

Climate change mitigation through the measurement, reporting and verification (MRV) of greenhouse gas emissions

Practicum on the implementation of the Paris Agreement

United Nations University (UNU-IAS)

July 22nd - August 1st 2025

Location: [Lecture room, 6th floor in the UNU building](#)

Time: 14:00-15:40 and 15:50-17:30¹

Lecturer: [Dr Akio Takemoto](#)²

Contact Information: atakemoto@unu.edu

Office Hours: 9:30-17:30 (by appointment)

Course Description

“Transparency” is regarded as a vital element to ensure the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) to function as a vehicle where government parties and stakeholders to implement their climate action committed. In a narrow interpretation, “transparency” means the set of rules and arrangement under Art.13 of the Paris Agreement. The Parties are responsible for reporting on the progress of the implementation of their nationally determined contributions (NDCs) together with the quantitative and qualitative information such as the national greenhouse gas (GHG) inventory, biennial transparency report (BTR) with common tabular format (CTF) under the Enhanced Transparency Framework (ETF)

At the same time, the concept of “transparency” can be found in many areas of work for practitioners of climate actions, and often, they are not explained how they are different, and related with each other. As to the measurement, report, and verification (MRV) or modalities, procedures and guidelines (MPGs), which are often used synonym for transparency, there are different sets of rules operated in layers, which are relevant with each other, i.e. international, national, sector, entity or facility-level, as well as project level.

¹ See Course Outline below for the exact time of each class

² The course is delivered in collaboration with Overseas Environmental Cooperation Centre (OECC) which participates in all the classes as a secretariat.

The course will provide an explanation on how these MRVs in layers work on climate actions of multiple stakeholders towards the implementation of the Paris Agreement. At the same time, the Course particularly shed a light on GHG emissions and climate action at entity or facility-level, bearing in mind that there are accelerated efforts to drive the private sector engagement in climate action while considering relevant articles of the Paris Agreement and its implementation and governance mechanism in detail.

The course is provided by lectures by professionals and practitioners in the field, demonstration/hands on training of GHG emissions calculation applying relevant methodologies, site visits to observe actual efforts by the private sector to reduce GHG emissions through installation of decarbonization technologies and their MRV, and group work/presentation. Participants are expected to develop an analytical essay for enhancement of transparency with their selected case studies.

Course Objectives and Learning Goals

This course will aim at enhancing the understanding of the participants on the theory and practices of transparency of climate action operated in different levels. At the completion of the course, participants are expected to build their capacity to integrate information and knowledge gained through lectures and hands-on practices on transparency and GHG MRV and to develop strategies to enhance and lead climate actions at various levels.

The course is comprised of the five Components as follows:

- Component 1: An overview of relevant transparency will be provided, explaining function of MRV and institutional frameworks pertaining to stakeholders in actions in different levels.*
- Component 2: Theory and practices of transparency at national level including policy measures, support and finance as well as methodological aspects of GHG inventory (e.g. data collection procedures sourced from national statistics in line with the Intergovernmental Panel on Climate Change (IPCC) guidelines) will be provided referring to the rules, modalities and procedures under the Paris Agreement.*
- Component 3: Theory and practices of transparency at entity/facility level including policy measures, support and finance as well as methodological aspects of GHG inventory (e.g. scopes and data collection procedures incl. measurement and estimation) will be provided referring to requirements by standards (e.g. ISO and GHG protocol), legislations (e.g. EU-ETS) as well as initiatives (e.g. SBTi, TCFD).*
- Component 4: Site visit is conducted to some facilities of the private sector to provide hands on experiences and dialogue with corporate practitioners on the efforts of transparency and GHG MRV at entity/facility level and on their GHG mitigation actions and initiatives.*
- Component 5: Presentations and discussion on the roles of transparency and GHG MRV and relevant policy measures, support and finance as important driving forces towards strengthened climate actions.*

Requirements and Grading Policy

All students are expected to complete the required readings before each class. The course requirements also include active class participation and assignments:

- *Class participation and discussion (40%)*
- *Assignment 1: Short report (10%)*
- *Assignment 2: Analytical essay (50%)*

Class Participation

The course requires students to attend all classes, to arrive on time, to complete the readings and to participate actively in class discussions³. This means speaking during each and every class. At the discretion of the instructor, frequent late arrivals or absences may result in a lower grade. Please note that the first session is of particular importance and cannot be missed. Students are also strongly encouraged to regularly follow the news to keep up with international discourse and developments on climate change, as these will be reflected in the class discussions. Relevant news sites and reporting archives will be shared by the instructor during the class.

Assignment 1: Short report

Participants who will join the site visit per the Lecture 14 are requested to submit a short report on the site visit focusing on the practice of the private sector and how good practices on transparency and GHG MRV as well as mitigation actions can be replicated.

For online participants who will not participate in the Lecture 14 will be assigned to submit a short report on a good practice of the GHG MRV and mitigation action by a company in their country and how such climate action can be replicated.

Format:

- *Arial 12, 1.5 space, justified alignment, double side, references (in-text citation and bibliography can include both reports and academic articles)*
- *Harvard referencing style*
- *Maximum of 800 words (excluding references)*

Submission deadline of the Assignment 1: Friday, August 8th, 2025

Assignment 2: Analytical essay:

Participants are requested to analyse status quo and gaps in performance of mitigation actions including aspects of policy and measures, capacity, finance and incentives at national, sectoral, or entity/facility level and propose recommendations for measures including technology, finance and capacity building for enhanced transparency and GHG MRV towards strengthened climate actions.

Format:

- *Arial 12, 1.5 space, justified alignment, double side, cover page, references (in-text citation and bibliography can include both reports and academic articles)*
- *Harvard referencing style*
- *Maximum of 3,500 words (excluding references)*

Submission deadline of the Assignment 2: Friday, August 15th, 2025

³ Participation to the site visit is exempted for online participants, if any.

Course Outline

Lecture No.	Frame work	Title	Date	Instructors/Invited Speakers if any
1	Introduction	Introduction to the concept of transparency, its objectives, essential elements and functions	Tuesday, July 22nd, 2025 ~ 14:00-15:40	Dr. Akio Takemoto, OECC and Dr. Atsushi Sato, MURC
2	Transparency at national level	Overview of the National GHG Inventory System and Transparency Reporting and Assessment	Tuesday, July 22nd, 2025 ~ 15:50-17:30	Dr. Atsushi Sato, MURC
3		Methodological aspects of national inventory system – Energy sector	Wednesday, July 23rd, 2025 ~ 14:00-15:40	Dr. Atsushi Sato, MURC
4		Methodological aspects of national inventory system – Industrial Process and Product Use (IPPU), and Waste sectors	Wednesday, July 23rd, 2025 ~ 15:50-17:30	Dr. Atsushi Sato, MURC
5		Methodological aspects of national inventory system – Agriculture, and Land Use, Land-Use Change and Forestry (LULUCF) sectors	Thursday, July 24th, 2025 ~ 15:50-17:30	Dr. Atsushi Sato, MURC
6		Policy measures for mitigation and adaptation, support and finance related to transparency and reporting under the UNFCCC	Friday, July 25th, 2025 ~ 14:00-15:40	Dr. Atsushi Sato, MURC
7	Transparency at entity/facility level	Basics of entity/facility level transparency and GHG MRV including Scope 1, 2 and 3 emissions	Friday, July 25th, 2025 ~ 15:50-17:30	Mr. Akihiro Tamai, & Ms. Aya Marabini OECC
8		Details of entity/facility level transparency and GHG MRV including mandatory reporting system of GHG emissions	Monday, July 28th, 2025 ~ 14:00-15:40	Mr. Makoto Kato OECC
9		The incentive mechanisms and carbon disclosure - Task force on Climate-related Financial Disclosures(TCFD), Science Based Target Initiative (SBTi) and International Sustainability Standards Board (ISSB) – Part 1	Monday, July 28th, 2025 ~ 15:50-17:30	Mr. Kimihiro Kuromizu, OECC
10		The incentive mechanisms and carbon disclosure - Task force on Climate-related Financial Disclosures(TCFD), Science Based Target Initiative (SBTi) and International Sustainability Standards Board (ISSB) – Part 2	Tuesday, July 29th, 2025 ~ 14:00-15:40	Mr. Kunihiro Kobayashi, and Mr. Takayama, OECC
11		Linkage of transparency and GHG MRV to carbon markets - Part 1: ETS and crediting mechanisms	Tuesday, July 29th, 2025 ~ 15:50-17:30	Mr. Jun Watanabe, OECC

12		Linkage of transparency and GHG MRV to carbon markets - Part 2: Integrity standards Core Carbon Principle, VCMI's code of practice, and the SBTi's Corporate Net-Zero Standard	Wednesday, July 30th, 2025 ~ 14:00-15:40	Mr. Jun Watanabe, OECC
13		Incorporation of GHG MRV into practice towards enhanced climate action and expanded business profile	Wednesday, July 30th, 2025 ~ 15:50-17:30	Mr. Makoto Kato & Ms. Aya Marabini OECC
14	Site visit	Observing corporates' efforts to GHG MRV and enhanced mitigation actions ⁴	Thursday, July 31st, 2025 ~ 14:00-15:40	Mr. Makoto Kato, OECC
15	Transparency for climate action and growth	Discussion and presentation - Transparency and MRV as driving forces for enhanced climate action will be explained discussed	Friday, August 1st, 2025 ~ 14:00-15:40	Dr. Akio Takemoto, OECC and Dr. Atsushi Sato, MURC

Course Readings

Participants are expected to actively contribute to class discussions based on the reading material provided. The lecturer reserves the right to update the reading list throughout the course and will alert participants to the changes in class. If any required readings from academic journals or e-books are added to the course, these can be accessed through the public work stations at the UNU library, using your UNU student login and password. Additional readings from web based content will also be included.

Course Readings by major framework components

Frame work	Recommended Readings
1	Introduction

⁴ The exact place(s) of the site visit will be announced upon confirmation of availability during the course. Participation to the site visit is exempted for online participants, if any.

	<ul style="list-style-type: none"> • UNFCCC – History of the Conventions: https://unfccc.int/process/the-convention/history-of-the-convention#Climate-Change-in-context • UNFCCC – What is transparency? https://unfccc.int/process-and-meetings/transparency-and-reporting/about-transparency/what-is-transparency
2	<p>Transparency at national level</p> <ul style="list-style-type: none"> • All about the NDCs https://www.un.org/en/climatechange/all-about-ndcs • Moving towards implementing an Enhanced Transparency Framework https://unfccc.int/enhanced-transparency-framework • FAQs of Task Force on National Greenhouse Gas Inventories - IPCC https://www.ipcc-nggip.iges.or.jp/faq/faq.html
3	<p>Transparency at entity/facility level</p> <ul style="list-style-type: none"> • Partnership to Strengthen Transparency for Co-Innovation (PaSTI) https://www.env.go.jp/earth/ondanka/pasti/en/index.html • MRV Information Platform for ASEAN Member States https://mrv-info.com/index.html • GREEN HOUSE GAS PROTOCOL https://ghgprotocol.org/ • Task Force on Climate-related Financial Disclosures https://www.fsb-tcfd.org/ • The International Financial Reporting Standards Foundation https://www.ifrs.org/

Important Information

Class Conduct & Etiquette

Participants are expected to arrive on time and not to engage in disruptive behavior during class. This includes, among other things, private side conversations, the use of cell-phones and other electronic devices, or the reading of newspapers. Cell-phones should be switched off and stored in the bag. We wish to create an atmosphere of open and tolerant discussion in the classroom and request participants to recognize every individual's right to have an opinion. The lecturer and other participants should be treated with dignity and respect, in particular in discussions on contentious political issues where a diversity of opinion is likely to arise. However, we also recognize that there are limits to tolerance and the lecturer reserves the right to request disciplinary action against any student who violates this policy or repeatedly shows disruptive behavior in class.

Any disruption of the class by cell phones, instant messaging programs or other communication devices will not be tolerated. The lecturer reserves the right to revoke this permission if a student is found using a computer for any non-course related activities.

Plagiarism & Academic Misconduct

Please be aware that the consequences of plagiarism are severe and participants found guilty of academic misconduct will be punished in accordance with UNU's academic honesty policies. The lecturer reserves the right to run all assignments through an anti-plagiarism software provided by the UNU. If evidence of academic misconduct on the assignments should be found, they will receive a failing grade. In case of repeated violations of academic conduct, the participants may receive a failing grade for the entire course and will be reported to the appropriate authorities for disciplinary action.

Invited Speakers/Lecturers Bio

To be announced.