Information Matters, Philippines:
Capacity Building for Enhanced Reporting and Facilitation of International Mutual Learning through Peer-to-Peer Exchange

Training-Workshop on MRV Domestic Architecture and Baselines Scenario Setting

Manila, 24-30 April 2014

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Introduction

The GIZ on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) has initiated the "Information Matters: Capacity Building for Enhanced Reporting and Facilitation of International Mutual Learning through Peer-to-Peer Exchange" Project, which aims to provide technical support to the Philippines through the Climate Change Commission (CCC) in building and improving climate information basis in order to be more able to plan and implement national low carbon development policies. These information bases include data collection of emissions inventories, emissions trends, emissions reduction potentials, ongoing mitigation actions, climate policies, financial, technology and capacity building support needs and received support, international collaboration and international commitments, and established procedures and methodologies to monitor and collate these data. Ricardo-AEA, as a subcontractor of GIZ, provides the technical expertise for the capacity building missions to the CCC and sectoral lead agencies including backstopping support. The content of these CB workshops is decided in close consultation between GIZ and CCC. Prior to this, a gap analysis study on national climate reporting and a further stakeholder consultation were conducted.

Thus, training-workshops on Measurement, Reporting and Verification (MRV) Domestic Architecture and on Baselines Scenario Setting for the Information Matters Project were held on April 24-25, 2014 and April 28-30, 2014, respectively. These activities aimed to build the capacities of the participants in generating and applying baseline scenarios and in developing and applying MRVs for emissions, mitigation actions and climate support.

BMUB International Climate Initiative (IKI)

Since 2008, the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) has been financing climate and biodiversity projects in developing and newly industrializing countries, as well as in countries in transition. Based on a decision taken by the German parliament (Bundestag), a sum of at least 120 million Euros is available for use by the initiative annually. For the first few years the IKI was financed through the auctioning of emission allowances, but it is now funded from BMUB budget. The Initiative places clear emphasis on climate change mitigation, adaptation to the impacts of climate change and the protection of biological diversity. These efforts provide various co-benefits, particularly the improvement of living conditions in partner countries.
The IKI focuses on four areas: mitigating greenhouse gas emissions, adapting to the impacts of climate change, conserving natural carbon sink with a focus on reducing emissions from deforestation and forest degradation (REDD+), as well as conserving biological diversity.
New projects are primarily selected through a two-stage procedure that takes place once a year. Priority is given to activities that support the creation of international climate protection architecture, transparency, and innovative and transferable solutions that have impacts beyond the individual project. The IKI cooperates closely with partner countries and supports consensus building for a comprehensive international climate agreement and the implementation of the Convention on Biological Diversity.

BMUB IKI Homepage
www.international-climate-initiative.com

Methodology and Approach

The facilitator used a combination of plenary presentation for discussion of concepts, key elements, and mechanisms and breakout sessions for application of acquired knowledge and skills. The outputs from the break-out sessions were then presented back in the plenary so resource persons and other participants would be able to raise comments and/or clarifications.

The entire training-workshop lasted for five days, where the first two days were allocated for concepts, types, key elements, and mechanisms of MRV, while the succeeding three days were devoted to Baseline Scenario Setting. At the end of each training-workshop, post-training evaluations were administered to test the training-workshops' efficiency, effectiveness, relevance to participating agencies as well as the level of the attainment of workshop objectives. An exam was also given during the last day of the training-workshop so the resources persons would be able to gauge how participants appreciated the knowledge and expertise they have shared.

Participants and Resource Persons

Representatives from line agencies specifically for Waste, Industry, Energy, Transport, Agriculture, and Forestry sectors attended the training-workshops, joined by officials and staff from the Climate Change Commission and GIZ. Technical expertise on MRV and Baselines were provided by RICARDO-AEA, a British Company and subcontractor of GIZ for the Information Matters project, led by Dr. John Watterson and Dr. Ross Hunter.

Part I: TRAINING ON MEASUREMENT, REPORTING, AND VERIFICATION (MRV) DOMESTIC ARCHITECTURE

Preliminaries

Prayer and National Anthem were rendered, followed by opening remarks from Assistant Secretary Joyceline Goco of the Climate Change Commission and Dr. Bernd-Markus Liss, Principal Adviser of GIZ-BMUB Projects.

On behalf of the Climate Change Commission, Asec. Joyceline Goco thanked the participants for attending the workshop. She mentioned that the workshop is a consensus among agencies since it was identified as one of the priorities from the gap analysis. The initiative is part of the Commission's complementation to the needs of line agencies in building their capacities particularly on MRV system. Thus, she encouraged the participants to raise questions and/or clarifications in order to maximize the presence of experts from Ricardo-AEA.

Dr. Bernd-Markus Liss welcomed the participants and mentioned that it is first of a series of trainings as identified and prioritized from the gap analysis. The activity is attached to the Support CCC project focusing on providing information and transparent reporting, which is part of the One GIZ approach as a consistent package to assist the country in generation of substantial data and building awareness on climate change discussion. He hoped for a fruitful discussion and a lot of interaction to enhance the country's climate change related actions.

It was then followed by an introduction of participants and overview of the project and presentation of project updates.

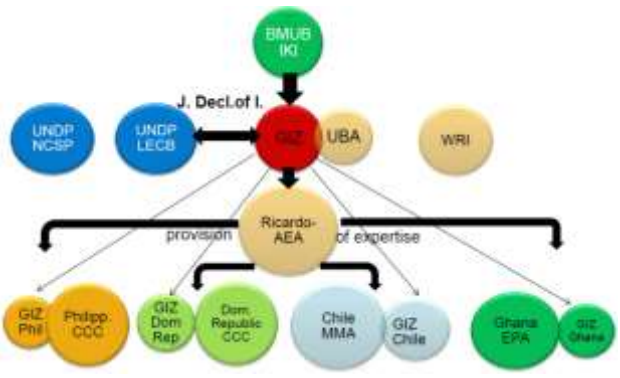
1. Information Matters: Transparency through Reporting – An Overview of the Project

Ms. Kirsten Orschulok, GIZ

Ms. Kirsten Orschulok, Junior Adviser of GIZ presented an overview of the project and updates from the three participating countries. Under the support of German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), the project aims to strengthen the participating countries' capacities for enhanced reporting of the climate relevant information to UNFCCC. It is a project being implemented in the Philippines, the Dominican Republic, Chile and Ghana and a project that complements with UNDP-LECB and NCSP in partner countries, UNEP, WRI and the International Partnership on Mitigation and MRV. The technical expertise required by the project is being provided by Ricardo-AEA, a British Consulting Firm. Figure below shows the project structure and partners involved in the project.

Figure 1. GIZ Information Matters Project steering structure

Source: Orschulok, K. (2014). Information Matters Project. [Powerpoint slides]



The gap analysis in September was validated during the kick-off workshop on October 2013, focusing on three key elements, institutional, technical and capacity on GHG Inventory, MRV of Mitigation Actions and Tracking Climate Finance dimensions, overarched by five (5) key concerns specifically on coordination, policy framework, institutional mandate, common processes and procedures, and data access and archiving. From the gap analysis, specific needs and priorities on MRV systems and GHG monitoring were identified and through tailored capacity-building trainings and workshops, countries will be able to improve and refine procedures, methodologies and responsibilities to institutionalize their reporting system, with the special focus on the requirements for national-level mitigation-related reporting to the UNFCCC. The series of capacity building activities is the key building block towards the peer-to-peer exchange workshop in Bonn on September 2015.

Figure 1 shows the overall project timeline, while below are updates on the project in three other participating countries.

a. Chile: although the country already identified five (5) NAMAs with its corresponding MRV system, a national MRV system integrating the 5 MRVs will be developed. Training on Improvement of the MRV of GHG Inventory is also on the pipeline as well as Baseline Training as requested by the partners.

b. Dominican Republic. The country's direction is to set up an institutional arrangement for MRV and GHG inventory since both are new topics, unlike in the Philippines where the country has already good institutional arrangement for GHG Inventory.

c. Ghana. The country is keen on improving the quality of GHG inventory in order to define better the country's goal. They have already secured funding from GEF for the preparation of their Biennial Update Report and want to submit the report in December 2014.

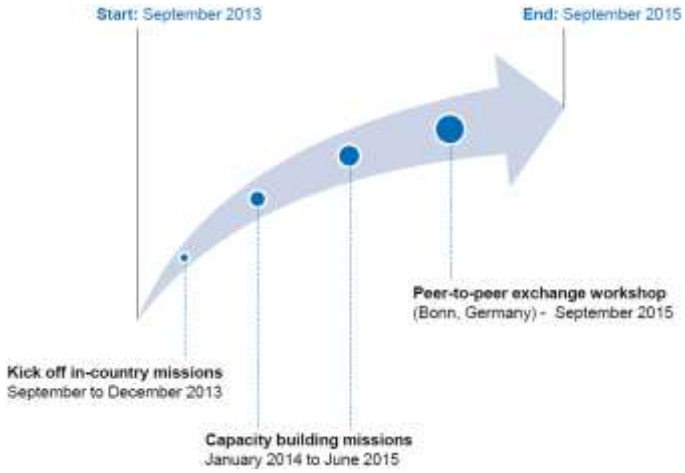


Figure 2. GIZ Information Matters Project Timeline

Source: Orschulok, K. (2014). Information Matters Project. [Powerpoint slides]

2. Information Matters: Status of the Project in the Philippines

Ms. Sandee Recabar, Senior Science Research Specialist, Climate Change Office, Climate Change Commission

The work is designed to identify gaps related to collection, processing, analysis and, tracking, and reporting of climate relevant information. It looks at what capacity building is needed to fill the gaps identified and what each country would like to prioritize.

In the Philippines, the concept of mitigation as a function of adaptation is important to policy makers in pursuit of national sustainable development. And more than mere compliance to UNFCCC agreements, the Philippines may also utilize the updated baseline information from national climate reports as rational basis in de-

veloping, coordinating and prioritizing climate-responsive policies, plans and programs, i.e., informed decision-making.

The capacity building activities under the project are focused on relevant government ministries, departments and agencies (MDAs), or equivalent, at national and local levels and across all relevant sectors. These activities are bounded by the following criteria:

a. Relevant to international reporting of climate change information (i.e. the National Communication);

b. Realistic and achievable within the project timeframe;

c. Complement or strengthen on-going projects;

d. Cover any of the sectors or elements relevant to mitigation monitoring and reporting;

e. May be under cross cutting issues such as MRV system, and institutional strengthening, on sector specific issues both at national and local levels;

f. Ensure an enduring outcome, with the aim of institutionalizing processes and procedures;

g. Not only assist with international reporting, but also relevant to building knowledge, skills, tools, processes and procedures applicable to national monitoring (MRV and M&E) of climate relevant policies, strategies, projects and programmes; and

h. Relevant to understanding how mitigation is a result of adaptation and/or development actions (co-benefit).

A kick off workshop was done in September 2013 that paved the way for validation of gap analysis and identification and prioritization of needed capacities. Below is a summary of results of the gap analysis:

- GHG inventory is yet to be institutionalized although capacity building of sectoral leads is ongoing.
- The need for GHG inventory tools since activity data depends on this. No MRV systems in place, hence data collection needs by all sectors have to be identified.
- No training on QA/QC. There is a need to identify needs by all sectors.
- Tools on MRV and tools for analysis of mitigation actions
- Application of MRV and mitigation action analysis tools
- Capacity to develop country-specific emission factors for the GHG inventory: how to calculate
- Baseline (GHG emissions): capacity to extract, gather: tools and criteria to establish the baseline within 1 year

In February 2014, a Stakeholders Consultation workshop was held in order to identify priority topics to be covered by the Project. This included the time frame and mode of delivery as well. To that end, below are the immediate next steps following the agreed roadmap of the project.

a. Back-to-back capacity building missions:
    - MRV domestic architecture (April 24-25, 2014)
    - Baselines scenario setting (April 28-30, 2014)

b. Possible third and fourth mission on:
    - Climate relevant data management (Aug 2014)
    - Baselines training, Part II (October 2014).
    - Backstopping support after sectoral representatives agree on a way forward after each training-workshop.

It was then followed by an overview of workshop objectives and expectations check by Dr. John Watterson, consultant from Ricardo-AEA. Dr. Watterson requested the participants to list down three key things that worry them in the context of MRV. As can be seen in the table

below, there are four (4) clusters of worries; basics and relevance of MRV, institutional readiness, type, availability and credibility of data, and the complexity of the concept that intimidates people.

Table 1 Workshop Output: Participants' concerns on the basics of MRV

Board of Worries	
Basics of MRV and its relevance to the country	• What tools to use in measuring GHG? • What comprises domestic architecture? (in the context of MRV) • What is the difference between monitoring and reporting? How is it verified? • What are good practices for a national MRV system? • Elements that will be MRVed other than emission reduction? • Are there MRV standards? • Are there standard/international guidelines on the MRV system and/or process? • What is the difference between MRV and M&E? • What and how MRV can be applied in tracking climate related information • How do we use MRV is statistics?
Type, Availability and Credibility of Data	• Format to report it (what to report?) • Data availability or database • NFI in two years • In terms of verification, do we use top-down consumption of figures as counterbalance to check/validate/adjust bottom-up qualifications? • Monitoring sources of double-counting/overestimation to prevent this in the reporting especially across sectors • Credibility and integrity of available national data and information
Institutional Readiness	• What would be required from our agencies? • How do I know which organizations to involve? • How to institutionalize MRV: basics and best design for the Philippines
Complexity of the Concept	• Why do MRV? Would reporting be enough for developing counties • How does international MRV relate to the National MRV • Can we do away MRV? • Can MRV be layman-ized? • The word domestic architecture is quite intimidating.

Plenary Presentation: Key Topics and Concepts relevant to MRV

1. Basic Concept of Measurement, Reporting, and Verification (MRV) System

Dr. John Watterson, RICARDO-AEA

In principle, MRV means assessing and communicating how and whether something changes over time. The system has three processes:

M - Provides data on relevant indicators, for instance commitment to GHG reduction or poverty reduction.

R – Communication of findings to relevant stakeholders.

V – Reviewing the measured and reported date to ensure quality. An outside inspector helps look at the information provided and how it can be improved ensuring that it is accurate based on measurement and reporting.

Table 2 Basic Concepts on MRV

Source: Watterson, J. and Hunter, R. (2014). *Basic concepts of MRV.* [Powerpoint slides]

Measurement	Reporting	Verification
• Measure using indicators – qualitative or quantitative • Indicators should be - Related to the desired change in the development of a national GHG emissions or the aims of a mitigation policy - SMART to be meaningful • Indicators require target value, baseline, and timeline to which target values and baseline relate	• Consider the audience – national and international • Consider the information needs • Consider what this means in terms of data	• Can range from simple quality control checks to more complex, independent third-party assessments • Some Lessons from CDM: - Verification ensures credibility and accountability of a project's estimated GHG emission reductions - Independence of verifiers (i.e. third party) is needed to ensure confidentiality of industry data and credibility - Domestic capacity for verification services are often weak, need to draw on international auditors or build capacity - What to verify must be made clear: Verifiers should only be responsible for data that is easily verifiable (e.g. data on fuel use, compliance with procedures) and not for assessing politically-influenced elements, such as baselines.

MRV relates to changes and a toll to support informed decision making similar to an M&E system, and in order to make it cost-efficient, it should be designed to achieve just the right level

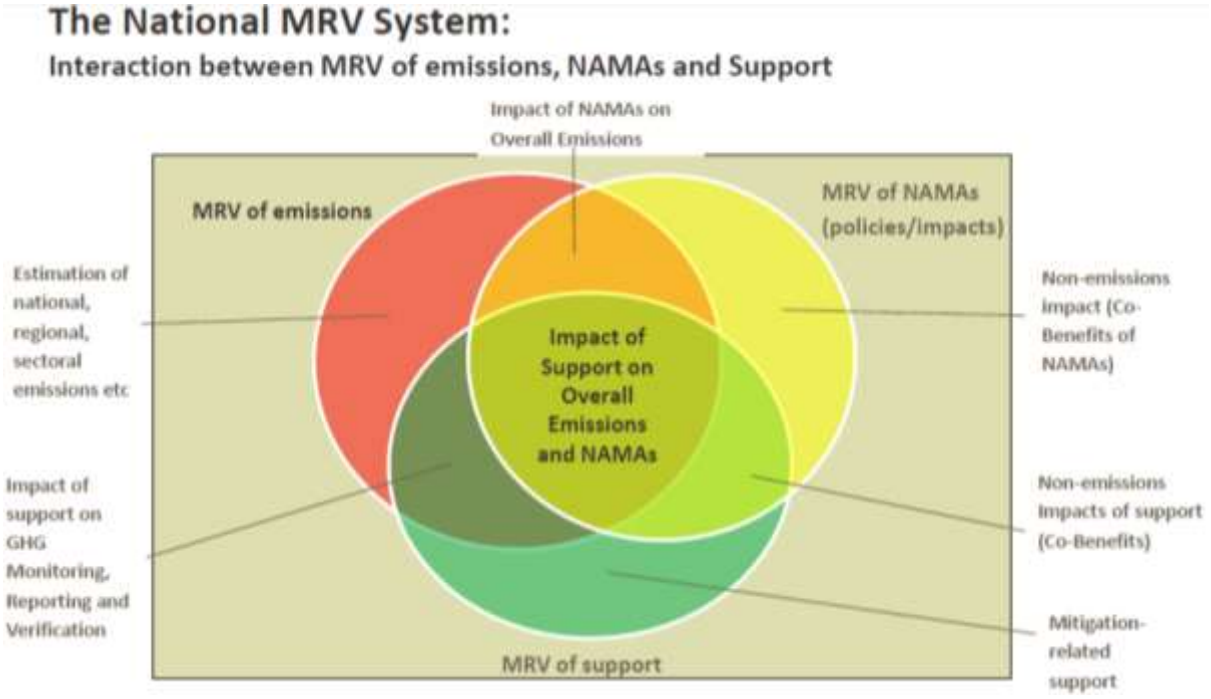
of accuracy required for the decisions it aims to inform, working on existing structures and information. Thus, it is necessary to have a robust MRV to increase the likelihood of gaining international support. And in an MRV within a policy cycle, it is important that learnings from the implementation and evaluation are reflected back into the design phase for further improvement. Below are the key steps of policy cycle:

- Step 1: Policy Design for development and implementation MRV system, utilizing expertise of the country.
- Step 2: Policy implementation to operate the MRV system with clear coordination of roles and responsibilities of agencies/sectors involved.
- Step 3: Policy evaluation using the generated MRV data.

On one hand, the figure below shows the three types of MRV and the link of each MRV type to one another.

Figure 3. National MRV System and the linkages between the three types of MRVs

Source: Watterson, J. and Hunter, R. (2014). *Basic concepts of MRV.* [Powerpoint slides]



Plenary Discussion

The discussion focused on the difference between an MRV and M&E system and below is a summary of key inputs from the participants.

a. In M&E there is no official reporting element, while evaluation is conducted internally

b. An M&E builds on an existing report, while an MRV requires report prepara-

tion and a third party for the verification.

There is no big difference between MRV and M&E, except for some variances on reporting element. The principle of MRV is similar to an M&E system since mechanisms and indicators are being developed prior to its application

Breakout Session

The participants were divided into 6 smaller groups and assigned with their corresponding letters (2Ms, 2Rs, and 2Vs) following the guide questions given by the facilitator.

- Why are M R, and V important?
- What are the main steps and key issues in performing the M, R, and V?

Table 3 below summarizes the outputs of first breakout session.

Table 3. Workshop Output: Importance of MRV and Key Steps in conducting MRV

A. Measurement		
Why M is important	• Useful for data management, we cannot manage what we cannot measure • Decision making • determining trends and patterns • Aide in use of tools and models • Identification of level of effectiveness of policies • Lays the foundation for evaluation • Important input to reporting	• Determines the problem: cannot solve what you don't know • Identifies actual vs ideal scenario • Foundation of policy making process
Main Steps	• Visioning, goal setting • Identification of indicators • Identification of indicators • Setting of targets • Data Collection • Data Processing (QA and QC) • Data Analysis	• Identify the context: what needs to be measured? (GhG, Policy, Emissions, Etc.) • Determine baseline info • Establish additional data needs • Identify responsible sectors for data gathering and resources • Identify sectors for data processing and analysis
Key Issues	• Costs • App methods • Identification of institutions and capacities • Data availability: access, gaps, and quality and confidentiality as well	• Funding resources • Infra needs • Equipment and facilities in gathering the data • People/Staff • Capacity Building • Sustainability of activities and programs related to data gathering • Following through with an Action Plan
B. Reporting		
Why R is important	• Provide understanding on what the action is all about, how it was done, what are the gaps and challenges, outcomes, lessons learned and way forward. • To share to a wider audience of policy makers/decision makers the results of the report in order to have wider perspective and basis for decision-making • To communicate with the audience • To show good practice • Consultation of stakeholders' needs which leads to improvement of data quality • Information/data will be disseminated which will be the basis for evaluation • Basis on whether targets are met within the target timeline	• Basis for decision making • Basis whether the targets are being met of not
Main Steps	• Knowing and identifying the information about the action and the intended audience • Working out on the information (pro-	• What do we need to know? • Tasking • How to present the report (language) • Processing the data

	cessing) for the intended use • Drafting of the report • Peer review of the draft (consultation with info owners to contextualize) • Finalization and submission of report	• Revalidate set of data thru participatory approach
Key Issues	• Goal setting and data needed: baseline, indicators • Best arrangement among agencies since report will have various data • Who will be involved on drafting the report? • Who decides on what will be in the report? • How will the report be disseminated? Effective communication (Quality of report based on the data) • Selection of communication channels given budget constraints • Proper Dissemination of data • Stakeholders response to data reported • How to localized report • (cost, data availability, technology)	• Identification of actors/players and information requirement • Logistical/administrative requirements • Overall integrator/writer at the report.
C. Verification		
Why V is important	• Ensure credibility and integrity of the data • Means of checking if the methodology was used/followed • V if the data/info in the R were interpreted and analyzed correctly • Can avoid biases because done by a third party • Need to verify so that they can fit or acceptable for publishing	• Credibility • Accountability • Integrity to ensure data is not bias to come up with more précis information to be used by the policy makers
Main Steps	• Availability of report • Engage third party verifier • Set verification guidelines, to include verifiable indicators • Ground-truthing or field validation • Agreed verification report (w/stakeholders) • QA/QC in all steps of verification process • Periodic review for – years	• Select a third party • Prepare materials for verification like methods and data • Pre-determine the parameters • Selection of sites to visit
Key Issues	• Accreditation of verifies • Who will undertake the verification and what needs to be verified since there is no guidelines set for verification • Will only be the donor-supported actions be verified? • What is the framework for verification? External verification of domestic actions may not be acceptable	• Limited access to data • Unavailability of some data • If verification is the same as validation or audit? • Issues on technologies or tools to use in verification

2. MRV of GHG Inventories

Dr. John Watterson, RICARDO-AEA

GHG inventory not only aims to show development of GHG emission at the national level over time and to allow prioritizing of sectors, sources or gases for mitigation actions, but also provides relevance on projections, setting scenarios and targets, deriving regional and local data, providing guidance and expertise to gain knowledge, identify good practice and lessons, and developing a national data.

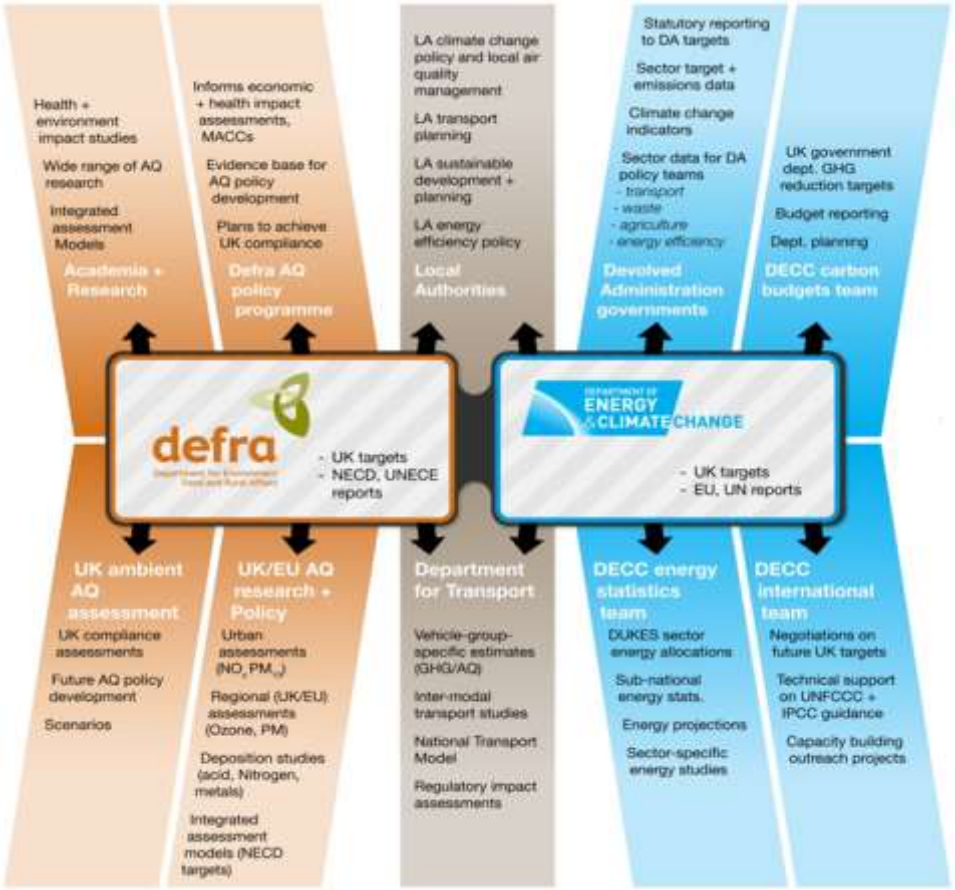
In the UK, many have been using the inventory data and inventory experiences in decision making and as can be seen in the diagram, Defra and Energy and Climate Change are two key sources of these inventory data.

GHGI also provides a basis for NAMAs especially on scoping and accounting boundary, performance metrics and MRV Reference levels for crediting and funding options both from domestic & international sources.

It covers five key sectors particularly; waste, energy, agriculture, industrial processes and solvent, and land-use, land-use change and forestry (LULUCF). And in doing GHG inventory, there are key considerations and key elements need to be in place

Figure 4. Use of inventory data and inventory experience in the UK

Source: Watterson, J. and Hunter, R. (2014). *MRV of emissions*. [Powerpoint slides]



Key Consideration in GHG Inventory[1]

- Use of IPCC Guidelines , recommended to use the IPCC 2006 Guidelines

[1] Source: Watterson, J. And Hunter, R. (2014). *MRV of emissions*. [Powerpoint slides]

- Basic estimation approach: Emissions = Activity Data * Emission Factor

- Tiered approach to emission estimation: Tier 1 – Default approach; Tier 2 – Country-specific; Tier 3 - Installation specific or model approaches

- Activity Data (AD) Sources: surveys, national statistics, proxy data, bottom up data

- Emission Factors (EFs) Sources: international defaults, country-specific factors, used of data from other countries with similar national circumstances. It is recommended to develop EF Tier 2 and higher after the full compilation of the GHG inventory.

Key Elements in GHG Inventory[2]

a. Institutional Elements:

- Responsibilities / roles for data collection, inventory compilation, QA/QC, reporting agreed

- Long-term budgets for inventory related activities

- Reliable access to data sources

b. Capacity-related elements

- Sectoral experts understanding methodologies, data, QA/QC

- Compilation team, understanding UNFCCC reporting requirements, QA/QC, data handling and archiving processes

c. Technical elements.

- Emission calculation methodologies

- Defined processes for data collection, emission calculation, data storage, report generation, QA/QC, long-term inventory improvement

- Tools for data processing and data archiving (MS Excel is an option)

In summary, one must be reminded of the following[3]:

- Inventories form the basis for mitigation policies, projections, scenario setting;

- Having a GHGI provides economy-wide data. Completeness is essential to enable cost-effective, prioritised policy effort;

- Having a GHGI that meets some/all of the UNFCCC GLs, GPG and underpinning MRV requirements provides credibility, relevant for donors;

- The GHGI inventory agency will develop into a resource of technical expertise that can be drawn upon across a wide range of technical and policy areas;

- Inventory systems are live systems that operate year-round, geared to addressing specific outcomes; and

- Developing data at national, regional, local level is achievable through a mixture of top-down and bottom-up data management, and it is useful to foster

[2] Source: Watterson, J. And Hunter, R. (2014). *MRV of emissions*. [Powerpoint slides]

[3] Source: Watterson, J. And Hunter, R. (2014). *MRV of emissions*. [Powerpoint slides]

better engagement across different stakeholders.

Plenary Discussion

Below is a summary of concerns raised during the discussion.

- On Quality Assurance (QA) and Quality Check (QC) within Reporting Dimension. Verification is not explicitly defined because under the UNFCCC, it is some sort of external review. QA and QC are related since QC consists of routine steps to check if the calculation is precise, while QA is defined as an external peer review, involving an outsider for the conduct of review of actions, hence generating unbiased perspective to improve a specific action.

- A Robust MRV System. It necessary to level off with the definition of robust prior to determining whether an MRV system is robust or not, however on a technical point of view, it means that whether the instructions are applied differently, outputs are still the same. Thus it is important to have proper documentation and make such documentation available and accessible to all sectors.

- MRV in relation to GHG Inventory (GHGI) and policies. For GHGI, specific guidelines and requirements are outlined by the Convention to ensure that such inventory is robust, while in the context of MRV, information should be put together in order to develop a country-specific MRV system.

Breakout Session

The participants were sub-divided according to their sectors (Transport, Waste, Energy, and Forestry) and tasked to discuss the following questions:

- Which data is required to compile a GHG inventory for your sector?
- Which of the datasets already exist?
- Which institutions hold them?
- Which data sets are not yet available?
- How could data gaps be filled?

The results of their discussions were laid out on the zopp boards and were presented to the plenary. The table below presents the results of the group discussions:

Table 4. Workshop Output: Data requirements and Institutional Actors for conducting MRV for GHG Inventory

Required Data	Existing Data	Institutions	Not yet Available	How could data gaps be filled up
		Forestry		
Forest Cover	Forest Cover/ Activity Data 2003 and 2010 (GIZ and ground validation)	NAMRA	Forest Carbon Density/Emission Factor - No forest carbon - No forest/timber inventory since 2003-2005	Use of appropriate methodology for NFI *(currently using the rectangular plot but now trying to use circular plot)*
Carbon Data	NFI-FRA for reporting to FAO	FMB		Remote sensing and ground validation
LULUCF			Data sets for different land use categories	Development allometric models
			Stratification of land use types	Use of default values
		Waste		
Type of waste management facility	Available, but there is a need to harmonize definition of the SWM facility as guided by IPCC	NSWMCS/EMB		Harmonize IPCC/NSWMCS definition
Waste composition (% month)	Available, but not yet representative for the national data although present in the 10 year plan of the LGU	NSWMCS/ EMB (for QA/QC) LGUs source of data		Update, establish "typical" values
Waste generation rate (tp4)	Available, but not yet representative for the national data although present in the 10 year plan of the LGU			
Tons of composted/digested waste	Available but only few LGUs report the volume of waste processed as well as recycled (not comprehensive)			
Tons of recycled waste				
		Transport		
Fuel consumption		DOE	VKT	Motor vehicle inspec-

by type of fuel (data)				tion system
Fuel Density		DOE	PKT/Fuel Efficiency	Odometer reading
NCV/ Heating Value		DOE based on IPCC	Regional fuel split	
Emission factor per fuel type based on the IPCC			Emission control devices fitted on MV	MVIS
		Energy		
Energy Consumption Data	EBT/OEB • Production • Transformation • generation	DOE, PS (oil consumers, powerplants, industries) Attached agencies of DOE	Energy Activity data (heat rate, efficiency, etc.)	• Late or no submission of data from stakeholders • Local Emission Factor • Survey and Reporting system • Institutionalization of data submission • Monitoring and Validation

3. MRV of Nationally Appropriate Mitigation Actions (NAMAs)

Dr. Ross Hunter, RICARDO-AEA

The UNFCCC outlines specific guidelines for MRV of domestically supported NAMAs and different from GHG Inventory particularly on five key elements (Table 5).

Table 5. Differences between MRV of NAMAs and the GHG Inventory

Source: Watterson, J. and Hunter, R. (2014). *NAMA MRV.* [Powerpoint slides]

Key Elements	MRV of NAMAs	GHG Inventory
Scale	Specific Measures	Economy and sector wide
Scope 1	Cost, Impacts, outcome	Emissions
Causality	Yes	No
Implementation	Yes	No
Co-benefits	Yes	No

There are 10 steps in MRV of NAMAs and the earlier a country gets into the process the better for a country to implement such MRV. As Figure 5 indicates, number 3, 6, and 9 are key steps in NAMA MRV.

NAMAs are not limited to achieving only mitigation, but can help achieve all kinds of non-GHG-related objectives such as but not limited to job creation, increased income, improved air quality, improved health, increased crop production, safeguarding biodiversity, improving livelihoods, and improving water availability. However, it must be noted that in selecting indicators for NAMA MRV, the impact chain must be considered to understand which indicators will show its track for various objectives, along with potentially unwanted impacts.

In UK approach, indicators were based on relevant effects as well as drivers. They have devel-

oped trajectories based on expected developments and collected indicators values annually, which would then be compared with the trajectories. The focus was to look at energy efficiency of the industry and it resulted to the following observations and lessons-learned.

Key Observations

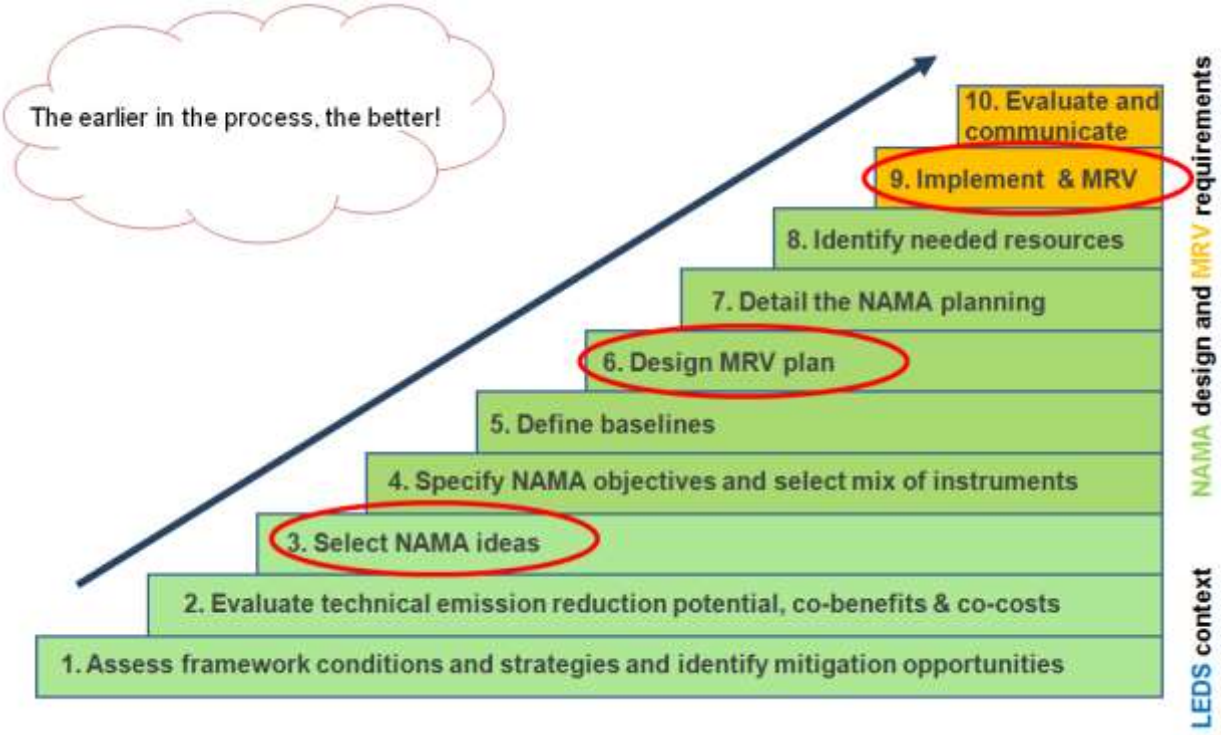
- Absolute emission development in line with trajectory
- Key driver energy efficiency is far from desired trajectory
- Absolute emissions is in line with trajectory mainly because of economic downturn

Lessons learned[4]

- Finding the right level of detail in indicators is key
- Indicators related to factors influencing emissions provide good insight into effectiveness of measures
- Getting acceptance and support from "policy owners" takes time
- Policy owners might lack necessary expertise to provide the indicator data required
- GHG inventory cannot provide all indicator data (and likely never will)
- Accept system is not perfect at first and improve over time

Figure 5. MRV in the NAMA Process

Source: Watterson, J. and Hunter, R. (2014). *NAMA MRV.* [Powerpoint slides]



[4] Watterson, J. and Hunter, R. (2014). *NAMA MRV.* [Powerpoint slides]

- Independent evaluation by non-government organization (Climate Change Committee) can lend credibility to the result, but at the same time can hinder open discussion on evaluation results.

In Wales on one hand, indicators were divided into three tiers, looking at the transport sector:

- Tier 1, Sector carbon dioxide equivalent emissions. CO2e emission estimates consistent with the 3% target
- Tier 2, Activity Data. Activity data used to compile the Greenhouse Gas Inventory for Wales
- Tier 3, Policy. Monitors things Welsh Government is actively doing to reduce GHG emissions. Provide an indication of how individual measures and policies are performing

Table 6 shows the challenges and good practices for MRV of NAMAs.

Table 6. Challenges and good practices for MRV of NAMAs

Source: Watterson, J. and Hunter, R. (2014). *NAMA MRV.* [Powerpoint slides]

Challenges	Good Practices
• Change of emission levels, jobs, health, etc. can have many influencing factors. • An MRVed change might stem from a specific NAMA, but potentially also from the interaction of several NAMAs or factors external to mitigation actions, e.g. economic or social developments • It is not easy to understand whether a specific NAMA has caused an MRVed change and to what extent. • What can be done? Accept these limitations and adjust expectations. • Move away from a CDM-like MRV focussing on highly accurate emission reduction values • Aim to understand, whether your NAMA does contribute to achieving desired impacts and whether it has a relevant impact or not - MRV systems can be set up to at least help understanding causality - Package NAMAs targeting the same impacts and assess their combined impacts - Assess potential impacts in detail a forehand and design MRV accordingly	• **Good information and communication** are of vital importance. Gathering and keeping a record of information for reporting relies on good communication and coordination between all entities involved in the monitoring process. • **Define clear roles and responsibilities** and give **transparent guidance** to each organisation involved in developing and implementing the NAMA MRV-plan. This will ensure the reliability and consistency of the measured information, as well as its timely reporting and verification. • **Calculate emission** mitigation and mitigation costs based on **proven or credible methods** and using the **best available data**. • **Monitoring quality and reliability of data** and an **open and transparent access to information** increases the efficiency of the MRV process. Emission mitigation and mitigation costs should be calculated based on **proven or credible methods** using the **best available data**. • **Examine existing MRV best practice** to ensure the MRV plan is designed according to national requirements. • **Perform** continuous **review and improvement of the MRV plan**. Organisations with different expertise should be involved, in order to maximise technical capabilities.

Plenary Discussion

The discussion focused on the following concerns:

- Developing one MRV system for all NAMAs. This is to avoid conflict from various sources of datasets. Thus, it is important to consult all sectors in developing the system specific to the country's context; otherwise each sector might find it difficult to explain such variances, especially to policy makers. Additionally, one MRV sector for all mitigation actions facilitates the reporting process of the national wide emission reduction.

- Difference of MRV of NAMAs and REDD-plus since both are voluntary and focused on mitigation. Both are similar in terms of principles; however each system would vary based on the requirements of "who and what to report".

- Difference between verification and validation. The two concepts have their respective distinctions but at the same time an overlap to each other. In that sense, verification is all about accuracy while evaluation is judging before the criteria or defining the performance of the criteria.

- MRV of supported NAMAs. The discussion on indicators and guidelines for supported NAMAs is still on-going, which would then require a robust MRV system. At the moment, GCF and the NAMA facility are already in place for MRV support and could give orientation of indicators for tracking international climate finance.

Breakout Session

The groups were asked to identify 5 success factors for NAMA MRV and discuss why these were chosen. The facilitator reminded the groups to reflect back on the presentation specifically on slides 28-34 of the GIZ MRV Tool to support their discussion

Table 7. Workshop Output: Five (5) most important success factors for NAMA MRV and why these factors

Success Factors	Why
Forestry	
Reliability and Accessibility of data	If this is in place, cost is reduced for collection new one
Development of proven and credible methodology	To support the reliability of accessibility of data, there could be consistency and ease of application
Financial and technical efficiency and effectiveness of the MRV for NAMAs	To build capacity
Functional Institutional Arrangement	To ensure inclusiveness and clarity of roles
Periodic evaluation of the MRV system	To create a feedback mechanism
Transport	
Steering structure (institutionalized)	Accountability and transparency
Public ownership of transport NAMA MRV (data provider)	Provides sustainability and continuity
Enhance staff technical capacity to conduct measurement	Reliability and consistency, continuity
Mainstreaming MRV systems in regular programs	Common understanding of all levels at the Department
Clearly defined sector methodology	Accuracy and reliability
Energy	
Designate organization to measure and report (M, R)	
Design and continuously improving of MRV plan (M)	
Define a baseline (M)	
Determine cost effectiveness of the action (M)	
Third Party Verification (V)	
Waste: look at success indicators	
Mainstreaming MRV in the database management system of the waster sector, some for M and R, no V	
QA and QC of gathered data to ensure reliability	
Appropriate and credible methods to calculate emission reduction of NAMA measures	Ensure reliability
Resource allocation for MRV for NAMAs	

4. MRV of Support

Dr. John Watterson, RICARDO-AEA

MRV of support is the third pillar of a national MRV system. It is a tool to help realize developing countries' nationally-determined, climate-compatible development goals. It has two interrelated dimensions a) support needed and b) support received that covers three types of support such as finance, technology, and capacity-building.

- *Finance Support*. Finance for climate activities and related capacity building and technology development and transfer.
- *Technology Support*. Measures taken to promote, facilitate and finance the transfer of, access to and deployment of climate-friendly technologies.
- *Capacity Building Support*. In relation to climate activities and climate-friendly technology development/transfer.

MRV of support is anchored on the agreements in the UNFCCC.

- Developed country Parties are required to provide resources to support and enable climate action and national reporting by developing country Parties. Recent developments include:
  - Developed countries' pledged to mobilize US$100bn per year by 2020.
  - Parties established the Green Climate Fund, Technology Mechanism, Framework on Capacity Building and NAMA Registry, which supports the matching of financial, technological, and capacity-building support from developed countries with actions being initiated by developing countries.
- In their national communications and now their Biennial Update Reports (BURs), developing countries are asked to provide information on international support needed and received in relation to their climate actions.
- Partly mirrored by developed countries' 'MRV of support' requirements – they must provide information, in their national communications and now Biennial Reports, on the support they have provided for developing countries' climate actions.

Thus, developing an MRV of support would provide relevance specifically on:

- Needs assessment which is integral to the national climate policy and investment planning process. It enables more coordinated and successful engagement with donors and illuminates opportunities to harness domestic resources more effectively to promote national climate objectives.
- Tracking and evaluation of support received. In order to:
  - inform the needs assessment process and enables more coordinated delivery of support to that country;
  - help developing countries to identify best practice and make better decisions about how to use international support options; and
  - inform the improved design and operation of international support mechanisms, by highlighting gaps, weaknesses and success stories.
- A tool to support national climate policy development and implementation, especially that

- MRV of support' (needed/received) is linked to, and should be embedded within, national climate/sustainable development policy and planning system and it is an integral tool for realizing a country's nationally-determined goals and priorities.

Table 8 details the system design that covers objectives and principles on developing the MRV of support and steps in getting started for both MRV of Support Received and Support Needed

Table 8. MRV of Support System Design

Source: Watterson, J. and Hunter, R. (2014). *MRV of Support.* [Powerpoint slide]

MRV of Support System Design	
Objectives and Scope	**Principles**
• **Purposes:** mitigation only or both mitigation and adaptation? • **Sources:** international/domestic; public/private; South-South flows? • **Types/Instruments:** grants, concessional loans, equity, risk mitigation, international carbon market mechanisms? • **Amounts: '**agreed full costs' vs 'agreed full incremental costs'? • **'Mitigation'/'adaptation':** lack of standardised definitions.	• A national MRV system integrating 'MRV of support' should: • **Be 'fit-for-purpose' –** serve nationally-determined objectives, which will determine the appropriate scope and scale. • **Be embedded within the national policy and investment planning cycle -** as illustrated above. • **Ensure efficiency and coherency** - e.g. integrated F/T/CB needs assessment; integrated coverage of all three MRV pillars; ensure coordination of data collection and management and evaluation process etc). • **Build on existing systems –** Starting with a 'stock-take' of existing data, institutions, systems and capabilities. • **Consider a phased implementation** - which increases in coverage and complexity as data and institutional capacity is developed over time.
Getting Started on MRV of Support Received	**Getting Started on MRV of Support Needed**
1. Define the scope of the system (e.g. sources of support received). 2. Define the scale of the system (e.g. national, regional, sectoral). 3. Map the existing institutional and donor support landscape for delivering climate change-related policies, and for receiving international support. 4. Identify data and capacity gaps – where gaps exist determine how the data can be tracked in the near-term (e.g. third-party data collection) and how can capacity be built over time. 5. Designate clear responsibilities within relevant government agencies and bodies (including oversight + coordination role) for functions on; Data collection/tracking, Processing/Synthesis, Reporting, and Evaluation 6. Consider phasing of measurement & reporting	1. Define the scope of the system (e.g. priority sectors/measures; relevant sources and instruments of finance, technology, capacity building). 2. Define the scale of the system (e.g. national, regional, sectoral) 3. Map the existing institutional and donor-support landscape for climate change-related policies, and for conducting related needs assessment. 4. Identify data and capacity gaps… where gaps exist determine what is possible to do in the near-term (e.g. top-down/qualitative needs assessment) and how can capacity be built over time? 5. Designate clear responsibilities within relevant government agencies and bodies (including oversight + coordination role) for functions on; Data collection and management, Synthesis and analysis, Reporting, and Evaluation 6. Consider phasing of measurement & reporting

In Summary[5]:

MRV of support' comprises of

- Two interrelated limbs: MRV of support needed and MRV of support received.
- Three types of support - finance, technology and capacity-building - to be considered under each limb.

'MRV of support' is anchored in the UNFCCC. But should be viewed as much more than just fulfilling UNFCCC reporting requirements. There are national and shared international benefits to generating this information.

'MRV of support' is integrally linked to and should be embedded within the national climate policy and investment planning process. Evaluation of support received feeds into 'measurement' of future support needs.

THE IMPORTANT QUESTION: What do YOU consider to be relevant and feasible for your national MRV system to cover?

a. Start by defining objectives for a national MRV system integrating 'MRV of support'. That will determine what information it needs to generate.
b. Then do a 'stock-take' of existing data, institutions, systems and capabilities.
c. Build on existing structures and consider a phased implementation, which increases in coverage and complexity over time.

Breakout Session

The participants were sub-divided into two groups. Group 1 - MRV of Support Received composed of representatives from DBM, CCC, DOF, and NEDA answered the following questions:

- How could we assess what support has been received, by whom and in which form?
- Which institutions should be involved in this process?
- Are there existing reports or processes (e.g. budgetary processes), which could support collecting this information?

The following were the results of their discussions:

[5] Watterson, J. and Hunter, R. (2014). *MRV of Support.* [Powerpoint slides]

Table 9. Workshop Output: MRV of Support Received

Process of Assessment	Agency Involved	Reports required
Sectoral Needs (financial/technical and cap building)	NGAs and NEDA, CCC	• DOF-ICC Review
Project Proposal Submission	DBM and NEDA (DBM: PhP900M and below; NEDA: PhP1B and above)	• COA Audit Report
Project Evaluation Financial and technical	Financial: DOF, DBM, NEDA Technical: CCC	• DBM: Budget Execution Document (BED) • Budget Accountability Report (BAR)
M&E: Project Performance Evaluation (RBMES)	NEDA, DBM, COA, CCC	• NEDA: Socio-Economic Report (SER) • ODA: Progress Reports and Project Evaluation Reports

Group 2 - MRV of Support Needed (comprised of sector agencies) answered the following questions:

- What do we need to do to understand which support is required, by whom and in which form? Please think about financing, capacity building, technology transfer.
- Who should be involved in the assessment of support needs, e.g. which ministries/institutions?
- Are there existing reports or processes (e.g. budgetary process) which could support collecting this information?

The following were the results of their discussions

Table 10. Workshop Output: MRV of Support Needed

What to Understand	By whom	In What Form	Who is involved in the assessment	Existing reports/processes
Stocktaking of existing resources (outside and internal)	• Respective agency/office	Technical and financial assistance (grant)	Key stakeholders (NGAs, academe, CSOs)	IPCC Assessment Reports/Guidelines
How to access climate fund	• National Government • LGU • Private Sector (PPP)			National Communication
Database of climate technologies	• DOE/DOST PAGASA	Technology assistance, procurement		
Criteria of projects tagged as climate projects	• Sectoral agencies (centralized with CCC)			PNRPS/NCCAP/NFSCC
Availability of experts on MRV	• Sectoral agencies	Hiring of a dedicated expert (consultants)/technical support		

What to Understand	By whom	In What Form	Who is involved in the assessment	Existing reports/processes
Tools in GHG inventory for Solid Waste Sector	• National Govt and LGUs	Capacity Building	Environmental Sector	• IPCC Guidelines • GIZ GHG emission calculator • Others
Creation of dedicated unit (institutional)				Sectoral planning process
Streamlining data collection				
Domestic (local emission factor establishment for GHG inventory	• Relevant sectors	Study to establish local emission factor	Relevant sectors	Sectoral planning process
Identifying gaps and evaluating options				National EST strategy(transport)
Harmonize NCCAP with PEP, NREP, PDP				PEP
TA in recognizing IPCC data requirements with local sectoral data available				NSWM strategy
Data Management System		Software/hardware; Spatial mapping		

5. Institutional Structures for MRV

Dr. Ross Hunter, RICARDO-AEA

Establishing the institutional structures for MRV is relevant in putting things in order, but it should be noted that in doing so, creation of new institutions is not always necessary, often connecting, simplifying, extending existing structures is what is needed . Figure 6 shows the building blocks in setting up institutional arrangement for MRV.

There are two types of institutions for MRV system, centralized and decentralized systems, where each has its pros and cons (**Error! Reference source not found.**).

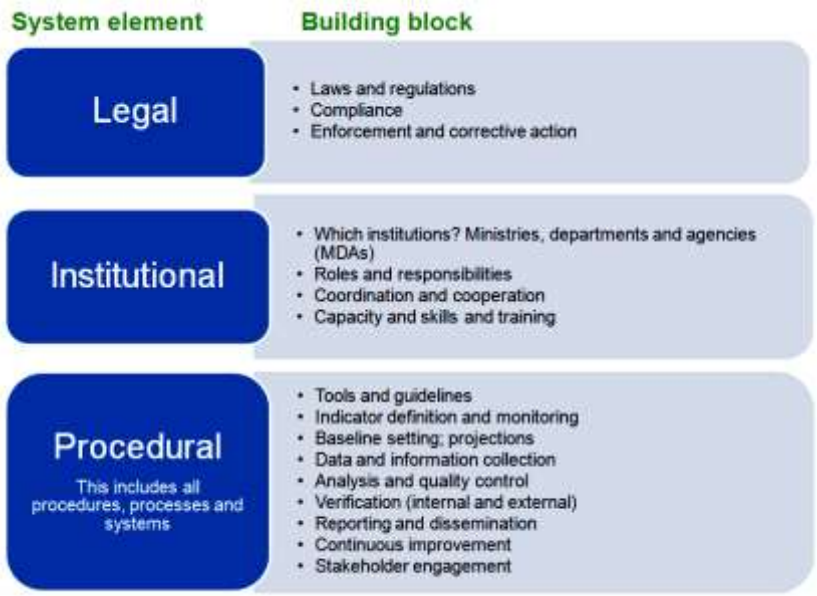
Table 11 Types of Institutions for the MRV system

Source: Watterson, J. and Hunter, R. (2014). *Institutional Structures for MRV.* [Powerpoint slides]

	Centralized	Decentralized
Pros	Greater control over the MRV process, easier to ensure standardisation and comparability	• Easier to ensure that the MRV system is fit-for-purpose • MRV system more targeted to local circumstances
Cons	But need to fully involve all institutions, or risk losing local input into MRV design	Lack of coordination can make standardisation difficult

Figure 6. Building blocks of the institutional arrangement for MRV

Watterson, J. and Hunter, R. (2014). *Institutional Structures for MRV.* [Powerpoint slides]



For instance, while Brazil has a decentralized MRV, the government realized that they need to develop a national MRV system since they find it difficult to bring together all MRV systems into one system. In UK, coordination and management of data are both under one institution; however the challenge is scaling-up of data at the national level.

Meanwhile, Figure 7 shows the government coordinating structure for MRV and Figure 8 shows a sample of its MRV system.

Thus, the approach may vary from one country to another and it is important to be reminded of the following key elements

- Building on existing institutions
    - Start with a situational analysis – may already have many of the institutions needed
    - Usually more effective to build on existing institutions, but in some cases may breed entirely new institutions
- Ensuring clear roles and responsibilities. Set roles out in legislation or in MoUs if needed
- Getting senior buy-in from the institutions involved. This will be important for getting full cooperation from that institution
- Developing capacity. Likely to be significant training and development needs, but it is best to prioritize.
- A two-way process. Ensure that institutions involved in MRV have a say in how the system is shaped, which will encourage greater buy-in.
- Good communication. An institutional framework will only be successful if the institutions communicate effectively with each other

Figure 8. MRY system of Kenya

Source: Watterson, J. and Hunter, R. (2014). *Institutional Structures for MRV.* [Powerpoint slides]

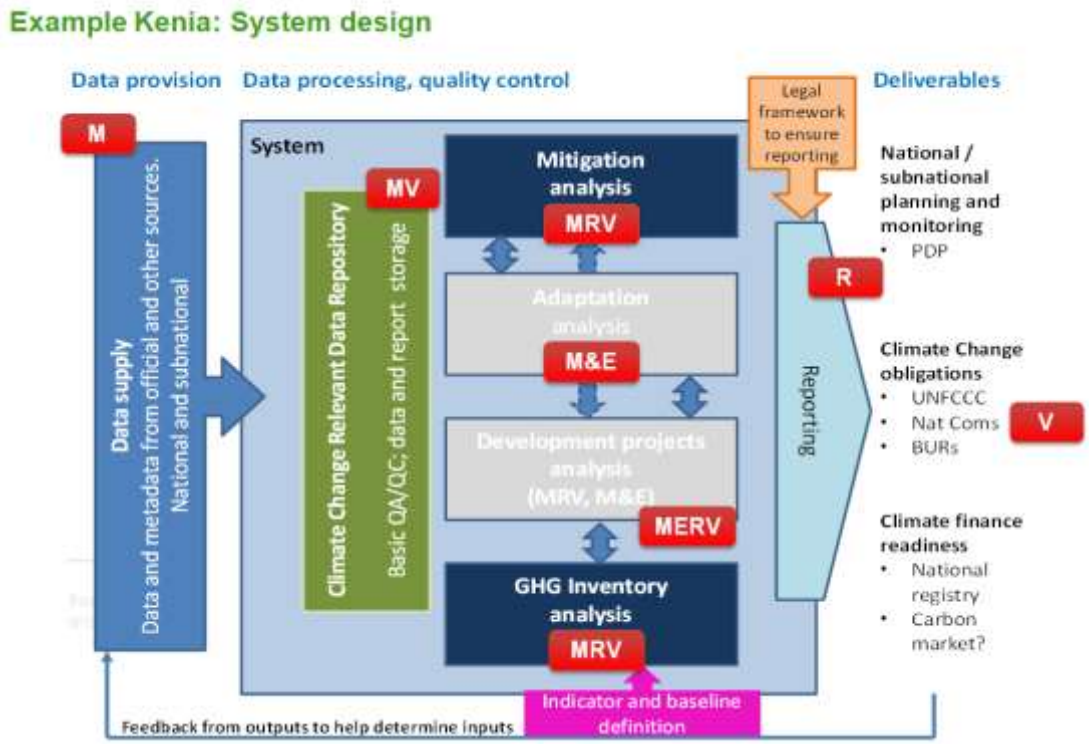
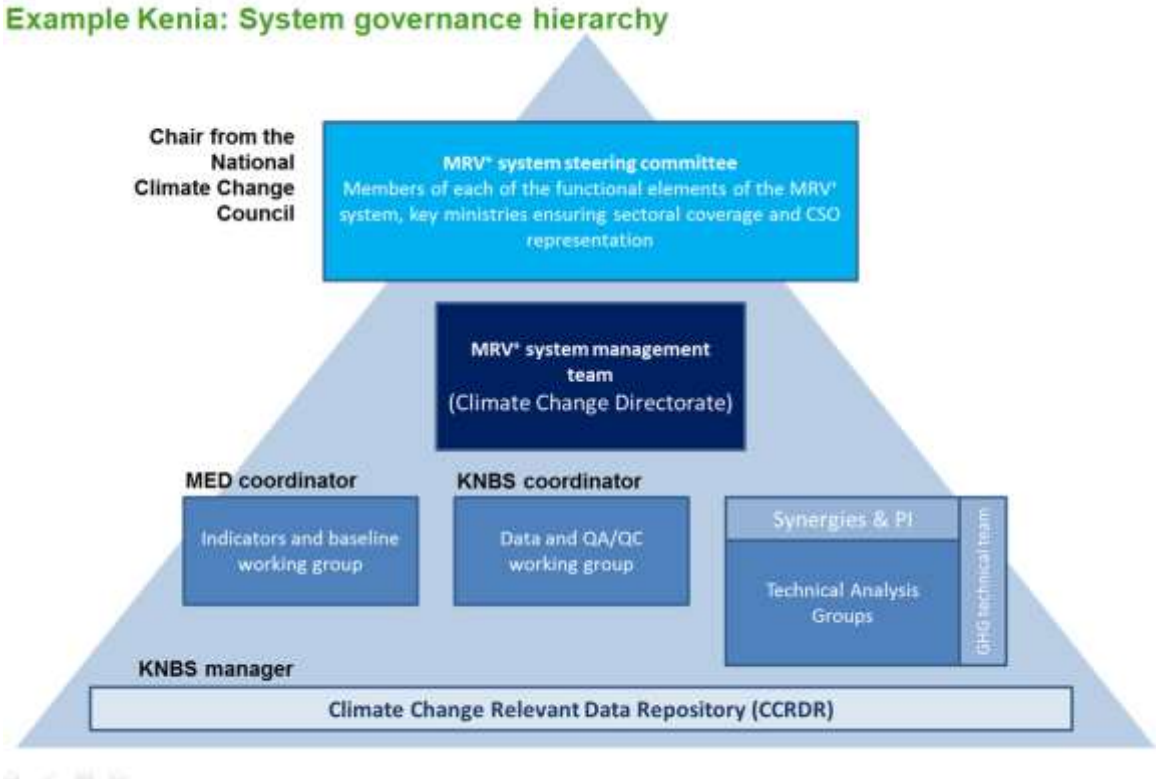


Figure 7. Government structure for MRV in Kenya

Watterson, J. and Hunter, R. (2014). *Institutional Structures for MRV.* [Powerpoint slides]



Plenary Discussion

The discussion focused on Kenya's case in building their MRV system.

- Kenya started with a complex framework that needs simplification into a system that would lead to data collection, data flow and reporting. The baseline working group ensures that the flow of datasets is correct prior to channeling any information to the steering committee.

- Buy in of Senior Officials. There are two points in identifying champions or to generate a buy-in from senior officials 1) clear illustration of benefits and 2) clarify composition and functions of the steering committee to justify that such setting-up is the appropriate structure for the country.

- Legal framework. This outlines specific level of reporting needs as well as target for reporting to ensure timeliness of reports, which can be detailed either in a form of MOA or any other issuances appropriate for the country. Hence, putting a legal basis on requiring all institutions involved to provide data on mitigation, adaptation, development projects and GHG inventory.

- Project timeframe. Kenya set a specific timeframe of 3-5 years, adhering to a phased approach. In the case of South Africa, the first phase effectively looked at available information specifically on what is working and not, the second phase was focused on improving the datasets and indicators and identifying the agencies involved, which has led to the third phase of a more structured system particularly forging a Memorandum of Agreement to clarify the roles of agencies involved.

- Cost-saving estimation in developing an MRV system. At this level, there is no cost-saving estimation yet, but the key is to build on the existing system and work on the country's specific need to become more cost effective.

- Response of the institutions in the restructuring the MRV system. It will depend on the current circumstances, but such action would bring both positive and negative implications. On the positive side, things will be more organized in determining the level of data needed, while on the negative side, data are often considered as power and people do not want to share this because they become vulnerable.

- In the case of Kenya, jobs would be lost but the government makes best use of the reorganization in terms of strategically placing the agencies to maximize their role, for instance the Office of Statistics. The reason behind a centralized data system is to primarily address the problem of monopolizing existing data. Thus, accessibility of data would be much easier.

Breakout Session:

The participants were sub-divided into 3 groups: MRV of GHGI, NAMAs, and Support. The groups were tasked to list all institutions and their corresponding roles in MRV, which would be the basis for drawing out of simple institutional structure for the MRV system.

Figure 9. Workshop Output: Institutional structure for the MRV system (Data flow)

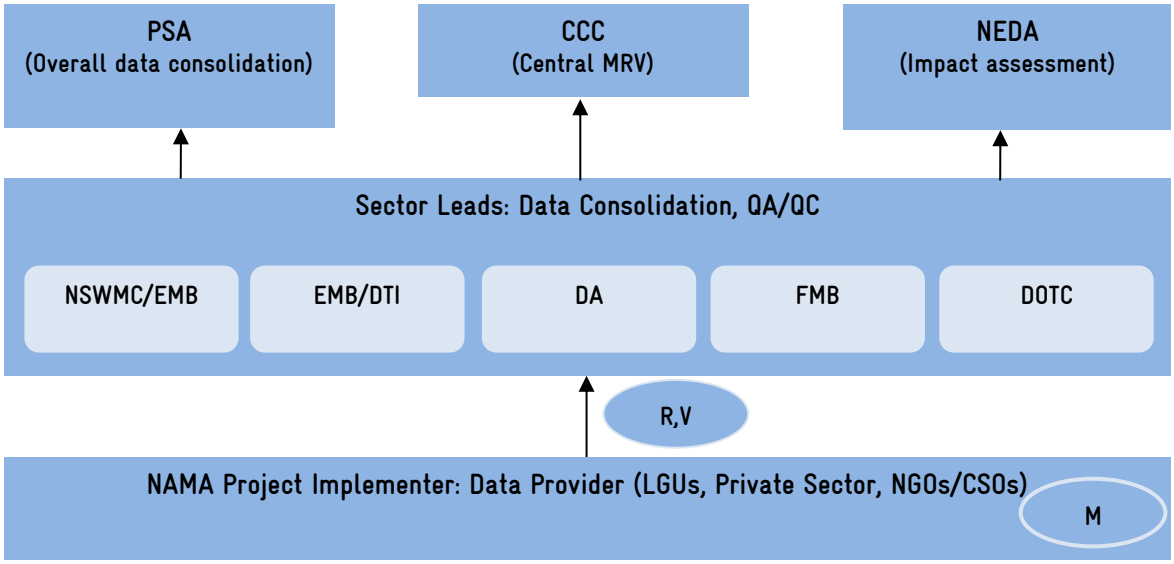
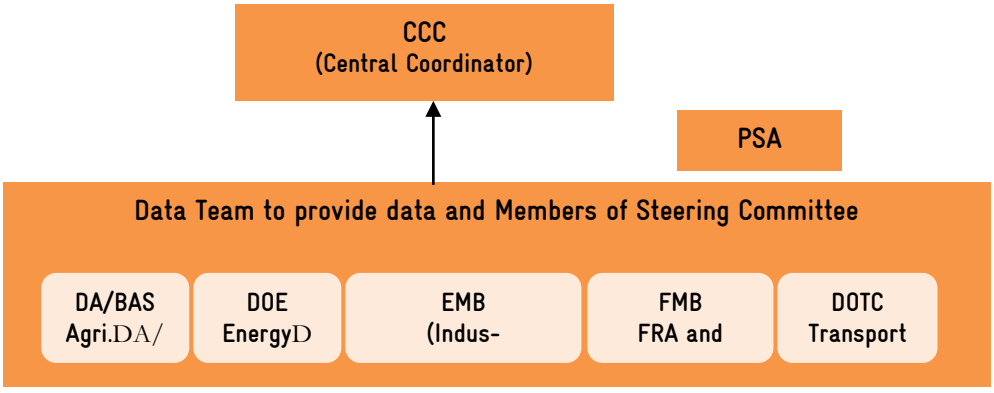


Figure 10. Workshop Output: Institutional structure for the MRV system (Coordination mechanism)



- CCC as overall/central coordinating agency
- Sector Agencies: To handle sectoral MRV with corresponding Data Team for Database Management
- Steering Committee: To discuss MRV related issues, spearheaded by the CCC with members from each sector

Table 12. Workshop Output: Institutional structure for the MRV system (Roles and responsibilities of agencies and institutions)

	DOF (Central MRV, based on RA 10174)
Steering Committee (Climate Finance)	CCC, DOF, DBM
Coordinating Agencies	Relevant NGAs
Data Team	DOF, DBM, CCC, DENR, NEDA, DILG
Data Provider	PSA, NGAs, Business Sector, CSO, Private Sector, Academe, Financial Institutions, LGUs

The participants were then grouped according to their respective sectors and tasked to develop a roadmap for MRV architecture and BUR/NatCom for the Philippines focusing on waste, forestry, energy, transport sectors, while CCC was tasked to cover discussion on policy. Dr. Watterson enumerated the following points on the purpose and importance of Roadmap Formulation[6]:

a.) [It is] An important and useful tool for planning and structuring the MRV, and GHGI and reporting process.

b.) It enables the identification of elements of the system that will need to be fast tracked, e.g. in order to start meeting international reporting obligations.

c.) It identifies key outputs, deliverables and process activities, such as:

- Putting funding in place for the MRV system, including any additional funding that may be needed for organizations to support the system;
- Appointing the Steering Committee, management team, and Technical Working Groups Secure office space and equipment;
- Setting up the Data Storage System (DSS) and the Technical Analysis Groups (TAGs). The TAGs need to work out individually what they need to report (now and in the future – immediate, intermediate and longer term), what data they need from which organizations. They also need to participate in providing specifications for the Data Supply and Reporting Obligation Agreements (DSROAs); and
- Establishing the GHGI process, in order to deliver on a regular basis: a

[6] Watterson, J. and Hunter, R. (2014). *Plenary: Roadmap Formulation.* [Powerpoint slides]

clear methodology and team in place to repeat the process cycle aiming to continually improve the transparency, accuracy, completeness, comparability, consistency (TACCC) of the GHG inventory each time.

d.) Highlights important milestones, and shows relationships between activities.

Table 13. Workshop Output: Climate Change Commission MRV Roadmap

MRV of GHGI	MRV of NAMAs	MRV of Support
1. Institutionalizing the system 2. Capacity Building to prepare identified agencies. 3. Rapid data assessment and identification of data gaps - Integrating data in existing reporting system - Identification of data providers 4. Formulation of legal instrument and identification of funding mechanism - Development of Guidance document - Legal instruments for data sharing and collection - Integration of GHG inventory in the regular 5. Conduct of GHGI. 6. Quality Assurance and Quality Control - Identification of Q/A Q/C Team 7. Data Archiving and Documentation (Database System) 8. Monitoring and Evaluation for Future Improvement	1. Identification of sectors. 2. Conduct of NAMA options study to identify climate change mitigation potential - Capacity building of cc mitigation tools and methodologies application 3. Identification of NAMA per sector 4. Institutional Arrangement - Stakeholders consultation 5. Development of NAMA MRV Road Map 6. Establishment of MRV System - Identification of relevant agencies - Development of data documentation, archiving and sharing	1. Stocktaking of financial sources 2. Formalized the Institutional Arrangement (MRV Team) 3. Development of Assessment and Monitoring Protocol

Table 14. Workshop Output: Waste and Industry Sector MRV Roadmap

Establishing MRV system	Data QC/QC Working Group	Data Storage System (DSS)
Secure funding support for MRV system	Set up DSS	DSS manager to submit report
Review system Procedure	Enhancement of data gathering(SME/LGU)	Manage and upload data
Agree system implementation plan including best option for enforcing DSROAs	Define the process and procedure for data QA/QC at ROs	Store all formal outputs and reports generated by the MRV system in the DSS
Review and address existing capacities and gaps and logistical requirements	Review the quality of data collected and take remedial action	Ensure that the DSS is always backed-up sequentially
Identify and invite MRV funding and implementation partners from government and CSO	Set government the required data specifications and quality required	Create and maintain list of data suppliers for the MRV system
Draft TOR for working groups and teams	Data and QAQC manager to submit report regularly	
	Draft Sectoral overview of data quality and	

	work
	Keep the prioritized improvement plan under review and amend as necessary

Table 15. Workshop Output: Forestry Sector MRV Roadmap

1.	**ESTABLISHMENT OF A NATIONAL IMPLEMENTATION AND COORDINATION SYSTEM FOR REDD+**
a.	Support the establishment of a national REDD+ Registry and related protocols and decentralized units as coordination and monitoring structure
b.	Support the development of a national MRV system (up scaling of the sub-national pilot MRV system currently developed for Leyte Island) and building respective capacities
c.	Support further development and implementation of an improved forest policy towards implementation of REDD+ objectives
2.	**DEVELOPMENT OF FINANCING / BENEFIT-SHARING MECHANISMS FOR REDD+**
a.	Elaboration of a concept for a national REDD+ financing system using international funding sources and national/sub-national budgets for forest protection and sustainable forest management (e.g. CBFM Strategy, National Greening Programme, budgets of sector agencies and LGUs)
b.	Elaboration of options for REDD+ benefit-sharing mechanisms, with reference to existing experiences (e.g. CBFM, IRA, NIPAS) and based on innovative approaches, i.e. community incentive and support systems, or the environmental conditional cash transfer (eCCT) approach, payment for environmental services (PES)
c.	Pilot Testing of Financing and Benefit Sharing Options
d.	Harmonization of various tested REDD+ financing options and benefit sharing schemes (GIZ, other development partners, etc.)
e.	Advocate for adoption of financing options and benefit sharing mechanisms for REDD-plus
3.	**INTEGRATION OF ECOLOGICAL, SOCIAL AND GOVERNANCE STANDARDS (SAFEGUARDS) IN IMPLEMENTATION OF REDD+**
a.	Support the adoption of the REDD+ Safeguards Guidelines by the NMRC and its popularization
b.	Develop national and local capacities on REDD+ safeguards and safeguards implementation
c.	Establishment of REDD+ Safeguards for the Philippines
d.	Development and adoption of a consultation and feed backing mechanism with national stakeholders on international CC and REDD+ processes
4.	**FOREST LAND USE PLANNING AND REDD+ IMPLEMENTATION IN SELECTED AREAS (3 PILOT SITES)**
a.	Build capacities for forest land use planning (e.g. facilitation skills, mapping, GIS, socio-economic surveys, surveys on capacities of natural environment and potential for different land uses, plan establishment, zoning)
b.	Elaborate forest land use plans (FLUP) and their integration in a 'ridge to reef' approach into existing planning frameworks at sub-national level, e.g. physical framework and development plans (province), comprehensive land use plans, comprehensive development plans (CLUP / CDP) (municipalities / cities), integrated natural resources management plans (local level = barangays), taking into account specific IP concerns in ancestral domains for ADSDPPs
c.	Support zoning (delineation of forest and other land uses and establishment of respective ordinances), establishment of co-management agreements and long term user and tenure rights for local communities and IPs

d.	Implement concrete measures (reforestation, assisted natural regeneration, agroforestry, sustainable forest management, livelihoods activities, forest based enterprise development, etc.) that generate emissions reduction and CO2 removals and REDD+ co-benefits
e.	Assist the establishment of local structures for protection and sustainable management of forest (e.g. Municipal Environment and Natural Resources Offices, forest protection committees, forest guards = bantay gubat)
f.	Forest Carbon Baseline Study
5.	**AWARENESS BUILDING, INFORMATION AND KNOWLEDGE MANAGEMENT**
g.	Support/ participate information events and campaigns on REDD+ in cooperation with media and other relevant actors (government units, NGOs/CSOs, private sector, academe)
h.	Support/ participate workshops, conferences, seminars, learning sessions/ exchanges at local and national level
i.	Participate in policy and technical discussion on REDD+ at regional (ASEAN, Asia and Pacific) and international level (e.g. UNFCCC)
j.	Document, package and disseminate project results and experiences in appropriate form (publications, participation in regional /international events, side events and contributions to related knowledge/ learning platforms)
k.	Ensure proper steering of project

Table 16. Workshop Output: Agriculture Sector MRV Roadmap

Establishing the MRV System	Data QA/QC	Data Storage System	GHG Technical Team
Secure Funding for the establishment of the system	Set up DSS	Identify the agency that will house the DSS	Identify lead and establish team
Create an SC and corresponding TWG members for each subsector	Capacity building activities	Store all outputs and inputs in the DSS	Provide capacity building
Conduct assessment for the establishment of a system	Harmonization of the data collection, generation, and analysis	Make Sure that DSS is always backed-up	Coordinate with data QA/QC QG and the SC when necessary
Acquisition of technical and creation of a framework on how the members of the sector undertake this activity	Ensure that the file format generated by the system is acceptable/compatible with other system	• Ensure that updates on the system will be done when appropriate • Ensure that file format is generated • Creation of a Task Force within the agency to make sure that the data will be available	

Table 17. Workshop Output: Energy Sector MRV Roadmap

Establishing the MRV System	Activities
	Identify and Appoint the lead and its members of the Energy Working Group
	EWG will establish the MRV system design and familiarize themselves with the components

	Review and agree on implementation workplan
	Establish other working groups with their corresponding implementation plan such as: QA/QC, Indicators and Baseline, DSS, TAGs, Energy Technical Team
	Review and address existing capacities and gaps and logistical requirements
	Secure funding to address requirements and gaps
	Implement programs to address gaps and logistical requirements and improved/build capacities
	Agree on SWG MRV system progress reporting lines and requirements including meetings
	Periodic Progress review

Table 18. Workshop Output: Transport Sector MRV Roadmap

Legal	Legal framework - issuance of a Department Order for the creation of Transport MRV team a. Define mandates of Transport MRV team b. Define roles and responsibilities of the composition of Transport MRV team c. Define reporting bodies and consolidator, e.g. CCC d. Define frequency of steering committee and other meetings
Financial	Secure funding for the creation of the MRV team
Technical	Request for TA for the development and establishment of transport MRV system
Institutional (Administrative)	Create the Transport MRV team (Steering Committee)
	Appoint composition of Transport MRV team
	"Review and address existing capacities and gaps and logistical requirements (office space, equipment, logistics)"
----Develop system----	
Measurement	• Define key indicators for transport (e.g. vehicle counts, PKT, TKT, fuel consumption, GHG emissions, etc) • Define and formalize data-gathering methodology and instruments (how to generate, which agencies as data source) • Identify data gaps and collect additional transport data • Establish system for data archiving, management and dissemination (for reference and verification) • Establish QA/QC system for both data and metadata
Reporting	• Develop reporting method and reporting standards (outline) • Define frequency of reporting (e.g. annually)
Verification	• Consolidate and institutionalize previously established measurement and reporting standards • Assign/accredit third-party verifiers of measurements and reports, e.g. research agencies, academe, NGOs
Cap Dev	• Build capacity for transport technical staff to enforce MRV system (Trainings) • Conduct of regular meeting (pursuant to Department Order) • Secure annual funding for the sustainability of Transport MRV system

Forward Planning

Ms. Sandee Recabar, Senior Science Research Specialist, Climate Change Office, Climate Change Commission

Ms. Recabar presented the National GHG Inventory Plan and mentioned that data from the sectors must be in its official form since these would be reflected in the report to UNFCCC. Thus, there is a current move of institutionalizing GHG inventory and figure on the right shows the institutional arrangement for GHG Inventory.

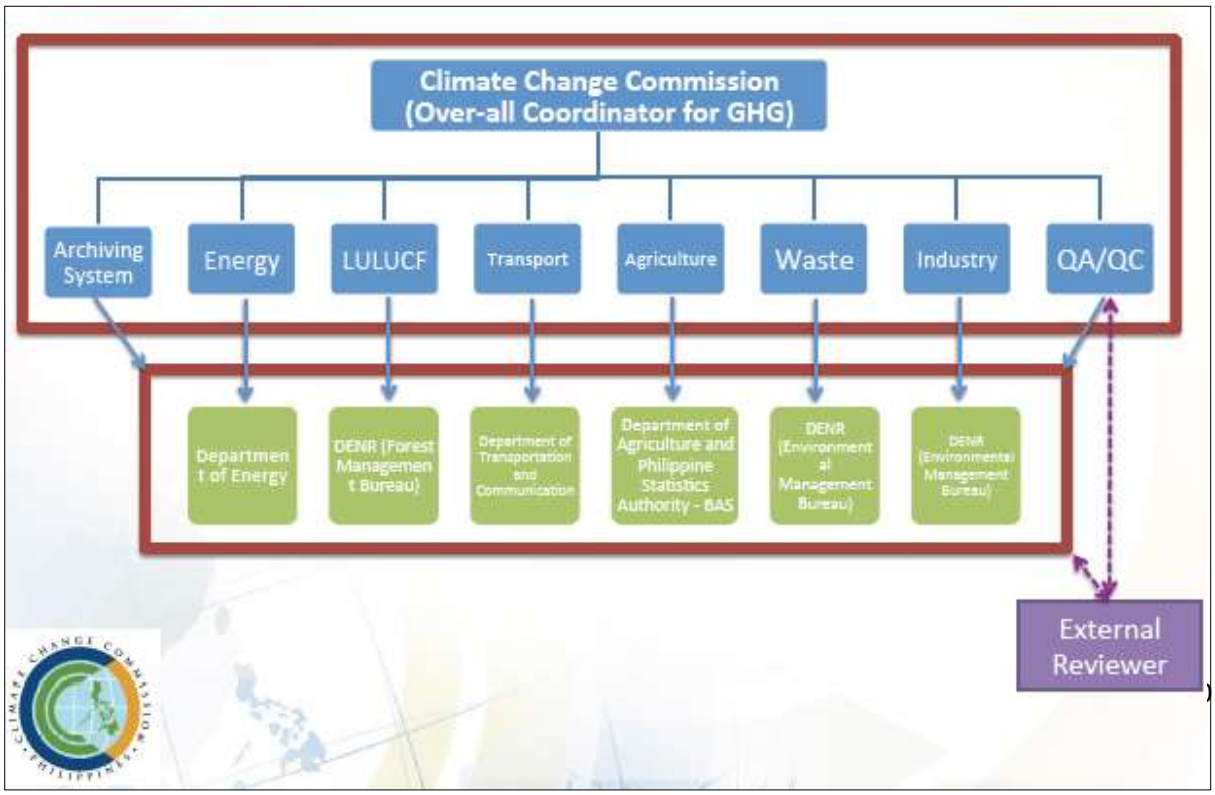
The Commission already conducted series of activities for the past two years, but there is still missing data on forestry and energy sectors from the latest rapid data assessment. Thus, CCC will sit down with the concerned agencies to formalize the institutional arrangement in the form of an Executive Order and to provide guidelines and protocols on data collection, reporting, etc., but it must be noted that actual conduct of inventory will be done by agencies. She also mentioned that since CCC will participate in budget hearings, it would be a good opportunity for the agencies to include budget allocation for GHG inventory.

To that end, she reminded the agencies of the upcoming activities

- May 5: meeting with DOTC (FGD of DOE and DOTC)
- May 14: GHG Strategy
- May 16: Workshop on criteria development for NAMAs
- May 20: FGD of DOE and DOTC regarding energy sector national GHG inventory
- May 21: Meeting on IT committee on info system to initially define the committee's roles and the presence of database keepers would put more value in the meeting.

Figure 12. Philippine Climate Change Commission Institutional Arrangement for GHG Inventory

Source: Recabar, S. (2014). *Philippine Climate Change Policies and Initiatives*. [Powerpoint slides]



Part II. TRAINING ON BASELINE SCENARIO SETTING

Preliminaries

Prayer and National Anthem were rendered, followed by the opening remarks from Assistant Secretary Joyceline Goco from the Climate Change Commission and Dr. Bernd-Markus Liss, Principal Adviser of GIZ-BMUB Projects.

Asec. Joyceline Goco welcomed again the participants and thanked those who attended the MRV training-workshop for their active participation. Asec. Goco mentioned that in the first few years, the Commission focused on adaptation however, it is now gearing towards mitigation. The basics are already in-place through the MRV training-workshop, thus the current workshop will tackle baselines necessary for setting the country's targets. She hoped that inputs would be translated into actual work of line agencies.

Dr. Bernd-Markus Liss emphasized that agencies are doing well in picking up new concepts in GHG emission reduction, which adds relevance to Support CCC project in putting more knowledge and building the capacity of agencies in decision making. He hoped for a good workshop, since it will facilitate a deeper analysis on actions that can be improved.

It was the followed by an introduction of participants and recapitulation exercise on MRV training-workshop

Table 19 Workshop Output: Participants' concerns on the basics of Baselines

Board of Worries
• **Cost**
• **Cross sectoral concerns that might affect baseline scenario**
• **Assuming that baseline scenario has been set (figures, period, projection, etc.), who is the proper authority to check and/or confirm it? Another government agency? An independent consultant? An International Authority?**
• **How to generate data for the baseline determination.**
• **How many key assumptions (factors) would be required in order to develop a sound baseline?**
• **Availability and consistency of data and data sources**
• **Insurance on uncertainties**

Plenary Presentation: Key Topics and Concepts relevant to Baseline Scenario Setting

Presentation of the Stock Taking Tool

Prior to proceeding with the first topic, Ms. Kirsten Orschulok presented the Stock-Taking tool which was also used during the gap analysis. This was done to determine the level of data available in each sector agency and how data are being used.

From the experiences of the IM partner countries, the **Stock Taking Tool** was developed as the first knowledge product of the IM project. It is an analytical tool that countries can apply for the identification of prioritized action for national MRV systems including LEDS and NAMAs. It aims at guiding countries in the assessment of the current comprehensive mitigation architecture, to create transparency and an information basis for planning and implementing mitigation actions, planning and implementing mitigation actions, and to comply with the UNFCCC requirements, e.g. to generate a Biennial Update Report (BUR).

Moreover the tool can also be applied for broader functions of a national MRV system, e.g. related to reporting at the national level. The output of this gap analysis tool is a prioritized list of gaps. This information can be used as basis for the development of a strategy for the further development LEDS, NAMAs and the national MRV system. Furthermore it can serve as input for the reporting on support required (in the form of financial, technology transfer or capacity building support) in the BUR.

The use of this tool is voluntary; the tool has not been endorsed by the UNFCCC

Figure 13. GIZ Stock Taking Tool

Available at: http://mitigationpartnership.net/giz-2014-stock-taking-tool

1. Basic Concepts of Baselines

Dr. John Watterson, RICARDO-AEA

Baselines can be used for domestic purposes and with climate change; the concern now is focused on taking actions to reduce emissions. There are two processes of quantifying emissions; annual and cumulative. Annual emissions are quantity of emissions that occur during one year, while cumulative emissions are quantity of emissions that occur over a longer period of time, typically the sum of annual emissions over a multi-year period. Calculating both annual emissions and cumulative emissions are useful for different purposes, especially on:

- Stabilization of atmospheric concentrations of greenhouse gases are determined by the total amount of GHG emitted year after year.
- Generating a snapshot of emissions levels in a given year, but this may not provide an accurate portrayal of emissions pathways because it could be an unusual year in terms of emissions growth or decline. Rather, it is helpful to understand cumulative emissions levels and cumulative emissions reductions over the goal period.

Baselines looks at concept of base year since mitigation efforts or goals are normally referenced to some kind of "base". A base year is a specific year against which some goal types are tracked over time and the first year of the goal period. Thus, base year emissions level is the GHG emissions level calculated in the base year.

A base period on the other is an average of multiple years against which a jurisdiction's emissions are tracked over time. However a base period can be chosen instead of a base year when there are significant fluctuations in emissions levels over time, which is referred to as base period emissions level or the average amount of emissions over the base period. These goals are most often framed in terms of a percent reduction below base year emissions to be achieved by the target year or target period. Thus, base year differs from baseline scenario and baseline emission, where the former is a set of assumptions and data describing the most likely events or conditions that would have occurred in the absence of the policy intervention, based on available information, while the latter is an estimate of GHG emissions and removals associated with the baseline scenario or sometimes used to describe the same concept as a baseline, such as counterfactual, reference case, reference scenario, or business-as-usual scenario.

In selecting a base year, it is important to always document the reasons for selection such as those identified in Table 20:

Table 20. Considerations for selecting a Base Year

Source: Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

Problems is selecting a Base Year	Possible Solutions
Emissions data for some years of poor quality of missing	• Choose a base year where you have accurate and complete data – both emissions data quality and availability • This might mean years closer to the current date, rather than further back in time
High level of variability in emissions over some or all of the time series	• Try to choose a base year that is representative of "average" emissions in order to avoid selecting a year with uncharacteristically high or low emissions (high might help with a reduction target) • Perhaps use an average base period instead
Choosing a base year that aligns with existing mitigation goals, such as the Kyoto Protocol or Copenhagen Accord pledges	• Although aligning the base year for mitigation pledges might promote consistency with international obligations, there may be problems with data accuracy for "early" years • So choosing years closer to the current date might be better for policy implementation and tracking purposes

On one hand, in choosing the goal it would be helpful to reflect back on things that a country

or an agency wants to achieve, whether it is GHG mitigation which can be called either a policy, mitigation action or a NAMA. There are different types of goals[7]:

a. Single year and multi-year goals

- Some goals are designed to achieve emissions reductions by the final year of the goal period – i.e., the target year: single year goals.
- Other goals are designed to achieve emissions reductions (or reductions in intensity), or limit emissions (or emissions intensity), over several years: multi-year goals
- Multi-year goals have a "target period" rather than a target year, during which emissions levels (or intensity) or emissions reductions (or reductions in intensity) are constrained

b. Goal period

- The goal period is typically the period of time between the base year and target year/period.
- Some goals are not based on a base year, and so the goal period differs by goal type

c. Emissions reductions

- Emissions reductions are the difference in emissions measured between two different points in time (e.g., between base year emissions and target year emissions) or within the same point in time but between a baseline scenario and actual emissions levels
- For example, emissions reductions associated with a base year goal are measured as the difference between emissions levels in the target year and emissions levels in the base year
- In the case of baseline scenario goals, emissions reductions associated with the goal are the difference between the baseline scenario emissions level in the target year and the target year emissions level

In choosing the type of goal and goal period Table 21show key elements that can be taken into consideration, but at the same time be reminded that baseline scenario goals pose a significant risk of low environmental integrity since baseline scenarios can be very uncertain and are often inaccurate projections of future emissions levels. If baseline scenario emissions are overestimated, the ambition associated with the baseline scenario goal will likely be compromised. Table 22 also shows some examples of systems that use the different goal types.

[7] Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

Table 21. Selecting base scenario goal types

Source: Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

Aim	Type of goal to choose	
Achieve absolute reduction in GHGs (e.g. Kyoto Protocol commitment)	• Base year and fixed level goals. Environmentally "robust" – even if for example there is great economic growth, the goal still needs to be achieved	
Accommodate growth in economy or populations	• Choose intensity goal rather than a baseline scenario goal • Less uncertainty associated with intensity goals, as they require assumptions about only one variable in addition to emissions (as opposed to projections that require assumptions about several variables as inputs to models)	
Goal period	**Advantages**	**Disadvantages**
Short	• Mobilize investment and planning for emission reductions more quickly • Encourage quicker phase-out of inefficient practices and technologies	• Once goal is met, if another goal is not set quickly, momentum to continue with GHG mitigation efforts may be lost
Long	• Facilitate long-term planning • Provide more certainty and flexibility for decision makers and stakeholders to make investment choices during the goal period • Moderate the risk of unpredictable events that may temporarily increase emissions (e.g. natural disasters, large fluctuations in energy prices)	• Lack of urgency to initialise emission mitigation reductions – "leave it until later" – procrastination! • "Emission reduction fatigue" can set in. People and organizations become bored with the same message, or impatient when reductions are slow to materialise

Table 22. Examples of systems that use the different goal types

Source: Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

Example	Approach (most like)	Notes
UNFCCC Kyoto Protocol	• Cumulative multi-year goals inform average multi-year goals of nations	• Complex modalities • Trading mechanisms used (ETS, JI, CDM) • Emphasis on global total, long-timescales and cumulative atmospheric ppm
European Union Effort Sharing Decision	• Single year goal to set target year emissions • Annual multi-year goal to set trajectory	• Complex modalities • Trading mechanisms, and emission banking allowed
UK National Carbon budgets	• Cumulative multi-year goal • Corresponds to Kyoto targets and average multi-year goal in climate change act (80% 2050)	• Average reduction to be achieved over 5-year periods • Trading mechanisms, and emission banking allowed
UK Wales	• Annual multi-year goal (3%/year) to • Average multi-year goal (40% 2020) sets trajectory	• Traded sector not included in target (except electricity) so no trading mechanisms

The succeeding discussions deal with baseline scenario and baseline emission scenario, of which both are of different concepts. Baseline is relevant to[8]:

a. Setting a mitigation goal. A baseline scenario can be used as a reference point against which the ambition of a mitigation goal (i.e., goal level) is set.

b. Assessing progress toward a mitigation goal. For baseline scenario goals, a baseline scenario is necessary to assess progress toward the goal's achievement by serving as a reference case against which progress is measured.

c. Reporting. Emissions projections are required by some reporting regimes. For example, under the UNFCCC, Annex I Parties are required to outline emissions projections for a number of different scenarios, including with and without policies and measures.

d. Mitigation assessment. Means of determining, selecting, and analyzing mitigation options and strategies and a critical element of carrying out a mitigation assessment is the development of a baseline scenario.

Baseline Scenario

A baseline scenario is a reference case that represents the events or conditions most likely to occur in the absence of activities taken to meet the mitigation goal. It requires the user to make baseline scenario assumptions (e.g., related to emissions drivers such as economic activity, energy prices, population growth, and policies and measures) and involves a large number of inputs, including historical activity and emissions data, key drivers, and methodological choices about assumptions for key drivers and included policies and actions. However, how these inputs are defined depend on the objectives, resources, and circumstances and can have a significant effect on resulting baseline scenario emissions

Baseline Emission Scenario

A baseline emission scenario level is an estimate of the net GHG emissions level resulting from GHG emissions and removals within the goal boundary. The development of a baseline scenario is necessary for baseline scenario goals. Baseline scenario goals are most often framed as a percent (%) reduction below baseline scenario emissions in a target year or target period

Baseline scenarios may be static or dynamic and each has their advantages and disadvantages[9]:

a. **Static baseline scenario** is developed and fixed at the start of the goal period and not updated over time. A fixed reference case against which a goal is set and progress is tracked, but which may deviate from a "business-as-usual" scenario.

b. **Dynamic baseline scenario** is developed at the start of the goal period and updated during the goal period based on changes in emissions drivers (e.g., GDP or energy prices). Intended to represent the latest or a very current business-as-usual scenario, but not does represent a fixed reference case against which a goal is set and progress is tracked.

For example, a user develops a baseline scenario based on an assumption that GDP will grow at an average annual rate of 5% between 2015 and 2025, but in 2020 the GDP grew at an average annual rate of 2% between 2015 and 2020 and projected to grow at an average annual rate of 1% between 2020 to 2025. Therefore, a user with a dynamic baseline scenario should update the baseline scenario based on the revised GDP growth rates, both for the period 2015-2020 and for the period 2020-2025, while a user with a

[8] Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

[9] Ibid.

static baseline scenario should not make a similar update to their baseline.

Consequently, users with baseline scenario goals can develop a range of plausible baseline scenarios, instead of a single scenario because baseline

Figure 14. Advantages and disadvantages of Static and Dyanamic Baseline Scenarios

Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

Type of baseline	Advantages	Disadvantages
Static baseline scenario	• The emission level to be achieved by the target year is fixed, which offers users and decision makers an unchanging target and guarantees that a certain emissions level will be met in the target year • Allows users to calculate the emissions level associated with meeting the goal ex-ante	• Does not reflect the level of effort associated with meeting the goal • For example, it does not 'net out' changes in emissions due to mitigation efforts from those resulting from changes in emissions drivers such as GDP or energy prices (assuming these drivers are not directly affected by mitigation policies)
Dynamic baseline scenario	• Better reflects the level of effort associated with meeting a goal, since it is updated to account for changes in emissions drivers, and users can therefore better identify changes in emissions resulting from mitigation policies and actions	• The emissions level associated with meeting the goal cannot be calculated ex-ante at the start of the goal period since the emissions level may change during the goal period due to updates to the baseline scenario • Does not offer users and policy-makers the certainty of an unchanging target, and does not guarantee that a certain emissions level will be met in the target year

This action may lead to recalculating base year of baseline scenario emissions due to changes in goal boundary including sectors, gases, and geographic area. These changes in calculation methodologies include updated inventory calculation method, improvements in the accuracy of emission factors or activity data, changes in GWP values, and discovery of significant error(s) in original calculations.

There is a quite range of variability in practice for baseline which includes policies and actions on baseline scenario and as Figure 15 shows, variability on policy delves on planned, implemented, and adopted.

scenarios are generally very sensitive to key drivers, assessing the baseline scenario against a number of other plausible emissions pathways will help to ensure that the scenario is "robust". A range can reflect the upper and lower bounds of plausible emissions pathways associated with a range of values for key emissions drivers like GDP, energy prices, population, and technological change. Furthermore, each baseline scenario in the range can reflect a different storyline about future events (e.g., high GDP growth scenario, low GDP scenario, etc.), while a user should be reminded of spatial considerations.

In summary, in dealing with baselines there is a need to:

a. Understand the definitions such as counter-factual, BAU, baseline, base year, etc.

b. Familiarize with methodologies and approaches. the first step is to map the "causal chain" - what changes will the policy lead to - and define the GHG assessment (we will cover this later)

c. Think through the specific approaches to baseline setting. Broadly there is an estimation (or calculation) and modelling and there is no hard and fast rule on which would be best because it will depend on various factors such as availability of data etc.

d. Think about the impacts from other policies so an assessment of what other interventions are leading to reinforcing or counteracting trends

Think of the best institutional framework needed to set good baselines.

Plenary Discussion

Below is a summary of the discussions during the open plenary, clustered into three topics.

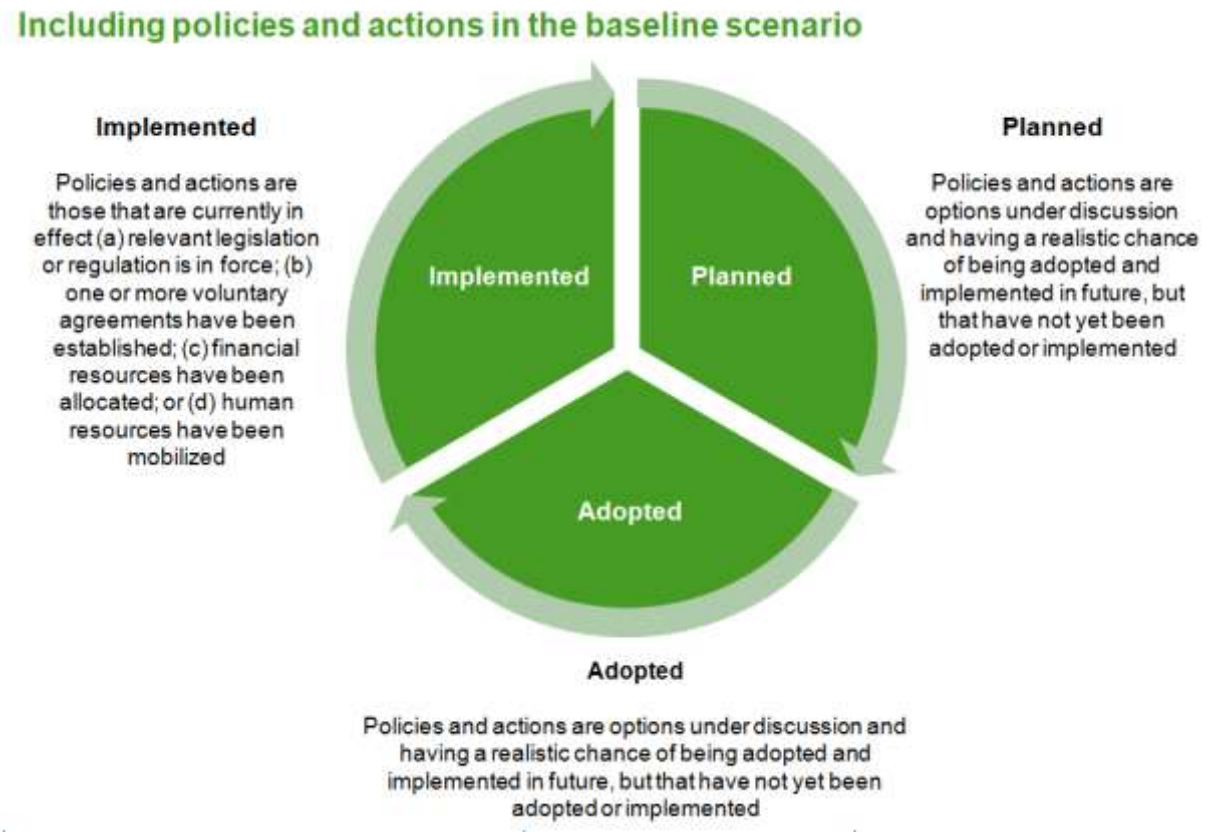
a. Establishing Baselines

- For future aspiration within a development space. A baseline is some kind of a projection looking towards a future, for instance doing more to reduce GHG emission with the set baseline scenario. It does not have to be linear direction since it could also do things that would complicate the future results. Nonetheless, it will depend on the assumptions and these assumptions should be well documented, otherwise efforts might likely be useless.

Figure 15. Taking into account policies and actions in the baselines scenario

Source: Watterson, J., Hunter, R. and Thistlethwaite, G. (2014). *Basic Concepts of Baselines*. [Powerpoint slides]

- Sectoral baseline using several assumptions. This is possible and a user can make things



either simple or complicated depending on the user's need. For instance, a user wants to determine the emission per capita, thus population is the key data. However, a user can also consider economic growth or technology as alternative means to determine this.

- Difference between baseline and Reference Emission Level (REL). A reference emission level is being used in the latest means of judging mitigation in the forestry sector. It is also a kind of baseline since it requires suited changes in the forestry sector and projection where the future is not yet known. It becomes complicated with dynamic baselines since the commitment to the baseline may suddenly change as well.

b. Dealing with Assumptions

- Assumptions that do not directly affect the country like forest fire in Indonesia. It may be possible but for other cases like global economic downturn that directly affects the country.

c. Policies affecting Baselines

- Difference between implemented, adopted, and planned. If it is being adopted but not implemented, then the policy is not implemented. Implemented policies relate to evidence such as GHG emission savings, while adopted can be a law even if it is not yet implemented.

- Business as usual (BAU) could include adopted or implemented measures or neither. The key is to understand what it means based on the country's situation and the way such country wants to communicate it. BAU could mean either nothing or efforts that are already being done.

- Implemented policy that results to emission reduction under BAU. That would come under implemented with the existing measures and could be considered as baseline scenario, but how to domestically assume it would still depend on the country's specific decision.

Breakout Session

The participants were grouped according to their sectors and tasked to discuss the following guide questions:

- What are the key factors e.g. data, other assumptions in your sector

- Which of these factors are of sufficient quality and which factors will limit your ability set of baselines?

The general input drawn from the exercise indicates that it is necessary to look at current situation as basis for projecting the future. It seems that quality of available data varies across sectors, for instance energy sector has good quality of data and models for data generation, while other sectors like land use and forestry still require wide array of data. Furthermore, it is essential to consider existing policies and improvement of quality to generate more reliable data.

The tables below were the results of the exercise.

Table 23. Workshop Output: Key factors for setting the baseline

Key Factors	Assumption	Limiting
A. Forestry Sector: DENR-FMB		
Methodology: Inventory Design for ex: discussion on the design to be adopted for inventory rectangular or circular plots	Use of IPCC default values (computation of root factor)	Resources
Data - Forest Cover (NFI) - Legal definition of Forestry data (contentious issues: how to define forestry or forest land, since the definition of forestry has an impact on the kind of data for the inventory and baseline setting) - FRA - Rate of Deforestation	• Base year 2010 (*2003 no ground validation, 2010 with ground thrusting) • Existing policies e.g. EO 26 NGP, EO 23) • UFCCC Categories (6 categories in the stratification of forestland uses) • Established guidelines/ framework on updating data	Overlapping mandates (the different NGAs have their own jurisdiction like protected areas are under PAWB)
B. Waste Sector: EMB/NSWMC		
Data - Population - Economic Growth - SWM Plan including WACS - LGU survey (SWM)	NSO Latest Survey (pop) Gross Regional and Domestic Product (NEDA)	On WACS: - Different methodologies used - Not all LGUs with SWMP has WACS - Timeliness of reports (quarterly) - Capacity building needs - Financial support
Policy Issuances - RA 9003 - Local Ordinances		• Enforcement • Technology • Not all LGUs has local ordinances
Rate of Urbanization which directly proportional to waste generation similar to population growth		Lack of historical data
C. Industry Sector: DENR-EMB		
Number of Industries - Growth and increase in the manufacturing sector and BPOs	Industry Roadmap per sector as initiated by DTI PDP (NEDA) and PIP (DTI) Self monitoring report of Com-	Availability and sources of data to determine the baseline setting

Existing practices/current industrial processes - Types of fuel used/consumed, quantity of fuel consumed (most are using bunker, fuels) -Types of processes -Control devices used	panies (EMB) Data from industry associations	
D. Energy Sector: DOE		
Policies (national and sectoral)		Need for clear energy efficiency conservation
Plans, Programs, Projects	Acceptable	Timeliness
Current and historical activity and performance data		Few actual data are estimated and interpolated
Forecasting		Planning Period difference since energy plans longer than the PDP
Economic and social assumptions		
Best fit economic model for energy demand and supply Efficient Tool (LEAP, SIMPLE E)	Statistically tested to be significant and Robust (different models, the same results)	Manpower
E. Transport Sector: DOTC		
Road (vehicle registrations) Rail (frequency of trips O-D)	• Policies on the transport sector (e.g. mitigation, alternative fuels, mass transport, TDM) • CDP (socio-econ, infra) • Global Energy Prices • Economic Growth • Population Growth • Passenger and Freight Movement	• Availability of fuel consumption data (DOE dependent) Airline and supplier data • Technical capacity on data processing and analysis: • Reliability of processed data • Fuel consumption data (airline and supplier)

2. Application of Baselines

Dr. John Watterson, RICARDO-AEA

An effective GHG assessment involved both ex-ante and ex-post assessments, where the former is a forward-looking which estimates expected future GHG effects of a policy or action, before such action is implemented, while the latter is a backward-looking that estimates historical GHG effects of a policy or action, after the policy or action has been implemented. Figure 16 shows the relationship between two assessments.

Below are some examples of baselines

A. The UK carbon budgets in the UK Climate Change Act outlines the following:

- 2050 emissions target;
- Requiring the government to set 5 year carbon budgets, with first 3 carbon budgets being set by June 2009, and later carbon budgets being set 11 ½ years before they start;
- Requiring the government to meet these carbon budgets;
- Role of the Government to set and meet carbon budgets

Thus, the law provided an opportunity to government's interaction with the Climate Change Committee resulting to the milestones in Table 24:

- Setting-up of Committee on Climate Change (the CCC);
- Requiring government to report annually to Parliament on emissions levels; and
- Requiring CCC to report annually to Parliament on progress in meeting carbon budgets.
- Role of Climate Change Committee on advising on level of carbon budgets and monitoring progress

Figure 16. Relationship between ex-ante and ex-post assessment

Source: Watterson, J., Hunter, R., and Harries, J. (2014). *Application of Baselines*. [Powerpoint slides]

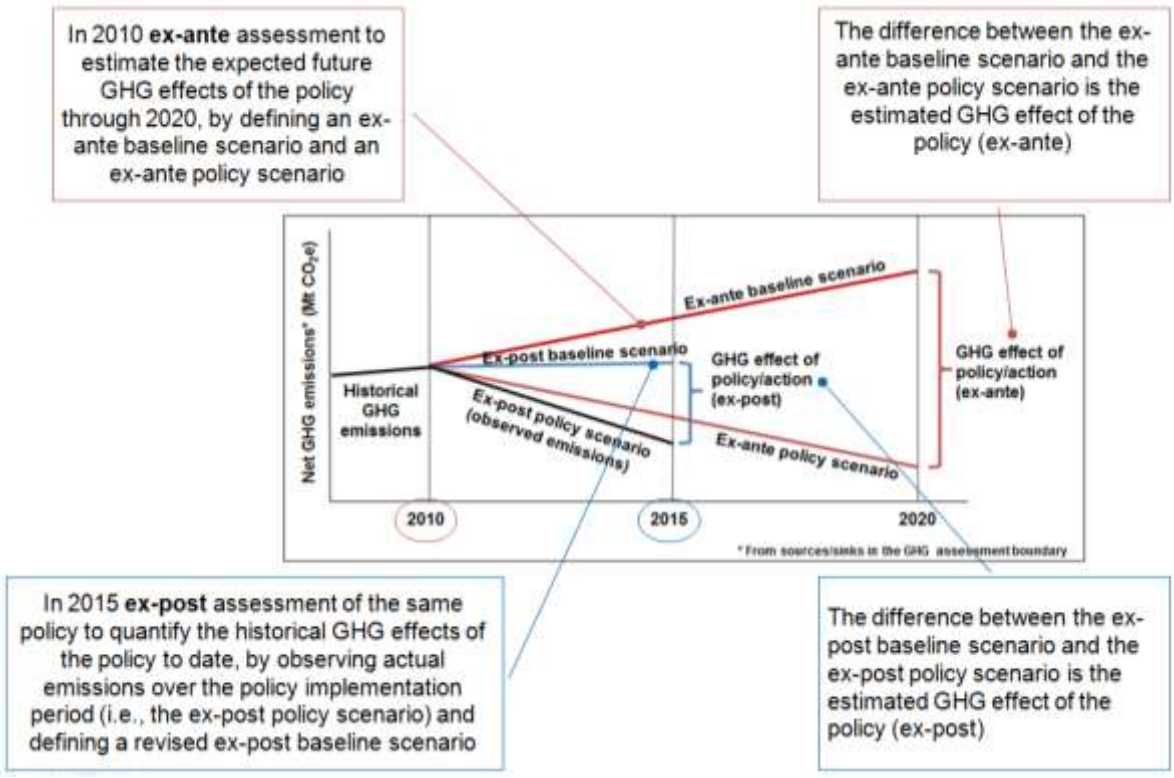


Table 24. UK Climate Change Committee Milestone

Source: Watterson, J., Hunter, R., and Harries, J. (2014). *Application of Baselines*. [Powerpoint slides]

Milestones			
2009	Renewable energy to grow in line with EU targets		
2010	Publication of Renewable Energy National Action Plan		
Indicator	Level in current reporting year (2009)	% Change against previous year (2008)	Desired trend
Total installed capacity from renewables sources[8]	8,030.6 MW	+18% compared to 2008	Upwards
Total generation from renewables sources	25,222 GWh	+17% compared to 2008	Upwards

B. New York City's Progress toward Meeting its Goal. The baseline is based on 2005, but there is an intermediate baseline looking at policy that may have implication in achieving targets.

C. Wales Setting Baselines and Meeting Goals. A quite complex example due to areas of devolved competencies.

National Targets

- Aims to achieve at least a 40% reduction in greenhouse gas emissions in Wales by 2020 against a 1990 baseline.
- Began with 3% in 2011 and the target is to reduce greenhouse gas emissions by an additional 3% of the baseline in each subsequent year. The baseline has been selected to ensure that it is as up to date as possible, and representative of emissions levels at the start of the target period.
- To measure the target, it compares the relevant emissions in each year from 2011 onwards to a baseline of the average of the relevant emissions between 2006 and 2010.
- The 3% target includes all 'direct' greenhouse gas emissions in Wales except those from heavy industry and power generation (traded sector), but including emissions from electricity use in Wales by end-user. Target ranges for sectoral emissions reduction set.
- Progress against the target will be assessed by a simple comparison between the level of emissions and the baseline. No complex accounting systems or inclusion of offsetting of emissions.
- The disaggregated greenhouse gas inventory provides the means of setting the baseline and determining progress.

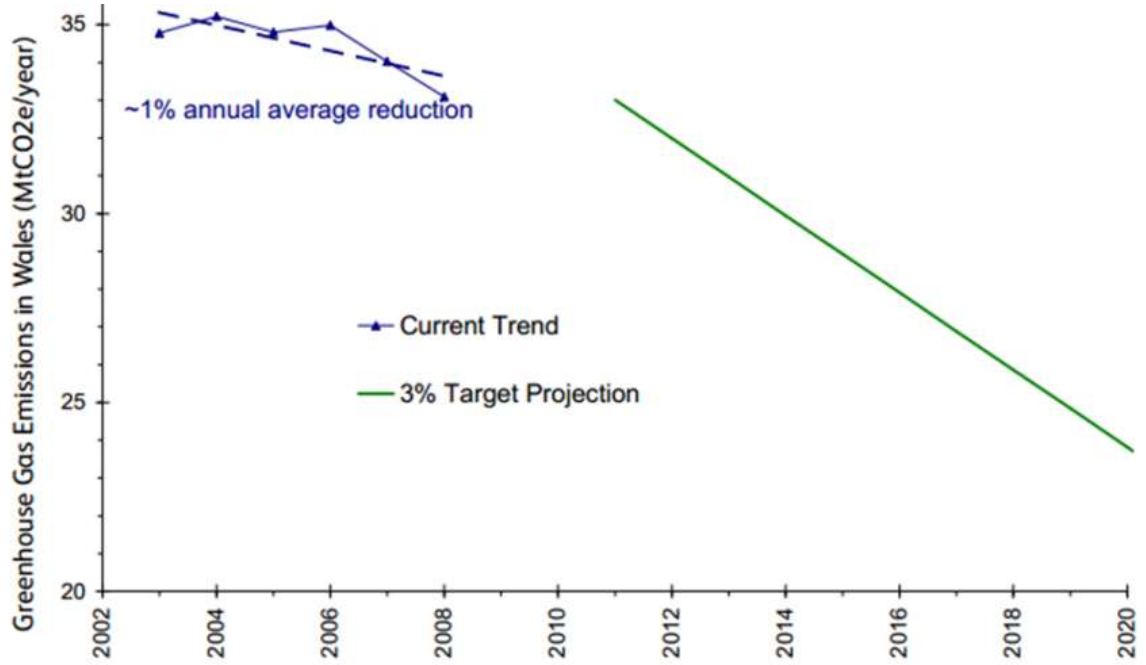
Figure 17 shows Wales' trajectory versus current trend on GHG emissions, while Table 25 details the estimated GHG emission reductions by each sector.

Sector Targets. Current and future actions will focus on reducing emissions to define levels by 2020 as follows:

- Transport emissions reduced to between 5.21 and 5.78 MtCO2e against a baseline of 7.14 MtCO2e.
- Waste sector emissions reduced to between 0.64 and 0.95 MtCO2e against a baseline of 1.30 MtCO2e.
- Direct emissions from the Public sector reduced to a maximum of 0.83 MtCO2e against a baseline of 1.13 MtCO2e.

Figure 17. Wales' emission trajectory

Source: http://wales.gov.uk/docs/desh/publications/101006ccstratfinalen.pdf



- Residential emissions reduced to between 5.46 and 6.04 MtCO2e against a baseline of 7.48 MtCO2e.
- Business emissions (that fall within Wales' 3% target) reduced to between 8.33 and 10.30 MtCO2e against a baseline of 11.24 MtCO2e.
- Agriculture and land use emissions reduced to between 4.07 and 4.97 MtCO2e against a baseline of 5.57 MtCO2e.

Table 25. Wales' estimated reductions per sector

Source: Watterson, J., Hunter, R., and Harries, J. (2014). *Application of Baselines*. [Powerpoint slides]

Sector	$MtCO_2e$ savings in 2020	Contribution to 3% target
Transport	0.29	0.10
Residential	0.54	0.18
Business	0.62	0.20
Agriculture and Land Use	0.60	0.20
Waste	0.66	0.21

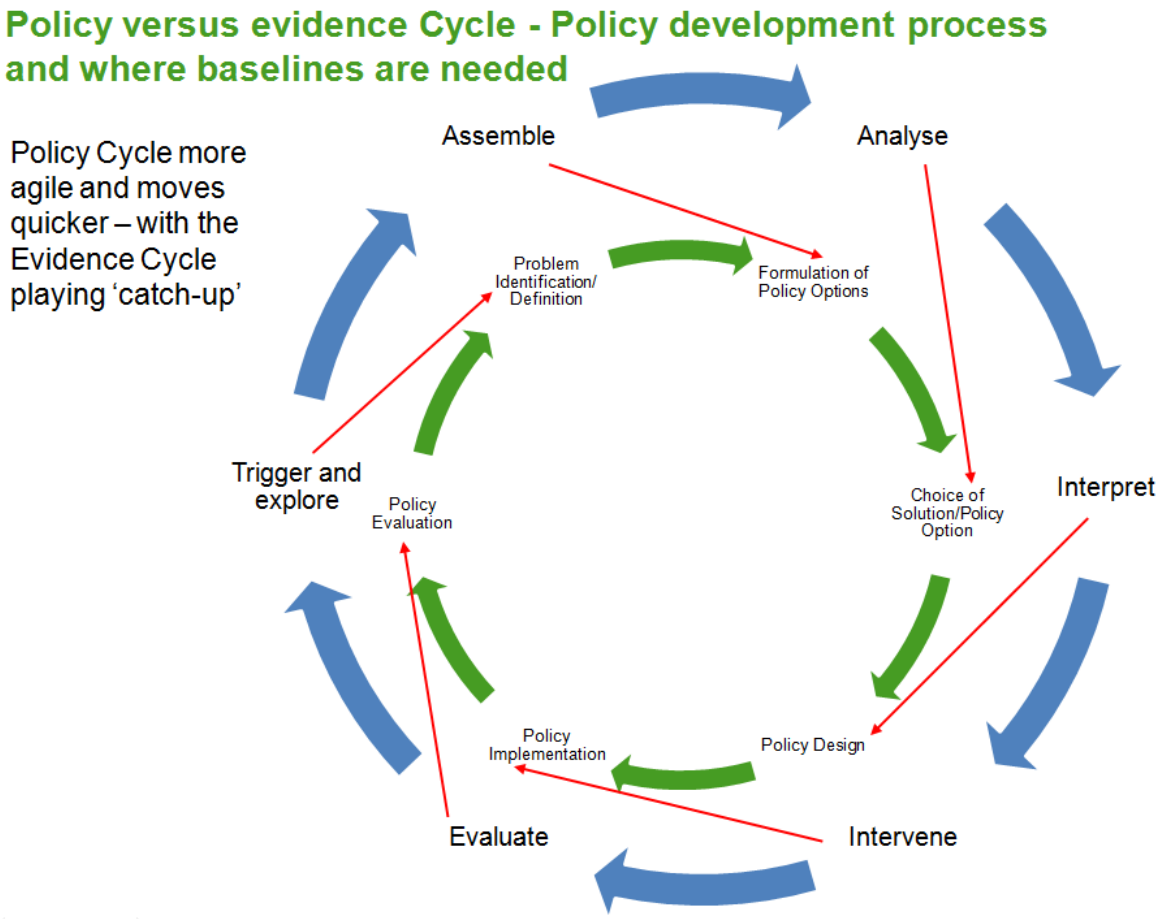
- A greater contribution from the public sector to emission reduction anticipated as a result of their ability to influence wider emissions as described above

The Wales case shows gap on policy action as a result of the analysis between the baseline and the target.

Figure 18 shows policy cycle versus evidence cycle. This shows the policy development process where baselines are needed.

Figure 18. Policy versus Evidence Cycle

Source: Watterson, J., Hunter, R., and Harries, J. (2014). *Application of Baselines*. [Powerpoint slides]



Plenary Discussion

Below is a summary of the discussion during the open plenary.

- Getting an average data even if there are data gaps. In some of the analyses, there can be three steps 1) interpolation, 2) firming up when data is available, and 3) re-analyze at a certain point.
- Using GHG inventory for 2000 as baseline for the country. It could be a choice of the government or extrapolation of previous years to address data gaps.
- Defining data using qualitative data. It can be done using the national GHG emission target and for specific policies related to adaptation and mitigation, which is a lot more of qualitative rather than quantitative data.

- Practical choice between straight forward or detailed assumption. It would depend on whether a user can or cannot project with the existing scenario. Ideally, having more details in a projection creates better evidence in determining future actions.

Breakout Session

Participants were grouped according to their sector representations, while representatives from the Climate Change Commission were requested to join in the discussion of the sectors. The groups were tasked to look at possible indicators for possible mitigation activity in their respective sectors. Discussion focused on the following guide questions.

- What indicators might you need to judge progress of the implementation of the mitigation activity?
- Might the mitigation activity interact with other mitigation activities that could occur in the same sector, or in other sectors? What problems might these interactions cause?

The general input drawn from the exercise indicate that baselines have direct relation to indicators, for instance such baseline might consider a policy that would have impact in the future and in order to put a policy in place, appropriate mechanism is necessary to track its effectiveness. Baseline provides multitude of information such as emissions and future projections but principles of metrics and baselines also apply not just in measuring GHG emission.

The results of the exercises were the following:

Table 26. Workshop Output: Sector specific examples – metrics and baselines

Indicators	Cross sectoral Activities/Issues
A. Forestry Sector: NGP (not yet included as Mitigation Action)	
Outcome • Open and denuded forestland area reduced • Protected Forestland increased • Carbon stocks enhanced	• Species selection • Seedling production • Maintenance and protection • Carbon accounting • Eligible Areas for NGP • REDD+ sub national Implementation
Output • Area planted • Seedlings planted • Seedlings produced • Jobs generated	
Activity • Nursery establishment • Seedling production • Survey and Mapping of NGP Areas	
Input • Planting materials • Funding • Manpower	

B. Waste Sector: Solid Waste	
Outcome • Decreased concentration of methane in the atmosphere	• Reporting of captured methane used for energy • Responsible agency for CH4 computation • Technology • LGUs financial capacity
Output • No of LGUs complying with RA 9003 • No of existing dumpsites with capacity to extract dumpsite gases	
Activity • No of LGUs with MRFs • No of open dumpsites closed • No of sanitary landfill constructed and rehabilitated	
Input • Policy • Financial Resources • Capacity development for LGU	

Interesting Issue: global issue. There is a need to remember the data that will be required for the baseline

C. Industry Sector : Waste from one sector is raw material of another; Less clincher production since source is iron and steel; Less fossil fuel consumption	
Outcome • Increase in the use of alternative fuels and raw materials • Decrease in the consumption of fossil fuels • Decrease in production of clincher	Possibility if double counting between agriculture and iron-steel sector
Output • Policy implementation • Savings Generated • Less energy and maintenance cost • Livelihood opportunities • Lower health risk (production of clincher)	Sustainable supply of raw materials i.e agri wastes

D. Energy: Energy Generation thru Biogas Facilities	
Outcome • Scaled up mitigation activity with International support	
Output • KwH generated • Methane emission reduced • No of HH energized	
Activity • Identify no of project site/farms/heads • Determine volume of waste generated	• Full cost support • Organic farming program
Input • Methane emissions without project • Grid emission factor • Potential livestock farms and heads	

Indicators	Cross sectoral Activities/Issues
E. Transport: Public utility buses phasing out 15 years and up	
% Buses replaced >15 years	Public vehicles dropped/replaced can be used for private purposes
% dropped (units) from franchise	Options for refitting/technology conversion? →catalytic converter/filter
% using alternative fuels<15years	CO2 emissions
%Buses using emission central devices	Road Accident

3. Connections of Baselines and Projections

Dr. Ross Hunter, RICARDO-AEA

Emission factors have three tiers; a) tier 1 which guidelines are provided by IPCC, b) tier 2 involves national level factors and technologies, and c) tier 3 covers changes in the assumption overtime due to technological capacities. Table 27 shows the level of complexities on projections.

Table 27. Emission Factor Tiers

Source: http://ec.europa.eu/clima/policies/g-gas/monitoring/studies_en.htm

Grade	Activity data projection	Emission Factor projection
1	Activity data for the years of the projection are directly derived from international level projection studies; where these are not available, the projection could fall back on the assumption that the activity rate will not change	The emission factors are equal to those used in the latest historic inventory; in inventory terms this would mean that the projection could use Tier 1 default emission factors from the IPCC 2006 Guidelines
2	Activity data for the years of the projection are directly derived from international level projection studies; where these are not available, generic growth factors or proxies should be used to project activity rates	Emission factors should reflect the technological developments within the Philippines, both those that occur autonomously and those that are induced by policies and measures; in inventory terms this would mean that the projection would use Tier 2 or Tier 3 emission factors.
3	Philippines could use its own projected activity data, provided that these are produced with a sophisticated model in a transparent, comparable, consistent and complete manner	Emission factors should reflect the technological developments within the Philippines, both those that occur autonomously and those that are induced by policies and measures; in inventory terms this would mean that the projection would use Tier 2 or Tier 3 emission factors

According to IPCC, emission scenarios are alternative images of how the future might unfold and are in appropriate tool to analyze how driving forces may influence future emission outcomes and to assess the associate uncertainties. Emission scenarios are equivalent to projections and not part of BUR, rather an element of Low Emission Development Strategies. LEDs are relevant to a) economy-wide, long-term mitigation goals ranging from 15 to 30 years, b) assessment of cost-efficient mitigation options and their prioritisation, and c) stipulation of concrete short- and mid-term mitigation actions.

The UNFCCC has specific guidelines on projections:

a.) Without measures" - excludes all policies and measures implemented, adopted or planned after the base year.

b.) "With (existing) measures" - encompasses currently implemented and adopted policies and measures

c.) "With additional measures" - also encompasses planned policies and measures but includes an estimate of the impact of additional mitigation measures

There are two models of projections; top-down and bottom-up models with corresponding characteristics, strengths, and weaknesses

Top-Down vs Bottom-Up

Baseline scenarios on one hand are scenarios against which mitigation options are measured and usually "with existing measures" scenario, but can still be "without measures" like in South Africa. It needs to consider issue of early actions whether it should become part of the baseline scenario and selection of base year may depend on data availability. Baseline scenarios should also include all policies and actions that have "significant" effect on GHG emissions (either increasing or decreasing) and policies that are implemented or adopted in the year of baseline scenario. At present, there is no international guidance on how to develop baseline emissions scenarios

Plenary Discussion

The following are highlights of the discussion.

- Taking into consideration VA in setting a baseline scenario. It may not be necessary to factor in VA in events with little control such as natural disasters or economic growth, instead natural disasters can be used in determining the projection if frequency of occurrences is known.

- For instance, if drought is the perennial problem to energy sector, then data showing that it will get worse can be integrated in the baseline. There is a need to parameterize events that are most likely to happen. The key is to document everything since events in the past may not necessary happen in the future, but still there is a basis that can be used for determining projections.

- Acceptable number of scenarios for determining baselines. In UK's case, there are 4 or 5 scenarios; however numerous scenarios might bring confusion. At the very simple level, if one is looking at the last 10 years of data on hydro especially on impacts of dry season, it might be good to also look at climate projection if there will be longer dry season due to climate change.

- *Inputs from CCC.* The Commission already conducted several capacity building activities with relevant agencies, as well as orientations related to GHGI and types of data needed. The Commission is very consultative and transparent on how to move forward in terms of developing the baselines

and activity data either national or sectoral. Rating of how much data is already available will be done with the sectors like energy and forestry sectors.

Table 28. Top-down and Bottom-up Projection Model

Source: Watterson, J., Hunter, R. and Wartman, S. (2014). *Connection Between Baselines and Projections*. [Powerpoint slides]

	Top-Down	Bottom-Up
Characteristics	• System Integration • Focus on macroeconomics, based on historical trends • Focus on monetary units • Can be very simple, e.g. Excel model of projected GDP and project carbon intensity of GDP, or forecasts of activity data and emissions factors (i.e. 'projected' inventory data) or very complicated, e.g. Dynamic general equilibrium models	• Technological detail • Macroeconomic variables exogenous to model • Focus on material units • Varies from partial equilibrium to simulation to emission reduction option database approach (GENESIS)
Strengths	• Can take account of 'economic interlinkages' (top-down optimisation models, or CGE models) • Good for long-term analysis, as more stable due to econometric relationships • Behaviour outside of energy sector endogenous to model (determined by model) • Useful for financial instruments	• Rich in technology detail - easier to understand the reasons behind GHG trends • Decoupling economic growth from energy demand • Useful for technology oriented policy analysis, and other non-financial instruments
Weaknesses	• Limited technology detail • But less informative in terms of the specific reasons for GHG trends • Some top-down models can be somewhat 'black-box' (difficulty to validate)	• Data intensity – can be hard to obtain data • Lack of stability over longer timeframes

Breakout Session

The sector-groups were reminded to consider the following guide questions in identifying key factors for setting baseline and baseline data gaps.

- What data are available to help set baselines in each sector
- What uncertainties might be associated with these data?
- What data gaps are there which would limit the setting of baselines?

The following were the results of the exercise:

Table 29. Workshop Output: Assessing and filling in baseline data gaps

Available Data	Uncertainties	Data Gaps
A. Forestry Sector		
Forest Cover: National Forest Inventory updated every 5 years	Differences in methodologies	Reference Level Reference Emission Level
Forest Cover Change Analysis Timber Demand Projections	Legal Definition of Forestry Terms	Land Use Categories which are consistent with the internation-al use
Forest Resources Assessment Rate of Deforestation	Admin Boundaries (boundary overlaps)	• Drivers if deforestation and Forest Degradation • Carbon Accounting Meth-ods • Emission and Sequestration Factors
B. Waste Sector		
Volume of Waste Generated in tons	Estimates only 2kilos per person: urban 0.5kilo per person: rural	
No of LGUs with SWM plans and Waste Analysis and Charac-terization Study	Accuracy of WACS	WACS: Classification is different from the IPCC
No of LGUs complying to RA 9003	Funding Source	
No of open dumpsites closed	Sustainability and Maintenance of Sanitary Landfill	
No of LGUs with MRF		
No of Sanitary Landfill Con-structed and rehabilitated		
Rapid data Assessment		No available data as required by IPCC (fraction of waste burned)
Population Stats		
Best Available technologies		
Note: Decomposition of waste and biological chemistry also lead to uncertainty in terms of latest models and science		
C. Industry Sector		
Number of industries	Completeness and comprehen-	Data on emissions from waste

Available Data	Uncertainties	Data Gaps
	sive Data	water
Type of industries	Sources of the data	
Biological Oxygen Demand EMB		COD: who are reporting Sludge removed
Data production for some industries (EMB)		• Data on SMEs, some industries who have not yet submitted reports • Non submission of Reports • Production process is non conventional and not within the IPCC guidelines • Absence of Local Emission Factor relying on IPCC default factor
Data Materials consumed		Incompleteness of the data
D. Energy Sector		
Production and Consumption of Fuel by type and sector including: Import, Export, Transformation and Generation	Assumption: Supply=demand What is sold equals to what is consumed	Non availability of data such as: • VKT by vehicle type • RE data specific targets • Energy efficiency targets and methodologies
	Specific activity data e.g. efficiency data and heat rate	Limited access to data and late/non-submission of data
	Sectoral overlaps (double accounting)	
E. Transport Sector		
Franchise data for buses (LTFRB)	Illegally operating buses	Fuels consumption for buses
IPCC Emission factor	Utilization ratio of bus fuels	Localized emission factors: actual estimate of CO2 for buses
Type of fuel that car be used per bus		Inspection data: information on certain technical attributes and current condition of the buses
		VKT/PKT for buses: Activity data to measure
		Ridership from the operator level: how many buses operates, how much cost per bus

4. Developing Indicators

Dr. Ross Hunter, RICARDO-AEA

The discussions delved on looking at indicators and concept of "mapping the causal chain" since it is fundamental to the setting and review of baselines, and approaches to avoid double counting of emission savings. It is important to think through possibilities since introduction of a policy to reduce emissions might have some unexpected effects, for instance Figure 19 shows transport sector and different tiers of impacts.

There are levels and flow of mitigation indicators, starting from inputs which are common to all working towards outcome that is high level and highly processed indicators. As can be seen below each level has their audiences and parameters with varying timelines.

Figure 19. Sample causal chain for the transport sector

Source: Watterson, J., Hunter, R., and Harries, J. (2014). *Indicators*. [Powerpoint slides]

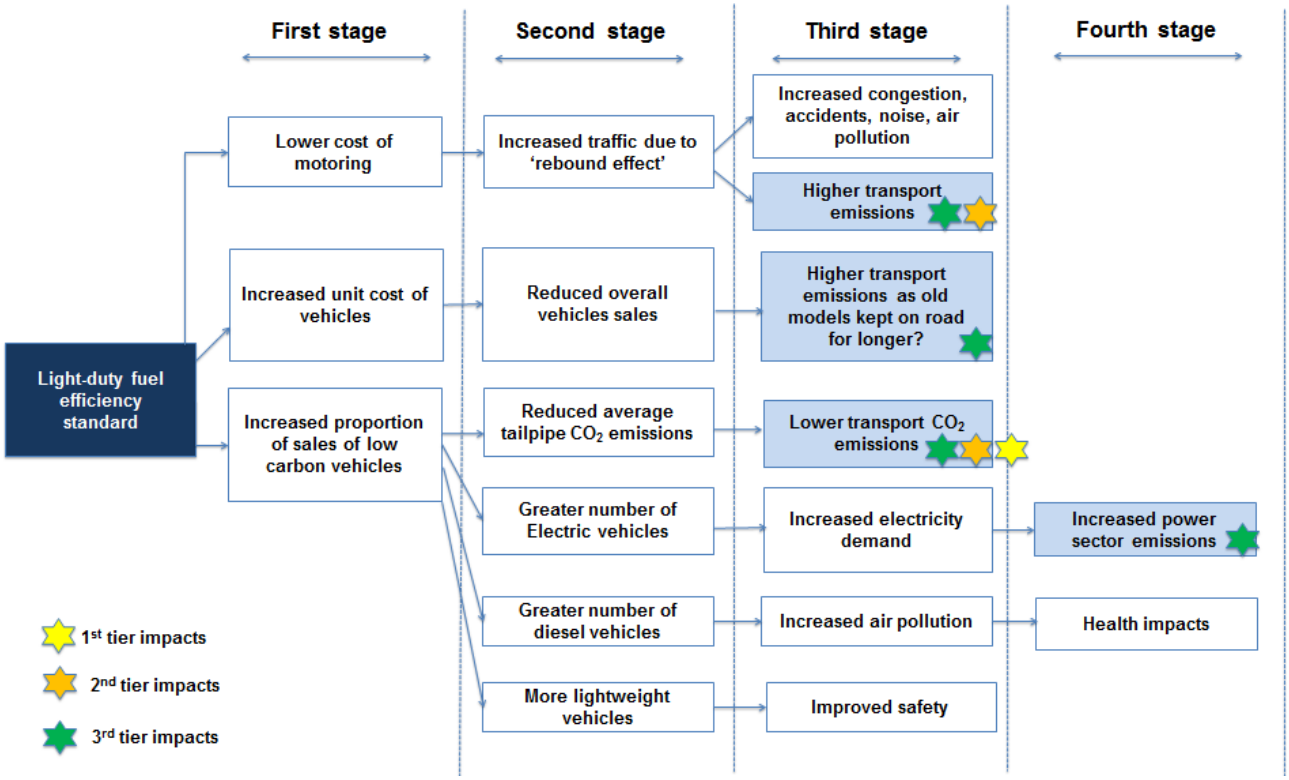


Table 30. Levels and Flow of Mitigation Indicators

Source: Watterson, J., Hunter, R., and Harries, J. (2014). *Indicators*. [Powerpoint slides]

Levels	Parameters	Audiences	Timelines
Outcome *(high strategic level; highly processed)*	• There are Outcomes at different levels – here we refer to a high level aggregated Outcome with national significance • May take significant time for Outcome to become apparent	• Parliament • International Development Organisations • Climate finance investors	3-20 years
Output *(medium strategic level; medium processed)*	• There are Outputs and lower level Outcomes that are more project or programme specific and monitoring at a "lower level" • Takes longer for these signals to be detected	• Ministries, Departments, Agencies • Programme and project implementers	1-5 years
Activity (*medium strategic level; medium processed)*	• Activities are quite commonly measured in governments • Many indicators are defined in terms of Activity	• Ministries, Departments, Agencies • Programme and project implementers	1-3 years
Input *(low strategic level; little processing)*	• Inputs can be measured from very early on in any mitigation/NAMA project	• Ministries, Departments, Agencies • Programme and project implementers	Upto 1 year

To that end, it is necessary to develop a good MRV plan, using milestones to keep an eye on effectiveness of mitigation actions and to judge the progress on achieving the goal. Below are key considerations in developing an MRV plan:

a. **Indicators.** Should be tailored to the policy or action, based on the type of policy or action, the requirements of stakeholders, the availability of existing data, and the cost of collecting new data. Cover input, activity, output and outcome.

b. Define **Parameters** for ex-post assessment. To estimate baseline emissions using the emissions estimation method(s) for each source and sink. Parameters are the variables (e.g., activity data, emission factors) that make up the emissions estimation equations or algorithm.

c. **Define** monitoring period for the policy. The policy monitoring period is the time period over which the policy or action is monitored. At a minimum, the policy monitoring period should include the policy implementation period. But note the effects on GHG

emissions may go on long after the policy has finished

d. **Create** a monitoring plan. Measurement or data collection methods, sources of data (either existing or additional data needed), monitoring frequency, whether the data are measured, modelled, calculated or estimated; uncertainties, sampling procedures, documentation, QA/QC

e. **Monitor** parameters over time. Performance indicators are likely to provide useful information on the validity of the assumptions made in the ex-ante assessment of the policy

5. Data Management: Steps, Principles, and Challenges

Dr. Ross Hunter, RICARDO-AEA

Data management is a good practice in assessing and gathering baseline data. Documentation is the key for data management and the more documentation, the better to ensure complete understanding of the data and its source, hence adhering to transparency and completeness of the data. Data management is a structured data archiving system for baseline datasets. It is important to have the following:

a. Agreements/working relationships with key baseline data providers to access updates, understand compilation processes etc;

b. A 'live' process to account for changes in baseline data;

c. Collection of some data may be terminated whilst new datasets may become available that are more fit-for-purpose;

d. Policies and measures constantly evolve to meet these requirements

It includes key steps to increase its robustness and accuracy, specifically to,

- Assess if data subject to any QA/QC processes
- Have the uncertainties within the dataset been calculated or are at least understood
- Determine how often it has been or will be updated to ensure 'currency'
- Understand its coverage with respect to the target or policy it will act as a baseline for e.g. does it cover all relevant activities and sectors? Is it a small periodic sample of a wider population?
- Know if it is a time series of data available, if not this may reduce suitability of it as baseline dataset.

In UK's experience, they have had some problems in data management and along these problems, solutions were identified:

Table 31. Problems and solutions in data management (UK)

Source: Hunter, R.. and Watterson, J. (2014). *Data and data sets Part 2*. [Powerpoint slides]

Time Series Consistency: Emissions from fuel combustion from upstream oil and gas sources	
Data Source	• Activity data from energy statistics • Emissions data from operator information (later years) and periodic industry studies (earlier years)
Problem	• The correlation between the energy statistics and periodic studies was poor for the period prior to the operator-reported emissions data. • Very high implied emissions for early years, but more stable for later years and consistent with other countries.
Solution	Amend time series using extrapolation of robust data. • Consultation with the industry and the energy statistics team identified a gap in the energy statistics for the early part of the time series. • Good relationship between the three years of data where the operator-reported data over-lapped with the energy stats data identified. • A 3-year average was derived and the activity data for the early years were corrected, by extrapolating this using the emissions data from the industry.
Data Confidentiality: EU inventory gap-filling, e.g. where Member State activity data are confidential	
Problem	The EU needs to combine data from 15 Member States to collate its own inventory. In some cases (like the UK cement activity data) the data from Member States are confidential so are not available
Solutions	Use an average of data that is available • Derive the implied emission factor from across Member States from the data that is available many parties • Combine this with reported emissions from all parties (including the ones that report data as 'commercial in confidence • Compile a "complete" activity data total for the EU using the derived IEF the total emissions across all countries
General Problems in UK Data Management	• Data reported in wrong units, or out by a factor of 100, 1000 etc • Step-changes in a time series due to: - change in scope of data (e.g. European Union – Emissions Trading Scheme Phase I, Phase II, Phase III) - change in the data gathering systems (e.g. changes in reporting thresholds for industrial sites that used to report data now not having to) - change in the provision of reporting guidance (e.g. where sector-specific guidance has been updated so all operators start to use a new EF for a given pollutant and this leads to a major step-change in the reported data) • Solutions that are simply mathematical, i.e. we can't resolve why the problem is evident, but we just have to disregard outliers and apply a 'data splicing' fix (more detail on this in a later presentation…) • Additional efforts to conduct stakeholder consultation

Thus, applying principles to data management might address common problems working towards developing a good set of baselines.

a. Transparency. Clear and full explanation of how data is compiled, having enough information to enable replication of data by others.

b. Consistency. Consistent use of data/methods across time series.

c. Comparability. Can it be compared to other baselines to illustrate similar trends or outcomes.

d. Completeness. Incorporates all sectors, TGHG's or activities that are to be

tracked/monitored (what is incorporated will vary with purpose).

e. Accuracy. Relative measure of exactness of baselines – not under- or overestimated and uncertainties removed as far as is practicable.

TCCC of data can still be enhanced by subjecting it to quality control (QC) and quality assurance (QA), where QC is a routine technical activity to measure and control quality of data, while QA is planned system of review procedures by others not directly involved in the compilation of data.

Finally, Dr. Hunter mentioned that in dealing with assumptions for baselines, it is important that assumptions are documented; subject for validation once data is available if such assumption still applies to given situation.

6. Dealing with Uncertainties

Dr. John Watterson, RICARDO-AEA

The discussion on data management introduced uncertainties and how these can be dealt with in the concept of baselines. It is important to assess these uncertainties to gain more understanding prior to taking steps in addressing such uncertainty, especially since it is an essential element of making projections but not intended to dispute the validity of projections rather to help prioritize efforts to improve the accuracy of projections in the future and to guide decisions on sourcing suitable data and methodological choice.

Uncertainties can be presented as a percentage, and also the 95% confidence range is shown, but sometimes, it is being categorized into high, medium and low uncertainties. Specific guidelines on dealing with uncertainty for inventories are outlined in the IPCC 2000 Good Practice Guidance and IPCC 2006 guideline, which has revisions to terminology.

Accuracy and precision of data are quite different:

- Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, so far as can be judged, and that uncertainties are reduced so far as is practicable."
- Biases are not dealt with by the uncertainty analysis – following the IPCC Guidelines and good practice QA/QC procedures should eliminate most sources of bias

Meanwhile, future projections of activity data, and choice of emission factors, definitions, natural variability in processes that produce emissions, assessment of the process or quantity are some causes of uncertainties. For example fuel activity data in UK, resulting to:

- Quoted uncertainty which refers to the total fuel consumption rather than the consumption by a particular sector, e.g. residential coal
- The analysis recognizes that the estimates of sector emissions may not be independent. Sectors may be aggregated or the correlation explicitly stated in the analysis
- For gaseous fuels uncertainties include losses and tended to be negative. For natural gas, a correction was made to take account of leakage from the gas transmission system but for other gases this was not possible.
- On minor fuels. Uncertainties in activity data for minor fuels (colliery methane, orimulsion, SSF, petroleum coke) and non-fuels (limestone, dolomite and clinker) were

estimated based on judgment comparing their relative uncertainty with that of the known fuels.

Towards the end, Dr. Watterson emphasized that at national level, for some or many sources, a fully representative dataset of emission factors cannot be generated, hence expert judgment is required. Estimation of uncertainty takes into account a) available analytical data, b) differences between estimates from different authorities, c) time series, and d) IPCC default values. One can also use qualitative uncertainty analysis to help even if there is already a quantitative estimate.

7. Methods in Addressing Data Gaps

Dr. Ross Hunter, RICARDO-AEA

Data gaps are consequence of existing barriers from obtaining data due to the following grounds:

- Lack of awareness of what data might be available
- Lack of structured data sharing processes
- Timeliness – key datasets are not available at the time required
- Sharing data may be viewed as losing power by individuals, departments or organizations
- Restrictions on statistics data prior to official release
- Commercially sensitive data – e.g. from individual companies or installations
- Keeping up with the policy cycle – new measures and targets can be developed and implemented very quickly, sometimes without consulting data and technical experts

Hence, solutions to the above mentioned are as follows:

- Start by undertaking a systematic review of data available to establish who may hold what data that you require
- Establish a working group of data key data providers – perhaps as a sub-group of a similar group that may be created for the GHG Inventory
- Implement data supply agreements (DSA's) with key data providers outlining what they will share and when
- Aggregate data to a level where it no longer is deemed as commercially sensitive – e.g. grouping data in order that individual sites and companies can no longer be identified

Specifically, data gaps due to lack of available or suitable data can be addressed through the following since in many cases 'ideal' baseline data will not be entirely available and gaps in suitable baseline datasets includes GHG Inventory, non-policy driver data, policy driver data, and spatial issues e.g. data type and quality may vary between regions

a. Explore widest possible range of datasets to use in setting a baseline
    - Periodic surveys instead of continuous data, where it is not available
    - Explore activity datasets used within the GHG Inventory
    - Remember to examine policy impact and implementation
    - Use several datasets to build up a robust picture if 1-2 crucial datasets not available
    - Analyze if regional datasets are reflective of national circumstances

- Use of high-level non-policy driver data e.g. total GDP

b. Define the objective in setting a baseline, for instance it aims for quantitative annual assessment of progress of an indication of direction of travel.

c. Data gaps may do not necessarily mean not fit-for-purpose

While in terms of time series, there are four available solutions: overlap, surrogate, interpolation, and trend extrapolation

a. Solution 1: Overlap. An assessment of comparability of two datasets over a time series that looks at consistent overlap or difference, preferably for multiple years to avoid bias and can either use comparable dataset or recalculate existing data on the basis of consistency

b. Solution 2: Surrogate Data. Using a dataset that is indicative of changes or trends to 'fill in' (or as a surrogate) data gaps, such as total vehicle km is indicative of road transport emissions or production output is indicative of industrial emissions. It is essential to understand relationship for multiple years data desirable to avoid bias prior to using surrogate data like regression analysis.

c. Solution 3: Interpolation. To fill gaps within datasets by estimating trends between two or more data points e.g. intermediate years where no data is available. This is useful for datasets with regular gaps, in its simplest form of linear interpolation. Hence, increasing confidence for a good QA/QC practice to compare interpolated data with surrogate data

d. Solution 4: Trend Extrapolation. To estimate trend and therefore actual value for a baseline by extending or 'extrapolating' trend backwards. This solution can also extrapolate forwards for projections, similar to interpolation although less known about the trend. It is important that trend must be constant to apply extrapolation and not erratic and should not be used for extended period of time since the longer the period the greater the uncertainty. Also other splicing techniques should be used alongside to improve confidence since "actual" data (when available) may differ from extrapolation.

In cases of shifting baselines, there are solutions to two (2) major causes: continuous updating of data compilation and temporal fluctuation in non-policy driver data;

a. Continuous Updating of Data Compilation.

- Recalculate baseline across the time series used (not forgetting to recalculate projections where they have been calculated)

- Ensure this new analysis baseline is clearly presented as a complete replacement to previous calculations (outlining that those are now void)

- Clearly outline why data has changed – it almost always done to improve the accuracy and robustness of data

- Maintain good communication with data users – particularly policy makers who can find such changes frustrating – to ensure they understand what has changed and why.

b. Temporal Fluctuations of Non-Policy Driver.

It may not possible to remove the impact from temporal variations but their effects can be mitigated using the following approaches:

- Select data that is not influenced by or corrected for such temporal variation (not possible when tracking high level GHG emission reduction targets)

- Consider setting baselines as an average over a longer period e.g. several years
- Consider setting budget periods that allow baselines to be recalculated every few years
- Calculate factors that can be applied to smooth out none-policy impacts e.g. a correction for fluctuations around average temperature

Thus, in summary:

a. Data may be available that you either are not aware of or cannot access. It might be necessary to try setting up effective communication and data exchange processes with data providers to resolve this.

b. Lack of suitable data or incomplete time series will hinder a user, however, it is necessary to become creative and open-minded when assessing what data may be used and look for appropriate methods to fill in gaps.

c. Be aware of, manage and seek to accommodate shifting baselines due to data method changes and temporal fluctuations, where possible.

Plenary Discussion

The following are highlights of the discussion.

a. Methods on dealing with Data Gaps

- Modifying the baseline with insufficient data without affecting its integrity. There are other techniques in setting the baselines like using other data and data splicing, otherwise a baseline cannot be set unless there is sufficient data to support it. Hence, it might be good to look at the data, maximizing its use prior to setting the baseline, where extrapolation can be done in the first year.
- Dealing with data gaps for activity data. Both surrogate and extrapolation is necessary to address such gap. For instance in GHG emission, there is a need to interpolate and extrapolate the data to get a surrogate data, but it must be noted that extrapolation is a continuation of the trend, and would depend whether the extrapolation is valid or not which would then result to a surrogate data.
- Data Splicing. This is to generate and put data together from different sources. If for instance, the case of Davao, where Davao Oriental was separated, data can be disaggregated using surrogate data to see the difference between two provinces.

b. Dealing with changing baselines.

- In the case of the country, annual reporting of government agencies is due on November 30th, hence December data is being added to complete the annual report, would it be a possible cause for changing the baseline? It does not mean that in setting a baseline one should have a complete set of data, but there are several ways to address this:
  - Extrapolation of data from the first 11 months to complete an annual dataset and then compare it to a surrogate for December.
  - It is not necessary to completely revise the method every year, rather looking at the data annually to identify if there are radical changes which would have implication on policies.
- If setting a baseline was based on 1999 data and there was a sudden change in methodology applied to generate a new data in 2004, is it necessary to change the baseline based on 2004 data to inte-

grate the new method? The final decision is dependent on the policy whether to change the baseline or not. However from a technical point of view, that recent data should be used either thru extrapolation from 1999 data or utilization of the new methodology for comparison with the previous methodology in data generation.

8. Institutionalization of Baselines and MRV of Baselines

Dr. John Watterson, RICARDO-AEA

The session focused on factors that are important in the institutionalization of baselines, and how MRV could be applied and looked at the concepts of ex-ante and ex-post analysis, because these are fundamentals to the setting and review of baselines.

In Kenya's case, the development of its MRV+/ National Performance and Benefit Measurement Framework (NPBMF) system took 1 year from February 2012 to March 2013, and its implementation is now on-going. Below are relevant features of Kenya's system:

- An integrated framework for the MRV of mitigation and adaptation actions; and the synergies between them.
- One stop shop for:
    - National/sub-national planning and monitoring (V2030 – Kenya's development programme covering the period 2008 to 2030; Medium Term Plans; Nationally Integrated M&E System; Kenya National Bureau of Statistics; County)
    - UNFCCC reporting obligations (NCs, BURs, NAMAs Registry)
    - Climate finance readiness (National Adaptation & Mitigation Registry; Carbon Markets)
- Simplified coordination/governance to minimise need for extra staff
- Use of established institutions

The framework system aims to develop a National Performance and Benefit Measurement Framework (NPBMF), which is an integrated framework for measuring, reporting and verifying results of mitigation actions, adaptation actions and the synergies between them. The MRV System has been designed that sits within a wider NPBMF combining adaptation and mitigation functions. It incorporates Measurement Reporting and Verification (MRV) of greenhouse gas (GHG) emissions and mitigation activities Monitoring and Evaluation (M&E) of the adaptation activities. The MRV+ system will carry out a process that contains three main stages:

a. **Measurement, Monitoring (and Evaluation)**: First of all data and information needs to be gathered and fed into the system, the data and information needs quality checking and then the evaluation of the data can be carried out.

b. **Verification**: the analysis will produce results that will need to be cross checked and verified in some way to ensure they are a realistic estimate of the outcomes being monitored.

c. **Reporting**: once the results have been verified they can then be reported in whatever format is required

On the other side, developing an M&E system goes beyond merely measuring, reporting and verifying (MRV) measures that incorporates an element of evaluation and learning". The deci-

sion is not just about what information is collected and how it is collected but also how it is being analysed and used, while monitoring obviously suggests an on-going process of information and data collection, evaluation involves assessing ex-post the impact of a policy intervention after it has been introduced. And to track progress, indicators should be used adhering to a Tiered Framework and conduct of situational analysis that looks at institutions for sources of information and how these institutions could work together.

Plenary Discussion

The discussion focused on key inputs in terms of appropriate set up for MRV and GHG Inventory in the Philippines.

- It will still depend on the country' local context and what is best for it given such situation. The country has made good progress in generating good quality of data and the key is to build and work within the existing structures.
- A GHG inventory was done in 2009 by local consultants, and from there it was decided that agencies should conduct their own calculations for sustainability. The first step it to capacitate the agencies in GHG inventory towards creating a system on identifying mitigation activities.

To conclude the outcomes of the five days workshop, he mentioned the following key reminders:

- <u>Participants now have a good grounding in the principles and practices of baselines, thus</u>
    - Developing baselines can be done, even with limited data.
    - Remember to document assumptions, even if they are associated with large uncertainties (*all countries have the same problem here, to differing degrees)* – don't let large uncertainties stop your work.
    - Review and revise the baseline periodically.
    - Always reflect back on the "Action Plan" from time to time, to be reminded of actions identified.
- <u>On Data Management and Uncertainties</u>
    - Start simple and build up, because datasets are available from different sectors and proxy statistics can be utilized to generate data needed for creating a baseline.
    - There is no magic solution to address uncertainties, but 1 or 2 years of data can do a lot of things, hence creating a reference with sensitivity to certain factors.
    - If QA/QC would be of help to agencies, it would be good to be aware and get hold of more information on the topic.

Together with the participants, he also identified key learnings, which **are doable for the country:**

- Visualization of projections and applications of ex-post and ex-ante policy analysis;
- Making sense/use of available data/information for baselines;
- Start simple in establishing the baseline;
- Application of projection models/methods;
- Completing a set of data requirement can mean years of gap (so do not rush, be patient?)

- Difference in concepts of baseline scenario and base year;
- Policy vs evidence cycle, policy development process;
- Importance of methodological tiers in terms of baseline scenario setting;
- Relevance of National, Regional, local actions to setting baselines;
- Developing baselines: different approaches; and
- Importance of immediate assessments.

Forward Planning

Representatives from the Climate Change Commission and GIZ facilitated the session on identifying steps in moving forward. The participants were requested to provide inputs on two aspects: 1) next steps for them after gaining knowledge and skills from the two training-workshops and 2) their expectation in general and from CCC after the training-workshops. Tables below summarize the inputs from the participants.

Table 32. Workshop Output: Forward planning – Lessons learned and next steps

Clusters	Taking account of what you have learned what are the next steps for you, your team, your department and your organization
Data and Methodologies	• Establish data collection guide for management (transport) • Clear, identify, adopt appropriate methodologies • Gather all available information to come up with baseline and projections (DOE) • Check and calibrate existing inventory in the sector • Initial analysis of data
Data Sharing	• Participate in a data sharing agreement (DILG) • Discuss with DOTC possibility of forming inter-agency working group
Training	• Hands-on baseline training with transport (TCC project) • Follow up training to capacitate origin in performing its functions
IEC	• PCCI Environment Committee to generate awareness and voluntary implementation among business (big, MSMEs) • Explore the development for appreciation of measurement uncertainties for GHG MRV: QA/QC, Sensitivity Analysis
Institutionalization	• Institutionalization of the GHG inventory process (industry and waste sectors) for actual application • Technical Assistance for institutionalization of GHG Inventory: Tools and how to gather data
Policy Framework Setting	• CCC to identify base year and policy direction to determine applicable baseline • Stocktaking of existing policies and data • Await CCC coordination and direction to provide mandate in creation of sectoral WGs • Framework Setting: institutional, operational, and legal framework/ also on MRV of REDD-plus

Table 33. Workshop Output: Expectations and needs to achieve next steps

Clusters	What are your expectations/ needs in general or from CCC to achieve next steps
Database	• Set up of a database/Software re: GHG international and local

GHG Inventory	• Simplified calculation of GHG emission • Consolidated analysis of data coming from all sectors to establish a baseline
IEC	• Building appreciation that MRVing transport NAMA be made more palatable, sexy, and cool a. Data packaging b. Marketing of Opportunities/Options c. Message of Delivery
Capacity Building	• Trainers Training and IEC (appreciation of LGUs and business on GHG Inventory/MRV) • Capacity Building and mainstreaming into sectoral database • Institutionalization
Policy Framework Setting	• Policy Direction and Framework • Policy Direction and Mandate from CCC in terms of roles of agencies • CCC to assist and guide in establishing the roadmap (system for mitigation actions) • Integrate sustainable development/co-benefit indicators in setting the criteria for Mitigation Actions – inter-linkages of policies since MRV is not just about CC mitigation • Buy-in of principals (NGAs Secretaries in the form of EO) • Link the activities to a Vision
Support	• Full support covering finance and technical aspects of GHG Inventory and MRV

Plenary Discussion

Below are key highlights of the plenary discussion.

- Inclusion of sustainable development indicators. It will depend on the policy direction of the government, but mitigation is still a function of adaptation based on CC Law and NSFCC. Nonetheless, in identifying mitigation actions, criteria must be set where sustainable development indicators may be included.

- NEDA is developing the SD framework, at the same time looking at complementation between NCCAP, PDP and the SD framework. It is the key benefit of mitigation action, with emission reduction as only co-benefit of such action. The basis of approval is that such mitigation action must provide sustainable development to the community.

- Setting-up of database. There is a recent move to come up with a consolidated database for GHG inventory, while some initiatives for GHG inventory are already happening at the local level. Thus, it is important to capture all little steps and integrate them at the national level.

- Provision of full support. This covers financial support, support to collection of activity data, support to technology and methodology, laptops-software for GHG Inventory, as well as policy support for institutionalizing GHGI within the mandates of line agencies.

- Providing guidelines to business sector in terms of needed data for GHGI. As observed in the rapid assessment conducted by the Commission, bulk of the data would come from the business/private sector. Thus, there is a need to engage the business sector in providing the data needed. Mandating the industries to 100% compliance of data submission is an option, but the Commission does not agree on such arrangement, rather CCC wants them to understand the data they are submitting especially the benefits out of generating quality data.

- The business sector is already capacitated through EMB specifically on calculation of their GHGI and the sector has been re-

questing for a follow up training since they already saw the relevance of GHG inventory. And with the massive interest on GHGI, CCC looks at the possibility of developing a reporting program for GHG inventory and other methods like incentivizing the industries for their efforts in coming up quality data.

Closing Remarks

Dr. Watterson and Dr. Hunter thanked the participants for their active participation in the entire duration of the training-workshops. They thanked GIZ and CCC for making the activity possible and hoped that their inputs would be used by sectors in putting up their own systems.

Ms. Orschulok also thanked everyone for their hard work especially in coming up with the outputs from the breakout sessions, looking forward for more workshops to further enhance agencies capacities.

Assistant Secretary Goco expressed her thanks to everyone and to the secretariat for organizing the event. She mentioned that two more workshops will be conducted on August and October as follow up trainings and hoped that line agencies would continue to show interest in the Commission's future activities for capacity enhancement.

Lastly, ***Dr. Liss*** thanked the participants for showing great interest on the topics as being shown by the workshop outputs. He mentioned that working with CCC and other GIZ partners only shows that things are doable and things are proceeding. And with the identified next steps, GIZ will continue to be with its partners towards having quality and credible data for transparent reporting.

References

World Resource Institute (WRI). Greenhouse Gas Protocol. *Policy and Action Standard. An accounting and reporting standard for estimating the greenhouse gas effects of policies and actions*. Third Draft for Advisory Committee, Technical Working Group, and Pilot Tester Review. April 2014. (Finalised version of standard expected to be published in August 2014).

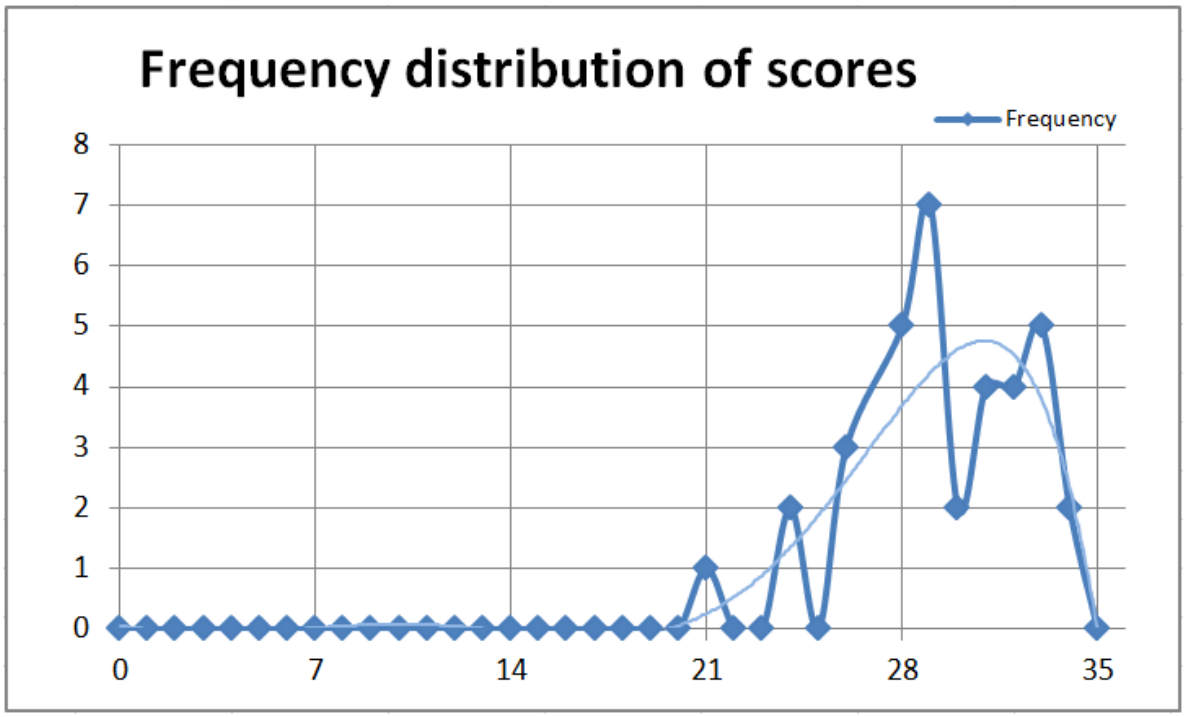
World Resource Institute (WRI). Greenhouse Gas Protocol. *Mitigation Goals Standard An accounting and reporting standard for designing and assessing progress toward national and subnational goals*. Third Draft for Advisory Committee, Technical Working Group, and Pilot Tester Review. April 2014. (Finalised version of standard expected to be published in August 2014).

Post-Test Scores on Baseline Scenario Setting

A 19-item post-test was developed by the trainers to gauge the level of understanding of the participants on the basic elements in establishing baselines and baseline scenarios. The highest possible score obtainable was 35.

The graph below shows the frequency distribution of scores garnered by the participants. A total of 35 participants took the test. The highest score registered was 34 while the lowest was 21. The lowest score obtained represents 60% of the total possible correct answers.

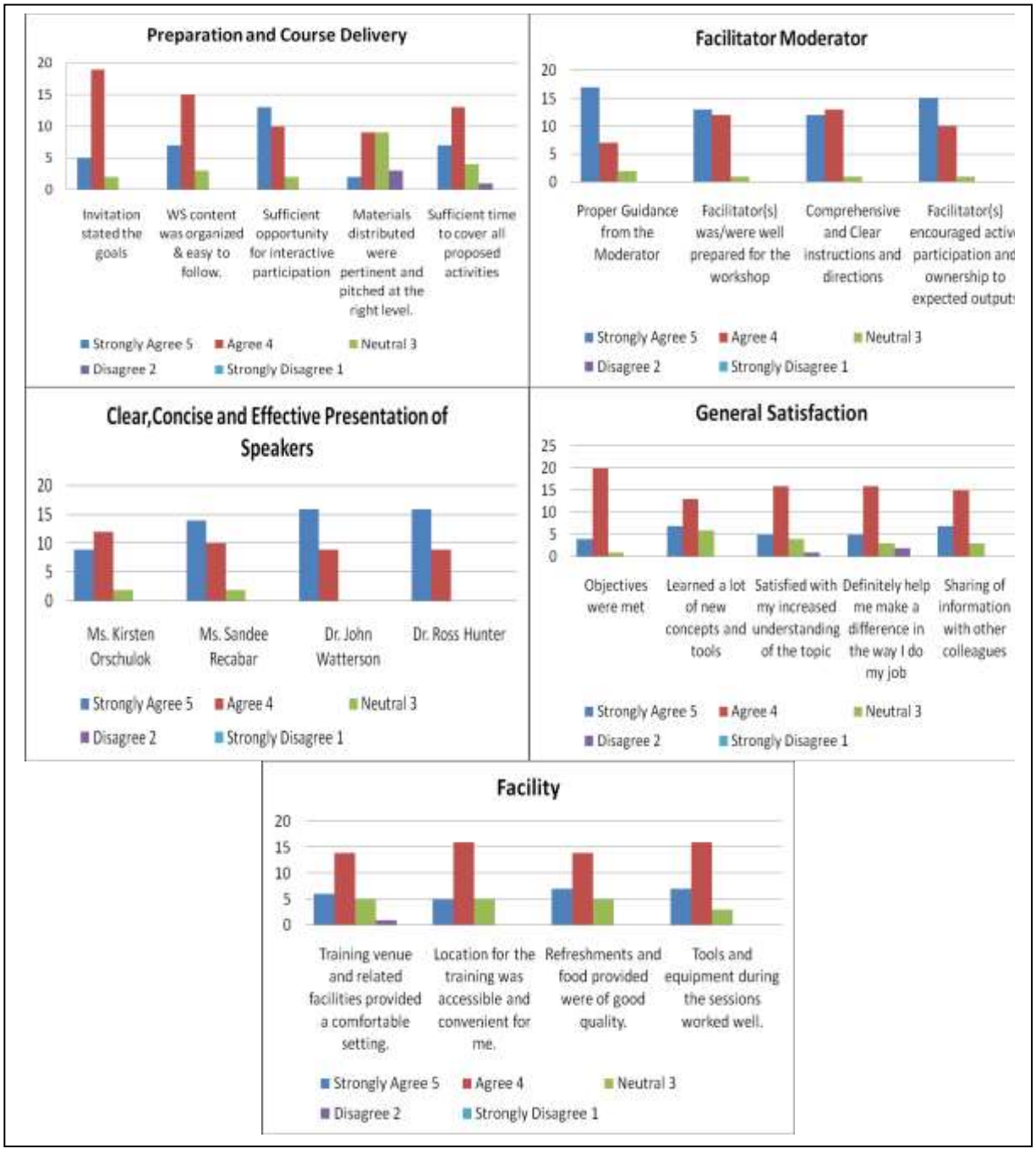
The group's average was 29.7 while the median and mode were 30 and 29, respectively. Standard deviation was 2.86 based on total population.



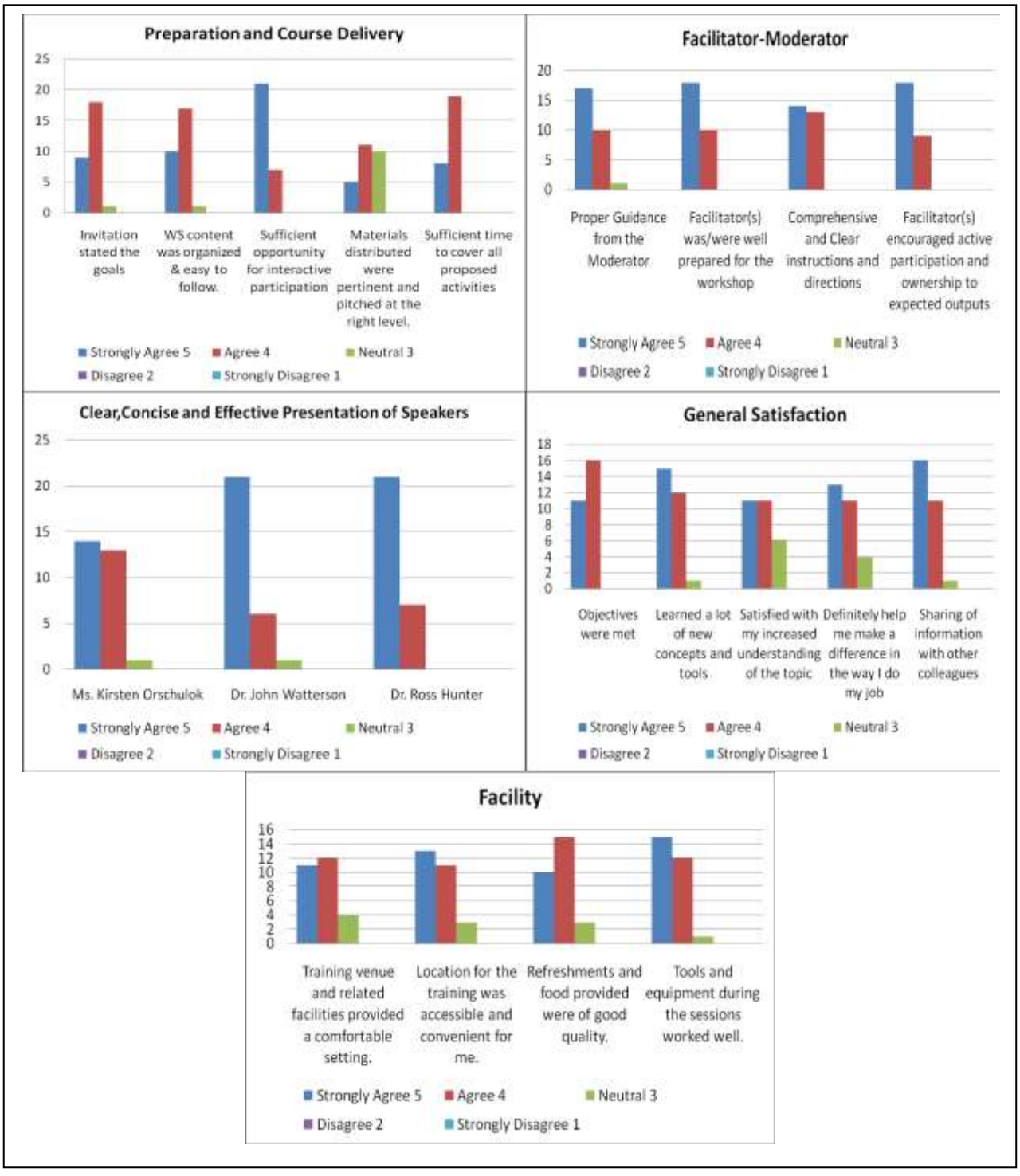
Post-Training Evaluation by Participants

In general, participants showed much interest on both training-workshops, given that majority of participants' general satisfaction was rated "4" for both MRV and Baselines, except for learning new concepts and information sharing on baselines which were rated "5". On the average 69% have agreed that workshops' objectives were met and participants are highly satisfied with the inputs and expertise shared by the consultations from Ricardo-AEA.

i. MRV Domestic Architecture



ii. Baseline Scenario Setting



Specific Comments were:

Questions	MRV Domestic Architecture	Baseline Scenario Setting
What will you do differently in your work/practice setting as a result of this workshop	• Provide e-copy of presentations • A lot of technical references • Keep MRV in mind in meetings, thereafter • Be more conscious about how agency practices verification aspect of MRV	• Application of causal chain for dynamic analysis • The workshop gives importance to mainstreaming MRV. • Data gathering and analysis, projecting, determining indicators and gaps would allow us to always remember the goal of MRV and setting baseline scenario • Potentially replicate or take off from topics not discussed • Document every work done for ease of transfer of work from one person to another • I appreciate it more, in terms of the application of extrapolation, interpolation, and use of surrogate data. • I would probably raise the need for verification of our work. • I will apply the concept of baselines in tracking/monitoring of my team. • Discounting of data, apply possible fix to fill in gaps. • Knowledge sharing/ Re-echo learnings • Communicate with supervisor to get "buy in"
What aspects of the workshop could be improved	• Lectures • Lay-out of seating arrangement • Presentation materials, particularly power point slides, can be streamlined so that only relevant context will be shown	• Hands-on exercises • Theoretical sample of baseline setting to work on (sort of hands-on) • The breakout sessions can be improved considering that discussions tend to be sector-specific because of grouping. Other groups may not be keen on what others are talking about during discussions. • Instead of multiple breakouts, use of other activities or exercises. • Application of concepts. • Relate examples to sectors
Other remarks	• Improvement on substantive part of MRV • Water is not served regularly • The workshop appropriately addressed general questions and concerns about MRV. • Breakout sessions were effective	• In general, objective 1 was satisfactorily achieved. • To be able to do more from conceptual to operational realm, a deeper (even more technical) discussion and hands-on training (use of actual data, deconstruction of how to fill data

	in providing context of MRV application.	gaps, by using different methods) might better address objective 2. • I like how each presentation is paced well, Dr. John and Dr. Ross are very well versed. Thank you for sharing your expertise with us. • The facilitators/presenters communicated the points very well (and are hilarious) • This is really not my scope of work but I did learn new things. Thanks you very much. • Focus on how to's • Breakout sessions are more useful in: - Asking participants to examine their respective sectors in terms of their gathering, processing, coordinating, reporting, and using of data. - Reporting the progress within a sector to all other sectors (which is significant given the nature of CC-related issues) • Provide workshops and training materials ahead. • More fruits

Annex 01: Training Agenda for MRV Domestic Architecture Workshop

TRAINING-WORKSHOP ON MEASUREMENT, REPORTING AND VERIFICATION (MRV) DOMESTIC ARCHITECTURE

Richmonde Hotel, Ortigas, Pasig City * 24-25 April 2014

Objectives:

- Participants/sectors will have a common understanding of the purpose, principles and practice of MRV applied to emissions, mitigation actions and climate support.
- All participants understand the roles and responsibilities for organizations within the MRV systems(s) and any institutional gaps identified.
- A roadmap identifying the activities and timelines of the major tasks needed to operationalize the MRV system(s) will be drafted.

AGENDA

Time	Activity / Topic	Discussant
Thursday, 24 April 2014		
08:45a	**Registration**	
09:00a	**Opening ceremonies** • Prayer and National Anthem • Welcome Remarks • Introduction of Participants	• ASec Joyceline Goco, Deputy ED, CCC-CCO • Dr. Bernd-Markus Liss, Principal Advisor, GIZ
	Setting the scene • About the Information Matters Project • Overview and objectives of the 2-day training-workshop	• Ms Kirsten Orschulok, GIZ IM Project • Ms Sandee Recabar, Senior SRS, CCC-CCO • Dr John Watterson and Dr Ross Hunter, Ricardo-AEA/IM Project
10:15a	*AM Break*	
10:30a	**Basic concepts of MRV**	
11:15	***Breakout Session A: The M, the R and the V exercise***	•

12:00n	*LUNCH*	
01:00p	**MRV of GHG inventories**	•
01:40p	***Breakout Session B: GHG Inventory exercise***	•
02:45p	*PM Break*	
03:00	**MRV of NAMAs**	
03:45	***Breakout Session C: MRV of NAMAs Exercise***	
05:00p	**Closing of Day 1; Expectations for Day 2**	•
Friday, 25 April 2014		
09:00a	**Preliminaries** • Recapitulation • Overview of Day 2 Agenda	•
09:15	**MRV of Support**	•
09:50	***Breakout Session D: Exercise on MRV of support***	•
11:00	*AM Break*	•
11:15	**Institutional structures for MRV**	•
12:00n	*AM Break*	
01:00	***Breakout Session E: Institutional structures for the Philippines***	•
02:30p	***Breakout + Plenary: Roadmap Formulation*** Sectoral Breakout Groups + CCC as breakout-group (45 mins) • Develop road map – MRV architecture and BUR/NatCom • What needs to be in place by when? Reporting back to plenary (5 mins per group)	•
03:30	*PM Break*	
03:45p	***Plenary Session B: Way Forward (Simple Action Plan)*** Discussion on how to combine the high level roadmap by the CCC with the sectoral roadmaps	•
04:45p	**Closing ceremonies** • Post-workshop participant survey • Closing remarks and summary	•

Engr. Voltaire L. Acosta
Moderator

Annex 02: Training Agenda for Baselines Scenario Setting Workshop

TRAINING-WORKSHOP ON BASELINES SCENARIO SETTING

Richmonde Hotel, Ortigas, Pasig City * 28-30 April 2014

Objectives:

- Participants/sectors will have a common understanding of the purpose, principles and application of baselines in the context of GHG mitigation
- Participants will have a common understanding of how to generate and apply a baseline to monitor the effectiveness of GHG mitigation actions

AGENDA

Time	Activity / Topic	Discussant
Monday, 28 April 2014		
08:45a	**Registration**	
09:00a	**Opening ceremonies** • Prayer and National Anthem • Welcome Remarks • Introduction of Participants	• ASec Joyceline Goco, Deputy ED, CCC-CCO • Dr. Bernd-Markus Liss, Principal Advisor, GIZ
	Setting the scene • About the Information Matters Project (Quiz/Game) • Overview and objectives of the 3-day training-workshop	• Ms Kirsten Orschulok, GIZ IM Project • Ms Sandee Recabar, Senior SRS, CCC-CCO • Dr John Watterson and Dr Ross Hunter, Ricardo-AEA/IM Project
10:15a	*AM Break*	
10:30a	**Basic concepts of baselines** • What is a baseline? • What are relevant concepts for setting baselines? • WRI accounting standards • Key decision steps	
11:30	***Breakout Session A*** • Key factors to consider for setting a baseline in each sector e.g. data, assumptions	•

12:00n	*LUNCH*	
01:00p	**Application of baselines** • Examples of how the UK used baselines in climate policy • Policy development process and where baselines are needed ▪ Policy vs. evidence cycle challenges ▪ Targets vs. policies	•
02:45p	*PM Break*	
03:00p	**Connection between baselines and projections** • Projection development methods/models • "Influencing factors" without/with existing mitigation measures (WOM/WEM)	•
04:30p	**Closing of Day 1; Expectations for Day 2**	•
Tuesday, 29 April 2014		
09:00	**Preliminaries** • Recapitulation • Overview of Day 2 Agenda	•
	Indicators • GHG / non-GHG • Impact chain • Tracking policy effectiveness and implementation • How the factors will interact	•
10:15	*AM Break*	
10:30	***Breakout Session B*** • Sector-specific examples to work through	•
12:00n	*LUNCH*	
01:00p	**Data and datasets, Part 1** • Data management and quality • Making the most of limited data • Applying TACCC principles to baselines • Data QA/QC • Understanding uncertainty	
02:00p	**Uncertainties** • Why and how to assess uncertainty • Error propagation and Monte Carlo approaches • Uncertainty in the UK projections	•
02:45p	*PM Break*	
03:00p	***Breakout Session C*** • What data is available in each sector? • Where are the gaps that would prevent a baseline be-	•

	ing created?	
04:30p	**Closing of Day 2; Expectations for Day 3**	•
Wednesday, 30 April 2014		
09:00	**Preliminaries** • Recapitulation • Overview of Day 3 Agenda	
	Data and datasets, Part 2 • How to address data gaps • How to address barriers to lack of data • How to address constantly changing datasets (e.g. GHGI)	
10:15	*AM Break*	
10:30	***Breakout Session D*** • Sector data gap filling and overcoming barriers	
11:30	**Institutionalise baselines and MRV of baseline** • Processes and procedures • Roles and responsibilities • Sectors	
12:00n	*LUNCH*	
01:00p	***Breakout Session E (continued)*** • Create draft implementation plan	
02:45p	*PM Break*	
03:00p	***Breakout Session E (continued)***	
	Brief presentations from each breakout group: Implementation Plan	•
04:30p	**Closing ceremonies** • Post-workshop participant survey • Closing remarks and summary	•

Engr. Voltaire L. Acosta
Moderator

Annex 03: Post-Training Evaluation by Participants

MRV Domestic Architecture Post-Training Evaluation Data

	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1	Total	Weighted Average
PREPARATION AND COURSE DELIVERY							
Invitation stated the goals	5	19	2			26	**4.12**
WS content was organized & easy to follow.	7	15	3			25	**4.16**
Sufficient opportunity for interactive participation	13	10	2			25	**4.44**
Materials distributed were pertinent and pitched at the right level.	2	9	9	3		23	**3.43**
Sufficient time to cover all proposed activities	7	13	4	1		25	**4.04**
FACILITATOR/MODERATOR							
Proper Guidance from the Moderator	17	7	2			26	**4.58**
Facilitator(s) was/were well prepared for the workshop	13	12	1			26	**4.46**
Comprehensive and Clear instructions and directions	12	13	1			26	**4.42**
Facilitator(s) encouraged active participation and ownership to expected outputs	15	10	1			26	**4.54**
SPEAKERS: Clear, Concise and Effective Presentation							
Ms. Kirsten Orschulok	9	12	2			23	**4.30**
Ms. Sandee Recabar	14	10	2			26	**4.46**
Dr. John Watterson	16	9				25	**4.64**
Dr. Ross Hunter	16	9				25	**4.64**
GENERAL SATISFACTION							
Objectives were met	4	20	1			25	**4.12**

	Learned a lot of new concepts and tools	7	13	6		26	**4.04**
	Satisfied with my increased understanding of the topic	5	16	4	1	26	**3.96**
	Definitely help me make a difference in the way I do my job	5	16	3	2	26	**3.92**
	Sharing of information with other colleagues	7	15	3		25	**4.16**
FACILITY							
	Training venue and related facilities provided a comfortable setting.	6	14	5	1	26	**3.96**
	Location for the training was accessible and convenient for me.	5	16	5		26	**4.00**
	Refreshments and food provided were of good quality.	7	14	5		26	**4.08**
	Tools and equipment during the sessions worked well.	7	16	3		26	**4.15**

Baseline Scenario Setting Post-Training Evaluation Data

	Strongly Agree 5	Agree 4	Neutral 3	Dis-agree 2	Strongly Dis-agree 1	Total	Weighted Av-erage
PREPARATION AND COURSE DELIVERY							
Invitation stated the goals	9	18	1			28	**4.29**
WS content was organized & easy to follow.	10	17	1			28	**4.32**
Sufficient opportunity for interactive participa-tion	21	7				28	**4.75**
Materials distributed were pertinent and pitched at the right level.	5	11	10			26	**3.81**
Sufficient time to cover all proposed activities	8	19				27	**4.30**
FACILITATOR/MODERATOR							
Proper Guidance from the Moderator	17	10	1			28	**4.57**
Facilitator(s) was/were well prepared for the workshop	18	10				28	**4.64**
Comprehensive and Clear instructions and direc-tions	14	13				27	**4.52**
Facilitator(s) encouraged active participation and ownership to expected outputs	18	9				27	**4.67**
SPEAKERS: Clear, Concise and Effective Presentation							
Ms. Kirsten Orschulok	14	13	1			28	**4.46**
Dr. John Watterson	21	6	1			28	**4.71**
Dr. Ross Hunter	21	7				28	**4.75**
GENERAL SATISFACTION							
Objectives were met	11	16				27	**4.41**
Learned a lot of new concepts and tools	15	12	1			28	**4.50**
Satisfied with my increased understanding of the topic	11	11	6			28	**4.18**
Definitely help me make a difference in the way I do my job	13	11	4			28	**4.32**
Sharing of information with other colleagues	16	11	1			28	**4.54**
FACILITY							
Training venue and related facilities provided a	11	12	4			27	**4.26**

	comfortable setting.					
	Location for the training was accessible and convenient for me.	13	11	3	27	**4.37**
	Refreshments and food provided were of good quality.	10	15	3	28	**4.25**
	Tools and equipment during the sessions worked well.	15	12	1	28	**4.50**

Annex 04: Photo-Documentation Release

To support the Philippine government in their processes of enhancing climate reporting mechanisms, the Climate Change Commission (CCC) partnered with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH's Information Matters Project in the conduct of back-to-back in-depth training-workshops on measurement, reporting and verification (MRV) domestic architecture and baseline scenario setting on April 24-25 and April 28-30 at the Richmonde Hotel, Ortigas, Pasig City. Technical expertise was given by Ricardo-AEA, a British consulting firm specializing in MRV methodologies and climate-relevant data management.

More than 40 representatives from sectoral lead, planning, statistics and budget agencies participated in the training-workshops. The conducted activities endowed them with a holistic perspective on generating and applying baseline scenarios as well as on developing and applying MRVs for greenhouse gas emissions and sinks, mitigation actions and climate support. This enhancement of capacities of relevant agencies in the field supports the United Nations Framework Convention on Climate Change (UNFCCC) initiatives at the international level and provides a clear basis for lead national agencies to mainstream sustainable development objectives and climate-relevant programs.

The Information Matters Project is part of the International Climate Initiative. The German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supports this initiative on the basis of a decision adopted by the German Bundestag.

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