financing, alleviate high costs for some or all consumers, compensating for political uncertainty about the carbon pricing scheme, increasing political uncertainty or serving other policy priorities such as energy security, affordable access to electricity for all citizens etc.

However, the merits of these supplementary policies should be carefully assessed, as supplementary policies may interact with an ETS, possibly creating negative outcomes on cost-effectiveness. Policies can in principle be mutually reinforcing (see e.g. the energy efficiency example above), but can also work against each other (e.g. if one policy reduces the cost of fossil energy use with another policy

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67 Ibid.

68 Ibid.

69 Based on the list provided in Ibid, page 9.
increasing it) or one policy can make another policy redundant (e.g. if a certain emission reduction achieved by the ETS is already higher as compared to targets set by other policies). Generally speaking, technology specific policy measures (such as technology standards, mandatory shares of certain technologies in a wider mix) might force more expensive abatement options into the market resulting in a less cost-effective overall outcome.

An important concern if the likely impact of such supplementary policies is not well understood is that such policies could deliver an uncertain share of emissions reductions needed under the cap, which creates uncertainty about the price signal in the ETS. This uncertainty in price levels could be detrimental to investments in the transition to a low-carbon economy. Also, if supplementary policies are responsible for a substantial share of emission reductions in an ETS, the vulnerability of the allowance price to economic conditions becomes higher. Supplementary policies may overall not even result in an overall reduction in emissions under the cap, as emissions can increase in other sectors. This outcome could be managed by setting a cap which takes into account the emissions reductions of the supplementary policies.

Policy interactions can be managed using an iterative process, as summarized in Figure 17. This process consists of five main steps: understanding the fundamentals of the emissions abatement in a jurisdiction including the abatement potentials and costs, establishing the core policy set, considering supplementary policies and assessing broader economic outcomes. Following each of the latter two steps, adjustments can be made to the policy core or supplementary policies in order to manage any identified interactions. Finally, it is important to review the policy outcomes and adjust policies on a regular basis. Throughout this process, building political support for mitigating climate action is needed.
Whereas Figure 17 provides a theoretical step-wise approach for establishing a policy mix for greenhouse gas abatement, in practice a carbon price policy instrument (like an ETS) is introduced in an already existing mix of energy and climate policies. This is also the case for Turkey. For such cases, five key stages, as given in Figure 18 can be distinguished that policy makers need to go through to uncover relevant policy overlaps when introducing a carbon price policy.

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**Figure 17: Establishing and maintaining a cost-effective policy package**

**Figure 18: Steps for integration of energy and climate policies**

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70 Ibid.
Box 7: The EU policy package – an example of interactions between carbon pricing, renewable energy and energy efficiency policies

The energy and climate change policy mix in Europe provides a good example of how other energy policies interact with an ETS. The EU ETS covers 45% of the EU’s total GHG emissions, covering the power, industry and aviation sectors. As identified by the International Emissions Trading Association’s (IETA) (2015) paper Overlapping Policies with the EU ETS, there are several policies that interact with the EU ETS, including the Energy Efficiency Directive (EED) and the Renewable Energy Directive (RED).

The EED establishes measures that will contribute to the EU’s 20% energy efficiency target by 2020. Specific measures include energy distributors or retail energy sales companies achieving 1.5% energy savings annually, energy efficient procurement from the public sector and renovations to improve the energy performance of government owned buildings. The overall impact of these measures under the EED will be a reduction in greenhouse gas emissions. However, the interaction of the EED with the EU ETS was not recognized in cap setting. IETA estimates that the impact of measures to achieve the EED’s targets results in a cumulative reduction of EU ETS allowance demand of approximately 515 MtCO$_2$e over 2008-2020, thereby contributing to an oversupply of allowances in the market.

The RED sets a binding target of renewable sources (RES) contributing to 20% of the overall energy consumed by 2020. In the electricity sector, the RED targets a goal of 34% RES share by 2020. To implement this directive, EU Member States have deployed various measures to encourage investment in renewable energy including renewable portfolio standards and feed in tariffs.

For instance, in Germany the production of electricity with renewable energies is promoted via a feed-in-tariff scheme that existed before the introduction of the EU-ETS. The scheme has been revised several times in course of the last years, inter alia reducing the tariffs by taking into account the technological progress and cost reduction within renewables and introducing a scheme of market share targets for renewables within the electricity market e.g. in order to ensure grid stability.

Furthermore, with the Fukushima accident in Japan in 2011, the decade old political discussion in Germany on nuclear power finally ended with the final phase-out decision, combined with many policies and measures to bring about the "Energiewende", in the core by transforming the whole energy system towards renewables and increasing energy efficiency in all sectors. Even if the EU-ETS is a scheme on EU level, the emissions share of German installations within the EU-ETS is more than 20% and electricity production is the largest emission source, mainly due to the still relevant share of coal-based production (lignite as well as hard coal). Therefore, it could be assumed that German policies have an effect on the EU ETS.

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73 Source: IETA, 2015, Overlapping Policies with the EU ETS.
74 The German word „Energiewende“ can be translated directly as „energy turnaround“. It expresses the change in energy policies to phase out nuclear electricity production and reduce GHG emissions within the electricity sector and other sectors at the same time. It includes enhanced efforts inter alia on further increase of renewable energy production and increased energy efficiency.
These policies result in growing share of renewables, everything being equal, reducing emissions. Additional policies beyond those that were taken into account when setting the cap, can contribute to low prices and reduced incentives for other sectors covered by an ETS. On the other hand, nuclear power production is at least partly replaced with fossil fuel-based production. Higher emissions clearly would be the result, by strengthening demand and also driving prices up, potentially and rapidly. To an extent that might cause problems for the electricity sector and industries, this by analogy to the energy efficiency example given above.

In parallel with the discussion above IETA argues that the emissions reductions achieved through these supplementary measures came at a higher cost, than if they were driven by the EU ETS alone\(^75\). For example, the implicit carbon price of emission reductions from wind energy in Germany ranged from €57–168/tCO\(_2\) between 2007 – 2010\(^76\). While the 20% RES target was incorporated in the cap setting of the EU ETS as the three targets (energy efficiency, GHG emissions and renewable energy) were set at the same moment in time, IETA estimates that the overachievement of the target will result in a cumulative reduction in demand of EU ETS allowances of approximately 210 MtCO\(_2\) over 2008 – 2020\(^77\).

These examples show how difficult it is to adequately take the policy outcomes from various complementing policies into account in the design of the carbon pricing policy, most notably in the cap setting in an ETS with an absolute emission cap, showing the need for continuous alignment between the various policies in the policy mix.

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3.2 Mapping of Turkish existing and planned energy and climate change policies

This section identifies energy and climate change policies in Turkey that would require attention once an ETS would be introduced in Turkey. Recommendations are provided on possible ways forward, e.g. on how features of existing policies could be used in some of the design steps distinguished in Chapter 2. In order to do a more detailed analysis, the focus is on policies in the energy, industry and transport sectors that together are responsible for 72% of the total emissions in Turkey and for which also most information is available vis a vis policy interaction with an ETS.

A distinction is made between policies and instruments at the international level (Section 3.2.1) and the national level (3.2.2). The international policies do not have a direct effect on legislations or sectoral strategies but they provide a framework for the strategic targets for the country. For the national policies, first laws and regulations and secondly, framework policies are analysed. This method aims to make the difference between binding and non-binding policies clear. Additionally, framework policies are also divided into two groups in itself: multi-sectoral and sector specific policies. This approach allows to first show the big picture, and then to focus on the more specific sectoral policies.

Figure 19 provides the structure of the following section.

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\(^75\) Ibid.  
\(^76\) Ibid.  
\(^77\) Ibid.
Figure 19: Structure of this Section: Turkish energy and climate change policy landscape

3.2.1 International policies

International policies are important because they provide the background environment for setting up national strategies and policies. National energy and climate change policies can thus not be understood without understanding the international context. This section provides an overview of the international agreements to which Turkey is a party. First the United Nations Framework Convention on Climate Change (UNFCCC) is discussed and then the EU accession process.

United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is the framework agreement related to the climate change initiated by the United Nations. The objective of the framework is “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”\(^7\) It was first negotiated in Rio in 1992 and entered into force in 1994. After that, the first United Nations Climate Change Conference, also known as Conference of Parties (COP), was held in Berlin in 1995. Parties are classified into five groups under the UNFCCC. Annex I countries are developed countries that were members of the OECD in 1992 and economies in transition (EIT). Annex II parties are OECD countries that are listed in Annex I but not the EIT parties.

\(^7\) Please see Article 2 of the UNFCCC; http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
Non-Annex I parties are the developing countries and the 49 parties are listed as least developed countries\(^\text{79}\). Turkey became a party to the Convention in 2004 and is listed in Annex I of the Convention. Both the Kyoto Protocol and Paris Agreement were negotiated in following COPs under the umbrella of the Convention. The following sub-sections discuss the Kyoto Protocol and Paris Agreement as Turkey is a party to these agreements. Last but not least, information is provided on Turkey’s Intended Nationally Determined Contribution (INDC), which is the first emission reduction target submitted to the UNFCCC by Turkey in the run-up to the Conference of the Parties in Paris in December 2015.

**Kyoto Protocol**

The Kyoto protocol was adopted in the 3\(^{rd}\) COP in Kyoto Japan in 1997. It entered into force in 2005. The aim of the protocol is to reduce the greenhouse gas emissions and define targets for reductions by countries. The protocol sets binding emission targets for 36 developed countries and the EU. Belarus, Malta and Turkey are listed as an Annex I country but they do not have a binding emission reduction targets under the Kyoto Protocol. Flexible market mechanisms, “International Emission Trading”, the “Clean Development Mechanisms” (CDM) and “Joint Implementation” (JI) were defined in the Kyoto Protocol that can be used by Annex I parties to meet their mitigation targets with the aim to achieve cost-effective emission reductions.

Some Annex I countries indeed used international emissions trading to meet their reduction targets and buy offset credits of the CDM projects that are developed in the non-Annex I countries and JI project credits that are developed in other Annex I country to meet their reduction obligations. With these mechanisms, for the first time GHG emissions in developed countries and emission reductions in both developed and developing countries became priced. The first commitment period of the protocol started in 2008 and ended in 2012, the second period started after the first period and extended to 2020.

Turkey became a party to the Kyoto Protocol in 2009. Turkey does not have emission reduction targets under the Kyoto Protocol, but due to its special status\(^\text{80}\), did also not have access to the flexible market mechanisms such as CDM and JI to deliver emission reductions to countries with a target. In the absence of absolute binding emission targets and without access to the CDM, Turkey became an active country in the voluntary carbon markets since 2006. Those voluntary carbon market projects have typically been implemented in Turkey following CDM methodologies. As explained in Section 2.5 where the use of off-sets in an ETS was discussed, with the introduction of an ETS, part of the emissions of Turkey would be under a binding target, i.e. those set by the ETS cap. Many of the projects in the voluntary market in Turkey are in sectors that are likely to be part of an ETS, most notably the power sector.

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\(^{79}\) Please see: http://unfccc.int/parties_and_observers/items/2704.php

\(^{80}\) Turkey has been a party to UNFCCC since 2004 and the Kyoto Protocol (KP) since 2009. In the Marrakesh Accord (CP7), Turkey was removed from the list of countries in Annex II of the KP, and the special circumstances of Turkey was recognized by the parties. Following this decision, Turkey is not an Annex-II country, and accordingly, it is not responsible for providing technical and financial support to developing countries in line with the UNFCCC and KP. Although Turkey is an Annex-I country according to the UNFCCC, it is accepted as a developing country, and there has access to funds to combat climate change. Based on Decision of Marrakesh Accord (CP7) to recognize Turkey's special circumstances on 10.11.2001, Turkey's access to international climate finance is currently being negotiated with the Parties.
If those projects would be eligible to deliver off-sets into an ETS or would otherwise be allowed to continue, this goes along with a risk double counting of emission reductions within the power sector given that the projects reduce emissions that are themselves under the ETS cap. The existing voluntary market in Turkey is thus an area that does need explicit attention when an ETS would be phased in, which is further discussion in Section 3.3.

**Paris Climate Change Agreement**

The Paris Climate Change Agreement (Paris Agreement) was the key outcome of the Paris Climate Conference (COP21) in December 2015. The Paris Agreement strengthens the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. Contrary to the Kyoto Protocol, the Paris Agreement brings a bottom up approach based on the effort of each individual country. These efforts are summarized in the intended nationally determined contributions (INDCs) of the countries submitted ahead of the Paris conference. The Paris Agreement was opened to signature on 22 April 2016 and at the time of writing (October 2016) 191 countries signed it including Turkey. The agreement will enter into force on 4 November in 2016 given that already this year, sufficient countries ratified the agreement. For those that ratified the agreement, the INDCs become NDCs, nationally determined contributions. Article 6 of the Paris agreement is arguably the most relevant one to this report. Article 6 opens the way for further international cooperation with carbon pricing tools to reach the targets defined in the NDCs, comparable albeit not identical to the flexibility mechanisms under the Kyoto Protocol. This includes the potential use of international transferred mitigation outcomes (ITMO) and a new sustainable development mechanism that might be similar to the former CDM. It is fair to say that there are still many discussions on the exact form, modalities and procedures or these new mechanisms and the expectation is that these new mechanisms only will play a role beyond the 2020 period. They could then play a role in terms of linking a possible Turkish ETS to other ETSs via the use or exchange of off-sets (as discussed also in Section 2.5 and 2.9).

**Intended Nationally Determined Contribution**

As explained above, the INDCs were prepared by each country to outline their intended efforts to reduce greenhouse gas emissions after 2020. The INDC process very much was a bottom-up process since every country prepare their own INDC and set their own targets with taking into account their national circumstances. Countries can use the flexibility mechanisms to meet their targets in their INDCs.

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81 The main objectives of the agreement are to keep the global average temperature increase well below 2°C and pursue efforts to limit this to 1.5°C above pre-industrial levels, to increase the adaptation activities and low carbon development, and to increase carbon finance flows. In this context, parties will submit their nationally determined contributions (NDCs) to the secretariat. It is expected that the developed countries will have certain reduction targets and they will complete their transition to a carbon neutral economy by the end of 2050. It is also expected that developing countries should take actions within their national limitations. In the Paris Agreement, a top down approach was used for the emission reduction effort contrary what was the method in Kyoto Protocol. The Paris Agreement was opened for signature on 22 April 2016. Along with 178 other parties, Turkey signed this agreement on 22 April 2016. The agreement will enter into force after 55 countries that collectively emit at least 55% of the global GHG emissions have ratified the agreement. To make the Paris Agreement binding for Turkey, the Paris Agreement should be ratified and published under the authority of the Presidency of the Republic of Turkey in accordance with the Constitution of the Republic of Turkey. Turkey has not ratified the agreement yet.

In the run-up to the Paris Climate Change conference in December 2015, the Republic of Turkey submitted its INDC to the UNFCCC on 30 September 2015. This included an emission reduction target of up to 21% compared to the business as usual scenario in 2030\textsuperscript{83}, which is expected to be 1,175 MtCO\textsubscript{2e} in 2030.

This is almost two and a half times the 2014 emissions level of 467.6 MtCO\textsubscript{2e} according to the Turkish Statistical Institute\textsuperscript{84}. In terms of the possible introduction of an ETS in Turkey and the INDC, the most obvious link is the link to the cap-setting process that was introduced in Section 2.3. The mitigation scenario in the INDC could be regarded as an upper limit for Turkish GHG emissions pathway and the ETS cap for the sectors covered by the ETS should be set in line with this economy-wide target, comparable to the EU where the EU ETS ambition is also closely aligned with the economy-wide ambition as explained in Section 2.3.3. Also, the foreseen process of updating the INDCs could play a role in defining the trading periods in the Turkish ETS (as discussed as well in Section 2.3), e.g. by aligning those with the INDC update cycle. In Turkey’s INDC, it is also stated that Turkey intends to use international carbon credits in order to achieve the mitigation target given in the INDC. This clearly links to the potential use of international off-sets in a Turkish ETS (discussed in Section 2.5) and the development of new international offset mechanisms under the Paris Climate Change Agreement.

**EU accession**

As Turkey is currently a candidate for EU accession process of Turkey is evaluated by the EU Commission with yearly progress reports. Environment and climate change policies and regulations are discussed under Chapter 27 of EU Commission Turkey progress report. Turkey’s INDC submission and the Turkish MRV system were highlighted in the report\textsuperscript{85}. The EU 2030 climate and energy framework continues to be based on the three pillars of GHG reduction, as well as energy efficiency and renewable energy\textsuperscript{86}. In addition to that, 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. Depending on the further political and other developments regarding the EU accession, it is likely that Turkish climate change and energy policies will more and more be aligned with EU policies. In view of the design of an ETS in Turkey, it means a future link to the EU ETS is important to consider from the beginning. The alignment of the MRV regulation in Turkey, discussed below, with the EU MRV regulation is an example of this.

### 3.2.2 National Policies – laws and regulations

The section provides a list of national climate change related policies, regulations and strategy documents with short descriptions to provide the reader with an overview of existing energy and climate change related policies in Turkey. Where relevant, possible problematic interactions of those policies with an ETS or possible synergies are highlighted. To analyse the national policies, national policies have been grouped in the following two categories:

1. Laws and regulations
2. Framework policies

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\textsuperscript{83} Ministry of Environment and Urbanization (2015) Republic of Turkey Indented Nationally Determined Contributions (INDC).


\textsuperscript{85} European Commission; Turkey 2015 Progress Report, page 76.

\textsuperscript{86} EU 2030 climate & energy framework as summarised here: http://ec.europa.eu/clima/policies/strategies/2030/index_en.htm
Policies that are legally binding are discussed in the section on laws and regulation, policies and other relevant strategic documents that are not legally binding are grouped in the section on framework policies. While the adopted laws are there to be implemented, some of the strategy papers and strategic plans are not realized. As such, the documents discussed under framework policies should be seen as vision papers of the government and the targets defined in those papers are not binding. The framework policies are further subdivided into two groups; multi-sectoral policies and sector specific policies. This allows to start with multi-sector strategies and then zoom in on strategies for single sectors. This allows us first to see the big picture, and then to focus on the more specific issues.

In this section existing laws and regulations which may have impact on are future ETS are discussed. Contrary to the framework policies that will be discussed, in the next section these regulations are directly binding policies. Following the legislative hierarchy applicable to Turkey (for more info, we refer to Chapter 4), first applicable laws are discussed, followed by regulations and communiques.

**Laws**

Under this subsection, environment law, renewable energy law and energy efficiency law are discussed. These laws do not have direct target on emissions but the incentives they described will have impact on the emissions and eventually on the cap. Thus impact of these laws and their synergy with the ETS should be taken into account.

**Environmental Law**

The Environment Law is mainly relevant in relation to a possible ETS in Turkey for two reasons. First it includes a provision about using carbon trading as a market instrument in order 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.” Article 3 of the Environment Law can thus be seen as providing a basis for a future ETS in Turkey. The law itself have impact on emission but it clearly shows a path to the carbon pricing mechanisms. We will dive deeper into the legislative framework of a future ETS in Turkey and the possible role of the Environmental Law in this framework in Chapter 4. Secondly, the environmental law forms the basis for the environmental permit system in Turkey. The inclusion of entities into a possible ETS in Turkey might in the future be arranged via a permit system directly or indirectly linked to the environmental permit, similar to the practice in many Member States in the EU (discussed further in Chapter 3).

**Renewable Energy Law**

Increasing the share of renewable energy in the overall electricity production is one of the main goals of Turkey. In order to achieve the renewable energy goal, the Renewable Energy Law was adopted in 2005. With this law, feed-in-tariffs that are above electricity market prices are guaranteed for renewable energy technologies for their first ten years of operation. An amendment was approved in 2010. Partly as a result of the Renewable Energy law, the share of renewable energy technologies (excluding hydro) in the electricity production went from 0.3% in 2005 to about 5% in 2014. The feed-in tariffs did have a positive impact on the development of renewable electricity production. As the share of renewable technologies in the electricity mix will have a direct impact on the future emissions of the power sector, the expected renewable energy share resulting from, among others,
the renewable energy law, needs to be an integral part of the ETS design. This is discussed in more detail in Section 3.4.
Energy Efficiency Law
The Energy Efficiency Law was adopted in 2007. As stated in the first Article of the Law: “The purpose of this Law is to increase efficiency in using energy sources and energy in order to use energy effectively, avoid waste, ease the burden of energy costs on the economy and protect the environment.” In other words, the law aims to make Turkey a country with a low energy intensity, to reduce overall energy costs for the economy and to protect the environment. An important aspect of the national climate change strategy of Turkey is to stimulate energy efficiency in all sectors of the economy. Energy efficiency policies are important tools to tackle climate change and reduce GHG emission. Implemented effectively, they reduce energy consumption and thus the GHG emissions for the sectors they target either directly for direct emissions or indirectly for the emissions related to the electricity production. As such, the impacts of these policies need to be considered carefully in designing emission trading system as also discussed in the introduction to this chapter. Ignoring energy efficiency potential that is not tapped due to non-financial barriers by not targeting those with additional policies could lead to higher carbon prices. However, too stringent and/or command and control type energy efficiency policies might result in higher abatement costs for the economy as a whole and potentially to artificially low carbon prices if not taken into account carefully in the cap setting process. This is discussed in more detail in Section 3.4.

Regulations and Communiques
In this section regulations and communiques that would have interaction with the possible ETS are discussed.

Regulation on Monitoring, reporting and verification of greenhouse gas emissions
The first Regulation on Monitoring, Reporting and Verification of GHG emissions has entered into force in 2012. This regulation has been superseded by a new Regulation on Monitoring of Greenhouse Emissions adopted in 2014 which is still in force. In addition to this, the Communiqué on Monitoring and Reporting Greenhouse Gases and the Communiqué on Verification of Greenhouse Gas Emission Reports and Authorization of Verification Institutions were published. Installations under the scope of the Regulation (listed in Annex 1 of the regulation) include electricity and steam production, petroleum refining, petrochemicals, cement, iron-steel, aluminium, brick, ceramic, lime, paper and glass production. The MRV regulation covers approximately 55% of Turkey’s total emissions. It is clear that the MRV regulation in Turkey provides a solid basis for setting the scope of an ETS Turkey (discussed in Section 2.2), and in addition, the data collected via the MRV regulation can provide a solid basis for defining the cap of a possible ETS (Section 2.3), and the allocation of allowances (Section 2.4). The MRV regulation can therefore, as discussed in more detail in the following chapters, play a pivotal role in the design of an ETS in Turkey.

Regulation on the Control of Industrial Air Pollution
The Regulation on the Control of Industrial Air Pollution aims to reduce NOx, SOx, dust and other industrial emissions. However, this regulation does not directly limit CO2 emissions that are likely to be included in a Turkish ETS. As such there is no direct interaction with a possible ETS in Turkey.

87 Regulation on Monitoring of Greenhouse Gas Emissions was published on Official Gazette No. 29003 on May 17, 2014.
88 Communique on Monitoring and Reporting Greenhouse Gases was published on Official Gazette No 29068 on July 22, 2014.
89 Communique on Verification of Greenhouse Gas Emission Reports and Authorization of Verification Institutions was published on Official Gazette No 29314 on April 2, 2015.
90 Regulation on the Control of Industrial Air Pollution entered into force upon its publication in the Official Gazette no. 27277 on 03.07.2009.
Indirectly, there are synergies between the impact of air pollution and GHG reduction policies. Many technologies that reduce GHG emissions (e.g. renewable versus fossil fuel based power production) also reduce air pollution and vice versa. In the European Union the Industrial Emissions Directive entered into force on 6 January 2011 to reduce industrial emissions. The Directive is based on IPPC Directive and other six previously existing directives. The Industrial Emissions Directive aims to reduce the harmful emissions from industry by the application of Best Available Techniques. This Directive does not limit CO\textsubscript{2} emissions on purpose in order not to interact with the EU ETS that was chosen as the main instrument to reduce GHG emissions. In Turkey, under EU accession, this Directive might be adapted and enter into force as well, replacing the current regulation. The Industrial Emissions Directive prescribes the use of Best Available Techniques related to air pollution. Since these technologies also might have a different profile in terms of CO\textsubscript{2} emissions, it is important to take the likely impact of this regulation into account in the cap setting process of a possible Turkish ETS.

**Regulation on Energy Performance in Buildings**

The regulation on the Energy Performance in Buildings\textsuperscript{91} entered into effect and defines a series of measures to increase the energy performance of both new and old buildings, to stimulate the use of renewable energy and to provide labelling for all buildings based on primary energy use and CO\textsubscript{2} emissions. The regulation also contains standards for the design of the projects in respect to energy efficiency, standards for the thermal insulation of the buildings, standards for the design and application of heating and cooling units, etc. With these standards, better applications of measures are being taken to increase the energy efficiency and use of renewable energy. This regulation thus addresses building energy use across sectors (both the household and service sector). Given that the building sector is unlikely to be included in a possible ETS in Turkey, there is no direct relation between this policy and the ETS. However, indirectly the regulation has an impact on the electricity consumption and production in Turkey and this impact thus needs to be carefully considered in defining the ETS cap as will be discussed in more detail in the next section.

**Regulation on the Unlicensed Electricity Production**

With the Regulation on the Unlicensed Electricity Production in the Electricity Market and the Communique on the Implementation of the Regulation on the Unlicensed Electricity Production in the Electricity Market\textsuperscript{92}, real and legal persons can carry out electricity production based on renewable energy resources in the unlicensed electricity market, without having the obligation to be licensed.

This Regulation has had an important impact on the solar power generation, which grew from 71 to 410 MW of capacity between May 2015 and May 2016 alone. In parallel with the INDC target on solar power (increasing electricity production from solar power to 10 GW), it is expected that with this Regulation, the total capacity of unlicensed renewable energy will increase further.

\textsuperscript{91} Regulation on Energy Performance in Buildings came into effect upon their publication in the Official Gazette no. 27075 on 5 December 2008. The Regulation was revised and came into effect upon their publication in the Official Gazette no. 27539 on 1 April 2010.

\textsuperscript{92} The Regulation on the Unlicensed Electricity Production in the Electricity Market and Communique on the Implementation of the Regulation on the Unlicensed Electricity Production in the Electricity Market came into effect upon their publication in the Official Gazette no. 28783 on 2 October 2013.
**Communiqué on Voluntary Carbon Market Project Registry**

The Regulation on the Registry of Projects for Greenhouse Gas Mitigation\(^93\) entered into force in order to set the procedures and principles for recording the voluntary carbon market projects that were already discussed above in the section on the Kyoto protocol. The objective is to keep track of the issued voluntary carbon projects in Turkey. The number of projects in Turkey and their respective emission reduction estimations are shown in the table below.

**Table 24: Number of Registered VCM Projects and their annual emission reduction potential\(^94\)**

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Number of Projects</th>
<th>Annual GHG reduction potential (tCO(_2)e per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydropower</td>
<td>142</td>
<td>8,440,707</td>
</tr>
<tr>
<td>Wind power</td>
<td>129</td>
<td>9,972,858</td>
</tr>
<tr>
<td>Bio-gas/Landfill</td>
<td>32</td>
<td>4,043,066</td>
</tr>
<tr>
<td>Geothermal</td>
<td>10</td>
<td>1,845,731</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>10</td>
<td>239,608</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>323</strong></td>
<td><strong>24,542,000</strong></td>
</tr>
</tbody>
</table>

Participation in the Voluntary Carbon Markets (VCMs) has been the only market based mechanism in Turkey. Approximately 323 VCM projects were developed and/or implemented in Turkey under the most common voluntary carbon market (Gold Standard: 243, Voluntary Carbon Standard: 80) that in practice often make use of (adapted) CDM methodologies. The majority of these projects are renewable energy projects.

The link between existing projects under the voluntary market, the risk of double counting when an ETS would be introduced in Turkey has already been discussed in Chapter 2.5 and will be further elaborated below. At a more practical level, the experience with the voluntary project register and the regulation overseeing this registry can be used in the development and operation of an offset scheme in an ETS registry if deemed required. This will be touched upon in the following chapters.

**3.2.3 National Policies – framework policies and strategies**

Framework policies and strategies define strategic visions for the related sectors but do not directly regulate the sectors. The targets defined in these framework policies can thus be seen as a recommendation or as guidance for the related ministries. First multi-sectoral policies and then sector specific policies are discussed in this section.

**3.2.3.1 Multi-sectoral policies**

**Tenth Development Plan**

The Tenth Development Plan (2014 - 2018) was approved in 2013. The development plan can be seen as a roadmap for the ministries and their strategic papers. Since the development plan draws a roadmap for the whole country, it will have impacts on the GHG emissions in multiple ways.

\(^93\) The Regulation on the Registry of Projects for Greenhouse Gas Mitigation by the MoEU was published in the Official Gazette No. 27665 on 07.08.2010.

\(^94\) Gold Standard and VCS, 2016.
For instance, Article 72 of the Development Plan states the importance of local energy resources and underlines the importance of increasing the use of lignite, nuclear power and renewable energy sources as well as energy efficiency measures. In addition, Article 793 indicates that local coal will be used for the electricity generation. Furthermore, under the section domestic resource based program, utilization of local coal is emphasized. The importance of renewable energy is also underlined for other sectors, and efficient usage of energy is a key issue for the development plan as well. It is clear that all of these strategic directions have an impact on GHG emissions. It is important that Turkey’s future development plans for the period beyond 2018 (the period in which an ETS might be introduced) are developed hand in hand with Turkey’s strategic direction in terms of climate change as outlined in its INDC.

**National Climate Change Strategy Document**

The National Climate Change Strategy Document (NCCS) is one of the main policy documents which guides national climate change policies and can also be seen as one of the most important strategic documents for the ministry of environment and urbanization. The NCCS was prepared by stakeholders from the Coordination Board on Climate Change (CBCC), related private sector participants, NGOs, and it was approved by the Higher Planning Council in May 2010.

The 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.”

The overall strategies in the NCCS are given in Table 25. It can be summarised as follows: by participating in international negotiations and also taking national stakeholder’s feedback into account, the national climate change action plan shall be prepared by considering all related circumstances of Turkey.

**Table 25: Overall strategies listed in NCCS**

<table>
<thead>
<tr>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- To actively participate in negotiations carried out for establishment of a comprehensive and functional international cooperation mechanism, within efforts to combat and adapt to global climate change;</td>
</tr>
<tr>
<td>- To prepare the National Climate Change Action Plan, with a dynamic approach, within the overall framework of the National Climate Change Strategy, the Ninth Development Plan and other national policy and strategy documents;</td>
</tr>
<tr>
<td>- To initiate the organizational restructuring on climate change, in concerned institutions;</td>
</tr>
<tr>
<td>- To establish the necessary infrastructure, so that the greenhouse gas emissions inventories can be developed in a sounder manner;</td>
</tr>
<tr>
<td>- To develop climate change policies in cooperation with all stakeholders.</td>
</tr>
</tbody>
</table>

95 Source: Republic of Turkey, National Climate Change Strategy (2010 - 2020).
In addition to this, the NCCS sets some short term, medium term and long term activities for GHG emission reduction in the energy, transportation, industry, waste, land use, agriculture and forestry sectors. Table 26 provides the strategies and the targets stated in the document. As can be seen from the list, the general aim of the targets is to reduce GHG emissions, such as energy efficiency measures, usage of renewable sources, energy management measures, fuel switch and transportation type, incentives etc. In line with the 10th Development Plan, for the purpose of energy security, usage of clean coal is also in the list. The impacts of these measures should be taken into account when cap setting or deciding the sectoral coverage of the ETS.

Table 26: Sector strategies defined in the NCCS

<table>
<thead>
<tr>
<th>Climate change strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
</tr>
<tr>
<td><strong>Short term</strong></td>
</tr>
<tr>
<td>All domestic sources will be used in line with energy security.</td>
</tr>
<tr>
<td>Energy certificate for buildings and increasing the renewable energy usage in buildings.</td>
</tr>
<tr>
<td>Energy efficiency measures in buildings.</td>
</tr>
<tr>
<td>Increasing low and zero GHG emission technologies (clean coal, nuclear, renewable energy).</td>
</tr>
<tr>
<td>Usage of alternative fuels.</td>
</tr>
</tbody>
</table>

| **Transportation**        |
| **Short term**            | **Medium term** | **Long term** |
| Maritime and lake transport will be supported for short distances. | Increasing share of railways and maritime for passenger transportation. | |
| Increase usage of cycling and pedestrian access in the cities. Improving public transportation. | Fuel switch to decrease CO₂ and NOx emissions. | |
| Usage of alternative fuels. | Supporting aviation. | |
| Smart transportation system and R&D for the decreasing fuel usage by improving standards of the roads. | | |
| Energy efficiency measures. | | |

| **Industry**              |
| **Short term**            | **Medium term** | **Long term** |
| Energy studies for the installations that consume energy more than 5000 TOE. | Incentives for clean production, climate friendly and innovative technologies. | |
| Heat recovery, engine. | | |
| | | |
Climate change strategies

- speed control and cogenerations systems will be encouraged in the industry
- Encouraging the use of alternative raw materials and fuel in industry
- R&D studies and technology transfer will be encouraged.

**National Climate Change Action Plan**

The National Climate Change Action Plan (NCCAP) was prepared within the framework of NCCS, Development Plan, and other national policies and strategy documents. The NCCAP was approved by Coordination Board on Climate Change (CBCC) in 2011. The NCCAP sets clear objectives for both mitigation and adaptation aspects of climate change. Within the NCCAP, the following purposes and corresponding objectives for the sectoral cross-cutting issues are listed:

- 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 in the existing and new global and regional carbon markets until 2013;
- Carrying out studies to establish a carbon market in Turkey by 2015.

In addition to the objectives above, the Action Plan also states that “Optimal usage of emission trading mechanisms that contribute to cost-effective limitation of greenhouse gas emissions”. Market based mechanisms are considered as a tool for cost-effective reduction of GHG emissions.

Some of the actions identified in NCCAP related to market based mechanisms are:

- 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;
- Developing a portfolio for nationally appropriate mitigation actions for Turkey so that Turkey can benefit from the carbon markets;
- Identifying key sectors for the carbon markets, identifying the greenhouse gas emission reduction potential in these sectors;
- Making legislative arrangements to enable public institutions regulatory and supervisory role in the emission trading system;
- Developing the existing structure and building new structures to enable carbon assets to be traded with maximum economic value and have their values increased;
- Beginning infrastructure development for establishment of the National Emission Trading System;
- Carrying out activities to increase awareness in carbon markets in Turkey;
- Providing support to stakeholders necessary to identify, develop, market and manage carbon projects.
In the NCCAP, there are also sector specific targets. Some of these sectoral targets are listed in the table below. The targets are related to energy, industry, building, transport, waste, agriculture and land use and forestry. The sectoral objectives as listed are not directly binding regulations. They did, however, play a role in the formulation of Turkish INDC and the individual sectoral objectives can play a role in the scope and cap-setting process of a Turkish ETS.

Table 27: Sectoral objectives listed in NCCAP

<table>
<thead>
<tr>
<th>Sectoral Objectives in the NCCAP</th>
<th>Energy</th>
<th>Industry</th>
<th>Building</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Reduce primary energy intensity by 10% compared to 2008 by 2015;</td>
<td>• Limiting the GHG emissions originating from energy usage (including electrical energy share) in the industry sector;</td>
<td>• Decrease annual energy consumption in the buildings and premises of public institutions by 10% until 2015 and by 20% until 2023;</td>
<td>• Increase 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;</td>
</tr>
<tr>
<td></td>
<td>• Ensure that the share of renewable energy in electricity production is increased;</td>
<td>• Develop and use new technologies for reducing GHG emissions in the industry sector until 2023.</td>
<td>• At least 20% of the annual energy demand of new buildings are met via renewable energy resources as of 2017.</td>
<td>• 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.</td>
</tr>
</tbody>
</table>

**Energy Efficiency Strategy Paper**

The Energy Efficiency Strategy Paper (EESP), prepared by the Ministry of Energy and Natural Resources, was adopted in February 2012 with the Decision of Higher Planning Council. The main target of this document is to reduce the energy consumed per GDP by at least 20% compared to the 2011 level. The purpose of the EESP is to draw a roadmap for the energy efficiency activities in Turkey, to define responsibilities for institutions, and to increase collaboration between NGOs and the private sector in order to reach energy efficiency targets.

The EESP describes seven strategic purposes and corresponding strategic targets. These purposes and targets are focused towards the industry, the electricity system, private/public buildings, electrical products, and transport as it can be seen below. With energy being the major source of GHG emissions, it can be said that the EESP directly influences the majority of Turkey’s GHG emissions. The EESP can thus be seen as a strategic paper beyond the individual sectors given it defines strategies for the whole economy. Since all of these measures have an impact on GHG emissions, they should be taken into account during the ETS design phase.
Table 28: Strategic purposes and targets in EESP

**Strategic purposes and targets in the EESP**

**Purpose 1:** To reduce energy intensity and energy losses in industry and services sectors.
- The reduction targets for each industry will be determined in collaboration with the sectors but shall be at least 10% for each sub sector, within the 10 years after publication of the document.

**Purpose 2:** To decrease energy demand and carbon emissions of the buildings; to promote sustainable environment friendly buildings using renewable energy sources.
- 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.
- At least one fourth of (1/4) building stock in 2010 shall be made as sustainable buildings by the year 2023.

**Purpose 3:** To provide market transformation of energy efficient products.
- 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.

**Purpose 4:** To increase efficiency in production, transmission and distribution of electricity, and to decrease energy losses and harmful environment emissions.
- The total average cycle efficiency of the coal thermal power plants including waste heat recovery installations shall be increased to 45% by the year 2023.
- Some demand side management measures shall be developed for decreasing the electrical energy intensity at least 20% until 2023.

**Purpose 5:** 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.
- 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.
- The use of bio-fuels obtained from biomass sources or synthetic fuels in transport shall be promoted.

**Purpose 6:** To use energy effectively and efficiently in public sector.
- Annual energy consumption in the public buildings and facilities shall be decreased 10% by 2015 and 20% by 2023.

**Purpose 7:** 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.
- The institutional structure, capacity and mutual cooperation of implementing organizations shall be strengthened until the end of 2012.
- 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.
- 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.
- 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.
- 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.
As explained in the introduction to this chapter, supporting energy efficiency policies focused on removing non-financial barriers that hamper the uptake of often cost-effective measures are an essential part of a policy mix aiming at low-cost decarbonisation. Also, these policies could target energy efficiency in sectors that will most likely not be included in an ETS. At the same time, technology-specific or sector by sector targets for energy efficiency should ideally be avoided in order let the market find the most cost-effective solutions. As we will outline in more detail below, it is important to screen the strategic purposes and targets in the EESP against this background.

3.2.3.2 Sector specific policies

Under this section power, industry and transportation sector policies will be analysed. Since they are the biggest three emitting sectors and common scope of the most of the international ETSs.

Power sector - Strategic Plan of the Ministry of Energy and Natural Resources

The Strategic Plan of the Ministry of Energy and Natural Resources (MENR) was prepared for 2015 - 2019 with the goal of “providing the highest contribution to national welfare by utilizing energy and natural resources in the most efficient and environmentally-conscious manner.” Like the Development Plan, the NCCS and the NCCAP, this strategy document can be seen as a roadmap for energy policies in Turkey and future versions of it would ideally be developed hand in hand with Turkey’s strategic direction in terms of climate change as outlined in its INDC. Even though targets defined in the plan could not be achieved and are not binding, these goals would have direct impact on the power sector emissions and also cap of the possible ETS. Goals defined in the strategy plan that could have impact on emissions are listed below; One of the goals defined in the plan is to have a strong and reliable energy infrastructure. In order to achieve this target, natural gas storage will be increased infrastructure investments are completed. Second of the goal is to reach an optimum resource diversity by increasing local coal usage, renewable energy share and nuclear energy share and decreasing the natural gas usage in electricity production increasing the local crude oil production and exploration of new local coal source mines. Third of the goal is energy efficiency measures with privatization and modernization of the state owned power plants, using more efficient street lightings, decreasing loss and illegal consumption and expanding regional heating systems. All of these measures could have a direct impact on the emission cap on both ways. Thus they need to be into account during the design phase.


The Electricity Market and Supply Security Strategy Document was published in 2009. As stated in the document, the Strategy Document is prepared by keeping in mind the transnational needs and hitherto developments and actions, for publicizing the privatization program and the methodology to follow in the coming period for creating the targeted market structure in electricity energy sector. Also, the Strategy Document is prepared in order to define and announce the steps necessary for ensuring supply security, and targets for resources to be used in electricity supply in the medium and long term.

As we outline in more detail below, it is essential for Turkey to develop a holistic package for the power sector in Turkey balancing the multiple policy objectives such as security of supply, a diversified and lower carbon power supply, and a liberalised market resulting in affordable power prices and to define what role an ETS is expected to play to meet these multiple objectives.
Industry sector - Turkish Industrial Strategy Document
The Turkish Industrial Strategy Document (2011 - 2014), prepared by Ministry of Science, Industry and Technology, has a sub-section for the environment, which contains climate change related objectives. The overall objective stated in the document is: “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”. This Strategy Document thus aims a more sustainable development pathway for industry.

The GHG emission from the industry is responsible around 28% of the total GHG emissions. The largest emitters within industry are the minerals and metals sectors. Within the principles of sustainable development for Turkish industry, implementation of environmental policies is an essential part of industrial strategy and it is of great importance that this process is directed with the right transition strategies. In Table 29, climate-related policies in the industry sector are summarized from this strategy document as well as the sixth national communication to the UNFCCC.

Table 29: Climate change policies defined for industrial sector

<table>
<thead>
<tr>
<th>Climate change policies for the industrial sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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.</td>
</tr>
<tr>
<td>• Transition to an energy efficient and clean production processes in industry will be promoted; informational activities will be planned. For this purpose, industry will be moved to production zones enabling it to produce with organized infrastructure facilities; greenhouse gas emissions will be controlled, monitored and reported.</td>
</tr>
<tr>
<td>• 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.</td>
</tr>
<tr>
<td>• Increasing energy efficiency in industrial installations and providing financial support to energy efficiency projects.</td>
</tr>
<tr>
<td>• Making studies to increase use of waste as an alternative fuel at the appropriate sectors.</td>
</tr>
<tr>
<td>• Reducing emission intensity with the implementation of National Strategy and Action Plan on Energy Efficiency.</td>
</tr>
</tbody>
</table>

Transport sector - Turkey Transport and Communication Strategy Document
The amount of total greenhouse gas emissions from transport sector is 73.7 Mt CO₂e in 2014. Transportation emissions has been increased with the rate of about 170% % with respect to 1990. Contribution of transport sector GHG emissions to national total GHG emissions is around 16%.

96 Sources: Turkish Industrial Strategy Document (2011-2014), Sixth National Communication of Turkey.
Sub-sector share of the transportation is given in the annex in which road transport is the major greenhouse gas emissions shares of the emission of the sector. The Turkey Transport and Communication Strategy Document (2011 - 2023), prepared by Ministry of Transport, Maritime Affairs and Communications aims to develop a more sustainable transport system. Table 30 provides 2023 and 2030 targets defined for the transport sector from this document and the sixth national communication of Turkey to the UNFCCC.

**Table 30: Targets defined for the transport sector**

<table>
<thead>
<tr>
<th>Specifie Targets for 2023:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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;</td>
</tr>
<tr>
<td>• Decreasing the share of roads in freight transport (which was 80.63% in ton-km in 2009) below 60%,</td>
</tr>
<tr>
<td>and in passenger transport (which was 89.59 in passenger-km in 2009) to 72% as of 2023;</td>
</tr>
<tr>
<td>• 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;</td>
</tr>
<tr>
<td>• 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Targets for 2030:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ensuring balanced utilization of transport modes in freight and passenger transport by reducing the share of road transport and increasing the share of maritime and rail transport;</td>
</tr>
<tr>
<td>• Enhancing combined transport;</td>
</tr>
<tr>
<td>• Implementing sustainable transport approaches in urban areas;</td>
</tr>
<tr>
<td>• Promoting alternative fuels and clean vehicles;</td>
</tr>
<tr>
<td>• Realizing high speed railway projects;</td>
</tr>
<tr>
<td>• Increasing urban railway systems;</td>
</tr>
<tr>
<td>• Achieving fuel savings by tunnel projects;</td>
</tr>
<tr>
<td>• Scraping of old vehicles from traffic;</td>
</tr>
<tr>
<td>• Implementing green port and green airport projects to ensure energy efficiency;</td>
</tr>
<tr>
<td>• Implementing special consumption tax exemptions for maritime transport.</td>
</tr>
</tbody>
</table>

3.3 Phasing in an ETS – recommendation on the interaction with other policies

In this section, we assess possible interactions of Turkey’s current policy mix with an ETS. Based on the theory presented in Section 3.1 and building on the overview of existing policies presented in 3.2, the following three policy domains where explicit alignment during the phase in of an ETS is needed:

- Energy efficiency policies;
- Renewable and other policies for the power sector;
- The voluntary market for emission reduction credits.

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97 Sources: *Turkey Transport and Communication Strategy Document (2011 - 2023), Sixth National Communication of Turkey, Intended Nationally Determined Contribution (30 September 2015).*
Rather than analysing the specific interaction of each individual policy, policies are aggregated in these groups and the interaction of each of these groups of policy with an ETS is then assessed. Recommendations to avoid potential negative interactions are also provided in this section.

3.3.1 Energy efficiency policies

Turkey’s existing energy efficiency policies, which have been listed in Section 3.2, aim to lead to reductions fuel and electricity use in sectors and subsequently to a reduction in GHG emissions. For example, Turkey’s energy efficiency policies that aim to reduce energy consumption in buildings and appliances result in a fall in electricity production, and therefore a fall in GHG emissions. Policies that target reductions in the energy intensity of industry sectors will have a similar effect. In terms of the alignment process between an ETS that is phased in and existing energy efficiency policies, we suggest the following approaches:

1. Re-consider specific technology standards or sub-sector targets on energy efficiency for those sectors that will be covered by the ETS.
2. Focus energy efficiency policies on removing non-financial barriers towards the uptake of energy efficiency measures and on sectors not in the ETS.
3. Align the cap-setting in the ETS with the projected outcome of the energy efficiency policies.

Re-consider specific technology standards or sub-sector targets on energy efficiency for sectors covered by the ETS

As discussed in Section 0, the purpose of an ETS is to internalize the cost of GHG emissions. Market forces then determine the most cost-effective mitigation outcomes in a technology and sector neutral manner. As explained in Section 3.1, forcing certain abatement technologies into the market via mandatory technology standards or by introducing sub-targets for individual sectors under the ETS jeopardises the overall cost-effective outcome of the ETS. Such standards or targets would interfere with these market forces as they may be incentivizing investments in abatement that are not the most cost-effective. Assuming at least a significant part of the industrial sector will be covered by the ETS, this implies that the sub-sector targets of at least 10% energy efficiency improvements as defined in the EESP (purpose 1, see Section 3.2.2) might have a counter-productive effect and we recommend removing such very specific sub-sector targets for those sectors that will be included into the Turkish ETS. The sub-sector targets may have a counter-productive effect on the ETS as it incentivizes emission reductions which may not necessarily be the most cost-effective. Similarly, the specific targets on the cycle efficiency of fossil power production (purpose 4 of the EESP) is potentially redundant with an ETS, because an ETS will provide the incentives for the market to choose the cheapest abatement options.

At the international level, not defining specific targets has a precedent in e.g. the European Industrial Emissions Directive. From the original Directive, Article 9 explicitly excludes specific targets or standards on energy and GHG efficiency in order not to interfere with the EU ETS98.

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98 Relating to the EU ETS Directive (2003/87/EC), Article 9 of the Industrial Emissions Directive states that (1) “Where emissions of a greenhouse gas from an installation are specified in Annex I to Directive 2003/87/EC in relation to an activity carried out in that installation, the permit shall not include an emission limit value for direct emissions of that gas, unless necessary to ensure that no significant local pollution is caused” and (2) “For activities listed in Annex I to Directive 2003/87/EC, Member States may choose not to impose requirements relating to energy efficiency in respect of combustion units or other units emitting carbon dioxide on the site.”
In Turkey, as discussed above, as part of the EU accession process, the Industrial Emissions Directive might be adapted and enter into force as well.

**Focus energy efficiency policies on removing non-financial barriers towards the uptake of energy efficiency measures and on sectors not in the ETS**

Rather than defining specific targets on energy efficiency or setting technology standards in sectors that are under an ETS, energy efficiency measures should stimulate overcoming non-financial barriers towards the uptake of energy efficiency measures as explained in Section 3.1. Examples of such non-financial barriers are insufficient access to technology (e.g. by a lack of technology providers), knowledge gaps (not knowing which technology is available) and ownership issues (e.g. owners of buildings are not the same as those paying the energy bills). If such barriers prevent efficiency measures to be taken, the overall outcome can be less cost-effective (Figure 16) and policies to overcome such barriers can thus support a policy package for cost-effective GHG abatement.

Typically, such non-financial barriers (such as limited knowledge, insufficient access to capital, limited responsiveness to price signals) play an important role for smaller energy consumers, e.g. electricity consumption by households and energy use in buildings and electricity use by small and medium-size enterprises. The carbon pricing signal in the power prices (if any, see below) is often insufficient for such measures to take place. Obviously, additional energy efficiency policies are also required for those sectors that are not covered in the ETS such as, in many jurisdictions, the transport sector.

Of the strategic purposes of the EESP as outlined in Section 3.2.3, Purpose 2 (on buildings), 3 (on energy efficient appliances), 5 (on transport), 6 (on the public sector) and 7 (on strengthening institutional capacity) can be seen as policy targets that could strengthen and complement an ETS in Turkey provided that their impact on the electricity consumption in Turkey is taken into account in the cap-setting. This is because they either address sectors that are most likely not included in the Turkish ETS and/or address non-financial barriers e.g. by strengthening the institutional capacity within Turkey on energy efficiency.

**Align the cap-setting in the ETS with the projected outcome of the energy efficiency policies**

The energy efficiency policies targeting lower electricity consumption in sectors within or outside the ETS and policies targeting lower fuel use in sectors within the ETS will lead to lower emissions under the ETS. In the cap setting for the ETS, it is important that the projected outcomes of such policies are adequately accounted for in the cap. If these emissions reductions are not taken into account during cap setting, the allowance market may be oversupplied, leading to a carbon price that does not stimulate the desired level of emissions reductions. For example, as discussed in Section 3.1 the impact of the EU’s Energy Efficiency Directive was not fully recognized in the cap-setting, leading to a substantial reduction in allowance demand. To date, the alignment between the outcome of national and EU energy efficiency policies remains a point of discussion in the EU ETS. The MSR that will be introduced in the EU ETS in 2019 will help to at least control the surplus of allowances that might be the result of this (further discussion in Section 2.7.3).
3.3.2 Renewable energy and other policies for the power sector

Turkey’s renewable energy and fuel mix policies affect GHG emissions levels, most notably in the power sector. As the power sector will most likely be included in an ETS, interactions of these policies will need to be taken into account. In terms of the alignment process between an ETS and existing energy efficiency policies, we suggest the following approach:

1. Develop a holistic policy package for the power sector balancing the multiple policy objectives.
2. Align the cap-setting in the ETS with this holistic policy package for the power sector.

Develop a holistic policy package for the power sector balancing the multiple policy objectives

Turkey’s renewable energy policies aim to expand electricity generation from renewable sources, resulting in a decrease in emissions. Other strategic policy aims for the power sector are to increase the use of nuclear and local fossil resources such as coal. The overall objectives of these policies together are to increase Turkey’s energy security and to guarantee an electricity supply system at an affordable price. The position of an ETS amidst these strategic, but diverse, policy goals for the power sector is a complex challenge that deserves detailed attention in the process of the ETS design. A balance needs to be found between an ETS as market instrument to find the most cost-effective abatement options in the electricity sector and the other policy goals as outlined above.

In theory, following the reasoning presented in Section 3.3.1, policy to stimulate specific technologies, similar to technology specific energy efficiency measures as described in the previous section, may reduce the cost-effectiveness of an ETS as they can interfere with the market forces that should decide to implement mitigation options based on cost. Renewable energy support policies might incentivize emissions reductions in the power sector, whereas more cost-effective mitigation options may exist in other sectors.

Also, within the power sector, certain mitigation options are incentivized by renewable energy policies, whereas others are not. Turkey’s feed-in-tariffs are not technology neutral as different rates apply to the various renewable energy technologies. Thus, the feed-in-tariff in conjunction with the ETS may not necessarily be incentivizing investments in the most cost-effective renewable energy technology. Although, as described in Section 3.1, such technology specific policies can be justified if they reduce the costs of renewable energy technologies that are needed in the long term for emissions abatement, the use of technology specific support policies just to increase their share in the overall power supply system, is in principle not in line with a policy mix aiming for low-cost abatement.

Turkey also aims to increase electricity generation from indigenous coal resources and limit the use of natural gas for power generation. Also for those support policies, the technology specific character of the target contradicts in principle with the use of an ETS as market based instrument. And, in contrast to the renewable support policies, these technology support measures increase the emissions level of Turkey rather than bringing emissions down and financial support for such technologies thus directly contradicts with the ETS as an instrument to internalise emission costs.
Taking as starting point that (to achieve?) a) a transition to a lower carbon power mix b) a reliable and affordable power supply and c) a power supply mix that relies more on domestic sources are all reasonable policy objectives, we suggest the following steps to arrive at a holistic policy mix for the power sector:

1. Decide on the envisioned role of carbon pricing in the power market, e.g. the degree of market liberalisation and price formation for the power sector.
2. Decide on specific technology support policies to ensure security of supply and a diversified mix of power supply technologies.
3. Decide on cost containment measures, ensuring affordable electricity supply for all, e.g. by using part of the ETS revenues.

Regarding the first issue, it is important to realise that carbon pricing only incentivises low carbon electricity generation as well as efficient use of electricity if the resulting carbon costs are passed through in the electricity prices. However, in other jurisdictions, electricity prices are set or heavily regulated by the government. In such cases, liabilities put at the producer side will not be reflected downstream. Turkey, in the process of liberalising its power market, needs to choose to which extent carbon pricing will be allowed to impact power prices and decide on the point of obligation in relation to this (see Box 7).

**Box 8: Relation point of obligation for the power sector and market liberalisation**

Both the Chinese ETS pilots and the Korean ETS have chosen to require both generators of electricity as well as consumers of electricity to surrender allowances for electricity. At the generator side to incentivise fuel switches and efficient generation at the consumer side to incentive efficient use of electricity. Both countries made that choice because the power market is not (fully) liberalised giving limited options for electricity generators to pass on the costs of the allowances into the electricity prices. This in contrast to the EU and California where there is only an obligation to surrender allowances for the electricity generators. The example of China is relevant given a similar process market liberalisation as well at the reliance on coal for the electricity supply.

Based on the envisioned role carbon pricing is intended to play, it is then recommended to assess in more detail the specific technology support policies for power production that are in place in Turkey, such as the renewable energy feed-in tariffs, the specific support for coal fired power production etc. The foreseen role of these technologies in Turkey’s power mix, the relative price of these technologies and the way support will be financed should be taken into account in deciding which policies to keep and which ones to stop. Ideally, the carbon market itself will support a gradual increase in renewable technologies over time, making direct technology support polices less and less needed.

Special point of attention in all these considerations needs to be on the resulting electricity price for consumers and the investment needs required for the modernisation of the power sector. In a liberalised market with the ETS driving the abatement, the costs for modernising and decarbonising the power sector will be borne by the final consumers. The allocation methodology for the power sector and the way auction revenues are used are important variables that can be used to mitigate this. In Box 8 and 9, we give examples on the support given in Europe to Member States that need to upgrade their coal based power production and on the use of auction revenues to compensate power consumers.
Box 9: Measures in the EU ETS to support Member States in the modernisation of the power sector

**Article 10c: transitional free allocation to the power sector**

While power generators under the EU ETS generally have been obliged to buy all of their allowances since 2013, there is a derogation option for this rule in Article 10c of the Emissions Trading Directive (Directive 2003/87/EC). But only certain Member States qualify for this derogation. One of the eligibility criteria is that "in 2006, more than 30% of electricity was produced from a single fossil fuel, and the GDP per capita at market price did not exceed 50% of the average GDP per capita at market price of the Community." In practice, the beneficiaries of this rule are the states that joined the EU after 2004. Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Poland and Romania have made use of this derogation.

All countries using the derogation must draw up plans that determine where investments into electricity sector modernisation and diversification will be made. In particular, investments should be made in: retrofitting and upgrading their infrastructure, clean technologies and diversifying their energy mix and sources of supply. These investments are meant to be financed with the money saved by free allocation. The investments must equal or exceed the market value of the allowances allocated for free. Member States can choose their own approach to these investments and each Member States’ plans to monitor and enforce the intended investments were reviewed by the European Commission and have been approved in Decisions.

Originally, this arrangement was going to end in 2020 with 0% free allocation, but it will continue in the time from 2021-2030. A Commission proposal suggests limiting free allocation to 40% of a MS’s auctioned allowances. The COM proposal of July 2015 suggests that MS ought to conduct bidding competitions for projects that require more than 10 million € in investments. Such projects will be supported via free allocation. Bidding competitions should honour the principles of transparency, non-discrimination and sound financial management. Projects ought to diversify the energy mix and fuels. Projects shall be selected that lead to net emissions reduction; that will not result in any market-driven increase in demand for electricity and that exhibit the best cost-benefit-ratio. Art. 10c attempts to reconcile the environmental integrity of the EU ETS with the interest of mentioned countries to have more time available for the modernization of their infrastructure and for catching up with the EU’s more mature economies. This arrangement also acknowledges the need for energy that is not only as clean as possible, but also save and affordable. Since Turkey, too, is still highly dependent on coal and consumers are sensitive to energy price increases, a similar arrangement is worth considering in order to smoothen the transition to a low-carbon economy and in order to decrease electricity generators’ and consumers’ possible reservations about an ETS.

**The modernisation Fund**

Another measure with the aim to transfer money from the economically strong Western European countries to the less advanced economies in Eastern Europe is the Modernisation Fund, which will become active with the start of the 4th ETS Period 2021. A number of allowances equal to 2% of the 2021-2030 cap, that is about 310 million EUAs, will be assigned to the fund and the revenue from their auctioning will be used for investments into energy efficiency and modernisation of energy systems in eligible states.

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100 EU Commission, Directorate General Climate, Transitional free allocation to electricity generators. Available online: http://ec.europa.eu/clima/policies/ets/allowances/electricity/index_en.htm

101 Ibid.
The Commission estimates that the fund will provide up to 8 billion €\(^{102}\) (this is also dependent on allowance prices). States with a GDP per capita below 60% of EU average are eligible for funding. The fund money is distributed over recipient states according to GDP and verified emissions. The fund is administered by an Investment Board (IB) and a Management Committee (MC). The IB draws up the investment policy, investment criteria and financing instruments. It will probably be presided by a member of the EU Commission. The MC is appointed by the IB. It is supposed to consist of representatives from the recipient MS, the EU Commission, the EIB and three representatives from other MS. It handles the fund’s day-to-day business. The states have to report about financed projects to the MC. If the EIB suggests to decline funding for a certain project (a decision for which it needs to provide reasons), the MC can override that decision with a 2/3 majority. Small-scale projects are eligible for funding, too\(^{103}\). It is interesting to note that such a fund based on allowances can have a counterintuitive effect: it can cause the recipient states with high shares of fossil fuel to have an interest in a higher carbon price, because revenue from the fund will increase accordingly and more investments can be made.\(^{104}\)

**Box 10: The use of auction revenues in California**

**Sharing auctioning revenue with citizens and businesses: The California Climate Credit**

California uses some of the auctioning revenue coming from the California Cap and Trade Program (Cal CTP) (about 40% of $1.7 billion by spring 2014\(^{105}\)) to fight climate change or its consequences through clean energy investments\(^{106}\). For this purpose, a carbon pollution fund has been set up which has a strong focus on reducing transportation emissions, but also invests into energy efficiency measures and better management of natural resources and waste\(^{107}\). The remaining 60% of the auctioning proceeds (spring 2014\(^{108}\)) are spent to help citizens and businesses decrease their footprint on a small scale by investing into energy-saving equipment\(^{109}\) and – ideally – eventually save even more money through those measures\(^{110}\).

The Residential Climate Credit for households is paid out twice a year, in April/Mai and October/November via a household’s utility bill. The received amount is identical for all households purchasing electricity from the same provider, but varies among providers. That is, households with different utility providers also receive different amounts\(^{111}\). Thus the credit applied to the bill ranges significantly, from $17.44 to $143.47 (as of July 2016)\(^{112}\).

\(^{102}\) BRIEFING: EU ETS Modernisation Fund keeps west-to-east cash transfer, aims to step up scrutiny. Available online: http://carbonpulse.com/7409/


\(^{104}\) For more analysis in this regard please confer: Sharing the Burden EU ETS support to Central and Eastern Europe. Available online: https://sandbag.org.uk/site_media/pdfs/reports/Sharing_the_Burden_EU_ETS_Support_to_Central_and_Eastern_Europe.pdf

\(^{105}\) BRIEFING: EU ETS Modernisation Fund keeps west-to-east cash transfer, aims to step up scrutiny. Available online: http://carbonpulse.com/7409/

\(^{106}\) NRDC, Carbon Pollution Funds Poised to Deliver on Advancing Clean Energy in California. Available online: https://www.nrdc.org/Experts/Alex-Jackson/Carbon-pollution-funds-poised-to-deliver-on-advancing-clean-energy-california

\(^{107}\) Ibid.

\(^{108}\) NRDC, Carbon Pollution Funds Poised to Deliver on Advancing Clean Energy in California. Available online: https://www.nrdc.org/Experts/Alex-Jackson/Carbon-pollution-funds-poised-to-deliver-on-advancing-clean-energy-california

\(^{109}\) Ibid.

\(^{110}\) For example, programmable thermostats, LED bulbs, irrigation controllers, smart plugs or water-saving shower heads. There is a small file meant to give some advice to households what to buy and what kind of savings to expect from those upgrades. Available online: www.energyupgradeca.org/~/media/energy-upgrade/files/Climate%20Credit%20V2.pdf?la=en

\(^{111}\) Energy Upgrade California, What is the California Climate Credit? Available online: http://energyupgradeca.org/en/learn/energy-impact-on-our-climate/what-is-california-climate-credit


\(^{113}\) California Public Utilities Commission, California Climate Credit. Available online: http://www.cpuc.ca.gov/climatecredit/
The rate is subject to change and is calculated according to set rules by the California Public Utilities Commission. The program will continue until at least 2020\textsuperscript{113}.

For small businesses, different rules apply. The Small Business Climate Credit is available to any commercial, industrial or agricultural customer normally using less than 20 kW of maximum power a month; their monthly energy consumption may not have exceeded 20 kW more than three times in the preceding year. The credit is usually applied to small businesses’ utility bills monthly. Like the household credit, the amount of money that small enterprises receive is dependent on the businesses’ utility providers. In contrast to the household credit, small business credit pay-out is also dependent on electricity consumption\textsuperscript{114}.

Numerous sectors in industry can receive California Industry Assistance Credit, this also serves to prevent carbon leakage. Those facilities that already are covered by the Cal CTP due to their size and activity are automatically eligible. Many facilities however, first have to claim eligibility through an application (e.g. if they emit less than 10,000 tCO\textsubscript{2e} per year). Most facilities have to reclaim eligibility annually and some may be subjected to audits. The money is paid out once per year. The amount is dependent on efficiency benchmarks (thereby rewarding early action) and the amount of electricity consumed\textsuperscript{115}.

**Align the cap-setting in the ETS with the projected outcome of renewable policies**

The emissions reductions stimulated by the technology support measures that are kept, or more in general the overall impact of the policy mix for the power sector need to be taken into account in the cap setting process. This is similar to the EU ETS, where the Renewable Energy Directive was taken into account. If policies that reduce emissions such as renewable energy policies (and energy efficiency, as discussed in the previous section), are not taken into account in the cap, negative interactions such as market oversupply and uncertainty on price levels may result.

### 3.3.3 Voluntary emission reduction offset market

Most voluntary emission reduction (VER) projects registered in Turkey are renewable energy projects. If the credits generated from these projects are eligible for use in an ETS, there is a risk that emissions reductions in the power sector will be double counted. To avoid double counting, the existing VER system in Turkey needs to be adjusted with the phase in of an ETS. Based on the background provided in Section 2.5, it can be recommended, in line with existing voluntary carbon standards, not to allow new voluntary projects in sectors that are also covered by the ETS to rule out such double counting. For existing projects that continue to generate voluntary emission credits in sectors covered by the Turkish ETS, a transitionary solution can be found by reducing the cap with equivalent amount of credits generated by this projects. This can be achieved by defining a dedicated reserve that reduces the amount of allowances available for allocation for fossil power plants. This is an approach used in JI projects in Eastern Europe (see Section 2.5 for further details).

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\textsuperscript{113} Energy Upgrade California, Climate Credit Frequently Asked Questions for California Households.


\textsuperscript{115} Energy Upgrade California, CA Industry Assistance Credit for Industrial Businesses. Available online: http://energyupgradeca.org/en/see-whats-new-and-fun/faqs/CA-Industry-Assistant-Credit-FAQs
The Member States that continue issuing ERUs from JI projects did so out of a specific reserve within the allocation plan that was fed by a deduction of (free) allocation to the power sector, thereby avoiding the double counting of the emission reductions. A similar approach could be followed by Turkey.

3.4 Conclusions - a policy road map for Turkey by minimizing possible conflicts and maximizing possible synergies

Policy theory indicates that a cost-effective policy mix for a country aiming to bring down emissions consists of an ETS or other carbon pricing policy as the core tool to achieve cost-effective mitigation. This core policy should be supported by policies to unlock the often cost-effective energy potential that is not necessarily sensitive to price signals. Also technology support policies can be justified to bring down the costs of abatement technologies that are needed for long term mitigation. In addition, policies targeting emissions sources not covered by the carbon pricing policy are needed.

In addition, other supplementary policies may be justified to support other policy goals such as energy security and a diversified energy mix. Based on an analysis of the current and planned policies in Turkey, we arrive at the conclusion that with the introduction of an ETS, there are three policy areas that need attention in order to let the ETS function as a tool to arrive at a cost-effective mitigation for Turkey:

- Several policies/policy targets exist in Turkey to stimulate electricity efficiency in e.g. buildings, transport and industry. While such policies are key in a cost-effective policy mix to ensure this often cost-effective potential is unlocked, they potentially overlap with an ETS by reducing electricity demand and thus production. It is suggested to re-consider specific technology standards or sub-sector targets on energy efficiency for those sectors that will be covered by the ETS, to focus energy efficiency policies on removing non-financial barriers towards the uptake of energy efficiency measures and on sectors not in the ETS and to align the cap-setting in the ETS with the projected outcome of the energy efficiency policies.

- In addition, policies exist to stimulate the uptake of certain technologies for electricity production in Turkey, in the form of feed-in tariffs and other support policies. To some extent such policies can be justified as technology support policies to bring down the costs of these technologies. We suggest, however, not to adopt specific technology-by-technology targets electricity production once an ETS is introduced and to carefully assess which levels of support are needed for certain technologies balancing the various policy objectives. A special category are policies that actively targets the increase of the use of coal for power generation and the use of natural gas and oil extraction. Although it can be expected that the use of fossil fuels will for the time being continue to increase given Turkey’s rapid economic growth, it needs careful consideration to on the one hand introduce a policy mix that makes fossil fuel use more expensive as compared to alternative non-fossil use (the ETS) while on the other hand reducing the costs of fossil fuel use by stimulating its use. In the considerations on the right policy mix for the power sector, also the degree of liberalisation of the power sector and the impact an ETS and other policies have on the electricity prices need to be taken into account. As with the energy efficiency policies, the likely impact of such policies needs to be taken into account in setting the cap. Transitionary measures such as those used in the EU ETS for the power sector in Eastern Europe can help to ease the transition.
• With the switch from an off-set market (where reduction projects result in credits used by others to compensate emissions) to a cap and trade system (where emissions are directly capped), a solution need to be found for off-set projects in the voluntary market in Turkey that impact emissions that are under the cap. This is the case for many of the voluntary off-set projects in Turkey in the renewable electricity sector. It is vital to address this possible double-counting by explicitly reducing the cap for each voluntary credit issued from existing projects and by not allowing new voluntary projects in sectors that are also under the ETS, in line with the applicable off-set standards.

We suggest making the alignment of the ETS with the existing policy package in Turkey an explicit part of the roadmap towards the phase in of an ETS in Turkey.
4 Legal and institutional basis for an ETS in Turkey

A well-functioning ETS is embedded in a strong legal and institutional basis. In this chapter we zoom in on possible legal options to establish an ETS in Turkey and on the institutions that could play a role in implementing and operating an ETS in Turkey. As an important example and reference case for Turkey, this chapter first analyses the legal and institutional basis of the EU ETS at the EU and Member State level. In addition, case studies for Korea and California are discussed (Section 4.1). This chapter then examines current legislation in Turkey that is of relevance in relation to a possible legal structure of an ETS in Turkey and key institutions that can play a role in the implementation of an ETS in Turkey (Section 4.2). This is followed by a gap analysis, where required legislation and institutional roles are compared to existing legislation and institutions (Section 4.3). This then results in recommendations for the possible institutional and legal set-up for an ETS in Turkey (Section 4.4). In summary, this chapter tries to answer the following questions:

1. What is the legal and institutional structure of the EU ETS and other ETSs in operation globally?
2. What legislation and which institutions can be identified in Turkey that could play a role in setting a good legislative and institutional basis for an ETS in Turkey?
3. Where are the institutional and legal gaps in Turkey related to the structure needed to implement an ETS?
4. What are the options to fill the gaps?

4.1 Legal and institutional structure of existing ETSs

4.1.1 EU ETS legislative structure

The EU Emissions Trading System is one of the cornerstone policies of the EU’s climate change strategy. The EU ETS is an environmental law at the EU level. This implies decisions on the EU ETS are made the EU rather than the Member State level. Member State have some flexibility in the way the EU ETS is implemented in their country. As a result, different institutional structures can be witnessed at the Member State level. The following sections first describe the EU ETS’ legal and institutional structure on EU level.

Then, legal and institutional design will be described using the examples of Germany and Poland. These country examples where chosen because both countries have a population comparable to Turkey, and a similar economic structure. The two countries also have clearly different administrative and political structures allowing to compare possible options for the implementation of an ETS. Poland furthermore has an income level per capita comparable to Turkey, a central government structure comparable to Turkey’s and it relies, as Turkey heavily on coal for its energy system.

The EU ETS finds its basis in the Kyoto Protocol (1997) linked to the United Nations Framework Convention for Climate Change (UNFCCC). With this Protocol, legally-binding GHG emission reduction targets, had been set for the EU and following this, “in March 2000 the European Commission
presented a green paper on “Greenhouse gas emissions trading within the European Union” with some first ideas on the designs of the EU ETS”.

“This led to the adoption of the EU ETS Directive in 2003 and the introduction of the EU ETS in 2005\textsuperscript{116}. Details on the various design elements of the EU ETS is provided in Chapter 2. The EU ETS is built on several pieces of European legislation but the main primary legislation is the “Emission Trading Directive” that was originally adopted in 2003\textsuperscript{117}. The legal framework is complemented by secondary legislations and some relevant non-ETS legislations.

Table 31: Legislative structure of the EU ETS

<table>
<thead>
<tr>
<th>Main Legislation</th>
<th>Secondary Legislations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions Trading Directive</td>
<td>Regulating the main principles, rules and the core of the market.</td>
</tr>
<tr>
<td><strong>Secondary Legislations</strong></td>
<td></td>
</tr>
<tr>
<td>The Monitoring and Reporting Regulation (MRR)</td>
<td>Detailing rules regarding monitoring procedures and requirements</td>
</tr>
<tr>
<td>The Accreditation and Verification Regulation (AVR)</td>
<td>Instituting the third-party verification system for auditing emission reports</td>
</tr>
<tr>
<td>The Registry Regulation</td>
<td>Detailing the functioning of the Union registry</td>
</tr>
<tr>
<td>The Auctioning Regulation</td>
<td>Detailing the process, the timing and administration of allowance auctions</td>
</tr>
<tr>
<td>The Decision on Harmonized Allocation Rules</td>
<td>Setting the rules of free allocation to installations</td>
</tr>
<tr>
<td>Regulations on the Qualitative Criteria and Quantitative Limits for the Use of International Credits</td>
<td>Regulating the offset rules</td>
</tr>
<tr>
<td>Certain provisions of the Markets in Financial Instruments Directive (MiFID)</td>
<td>Regulating the functioning of the market</td>
</tr>
<tr>
<td>Market Abuse Directive (MAD)</td>
<td>Regulating the functioning of the market</td>
</tr>
</tbody>
</table>

Primary legislation
As mentioned above the main legislation about EU ETS is the **EU ETS Directive** originally adopted in 2003 as Directive 2003/87/EC, containing the following main elements:

- Subject matter, scope and definitions (Article 1 to 3);
- Greenhouse gas emission permits (Article 4 to 8);
- Allocation and issue of allowances (Article 9 to 11);
- Transfer, surrender and cancellation of allowances (Article 12);
- Monitoring, reporting and verification (Article 14, 15, 21);
- Penalties (Article 16);
- Opt-in and opt-out (Article 24 and 27).

The EU ETS Directive has been subject to amendments a few times over the years (Figure 20).

Figure 20: Revisions on the EU ETS Directive

With Directive 2004/101/EC the EU ETS was linked to the Kyoto Protocol’s Flexible Mechanisms, the Joint Implementation and the Clean Development Mechanisms including provisions:

- Allowing operators to use credits from the project-based mechanisms (CERs and ERUs) to comply with their obligations under the EU ETS; and
- Specifying additional criteria to be applied when approving and authorizing participation in the project mechanisms under the Kyoto Protocol.

With Directive 2008/101/EC\(^ {118} \) the scope of the EU ETS was extended to include the aviation sector. In December 2008, the 2020 Climate and Energy Package was agreed by the European Council and the European Parliament. The resulted in revisions to the EU ETS to make it fit for its third trading

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period (2013-2020). The revised Directive 2009/29/EC\textsuperscript{119} accommodates the introduction of a centralized, EU-wide cap on emissions for Phase III, which will decline over time, delivering an overall reduction of 21\% below 2005 verified emissions by 2020. It also includes provisions for the introduction of new sectors and gases, and harmonized rules on free allocation with a move toward greater auctioning of allowances. These rules are designed to ensure a more EU harmonized approach to implementation of the EU ETS.

Currently, revisions to the EU ETS to make it fit for the fourth trading phase (2021-2030) are being discussed. The European Commission proposed a revised EU ETS Directive\textsuperscript{120} in July 2015 which is currently going through the legislative process. Key elements include changes to bring the cap of the EU ETS in line with the 40\% EU target for 2030, better targeted carbon leakage and allocation rules, and the establishment of an innovation and modernisation fund.

The EU ETS Directive regulates the main principles and rules of the EU ETS such as the scope, the cap-setting, the allowance allocation, the approach towards MRVA, the registry, sanctions, and offset rules. The EU ETS Directive is complemented by secondary legislation that form the basis for the detailed implementation of the EU ETS. Below the most important secondary legislation is discussed.

**Secondary Legislations**

Accurate monitoring, reporting and verification (MRV) as well as appropriate Accreditation of verifiers is necessary for a well-functioning ETS (Section 2.8). For this purpose, following the revision of the EU ETS Directive in 2009, updated rules for monitoring and reporting have been adopted in the **Monitoring and Reporting Regulation\textsuperscript{121}** to improve and harmonize the MRV requirements in Phase III of the EU ETS (2013-2020). Together with a new **Regulation for Verification of Emissions and Accreditation of Verifiers\textsuperscript{122}** which lays down provisions for the verification of reports submitted pursuant to ETS Directive and for the accreditation and supervision of verifiers, the MRR replaces the Monitoring and Reporting Guidelines (the MRG). Compared to the MRG the MRR clarifies areas of confusion, includes requirements to encourage greater consistency, efficiency and fairness, includes simplifications to improve cost-effectiveness, reduces duplication and clearly identifies responsibilities. The Accreditation and Verification Regulation also specifies provisions for the mutual recognition of verifiers and peer evaluation of national accreditation bodies.

For the efficient functioning of the EU ETS, another important element is the registry which records emission allowances and the various transactions concerning these including the surrendering of allowances for compliance. The details the EU ETS registry are regulated in the **Regulation establishing a EU registry\textsuperscript{123}**.


\textsuperscript{120} See https://ec.europa.eu/clima/policies/ets/revision/index_en.htm


Following the revision of the ETS Directive in 2009, EU ETS transactions were in 2012 centralized in a single EU registry operated by the European Commission and this Regulation lays down general, operational and maintenance requirements concerning the Union Registry for the trading period commencing on 1 January 2013 and subsequent periods. This Regulation also provides for a communication system between the Union Registry and the international transaction log where e.g. CDM and JI credits are registered.

Auctioning is the default method of allocating allowances within the EU ETS. The auctioning of allowances is governed by the Auctioning regulation\(^{124}\). This Regulation covers the timing, administration and other aspects of auctioning to ensure it is conducted in an open, transparent, harmonized and non-discriminatory manner. The regulation seeks to put into practice a number of criteria which the revised EU ETS Directive states auctions must meet, such as predictability, cost-efficiency, fair access to auctions and simultaneous access to relevant information for all operators.

**The Decision on Harmonized Allocation Rules\(^{125}\)** lays down the rules for the harmonized free allocation of emission allowances under from 2013 onwards. This decision applies to the free allocation of emission allowances in phase III of the EU ETS (2013-2020).

**Other relevant legislation not directly linked to the EU ETS Directive**

It is also important to note that EU also changed some non-ETS legislation to ensure a proper functioning of the EU ETS carbon market. For instance, as the emissions allowances became tradable assets and this trade also involved often complex products, financial regulations were altered to include carbon market transactions as briefly touched upon in Section 2.8.2.

For example, the **Markets in Financial Instruments Directive\(^{126}\)** (known as "MiFID") came into force in November 2007 which was subsequently amended with Directive 2008/10/EC. It was intended to enhance investor protection, improve cross-border market access and promote competition in the financial markets across the EU. The European Commission has proposed that MiFID be amended and recast in two separate pieces of new legislation: a second MiFID ("MiFID II") and a Regulation ("MiFIR"). The directive and regulation include fewer exemptions and expand the scope of the original MiFID to cover a larger group of companies and financial products. Both MiFID II and MiFIR are set to take effect in January 2018. The **Market Abuse Directive (MAD)\(^{127}\)** came into force in January 2003, aiming to harmonize national laws prohibiting the misuse of inside information (sometimes referred to as "insider trading") and market manipulation. Similar to MiFID, the European Commission has proposed that MAD be amended and recast in two separate pieces of legislation: a Regulation ("MAR") and a Directive on Criminal Sanctions for Market Abuse ("CSMAD") that apply as of July 2016.


Together, MAR and CS MAD are known as MAD II. As part of the general need to strengthen market oversight of financial markets due to the financial crisis, also allowances in the EU ETS will be treated as financial instruments even within the spot market as of 2018 and are regulated by the financial sector regulations mentioned above. However, trading activities of operators covered by ETS serving their compliance needs are not subject of financial market regulations in order to avoid putting a too high burden on operators with rules targeting the financial sector. Reference is made once more to the overview paper by the International Carbon Action Partnership that provides more info on this issue\textsuperscript{128}.

4.1.2 Implementation of the EU ETS in Germany and Poland

The implementation of the EU ETS differs between Member States. As explained, Germany and Poland are used as case studies to highlight key implementation options. It should be noted that this section will not treat all design elements of the EU ETS. This is, because for most design elements like the cap-setting or the scope, there are no differences among member states because they are determined and fixed on EU level and/or do not require Member State implementation. The following issues will be discussed:

1. The process the transpose the EU directives into national law.
2. The institutional body used to implement the EU ETS.
3. The organization of the MRV system.
4. The system to enforce compliance and impose sanctions.
5. Registry and auction platforms.

Transposing the EU ETS Directive into national law

Germany:
The main legislation for emissions trading in Germany is the Greenhouse Gas Emissions Allowance Trading Act (Treibhausgas-Emissionshandelsgesetz, TEHG) of 2004. This law is complemented with other provisions such as the Allocation Regulation (which regulates the free allocation of allowances), the Project Mechanisms Act (on JI and CDM, implementing the EU Linking Directive), the Emissions Trading Auctioning Regulation (determining the competent authority (CA) and procedures for auctioning) and the Data Collection Ordinance (regulating collection of emissions trading related data)\textsuperscript{129}.

While the aforementioned package of regulations constitutes the (necessary) national implementation of the EU ETS directive, another regulatory field plays an important role in the overall legal infrastructure of the ETS in Germany: The national air pollution control laws/regulations (national implementation of the EU industrial Emissions Directive), which inter alia set the rules for industrial installations to achieve the necessary permit to operate. Within these rules, a clear understanding of installation boundaries has developed, both on the operators’ and the local authorities’ side. The German GHG Emissions Allowance Trading Act (TEHG) refers to this established system of installation boundaries, rather than inventing new rules and especially new definitions on installation boundaries.


\textsuperscript{129} For a list of legislation in Germany, please see: DEHSt. Available online: https://www.dehst.de/EN/Emissions-Trading/Legislation/Germany/Germany_node.html
The existing air pollution regulation has been amended so that the installation permits include a reference to the emission trading scheme – an installation permit can now be rejected or revoked if the installation fails to comply with its obligations under the EU ETS. Granting installation permits is in the responsibility of authorities on provincial (“Bundesland”) level. This competency derives from the split of responsibilities as defined in the German constitution in general and specifically within the Federal Emission Control Act\(^\text{130}\) (BImSchG) where provincial level authorities are tasked with the control of installations. With the introduction of legislation covering GHG emissions the controlling function has equally been assigned to these provincial authorities. These authorities have a better knowledge of the local situation and better possibilities for on-site visits and checks than the central authority (DEHSt, see below) which oversees the ETS in Germany.

**Poland:**

In Poland, the Emissions Trading Act (ETA) of 2004 created the overall framework for emissions trading in Poland with its procedures and administrative structures. It regulated, scope, permit procedure, allowance issuing, the responsibilities of the competent authority and transfer of allowances. There were two sub-systems established: a national ETS which covers GHGs and other pollutants (NOx, SO2 and dust)\(^\text{131}\) and the EU ETS which only covers GHGs. The ETA was replaced in 2011 by the ETS Act, which continued to regulate the scheme. There has been criticism that the ETS Act provides an incomplete transposition of the EU directive only, e.g. principles concerning auctioning were not transposed and not implemented. This meant that additional interpretations, negotiations and cooperation were necessary between the EU and the Polish government were needed in order to clarify the situation. Gaps like these could harm the implementation of the EU ETS and have a negative impact on the predictability, reliability and functioning of the system. The Emission Management Act of 2009 transposes the Linking Directive, therefore it is the basis for CDM, JI and GIS\(^\text{132}\).

**The institutional body used to implement the EU ETS**

**Germany:**

In Germany, the national competent authority is the German Emissions Trading Authority (Deutsche Emissionshandelsstelle, DEHSt). It was set up within the framework of the Federal Environment Agency (Umweltbundesamt, UBA). It has around 150 employees. The following figure shows the hierarchical position of the DEHSt under the administrative structure of the Germany.

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\(^{130}\) BImSchG full text (German): [https://www.gesetze-im-internet.de/bimschg/index.html](https://www.gesetze-im-internet.de/bimschg/index.html)


\(^{132}\) Verschuuren, Jonathan; Fleurke, Floor (2014): Report on the implementation of the EU ETS on Member State level, pp. 50-53.
"The DEHSt at the German Environment Agency is the competent national authority to implement the market instruments of the Kyoto Protocol". The DEHSt coordinates and informs the other authorities involved on federal and provincial (Bundesland, comparable to the individual states in the USA) level. It also supports verifying bodies and are the Designated National Authority for CDM projects and the Designated Focal Point for JI projects. The DEHSt plays a crucial role in monitoring and compliance as it is also responsible for approving monitoring plans and issuing monitoring approvals and after checking whether installations comply with the monitoring rules. About 40-50 inspectors at DEHSt are concerned with inspecting compliance (supervising verifiers’ work as well as own in-depth reviews of monitoring plans and emission reports delivered by operators).

The DEHSt is divided into two departments with separate areas of expertise (Figure 22). One department focuses on industry, emission reduction projects, customer support and legal issues, the other department specializes in the energy sector, economic aspects of emissions trading, registries and information technology.

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133 https://www.dehst.de/EN/Servicesites/About-Us/about-us_node.html
134 Ibid, p. 29.
Figure 22: Organizational Structure of the DEHSt
In Germany, GHG emissions permits are issued and enforced by provincial authorities for industrial emissions. The same authorities also issue general environmental permits. They undertake inspections, but not with a focus on GHG but rather on environmental issues caused by other industrial emissions.

It is further worth mentioning that “much of the cost of administrating the system in Germany is covered through revenues from auctioning of allowances”\textsuperscript{135}. Finally, it is good to mention that in Germany, there also is a working group on emissions trading which was established during the early planning process for the EU ETS (2001). This working group for stakeholder consultation composes of the representatives of the covered entities, trade associations, environmental NGOs, trade unions, political parties, federal states and agencies. “The group is supported by financing from both the Ministry for the Environment and contributing companies”\textsuperscript{136}.

**Poland:**
In Poland, in contrast to Germany, several authorities are charged with the enforcement of the EU ETS. The Ministry of Environment is the main supervisor and transposes and implements the EU directives. The National Centre for Emissions Management (KOBIZE) is the central competent authority, it oversees the issuance of allowances, assesses verified emission reports, maintains databases, collects data about the scheme and analyses it\textsuperscript{137}. It offers a helpdesk, workshops and prepares guidelines or translations of EU documents\textsuperscript{138}. KOBIZE also administers auctioning\textsuperscript{139}. But unlike the German DEHSt, the KOBIZE shares its status as competent authority with a range of other institutions. Provincial governors or marshals issue permits, approve monitoring plans and improvement reports and decide about site visits. Free allocation is handled by the Council of Ministers. Regional Inspectorates of Environmental Protection (WIOS) estimate emissions and inspect and enforce compliance. The public is informed by KOBIZE, the Ministry of Environment and provincial governors/marshals\textsuperscript{140}.

More in general, it can be concluded that there is a large variance among EU Member States when it comes to competent authorities. While most countries have determined one focal authority, the number of additional institutions that are involved and carry competencies and responsibilities can be considerable. This number of additional institutions can be as high as fifteen (Belgium) or nine (Lithuania), with four to six being the average. Few countries only have one competent authority (e.g. Germany, Ireland, Denmark, Estonia)\textsuperscript{141}. Which design and division of competencies were chosen in each country can generally be explained by the respective country’s constitution and its administrative and political tradition. A more specific explanation on these choices would exceed the scope of this document, with little value added for the Turkish case, except for the lesson that new

\textsuperscript{136} Ibid., pp. 54f.
\textsuperscript{137} Ibid., p. 61.
\textsuperscript{138} Ibid., pp. 54f.
\textsuperscript{139} Ibid., p. 54f.
\textsuperscript{141} Ibid., p. 72.
institutions for a Turkish ETS should be tailored to the existing administrative corpus and Turkey’s governance structures.

**Organization of MRV systems**

**Germany:**
As highlighted above, in Germany, the monitoring plan must be submitted to the DEHSt. The plan is examined on compliance with the EU Monitoring Regulation and if it does not comply, the operator must remedy deficiencies within a specified time and submit a revised plan. There is ex-ante and ex-post control of the monitoring plan. Ex-ante approvals are mostly done electronically. Ex-post control is an ongoing process involving continuous measuring, new scales and other updates of the plans. In 2014, site visits were commenced and have been generating additional input. As far as verification is concerned, after the verifiers have done their work, the DEHSt checks the emissions report with e.g. automatic plausibility checks detecting e.g. unusual annual changes in emissions reported from an installation and delivering cases for closer inspections. As the EU ETS and its compliance cycle constitute a very complex system, the DEHSt tries to facilitate the process for the companies as much as possible by organizing conferences and regular mailing of information. The DEHSt also has established a helpdesk. The authority does not only enforce, but also deliver support.

**Poland:**
In the case of monitoring, the strong division of competencies among different institutions in Poland resulted in enforcement issues. Since it is up to each regional governor or marshal whether to hold an inspection before issuing a GHG emissions permit or not, control might be rather weak. Moreover, there is no direct link between these regional administrations and the monitoring and compliance systems of KOBIZE and WIOS. This has resulted in difficulties assessing installations and their eligibility for emissions permits. This shows that if a country chooses to distribute administrative and compliance tasks over several competent authorities instead of one or two, it is key to thoroughly link and coordinate their activities in order to ensure a strong exchange of information and proper functioning of the system. It shall be stressed that despite the shortcomings that were mentioned, the Polish implementation has still been considered to be functional and sufficient overall.

**Imposing Sanctions**
In general, sanctions are defined in the EU Directive. Operators who do not surrender sufficient allowances to cover their emissions in the preceding year must purchase allowances to make up for the shortfall and are “named and shamed” by having their names published. Additionally, these operators must pay a fine for each excess tonne of greenhouse gas emitted. In 2013, this fine was 100 Euro per tonne of CO₂ equivalent, rising annually in line with inflation. In addition, member states define and impose sanctions at their discretion.

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142 Verschuuren, Jonathan; Fleurke, Floor (2014): Report on the implementation of the EU ETS on Member State level, pp. 30f.
143 Ibid., p. 34.
Germany:
In Germany, the Emissions Trading Law implements the EU directive’s sanctioning scheme. There are automatic sanctions that are determined by the EU ETS directive for not surrendering enough allowances. In addition to that, Germany uses a number of tools in order to provide the legally well-functioning of the emissions trading system. Surrender obligation, publication in the Federal Gazette and account suspension may be listed as the main deterrent forces. The DEHSt publishes a journal in which, among other, companies that did not surrender enough allowances are listed. Moreover, the DEHSt can block access to installations’ accounts if they fail to surrender sufficient allowances. There are also (national) administrative sanctions if companies do not comply with rules set in the TEHG or other legal provisions, which can be as high as 500,000€ per individual infringement. There are also criminal sanctions for infringement of said laws or provisions of the criminal code. Noncompliance has been discovered either automatically by the DEHSt computer systems who will report any suspicious figures. DEHSt inspectors, too, discover cases via careful cross-checking of data.145

Poland:
In terms of sanctions, the Polish way of implementing the ETS Directive does not differ very much from the German one. Account blocking, “name and shame”, inspections and estimation of emissions as well as financial fines are available sanctions. Fines are determined by the ETS Act: Failure to submit a verified emissions report: 10,000€; failure to notify changes to the installation: 5,000€; running an installation without permit: 50,000€, failure to surrender a sufficient number of allowances by 30 April: 100 € per tCO$_2$e.146

Registry, and auction platforms
The EU ETS has a centralized “Union Registry” for all account holders and for all issued allowances since 2012 governed by the Registry Regulation discussed in the previous section. The union registry keeps track of the ownership of allowances and transactions. The Union registry covers all 31 countries participating in the EU ETS. The union registry is an online database for accounting transactions and account holders. The registry hold records of the main topics listed below;147:
- National implementation measures (a list of installations covered by the ETS Directive in each EU country and any free allocation to each of those installations in the period 2013-2020);
- Accounts of companies or individuals holding such allowances;
- Transfers of allowances (“transactions”) performed by account holders;
- Annual verified CO$_2$ emissions from installations and aircraft operators;
- Annual reconciliation of allowances and verified emissions, where each company must have surrendered enough allowances to cover all its verified emissions.

The auctioning regulations define the rules of auctioning platforms. With this regulation member states can give their rights of auctioning to a common platform. The Commission and 25 Member States authorized the European Energy Exchange (EEX) and its clearing system, the European Commodity Clearing (ECC) as common auction platform. Additionally, Member States have right to opt out of the common platform.

146 Ibid., pp. 60f.
147 http://ec.europa.eu/clima/policies/ets/registry/index_en.htm
Three member states; Germany, Poland and the United Kingdom, decided to have their own auctioning platform. Both Germany and Poland appointed EEX for their (national) auctioning platform. The revenues generated from auctioning are distributed to the member states according a general formula defining the single member states shares. This is not influenced by the auctioning platform used.

### 4.1.3 Legal and institutional structure of the Korean and Californian ETS

The California Cap and Trade Program is the second largest ETS in the world with regard to emissions covered. The Californian Cap and Trade Program’s legal basis is the California Global Warming Solutions Act of 2006 (AB 32). This law requires California to return to 1990 emission levels. The California Air Resources Board (CARB) is the equivalent of the national competent authority in EU MS and implements and enforces the ETS in California including the auctioning process. Capped entities must register at the CARB in order to participate in the allowance market. Even though the CARB is a sub-part of the Californian Environmental Protection Agency (Cal EPA), the CARB’s management of the ETS is autonomous and the Cal EPA has no influence on the ETS regulations.

In Korea, “A Framework Act on Low Carbon and Green Growth” was passed in December 2009, which provides the legal foundation for an emissions trading system along with other low-carbon policies including carbon disclosure requirements, carbon labelling, and increase of renewable energy use.”

“The Act on the Allocation and Trading of Greenhouse Gas Emission Permits (henceforth, the ETS Act) and its Enforcement Decree were legislated in 2012”. This ETS Act is accepted as the basic law for the Korean ETS. Although this Act is not specific on ETS policy design, it creates the legal infrastructure for specific ETS rules. The ETS Act not only provides a basic framework for trading of GHG emissions, but also “calls for preparing a basic plan every five years and an emission allocation plan at least six months before each five-year target period starts”. The competent authority is the Ministry of Environment. Another important institution is the Greenhouse Gas Inventory & Research Center (GIR), which provides research and data on GHG management and mitigation, manages the national GHG inventory MRV system and operates the National Greenhouse Gas Management System (NGMS). It therefore functions both as managing bureaucracy and think tank.

Prior to the introduction of the ETS, South Korea was already running the Target Monitoring Scheme (TMS), starting from 2010. Under this program, 470 entities (mostly power and industry) were required to report emissions and meet reduction targets (below BAU levels), however, there was no allowance trading involved. This mechanism has certainly been helpful in building up capacities and experience before the ETS commenced in industry and administration alike.

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154 About GIR. Available online: http://www.gir.go.kr/eng/index.do?menuId=5
Thus, South Korea has two mitigation systems in place, but the TMS now primarily targets installations and companies that are not covered by the ETS. This also includes public institutions like large offices, hospitals and universities. ETS and TMS alike are supervised by the Ministry of Environment. The Ministry of Trade, Industry and Energy, Ministry of Agriculture and Ministry of Land, Infrastructure and Transportation act as managing institutions besides the Ministry of Environment. They have the expertise to determine covered entities and set the targets for individual entities. It should be noted that this kind of arrangement, of course, may make communication and decision making among agencies difficult and lengthy.

4.1.4 Legal and institutional set-up: learnings for Turkey from international case studies

Several conclusions can be drawn from the legal and institutional structure of the EU ETS. In both Poland and Germany, existing administrative structures have been used when implementing the EU ETS. Building on such administrative structures can ease the implementation of the ETS and can ensure existing experiences with other legislation (e.g. on environmental permitting) are used to the extent possible.

The incomplete transposition of EU directives in Poland also holds a lesson for Turkey. While Turkey will, of course, not have to transpose any laws from a supranational instance, the case shows that there is a danger that incomplete regulation may be passed. Since this should be prevented, it is important that all intended design elements, procedures and responsibilities are clearly stated in the regulatory text.

Another institutional aspect of interest is that of the competent authority. The German example shows that a single competent authority can be very efficient. It is clear that the DEHSt is well-staffed and adequately funded. This is crucial, because a single competent authority might otherwise be overwhelmed by its various tasks. In case that the establishment of a well-staffed and well-funded single authority is for some reasons not politically feasible, a more decentralized approach as the one taken in Poland is an alternative. Many Member States have chosen an implementation approach that features several authorities involved in addition to a central competent authority. This is not per se an inferior approach, but it may be more challenging with regard to coordination and administration.

The Polish example shows that a decentral approach is more prone to coordination problems that might result in weaker control and lower administrative capacity. Efforts should thus be made to prevent such governance problems. The German example where local authorities play a minor role in issuing installation permits and undertaking on-site controls may be interesting for Turkey because it allows for better control under the condition that local or regional authorities (e.g. departments in general administration, environmental agencies etc.) have the required capacities for such competencies.

Sanctions in Germany and Poland are very similar as they mainly based on European Law. They show what kind of non-compliance can occur and at what level differentiated penalties can be set. Penalties should be set at a level where they have a deterring effect so that covered entities will be urged to

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155 Republic of Korea Ministry of Environment, Greenhouse Gas Target Management System. Available online: http://eng.me.go.kr/eng/web/index.do?menuId=207&findDepth=1
comply. It might be sensible to view penalties in other laws in Turkey and to set penalties at a comparable level. It is also advisable to include a naming-and-shaming approach that discloses noncompliant companies to the public. Taking into account Turkish cultural traditions, “naming and shaming” should be very deterring and effective as well. This also requires the public to be aware of climate change and climate policy so that disclosed noncompliance will resonate as it should. If that is provided, a company that pays attention to its reputation will strive to comply with an ETS regulation.

Also the Californian and South Korean examples contain experiences that can be used by Turkey. The competent authority in California, the CARB, is part of the Environmental Protection Agency, but wields autonomous agency. A similar arrangement under the Turkish Ministry of Environment and Urbanisation might be conceivable, too. This would concentrate knowledge, administrative capacity and responsibility in one institution instead of dispersing it on different ones. For that same reason, Turkey may also want to consider giving to the competent authority the competence to hold auctions as it is the case in California.

The Korean example shows that having a “leaner” system (here: TMS) prior to introducing a full ETS can be helpful in building capacity and fostering familiarity in industry and business. After the ETS had been introduced in South Korea, the TMS continued having a purpose as it regulates entities and facilities outside the ETS. However, it should be noted that running two systems in parallel also increases administrative complexity and may lead to confusion. It also means that more administrative resources are likely to be required. For Turkey, the Korean example suggests that a pilot ETS can also serve the purpose to build capacity and introduce industry to the concept of emissions trading. If a full ETS is built in Turkey, it will be advisable to transfer as much from the pilot system and not to build a new system in parallel.

A last learning point is that in all jurisdictions studied, primary legislation was adopted as the legal basis for the ETS.

4.2 Legislative and institutional basis for developing an ETS in Turkey

4.2.1 Existing legislation in Turkey with relevance to a possible ETS

As discussed in Chapter 3.2.3, the National Climate Change Action Plan (NCCAP) adopted in 2011 is the first official document that refers directly to the establishment of a carbon market in Turkey. It refers to the development of a legal and institutional structure for a national ETS. The NCCAP thus paves the way for the further institutional and legal preparation of an ETS in Turkey. To keep this momentum, it is important that future updates of the NCCAP as well the National Climate Change Strategy Document (NCCS) also discussed in Section 3.2.3 continue to mention carbon markets as one of the possible policy instruments for climate change mitigation and embed a future ETS in Turkey’s overall climate change mitigation ambition as outlines in its INDC.

In Turkey’s legislative hierarchy, laws precede regulations which in turn are higher in legislative hierarchy as compared to communiqués. Based on the policy overview provided in Chapter 3.2, several existing policies can be identified that have a direct relevance to a possible ETS in Turkey (Table 32).
Table 32: Existing legislation in Turkey with direct relevance to a possible ETS in Turkey

<table>
<thead>
<tr>
<th>Type of the Legislation</th>
<th>Main Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acts</td>
<td>Environmental Law</td>
</tr>
<tr>
<td>Regulations</td>
<td>Regulation on Monitoring of Greenhouse Gas Emissions</td>
</tr>
<tr>
<td>Communiqués</td>
<td>- Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions</td>
</tr>
<tr>
<td></td>
<td>- Communiqué on Verification of the Greenhouse Gas Emissions Reports and Authorisation of Verifying Institutions</td>
</tr>
<tr>
<td></td>
<td>- Communiqué on Voluntary Carbon Market Project Registry</td>
</tr>
</tbody>
</table>

Article 3(h) of the Environment Law directly refers "carbon trading mechanism" and accepts "utilization of market-based mechanisms such as carbon trading" as one of the targeted general principle regarding environmental protection and preventing environmental pollution as stated in the Chapter 3. A question is thus whether new legislation establishing an ETS in Turkey could be legislation under the current Environmental law or, alternatively, whether such legislation should be established as new primary law. This is an important choice, that will be further discussion as part of the recommendations for the legal set-up of an ETS in Turkey.

In Turkey, the Regulation on Monitoring of Greenhouse Emissions regulates the principles and procedures for monitoring and reporting of obligations of the facilities under its scope. Principles and procedures for the monitoring and reporting obligations of the facilities and authorization of the verification institutions are further elaborated by means of Communiqué on Monitoring and Reporting of Greenhouse Emission. Further, the Communiqué on Verification of the Greenhouse Gas Emissions Reports and Authorization of Verifying Institutions regulates procedures and principals related to verification of greenhouse emission reports, qualification requirements for verification institutions/enterprises, evaluation of the verification applications, liabilities of the verification institutions/enterprises and auditing of verification institutions. The regulation and communiqués are currently rooted in the Environmental Law. With the adoption of new legislation establishing an ETS in Turkey, this regulation should be transposed to the new ETS legislation. The scope and coverage of the MRV regulation in Turkey can play an important role in setting the scope of an ETS.

Communiqué on Voluntary Carbon Market Project Registry regulates the procedures and principles for recording voluntary carbon market projects in Turkey. It finds its legal basis in the Environmental law. Elements from this communiqué could potentially be used in the development of secondary legislation for establishing an ETS registry in Turkey.

Section 4.1.1 also briefly touched on financial market regulations that are in the EU ETS now also partly applicable to the trade in emission allowances. Depending on the design of a possible ETS in Turkey, financial market regulations are thus important to consider as well, especially if advanced financial products such as derivatives would be allowed on the market. Within this context, the Capital Markets Law is worth mentioning. Although, there is no direct reference to carbon markets or an ETS in the current legal text, the law states that capital markets instruments, precious metals, precious stones, and other contracts, papers and values that are approved by Capital Market Board will be traded under exchanges established under Borsa İstanbul A.Ş. (İstanbul Exchange Corporation)". This provision under the Capital Markets Law can be a starting point for a future emission allowance exchange structure. Given that the Capital Markets Law defines and regulates capital market instruments, it is also important legislation to consider in the decision making about
the legal nature of emission allowances (i.e. as financial instruments or not). A decision on this will among other depend on the type and nature of emission allowance products that will be allowed in the Turkish ETS.

A final piece of legislation worth mentioning is the electricity Market Law, especially, Article 11 of the Electricity Market Law which refers to the Energy Markets Management Corporation (EPIAS) as the institution to be in charge of the management of energy trading markets should be stated here. Paragraph (8) of Article 11 states that matters relating to "emission trading activities shall be regulated by the energy market regulatory authority (EMRA) with the consultation of the Ministry of Energy and Natural Resources and Capital Market Board". This law thus foresees thus a regulatory role for EMRA in overseeing emissions trading activities.

4.2.2 Relevant institutional structures in Turkey for the set-up of an ETS

The Ministry of Environment and Urbanization (MoEU) is in the "Decrees Law on Organization and Functions of Ministry of Environment and Urbanization" mandated to "drafting legislations concerning environment and urbanization and auditing their implementation, making policies to prevent pollution and determining standards for the protection of the environment, audit and impact assessment of facilities which may create pollution by leaving waste to receiving environment, making policies regarding global climate change, making urbanization policies and auditing their implementation". Given this mandate, it seems appropriate that the MoEU is the coordinating ministry for the possible establishment of a national carbon market in Turkey. Also in other strategic documents, such as the Energy Efficiency Strategy Paper and the Istanbul International Finance Center Strategy and Action Plan (2009), the MoEU is referred to as the coordinating ministry for the carbon market.

In the context of national and international Climate Change policies of Turkey also the Climate Change and Air Management Coordination Board (CCAMCB) is worth mentioning. Its functioning and working procedure are described in the "Regulation on Working Procedures and Principles of the CCAMCB". The chairman of the Board is the Minister of Environment and Urbanization with board members being several ministries and other organizations.

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156 Source: Official Gazette Date: 4.7.2011 Numbered: 27984.
157 Published in the Official Gazette dated 25 February 2012 and numbered 28215
159 The Coordination Board on Climate Change (CBoCC) was established base on Prime Ministry Circular numbered 2001/2 under the Ministry of Environment and Forestry with the purpose of "taking necessary measures to prevent harmful effects of climate change, completing more productive studies, ensuring coordination and separation of duties among prove and public institutions & bodies, determination of domestic and foreign policy taking into considerations the conditions of Turkey on this issue". CBoCC, restructured with Circular Numbered 2010/18 and 2012/2. With Circular Numbered 2012/22 an "Air Emissions Coordination Board" was established. Then, as subjects of combating climate change and air emission management are interconnected it was decided to merge the two boards. The boards have been restructured, merged and by Prime Ministry Circular numbered 2013/11 which is published in the Official Gazette on the date of 7th October 2013 with number 28788 the name was modified into "Climate Change and Air Management Coordination Board (CCAMCB)"
160 The members of the Board are the Undersecretary of the Ministry of European Union, the Ministry of Science, Industry and Technology, the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Energy and Natural Resources, the Ministry of Food, Agriculture and Livestock, the Ministry of Interior, the Ministry of Development, the Ministry of Education, Ministry of Forest and Water Affairs, Ministry of Health, Ministry of Transportation, Maritime Affairs and Communication, the Undersecretariat of Treasury, Chairman of Turkish Union of Chambers and Commodity Exchanges (TOBB), General Secretary of Turkish Industry and Business Association (TÜSİAD), Independent Industrialists and Businessmen's Association (MÜSİAD).
The CCAMCB is responsible for coordination of the studies on determination of national and foreign policies and taking necessary measures for the purpose of combatting with climate change and prevention of air pollution. Each year at least once, the CCAMCB comes together with decisions taken by majority of participating member votes. The CCAMCB has study groups and coordinator institutions, shown in Figure 23, which are coordinated by the Coordinating Institution. Each study group comes together at least twice a year\textsuperscript{161}.

![CCAMCB Diagram]

**Figure 23:** Climate Change and Air Management Coordination Board Study Groups and Coordinator Institution

The CCAMCB is not a political decision making body. Nevertheless, given that all relevant ministries are represented in it, and given that the various working groups are well placed to the further preparation of an ETS in Turkey, it seems advisable to use the CCAMCB, mandated by a political decision, for further preparatory work towards a possible ETS introduction.

Following, the overview of ETS-relevant legislation in Section 4.2.1, other institutions with relevance to an ETS are the Capital Market Board, EMRA, EPİAŞ, Borsa İstanbul A.Ş. (Istanbul Exchange Corporation), and Takas Bank. The **Capital Markets Board of Turkey (CMB)** is the regulatory and supervisory authority in charge of the securities markets in Turkey. Empowered by the Capital Markets Law, the CMB has been making detailed regulations for organizing the markets and developing capital market instruments and institutions.

\textsuperscript{161}http://www.csb.gov.tr/db/iklim/webmenu/webmenu12632.pdf
The CMB can thus play an important role in developing relevant regulation regarding market aspects of the ETS (e.g. definition of trading products, legal nature of allowances, market access etc. Borsa İstanbul A.Ş. which is established Pursuant to article 138 of Capital Market Law serves as a securities exchange and brings together all the exchanges operating in the Turkish capital markets under a single roof. Borsa İstanbul A.Ş. is thus the relevant institution for the establishment of a carbon market exchange in Turkey. Takasbank, provides clearing, settlement and custody, central counterparty, and banking services to its members in Turkish capital markets and could play a role in developing banking services in relation to the carbon market. All these institutions function under the Ministry of Finance that should thus play a leading role in governing the financial aspects of the carbon market and the financial market oversight.

In order to perform the regulatory and supervisory functions in the energy markets, the Energy Market Regulatory Authority (EMRA) is the independent regulator, as to ensure the development of financially sound and transparent energy markets. Main objective and principal activity of the Energy Markets Management Corporation (EPİAŞ) which is established base on the Electricity Market Law is to “Plan, establish, develop and manage energy market”. Given that the Electricity Markets Law explicitly refers to these institutions in relation to emissions trading activities and in view of the relation between a possible ETS and a further liberation of the electricity market (as discussed in Section 3.3.2), it is essential that the possible introduction of a carbon market in Turkey is aligned with the functioning of the energy market.

4.3 Gap analysis

The analysis of international examples (Section 4.1) and the summary of existing legislation and institutions in Turkey with relevance to a possible ETS (Section 4.2) allows to do an analysis of legal and institutional gaps that need to be filled before an ETS can be introduced in Turkey. This gap analysis is presented in the section and form the basis for the recommendations given in the next section. For this gap analysis the EU ETS legislation and institutional set-up is used as basis and the required legislation and institutions are linked to the design elements of an ETS discussed in Chapter 2.

A legislative gap analysis is presented in Table 33.

<table>
<thead>
<tr>
<th>Design Parameter</th>
<th>Legislation in EU</th>
<th>Tasks of the Legislation</th>
<th>Equivalent legislation or gap in Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decide on the scope</td>
<td>Emissions Trading Directive</td>
<td>Definition of the scope and coverage of emission sources</td>
<td>No current legislation setting the scope of an ETS in Turkey, only general reference to emissions trading in Environmental Law. Scope and coverage of the &quot;Regulation on</td>
</tr>
</tbody>
</table>

162 Linking is not explicitly discussed, because there is no linking legislation in place in the EU ETS.
<table>
<thead>
<tr>
<th>Design Parameter</th>
<th>Legislation in EU</th>
<th>Tasks of the Legislation</th>
<th>Equivalent legislation or gap in Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring of Greenhouse Gas Emissions</td>
<td>Emissions Trading Directive</td>
<td>Cap is set in line with economy-wide targets for the EU in 2020 (phase III of the EU ETS) and 2030 (upcoming phase IV)</td>
<td>No current legislation defining a cap for an ETS in Turkey yet. INDC of Turkey gives emissions trajectory and target for Turkey till 2030. Cap setting should, after deciding on the scope of the ETS, be aligned with the targets of the INDC. Paris agreement foresees INDC renewal every five years, which could form the basis for defining the cap periods for a Turkish ETS (Chapter 5).</td>
</tr>
<tr>
<td>Set the cap</td>
<td>Emissions Trading Directive</td>
<td>Main principles of allowance allocation are defined in the ETS Directive, details in the secondary legislation.</td>
<td>No current legislation defining the distribution of allowances in an ETS in Turkey.</td>
</tr>
</tbody>
</table>
| Distribute the allowances | • Emissions Trading Directive  
• The Auctioning Regulation  
• The Decision on Harmonized Allocation Rules | Rules of usage CER, ERU and international credits are defined in the Directive. Specific issues like qualitative and quantitative limits are defined in the regulation. | The ”Communiqué on Voluntary Carbon Market Project Registry” establishes a registry for off-set projects, which could in the future be linked to the development of an ETS registry and to off-set rules in an ETS. |
| Consider the use of offsets | • Emissions Trading Directive  
• Regulations on the Qualitative Criteria and Quantitative Limits for the Use of International Credits. | Rules for banking and borrowing issues | No current legislation defining temporal flexibility for an ETS in Turkey. |
| Decide on temporal flexibility | Emissions Trading Directive | | |
| Address price predictability and cost containment | • Emissions Trading Directive  
• Decision on market stability reserve | Rules on the functioning of the market stability reserve | No current legislation on price predictability and cost containment for an ETS in Turkey. |
<table>
<thead>
<tr>
<th>Design Parameter</th>
<th>Legislation in EU</th>
<th>Tasks of the Legislation</th>
<th>Equivalent legislation or gap in Turkey</th>
</tr>
</thead>
</table>
| MRV compliance, sanctions and registry | • Emissions Trading Directive  
• The Monitoring and Reporting Regulation (MRR)  
• The Accreditation and Verification Regulation (AVR)  
• The Registry Regulation | Rules defining the MRVA and compliance cycle, definition of sanctions and rules on the EU ETS registry | MRV: Turkey has the Regulation on Monitoring of GHG emissions in place under the Environmental Law as well as communiqués on verification. This Regulation should be linked to an ETS, once an ETS is introduced. Sanctions: Sanction in Regulation on Monitoring of GHG emissions refer to general sanction article of the “Environmental law”. Registry: Turkey has registry where emissions under the Regulation on Monitoring of GHG emissions are registered and a registry for voluntary off-set projects. Both could form the basis for a full-functioning ETS registry. |
| Market rules | Provisions of the Markets in Financial Instruments Directive (MiFID)  
Market Abuse Directive (MAD) | Defines allowances in certain conditions as financial instruments regulated by these financial sector regulations mentioned | The Capital Markets Law and relevant secondary legislation could be adapted to cover also the carbon market. Capital Markets Law also establishes the Borsa İstanbul A.Ş that could be the basis for carbon exchange. |

The gap analysis reveals that the current Regulation on Monitoring of GHG emissions in Turkey and the related communiqués on the verification and accreditation provide a solid basis for the set-up of a **MRVA system** for a possible Turkish ETS to which they should then be linked. Depending on political decision regarding the scope, the Regulation could also be a basis for the **scope definition** of a Turkish ETS as well will show in Chapter 5. Furthermore, existing legislation for the financial sector (i.e. the Capital Markets Law) could play a role in defining certain **market oversight** rules related to allowances as financial, tradable products.

New legislation is needed, however, to set the **cap, distribute the allowances**, define the rules for **off-sets** and establish a **registry** as well as **mechanisms for temporal flexibility, price predictability** and **cost containment**.

It is essential to align the cap with economy-wide targets for Turkey as outlined in its INDC. Given that the Paris foresees INDC renewal every five years, this could form the basis for defining the cap periods for a Turkish ETS.
In terms of institutional gaps, it became clear from the previous section that the MoEU is, given its mandate best positioned to take a leading role in preparing new ETS legislation that would define the scope of the Turkish ETS, the cap and the rules for allowance allocation, off-sets, temporal flexibility, and price predictability. In the preparation, the MoEU could be supported in the preparation by the inter-ministerial CCAMCB.

For the implementation of the ETS, a new department or independent body could be established that takes on a role like the competent authorities have in the EU ETS. This body could function under the MoEU and would be responsible for the implementation of the allowance allocation, the MRVA system, and the functioning of the registry. This is the only institutional body needed for the functioning of the ETS that is really missing in the current institutional set-up. In the implementation, certain aspects related to market oversight and the trading of allowances and could be mandated to the Ministry of Finance, via the capital markets law to Borsa İstanbul A.Ş. (for the exchange) and the Takasbank for banking services in relation to the carbon market.

4.4 Conclusion - recommendation for a legal and institutional set-up of an ETS in Turkey

Based on the analysis of international case studies and the Turkish situation, it can be concluded that an ETS in Turkey can be seen as environmental policy under the mandate of the MoEU. The Environmental law directly refers to the "utilization of market-based mechanisms such as carbon trading". New rule making for establishing an ETS in Turkey (i.e. scope, cap setting and methods for allowance allocation) could thus potentially be secondary legislation (e.g. a regulation) under the current Environmental law. An advantage of this route could be a faster and less cumbersome decision making process. However, given the economy-wide consequences of emissions trading, the link to Turkey’s economy-wide climate change mitigation ambition and the complex character of emissions trading as policy instrument, we recommend establishing new primary legislation focused on the scope, cap-setting, allowance allocation and MRVA system and the registry, also establishing rules for on off-sets, temporal flexibility, cost containment and price predictability with certain of these elements being worked out in secondary legislation under the new law.

This new primary legislation should be closely aligned with Turkey’s economy-wise climate change ambition as laid down in the INDC and could potentially be part of a wider Climate Change law. Once a political decision for the preparation of this legislation is taken, The CCAMCB, as multi-ministerial body, could play an advisory role in the further preparation of the legislation by the MoEU. The law could also mandate the MoEU to establish a new department or independent body that could take on the role of competent authority, responsible for the actual implementation of the ETS. The current legislation around MRVA should be transposed to the new ETS legislation once adopted.

For certain market aspects of the ETS (e.g. the definition of trading products, the legal nature of allowances, market access, i.e. issues related to the secondary carbon market), the new law could refer to existing legislation under the ministry of finance, most notably the Capital Markets Law, e.g. for the establishment of a carbon market exchange under Borsa İstanbul A.Ş and for banking services that could be developed by e.g. the Takasbank.
If needed, existing primary or secondary legislation in these areas need to be amended with an introduction of an ETS. This will, among others depend on the type of trading products allowed on the market.

In view of the relation between a possible ETS and a further liberation of the electricity market (as discussed in Section 3.3.2), it is essential that the possible introduction of a carbon market in Turkey is aligned with the functioning of the energy market. As such, it is important that the establishment of the ETS is aligned with the Energy Market Regulatory Authority (EMRA) and the Energy Markets Management Corporation (EPİAŞ) which is established based on the Electricity Market Law especially since the Electricity Markets Law explicitly refers to these institutions in relation to emissions trading activities.
5 Options, guidance and action plan for an emissions trading pilot in Turkey

This chapter’s purpose is to draft an action plan which guides the responsible authority towards a pilot phase of a Turkish emission trading scheme. An action plan lists in an “as specific as possible” manner the necessary steps to end up with a desired outcome. To be able to do that, the desired outcome has to be defined and described first. More concretely, this implies the intended design of the Turkish ETS pilot has to be defined. Therefore, this chapter first defines a possible design of a pilot ETS in Turkey before providing an action plan to establish such a pilot. It addresses the following key question:

- Taking stock of international ETS design experiences (Chapter 2), the existing energy and climate change related policy mix and their possible interaction with an ETS (Chapter 3), and the current legislative and institutional framework in Turkey (Chapter 4) as well as the insights obtained from stakeholders while executing this project, what are the feasible design options for a pilot ETS in Turkey?
- What are important criteria to consider when evaluating these feasible design options for a pilot ETS in Turkey?
- Applying these criteria via a thorough evaluation, how could a possible pilot ETS in Turkey look like?
- What steps have to be taken to prepare such a pilot ETS in Turkey?

It should be stated upfront that this chapter is not based on a political decision to develop and launch an ETS in Turkey. It is not based on detailed analytical work or analysis, but should be seen as a description on how a pilot ETS in Turkey could possibly look like taking stock of the stakeholder consultation that took place in this project and using the project team’s expertise. It is intended to be the starting point of further discussions with relevant stakeholders. These further discussions are needed for all of the design elements discussed below.

The structure of the chapter follows the four questions raised above in a step-wise approach. In Chapter 5.1, for each of the design elements distinguished in Chapter 2, possible options for a Turkish pilot ETS are defined. Section 5.2 the discusses the criteria that can be used to assess the feasibility of these design options for an ETS pilot in Turkey. These criteria are applied in Section 5.3, resulting for each of the design element in a preferable option. Finally, in a fourth step, Section 5.4, an action plan is developed for the pilot ETS that emerged from the previous sections.

5.1 Design options

Based on the input received from participants in the stakeholder workshops organized in the context of this project, it was possible to develop first initial narratives on how a Turkish ETS pilot could look like. We developed these narratives taking into account also findings and conclusions from Chapter 3 and 4 as well as the own assessment of the project team.
The various options for each of the design elements can in principle be combined to form an ETS pilot for Turkey. The options demonstrated in this section are intended to be the basis for the discussion on most suitable choices of design options for a Turkish Pilot Scheme in the following sections. The advantages and disadvantages discussed focus on those issues deemed most relevant by the project team considering the Turkish circumstances and in view of a smooth potential later extension to a full ETS. For a complete overview and thorough understanding of the design elements and the options though, the reader is referred to Chapter 2 of this report.

The options presented hereunder will be evaluated in the following sections, resulting in recommendations and proposals on specific design elements as well as on the overall shape of a pilot ETS. In some cases, reference is made to issues and decisions on design elements that might be tackled at a later stage, i.e. beyond the scope of a pilot scheme. Those decisions might be taken in the course of a pilot phase before the full introduction of an ETS in Turkey.

5.1.1 Decide on the scope, starting year and length of a pilot ETS

A pilot ETS in Turkey should reasonably not start before at least three annual reporting cycles have been performed under the MRV scheme. This to ensure the necessary data are available and the MRV process is reliable and accurate enough to form the basis for an ETS. Notwithstanding the considerations on an ETS compliance period’s length under Chapter 2.6, a possible pilot phase should not be longer than two or maximum three years. This seems sufficiently long to allow sufficient learning to take place and is still short enough to avoid the lock-in of policies and decisions which prove not suitable or weaken Turkey’s attempts to reduce emissions. Another possible consideration for the timing of a pilot scheme is the synchronization of the later full ETS periods with the five-year compliance periods of the Paris Agreement. The start date of a pilot scheme is furthermore not only depending on the availability of necessary data, but more on the regulatory lead times. This second aspect will be taken up in the action plan and the accordant discussion of lead times later in this chapter.

For the scope of a pilot ETS, it seems reasonable to take the scope of the MRV regulation as basis. In doing so, the installation is the point of obligation with respect to the regulation of emissions, the annual reporting and the surrender of allowances. Taking the MRV scope as basis means that existing gaps within the MRV-scheme, as it is today, in particular on enforcement and clear definition of installation boundaries, would have to be addressed prior to the invention of a pilot ETS. Another conclusion from the already established orientation towards the EU ETS is that for the power sector, only the electricity generator is subject to reporting and compliance obligations under a future ETS in Turkey, rather than having also the electricity consumer surrendering allowances for emissions associated with electricity consumption (as is the case in the Chinese and Korean examples discussed in Section 2.2). This does also fit to the already advanced liberalisation of the electricity market specifically for large consumers. In terms of scope, three viable options can be distinguished.
### Table 34: Scope of a pilot ETS in Turkey - viable options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MRV scope</strong></td>
<td>- The pilot ETS mirrors 100% the MRV regulation in terms of sectoral scope and gases included.</td>
<td>- Would from the start mirror the EU ETS to facilitate possible future link. Provides clarity to the MRV regulated entities about the next steps (inclusion in the Turkish ETS pilot). Gives push to maturing MRV system for all installations under the MRV regulation as well as to close gaps within the authorities. Market scheme large enough to ensure liquidity and cost efficient allocation of abatement measures.</td>
</tr>
<tr>
<td><strong>Limited scope</strong></td>
<td>- The pilot ETS focuses on the electricity sector and a limited number of additional big emitters (e.g. cement, iron and steel, refineries) and includes CO₂ only. Another scope reduction could to cover only state-owned installations in a pilot phase.</td>
<td>- Limited scope facilitates easier introduction. Bigger emitters are more likely to comply fully with MRV regulation. Bigger emitters have more capacity to get ready for emissions trading. Limitation to state-owned plants would limit the regulatory efforts to implement the scheme.</td>
</tr>
<tr>
<td><strong>Extended scope</strong></td>
<td>- The pilot ETS mirrors the MRV regulation in terms of sectoral scope and gases included, and covers in addition aviation and road transport via an upstream point of obligation.</td>
<td>- Unclear status for MRV sectors not covered by the pilot ETS, will make it more difficult to enforce compliance of non-covered entities with MRV regulation, thus a potential barrier for wider scope later. Smaller scope might have negative effect on liquidity and price formation and also on learning effects.</td>
</tr>
</tbody>
</table>

#### 5.1.2 Set the cap

In Section 2.3, the design aspects related to the cap-setting process were described. The options presented in this section do not take up all combinations of design options which are theoretically possible. Rather, taking into account the conclusions from the discussions on policy interactions (Chapter 3), the legal and institutional framework (Chapter 4) and the discussions with stakeholders, the set of options presented hereunder is seen as a set of realistic and manageable options. The discussion of design options therefore starts by mentioning the assumptions and deliberations with respect to those design aspects of cap-setting that are not presented in the form of options.
• **Ambition level**
  The level of ambition can hardly be presented in the form of options. As described under Chapter 2.3, the definition of the ambition level requires detailed economic and political analyses, considering the definition and functioning of economy-wide targets, the expectations regarding economic development, the sector-specific costs for abatement and an overall balance of system costs and welfare. Determining the level and degree of ambition is therefore an exercise which goes beyond this study, not least because this is in essence a political decision. Nevertheless, a selection of potentially suitable starting points for the determination of the ambition level can be found also in this study, especially under the different national cross-cutting and sector-specific climate and energy-efficiency policies presented in Section 3.2. Another suitable starting point with immediate relevance is of course the Turkish INDC as discussed in Section 3.2.1. To inform the further cap-setting-options discussion, a possible reduction path for existing installations/production capacities is derived here from the INDC target. To achieve 21% reduction in 2030 compared to a BAU-scenario, starting from the emission inventory of 2012, an average annual emission intensity improvement of about 1.3% is necessary from 2012 over all sectors. Knowing that the exact value of such a factor needs more analysis, we apply this number of 1.3% in the presentation of cap-setting options as illustration. It is an example on how the top-down part of a possible hybrid cap-setting approach could be reasonably derived to be in line with economy-wide and internationally pledged targets.

• **Top-down versus bottom-up approach**
  The main reason for assuming that a bottom-up approach for the cap-setting – at least for the cap for existing installations/production capacities – is preferable under Turkish circumstances is the fact that Turkey still expects significant growth (very obvious in the INDC) and that as a result, projections are highly uncertain. Moreover, existing statistical data might not be consistent with the exact boundaries of a future ETS. Therefore, a bottom-up approach for setting the cap-level for existing installations combined with a certain mitigation pathway over the years (see ambition level) seems to best reflect the actual emission pattern of ETS sectors and a good starting point for the functioning of a new ETS market (i.e. also to provide for a certain scarcity in this market). Certainly, an additional budget has to be considered for new installations, capacity extensions and production growth, taking into account Turkish economic development targets as well as a possible increase of power production relying on domestic (fossil) fuels. This part is methodically differentiated from the budget for incumbents in the options presented hereunder.

• **Time period of cap**
  The length of the periods for which a cap and other design elements are determined has been already discussed in the previous section, where it was recommended to have a pilot period of 2 to 3 years.

Regarding a reserve for allocation to new entrants, capacity extensions and increased utilization levels of existing capacities, it is very difficult to derive a realistic size upfront before the trading phase starts, due the uncertainties regarding the future production levels and efficiency developments as well as possibly different developments between sectors. When evaluating the accordant options later it should be noted, that for the (short) period of a pilot scheme the by far largest part of emissions will be from already existing installations. Therefore, the approaches on how to tackle growth in defining a suitable reserve as part of the cap-setting are defined in a way that it reflects the strategic relevance of this issue specifically for Turkey but does limit the effort necessary.
We argue that the size of the reserve can be determined in a quite generous manner, e.g. on the basis of current growth forecast, or not be defined in absolute terms at all. In such cases, in order not to harm the environmental integrity of a pilot ETS, it is of specific importance to define strict and ambitious rules for additional allocations out of the reserve as well as reductions in allocations in case of declining capacity or production, also for the sake of delivering clear signals to the private sector that further growth must be as efficient as possible. Therefore, the options on cap-setting and allocation presented below show a strong interdependence.

The above considerations on cap-setting, including the methodical differentiation between the cap for existing installations and a reserve for new installations as well as for production and capacity growth would lead to the following formulae for deriving the cap:

**Part 1: Absolute cap for existing installations**

\[
Cap_{\text{Exist},y} = Em_{\text{hist}} \times (1 - 0.013)^y
\]

Where:
- \(Cap_{\text{Exist},y}\): Cap for existing installations in year \(y\) [tCO\(_2\)]
- \(y\): Year of the scheme, starting from 1
- \(Em_{\text{hist}}\): Historic emissions of all installations covered by the scheme, from a period of, e.g. three years

This formula represents the above-described bottom-up approach on the basis of the covered installations’ historic emissions with an ambition level of 1.3% abatement per year (starting from the first year of the scheme).

**Part 2: Fixed reserve**

\[
Cap_{\text{New},y} = Cap_{\text{New},y-1} + Cap_{\text{Exist},y} \times EGR_y
\]

Where:
- \(Cap_{\text{New},y}\): Reserve for new installations/capacity extensions in year \(y\).
- \(EGR_y\): Estimated industry-wide growth rate in year \(y\), based on common statistical/scientific economic growth rate forecasts.

This is a very simple example of how a reserve could be determined ex-ante. Any kind of more sophisticated estimations, e.g. differentiating growth rates by ETS sectors, are possible as well. Therefore, the formula above serves only for illustration.

Decisions on banking, borrowing and the introduction of price or market stabilisation measures in the ETS as well as on the use of offsets do correlate with the cap-setting question. Relevant interdependencies will be considered in the respective sections hereunder.

In terms of the cap-setting, we envision two viable options as presented below.
Table 35: Cap-setting for a Turkish pilot ETS - viable options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Absolute cap with fixed reserve</strong></td>
<td>Clear absolute cap for the pilot phase for existing installations. Simple formula to arrive at absolute cap. Accurate data mostly available (from MRV). Growth is reflected via the reserve.</td>
<td>Uncertainty in determining the new entrant reserve. Lack of sector specific detail risk for acceptability. Price prediction difficult to make due to fixed reserve. Certain technical complexities in the monitoring of and differentiation between capacity changes and changes in capacity utilization level.</td>
</tr>
<tr>
<td><strong>Absolute cap with dynamic provision for growth</strong></td>
<td>Simple formula to arrive at absolute cap for existing installations. Growth and developments in Turkish power market are reflected.</td>
<td>Rules for allocation from the growth reserve can become complex. Additional data need for existing installations (output data from historic reference period), when calculation of growth reserve is based on the relation of actual years’ production levels to historic production level. Required ex-post allocation and surrendering of allowances beyond the moment of reporting might need more time for the whole compliance cycle. Uncertainty for market participants on allocation limits trading in first year of the pilot. Lacking clarity ex-ante on size of overall cap can impede market functionalities like price finding. With this approach, the compliance with the INDC (or any sectoral share of the INDC) cannot be assured in terms of absolute emissions in case of stronger growth than expected.</td>
</tr>
</tbody>
</table>

In addition, fixed absolute reserve for new entrants and capacity additions. The size could be determined on the basis of assumptions regarding new capacities planned to become operational in course of the period of the pilot scheme, especially within the power sector and emission-intensive industry sectors. Formula as given in the running text.

Beyond that, dynamic reserve for new entrants, capacity additions and for production growth (beyond thresholds to be set, see allocation) in existing installations. Reserve will be determined ex post on the basis of actual allocation for growth.
5.1.3 Distribute the allowances

To test a suitable auction set-up, stimulate a good price discovery right from the start and create revenues to cover administrative expenses and to feed specific funds in Turkey, it is recommended to let auctioning of allowances be an integral part of the pilot ETS design from the beginning.

In terms of free allocation, the various options for free allocation as discussed under previous chapters are also open for Turkey. We see the following three options on allocation for an ETS pilot in Turkey, also reflecting the above presented cap-setting approaches.

**Table 36: Allowance allocation – viable options**

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current EU ETS approach</strong></td>
<td>Would from the start mirror the EU ETS to facilitate possible future link. Big auction share will facilitate price discovery. No windfall profits for the power sector. Will leave many installations with a shortage, supporting the sense of urgency with the participants right from the start.</td>
<td>Relatively high costs for many participants right from start (auctioning for power sector, higher electricity prices for industry). Likely opposition from sectors affected endangering acceptance. Significant data collection needed to set appropriate benchmarks. Technically complex approach to apply all benchmarks (e.g. the fall-back approaches for heat) in application for free allocation.</td>
</tr>
<tr>
<td><strong>Full auctioning</strong></td>
<td>Big auction share will facilitate price discovery. No windfall profits for the power sector. Will support the sense of urgency with the participants right from the start. Would give great push to Turkey’s climate change ambitions. No separate rules for new entrants needed.</td>
<td>Needs another cap definition, not based on the allocation process. Relatively high costs from many participants right from start. Likely opposition from sectors affected endangering acceptance. Risk of Carbon Leakage that needs to be balanced with other measures. Strong price increase for electricity possible. Rules for compensation need to be set, risks ending up in distribution battles as complex as in a system of free allocation. Difficult to make consistent with cap-setting approaches presented above, due to lacking ex-ante clarity on market size (supply side) and complex reporting needs.</td>
</tr>
</tbody>
</table>
### Options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grandfathering+</strong></td>
<td>Allocation for installations close to emission according actual production, therefore low absolute costs. Clear link to emission data collected in the MRV cycle. Strong emphasis on existing emission reduction targets. Auction share creates price signals, revenues and experiences. Will leave many installations with a small shortage, supporting the sense of urgency with the participants right from the start without creating too much economic burden. Combination of allocation principles maximizes learning effects. Might contribute to prepare later linking.</td>
<td>Grandfathering generally regarded as a sub-optimal allocation method. Separate rules for new entrants and production growth within installations needed. Separate rules needed for auctioning share and use of related revenues. Exact auctioning amount for new installations and growth (difference to benchmark) difficult to determine. No full reward for early action by installations. Might make specific rules necessary, e.g. different reduction factor if Early Action can be demonstrated. But these rules would further add to the complexity. Data collection on production activity data needed. Risk of windfall profits especially for electricity sector that needs to be mitigated within energy sector policies.</td>
</tr>
<tr>
<td><strong>Full benchmarking</strong></td>
<td>Full reward for Early Action. Auction share creates price signals, revenues and experiences. Will leave many installations with a more relevant shortage, supporting the sense of urgency with the participants right from the start. No different rules necessary for incumbents and new entrants. Might contribute to prepare later linking.</td>
<td>Additional data need: output-related data (i.e. production) from installations also for reference period; development of benchmarks. Higher costs for those installations that exceed the benchmark with their specific emission intensity. Separate rules needed for auctioning share and use of related revenues. Exact auctioning amount for new installations and growth (difference to benchmark) difficult to determine.</td>
</tr>
</tbody>
</table>

#### 5.1.4 Consider the use of offsets

Economy wide action is required in Turkey and Turkey would like to remain involved in international developments and markets, e.g. those mechanisms included in the Paris Agreement. These are arguments to facilitate the use of offsets, either domestic or international offsets in the ETS pilot.
At the same time, international experience with offsets in an ETS has not only been positive and allowing off-sets might add to the complexity of the pilot ETS.

As Turkey already has an existing voluntary market with many projects running, a pilot ETS would need to explicitly take a decision on these existing voluntary market projects in case domestic offsets would be allowed. In this respect, the following aspects are important.

The current schemes for rewarding emission reduction projects in Turkey with voluntary carbon credits (offsets) are governed by international standards (e.g. Gold Standard, VCS). The Turkish government has so far not established an own crediting scheme. The only official activity so far is the set-up of a project registry as discussed in Chapter 3. Issuance of carbon credits for existing offset projects in Turkey which are registered under these international standards is, unless provisions such as outlined below are taken, stopped the moment the emissions that are reduced by the project are also capped in another form. For instance, a renewable energy project cannot generate any further offsets as soon as power sector emissions are covered by a cap. This is part of the international standards’ rules to avoid double counting.

The only way for continued issuance of carbon credits is for the project owner to demonstrate that an amount of allowances equivalent to the claimed emission reductions is cancelled in the relevant national system.

In line with options discussed in Section 2.5, there are therefore the following options regarding these existing projects:

- **No further provisions resulting in no further offsets once an ETS is introduced:** In case no further provisions are established, the supply of offsets from Turkish emission reduction projects for the ETS is factually limited to those offsets which are generated before the start of the ETS (i.e. before the power sector’s emissions are capped). Since Gold Standard and VCS would not issue further credits for emission reductions claimed by the projects after the invention of a cap, such a limitation does even not have to be explicitly mentioned in the rules. Anyway, for being clear on eligibility rules for offsets, we would recommend to still include an accordant provision in the regulation, saying that only offsets that were generated before the start of the ETS are accepted for compliance in the ETS if this option would be chosen.

- **Provisions to reduce the cap with further offsets generated by existing projects:** offsets from existing projects are explicitly taken into account the cap-setting and an amount of emission allowances equal to the number of voluntary credits issued is cancelled in case voluntary emission reductions are used to avoid double counting of emission reductions.

Regarding new projects, in line with Section 2.5, it is recommended not to allow new projects in sectors that are also covered directly by an ETS or that are indirectly covered (e.g. renewable electricity project, being itself not in the ETS, but having an impact on emissions from fossil power generation that are in the ETS). For emission reductions outside the ETS, Turkey could continue using existing standards or develop an own project scheme for domestic offset projects. This would allow Turkey to govern the project scheme and with this better reflect own political priorities in the implementation of emission reduction measures outside the ETS.

We envision three options for the use of offsets in a Turkish pilot ETS.
<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>No offset use</td>
<td>Avoids complexity to set-up offset rules. Reduction is achieved fully within ETS sectors.</td>
<td>Limited flexibility for ETS participants. No prospect for link to non-ETS sectors or international offset market. Existing basic offset infrastructure and market in Turkey not used.</td>
</tr>
<tr>
<td>Domestic offset use</td>
<td>If designed well (to avoid double counting with reductions achieved within the Pilot ETS), could be made compatible with existing voluntary market set-up. Helps stimulate domestic actions also in non ETS sectors. Increases flexibility in meeting obligations. Can increase cost-efficiency of the scheme, further adding to minimize costs for industries and to avoid carbon leakage.</td>
<td>Requires clear rules to avoid double counting, in particular on renewable electricity. Adds to the complexity of the scheme. Pilot scheme too small to really incentivise new domestic offset programs. Offsets are one of the issues to be dealt with in case of linking.</td>
</tr>
<tr>
<td>Domestic and international offset use allowed (to a certain extent) building partially on existing voluntary market and international markets.</td>
<td>Keeps Turkey connected to international carbon market developments. Helps stimulate domestic actions also in non ETS sectors. Increases flexibility in meeting obligations. Can further increase cost-efficiency of the scheme.</td>
<td>Requires clear rules to avoid double counting as well. Adds to the complexity of the scheme. Limit for offset use must be defined, e.g. per installation covered. Uncertainty on domestic versus international abatement. International offset market developments very uncertain at the moment. International offsets delivered to Turkey makes Turkey a “buyer country” and weakens the market for domestic offsets. Offsets are one of the issues to be dealt with in case of linking.</td>
</tr>
</tbody>
</table>

5.1.5 Decide on temporal flexibility

There are two main temporal flexibilities for operator’s compliance that can be included or not within an ETS. The first is to allow banking and borrowing within a period, the second is to allow for banking between periods. Borrowing between periods usually is not allowed under an ETS scheme to avoid high compliance risks. Banking between periods sometimes is allowed for (e.g. EU 2nd to 3rd period), sometimes not, especially in the beginning (again e.g. EU 1st to 2nd period).
<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>No borrowing and banking at all.</td>
<td>Increases pressure on covered entities. No need for rules.</td>
<td>Limited flexibility for ETS participants, typical annual fluctuations cannot be treated without banking and borrowing. Weakens economic advantages of an ETS in general and brings it closer to a command-and-control approach. Might harm fungibility of allowances within the market. No real reason visible not to allow this.</td>
</tr>
<tr>
<td>Borrowing and banking only within the pilot period.</td>
<td>Increases flexibility in meeting obligations. Can increase cost-efficiency of the scheme, further adding to minimize costs for industries and to avoid carbon leakage. Does not harm the environmental integrity of a Pilot scheme.</td>
<td>Requires according functionalities under a registry. Adds some complexity to the scheme. Some operators might tend to use borrowing extensively risking their compliance at the end of the period. Makes sanctions more important.</td>
</tr>
<tr>
<td>Borrowing and banking within the pilot period and banking beyond the period.</td>
<td>Increases flexibility in meeting obligations. Can increase cost-efficiency of the scheme, further adding to minimize costs for industries and to avoid carbon leakage.</td>
<td>Requires according functionalities under a registry. Adds some complexity to the scheme. Some operators might tend to use borrowing extensively risking their compliance at the end of the period. Risk of harming the environmental integrity of a scheme following the pilot scheme, if allocation rules to single operators of installations are too generous under the pilot scheme. Might also cause problems for later linking.</td>
</tr>
<tr>
<td>Banking only (no borrowing).</td>
<td>Certain flexibility by allowing installations to save allowances for later sale or surrender, reflects ownership of results from abatement measures. Avoids compliance risks at the end of a period due to extensive borrowing.</td>
<td>Limited flexibility for ETS participants, typical annual fluctuations cannot be treated with borrowing from the following year's free allocation.</td>
</tr>
</tbody>
</table>

### 5.1.6 Address price predictability and cost containment

A market approach such as an ETS always is related with issues regarding predictability of prices, be it driven by ETS participants’ fears that the price might be too high or by authorities that prices might be too low for incentivizing emission reductions or ensuring suitable revenues from auctioning. As shown in previous sections many options exist and are used around the globe to tackle this.
In order not to overburden a pilot scheme with additional complex regulations but nevertheless to address this issue, we envision as pragmatic and simple options as possible as presented below.

### Table 39: Price control – viable options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>No price control</td>
<td>Easiest solution. Minimum interventions - maximum market.</td>
<td>Risk of high volatility. Might harm acceptance. No instruments to correct market in case other design-elements are not working well (especially the cap-setting)</td>
</tr>
<tr>
<td>Price corridor</td>
<td>Clear price corridor. Technically easy to implement.</td>
<td>Harms the efficiency of an ETS, especially if corridor is very narrow. Hard political struggle on suitable price levels. Effect on actual market prices might be very limited, due to the small share auctioning has in the overall volume of allowances in circulation.</td>
</tr>
<tr>
<td>MSR (EU approach)</td>
<td>Might contribute to prepare later linking. Does not affect the efficiency of an ETS and its real reduction cost detection function.</td>
<td>Adds to the complexity of the pilot scheme. Instrument more suitable for more matured markets.</td>
</tr>
<tr>
<td>Price triggered supply side measures</td>
<td>Might contribute to prepare later linking. Gives strong role for authorities without harming reliability of the market as rules are transparent. Does not affect the efficiency of an ETS and its real reduction cost detection function.</td>
<td>Limits predictability for market participants, in particular if decisions of authorities are not basing on transparent rules. Price levels have to be set and responsibilities for governmental decisions and activities.</td>
</tr>
</tbody>
</table>

#### 5.1.7 Ensure oversight and compliance

As becomes apparent from Section 2.8, this design element is actually a package of quite different design aspects. Not all of them are of relevance when it comes to the discussion of strategic options for the overall design of a pilot ETS, as briefly explained here:

- **Entity subject to the (pilot) ETS, compliance cycle**
  With respect to the definition of the legal subject and compliance, various pre-requisites are already set by the existing MRV-scheme (e.g. installations as the point of obligation, annual reporting and verification, rules for verifiers and their accreditation). Therefore, no further options in this respect are discussed here.

- **Registry**
  The necessity of a registry for the management of accounts where allowances are held and for the tracking of compliance seems to be self-evident. The efforts will lie in the legal and technical implementation, where significant decisions will need to be taken (e.g. buying an
existing registry system/hardware/software versus own development, content/data/information to be publicly accessible). This will be addressed in the action plan.

- **Financial Market Oversight**

  On market oversight, it needs to be clear, which activities and functions are necessary, which is again depending on decisions on trading. Financial market rules play a role in ETS, but not necessarily in its design-phase. Trading products will develop over time, as will the rules that apply to them under financial market regulation. The definition of rules for new trading products/commodities is not an ETS-specific issue, but one where financial market experts can presumably draw on experience from many other historic cases where new products/intangibles were invented and traded between market participants.

The focus of this section lies on the question how the market itself should be developed in terms of trading products and market access, market oversight and enforcement, presented in respective table hereunder.

**Market access**

We distinguish the following three viable options for a Turkish pilot ETS:

**Table 40: Market access – viable options**

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full access for any natural or legal person</td>
<td>Would from the start mirror the EU ETS to facilitate possible future link. Broad market access facilitates price discovery and liquidity in the market. Broad market access stimulates broad mitigation action.</td>
<td>Broad access in combination with relatively small market increases likelihood market distortions/speculation. Rules and regulation more complex putting burden on institutional capacity in Turkey.</td>
</tr>
<tr>
<td>Access to plant operators (immediate ETS participants) only.</td>
<td>Simple market set-up in terms of design. Limits also need for market oversight. Reduces risk of speculation. Reflects relatively short pilot period.</td>
<td>Limited access might hamper liquidity in the market. Limited flexibility for especially large emitters. Might hamper later linking.</td>
</tr>
<tr>
<td>Access+ Access to plant operators plus actors from Turkish Financial market, e.g. banks.</td>
<td>Reduces risk of speculation assuming financial market actors are subject to general financial market oversight rules. Gives financial market a role e.g. on providing liquidity and enabling trades. Increase flexibility</td>
<td>Plant operators might fear speculation from financial sector General financial market oversight rules might need to be applied for the subject ETS as well.</td>
</tr>
</tbody>
</table>

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Trading products
Table 41: Trading products – viable options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide range of trading products including derivatives.</td>
<td>Market players can apply trading and hedging habits with other commodities.</td>
<td>Increased risk of misconduct and fraud.</td>
</tr>
<tr>
<td>Limitation to allowance trading (with spot or forward contracts), but no derivatives.</td>
<td>Reduces complexity and limits the need for market oversight. Reduces risk stemming from speculative trading. Fits to relatively short pilot period.</td>
<td>Limited flexibility for especially large emitters. Limited role for financial sector. No learning effects on use of derivatives.</td>
</tr>
</tbody>
</table>

Note: Not discussed under options, but important to consider in the implementation of trading are the treatment of revenues and costs for operators caused by the pilot ETS within taxation and treatment of allowances received or purchased within balance sheets of companies. Such aspects are rather not an inherent and specific problem of emission trading, but rather an exercise for finance and accounting specialists whenever new (valuable) products/commodities are becoming part of companies’ assets.

Trading forms
We distinguish the following two viable options for a Turkish pilot ETS:
Table 42: Trading forms - viable options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>All forms of trading allowed, including bilateral trade (including bilateral trades enabled by brokers or banks) as well as trading via the exchange</td>
<td>High degree of flexibility. Direct relations between operators can be used as well as existing market actors in financial markets.</td>
<td>Some risk of misconduct and fraud. Less transparent on price formation. Limited role of exchange.</td>
</tr>
<tr>
<td>Only trading via exchange (at least exchange cleared)</td>
<td>High transparency. Strong public oversight on exchange. Possibly advantageous for implementing price containment.</td>
<td>Limited flexibility. Possibly higher transaction costs (depending on e.g. fees of exchange). All actors (including financial market sector) must use exchange.</td>
</tr>
</tbody>
</table>

Compliance and enforcement
On compliance and enforcement, first of all compliance with the existing MRV regulation needs to be ensured. Furthermore, under an ETS compliance with the scheme, in particular surrendering of allowances (and offsets if allowed within the quota set) of an operator according the verified emissions have to be ensured. This raises the question of sanctioning non-compliance. Sanctions might include strict sanctions like additional surrendering of allowances and fines for non-compliance as well as smaller administrative fines for issues like misconduct in reporting obligations. In addition, public mentioning of compliance status might be included as a sanction, since for many (larger) companies such naming and shaming is perceived as very convincing.
Sanctions also might be differentiated in terms of time, e.g. starting with smaller fines and increase them in course of time or depending on repeated non-compliance of an operator.

Table 43: Enforcement – viable options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sanctions</td>
<td>Might ease introduction and acceptance of the ETS.</td>
<td>Risk related to environmental integrity. Risk for acceptance in the public as well as the private sector as equal treatment might not be ensured. Might lead to failure of the complete scheme.</td>
</tr>
<tr>
<td>Strict and differentiated sanctions from the beginning</td>
<td>Clearly shows political will to implement climate related policies. Strengthens credibility and seriousness of the scheme as well as the existing MRV-scheme. Delivers clear signals to operators to take ETS and climate policies in general serious and to take those into account for further business development. Strengthens role of authorities in charge. Usually seen as a must-component of an ETS to ensure proper functioning.</td>
<td>Definition of suitable sanctions and responsibilities necessary. Risk of legal disputes if sanctions imposed are challenged by operators. Might be criticised from private sector stakeholders.</td>
</tr>
<tr>
<td>Limited sanctions during the pilot, e.g. with possibility for corrections before being fined etc.</td>
<td>Same as above. Enables and supports learning and the character of a pilot scheme. Help authorities to improve their capacities as well before sanctioning.</td>
<td>Same as above. Might encourage some operators not to treat ETS seriously and to try to create undue advantages.</td>
</tr>
</tbody>
</table>

5.1.8 Consider linking

To link an ETS to other existing schemes, taking into account:
- The features of one`s own scheme;
- The features of the scheme to link with and
- International regulation to be developed under the framework of the Paris Agreement is a complex task, connected with a lot of negotiations that inter alia should also base on own real experiences with the instrument Emissions Trading.

As the Turkish Pilot scheme is not existing yet, own features and experiences cannot exist yet. Also the international framework – e.g. on accounting – under the Paris Agreement is not operationally established yet. Therefore, we recommend clearly not to link a Turkish Pilot scheme to another scheme, but to evaluate options on linking once the first experiences were made in Turkey. As a consequence, we do not consider linking options here explicitly but refer that evaluation to the Action Plan in course of the Pilot ETS. However, certain design options might make linking easier or more difficult. Wherever relevant for design of a Pilot, we therefore included this shortly in the sections with advantages and disadvantages above.
5.2 Criteria for the evaluation of design options

In the following section, the criteria given in Table 44 are used to assess the design element options as described in the previous section. The choice of criteria is based on the project team’s experience with ETS, also taken into account specific Turkish circumstances and needs in the context of a pilot phase, our observation of the previous discussion of design elements with stakeholders and the implicit criteria applied by stakeholders. They have been set in close consultation with the MoEU.

Table 44: Criteria for the evaluation of design options

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data availability</td>
<td>Is the necessary data and information available that is necessary to prepare and start the pilot ETS?</td>
</tr>
<tr>
<td>Manageability</td>
<td>Is the option manageable and feasible with limited resources? Extent to which existing institutions can be used to manage, oversee and run the pilot scheme. Effort for capacity building, training and set-up of technical and legal infrastructure.</td>
</tr>
<tr>
<td>Learning effects</td>
<td>For companies: does this option allow companies to learn, and get a routine in activities they will also need later, under the actual ETS? For the government: would the scheme under the chosen option deliver specific data and information that seems to be important or helpful for the preparation of further ETS phases beyond the pilot?</td>
</tr>
<tr>
<td>Fit with other design elements and policy instruments</td>
<td>Does an option hamper or support the progress/success of other design elements (as discussed in Chapter 2) and policy instruments (as discussed in Chapter 3)?</td>
</tr>
<tr>
<td>Acceptance by stakeholders/cost for operators</td>
<td>Would a design option face strong opposition from covered sectors or other stakeholders with legitimate interests? Installation operators’ perspective is the main factor here. Since acceptability by operators’ is deemed to mainly depend on expected additional costs, no separate criterion “costs for operators” is foreseen in the list of evaluation criteria, but this aspect is included here.</td>
</tr>
<tr>
<td>Environmental integrity</td>
<td>Will emission reductions (absolute or relative) be achieved? Are national strategies and pledges with respect to emission reductions/targets supported?</td>
</tr>
<tr>
<td>Linking perspective</td>
<td>Does the design option help the Turkish ETS to come closer to an overall ETS design which supports the possibilities to link with other schemes (esp. EU ETS)?</td>
</tr>
</tbody>
</table>
5.3 Evaluation of design options

The design options as described in Chapter 5.1 will be referred to by using a short version of their respective description. Please refer to 5.1 for further information on each option and a more general description of advantages and disadvantages of the various options. The evaluation is based on expert judgements by the project team without detailed analytical work or assessment and should be seen as a starting point for further discussion. In **bold**, the preferred option is given.

### 5.3.1 Decide on the scope

Table 45: Assessment of options for setting the scope

<table>
<thead>
<tr>
<th>Option</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data availability</td>
</tr>
<tr>
<td>Pilot ETS scope = MRV scheme scope</td>
<td>+</td>
</tr>
<tr>
<td>Limited scope: electricity sector and big emitters</td>
<td>+</td>
</tr>
<tr>
<td>Extended scope: MRV scheme plus aviation and road transport</td>
<td>-</td>
</tr>
</tbody>
</table>

The main reason for selecting the existing MRV scheme’s scope as the scope for a pilot ETS include the advantages already summarised in Section 5.1, like creating a large enough market to ensure liquidity ensure cost-efficient abatement over a large number of sources. The expectation that future phases of an ETS will most likely use the scope of the MRV regulation is an argument for choosing the MRV regulation as scope, given that it provides the possibility for all sectors to learn during the pilot phase. Also the perspective to link the scheme to other schemes in the future (most notably the EU ETS), speak for this variant. The possibility to significantly limit the regulatory and bureaucratic effort for the implementation of a pilot ETS by limiting the scope to state-owned power plants (mentioned as possible scope limitation in Section 5.1) could be further researched as well, but would make the scope of the pilot ETS fairly small.

### 5.3.2 Set the cap

Table 46: Assessment of options for setting the cap

<table>
<thead>
<tr>
<th>Option</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data availability</td>
</tr>
<tr>
<td>Absolute cap with fixed reserve</td>
<td>O</td>
</tr>
<tr>
<td>Absolute cap with dynamic provision for growth</td>
<td>O</td>
</tr>
</tbody>
</table>
The two options are only slightly different, with the second option being better when considering its near-term implementation. Since it leaves the determination of the part of the cap, out of which any production growth is served, to a later point in time (ex-post), more time is available for the determination of benchmarks, which are needed for the calculation of the cap for extensions/new entrants and increases in production levels (and for allocation, see below). It is not necessary to determine the exact amount of the reserve prior to the start of the trading scheme. However, existing data from the MRV scheme is not sufficient to set the basis for the dynamic growth provision. An additional data collection has to provide output-related data for the historic period that is also used to determine the emission level for the part of the cap which serves existing installations, so that the benchmarks can be applied for the allocation of additional capacity/production growth. This data collection needs to be done in course of the application process for allocation or with the first emission reports to be delivered at the latest (in order to enable ex-post adjustments for existing installations).

The second option allows for unlimited (emission) growth, which makes it probably more acceptable by industry, but not necessarily for policy makers and sectors not covered by the ETS. On the other hand, it should be noted that within a pilot phase, the by far largest proportion of allocation will be done on the basis of historic emissions and ex-post-adjustments potentially might also be done for cessations or lower production compared to the historic period, depending on the exact rule making. The second option has its drawbacks due to the fact that it ensures specific emission targets but does not set an absolute cap on emissions. Furthermore, it might need more administrative effort during the period.

In conclusion, we propose the second option as it saves time for starting with a pilot scheme and might have advantages in terms of acceptance by ETS participants.

5.3.3 Distribute the allowances

Table 47: Assessment of options for allowance allocation

<table>
<thead>
<tr>
<th>Option</th>
<th>Criteria</th>
<th>Data availability</th>
<th>Manageability</th>
<th>Learning effects</th>
<th>Fit</th>
<th>Acceptance</th>
<th>Environmental Integrity</th>
<th>Linking perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current EU ETS approach</td>
<td></td>
<td>-</td>
<td>O</td>
<td>O</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Full auctioning</td>
<td></td>
<td>+</td>
<td>+</td>
<td>O</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>O</td>
</tr>
<tr>
<td>Grandfathering+</td>
<td></td>
<td>-</td>
<td>O</td>
<td>+</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Full benchmarking</td>
<td></td>
<td>-</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

We deem all approaches which include the application of benchmarks as difficult for a pilot phase, since significant data are needed and the coordination is more complex. The grandfathering+ variant envisages benchmarks only for the allocation beyond existing capacities/current production levels, so that there is somewhat more time for the determination of suitable benchmarks. Different insights can be drawn from each option, but the grandfathering+ optimises learning given that different
allocation methods are combined. As argued in previous chapters, grandfathering tends to be the most acceptable form of allocation from the industry perspective and seems acceptable for a pilot ETS. The use of grandfathering in a pilot phase should go hand in hand though with the development of more advanced allocation methods for use beyond the pilot phase, given that grandfathering as allocation methodology cannot be sustained in following trading phases in order not interfere with the incentive to reduce emissions.

5.3.4 Consider the use of offsets

Table 48: Assessment of options for the use of offsets

<table>
<thead>
<tr>
<th>Option</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data availability</td>
</tr>
<tr>
<td>No offset use</td>
<td>O + - O + + -</td>
</tr>
<tr>
<td>Use of domestic offsets only</td>
<td>O O + + O O</td>
</tr>
<tr>
<td>Domestic and international offsets</td>
<td>O - + O O</td>
</tr>
</tbody>
</table>

Opening the ETS for international offsets already in the pilot phase does not seem to add any value to the overall design, also in view of the very uncertain outlook on new international offset mechanisms under the Paris Agreement. Arguments for the use of a domestic offset scheme are the involvement of non-ETS sectors in the pilot ETS as well as contributing to overall lower system costs and we recommend allowing the use of domestic offsets up to a certain % of the compliance obligation. The set-up of a new well-functioning domestic offset market focused takes considerable time and it is recommended to consider this further during the pilot phase for possible introduction beyond the pilot phase and use existing standards for the pilot phase.

Credits from existing projects in the voluntary market can be allowed into the pilot ETS. For existing projects under the voluntary programs that interfere with the scope of an ETS directly or indirectly, we envision to either not allow any further credits to be issued once the pilot ETS is introduced for those projects or, preferred, a provision in the pilot ETS rules to ensure that cap is reduced with an amount equivalent to the amount of voluntary credits issued and used for compliance. We further recommend not to allow new projects in sectors directly or indirectly covered by the ETS to ensure environmental integrity and not to make the system more complex than needed, although, in principle an approach similar to the existing projects can be envisioned (i.e. a correction to the cap). This means that new offset projects will only be allowed in sectors not covered by the ETS.
5.3.5 Decide on temporal flexibility

Table 49: Assessment of options for temporal flexibility

<table>
<thead>
<tr>
<th>Option</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data availability</td>
</tr>
<tr>
<td>No borrowing and banking</td>
<td>O</td>
</tr>
<tr>
<td>Banking and borrowing only within the pilot period</td>
<td>O</td>
</tr>
<tr>
<td>Borrowing within period, banking beyond</td>
<td>O</td>
</tr>
<tr>
<td>Banking only</td>
<td>O</td>
</tr>
</tbody>
</table>

In a pilot scheme’s context, allowing for banking and borrowing is perhaps not the most important design aspect. However, given that such kind of flexibility does not significantly add to the administrative efforts and might be important for operators especially in the beginning, the positive effects on learning and acceptance and a good fit with the general idea of a market based instrument encourage the possibility of borrowing and banking. Anyway, when stepping from a pilot scheme into the real ETS, policy makers should have the possibility to reset the entire market, so that banking and borrowing should be limited to the pilot phase itself.

5.3.6 Address price predictability and cost containment

Table 50: Assessment of options for market stabilisation

<table>
<thead>
<tr>
<th>Option</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data availability</td>
</tr>
<tr>
<td>No measures</td>
<td>+</td>
</tr>
<tr>
<td>Price corridor</td>
<td>-</td>
</tr>
<tr>
<td>MSR (EU approach)</td>
<td>-</td>
</tr>
<tr>
<td>Price triggered supply side measures</td>
<td>0</td>
</tr>
</tbody>
</table>

From the previous exchange with stakeholders, some kind of control over the price development seems to be favoured already in a pilot scheme. Of the presented options, the last one provides good manageability, transparency and a good fit, provided that price triggers are well-defined.
5.3.7 Ensure oversight and compliance

Market access

Table S1: Assessment of options for market access

<table>
<thead>
<tr>
<th>Option</th>
<th>Data availability</th>
<th>Manageability</th>
<th>Learning effects</th>
<th>Fit</th>
<th>Acceptance</th>
<th>Environmental Integrity</th>
<th>Linking perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full access to market</td>
<td>0</td>
<td>-</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Access limited to operators</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Access+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
</tbody>
</table>

In terms of manageability, when only operators are able to hold accounts for emission allowances, the need for additional regulation concerning trading products and financial market oversight will automatically decrease. However, it seems important that the financial market plays a role as well with a view to the future and to improve liquidity, flexibility and access for small actors (via their bank). Therefore at least some financial actors might be allowed as well, provided that provisions are taken to avoid speculative misconduct and fraud.

Trading forms

Table S2: Assessment of options for trading types

<table>
<thead>
<tr>
<th>Option</th>
<th>Data availability</th>
<th>Manageability</th>
<th>Learning effects</th>
<th>Fit</th>
<th>Acceptance</th>
<th>Environmental Integrity</th>
<th>Linking perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>All forms</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Exchange only</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The involvement of an exchange with experience in trading commodities (esp. energy market) seems to make sense for the performance of auctions. Using the same exchange also for the clearing and settlement of trades by operators (or their intermediaries, e.g. banks) could be beneficial due to synergies with the auctioning procedure. Limiting trading forms to one central exchange may help reduce risks of fraud and enhance transparency. In such a case, smooth and cheap access also for smaller companies to the trading system has to be assured.
Trading products

Table 53: Assessment of options for trading products

<table>
<thead>
<tr>
<th>Option</th>
<th>Data availability</th>
<th>Manageability</th>
<th>Learning effects</th>
<th>Fit</th>
<th>Acceptance</th>
<th>Environmental Integrity</th>
<th>Linking perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide range of trading products, including financial derivatives</td>
<td>O</td>
<td>-</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Only spot and forward contracts for emission allowances</td>
<td>O</td>
<td>+</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

In the context of a pilot scheme, certain restrictions for the financial markets to derive any possible products from the actual emission allowances seem to be justified in order to give the market the possibility to get used to the new possibility to trade emissions at all. Combined with the previously chosen limitation of market access to direct ETS participants and domestic financial market players under suitable rules, the limitation of trading products does also provide the better with the other design options. Obviously, the development of financial products such as options or other derivatives would in any case need some time, so that no significant activities on the supply side would be expected during the pilot ETS period. The same is valid for the demand side: justified need for derivatives would rather emerge if larger market participants implement significant hedging strategies – which is not expected to happen during a two- or three-year pilot scheme.

Enforcement

Table 54: Assessment of options on enforcement

<table>
<thead>
<tr>
<th>Option</th>
<th>Data availability</th>
<th>Manageability</th>
<th>Learning effects</th>
<th>Fit</th>
<th>Acceptance</th>
<th>Environmental Integrity</th>
<th>Linking perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sanctions</td>
<td>O</td>
<td>O</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Full sanctions</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>O</td>
</tr>
<tr>
<td>Limited sanctions</td>
<td>O</td>
<td>+</td>
<td>O</td>
<td>+</td>
<td>+</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Sanctions are an instrument for the authorities to keep control over a system. Therefore, sanctions can be seen as necessary to manage the overall system, even though the sanctioning scheme itself has to be managed as well. A system with limited sanctions seem to be the best way to keep control over compliance, but not stay in a realistic range in the context of a pilot phase.
5.3.8 Conclusion: possible design for an ETS pilot in Turkey

In Box 12, the possible design of an ETS in Turkey resulting from the evaluation of the design options above. The action plan drafted in the next section aims at establishing this pilot scheme.

Box 11: Possible design for an ETS pilot in Turkey

**Goal:**
The pilot ETS in Turkey aims to demonstrate to the suitability of a market based policy instrument to help achieving emission reductions compared to a business-as-usual scenario in a cost-effective manner. The pilot ETS design aims at making use of the experience gained in the MRV scheme, limit complexity and generate the knowledge that is necessary to design future phases of an ETS in Turkey.

**Design**
We recommend the Turkish pilot ETS to last for two or three years using the following design:

- **Scope:** Installations and gases covered by the pilot ETS shall be the same as in the already established MRV regulation.
- **Cap-setting:** The cap-setting process will be divided into a part serving the existing installations with their current production levels and another part reserved for growth, calculated ex-post on the basis of actual production growth and applicable benchmarks reflecting Turkish energy efficiency targets. This part of the cap is thus not quantified ex-ante. The first part, the cap for existing installations/production levels, is calculated on the basis of three years of historical emissions (as reported under the MRV regulation) and considers a certain path of specific emission reductions (e.g. a 1.3% reduction annually derived from the INDC), so that the pilot scheme is already characterized by an appropriate level of ambition. This is also needed to trigger trading.
- **Allowance allocation:** Grandfathering on the basis of three years of historical emissions (as reported under the MRV regulation, similar basis as for cap-setting) is used as the method applied for existing installations/production levels. A common reduction factor (to be determined) to be applied to the historic emission level shall reflect existing targets on e.g. energy efficiency and should lead to a certain level of shortage for most installations right from the start, also to trigger trading. The common reduction factor is stricter than the reduction path of the cap, so that a certain amount of emission allowances is available for auctioning. Production growth (including increases of activity levels of existing capacities, capacity extensions and new entrants) will get free allocation on the basis of benchmarks. In case of production decrease or (partial) cessation of operation, allocation is accordingly reduced. Whether or not to further reward early action by installations warrants a further discussion.
- **Use of offsets:** Domestic offsets from existing voluntary emission reduction projects registered under the Gold Standard will be allowed up to a certain % of the compliance obligation. For existing projects in sectors directly or indirectly (e.g. renewable electricity, impacting the generation of fossil electricity which is under the ETS) covered by the ETS, provisions need to be taken to avoid double counting. New projects will only be allowed in sectors not directly or indirectly covered by the ETS.
- **Temporal flexibility:** Banking and borrowing is allowed within the pilot phase.
- **Price predictability and cost containment:** Price triggered cost containment measures, triggering additional supply via auctions in case prices go beyond a certain limit.
- **Market access and trading:** Emission allowance accounts in the central registry can be opened and held by operators of installations covered by the pilot ETS as well as by domestic financial institutions. Only spot and forward trading of emission allowances allowed, no derivative products for the pilot phase, also limiting the need for changes to existing financial market rules, e.g. the Capital Market Law.
Allowances are solely traded via a dedicated central trading platform.  
- **Sanctions**: Sanctions applied to ensure compliance, but in limited form during the pilot phase.  
- **Linking**: No linking of the pilot ETS to any other emission trading schemes.

## 5.4 Action plan for the set-up of a pilot ETS in Turkey

The action plan drafted in this section aims at listing the activities and steps to be taken for the implementation of a pilot ETS scheme with the above derived design.

The action plan is the outcome of intensive discussion between the project team working on this assignment and took into account the input received in the workshops with relevant stakeholders and the MoEU. In view of the scope of this project, the initial list of actions listed below cannot be regarded as a complete list. The action plan shall rather be seen as a starting point before the work on a pilot ETS scheme is started and can and should be extended, and amended along the way, as necessary.

The introduction of a pilot ETS in Turkey is a highly political issue as the pilot ETS would establish a policy instrument as one of the core policy instruments to mitigate climate change. This has significant relevance also for other policies such as those addressing the power sector or industries. In terms of preparation, a sound preparation is in our view best warranted by a top level political decision confirming the political will to start an ETS in Turkey, followed by preparatory work to establish a new ETS law to set-up the scheme.

As outlined in Chapter 4, the mandate for these preparations should be with the MoEU, potentially supported by the CCAMCB and its working groups as consultation body. Furthermore, stakeholder consultation is key to ensure proper regulations within different governmental institutions and related responsibilities as well as acceptance and practical input from operators. In addition, other groups important for mid- and long-term political processes in Turkey or for specific design elements of an ETS should be represented as well. Those stakeholders might include e.g. political parties represented in the parliament, regional authorities, environmental NGOs or very specific groups such as institutions representing verifiers, financial sector and offset providers. A possible approach for Turkey might be, also based on the experiences gathered throughout the workshops within this project, to implement a Turkish Working Group on Emissions Trading, a format that has shown its value in some EU member states as well (UK and Germany, chaired by Environmental Ministry with Co-Chairs from other institutions).

These and further actions are presented in the action plan below. The action plan is presented with the help of tables. The first table gives an overview of the necessary actions to allow for a quick view on what has to be done in terms of:

- Preparatory analysis and the setting of parameters;
- Establishment of the necessary legislation and
- Operational activities for the implementation of the scheme.

The action steps themselves are again presented in tabular form so as to structure their brief description, an estimation of time need, responsibilities and possible support.
On purpose, no detailed time planning and order of the actions is defined here, given the draft and initial status of the defined actions. In the following concluding chapter, we provide some further insights on key assumptions, bottlenecks etc.
Table 55: Overview of action steps

<table>
<thead>
<tr>
<th>Category</th>
<th>Preparatory analysis, parameter setting</th>
<th>Set-up of rules</th>
<th>Implementation steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political decision and general preparatory activities</td>
<td>A.3: Modelling of pilot ETS</td>
<td>A.2: ETS law</td>
<td>A.1: Decision to proceed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A.4: Define stakeholder process</td>
</tr>
<tr>
<td>Administrative preparation</td>
<td></td>
<td></td>
<td>B.1: Set up of competent authority under the MoEU</td>
</tr>
<tr>
<td>Decide on the scope</td>
<td></td>
<td>C.1: Define rules on coverage</td>
<td>C.2: Establish list of installations</td>
</tr>
<tr>
<td>Set the cap</td>
<td>D.1: Determine historic emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D.2: Determine reduction factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribute allowances</td>
<td>E.1: Benchmark study</td>
<td>E.2: Allocation regulation</td>
<td>E.3: Implement the allowance allocation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E.4: Auction regulation</td>
<td>E.5: Set up auction platform</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E.6: Implement the auction process</td>
</tr>
<tr>
<td>Offset use</td>
<td>F.1: Supply side analysis</td>
<td>F.3: Offset regulation</td>
<td>F.4: Implement quota in registry</td>
</tr>
<tr>
<td></td>
<td>F.2: Preparatory technical analysis on technicalities of offset use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banking &amp; Borrowing</td>
<td></td>
<td></td>
<td>G.1: Implement B&amp;B in registry</td>
</tr>
<tr>
<td>Market stabilization</td>
<td>H.1: Define trigger prices for additional auctions</td>
<td></td>
<td>H.2: Monitor market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H.3: Implement additional auctions</td>
</tr>
<tr>
<td>Trading, Oversight and Compliance</td>
<td></td>
<td>I.1: Exchange trading terms</td>
<td>I.2: Set up trading</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I.4: Balancing and taxation</td>
<td>I.3: Monitor compliance</td>
</tr>
<tr>
<td>Registry</td>
<td></td>
<td>J.6: Terms for opening and holding accounts</td>
<td>J.1: Prepare tender</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J.2: Select IT service provider</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J.3: Plan implementation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J.4: Set up registry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J.5: Testing phase</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J.7: Create accounts</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 Decision to proceed</td>
<td>High level political decision on implementing a Pilot ETS including empowerment to develop regulatory framework as described below. Define structure for financing the administrative tasks.</td>
<td>Prime ministry’s office in consultation with MoEU and related ministries</td>
<td>Depends on political agenda</td>
</tr>
<tr>
<td>A.2 Pilot ETS law</td>
<td>ETS law which provides the basic rules for establishing a pilot ETS (called “pilot ETS law” in the following). Should include rules on cap-setting, scope, period, surrender of allowances, quota for offsets, banking &amp; borrowing, details of price triggered supply-side-measures (market stabilization), due dates and sanctioning scheme, lay the foundation for the set-up of new authorities and assign responsibilities to ministries and authorities, include references to existing regulations (MRV, Verification and Accreditation, Projects’ registry) and empower additional regulations (details of allocation, set-up and operation of registry, additional data collection, administration of auctions, use of revenues from auctions, provisions regarding eligibility of offsets).</td>
<td>MoEU</td>
<td>2 to 4 years, upon A.1</td>
</tr>
<tr>
<td>A.3 Modelling of pilot ETS</td>
<td>Quantitative modelling of a pilot ETS, considering all design aspects and different scenarios (e.g. regarding economic development), in order to test the assumptions and parameters on whether this would work. The modelling should also result in an auction factor to be applied to the allocation for existing installations (exact value of auction factor is basically a political decision; the modelling shall show whether a certain factor, e.g. 5%, would lead to a reasonable overall auction volume). Offset-quota should be tested and compared with offset supply.</td>
<td>MoEU</td>
<td>3-6 months</td>
</tr>
<tr>
<td>A.4 Define stakeholder process</td>
<td>Decide on formalization of stakeholder participation, format, chair, financing and participants.</td>
<td>MoEU</td>
<td>3-6 months</td>
</tr>
</tbody>
</table>
### Administration

Table 57: Summary of actions regarding the administration and implementation of an ETS in Turkey

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
</table>
| B.1         | **Set up competent authority (CA) under the MoEU**  
Define competent authority to oversee the pilot ETS, clarify structure, functions, roles and responsibilities, need for staff, staff acquisition and training, and financing. | MoEU | 6 months | Related ministries |

### Setting the scope

Table 58: Summary of actions regarding the scope of the ETS

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
</table>
| C.1         | **Define rules on coverage**  
Lay down unambiguous rules for coverage within Pilot ETS law. Create reference to coverage definition of Annex I of the Regulation on Monitoring of Greenhouse Gas Emissions, add clarifications where necessary (e.g. exact boundaries of an installation). | MoEU/CA | 2 months | (Legal) consultant, CA from other country, related ministries |
| C.2         | **Establish list of installations**  
In accordance with the rules on coverage, establish the exact list of existing installations to be covered by the pilot scheme. In case that there are still gaps in the enforcement of the MRV regulation at that time or the scope of installations differs from the MRV scheme’s scope due to specific/new definitions, another dedicated legal instrument (e.g. regulation/communiqué) might be needed with an obligation for the operators to notify the competent authority of their installations fulfilling the scope’s definitions, including all relevant data from the reference period. As part of the analysis identify installations that went into operation during or after the first year of the reference period, in order to determine the need for specific rules for calculating allocation for such plants. | MoEU/CA | 3-12 months (depending on the completeness of existing data) | Local authorities |
Set the cap

**Table 59: Summary of actions on cap-setting**

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.1 Determine historic emissions</td>
<td>MoEU/CA</td>
<td>2 months</td>
<td></td>
</tr>
<tr>
<td>With the help of the list of existing installations and their respective emissions throughout the reference period (recommended to be there years), calculate the starting point for the cap for existing installations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D.2 Determine reduction factor</td>
<td>MoEU/CA</td>
<td>6 months</td>
<td>Ministries that contributed to the INDC, research institute</td>
</tr>
<tr>
<td>Determine the reduction factor which shall be applicable to the cap for existing installations. The reduction factor shall basically reflect an ambitious path for existing installations to improve their emission intensity. The Turkish INDC and its underlying data/information could be a helpful source. Apply the reduction factor for every year from the middle of the reference period on to determine the annual cap for existing installations. The result is part of the Pilot ETS law.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Distribute allowances

**Table 60: Summary of actions on allowance allocation**

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.1 Benchmark study</td>
<td>MoEU</td>
<td>12 months</td>
<td>Research institute, consultant, related ministries</td>
</tr>
<tr>
<td>Initiate analysis of specific emissions (emissions per product) of installations covered by the pilot ETS. If possible, use data provided by installations under the MRV scheme (consider an additional data collection from installations, so that annual production quantities are available for every year where emissions are available). Order benchmarks for every relevant product by size and identify the values at the edge of the top 10, 15 or 20 percent specific emissions. Make the values available for policy decisions to be made for the allocation regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.2 Allocation regulation</td>
<td>MoEU</td>
<td>9 months</td>
<td>Related ministries,</td>
</tr>
<tr>
<td>The regulation supplements the pilot ETS law and defines the details of the allocation for existing installations and for growth (production growth in existing...</td>
<td></td>
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</tr>
<tr>
<td>Action item</td>
<td>Responsibility</td>
<td>Time need</td>
<td>Support</td>
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</tr>
<tr>
<td>installations, capacity additions, new entrants. Covers: calculation of allocation for existing plants (based on historic emissions), for installations commissioned since the beginning of the reference period and new installations/capacity extensions and production growth in existing installations, auctioning factor, benchmarks (or reference to a list of benchmarks to be amended later), rules for plant closures.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.3 Implement the allowance allocation Calculate initial allocation for every installation and issue emission allowances for the first year of the pilot scheme to the installations’ accounts in the registry.</td>
<td>CA</td>
<td>3 months</td>
<td>MoEU</td>
</tr>
<tr>
<td>E.4 Auction regulation The regulation supplements the pilot ETS law and defines the details of the auction process. The regulation can already state exact auction volumes for the pilot ETS, when it is established after the allocation regulation (since auction volumes can only stem from the share of allocation to existing installations held back for auctioning via the auctioning factor). Details on timing and technical specifications for operators to participate in auctions should be clarified. Defines use of revenues.</td>
<td>MoEU</td>
<td>6 months</td>
<td>CA, trading/auctioning platform and related ministries</td>
</tr>
<tr>
<td>E.5 Set up auction platform The institution in charge of performing the auctions in accordance with the pilot ETS law and the auction regulation, prepares the technical and organisational framework for performing auctions, including auction calendar, form of announcements, contracts, terms for participation in auctions (including possibilities for intermediaries to serve small companies) etc.</td>
<td>Auction platform operator</td>
<td>9 months</td>
<td>MoEU</td>
</tr>
<tr>
<td>E.6 Implement the auction process Perform first auction in accordance with the regulation’s auction calendar.</td>
<td>CA, auction platform operator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action item</td>
<td>Responsibility</td>
<td>Time need</td>
<td>Support</td>
</tr>
<tr>
<td>-------------</td>
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<td>---------</td>
</tr>
<tr>
<td><strong>F.1</strong> Supply side analysis on existing and new projects</td>
<td>MoEU</td>
<td>6 months</td>
<td>Research institute, consultant, certification standard organizations</td>
</tr>
<tr>
<td>Analyse the potential supply with offsets from existing emission reduction projects in Turkey. Establish data base with basic information of each project, certification standard, annual emission reductions, crediting period. Conclude, how many offsets per standard/year will approximately be available on the market from existing projects. Analyse potential supply from new projects outside the direct or indirect scope of a pilot ETS.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>F.2</strong> Preparatory technical analysis on technicalities of offset use</td>
<td>MoEU</td>
<td>6 months</td>
<td>Consultant, certification standards</td>
</tr>
<tr>
<td>Analyse different options for the actual procedure for operators to use offsets for compliance. Consider alternatives with and without transfer of actual offsets to the Turkish registry (option without transfer: acknowledge dedicated cancellation of offsets in the original offset registry).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F.3</strong> Offset regulation</td>
<td>MoEU</td>
<td>9 months</td>
<td>Related ministries, CA</td>
</tr>
<tr>
<td>Define regulation on the use of voluntary off-set credits from existing and new projects in the Turkish pilot ETS including provisions for the cancellation of an equivalent amount of allowances to avoid double counting for reductions that directly or indirectly influence emissions in ETS installations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F.4</strong> Implement interface and quota in registry</td>
<td>CA</td>
<td>4 months</td>
<td>IT service provider, certification standards</td>
</tr>
<tr>
<td>Implement any technical pre-requisites for the use of offsets and the monitoring of the individual use of the quota. Implement the technical solution for importing offsets into the registry or acknowledging cancellations in offset registries.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Banking & Borrowing

**Table 62: Summary of actions on banking and borrowing**

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.1 Implement banking and borrowing in registry</td>
<td>CA</td>
<td>3 months</td>
<td>IT service provider, MoEU</td>
</tr>
<tr>
<td>Set validity of allowances in a way that they can also be used for compliance in a later year (banking), make sure that issuance of allowances takes place well before due date for operators to surrender allowances and that there are no validity constraints, so that operators can use allowances issued for year x for compliance for year x-1.</td>
<td></td>
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</tbody>
</table>

### Market stabilisation

**Table 63: Summary of actions on market stabilisation**

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.1 Define trigger prices for additional auctions</td>
<td>MoEU</td>
<td>6 months</td>
<td>Research institute, consultant, related ministries</td>
</tr>
<tr>
<td>While the definition of price-limits to trigger supply-side measures is a political issue that could be based on preparatory analyses on abatement costs etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.2 Monitor market prices</td>
<td>CA</td>
<td></td>
<td>Trade exchange</td>
</tr>
<tr>
<td>Observe the reference price.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.3 Implement additional auctions</td>
<td>CA in consultation with MoEU</td>
<td>IT service provider</td>
<td></td>
</tr>
<tr>
<td>Determine whether the preconditions for supply-side measures is met and organize additional auctions.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Trading, oversight, compliance

**Table 64: Summary of actions on trading, oversight and compliance**

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I.1</strong> Exchange trading terms</td>
<td>Trading platform operator</td>
<td>6 months</td>
<td>MoEU, CA</td>
</tr>
<tr>
<td>Establish terms, rules and guidance for trading allowances via the exchange, addressing the internal structure and processes as well as the trading partners. For internal procedures, consider relevant laws and regulations and examples of similar trading products for a reliable and secure performance (e.g. procedures for clearing and settlement), clarify financing. For trading partners/counterparties, define requirements (e.g. participation in a training, need for collateral), clarify liabilities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I.2</strong> Set up trading</td>
<td>Trading platform operator</td>
<td>6 months</td>
<td>MoEU, CA, related ministries</td>
</tr>
<tr>
<td>Establish staff and technical capacities, training for participants, technical connection etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I.3</strong> Monitor compliance</td>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By the relevant due date, operators shall have surrendered allowances and offsets in their registry accounts. Compliance means that the overall number of allowances and offsets is at least equivalent to the amount of emissions according to the report, that surrender took place by the due date and that the offset quota is not exceeded.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I.4</strong> Balancing and taxation</td>
<td>Ministry of finance</td>
<td>6 months</td>
<td>Auditors’ association</td>
</tr>
<tr>
<td>From the beginning, companies should have clear guidance on how to value emission allowances in their balance sheets and how accordant profits and losses are considered for taxation. This can most likely be done by interpreting existing laws and regulations, but should be done in a manner that all involved parties (companies, auditors, financial administration) have the same view.</td>
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</tr>
</tbody>
</table>
## Registry

Table 65: Summary of actions on setting up a registry

<table>
<thead>
<tr>
<th>Action item</th>
<th>Responsibility</th>
<th>Time need</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.1 Prepare tender</td>
<td>MoEU/CA</td>
<td>3 months</td>
<td>Consultant, CA from other country, related ministries</td>
</tr>
<tr>
<td>J.2 Select IT service provider</td>
<td>MoEU/CA</td>
<td>3 months</td>
<td></td>
</tr>
<tr>
<td>J.3 Plan implementation</td>
<td>MoEU/CA</td>
<td>2 months</td>
<td></td>
</tr>
<tr>
<td>J.4 Set up registry</td>
<td>MoEU/CA and IT service provider</td>
<td>12 months</td>
<td>Consultant</td>
</tr>
<tr>
<td>J.5 Testing phase</td>
<td>MoEU/CA, IT service provider</td>
<td>6 months</td>
<td>Consultant, volunteering operators for testing</td>
</tr>
<tr>
<td>J.6 Terms for opening and holding accounts</td>
<td>MoEU/CA</td>
<td>6 months</td>
<td>(Legal) consultant</td>
</tr>
<tr>
<td>J.7 Create accounts</td>
<td>CA</td>
<td>4 months</td>
<td></td>
</tr>
</tbody>
</table>
6 Concluding remarks

The action plan as provided in Section 5.4 identifies multiple actions that could be taken to further develop and prepare an ETS in Turkey. A top level political decision confirming the political will to start an ETS in Turkey could be an important trigger to further catalyse these preparations. The mandate for these preparations should be with the MoEU. We grouped the preparatory activities into the following three clusters:

- Research, analysis and parameter-setting;
- Set-up of rules and regulation;
- Implementation/operation of the pilot ETS.

The first cluster includes tasks that set the quantitative basis for the design of a pilot ETS in Turkey, e.g. the determination of the historic emissions and reduction path for the cap, benchmarks for allocation and the impact offsets can have on the market.

The second cluster, the regulatory side, illustrates the necessary regulatory structure as developed in Chapter 4 and in the pilot scheme’s design developed in Chapter 5. New primary legislation, an ETS act should be developed to establish an ETS in Turkey, closely aligned with Turkey’s economy-wide climate change ambition as laid down in its INDC. Under the new primary legislation, implementation regulations will need to be developed for specific design elements such as the registry, the allowance allocation, the compliance cycle (transposing the current MRV regulation to the new primary legislation) etc. Finally, depending on certain design choices, changes to legislation under other ministries should be amended, e.g. to set rules for trading on the carbon market.

The third cluster includes all the tasks aiming at implementing and running the trading scheme, including the development of the registry system, setting up the auctioning and trading platforms, the communication with operators and the actual doing of allocation, auctioning, maintaining the registry accounts and monitoring compliance.

The description of the tasks was supplemented by an indication of responsibilities and time need. With respect to the time need assumptions, it is important to note that these are highly provisional. The assumptions are meant to point to bottle-necks or processes which have the potential to slow down the overall process of setting-up a pilot ETS in Turkey. Although certain indications in the tables above suggest a significant aggregated time need – e.g. all tasks associated with the registry set-up – it has to be stressed that, at the time of writing this study, the main political and legal process seems to dominate the overall picture of the timing.

The need for a separate law to establish and govern a potential pilot ETS in Turkey means that all other identified tasks might just fit into the time frame that is needed for a law to go through the necessary political and legal processes until being passed. This, in turn, makes the high level political decision to proceed with preparation for an ETS in Turkey and the drafting of an ETS law, so important.
Nevertheless, the listing of tasks and approximate time needs makes clear that the development, preparation and implementation of a pilot ETS is a large project, which needs professional project management and sufficient resources. The action plan lists tasks of a certain size/significance, but leaves out many supporting and supplementing activities which can also sum up to a significant amount, like the coordination and consideration of stakeholder involvement, the development of guidance and help-desk functionalities, training of staff etc. The presented action plan should therefore be seen as a starting point and can help to structure the initial planning of responsibilities and resources, but will need thorough revision and extension as soon as the launch of this large project – the set-up of a pilot ETS in Turkey – comes within political reach.