

TERMS OF REFERENCE (ToR):

1. ECONOMIC MODELLING OF EMISSIONS TRADING SYSTEM IN TÜRKIYE OBJECTIVE

The main purpose of the assignment is to conduct an economic modelling study on the impact of different ETS design options. This will inform decision makers and stakeholders on the design of the Turkish emissions trading system.

2. BACKGROUND

Climate action in Türkiye

Türkiye ratified the Paris Agreement in October 2021, and in the same year announced a target to reach net zero by 2053. After the ratification of the Paris Agreement, Türkiye's efforts have been focused on preparing plans and adopting policies to achieve these goals. Some of these efforts include establishing the Directorate of Climate Change (DoCC), which includes a Carbon Pricing Department, initiation of major studies for the preparation of the Draft Climate Law, organization of the Climate Council in 2022 and updating the NDC in line with the 2053 net zero target.

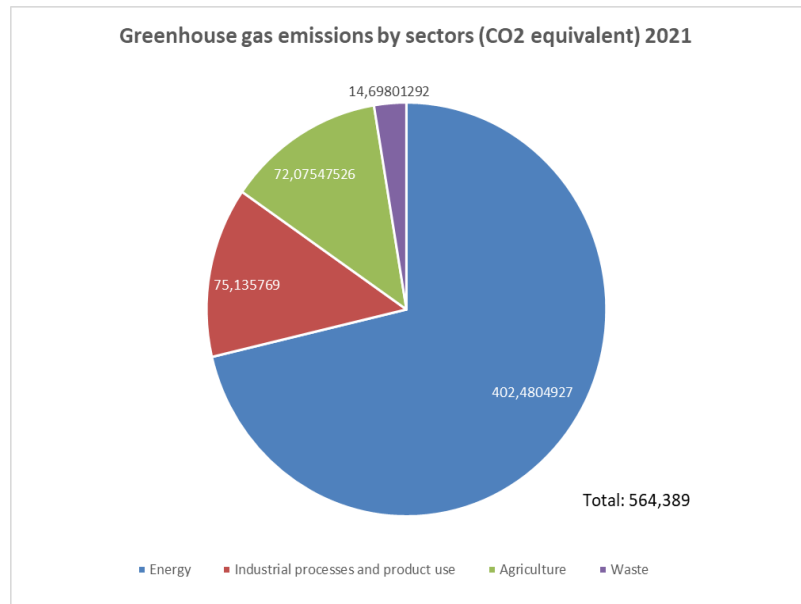


Figure-1: Greenhouse Gas Emission Shares by Sector, 2021¹

The following information is taken from Turkish Statistical Institution (TurkStat) Report, defines the greenhouse gas inventory of Türkiye.¹

The greenhouse gas inventory results revealed that overall greenhouse gas (GHG) emissions as CO2 equivalent (eq.) for the year 2021 compared to the previous year increased by 7.7% to 564.4 million tonnes (Mt).

In 2021, the energy sector had the largest share of total GHG emissions with 71.3%. The energy sector was followed by the industrial processes and product use sector with 13.3%, the agriculture sector with 12.8%, and waste sector with 2.6% (Figure-1)

The energy sector emissions were calculated at 402.5 Mt CO2 eq. in 2021, which increased by 188.4% compared to 1990 and also increased by 9.8% compared to previous year. Similarly, emissions from the

¹ Source: <https://data.tuik.gov.tr/Bulten/Index?p=Greenhouse-Gas-Emissions-Statistics-1990-2021-49672&dil=2>

industrial processes and product use sector were calculated at 75.1 Mt CO2 eq. in 2021, which increased by 228.7% compared to 1990 and also increased by 10.6% compared to previous year.

Agriculture sector emissions were calculated at 72.1 Mt CO2 eq. in 2021, which increased by 56.5% compared to 1990 but decreased by 1.5% compared to previous year. Waste sector emissions were calculated at 14.7 Mt CO2 eq. in 2021, which increased by 32.6% compared to 1990 but decreased by 9.9% compared to previous year

85.2% of total CO2 emissions originated from the energy sector including 32.7% of total CO2 emissions originating from electricity and heat production which is a sub-category of the energy sector. The remaining 14.5% of CO2 emissions originated from the industrial processes and product use sector and 0.3% from the agriculture and waste sectors in 2021”¹.

Climate policy

Türkiye aspires to integrate its climate change policies into development policies, disseminate energy efficiency, enhance the use of clean and renewable energy sources, participate actively in the international negotiations on climate change within and in doing so, and become a country that provides its people with high living standards and welfare in low carbon world.² In Türkiye, climate change-related issues are regulated through the articles of various laws, but the main climate policy documents are:

- National Climate Change Mitigation Strategy and Action Plan (2024–30),³ covering key areas, including energy, buildings, industry, transport, waste, agriculture, land use and forestry, just transition and carbon pricing mechanisms
- National Climate Change Adaptation Strategy and Action Plan (2024–30)⁴
- Green Deal Action Plan (2021-2030)

In addition to these documents above, targets have been set in the 12th Development Plan (2024-2028)⁵ and Medium-Term Program (2024-26)⁶ for the establishment of emission trading system within the scope of creating carbon-pricing instruments. The national emission trading system to be established is intended to protect Türkiye's competitiveness in foreign trade.

Progress towards emissions trading

The development of an Emissions Trading System (ETS) as a Carbon Pricing Instrument (CPI) fits into Türkiye's climate and development strategies according to the results of the Partnership for Market Readiness (PMR) Project by reducing GHG emissions in a cost-effective manner, incentivizing modernization, and introducing innovative technologies. The first updated NDC of Türkiye also

² Green Deal Action Plan of Turkey, 2021

https://www.eesc.europa.eu/sites/default/files/files/green_deal_action_plan_of_turkey.pdf

³ https://iklim.gov.tr/db/turkce/icerikler/files/undp_azaltim_spread.pdf

⁴ https://iklim.gov.tr/db/turkce/icerikler/files/%C4%B0klim%20De%C4%9Fi%C5%9Fikli%C4%9Fine%20Uyum%20Stratejisi%20ve%20Eylem%20Plan_%202024-2030.pdf

⁵ https://www.sbb.gov.tr/wp-content/uploads/2023/12/On-Ilkinci-Kalkinma-Plani_2024-2028_11122023.pdf

⁶ <https://www.resmigazete.gov.tr/eskiler/2023/09/20230906M1-1.pdf>

addresses ETS as a mitigation measure. In addition to these domestic drivers, Türkiye is planning to implement an ETS as a candidate country to the EU, and to mitigate the possible impacts of the EU's Carbon Border Adjustment Mechanism (CBAM)⁷. 12th Development Plan (2024-2028)⁶ and Medium-Term Program (2024-2026)⁷ also put some targets and measures regarding ETS.

Türkiye is currently seeking to establish a national ETS as a part of envisaged Climate Law.

Türkiye has been conducting carbon pricing studies under the Partnership for Market Implementation (PMI)⁸ and its predecessor, the Partnership for Market Readiness (PMR), since 2013. According to PMR outputs, it has been stated that the most cost-effective carbon pricing mechanism for Türkiye is the establishment of an ETS. Türkiye has been implementing a Measurement, Reporting and Verification (MRV) system, which covers most of the installations in the energy and industry sectors. These installations are expected to be in the emissions trading system.

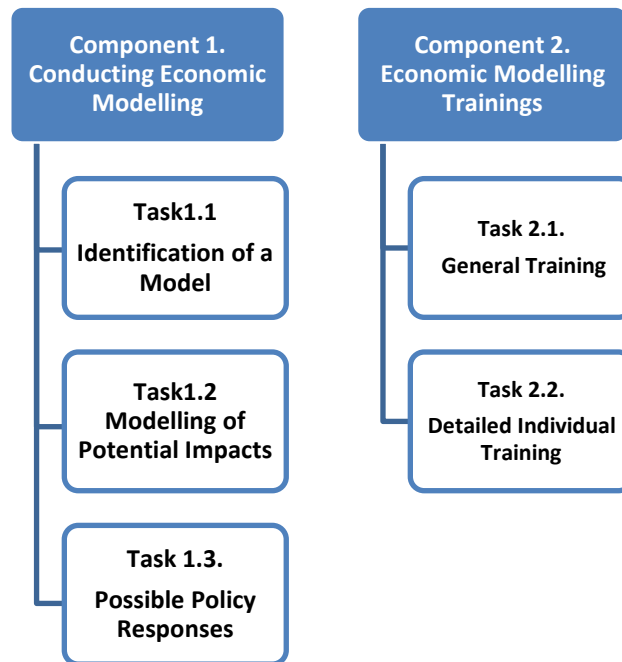
3. SCOPE OF WORK

The Consultant will work closely with the DoCC to develop and run economic modelling of ETS which aims to deliver and present the model results that test a range of ETS design scenarios. In addition, the Consultant will provide trainings for DoCC staff and stakeholders on modelling.

Scope of Work consists of 2 main topics, and their breakdowns are listed below:

⁷ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_2023.130.01.0052.01.ENG&%3Btoc=OJ%3AL%3A2023%3A130%3ATOC

⁸ The PMI is a World Bank trust fund that supports countries to design, piloting and implementation of emissions trading systems, offset crediting mechanisms and carbon taxes, in line with domestic priorities and capabilities. Specifically, the platform brings together developed and developing countries to share experiences and lessons learned with regard to these instruments. For more, see <https://www.thepmr.org/>



Component 1: Conducting Economic Modelling

Task 1.1: Identification of a Model

The Consultant shall review and identify appropriate model(s)/quantitative tool(s), e.g. an energy system model plus a computable general equilibrium model, to run the analysis under Task 1.2. The Consultant shall submit the model and scenario suggestions as a Modelling Framework Report.

Task 1.2: Modelling of Potential Impacts

The Consultant will provide a quantitative assessment of expected outcomes for Türkiye in the absence of emissions trading system (BAU), and 5-10 different scenarios. The questions to be addressed with the modelling study include (but are not limited to) the following:

1. What is the economic impact, including sectoral impacts, of implementing ETS?
2. What is the impact of expanding and narrowing the scope (sectors to be covered) of the ETS?
3. What is the impact of increasing ambition (so tighter caps) of the ETS?
4. What is the impact of introducing offsets (whether domestic or international) into the scheme at set quantity levels?
5. What is the impact of using different forms and levels of free allocation: grandfathering versus emissions intensity benchmark based on current output including assessing how the cost burden shifts between sectors?
6. What is the impact on revenue generated of different levels of auctioning over time? What is the impact on the economy of different approaches to spending revenue? For example, returning revenue to specific household deciles versus using the money for investment.
7. What is the impact on households of implementing an ETS?
8. What is the impact of applying a price corridor (either a floor, a ceiling or both)?

The final set of questions and the scenarios to address them will be determined with the DoCC. The modeling time period is from 2024 to 2035 with a focus on 2024 to 2030. Ideally, the model would include CO₂, CH₄ and N₂O. The outputs from the modelling shall include: change in GDP, change in output and employment by sector, carbon price level, GHG emissions by sector, technology mix by sector (e.g power mix change), investment costs, power price changes, inflation/price changes, trade balance. Inputs, assumptions (including technology costs) and outputs are to be agreed with the DoCC.

Each of the scenarios will be compared to a baseline scenario of no national emissions trading system. The baseline and core input assumptions for all scenarios will be calibrated in coordination with the DoCC, World Bank, stakeholders and, where relevant, incorporate outputs from previous economic modelling. All scenarios (except BAU) will assume Türkiye implements current climate and energy policies and at least meets emission mitigation targets (including their 2030 NDC target). At least two sensitivities will be tested for each scenario, which could explore for example, different rates of technology cost reductions, different fuel prices.

Modelling outputs will be provided in spreadsheet files. PowerPoint presentations will also be developed to highlight key results.

Task 1.3: Possible Policy Responses

Based on the Task 1.2., the Consultant will elaborate potential policy implications of the results. The Consultant will present the final modelling results, insights and guidance on how to use and interpret the modelling results in the Technical Report plus a summary PPT presentation.

Component 2: Economic Modelling Trainings

Training sessions will be held after the first workshop, and scheduled to ensure relevant DoCC staff are able to engage effectively in providing feedback at various stages of the project.

Task 2.1. General Training

In order to ensure the DoCC is able to continue to adequately engage with the modelling – both in agreeing the approach and scenarios but also in using the results, the Consultant will provide general training for DoCC staff and stakeholders. The training mainly shall cover:

- A general introduction to modelling: how it works, limitations, different types of models etc.
- A specific introduction to the model(s) used under this ToR.
- How to interpret, interrogate and use modelling results.

Task 2.2. Detailed Individual Training

One DoCC staff shall participate in a 5-day modelling training program selected by the Consultant. Ideally the training would be certified expert modelling training program abroad. The cost of the training will be met through another contract. The Consultant is responsible for identifying and recommending appropriate courses.

4. APPROACH

Coordination

The Consultant will appoint Key Expert 1 as coordinator for this contract and s/he will be responsible for daily coordination of the activities in the contract and act as a first contact point for the questions and any work related request of the DoCC throughout the project.

The Kick-off Meeting

The project will commence with a kick-off meeting that will be in Ankara at the premises of the DoCC. Before the kick-off meeting, the Consultant shall provide an updated description of its team composition, methodology and a detailed work plan, which will be discussed and agreed in this meeting.

Project Management Meetings

The Consultant will organize fortnightly project management meetings with the DoCC, WB and stakeholders to discuss progress, draft modelling results and other technical matters. Additional meetings may be held when necessary. The Consultant will set the agenda, incorporating any issues suggested by the DoCC, WB, where relevant prepare papers (or presentations) for discussion (e.g. setting out proposed scenarios), and prepare and submit minutes of these meetings. These meetings will be held virtually.

For each round of results to be discussed, the Consultant will provide the results in an EXCEL spreadsheet and, when necessary, with key results outlined in a PPT presentation.

Stakeholder Workshops

The Consultant will organize two workshops with stakeholders to provide insight and further information on the modelling work undertaken. The first workshop will be to present draft modelling results and is intended to elicit feedback and assist stakeholders to understand the results and implications of the modelling. The second workshop will be to present final results. The dates and times for the workshops will be determined in discussion with the Consultant but shall be held between 10 a.m. and 5 p.m. in Ankara (GMT+03:00). The Consultant is responsible for the preparation of the Turkish and English versions of the meeting agenda, workshop presentations, invitation letter, and list of invitees, brief documents, but workshop report only in English.

Trainings

The general training should take place the day after the first stakeholder workshop if possible, or during the same week for DoCC and stakeholders. Dates and times for the training will be determined in discussion with the Consultant but shall be held between 10 a.m. and 5 p.m. in Ankara (GMT+03:00).

The selection of a suitable course for individual model training is based on recommendations by the Consultant, DoCC and WB.

Technical Report

The Consultant will develop a technical report of the modelling undertaken under Component 1. The report shall include the following elements:

- An executive summary
- An introduction to the model used and methodology
- Key assumptions of the specific models used, including an explanation of the consequences of these assumptions on the final results
- Main data sources for scenarios
- Baseline scenario and any key assumptions made in this scenario
- Modelling scenarios and sensitivities
- Presentation of results based on metrics agreed with the DoCC/WB, including charts for individual scenarios and comparison charts. This shall include an explanation of channels of impacts to inform the DoCC and stakeholder on how these results were derived.
- Synthesis of the implications of these results, e.g. identifying vulnerable groups likely to be impacted.

The Consultant will also prepare a summary PPT presentation and spreadsheet of the final results.

Language

All deliverables and reports shall be prepared in English, but all executive summaries will also be prepared in Turkish. The interpretation services for the workshop meetings and trainings will be provided under another contract.

5. DELIVERABLES

There are 8 deliverables for which the Consultant is responsible, all of these deliverables will be sent to DoCC via e-mail, except for the delivery methods specified in the title details. The Consultant shall respect the deadlines, although the timing of the deliverables identified may be subject to change during the course of the contract with the approval of the DoCC and with the justification of the Consultant (as shown in table 1). The Consultant will receive feedback from DoCC and relevant stakeholders within two weeks of submitting the report and model results. Afterwards, the Consultant shall revise the report according to the feedback and submit it again within 2 weeks.

a. Modelling Framework Report

The Consultant shall submit the model and scenario suggestions as a Modelling Framework Report. This report should provide detailed justifications for the model selected. The model(s) used shall have high level of detail applicable to Türkiye for production sectors in order to be able to reflect different ETS scopes, also representation of the consumption side to reflect the impact of prices and revenue use, and trade linkages.

b. Modelling Scenarios

The Consultant will produce a list of agreed modelling scenarios for Component 1. The Consultant shall flag where further data is required to run the modelling scenarios so the DoCC, World Bank can provide the necessary information.

c. Inputs and Assumptions

The Consultant will produce a list of key inputs and assumptions that have been agreed with the DoCC. All input and output data will be shared with the DoCC and World Bank in EXCEL workbook.

d. Modelling Results

Draft modelling results for each scenario will be presented to the DoCC in the form of an EXCEL workbook and a slide deck, including comparative charts and initial insights from the results. The EXCEL workbook shall allow the user to interrogate precise results and relationships between them, and include charts for key output metrics. Final modelling results, incorporating feedback from the DoCC, World Bank team on the draft results, will also be presented in an EXCEL workbook with graphs and a slide deck. Results from the modelling will also be incorporated into the technical report.

e. Technical Report on Economic Modelling

The Consultant will develop a technical report of the modelling studies undertaken under Component 1. The technical report will be delivered incorporating final modelling results and feedback from the DoCC and stakeholder. Two (2) hard copies of the approved report and its electronic version (or on CD ROM) shall be submitted to DoCC.

f. Economic Modelling Workshops

In the first workshop the Consultant will provide a brief explanation of their modelling approach and present the draft modelling results from Component 1. Stakeholders will have an opportunity to ask questions and provide feedback on the assumptions and results. In the second workshop the Consultant will present the final modelling results from Component 1.

Organization costs of the meetings will be met by another contract under PMI. However, the Consultant will cover its own travel and accommodation expenses to and from the meetings to be held in Ankara.

g. Economic Modelling Trainings

The Consultant will deliver one day training for DoCC and stakeholders to improve their understanding of the model(s) and analytical frameworks utilized under this ToR, modelling more generally, and the interpretation of modelling results. The training session will be held just after the first workshop.

Organization costs of the meetings will be met by another contract under PMI. However, the Consultant will cover its own travel and accommodation expenses to and from the meetings to be held in Ankara.

Individual training must take place on a certified course abroad, all costs will be met by another contract under PMI.

h. Final report

The Consultant shall deliver a final report that provides on information on the deliverables and stakeholder engagement process throughout project implementation period.

6. TEAM COMPOSITION AND QUALIFICATION REQUIREMENTS FOR THE KEY AND NON-KEY EXPERTS AND CONSULTANT

A. GENERAL REQUIREMENTS OF CONSULTANTS

The Consultant shall be a firm with experience in carrying out similar tasks, specifically to include the following minimum qualifications

- At least 3 years experience in environmental or climate sector.
- Completion of 1 service contract in environmental or climate sector.

B. SPECIFIC REQUIREMENTS OF CONSULTANTS

- Experience in at least 2 service contracts concerning economic, climate change or energy modelling and analysis
- Experience in carbon pricing would be an asset
- Experience in training/capacity-building in economic modelling would be an asset.
- Experience and knowledge in Turkish climate policies would be an asset

C. TEAM COMPOSITION

The Consultant shall name key experts and the core team members for the specified roles within the Project Team and provide full curricula vitae and any other information considered relevant by the Consultant.

The minimum required experiences of proposed key experts are listed below.

C1. KEY EXPERTS

The Consultant shall employ following key expert with minimum requirements below.

Key Expert 1: The Senior Modelling Expert (1)

- At least 4 years of professional experience in economic modelling and technical data collection and analysis across various sectors and in relations to climate policies and actions;
- Demonstrated experience with carbon pricing assessment and modelling carbon pricing instruments;

- Demonstrated experience preparing technical and modelling reports related to the assignment, including carbon pricing, power and industry sector transition, and decarbonization (please cite relevant publications);
- Having a bachelor’s degree;
- Experience in training/capacity-building in economic modelling is an asset;
- Understanding and experience in Turkish climate policies is an asset;
- Excellent written and presentation skills in English are essential, ability to communicate in Turkish would be an advantage.

C2. NON-KEY EXPERTS

The Consultant shall employ following non-key experts with minimum requirements below.

The Modelling Expert(s)

- At least 2 years of professional experience in economic modelling and technical data collection and analysis across various sectors and in relations to climate policies and actions;
- Demonstrated experience with carbon pricing assessment and modelling carbon pricing instruments;
- Demonstrated experience preparing technical and modelling reports related to the assignment, including carbon pricing, power and industry sector transition, and decarbonization (please cite relevant publications);
- Having a bachelor’s degree;
- Understanding and experience in Turkish climate policies is an asset;
- Excellent written and presentation skills in English are essential; ability to communicate in Turkish would be an advantage.

7. MILESTONES AND PAYMENT SCHEDULE

The core project is expected to run for 9 months and the core modelling is expected to be completed 9 months after the signing of the contract. Table 1 provides time schedule for deliverables and **Hata! Başvuru kaynağı bulunamadı.** provides an overview of milestone payments, a final, detailed timeline will be agreed between the successful Consultant and the DoCC.

Table 1 Time Schedule for Deliverables

Deliverables	Time Schedule
Kick-off Meeting	First week
Modelling Framework Report	1 st Month
Modelling Scenarios Agreed	2 nd Month
Inputs Assumptions Agreed	2 nd Month
Draft Modelling Results	4 th Month

Economic Modelling Workshop	5 th Month
General Training	5 th Month
Technical Report on Economic Modelling	8 th Month
Workshop on the Final Model Results	9 th Month

Table 2 Milestone Payments

Tasks	Payment (% of the Contract Price)
Approved Modelling Framework Report	20%
Approved First Draft Modelling Results	40%
Approved Final Report	40%

8. CONTACTS

The Consultant shall report to Project Coordinator from DoCC.

DoCC contacts

Eyüp Kaan MORALI-Head of the Carbon Pricing Department | Türkiye, Directorate of Climate Change
(ekaan.morali@iklim.gov.tr)

Aydın SARGIN, Climate Change Expert | Türkiye, Directorate of Climate Change
(aydin.sargin@iklim.gov.tr)

Aygün AKTAŞ ACAR, Economist | Türkiye, Directorate of Climate Change
(aygun.aktas@iklim.gov.tr)