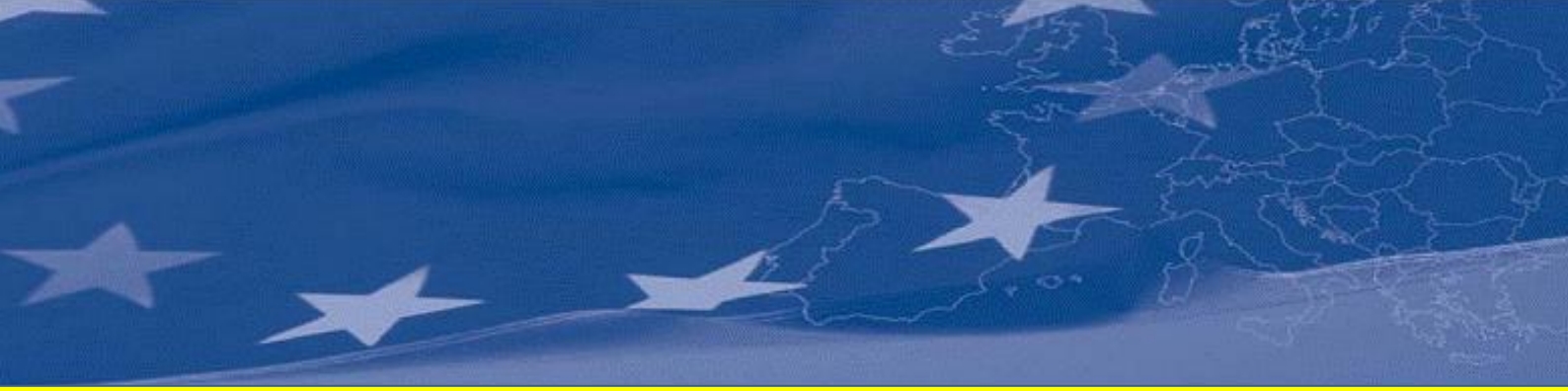

This project is co-financed by the European Union and the Republic of Turkey.

National Programme for Turkey 2013 –
Instrument for Pre-Accession Assistance

Technical Assistance for Developed Analytical Basis for Formulating Strategies and Actions Towards Low Carbon Development

Project Identification No: EuropeAid/136032/IH/SER/TR

Contract No: TR2013/0327.05.01-01/001

Activity 4.3.1: Capacity building for key stakeholders (training, coaching and mentoring services)

Consolidated Training Report

Ankara 2020

CFCU

human dynamics
public sector consulting

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT AND URBANISATION

This project is co-financed by the European Union and the Republic of Turkey.

Project Title:	**Technical Assistance for Developed Analytical Basis for Formulating Strategies and Actions Towards Low Carbon Development**
Service Contract No:	TR2013/0327.05.01-01/001
Project ID No:	EuropeAid/136032/IH/SER/TR
Project Value:	€ 3,865,010.00
Commencement Date:	29 May 2017
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Reporting Period	-	**Compiled by**	Teksin Öztekin, Erdinç Ersoy
Date of Report	-	**Checked by**	Dr. Mykola Raptsun (Team Leader)

This document has been produced with the financial assistance of the European Union and the Republic of Turkey.

REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT AND URBANISATION

Table of Contents

1. Introduction

The Consolidated Training Report includes ten reports on trainings conducted *Activity 4.3.1: Capacity building for key stakeholders (training, coaching and mentoring services).* Scope of work for Activity 4.3.1 is focused on capacity building for key stakeholders and envisages delivery of minimum ten training courses, which will contribute to building and enhancing the necessary institutional capacity to ensure low carbon development in the long term.

Based on close communication with the project Beneficiary and other key stakeholders, the TAT has analysed needs for training and suggested training topics and then prepared training programs/agendas for each of ten training modules, which were approved by the Beneficiary.

The trainings were focused on methodologies and tools that have a significant value for Turkey's future preparation of low carbon development and climate change mitigation strategies.

Leading international and national experts with deep knowledge of related training subjects were invited as trainer/lectors. All trainers' CVs were preliminarily submitted for Beneficiary's consideration and approval

TRAINING- 1

TIMES (Integrated MARKAL-EFOM System) Modelling Framework

2. TRAINING- 1

2.1. Introduction to the project and objectives of the TIMES training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the TIMES training is to introduce this integrated multisectoral economic/energy/environmental (GHG) modelling framework as a basic tool for the assessment of GHG mitigation actions potentials and costs in four target sectors, as well as for sectoral GHG scenarios analysis and preparation of recommendations on most important and cost-effective mitigation actions.

2.2. Description of Training

2.2.1. Training Information Sheet

Name of the event	**Introduction to TIMES Modelling Framework**
Date of the event	November 15, 2018
Event type	Training Course
Duration of the training	1-day
Venue of the training	Holiday Inn, Çukurambar - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	40
Represented institutions	Ministry of Environment and Urbanization
	Ministry of Transportation and Infrastructure
	Ministry of Agriculture and Forestry
	TurkStat
	Other Governmental and non-governmental institutions
	Project technical team members and sectoral experts
Trainers	Dr. Kemal Sarıca, Senior Expert, Lead Modeller
	Dr. ÖzgeYılmaz, Senior Expert, Buildings Sector
	Mr. Özgür Şakı, Senior Expert, Waste Sector
	Prof. Dr. İlkay Dellal, Senior Expert, Agriculture Sector
	Dr. Hediye Tüydeş Yaman, Senior Expert, Transport Sector

2.2.2. What is TIMES Modelling Framework?

TIMES (an acronym for The Integrated MARKAL-EFOM System) is a bottom-up optimization model generator that allows accurate energy and environmental policy analysis at the local, national or multi-regional level. This tool combines a technical engineering approach and an economic approach to represent technologies, fuels, emissions and their effect on all economic sectors.

As an integrated multisectoral economic/energy/environmental (GHG) model• and it Is applicable at the global, multi-regional, national, state/province, or community levels. The model allows to make long-time projections over a period of usually 20 to 50 or 100 years.

It has been developed and is well supported by the International Energy Agency's Energy Technology Systems Analysis Programme (MARKAL Has been developed and is well supported by the International Energy Agency's Energy Technology Systems Analysis Programme (MARKAL since 1980 and TIMES since 2000). Model Is used and tested in 70 countries by 250 institutions.

For more information on TIMES, please see ANNEX 4.

2.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively TIMES Modelling Framework by engaging in ongoing professional dialogues.

The major topics covered during the trainings were.

- Approach and methodology for using TIMES for sectoral (buildings, transport, agriculture and waste) GHG mitigation potentials and costs assessment
- Introduction to TIMES Modelling Framework – advantages and disadvantages
- Familiarizing of participants with the bottom-up model structure
- Basics of Reference Energy System
- Technology/Process definitions and understanding the use of it.
- Energy/Material relationships
- Fuel combustion and process emission differences

2.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on TIMES Modelling Framework was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by forty (40) representatives from governmental institutions, non-governmental organisation, academia as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

Ministry of Environment and Urbanization
Ministry of Transportation and Infrastructure
Ministry of Agriculture and Forestry
TurkStat
Other Governmental and non-governmental institution
REC Turkey
Project technical team members and sectoral experts

2.2.5. Trainers

Model Presenter:

- Kemal Sarıca Senior Expert, Lead Modeller:

Dr.Kemal Sarıca is an energy systems modeller. His main research interest is energy-economy-environment interaction under various climate change and energy policies. Besides, he is also interested in electricity market modelling for various market designs under full AC grid structure and their implications.

He completed his BS degree in Mechanical Engineering in 2001 at Boğaziçi University. He also completed his graduate and doctoral studies at the same university in 2004 and 2010 respectively, in Industrial Engineering focused on the energy and electricity sectors. He continued his post-doctoral research in Agricultural Economics Department at Purdue University working on US Renewable Fuel Standards (RFS), Clean Energy Standards (CES), Corporate Average Fuel Efficiency (CAFE) analyzing the possible impacts using the bottom-up and hybrid modelling approaches.

Dr. Sarıca is a founding member Association for Energy Economics (EED) and member of the International Association for Energy Economics (IAEE). He is currently, a professor in the Department of Industrial Engineering at Işık University.

Sectoral Experts:

- Assoc. Prof. Dr. Hediye Tüydeş Yaman, Senior Expert, Transport Sector

Graduating from the Civil Engineering (CE) Department, Middle East Technical University (METU) in 1994, Dr. Tüydeş Yaman first got an MS degree in Applied Mechanics. Upon receiving a scholarship, she later got accepted to Northwestern University, the USA in 1997 to pursue graduate degrees in Transportation. Her MS thesis was on "Airport Access Mode Choice Modelling" while her PhD dissertation was on "Network Traffic Management under Disaster Conditions". Joining the METU CE Department in 2006 as a full-time faculty member, Dr. Hediye Tüydeş Yaman focused on research in different fields for transportation planning and traffic engineering. Besides High-Speed Rail (HSR) and Intelligent Transportation Systems (ITS), she has also conducted research in traffic safety. Besides conducting many research projects on sustainable transportation and smart cities, she has been acting as the Head of METU-BILTIR Research Centre ITS Unit and gave presentations at various venues. More recently, she has taken part in the Low Carbon Turkey Project Component 1, as the transport expert.

- Özgür Şakı Senior Expert, Waste Sector

Mr. Özgür Şakı is a senior expert on waste management and material valorisation, particularly recycling. Having graduated from the environmental engineering department of Middle East Technical University in 1998, he also obtained an MBA degree from Bilkent University in 2001. He has more than 18 years of professional work experience mainly on the area of waste and resources including international development projects.

He is currently working as a freelance consultant in the field of the circular economy, waste prevention, recycling, resource efficiency and sustainable consumption and production (SCP) and acting as a senior waste expert of Low Carbon Development project. He has been actively involved in European Bank for Reconstruction and Development's Materials Marketplace and Waste Management Plans for Public Buildings, UNDP's Promoting Energy Efficiency in Buildings and IPA funded projects in Turkey including ÇEKAP and Near Zero Waste.

He recently worked as TC programme manager for the EBRD. He acted as project manager of the Near Zero Waste programme of the bank which aims to promote waste minimisation in Turkey. He also worked as a short-term project evaluator for the Çukurova Development Agency. Before, he worked as a project manager on waste prevention and management for the European Environment Agency (EEA). As a team member of Sustainable Consumption and Production Group, he took part in

programming, leading and managing EEA's waste, SCP and resource efficiency-related projects and representing the Agency in international platforms.

Previously he worked as regional manager of ÇEVKO, an NGO working in the field of packaging waste recovery. He mentored several municipalities on setting up packaging waste recovery system and coordinated projects with several stakeholders. He has also founded a research and development company mainly dealing with information technology and environmental issues located at technopolis area of Middle East Technical University.

- İlkay Dellal Senior Expert, Agriculture Sector

She graduated from Ankara University, Faculty of Agriculture, Department of Agricultural Economics in 1991. In the same department, she got M.Sc degree in 1994 on the income distribution of farms and the PhD degree in 2000 on the planning of farms with mathematical programming method. After PhD, her research efforts were mainly on climate change and agriculture. Getting a post-doctoral research scholarship from TÜBİTAK, she worked as a visiting researcher at the Department of Agricultural Economics in Texas A & M University in the USA in 2003-2004. During this stay, she studied climate change and agriculture issues and researched economic impact of climate change on Turkish agriculture. Since 2002, she has many articles on climate change and agriculture, carried out projects, participated congresses, symposiums, conferences and panels as a speaker, worked on the preparation of national documents on climate change. She worked as a research assistant at Ankara University in 1992-1999 and worked as a researcher, deputy director and director at the Agricultural Economics and Policy Development Institute of Ministry of Agriculture and Forestry in 2000-2009. Prof. Dr. İlkay Dellal has been working in the Department of Agricultural Economics at Ankara University as a full time academic staff since 2009 and she is currently Head of Department of Agricultural Policy and Extension

- ÖzgeYılmaz Senior Expert, Buildings Sector

She studied the hazardous waste generation of Turkey and participated in a number of capacity building projects that aim to improve hazardous waste management practices in Turkey. Furthermore, she worked on the design of large-scale hazardous waste management systems using optimization techniques (PhD). She focused on life cycle assessment of nanoparticles for utilization in water treatment and cleaner production strategies in the manufacturing industry during post-doctoral research in the USA. She has been working on sustainability expert and R&D Group Coordinator in Ekodenge since 2014. Her previous project experiences related to the building sector include:

- Contribution to baseline assessment, demand status, gap analysis and identification of barriers and opportunities in building sector related to low carbon development roadmap in Turkey under TECHNICAL ASSISTANCE FOR DEVELOPED ANALYTICAL BASIS FOR FORMULATING STRATEGIES AND ACTIONS TOWARDS LOW CARBON DEVELOPMENT - TR2013/0327.05.01-01/001
- FISSAC – Fostering Industrial Symbiosis for a Sustainable Construction Across the Value Chain (H2020, Grant agreement: 642154)
- R2Cities – Renovation of Residential Urban Spaces: Towards Nearly Zero Energy Cities (FP7 – Grant agreement: 314473)

2.3. Logistics and Organizational Arrangements

The first training course on TIMES Modelling Framework was held at five-star Holiday Inn Hotel, Ankara on November 15, 2018, with the participation of forty (40) attendees. (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with a classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, notebooks, pens etc. Also, a whiteboard was provided to the model presenter for interactive lecturing and exemplification.

During the training, a professional simultaneous interpretation was provided to create a better environment where clear understanding was provided for the participants

2.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings. Please see ANNEX 5.

During the training, a total of 21 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially
Are you satisfied with the training?	17	-	4
Do you think the training was performed according to the agenda distributed	16	1	4

Are you satisfied with the performance of the trainers?	19	-	2
Are you satisfied with the organizational arrangements including hotel, translation, catering etc.?	20	-	1
Do you think sufficient time was allocated for the Q-A session?	21	-	-
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings More participation from other ministries. In-depth trainings on the modelling tools		

In addition to the above-mentioned comments, some of the participants indicated the importance of carrying out trainings on the calculation of the emissions caused by the aviation sector and underlined the importance of the participation of other ministries such as the Ministry of Development, the Ministry of Natural Source and Energy.

To conclude, the training course on TIMES Modelling Framework has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic.

2.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 2

Computer Programme to Calculate Emissions from Road Transport (COPERT 5) Modelling Tool

3. TRAINING- 2

3.1. Introduction to the project and objectives of the COPERT training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

Result 1: Review of existing strategies in relation to Climate Change.

Result 2: Preparation of regulatory and sectoral impact assessments for EU climate acquis.

Result 3: Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.

Result 4: Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

The objectives of COPERT training is to conduct a capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development, in particular in the transport sector. The training was requested by the Ministry of Transport and Infrastructure and supported by the project Beneficiary, Ministry of Environment and Urbanisation.

3.2. Description of Training

3.2.1. Training Information Sheet

Name of the event	**Computer Programme to Calculate Emissions from Road Transportation (COPERT)**
Date of the event	November 22-23, 2018
Event type	Training Course
Duration of the training	2-day
Venue of the training	Holiday Inn, Çukurambar - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	21
Represented institutions	• Ministry of Environment and Urbanization • Ministry of Transportation and Infrastructure • Directorate General of High Ways • TurkStat • Other Governmental and non-governmental institutions • Project technical team members and sectoral experts
Trainers	Chariton Kouridis – Senior Training Expert for COPERT Tool in Transport Sector, EMISIA, Greece Nikolaos Panagiotiz Zisis – Junior Training Expert for COPERT Tool in Transport Sector, EMISIA, Greece

3.2.2. What is COPERT 5?

COPERT 5 is the EU standard vehicle emissions calculator. It uses vehicle population, mileage, speed and other data such as ambient temperature and calculates emissions and energy consumption for a specific country or region.

COPERT is a Microsoft Windows software program which is developed as a European tool for the calculation of emissions from the road transport sector. The emissions calculated include regulated (CO, NOx, VOC, PM) and unregulated pollutants (N2O, NH3, SO2, NMVOC speciation …) and the energy consumption is also computed.

What's New in COPERT 5?

Major improvements comparing to COPERT4:

1. Access mdb file → SQL compact edition
2. Improved software interface
3. Calculation of long time series in one file
4. Significantly reduced calculation time
5. Export extended to include all input and output information
6. Aggregated factors (hot and cold)
7. Cancel button
8. Cosmetic and operational changes

Minor improvements:

1. Advanced software update procedure
2. Import/Export in different file types (xls, xlsx, csv)

New Methodological Features:

Fuel

1. Fuel energy instead of fuel mass calculations
2. Distinction between primary and end (blends) fuels
3. Automated energy balance

Vehicle Types

1. Updated vehicle category naming
2. New vehicle types
3. Emission control technology level

Emission factors

1. One function type
2. Possibility to distinguish between peak/off-peak urban

3.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively COPERT by engaging in ongoing professional dialogues. The objective of the training was to conduct the capacity building for the key stakeholders to enhance the necessary institutional capacity ensuring low carbon development according to Activity 4.3.1

The major topics covered during the trainings were.

- COPERT 5
- General Methodology
- COPERT Activity Data (default and country-specific)
- COPERT 4 vs. COPERT 5
- What Is New In New Version 5.2
- CO2 Correction Methodology
- Fuel vs. Energy Fuel Balance in COPERT 5
- GHG Emissions

3.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on COPERT training was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by twenty-one (21) representatives from governmental institutions, non-governmental organisation, academia as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

- Ministry of Environment and Urbanization
- Ministry of Transportation and Infrastructure
- Directorate General of Highways
- TURKSTAT
- Other Governmental and non-governmental institution
- Project technical team members and sectoral experts

3.2.5. Trainers

Model Presenter:

- Chariton Kouridis – Senior Training Expert for COPERT Tool in Transport Sector, EMISIA, Greece

Mr Charis Kouridis is a mechanical engineer. He graduated from the Aristotle University of Thessaloniki, mechanical engineering department in 1998. He was the main developer of COPERT 3 and has been working with the development of the methodology ever since. He is a project manager in EMISIA since 2008 and his expertise includes emissions and energy consumption calculation from road transport. He is supporting COPERT users and monitors the development of the methodology.

- Nikolaos Panagiotiz Zisis – Junior Training Expert for COPERT Tool in Transport Sector, EMISIA, Greece

Mr Nikolaos Zisis is a software engineer. He graduated from the Aristotle University of Thessaloniki, computer science department in 2016. He has worked for a Danish start-up based in Copenhagen as an Android developer before joining EMISIA in 2017. He is the main developer of COPERT version 5 and he is currently maintaining and supporting the software. Meanwhile, he is working on EMISIA's SIBYL, a projection tool for vehicle population, emissions and energy consumption.

3.3. Logistics and Organizational Arrangements

The training course on COPERT was held at five-star Holiday Inn Hotel, Ankara on November 22-23, 2018 with the participation of over twenty attendees. (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with a classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, notebooks, pens etc. Also, a whiteboard was provided to the model presenter for interactive lecturing and exemplification.

During the training, a professional simultaneous interpretation was provided to create a better environment where clear understanding was provided for the participants.

3.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an "Evaluation Form". With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings. Please see ANNEX 5.

During the training, a total of 21 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially

Are you satisfied with the training?	12	-	-
Do you think the training was performed according to the agenda distributed	12	-	-
Are you satisfied with the performance of the trainers?	12	-	-
Are you satisfied with the organizational arrangements including hotel, translation, catering etc.?	11	-	1
Do you think sufficient time was allocated for the Q-A session?	12	-	-
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings More participation from other ministries. In-depth trainings on the modelling tools		

In addition to the above-mentioned comments, some of the participants indicated the importance of carrying out trainings on the calculation of the emissions caused by the aviation sector and some indicated that training on Sibyl Projections would be beneficial.

To conclude, the training course on COPERT has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic.

3.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 3

Ex-Ante Carbon-balance Tool (EX-ACT)

4. TRAINING- 3

4.1. Introduction to the project and objectives of the EX-ACT training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the EX-ACT training are as follows:

EX-ACT is a land-based accounting system, estimating C stock changes (i.e. emissions or sinks of CO_2) as well as GHG emissions per unit of land, expressed in equivalent tonnes of CO_2 per hectare and year. The tool helps project designers to estimate and prioritize project activities with high benefits in economic and climate change mitigation terms. The amount of GHG mitigation may also be used as part of economic analyses as well as for the application for additional project funds.

EX-ACT can be applied on a wide range of development projects from all AFOLU sub-sectors, including besides other projects on climate change mitigation, sustainable land management, watershed development, production intensification, food security, livestock, forest management or land-use change. Further, it is cost-effective, requires a compared small amount of data, and has resources (tables, maps) which can help to find the required information. While EX-ACT is mostly used at project level it may easily be up-scaled to the programme/sector level and can also be used for policy analysis.

4.2. Description of Training

4.2.1. Training Information Sheet

Name of the event	**Ex-Ante Carbon Balance Tool (EX-ACT)**
Date of the event	22-23 January, 2019
Event type	Training Course
Duration of the training	2-day
Venue of the training	Mövenpick Hotel, Çukurambar - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	41
Represented institutions	Ministry of Environment and Urbanization Ministry of Agriculture and Forestry TurkStat Other Governmental and non-governmental institutions Academics Project technical team members and sectoral experts

Trainers	**Louis BOCKEL**, the team leader and the originator of the EX-ACT design **Laure-Sophie SCHIETTECATTE**, EX-ACT Senior consultant

4.2.2. What is the EX-ACT Carbon Balance Tool?

EX-ACT is a land-based accounting system, estimating C stock changes (i.e. emissions or sinks of CO_2) as well as GHG emissions per unit of land, expressed in equivalent tonnes of CO_2 per hectare and year. The tool helps project designers to estimate and prioritize project activities with high benefits in economic and climate change mitigation terms. The amount of GHG mitigation may also be used as part of economic analyses as well as for the application for additional project funds.

EX-ACT can be applied on a wide range of development projects from all AFOLU sub-sectors, including besides others projects on climate change mitigation, sustainable land management, watershed development, production intensification, food security, livestock, forest management or land-use change. Further, it is cost-effective, requires a compared small amount of data, and has resources (tables, maps) which can help to find the required information. While EX-ACT is mostly used at project level it may easily be up-scaled to the programme/sector level and can also be used for policy analysis

4.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively EX-ACT by engaging in ongoing professional dialogues.

The major topics covered during the trainings were.

- A set of linked Microsoft Excel sheets
- Structured in nine logical topic modules
- Based on land use and management practices
- Equipped with a set of resource (tables, maps, FAO statistical data) that help to populate the tool
- Using IPCC default values (Tier 1) and/or region-specific coefficients (Tier 2)
- Comparing the situation without and with project

4.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on Ex-Act Carbon Balance Tool was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by forty-one (41) representatives from governmental institutions, non-governmental organisation, academia as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

- Ministry of Environment and Urbanization
- Ministry of Agriculture and Forestry
- TurkStat
- Other Governmental and non-governmental institution
- Academics
- Project technical team members and sectoral experts

4.2.5. Trainers

Model Presenter(s):

- Louis BOCKEL:

Agricultural Policy Support Officer in FAO Regional Office for Africa since early 2018, working closely with FAO ESA (Economics of Agriculture Development) Division (2002-2017). He has completed a PhD in economics and a series of masters in agriculture, farming systems and rural economy and sociology of developing countries. Having worked in over 50 countries as consultant or FAO expert since 1985, he was up to January 2018 team leader of the EX-ACT tool (2009-2017) which is designed to appraise GHG mitigation, climate resilience of public/ private investments on projects, policies, value chains (25 billion US$ of investments appraised with World Bank, GEF, IFAD, AFD, AfDB, ADB, USAID-CCAFS, National development Banks) in the Agricultural, Forestry and Land use sector. He carries out the technical supervision, the orientation of the tool development (new impact areas covered as labour, income generation, biodiversity) and the dissemination of the EX-ACT tools package, looking for new partnerships and collaboration to encourage broader use of the tools in project and policy appraisals. He also organizes and participates in EX-ACT trainings and workshops

- Laure Sophie Schiettecatte

With a PhD on the carbon cycle in coastal waters she co-leads the technical development of new EX-ACT modules and guidelines on the blue carbon, fishery and

aquaculture sectors. She conducts EX-ACT assessments for on coastal zone management (IFAD, WB, TCI), peatland restoration (BRG), the fishery sector and mangrove aquaculture (IFAD, FAO) and work desk appraisals for GEF, GCF, WB. She also participates and carries out EX-ACT training and contributes to the development of the EX-ACT Value Chains tool and guidelines. She also deals with reviewing EX-ACT publications.

4.3. Logistics and Organizational Arrangements

The third training course on Ex-Act Carbon Balance Tool was held at five-star Mövenpick Hotel, Ankara on January 22-23, 2019 with the participation of forty-one (41) attendees. (Please see ANNEX 3). 2 Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

Please click https://www.movenpick.com/en/europe/turkey/ankara/hotel-ankara/overview/?utm_source=google&utm_medium=local&utm_campaign=Glocal+ankara for more information regarding the hotel where the training course was held.

A meeting room with classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, exercise booklets, Ex-Act guidelines, notebooks, pens etc.

During the training, a professional simultaneous interpretation was provided to create a better environment where clear understanding was provided for the participants.

4.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings (please see ANNEX 5).

During the training, a total of 27 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	**Yes**	**No**	**Partially**
Are you satisfied with the training?	8	5	14
Do you think the training was performed according to the agenda distributed	26	-	1
Are you satisfied with the performance of the trainers?	14	1	12

Are you satisfied with the organizational arrangements including hotel, translation, catering etc.?	21	-	6
Do you think sufficient time was allocated for the Q-A session?	20	-	7
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings In-depth trainings on livestock Repetition of the training		

In addition to the above-mentioned comments, some of the participants indicated the importance of carrying out trainings on the calculation of the emissions caused by livestock. Language-wise some participants noted that it was hard to understand because of the accent of the trainers.

To conclude, the training course on EX-ACT has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic

4.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 4

Green building certification as an effective instrument for carbon emission mitigation (LEED)

5. TRAINING- 4

5.1. Introduction to the project and objectives of the LEED training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

Result 1: Review of existing strategies in relation to Climate Change.

Result 2: Preparation of regulatory and sectoral impact assessments for EU climate acquis.

Result 3: Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.

Result 4: Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Sector background

Buildings is an important and fast-growing sector of the Turkish economy, and it is responsible for the significant share (23 %) of the country's GHG emissions.

A 'green' building is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green (environmental) building certification recognise and

reward companies and organisations who build and operate more environmentally sound buildings with more efficient use of energy, materials and other resources.

Green buildings are significant contributors to the global GHG emission reduction, and building certification (rating) systems are very popular worldwide. Turkey made substantial progress in the implementation of green buildings, and it is ranked among the top 10 countries in the world in terms of gross square meters of LEED-certified buildings. At the same time, it is just the beginning, and there is still a huge potential that is remaining for widespread dissemination of green building certification in Turkey.

Objective of the LEED training is to provide the related project stakeholders with:

- Introduction to main principles, characteristics and features, which make buildings "green"
- Green buildings role in the mitigation of climate change
- Presentation of successful examples of residential, public and commercial green buildings implemented in Turkey and worldwide
- Overview of international and national experience of implementation of green building certification
- Green building certification – how it works (LEED certification experience)?
- Overview of benefits of green building certification for governmental and municipal authorities in terms of ensuring building's resource efficiency and environmental quality, including reduced carbon emissions
- Information about possible ways and approaches to facilitate and support the wide implementation of green building certification in Turkey

5.2. Description of Training

5.2.1. Training Information Sheet

Name of the event	Green Buildings Certification as an Effective Carbon Mitigation Tool (LEED)
Date of the event	27-28 March, 2019
Event type	Training Course
Duration of the training	2-day
Venue of the training	HM Commerce Hotel - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting

Total number of participants	73
Represented institutions	Ministry of Environment and Urbanization Ministry of Energy and Natural Resources Municipalities Other Governmental and non-governmental institutions Research and educational institution
Trainers	Murat Doğru Nursun Doğru Zeynep Çakır

5.2.2. Training Approach

During the training a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively LEED by engaging in ongoing professional dialogues.

The major topics covered during the trainings were.

- Main principles, characteristics and features, which make buildings “green”
- Green buildings role in the mitigation of climate change
- Presentation of successful examples of residential, public and commercial green buildings implemented in Turkey and worldwide
- Overview of international and national experience of implementation of green building certification
- Green building certification – how it works (LEED certification experience)
- Overview of benefits of green building certification for governmental and municipal authorities in terms of ensuring building’s resource efficiency and environmental quality, including reduced carbon emissions

Information about possible ways and approaches to facilitate and support the wide implementation of green building certification in Turkey Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on LEED was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by over seventy-three (73) representatives from governmental institutions, municipalities as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

- Ministry of Environment and Urbanization
- TurkStat
- Municipalities
- Other Governmental and non-governmental institution
- Project technical team members

5.2.3. Trainers

Model Presenter(s):

- **Murat Doğru:**

Murat DOĞRU graduated from METU Department of City and Regional Planning in 1993 and completed an MBA program in 1998. Murat DOĞRU is a specialist in Green Materials, Green Building and Green Settlement and Green Infrastructure. He has served consultancy about green building materials, LEED green building certification, Envision Green Infrastructure Projects Certification, environmentally friendly construction, green building and infrastructure projects, construction and city-Regional Planning in various projects in Turkey and foreign countries. Since 1993 he has contributed as a technical expert to numerous studies on Green Building Practices, Green City and Regional Planning, Urban Development, Transportation Studies and Planning, IT Projects, EU-IPA Projects and Architectural Projects. while he was a manager. In addition to the spatial dimension of planning; and also took part in sustainable and strategic planning, economic, social and institutional aspects. Between 1999 and 2009, he worked as Chief Advisor, Head of IT Department, Department of Studies and Projects, and Head of Department of Construction at Ankara Metropolitan Municipality. He also served as the Chairman of the Board of Directors and Member of the Board of Directors in Municipal Economic Enterprises. Regarding sustainable planning, it has been found in many applications in public and private. Since 2009, he has provided consulting services on green buildings, green settlements and green infrastructure projects. Murat DOĞRU, LEED® Accredited

Professional has ENV SP Green Infrastructure Certification. He is a member of USGBC, ASHRAE and ISI.

- **Nursun Doğru:**

In 1993, She graduated from METU Department of City and Regional Planning with First Prize. Between 1993-1996, She worked as a transportation planner and general manager technical consultant at the Ankara Metropolitan Municipality / EGO General Directorate and took an active role in the works of METRO and ANKARAY Projects. Between 1996-2003 She worked as a lecturer in the Department of City and Regional Planning, Faculty of Architecture, METU. In this period she gave lessons at; the city planning master studio, the legal dimension of planning, the economics and basic design courses for the planners. During this period, she also gained the title of European Union Expert from Ankara University European Community Research Center and served as an expert in administrative courts. In 1999, she completed her postgraduate education in METU Faculty of Architecture and received her doctorate in the same year in the field of expropriation law with her thesis on “The Effects of Rail Public Transportation Systems on People's Transportation Preference” 1999.

Between 2003 and 2006, she worked as Expropriation Specialist and Coordinator of Environmental Impact Assessment Projects in BP- under Baku- Tbilisi-Ceyhan Pipeline Project. Between 2006 and 2014, she worked at BILKENT HOLDING as Ankara Technology Development Center/CYBERPARK, then as TEPE CONSTRUCTION INDUSTRY CO. INC. As Director of Land Development and LEED Director. Between 2005-2007, she worked as Vice President and Member of Aesthetic Committee at Ankara Regional Council for the Protection of Cultural and Natural Property 2005. In 2011 LEED AP ND (Neighborhood Development) was Turkey's first and still the only specialist in the branch. Since 2014, she has been working as a Green Building-Settlement Expert and Project Coordinator at the ECOBUILD Green Building Consultancy Company.

- **Zeynep Çakır:**

Graduated from the Department of Aerospace Engineering, METU in 2006 (BSc) and 2011 (MSc). She worked as a systems engineer in Roketsan Inc. between years 2006-2008. She carried out her MSc study between 2008-2011 during when she worked as a TUBITAK-supported project and then graduate research assistant in the Department of Aerospace Engineering at METU. She had a special interest in global environmental issues and human-environment interaction since her early days in the university. She took several courses related to sustainable development, environmental economics, global warming and green buildings during her PhD study. She received LEED AP BD+C credential in 2013. She has been actively working on several LEED projects in

different regions of Turkey since 2012. She also has expertise on WELL building standard which focuses on healthy and human-centric building design and has been holding her WELL AP credential since 2016.

5.3. Logistics and Organizational Arrangements

The third training course on LEED was held at four-star HM Commerce Hotel, Ankara on March 27-28, 2019 with the participation of over seventy-three (73) attendees. (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, exercise booklets, LEED guidelines, notebooks, pens etc.

During the training, a consecutive interpretation was provided to create a better environment where clear understanding was provided for the participants for the introduction part. Since the main part of the training was in the Turkish language, no interpretation was needed after the introduction part of the event.

5.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings. Please see ANNEX 4. (There is no ANNEX 4 in previous pages please check the annexes)

During the training, a total of 33 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially
Are you satisfied with the training?	29	-	4
Do you think the training was performed according to the agenda distributed	22	1	5
Are you satisfied with the performance of the trainers?	32	-	1
Are you satisfied with the organizational arrangements including hotel, translation, catering etc.?	14	1	18

Do you think sufficient time was allocated for the Q-A session?	32	-	1
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings energy modelling More participation from the state institutions		

In addition to the above-mentioned comments, some of the participants indicated the importance of carrying out more in-depth & longer trainings on green buildings. On the other hand, some participants criticized the location of the selected hotel due to transportation problems encountered.

To conclude, the training course on LEED has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic.

5.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 5

The Vehicle Stock Projection and Scenario Evaluation Software (SIBYL)

6. TRAINING- 5

6.1. Introduction to the project and objectives of the SIBYL training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the EX-ACT training are as follows:

The objectives of SIBYL training is to conduct a capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development, in particular in the transport sector. The training was requested by the Ministry of Transport and Infrastructure and supported by the project Beneficiary, Ministry of Environment and Urbanisation.

6.2. Description of Training

6.2.1. Training Information Sheet

Name of the event	**The Vehicle Stock Projection and Scenario Evaluation Software – Transport Sector**
Date of the event	October 15-16, 2019
Event type	Training Course
Duration of the training	2-day
Venue of the training	Mövenpick Hotel, Çukurambar - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	26
Represented institutions	Ministry of Environment and Urbanization Ministry of Transport and Infrastructure TurkStat Other Governmental and non-governmental institutions Directorate General of High Ways Project technical team members and sectoral experts
Trainers	Chariton Kouridis – Senior Training Expert for SIBYL Tool, EMISIA, Greece Wim Verhoeve – Senior Training Expert for SIBYL Tool, EMISIA, Brussels

6.2.2. What is SIBYL?

SIBYL is a Microsoft Windows software program, envisaged as a vehicle stock projection tool with internal energy consumption, emission and cost estimation capabilities, with respect to the road transport sector and the evaluation of scenarios and policies. A detailed EU-wide vehicle stock baseline database has been included in the application so that the user can evaluate custom scenarios based on real-life data.

It is used as EU standard software and developed based on COPERT 4&5, which are widely used in many countries, including Turkey – the Ministry of Environment and Urbanisation, the Ministry of Transport and Infrastructure, TurkStat etc

6.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively SIBYL by engaging in ongoing professional dialogues. The objective of the training was to conduct the capacity building for the key stakeholders to enhance the necessary institutional capacity ensuring low carbon development according to Activity 4.3.1

The major topics covered during the training were:

- SIBYL general methodology
- SIBYL input data
- Case study: high share EV
- Hands-on session
- Future steps
- Examples of user request

6.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on SIBYL training was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by over twenty-six (26) representatives from governmental institutions, non-governmental organisation, academia as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

- Ministry of Environment and Urbanisation

- Ministry of Transport and Infrastructure
- Directorate General of High Ways
- TURKSTAT
- Other Governmental and Non-Governmental Organizations
- Project Technical Team Members and Sectoral Experts

6.2.5. Trainers

Model Presenter:

- Chariton Kouridis – Senior Training Expert for SIBYL Tool, EMISIA,

Charis Kouridis is a mechanical engineer. He graduated from the Aristotle University of Thessaloniki, mechanical engineering department in 1998. He was the main developer of COPERT 3 and has been working with the development of the methodology ever since. He is a project manager in EMISIA since 2008 and his expertise includes emissions and energy consumption calculation from road transport. He is supporting SIBYL users and monitors the development of the methodology.

- Wim Verhoeve – Senior Training Expert for SIBYL Tool Sector, EMISIA,

Wim Verhoeve is an industrial engineer working as Business Development Manager at EMISIA. He graduated from the University of Katholieke Hogeschool Brugge-Oostende in 1994. He has over 25 years of experience, including 8 years experience in GHG emissions in the transport sector, both on regional and the federal level.

6.3. Logistics and Organizational Arrangements

The training course on SIBYL was held at five-star Point Inn Hotel, Ankara on October 15-16, 2019 with the participation of twenty-six (26) attendees. (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with a classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, notebooks, pens etc. Also, eight laptops were provided to the participants for interactive lecturing and hands-on session.

During the training, a professional simultaneous interpretation was provided to create a better environment where clear understanding was provided for the participants.

6.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion

and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings (please see ANNEX 5).

During the training a total of 14 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	**Yes**	**No**	**Partially**
Are you satisfied with the training?	14	-	-
Do you think the training was performed according to the agenda distributed	14	-	-
Are you satisfied with the performance of the trainers?	14	-	-
Are you satisfied with the organizational arrangements including hotel, translation, catering etc.?	14	-	-
Do you think sufficient time was allocated for the Q-A session?	14	-	-
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings		

In addition to the following comments, participants expressed their satisfaction with EMISIA experts; and requested a training course where emission factors are developed, and assumptions & methods used for calculation. To conclude, the training course on SIBYL has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic.

6.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 6

Carbon Pricing and EU ETS Training

7. TRAINING- 6

7.1. Introduction to the project and objectives of the Carbon Pricing & EU ETS training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the Carbon Pricing & EU ETS training are as follows:

The objectives of Carbon Pricing & EU ETS training is to conduct a capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development, The training was requested by the project Beneficiary, Ministry of Environment and Urbanisation.

7.2. Description of Training

7.2.1. Training Information Sheet

Name of the event	Carbon Pricing & EU ETS Training
Date of the event	January 23 & 24, 2020
Event type	Training Course
Duration of the training	2-day
Venue of the training	Point Hotel, Çukurambar - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	32
Represented institutions	Ministry of Environment and Urbanization Ministry of Foreign Affairs Ministry of Energy and Natural Sources Ministry of Treasury and Finance Ministry of Agriculture and Forestry Ministry of Commerce Turkish Industry and Business Association Turkish Cement Manufacturers' Association Turkish Steel Producers' Association
Trainers	**Daniel Scholz** – Senior Training Expert for Carbon Pricing & EU ETS, FutureCamp, Germany **Johanna Lausen** – Junior Training Expert for Carbon Pricing & EU ETS, FutureCamp, Germany

7.2.2. What is Carbon Pricing & EU ETS?

“Carbon pricing” is a market-based strategy for lowering global warming emissions. The aim is to put a price on carbon emissions—an actual monetary value—so that the costs of climate impacts and the opportunities for low-carbon energy options are better reflected in our production and consumption choices.

The fossil fuels (coal, oil, and natural gas) we use to generate electricity, power our vehicles, and heat our homes all produce carbon dioxide emissions, which are a leading cause of climate change.

Putting a price on carbon helps to incorporate climate risks into the cost of doing business. Emitting carbon becomes more expensive, and consumers and producers seek ways to use technologies and products that generate less of it. The market then operates as an efficient means to cut emissions, fostering a shift to a clean energy economy and driving innovation in low-carbon technologies. Complementary renewable energy and energy efficiency policies are also critical to cost-effectively drive down emissions. Carbon pricing is widely considered as a powerful, efficient, and flexible tool for helping to address climate change, and is supported by an array of experts, businesses, investors, policymakers, civil society groups, states, and countries.

The EU emissions trading system (EU ETS) is a cornerstone of the EU's policy to combat climate change and its key tool for reducing greenhouse gas emissions cost-effectively. It is the world's first major carbon market and remains the biggest one.

It operates in all EU countries plus Iceland, Liechtenstein and Norway, limits emissions from more than 11,000 heavy energy-using installations (power stations & industrial plants) and airlines operating between these countries, and covers around 45% of the EU's.

7.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively Carbon Pricing and EU ETS by engaging in ongoing professional dialogues. The objective of the training was to conduct the capacity building for the key stakeholders to enhance the necessary institutional capacity ensuring low carbon development according to Activity 4.3.1

The major topics covered during the trainings were:

- ETS Introduction

- Status of ETS developments in Turkey
- Basics of ETS
- Scope and Coverage
- Allocation
- Monitoring, reporting and verification
- ETS implementation

7.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on Carbon Pricing & EU ETS was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by thirty-two (32) representatives from governmental institutions, non-governmental organisation, academia as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

- Ministry of Environment and Urbanization
- Ministry of Foreign Affairs
- Ministry of Energy and Natural Sources
- Ministry of Treasury and Finance
- Ministry of Industry and Technology
- Ministry of Agriculture and Forestry
- Ministry of Transportation and Infrastructure
- Ministry of Commerce
- Turkish Industry and Business Association
- Turkish Cement Manufacturers' Association
- Turkish Steel Producers' Association

7.2.5. Trainers

Daniel Scholz – Senior Training Expert for Carbon Pricing & EU ETS, FutureCamp, Germany

Mr Daniel Scholz is graduated from the University of Munich, Political Sciences department in 2007. He has been working at FutureCamp as a Senior Project Manager and Consultant in Key account for ETS various clients, Expert in international ETS

capacity building activities, implementation of carbon market research projects and policy advisory

Johanna Lausen – Junior Training Expert for Carbon Pricing & EU ETS, FutureCamp, Germany

Ms Johanna graduated from the University of Flensburg, Energy efficiency analysis of manual welding processes in the mechanical engineering department in 2017. She has been working at FutureCamp as a Project Manager and Consultant in Trading desk key account for various ETS clients, training expert on emissions trading implementation and trading strategies, key author in carbon market research projects.

7.3. Logistics and Organizational Arrangements

The training course on Carbon Pricing & EU ETS was held at five-star Point Hotel, Ankara on January 23-24, 2020 with the participation of thirty-two (32) attendees. (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with a classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, notebooks, pens etc. Also, a whiteboard was provided to the model presenter for interactive lecturing and exemplification.

During the training, a professional simultaneous interpretation was provided to create a better environment where clear understanding was provided for the participants.

7.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the training, and on their needs/preferences for the future trainings (please see ANNEX 5).

During the training, a total of 20 Evaluation Forms were filled in. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially
Are you satisfied with the training?	20	-	-
Do you think the training was performed according to the agenda distributed	19	1	-
Are you satisfied with the performance of the trainers?	20	-	-

Are you satisfied with the organizational arrangements including hotel, translation, catering etc.?	20	-	-
Do you think sufficient time was allocated for the Q-A session?	20	-	-
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings		

In addition to the above-mentioned comments, some of the participants indicated the importance of the topics covered by the training in terms of improving the understanding of how EU ETS approach and methodology may work in Turkey.

To conclude, the training course on Carbon Pricing and EU ETS has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic

7.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 7

The Main Components of the Paris Agreement and Its Implementation

8. TRAINING- 7

8.1. Introduction to the project and objectives of the Main Component of the Paris Agreement training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the Main Components of the Paris Agreement training are as follows:

The objectives of the Main Components of the Paris Agreement training is to conduct a capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development, in particular in the multi-cultural sector. The training was requested by the Ministry of Environment and Urbanisation.

8.2. Description of Training

8.2.1. Training Information Sheet

Name of the event	Main Components of the Paris Agreement
Date of the event	January 30-31, 2020
Event type	Training Course
Duration of the training	2-day
Venue of the training	Point Hotel, Çukurambar - Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	54
Represented institutions	Ministry of Environment and Urbanization Ministry of Transport and Infrastructure Ministry of Foreign Affairs /General Directorate of EU Affairs Ministry of Energy and Natural Resource Ministry of Treasury and Finance Ministry of Industry and Technology Ministry of Commerce Turkish Union of Chambers and Commodity Exchanges Turkish Industrialists' and Businessmen's Association TURSTAT Other Governmental and Non-Governmental Institutions

	Project Technical Team Members and Sectoral Experts
Trainers	**Leonardo Massai** – Senior Training Expert, Climalia, Italy

8.2.2. What is the PARIS AGREEMENT?

At COP 21 in Paris, on 12 December 2015, Parties to the UNFCCC reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future.

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to increase the ability of countries to deal with the impacts of climate change, and at making finance flows consistent with low GHG emissions and climate-resilient pathway. To reach these ambitious goals, appropriate mobilization and provision of financial resources, a new technology framework and enhanced capacity-building is to be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their national objectives.

The Paris Agreement requires all Parties to put forward their best efforts through "nationally determined contributions" (NDCs) and to strengthen these efforts in the years ahead. This includes requirements that all Parties regularly report on their emissions and their implementation efforts.

8.2.3. Turkey's Status

Turkey signed the agreement on April 22, 2016, but has not ratified the agreement yet, which entered into force in November 2016. As of today, 189 countries out of 197 signatories have already ratified and joined the agreement.

The Agreement t divides nations into two categories - as "developed" and "developing" ad it obliges the developed countries to financially support the efforts of the latter to build clean, climate-resilient futures.

The reason why Turkey has not yet ratified the agreement is that it's categorized as a developed country with the obligation to provide financial resources to assist developing countries in implementing the objectives of the climate convention.

However, Turkey considers itself as a developing country and needs financial assistance to be able to implement the agreement

8.2.4. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn collaboratively the main components of the Paris Agreement by engaging in ongoing professional dialogues. The objective of the training was to conduct the capacity building for the key stakeholders in order to enhance the necessary institutional capacity ensuring low carbon development according to Activity 4.3.1

The major topics covered during the training were:

- UNFCCC & KYOTO Protocol
- The long way to the Paris Agreement
- Turkey's special circumstances in the climate regime
- Main elements of the Paris Agreement –AGREEMENT PROVISIONS
- Main elements of the Paris Agreement-KATOWICE PACKAGE
- Paris Agreement Implementation
- Climate change multilateral negotiations (UNFCCC and Paris Agreement)

8.2.5. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letter for the training on the main components of the Paris Agreement training was sent to related project stakeholders by the Ministry of Environment and Urbanization (Beneficiary Institution) (Please see the ANNEX 2).

The training was attended by fifty-four (54) representatives from governmental institutions, non-governmental organisation, academia, as well as sectoral experts and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

- Ministry of Environment and Urbanization
- Ministry of Transportation and Infrastructure
- Ministry of Foreign Affairs / General Directorate of EU Affairs
- Ministry of Energy and Natural Resources
- Ministry of Treasury and Finance
- Ministry of Industry and Technology
- Ministry of Commerce
- Turkish Union of Chambers and Commodity Exchanges
- Turkish Industrialists' and Businessmen's Association

- TURKSTAT
- Other Governmental and non-governmental institutions
- Project technical team members and sectoral experts

8.2.6. Trainers

Leonardo Massai – Senior Training Expert for the Main Components of the Paris Agreement, Climalia, Italy

Leonardo Massai graduated from the Aristotle University of Florence, International relations and political science department in 2001.

He is a Co-Founder of Climalia (www.climalia.eu) and Associate to Acclimatise (www.acclimatise.co.uk), climate change services on adaptation, resilience and urban planning and development; and a Senior Legal Advisor and Assistant Professor on International and European Environmental Law and Policy, Climate Change, Carbon market and Emissions Trading, Forestry, Development Cooperation, Renewable Energy and Energy Efficiency.

8.3. Logistics and Organizational Arrangements

The training course on the Main Components of the Paris Agreement was held at five-star Point Inn Hotel, Ankara on October 15-16, 2019, with the participation of over fifty-four (54)attendees. (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with a classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, notebooks, pens etc. Also, eight laptops were provided to the participants for interactive lecturing and hands-on session.

During the training, a professional simultaneous interpretation was provided to create a better environment where clear understanding was provided for the participants.

8.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participant's opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings. Please see ANNEX 5.

During the training, a total of 27 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially
Are you satisfied with the training?	26	-	1
Do you think the training was performed according to the agenda distributed	21	-	6
Are you satisfied with the performance of the trainers?	26	-	1
Are you satisfied with the organizational arrangements including hotel, translation, catering, etc.?	24	-	3
Do you think sufficient time was allocated for the Q-A session?	27	-	-
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings		

In addition to the following comments, participants expressed their satisfaction with training and the expert; and requested a training course on Enhanced Transparency Framework (ETF) where case studies are presented. To conclude, the training course on the Main Components of the Paris Agreement has shown great interest and demand. Participants actively joined discussions and Q-A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic

8.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 8

TIMES modelling framework: theory and sectoral implementations for the agriculture and transport sectors

9. TRAINING- 8

9.1. Introduction to the project and objectives of the TIMES modelling framework: theory and sectoral implementations for the agriculture and transport sectors

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions, ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the TIMES training is to introduce this integrated multisectoral economic/energy/environmental (GHG) modelling framework as a basic tool for the assessment of GHG mitigation actions potentials and costs in four target sectors, as well as for sectoral GHG scenarios analysis and preparation of recommendations on most important and cost-effective mitigation actions.

9.2. Description of Training

9.2.1. Training Information Sheet

Name of the event	**TIMES modelling framework: theory and sectoral implementations for the agriculture and transport sectors**
Date of the event	4-5-6 March 2020
Event type	Training Course
Duration of the training	3-day
Venue of the training	The Premises of the Ministry of Environment and Urbanization, Ankara
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	21
Represented institutions	Ministry of Environment and Urbanization Ministry of Transportation and Infrastructure Ministry of Agriculture and Forestry Other Governmental and non-governmental institution
Trainers	Associate. Prof. Kemal Sarıca, Işık University and Lead Author of the reports on Component 3 - Activity 3.1&3.2

9.2.2. What is TIMES Modelling Framework?

TIMES (The Integrated MARKAL-EFOM System) is a bottom-up optimization model generator that allows accurate energy and environmental policy analysis at the local, national or multi-regional level. The theoretical background of the modelling framework is introduced. Two sectoral implementations, namely transportation and agriculture sectors, are elaborated, and results are discussed.

9.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn TIMES Modelling Framework collaboratively by engaging in ongoing professional dialogues.

The major topics covered during the training were:

- Class interactions and the use of the classical whiteboard and VEDA software directly.
- Develop professional knowledge, skills and understanding of relevant stakeholders in developing and implementing low carbon and climate mitigation measures.
- Enable participants to learn collaboratively by engaging in ongoing professional dialogues and learning from and with each other.
- Understand sectoral realizations of the modelling framework and capture the model results implications

9.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letters for the training on TIMES Modelling Framework: theory and sectoral implementations for agriculture and transport sectors were sent to related project stakeholders by the Beneficiary Institution - Ministry of Environment and Urbanization (Please see the ANNEX 2).

The training was attended by forty-seven (47) representatives from governmental institutions, non-governmental organisation, and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3)

9.2.5. Trainers

<u>Kemal Sarıca, Senior Expert, Lead Modeller:</u>

Dr.Kemal Sarıca is an energy systems modeller. His main research interest is energy-economy-environment interaction under various climate change and energy policies. Besides, he is also interested in electricity market modelling for various market designs under full AC grid structure and their implications.

He completed his BS degree in Mechanical Engineering in 2001 at Boğaziçi University. He also completed his graduate and doctoral studies at the same university in 2004 and 2010 respectively, in Industrial Engineering focused on the energy and electricity sectors. He continued his post-doctoral research in Agricultural Economics

Department at Purdue University working on US Renewable Fuel Standards (RFS), Clean Energy Standards (CES), Corporate Average Fuel Efficiency (CAFE) analyzing the possible impacts using the bottom-up and hybrid modelling approaches.

Dr. Sarıca is a founding member Association for Energy Economics (EED) and member of the International Association for Energy Economics (IAEE). He is currently, a professor in the Department of Industrial Engineering at Işık University.

9.3. Logistics and Organizational Arrangements

TIMES Modelling framework training was held in the premises of the Ministry of Environment and Urbanisation on March 4-5-6, 2020, with the participation of twenty-one (21) attendees (Please see ANNEX 3). Two Coffee Breaks (morning/afternoon refreshments) and lunch were organised by the project technical team.

A meeting room with a classroom setting was prepared, participants were provided with the visibility materials such as Agenda of the Training, folders, notebooks, pens etc. Also, a whiteboard was provided to the model presenter for interactive lecturing and exemplification.

Since the training language was Turkish, no simultaneous translation needed.

9.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an Evaluation Form which was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings (please see ANNEX 5).

During the training, 18 Evaluation Forms were filled. Please see the table below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially
Are you satisfied with the training?	18	-	-
Do you think the training was performed according to the agenda distributed	18	-	-
Are you satisfied with the performance of the trainers?	18	-	-
Are you satisfied with the organizational arrangements, including hotel, translation, catering, etc.?	18	-	-

Do you think sufficient time was allocated for the Q&A session?	17	-	1
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings In-depth trainings on the modelling tools		

To conclude, the training course on TIMES Modelling Framework has shown great interest and demand. Participants actively joined discussions and Q&A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic

9.5. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
3.	List of Participants
4.	Training and Capacity Building Evaluation Forms
5.	Training Materials
6.	Photos

TRAINING- 9

TIMES modelling framework: theory and sectoral implementations for the buildings and waste sectors

10. TRAINING- 9

10.1. Introduction to the project and objectives of the TIMES modelling framework: theory and sectoral implementations for the buildings and waste sectors

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions, ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 10 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the TIMES modelling framework: theory and sectoral implementations for the buildings and waste sectors training is to introduce this integrated multisectoral economic/energy/environmental (GHG) modelling framework as a basic tool for the assessment of GHG mitigation actions potentials and costs in four target sectors, as well as for sectoral GHG scenarios analysis and preparation of recommendations on most important and cost-effective mitigation actions.

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10.2. Description of Training

10.2.1. Training Information Sheet

Name of the event	**TIMES modelling framework: theory and sectoral implementations for the buildings and waste sectors**
Date of the event	29-30 April 2019
Event type	Training Course
Duration of the training	2-day
Venue of the training	The Premises of the Ministry of Environment and Urbanization, Ankara
Agenda	WEBEX Webinar
Total number of participants	25
Represented institutions	Ministry of Environment and Urbanization Ministry of Agriculture and Forestry TurkStat Other Governmental and non-governmental institutions Academics Project technical team members and sectoral experts
Trainers	**Associate. Prof. Kemal Sarıca**, Işık University and Lead Author of the reports on Component 3 - Activity 3.1&3.2

10.2.2. What is TIMES Modelling Framework?

TIMES (The Integrated MARKAL-EFOM System) is a bottom-up optimization model generator that allows accurate energy and environmental policy analysis at the local, national or multi-regional level. The theoretical background of the modelling framework is introduced. Two sectoral implementations, namely buildings and waste sectors, are elaborated, and results are discussed.

10.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn TIMES Modelling Framework collaboratively by engaging in ongoing professional dialogues.

The major topics covered during the training were:

- Class interactions and the use of the VEDA software directly.
- Develop professional knowledge, skills and understanding of relevant stakeholders in developing and implementing low carbon development and climate mitigation measures.
- Enable participants to learn collaboratively by engaging in ongoing professional dialogues and learning from and with each other.
- Understand sectoral realizations of the modelling framework and capture the model results implications

10.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letters for the training on TIMES Modelling Framework: theory and sectoral implementations for agriculture and transport sectors were sent to related project stakeholders by the Beneficiary Institution - Ministry of Environment and Urbanization (Please see the ANNEX 2).

The training was attended by twenty-five (25) representatives of governmental institutions, non-governmental organisation, and project technical team members.

The list of represented institutions are as follows: (Please see ANNEX 3).

10.2.5. Trainers

<u>Kemal Sarıca Senior Expert, Lead Modeller:</u>

Dr.Kemal Sarıca is an energy systems modeller. His main research interest is energy-economy-environment interaction under various climate change and energy policies.

Besides, he is also interested in electricity market modelling for various market designs under full AC grid structure and their implications.

He completed his BS degree in Mechanical Engineering in 2001 at Boğaziçi University. He also completed his graduate and doctoral studies at the same university in 2004 and 2010 respectively, in Industrial Engineering focused on the energy and electricity sectors. He continued his post-doctoral research in Agricultural Economics Department at Purdue University working on US Renewable Fuel Standards (RFS), Clean Energy Standards (CES), Corporate Average Fuel Efficiency (CAFE) analysing the possible impacts using the bottom-up and hybrid modelling approaches.

Dr. Sarıca is a founding member Association for Energy Economics (EED) and member of the International Association for Energy Economics (IAEE). He is currently, a professor in the Department of Industrial Engineering at Işık University.

10.3. Logistics and Organizational Arrangements

TIMES Modelling framework training was held through an online webinar platform called WEBEX on April 29-30, 2020 with the participation of 25 attendees (Please see ANNEX 3).

Since the training language was Turkish, no simultaneous translation needed.

10.4. Training Evaluation and Conclusions

After the training, the participants were asked to fill an “Evaluation Form”. With the distributed Evaluation Forms, it was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings. Please see ANNEX 5.

During the training, a total of 25 Evaluation Forms was filled. Please see the table given below for the summary of the evaluation form.

Training Evaluation Questions	Yes	No	Partially
Are you satisfied with the training?	25	-	-
Do you think the training was performed according to the agenda distributed	25	-	-
Are you satisfied with the performance of the trainers?	25	-	-
Are you satisfied with the organizational arrangements, including hotel, translation, catering, etc.?	22	1	2

Do you think sufficient time was allocated for the Q&A session?	24	-	1
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?	Further trainings In-depth trainings on the modelling tools		

To conclude, the training course on TIMES Modelling Framework has shown great interest and demand. Participants actively joined discussions and Q&A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic

10.5. Training Annexes

Annexes List	
1.	Agenda
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TRAINING- 10

Marginal Abatement Cost Curve (MACC)

11. TRAINING 10

11.1. Introduction to the project and objectives of the MACC training

The overall objective of the project is to reduce anthropogenic GHG emissions to contribute to the global efforts to mitigate climate change in line with scientific evidence.

The Project Purpose is to increase national and local capacity to prepare for medium and long-term climate action towards climate-resilient low-carbon development, which will gradually align with the EU climate policy and legislation by providing an analytical basis to support the realisation of low carbon in the long-term, specifically focusing on cost-effective climate change mitigation actions related to building, waste, transport and agriculture sectors of NCCAP.

The purpose of the project will be realised through the achievement of four distinct yet highly interconnected results:

- **Result 1:** Review of existing strategies in relation to Climate Change.
- **Result 2:** Preparation of regulatory and sectoral impact assessments for EU climate acquis.
- **Result 3:** Determination of the costs and emission mitigation potential of the actions specified within the energy, industry, buildings, waste, transport and agriculture sectors of the NCCAP.
- **Result 4:** Developing an analytical basis for possible strategies and actions ensuring green growth in the long term.

Sub-Activity 4.3.1: Capacity building for key stakeholders envisages delivery of minimum 11 training courses, which will contribute to capacity building for key stakeholders to enhance the necessary institutional capacity ensuring low carbon development in the long term.

More information about the project can be found on the website http://www.lowcarbonturkey.org/.

Objectives of the MACC training are as follows:

- Familiarizing the participants with the bottom-up model structure
  Basics of Reference Energy System
  Technology/Process definitions and understanding use of it.
  Energy/Material relationships
  Agriculture and Transport model structures
  Model data and base year calibration process
  How to use model results - real-life implications

11.2. Description of Training

11.2.1. Training Information Sheet

Name of the event	**Marginal Abatement Cost Curve (MACC)**
Date of the event	23-24 June, 220
Event type	Training Course
Duration of the training	2-day
Venue of the training	Online Platform, WebEx
Agenda	Please see ANNEX 1 for the Agenda of the Meeting
Total number of participants	9
Represented institutions	Ministry of Environment and Urbanization Project technical team members and sectoral experts
Trainers	**Associate. Prof. Kemal Sarıca**, Işık University and Lead Author of the reports on Component 3 - Activity 3.1&3.2

11.2.2. What is MACC?

A marginal abatement cost curve (MACC) is defined as a graph that indicates the cost, associated with the last (the marginal cost) of emission abatement for varying amounts of emission reduction. Therefore, a baseline with no CO_2 constraint has to be defined to assess the marginal abatement cost against this baseline development.

MACCs make easier to see the total cost associated with the desired mitigation level. Even-though concept of MAC curves is very useful with in the process of decision making around the policy-makers, due to the simple representation of the cost related to emission mitigation, one should consider the possible disadvantages of the MAC approach that can limit the benefits of its use.

11.2.3. Training Approach

During the training, a Participatory Approach was used to develop professional knowledge, skills and understanding of relevant stakeholders to enable participants to learn MACC collaboratively by engaging in ongoing professional dialogues.

The major topics covered during the training were:

- MACC theory and limitations
- Deployed model and the pathway to construct MACCs
- How to use MACCs to estimate the expected cost of mitigation
- Design of policies that should favour the technologies for the desired mitigation based on MACCs
- Use of MACC for possible emission mitigation abatement levels and limitations for real-life implications.

11.2.4. Participating Project Stakeholders

Following the approval of the training agenda and the list of expected participants, the official invitation letters for the training on Marginal Abatement Cost Curves sent to related project stakeholders by the Beneficiary Institution - Ministry of Environment and Urbanization (Please see the ANNEX 2).

The training was attended by nine (9) representatives of governmental institutions, non-governmental organisation, and project technical team members.

The list of represented institutions are as follows (please see ANNEX 3).

11.2.5. Trainers

Model Presenter:

- Kemal Sarıca Senior Expert, Lead Modeller:

Dr.Kemal Sarıca is an energy systems modeller. His main research interest is energy-economy-environment interaction under various climate change and energy policies. Besides, he is also interested in electricity market modelling for various market designs under full AC grid structure and their implications.

He completed his BS degree in Mechanical Engineering in 2001 at Boğaziçi University. He also completed his graduate and doctoral studies at the same university in 2004 and 2010 respectively, in Industrial Engineering focused on the energy and electricity sectors. He continued his post-doctoral research in Agricultural Economics Department at Purdue University working on US Renewable Fuel Standards (RFS), Clean Energy Standards (CES), Corporate Average Fuel Efficiency (CAFE) analyzing the possible impacts using the bottom-up and hybrid modelling approaches.

Dr. Sarıca is a founding member Association for Energy Economics (EED) and member of the International Association for Energy Economics (IAEE). He is currently, a professor in the Department of Industrial Engineering at Işık University.

11.2.6. Logistics and Organizational Arrangements

MACC training was held through an online webinar platform called WEBEX on June 23-34, 2020 with the participation of nine (9) attendees (Please see ANNEX 3).

Since the training language was Turkish, no simultaneous translation needed.

11.3. Training Evaluation and Conclusions

After the training, the participants were asked to fill an online Evaluation Form which was aimed to get the participants' opinion/suggestion and recommendation on the efficiency of the Training, and on their needs/preferences for the future trainings (please see ANNEX 5).

During the training, 6 Evaluation Forms were filled. Please see the table below for the summary of the evaluation form.

Training Evaluation Questions	**Yes**	**No**	**Partially**
Are you satisfied with the training?	6	-	-
Do you think the training was performed according to the agenda distributed	5	-	1
Are you satisfied with the performance of the trainers?	6	-	-
Are you satisfied with the organizational arrangements, including hotel, translation, catering, etc.?	5	-	1
Do you think sufficient time was allocated for the Q&A session?	5	-	1
What are your needs and preferences for future trainings in the area of GHG mitigation and low carbon development?			

To conclude, the training course on MACC has shown great interest and demand. Participants actively joined discussions and Q&A sessions. Most of the participants found the training course useful and beneficial. They expressed their interest in participating in more in-depth future trainings related to the topic

11.3.1. Training Annexes

Annexes List	
1.	Agenda
2.	Invitation Letter and Distribution List
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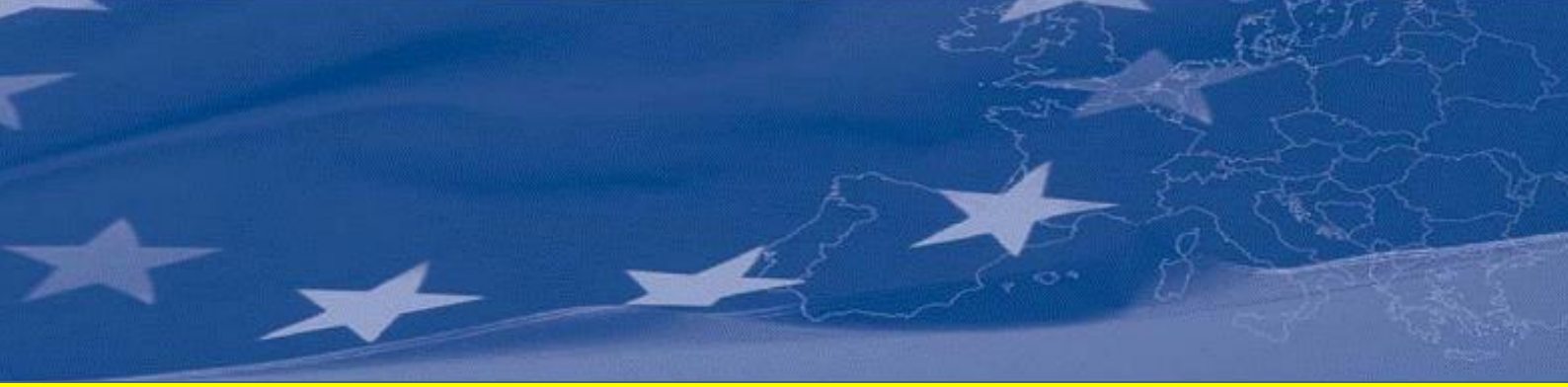
5.	Training Materials
6.	Photos



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