

Validation workshop report

Supporting the Application of the GACMO Model and
Capacity Building on MRV Related to Article 6
Participation in Ethiopia

(Project Ref. 11875-003/ICAT/2023/03)



19 March 2025



Validation workshop report

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AUTHORS

Mekonnen Maschal Tarekegn (PhD)
Global Environmental Solution, General Manager

Reviewers

Ivana Audia, Dr. Xianli Zhu, Dr. Aiymgul Kerimray
UNEP Copenhagen Climate Centre

Dr. Marina Vitullo, Dr. Vanessa Leonardi
ISPRA

Mr. Benti Firdessa (Director, MRV Directorate)
FDRE EPA, Ethiopia

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PREPARED UNDER

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Abbreviation

BAU	Business as Usual
CRGE	Climate-Resilient Green Economy Strategy
GACMO	Greenhouse Gas Abatement Cost Model
GHG	Greenhouse gas
GES	Global Environmental Solution
GWPs	Global warming potentials
ICAT	Initiative for Climate Action Transparency
IPCC	Intergovernmental Panel on Climate Change
MRV	Measuring, Reporting and Verification
NDC	Nationally Determined Contributions
UNEP-CCC	UNEP Copenhagen Climate Centre
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Organization for Procurement Services

1. Background

Ethiopia has shown its strong climate action commitment in various ways. The country has revised its climate resilient green economic development policy to align with the global climate actions and has submitted its Intended National Determined Contribution (INDC) in 2015 which became Ethiopia's NDC in 2017. Finally, it has been updated and submitted in 2021 with nomenclature of Ethiopia's Updated NDC 2021. The Ethiopia's Updated NDC has identified both mitigation and adaptation efforts to reduce both GHG emissions and the vulnerability of livelihoods to climate impacts. The updated NDC is integrated in Ethiopia's Ten-Year Development Plan published in June 2020, and will form the basis of updating its core climate strategy, the 2011 "Climate Resilient Green Economy" (CRGE) strategy. Ethiopia's own climate plans are within the range of what is considered to be a fair share of global effort; however, the country needs to have a system to tracking framework to see the exact contribution of each mitigation policies for its global share of carbon reduction. Also, the country needs to implement effective mitigation policies at reduced abatement cost with a reasonable emission reduction potential. In addition, the country needs to implement article 6 of the Paris agreement to increase its global benefits. Due to this reason, Ethiopia has demanded support of the Initiative for Climate Action Transparency (ICAT) to capacity building on Article 6 and GACMO tool Methodology for evaluating its mitigation policies and developing mitigation policies tracking framework of its Updated NDCs.

As a result, the ICAT Secretariat, the FDRE Environmental Protection Agency, and the UNEP Copenhagen Climate Centre (UNEP-CCC) have arranged and provided two support provisions such as application of the GACMO model and capacity building on the MRV related to Article 6 participation. The Initiative for Climate Action Transparency (ICAT) has taken the international lead in this global support provision by financial support and technical facilitation in coordinating the key international working teams including ISPra. ICAT has recruited Global Environmental Solution to facilitate and perform the mission in Ethiopia. Through a comprehensive online and in-person training session, ICAT and its partners have given technical support to enhance Ethiopia's capacity in utilizing GACMO tool and Article 6 implementation preparation, effectively. In addition, ICAT has given a technical support in the preparation of four technical documents such as assessment of existing tool and/or model utilized in the Ethiopia's Updated NDC, Guidance for Article 6 implementation readiness, Application Guidance of GACMO tool for Evaluating Mitigation Measures of the Ethiopia's Updated NDC and a Guidance of GACMO tool application for Updated NDC Tracking in Ethiopia. The technical documents preparations have passed stakeholder consultations and stepwise technical reviewing processes. In this

workshop, all technical documents were presented to potential stakeholders to make sure their interests are included in the final version as per to their sectors' perspective. Hence, this report was prepared to document all the additional comments, views and suggestions forwarded by participants of the validation workshop on the presented technical documents.

2. Objectives

The main objective of the validation workshop was to collect stakeholders' comments, opinion or views and suggestions on the guidance for Article 6 implementation readiness, GACMO tool implementation for mitigation policies evaluation and Mitigation policies implementation tracking systems according to their sectors perspectives.

3. Training place and venue

The validation workshop was taken place on 19 March 2025, in Addis Ababa, Elilly International Hotel, Ethiopia and streamed through Microsoft Team platform for international participants (Figure 1). The workshop has been taken place for half day that has covered four presentations. The workshop has been attended by 35 participants who came from various sectors such as Ministry of water and Energy, Ministry of Transport and Logistics, Ministry of mines, Ministry of Urban and Infrastructure, Ministry of Agriculture, Ministry of Industry Ministry of Trade, Ethiopian Civil Service University, Addis Ababa University, Federal Environmental Protection authority, Addis Ababa Environmental; Protection Authority and Oromia regional state Environmental Protection authority. Fully furnished facilities were arranged for the workshop with appropriate sound systems and participants were allowed to give any comments, questions and remarks.



Figure 1 Validation workshop organized in Elilly International Hotel, Addis Ababa Ethiopia, 19 March 2024.

4. List of participants

The workshop has 35 participants. About (12/35) 34% of them were female (Figure 2). The remaining 23 participants were male. And, eight (8) of the participants were directors in different ministries. Similarly, two (2) assistant professors from Addis Ababa and Ethiopian Civil Service Universities have participated. The remaining participants are senior experts who are working in the MRV related departments of the line ministries in Ethiopia.

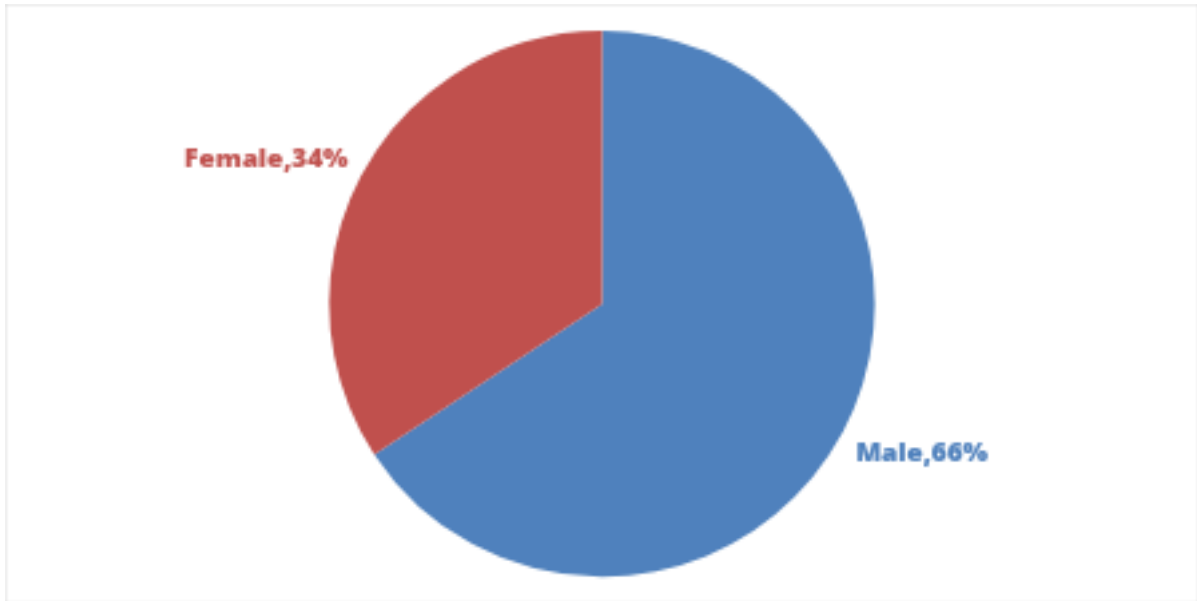


Figure 2 Gender distribution of participants of the GACMO Model in-person training

Table 1 Participant List of the Validation Workshop

S N	Name	Organization	Position	Sex
1.	Mr. Nigussue Lemma	Environmental Protection Authority (FDRE EPA)	Deputy Director General	M
2.	Mr. Benti Firdessa	Environmental Protection Authority (FDRE EPA)	Director	M
3.	Mr. Natan Cherinet	Environmental Protection Authority (FDRE EPA)	Expert	M
4.	Mrs. Nebeyat Getachew	Environmental Protection Authority (FDRE EPA)	Expert	F
5.	Hawi Girma	Environmental Protection Authority (FDRE EPA)	Expert	F
6.	Mr. Yohannes Bishaw	Ministry of Transport and Logistics (MoTL)	Director	M
7.	Mr. Yizengaw Yitayih	Ministry of Transport and Logistics (MoTL)	Expert	M
8.	Mrs. Behafta Hagos	Ministry of Transport and Logistics (MoTL)	Expert	F
9.	Tinsae Mengiste	Ministry of Industry (Mol)	Director	F

S N	Name	Organization	Position	Sex
10.	Mr. Esmael Mohammed	Ministry of Industry (MoI)	Expert	M
11.	Mrs. Eden Seyoum	Ministry of Industry (MoI)	Expert	F
12.	Rukiya Seid Yimer	Ministry of Urban and Infrastructure (MoUI)	Director	F
13.	Mr. Birhanu Sisay	Ministry of Urban and Infrastructure (MoUI)	Expert	M
14.	Mr. Anmut Bayu	Ministry of Urban and Infrastructure (MoUI)	Expert	M
15.	Hana Zebene	Ministry of Mining (MoM)	Director	F
16.	Mrs. Yayesh Mihiretie	Ministry of Mining (MoM)	Expert	F
17.	Mr. Sori Chalchisa	Ministry of Mining (MoM)	Expert	M
18.	Asefa Chimdi	Ministry of Agriculture (MoA)	Director	M
19.	Mr. Tolessa Benti	Ministry of Agriculture (MoA)	Expert	M
20.	Mr. Solomon Meless	Addis Ababa EPA	Expert	M
21.	Oumera Yadeta	EPA	Expert	
22.	Mr. Amare Fenta	Ministry of Water and Energy (MoWE)	Director	F
23.	Mrs. Sofia Mohammed	Ministry of Water and Energy (MoWE)	Expert	M
24.	Mr. Abeje Mengesha	Ministry of Water and Energy (MoWE)	Expert	M
25.	Dr. Mitku Adisu	Ethiopian Civil Service University	Asst. Professor	M
26.	Mr. Gizachew Wendimu	Addis Ababa University (AAU)	Asst. Professor	M

S N	Name	Organization	Position	Sex
27.	Mr. Getinet Abate	Environmental Protection Authority (FDRE EPA)	Expert	M
28.	Mrs. Yeshowork Asefa	Environmental Protection Authority (FDRE EPA)	Expert	F
29.	Mr. Gonfa Ararsa	Addis Ababa EPA	Expert	M
30.	Mr. Tesfaw Abey	Addis Ababa EPA	Expert	M
31.	Mrs. Samrawit Asrat	Addis Ababa EPA	Expert	F
32.	Mr. Birhanu Ayele	AAEPA EPA	Expert	M
33.	Mrs. Yeruksew Yilma	AA EPA EPA	Expert	F
34.	Mr. Esubalew Mihirete	FDRE EPA	Expert	M
35.	Mr. Gizachew Asrie	FDRE EPA	Expert	M

5. Details of the Validation workshop

In the validation workshop, four thematic documents were presented. The first presentation document has contained an output of the assessment of tool(s) / model used for the Ethiopian's NDC update & its implementation challenges. Secondly, a guidance document on how to get ready for Article 6 implementation in Ethiopia was presented. Following, the Ethiopian's Updated NDC progress tracking framework based on the GACMO model was presented and finally, the document showing the importance of applying GACMO tool to evaluate mitigation options in the Ethiopian's updated NDC was presented for the participants and question were collected and responses were collected with clarifications and important comments were collected for corrections to enrich the technical documents.

Presentation 1: Assessment of NDC Update planning tools and its Tracking system in Ethiopia

The presentation on the assessment of NDC update planning tools and tracking systems in Ethiopia highlighted the collaborative efforts between key stakeholders and the Initiative for Climate Action Transparency (ICAT) to support the country in enhancing transparency frameworks for effective climate action.

Through a multi-stakeholder partnership, tailored support and practical tools are being provided to assist Ethiopia in aligning its climate goals with national development priorities. The focus of the assessment in 2023 was about evaluating the GACMO model and building capacity building in Monitoring, Reporting, and Verification (MRV) related to Article 6 participation. The various methods such as desk reviews, online surveys, key informant interviews, and stakeholder consultations that were utilized to assess existing practices were explained. The identify potential challenges and gaps in institutional capacity, and explored effective tools / models while the NDC update planning process were also presented and potential comments were collected.

Findings highlighted institutional capacity challenges, gaps in knowledge management systems, and the importance of assessing tools/models and assumptions used in NDC updating planning. The evaluation aimed to understand the effectiveness of the tools in tracking progress towards achieving greenhouse gas emission reduction targets outlined in the updated NDC, emphasizing the need for comprehensive mitigation actions in various sectors to align with climate goals. Besides, this presentation demonstrates Ethiopia's commitment to enhancing its transparency and accountability in climate action through the utilization of practical tools, methodologies, and stakeholder consultations facilitated by the ICAT partnership. By addressing challenges, gaps, and enhancing institutional capacities, Ethiopia aims to strengthen its NDC update planning processes, ensuring alignment with national priorities and international climate objectives outlined in the Paris Agreement's Enhanced Transparency Framework. At the end, the presentation shows the future directions like institutional restructuring and coordination, operationalizing MRV frameworks, establishment of centralized information management system and sector-specific information management, standardized indicators and monitoring and integration of mitigation measures in GACMO.

Question from stakeholders (participants): in the country the issue of stakeholder's integration as well as workable institutional frameworks are observed as a big challenge. And, implementation of our Updated NDC demands integration among the possible line ministries and respective regional beurras as main ground truth data sources reporting our achievement. Nationally, Ministry of Planning and Development has its own mandate interest and FDRE EPA has his own interest. How it will be coordinated? How the implementation of Article 6 will be monitored? With response from the FDRE EPA, currently the FDRE EPA is under the Ministry of Planning and Development so that they will share common mandates. The coordinating body is FDRE EPA under the political mandated authority of Ministry of Planning and Development. All line ministries have environmental directorates or units so that all coordination bond will be created with these units or directorates.

Presentation 2: Guidance on How to Get Ready for Article 6 Implementation in Ethiopia

The presentation on "Guidance on How to Get Ready for Article 6 Implementation in Ethiopia" outlined key strategies and considerations for Ethiopia's alignment and preparation in implementing Article 6 of the Paris Agreement. Article 6 aims to enhance international cooperation for climate action through market-based and non-market approaches, offering opportunities for sustainable development, mitigation actions, and financial benefits. Ethiopia's engagement in international collaboration is pivotal to achieving its Nationally Determined Contributions (NDC) targets, necessitating the development of institutional frameworks and processes. Besides, key focus areas highlighted in the presentation included legal and regulatory alignment, accounting tools for ITMO transfers, MRV protocols, and establishing institutional architecture. Ethiopia's proactive measures include updating laws and regulations, developing accounting tools for tracking ITMO transfers, ensuring robust MRV systems, and aligning with the country's institutional architecture led by the Environmental Protection Authority (EPA) and the Ministry of Planning and Development (MoPD). By integrating Article 6 mechanisms into its strategic frameworks and investing in MRV capacity, Ethiopia aims to enhance transparency, credibility, and accountability in climate action implementation.

Moreover, the presentation emphasized the strategies for capacity building, knowledge sharing, and policy alignment were recommended to empower Ethiopia in actively engaging in international climate negotiations and effectively implementing climate actions in alignment with its National Determined Contributions (NDCs). Overall conclusion, the presentation highlighted the imperative for Ethiopia to align its national climate policies with the principles of Article 6 to drive sustainable projects, mitigate emissions, and enhance resilience. By leveraging the benefits of Article 6 mechanisms and fostering collaboration with diverse stakeholders, Ethiopia can strengthen its position as a leader in environmentally responsible practices and contribute significantly to global climate action efforts. The presentation also highlighted the issue of designing governance structures for implementation article 6 in Ethiopia; define clear roles and responsibilities, establish accountability frameworks, build institutional capacity and enhance reporting processes.

Question from participants (transport sector): We are trying to create a link with an Indian company to produce electric cars in Ethiopia by assuming the entry of carbon markets (Article 6 framework). In addition, we have developed a hydrogen energy assisting vehicular emission reduction proposal and employed a pilot scale. We have become effective in fuel saving as well as emission reduction efforts. We want to scaleup it and bring this scheme into the carbon

market framework. How do we process this carbon market framework system as per the Article 6? Who is the national coordinating bodies to realize such kind of project? Answer: Currently, Ministry of planning and Development is the focally mandated institution in Ethiopia in charge of facilitating Article 6 framework in Ethiopia. But, as per the guidance for Article 6 implementation readiness, we need to fulfil many things to initiate Article 6 in Ethiopia. The country needs to decide the Article 6 policy, establish intuitional framework and data registry systems. So, with good initiation of such kind of projects or schemes the FDRE EPA together with the Ministry of Planning and Development will facilitate to exercise the Article 6 implementation in the near future.

Presentation 3: Ethiopia's Updated NDC Progress Tracking Framework Based on the GACMO Tool

In the presentation, the Ethiopian effort to ensure climate actions transparency were presented. The Ethiopian action such as preparation of CRGE strategy on four pillars such as agriculture, forestry, renewable energy and advanced technologies as well as the country experience to integrate climate change adaptation and mitigation actions into its development plans and strategies were discussed as a good experience to enter the country into Paris Agreement. In addition, the NDCs document submission and ratification of Paris agreement and its procedural legal processes in 2015 (INDC), 2017 (1st NDC) and 2021 (Updated NDC) were presented in details. Besides, the potential GHG reduction targets of mitigations measures of the updated NDC were presented in the validation workshop so as to give a background information for the attendees. The newly added content of the Update NDC such as quantitative targets of the potential emissions of individual actions from all sectors were presented. In addition, the main identified gaps in the tracking systems to monitor the progress in the emission reduction targets was presented so as to introduced the main objective of this project and ICAT collaborative works. The potential methodology of GACMO tool based NDC tracking preparation has also been presented. Finally, the common mitigation options that are identified and found in both the Updated NDC and GACMO tool are identified and presented in the validation workshop. Additional assignment in identifications of more mitigation policies in their respective sectors have been given for the workshop participants.

Mitigation policies such as Efficient lighting with CFLs, Efficient lighting with LEDs replacing CFL, Efficient wood stoves, Efficient charcoal stoves, Efficient electric stoves, Efficient office lighting with CFLs, Efficient office lighting with LEDs, Efficient water pumping, Reforestation, REDD: Avoided deforestation, Geothermal power, Biogas from Municipal Solid Waste, Composting of Municipal Solid Waste, Solar PVs, large grid, Electric 18m buses, Electric 12m buses, Electric

two-wheelers and Wind turbines, off-shore are among the 119 mitigation policies found in GACMO tools. The GACMO model/tool inputs and potential assumptions were presented in the validation workshop. The potential input variables such as 55 ETB/USD exchange rate, discount rate (7.0%), the Ethiopia emission and other supplementary information for 2020 GC, population (in thousands) of 120300 and GDP (Current Million USD) of 107660 were shown in the conference. In addition, the source and exact figures of energy Balance of Ethiopia that helped for the GACMO model run was presented. Moreover, the growth factors, BAU as well as mitigation scenario GHG emission and its project were presented. Finally, the tracking framework for monitoring the performance or efficiency of an individually implemented mitigation options are presented for the participants. Additional discussion points on the model importance on measuring the contribution of an individual mitigation option for meeting the Ethiopia's Updated NDC emission reduction targets were entertained. Finally, a question and answer as well as commenting discussion time was given.

Presentation 4: Applying GACMO tool to evaluate mitigation options in the updated NDC in Ethiopia

In this workshop, the report that highlights the application of Greenhouse Gas Abatement Cost Model (GACMO) to evaluate mitigation measure of the NDC in Ethiopia was presented. The aims of the document pertaining to provide insights and guidance for integrating GACMO tools into the upcoming Nationally Determined Contribution (NDC) update, emphasizing the importance of informed decision-making in climate action were explained in details for clear understanding.

The importance of GACMO tool in analysing the potential impact of individual mitigation options on reducing greenhouse gas emissions was discussed in the context of Ethiopians' Updated NDC. The quantified emission reduction potential of each identified mitigation options versus the marginal abatement cost of implementation of each mitigation policy was presented and shown to see the suitability of each action. The extent of emission reduction across sectors and its future projections are also shown to see the impact of the mitigation policy in the future. The tool has carried out a comprehensive cost analysis for each mitigation option to assess the financial implications associated with implementation. In this aspect, the presenter has illustrated the MARC curve for the participant and explained the detail information to be interpreted.

Furthermore, the presenter has explained the financial sustainability of each mitigation option that was assessed by GACMO tools by comparing the projected costs with an anticipated benefits in terms of emissions reduction. The use of emission reduction potential Versus cost analysis to informed decision-making in the prioritization and selection of mitigation options for inclusion mitigation polices in the updated NDC for future updating was also

explained. As per the GACMO Tools application, various key findings were presented. Sector ministries are allowed to give their comments and questions of the output of the GACMO tool analysis in their context. Among the outputs, a hydro power connected to the main grid emerges as the most promising avenue for emission reduction in 2030, with a projected decrease of 42,307.44 kt/year. Additionally, the composting of Municipal Solid Waste proves to be the most cost-effective investment per ton of CO₂ reduced, priced at \$0.05/tonCO₂. Notably, options such as Biogas from Municipal Solid Waste and Landfill gas flaring has exhibited a negative cost, indicating potential cost savings upon implementation. On the contrary, Wind turbines, off-shore, present the highest cost per ton of CO₂ reduced at \$126.07/tonCO₂. The presenter has also illustrated the options like shifting freight transport from road to rail and Electric rail with higher costs compared to other alternatives.

Finally, the presenter has closed the presentation with conclusion of the importance of applying GACMO tool for evaluation the emission reduction potential and cost-effectiveness in selecting mitigation options for inclusion in the Nationally Determined. The tool helps to select the mitigation options with an optimized cost of investment and implementation with reasonable emission reduction. And, it was emphasized that the country has to apply the tool guidance for decision-makers to prioritize and implement cost-effective mitigation measures that can effectively contribute to Ethiopia's climate action goals.

Question from participant: how we can consider the remaining mitigation policies found in the GACMO tool that are not included in our NDCs but implemented and showing remarkable results by our sectors? As per their MARC evaluation result on their marginal abatement cost versus emission reduction potential they will be included in the NDC during the revision time in 2026.

Annex 1 - Training time table

Table 3 Validation workshop time schedule (9:30AM – 02:30 PM, 18 March 2024)

Validation workshop		
Supporting the Application of the GACMO Model and Capacity Building on MRV Related to Article 6 Participation in Ethiopia (Ref. 11875-003/ICAT/2023/03)		
19th March 2024, Addis Ababa, Ethiopia (Elilly International Hotel)		
9.00 – 9.45	Registration	GES Consulting firm
9.45-10.00	Welcoming remarks FDRE EPA	H.E. Mr. Nigusu Lemma, Deputy Director General, FDRE EPA.
10.00-10.15	Welcoming remarks ICAT Secretariat	Oleg Bulanyi, Senior Programme Manager, ICAT Secretariat
10.15-10.40	Assessment of the tool(s)/ model used for the Ethiopian’s NDC update & its implementation challenges (Deliverable A1) (15 min. presentation + 10 min. comments and questions)	Dr. Mekonnen Amberibir GHG Analyst, GES
10:40 – 11:10	Guidance on how to get ready for Article 6 implementation in Ethiopia (Deliverable G) (20 min. presentation + 10 min. comments and questions)	Dr. Mekonnen Amberibir GHG Analyst, GES
11.10-11.25	Health break	Elilly International Hotel
11.25-11.55	Ethiopian’s Updated NDC progress tracking framework based on the GACMO model (Deliverable D) (20 min. presentation + 10 min. comments & questions)	Dr. Mekonnen Maschal GHG Expert/GM, GES
11.55-12.25	Applying GACMO tool to evaluate mitigation options in the Ethiopian’s updated NDC (Deliverable C) (20 min. presentation + 10 min. comments & questions)	Dr. Mekonnen Maschal GHG Expert/GM, GES
12:25 – 13:00	Discussion	All participants
13.00 – 13.15	Closing remarks	Mr Benti Firdissa, focal point, ICAT Ethiopia

13:15 14:00	- Lunch break	Elilly International Hotel

Annex 2 –Selected Photos of the Validation workshop

Annex 2 – Photos of the validation workshop



