Autumn School · Berlin 2012 · October 15th–23rd
MRV – today, tomorrow and the future
Dokumentation
Autumn School
Berlin 2012 · October 15th – 23rd
'MRV – today, tomorrow and the future'
Documentation
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Glossary

BMU – German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BUR – Biennial Update Report
CDM – Clean Development Mechanism
CDP – Carbon Disclosure Project
COMICC – Interinstitutional Commission for Climate Change Colombia
ETS – Emissions Trading System
EU – European Union
GCF – Green Climate Fund
GEF – Global Environment Facility
GHG – Greenhouse Gas
GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
ICA – International Consultation and Analysis
ICI – International Climate Initiative
IPCC – Intergovernmental Panel on Climate Change
ISO – International Organization for Standardization
KfW – Kreditanstalt für Wiederaufbau
LEDS – Low Emission Development Strategy
MRV – Measurement, Reporting, Verification
NAMA – Nationally Appropriate Mitigation Action
NC – National Communication
OECD – Organisation for Economic Co-operation and Development
PBA – Programme-based Approaches
PoA – Programme of Activities
QA/QC – Quality Assurance/Quality Control
REDD+ – Reducing Emissions from Deforestation and Forest Degradation
TREMOD – Transport Emission Model
UBA – Umweltbundesamt (German Federal Environment Agency)
UNECE – United Nations Economic Commission for Europe
UNEP – United Nations Environment Programme
UNFCCC – United Nations Framework Convention on Climate Change
WBCSD – World Business Council for Sustainable Development
WRI – World Resources Institute
1 Introduction

1.1 Background

The International Partnership on Mitigation and MRV was launched at the Petersberg Climate Dialogue in May 2010, in Bonn, by South Africa, South Korea and Germany. The overall aim of the Partnership is to support a practical exchange on mitigation-related activities and MRV systems between developing and developed countries in order to help close the global ambition gap.

To this end, the activities of the Partnership contribute to the design and effective implementation of Low Emission Development Strategies (LEDs), Nationally Appropriate Mitigation Actions (NAMAs) and Measuring, Reporting and Verification systems (MRV). Bringing together climate experts from a variety of countries, the Partnership seeks to foster mutual learning between peers, identify best practice, establish a shared mitigation-related knowledge base and disseminate lessons learnt.

In this context, the Partnership offers various forms of capacity building in order to promote mutual learning and networking among its member countries. One of these capacity building formats is an annual ‘school’ which allows participants from developing and developed countries to gain in-depth knowledge and understanding on a particular topic and exchange ideas and views based on their practical experience at the national level.

The Partnership’s Autumn School in 2012 was entitled ‘MRV – today, tomorrow and the future’ and took place from 15 to 23 October 2012 near Berlin (Germany). It was organised by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, with the technical support of Ecofys Germany GmbH, and was financed by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The Autumn School brought together 24 decision-makers from 23 Partnership member countries who work at the forefront of activities to set up MRV systems in their countries.

The Autumn School was designed as an opportunity for policy-makers and planners to gain in-depth knowledge of designing and implementing national MRV systems, including methodologies for data collection, reporting and verification. The Autumn School furthermore aimed to enable participants to better support national processes for building and institutionalising an MRV system for greenhouse gases (GHGs), mitigation action and support. The school brought together diverse experts to share their experiences, to discuss country
needs and to shed light on how to implement MRV at the national level in a pragmatic, sustainable and cost-efficient way, while taking advantage of existing structures and experiences. Participants were given the opportunity to develop and/or refine tangible implementation steps, with a view to fostering their respective MRV systems. The Autumn School targeted decision-makers and multipliers who work at the interface between policy-making and implementation processes.
1.2 Objectives

The Autumn School aimed to enable participants to:

(1) understand MRV in the context of the UNFCCC (United Nations Framework Convention on Climate Change) negotiations and its implications for national greenhouse gas monitoring and the tracking of climate support;

(2) gain in-depth knowledge on designing and implementing national MRV systems, including methodologies for data collection, reporting and verification;

(3) share and document national experiences to shed light on how to implement MRV at the national level in a pragmatic, sustainable and cost-efficient way, while taking advantage of existing structures and experiences;

(4) gain knowledge to support the establishment and continuous improvement of their national MRV systems and feel empowered to share the acquired knowledge in their countries, sub-regions and regions;

(5) become part of a global network of MRV experts.

Photo (from left to right): Lea Kai from Lebanon, Boubacar Sidiki Dembele from Mali, Farhan Helmy from Indonesia
1.3 Participating countries

Participants were representatives from environmental ministries, other ministries and agencies responsible for climate change issues in the following countries:

- Argentina
- Belgium
- Brazil
- Chile
- Colombia
- Dominican Republic
- Germany
- Ghana
- Indonesia
- Israel
- Lebanon
- Mali
- Marshall Islands
- Mexico
- Panama
- Philippines
- Singapore
- South Africa
- South Korea
- Switzerland
- Thailand
- Tunisia
- Viet Nam
- United Kingdom
1.4 Training concept

The training concept is defined by two main areas: training content and the knowledge transfer approach. The content covered four areas:

- MRV requirements at the UNFCCC level
- MRV of national inventories
- MRV of nationally appropriate mitigation actions (NAMAs)
- MRV of climate finance.

Speakers at the Autumn School were chosen based on their expertise and ability to address topics comprehensively, i.e. to:

- give an overview on an MRV-related issue and its requirements for developing and developed countries, including the most current discussions, developments and open questions;
- give an understanding of how the requirements can be implemented and what problems might occur during the implementation process;
- present best practices on the issue.

Workshop participants had different levels of knowledge. In order to ensure that the training remained rewarding for all, participants with more experience in certain topics were invited to share their knowledge with the group through concrete examples.

The training approach was based on the premise that learning works best through active participation, experience sharing and discussion. Presentations were therefore only used on a limited basis as a means of knowledge transfer and complemented with group exercises and discussions of practical examples. In order to deepen learning even further, the key contents of each training day were summarised by a group of participants in a 5-10 minute presentation the following morning. Two training days were largely devoted to the repetition of knowledge transferred through longer exercises and discussions.

The MRV Autumn School consisted of seven training days and one excursion day. The contents were covered as follows:

Day 1 – 15 October 2012: MRV requirements and functions
Day 2 – 16 October 2012: MRV in national inventories
Day 3 – 17 October 2012: MRV in systems other than national inventories, e.g. CDM
Day 4 – 18 October 2012: MRV for NAMAs
Day 5 – 19 October 2012: Excursion day
Day 6 – 21 October 2012: Exercises summarising the training contents of the previous days on biennial update reports (BURs)
Day 7 – 22 October 2012: Expectations of climate financing donors and MRV of support
Day 8 – 23 October 2012: Exercises/discussions summarising the training contents of the previous days, main findings and evaluation

1.5 Further information

See more detailed information, as well as photos and presentations from the Autumn School, on the Partnership website: www.mitigationpartnership.net.

In the login area of this website, participants have the opportunity to download further background material and share their experience with peers.

Photo: Xavier Tschumi-Canosa from Switzerland, Yamide Dagnet from UK (WRI)

Photo: Julia Wolf from Germany, Brian Mantlana from South Africa
2 Main findings

The contents of this section have been compiled based upon the outcomes of three sessions during which the participants identified key elements/considerations for a domestic MRV system, best practice/recommendations for a domestic MRV system and the key findings from this Autumn School.

2.1 Key issues and recommendations for a domestic MRV System

A domestic MRV system will have to cover various potential elements related to MRV, depending on the activities of the country in question. Based on UNFCCC requirements, these will include a national inventory. For countries implementing mitigation measures and/or receiving climate-related funding or other forms of support, further MRV elements related to the measures and the support received will be of relevance.

Participants acknowledged that MRV is in the interest of each country, as it makes it possible to track the success of domestic policies: i.e. the impacts and co-benefits which have been achieved and how effectively they have been implemented. A further advantage of MRV acknowledged by the participants is that it can help to show the continuity of a country’s actions, which is relevant for donors of climate finance. The participants identified the following functions of a domestic MRV system:

- comparability (at national and international level)
- tracking (who is doing what and when)
- accuracy (ensure compliance with targets)
- transparency (trust and accountability, relevance for access to support)
- coherence between domestic and international systems
- coherence between top-down calculation and bottom-up aggregation
- quantification of results
- identification of good practices.

In setting up a domestic MRV system, it is important to first set clear objectives. Start-up and ongoing operation also require resources that are available over a longer timeframe. National (and potentially sectoral) circumstances have to be considered when developing the MRV system. This refers to reduction potential, technologies, infrastructure, institutional structures, capacities, etc.
For an effective MRV system, institutional structures, with their respective responsibilities clearly defined and backed by a political mandate, must be established, and information flows between the institutions involved must be determined. As far as possible, the existing institutional structures should be used as the basis. In order to reduce conflicts of interest, an independent agency (with no connections to a specific ministry) or an inter-ministerial committee might be an option. Knowledge management is also an essential element; countries should ensure that the knowledge and capacities created through MRV activities remain in the public administration and not just in other institutions contracted to perform the work.

Recommendations for setting up a domestic MRV system

- Start now with what you have and develop it further over time.
- Ensure clear objectives, commitment (including resources!) and leadership for the system.
- Ensure a shared vision through a participatory process.
- Assess the potential legal impacts of your plans.
- Plan enough time for the implementation of the system; a few months will not be enough.
- Plan and implement the necessary enabling environment (e.g. legislation).
- Plan and implement a strong enforcement framework.
- Carry out a cost-benefit analysis of the planned MRV system.
- Design the system to be flexible with regard to sectoral/national circumstances.
- Support the MRV system with updated emission projections.
- Over time, aim to establish an MRV system that covers all relevant domestic MRV activities, e.g. national inventory, NAMAs, CDM, etc.
- Aim to strike a balance between accuracy and practicability/cost in designing the MRV system.

Recommendations for setting up institutional structures

- Secure the necessary political mandate and set up all necessary institutional arrangements for coordination, ensuring clearly defined responsibilities and avoiding conflicts of interest.
- Ensure staff have or are provided with the necessary capacities/expertise for their tasks.
- Ensure all necessary knowledge and data remain within the institutional structures.
- In developing a national MRV system, build on the existing institutional structures.
- Using a decentralised/integrated structure like an inter-ministerial committee can be helpful for the coordination of a national MRV system.
MRV methodologies – sometimes also referred to as accounting methodologies. With regard to mitigation measures, baselines taking into account national or sectoral circumstances have to be established and should be updated regularly. Methodologies should be in place not only for emission reductions, but for all relevant impacts, including co-benefits, co-costs and risks. All the impacts of the measures should be assessed first using an ex-ante estimation before the implementation of measures and then later, during or after implementation, through an ex-post assessment. The attribution of impacts to one specific measure might be difficult, where several measures overlap or where factors beyond the control of a mitigation measure play a significant role. Indicators must be chosen in line with the desired impacts of measures and should be SMART (specific, measurable, accurate, relevant, and timely). The comparison of ex-ante and ex-post assessments can provide valuable insights for future mitigation measures, e.g. where targets have not been achieved. Dedicated quality assurance/quality control (QA/QC) processes are the key to a successful MRV. Such processes help to avoid and minimise errors in data collection, evaluation and reporting. Verification is of course a dedicated QA/QC step, but should not be the only one. Methodologies for the determination of emissions or emission reduction, for example, should be as simple and robust as possible, while still representing the monitored situation accurately. Many methodologies already exist (e.g. CDM and IPCC), and countries can choose the elements most suitable to their needs. Ideally, methodologies are also chosen to provide data that is comparable at the national and even international level. Comparability can be further enhanced by a common reporting format.

Recommendations related to MRV methodologies

• Assess existing MRV methodologies and use the elements best suited to your domestic MRV system.
• Use approaches and elements from recognised MRV methodologies (e.g. ISO 14064) to support comparability at national and international level.
• Set a common minimum quality standard for data at national level.
• Develop national guidelines for all elements of your domestic MRV system to ensure comparability.
• Simplify MRV methodologies (e.g. for emission determination) as far as possible, considering your specific situation.
• Integrate donor requirements (if applicable) into the existing MRV approach as far as possible.
• IT systems (e.g. for installation-level reporting or aggregation of installation-level data) can help to increase comparability and reduce errors, time and effort.
• Use accurate indicators in line with the objectives of mitigation measures.
2.2 Next steps after the Autumn School

The participants identified the following next steps which might be beneficial for setting up and operating their domestic MRV system successfully:

- develop non-binding and flexible technical guidance on MRV, e.g. based on existing experience and best practice in the Partnership;
- simplify the complex MRV-related methodologies;
- replicate summer school or elements of the summer school (e.g. related to NAMAs) at home;
- participate in further and more technical training to enhance MRV-related knowledge;
- when organising workshops at home, make them as interactive as the Autumn School;
- use negotiations for bilateral meetings with other countries, e.g. for continuation of information exchange and meetings with donors;
- enhance exchange between negotiators and MRV practitioners at national level;
- use the Partnership for continued networking/experience exchange, e.g. by using the protected area of the Partnership's website;
- ensure wider participation of large economies/emitters in exchanges within the Partnership.

Photo (from left to right): Moises Álvarez from Dominican Republic, Angel Ureña from Panama, Fátima López from Mexico, Hortensia Solís from Costa Rica, Diana Barba from Colombia
3 Summary of contributions

This chapter presents the key information transferred by presenters during the MRV Autumn School, including relevant points made in discussions and break-out groups.

Yamide Dagnet (World Resources Institute – WRI): MRV requirements under the UNFCCC

Yamide Dagnet briefly introduced the history of MRV. MRV is both an accounting and a political issue. On the accounting side, it helps to ensure environmental integrity, avoiding double counting and summarising sectoral or facility-level reduction efforts as a national total. On the political side, MRV allows comparability of a country’s efforts and is thus instrumental in preparing the ground for a legally binding agreement in the future. Ms. Dagnet defined the general functions of MRV to be evidence, engagement, enforcement and evaluation.

MRV already appeared in the Convention as requirements to collect and prepare data and report regularly (in the form of national inventories and National Communications) and can also be considered the backbone of the Kyoto Protocol (Articles 5, 7 and 8). MRV terminology appears for the first time in the Bali Action Plan with regard to mitigation and support. Ms. Dagnet stated that the MRV requirements between Annex I and non-Annex I countries were reduced over time. Looking into the future, ideally a common framework could be achieved post-2020.

Ms. Dagnet gave an overview on the current status of MRV requirements as well as open issues to be resolved in Doha and beyond, e.g. the development of domestic MRV guidelines for non-Annex I parties and options for the process of international consultation and analysis (ICA), which are currently under assessment with regard to costs incurred by the UNFCCC Secretariat. Ms. Dagnet closed with an overview on implications for domestic MRV, including the importance of institutional arrangements, the need for wider cooperation regarding MRV, NAMAs and low-emission development strategies (LEDS) and the integration of the MRV of various activities at the national level.

In the discussion following the presentation, the complexity of integrating MRV systems at various levels, e.g. MRV for NAMAs, national inventories and MRV at sectoral level, into one domestic MRV system was highlighted once again. Participants also pointed out difficulties in defining what a national MRV system is, which elements it entails and which institutional
structures are required. Domestic guidelines were considered helpful, where they were sufficiently technical and flexible to encompass national circumstances.

Download the presentation here.

Anke Herold (Öko-Institut): Introduction to national inventories and inventory review

Anke Herold introduced the basic principles for national inventories – transparency, consistency, comparability, completeness and accuracy, the main calculation principles and the sources of guidelines that inventories have to follow. Annex I countries currently have to submit an inventory annually. A regular requirement for inventory submission for Non-Annex I countries was agreed in Durban: an inventory has to be submitted with each biennial report. The Revised 1996 IPCC Guidelines and the 2000 IPCC Good Practice Guidance contain the provisions that Annex I countries should follow. Non-Annex I countries can also use the IPCC 2006 Guidelines. These guidelines include additional and more detailed methodologies, updated emission factors and a partial modification of how emissions are allocated. The heart of each inventory is the national inventory system, which can be defined as all institutional, legal and procedural arrangements made for estimating anthropogenic emissions or removals of all GHGs from sources or sinks. Inventory data can be accessed in different ways, e.g. informal cooperation with data provider, memorandum of understanding, legal acts, workshops and surveys. All national inventories are reviewed by expert review teams assembled by the UNFCCC Secretariat either in an in-country review or a centralised review.

In the discussion following the presentation, the question of whether inventory data could be used for NAMA MRV was raised. Ms. Herold indicated that this depends on the scope of the NAMA – where inventory approaches are equally or more detailed than a NAMA, the data could be used, but in some cases an inventory might not supply sufficiently detailed data. Nevertheless, experiences in inventory work might be helpful in making assumptions for NAMA MRV, e.g. in setting the baseline. A participant highlighted the fact that staff working on inventories and on NAMA MRV might not be the same and that, in such cases, a reconciliation of data and approaches should be carried out.
As many developing countries have inventory data only for the year 2004, the question arose of how consistency between emission projections and inventory emissions could be achieved, as allocation of emissions in projections and inventory might differ. Ms. Herold clarified that this is not always necessary, but that a country should use the approach for the projection that suits its circumstances best.

Download the presentation [here](#).

**Dirk Günther (German Federal Environment Agency): Institutional and procedural arrangement of the German National System on Emission Inventories**

The German National System on Emission Inventories goes beyond the scope of a national inventory. It covers air pollutants in general and is used for reporting to the United Nations (UN), the European Union (EU) and at the national level. The national inventory system, established in compliance with Article 5(1) of the Kyoto Protocol, is implemented through the Agreement by State Secretaries on the national system of June 2007 and Federal Environment Agency in-house Directive 11/2005. Apart from the Federal Environment Agency, other federal institutions, institutions of the federal states, the economic and scientific communities and independent experts also contribute to the inventory. Data collection is supported by, for example, an agreement with the Federal Statistical Office and the adoption of several acts on statistical data collection and cooperation agreements with industry. Cooperation agreements are more easily achieved when industry has a vested interest in collecting detailed data, for example, to show their good performance. In other cases, the set-up of a cooperation agreement can take considerable time and effort. Nevertheless, the involvement of industry in the inventory process is crucial.

The single national entity at the Federal Environment Agency covers the national system, report compilation, QA/QC and database management. It is supported in these tasks by the Central System on Emissions for emission calculation, reporting, storage and archiving and by the Quality System on Emission Inventories, providing for the implementation of good practice guidance for inventories and the preparation of a national improvement plan.

The detailed installation-level data from the EU Emissions Trading System (ETS) is not used for emission calculation, but to validate activity data and review emission factors. This is because the data is not available to the Agency in disaggregated form.
Input for the improvement of the national systems comes from various sources, e.g. nominations to the roster of experts for the UNFCCC review, support of the EU internal review procedures and the use of lessons learned from UNECE (United Nations Economic Commission for Europe) review support.

Mr. Günther highlighted the fact that the development of the national inventory system to its current state took around 10 years, but that the most important step is simply starting by using what you have and improving over time.

In the discussion following the presentation, Mr. Günther was asked to elaborate on the timeline of inventory preparation. Data is received by mid-year (end of June) and reviewed and inserted into the database by source category experts by the end of August. During September, database quality checks take place. From October source-specific experts perform further checks and coordinate with inventory experts to improve quality. Sections for the national inventory report have to be submitted by early October. In November and December a comprehensive consultation process in and among Federal Environment Agency departments takes place. Recommendations from the consultation process have to be formulated by the first or second week of December. After that, consultations within the departments take place. Recommendations are incorporated after Christmas or at the beginning of the year, and the inventory is submitted to the EU by 15 January.

A participant asked whether additional statistical data was collected for the inventory. This is not the case, as adding new statistical data collection processes is currently very difficult. The Agreement by State Secretaries foresees that the inventory should use existing data as far as possible. This can lead to difficult situations, if statistical data collection processes are discontinued. In such cases, bilateral solutions (e.g. direct reporting by industry) have to be found.

Asked whether the national inventory system could be replicated for the preparation of National Communications, Mr. Günther explained that parts of the existing structures are used to develop the German National Communication, particularly the inventory part. Other elements of the National Communication are prepared in other Agency departments. The institutional structure for the biennial update reports has not yet been defined.

A participant wondered how he could get political decision-makers to provide support for the national inventory. In Germany ratification of the Kyoto Protocol provides the basis for the implementation of the national inventory system, but of course the situation is different for developing countries. The experience in Germany is that the national system proved so valuable that it is now used for other purposes. Furthermore, the consultation process creates interest in policy. Long-lasting institutional arrangements are important, because they create support for the inventory and enhance understanding of its value.

Download the presentation here.
As part of the discussion on the German national inventory, Switzerland presented a concrete example about the development of the Swiss inventory. The first two inventories were provided as part of the National Communications in 1994 and 1997. The first inventory covered only some of the Kyoto gases: CO2, CH4 and N20. The review process supported further development of the inventory, but nevertheless from 1998 to 2001 only completed standard reporting forms where submitted. It was only in 2002, after the first national inventory, that a report on all direct and indirect GHGs was produced. The first key category analysis was performed in 2002, and the first quantitative uncertainty analysis in 2003. From 2003 onwards, after ratification of the Kyoto Protocol, the national inventory system was built. The inventory reviews have greatly supported further development of the inventory over time, as they promote experience exchange among inventory experts.

Mr. Fröhlich gave an overview on MRV systems other than inventories, covering standards (e.g. ISO 14064) and voluntary systems (e.g. Carbon Disclosure Project – CDP) and mandatory (e.g. EU ETS). More than 100 MRV methods/initiatives exist, but they use similar basic approaches to some extent. Considering the 30 most relevant methods, 48% link their methodological basis to the GHG Protocol (WRI/World Business Council for Sustainable Development – WBCSD). Where different methods are used, comparability cannot be guaranteed in all cases. Nevertheless, the most relevant standard, the ISO 14064, and the most widely used methodological approach, the GHG Protocol, seem generally compatible, although their focus is different: ISO 14064 defines what has to be “MRVed”, while the GHG Protocol provides information on how and why this is the case. The GHG Protocol provides sectoral guidance, while the ISO 14064 is sector-neutral.
Mr. Fröhlich presented the Carbon Disclosure Project, an initiative aimed at companies with the goal of collecting and distributing high-quality information to investors, enterprises and governments to prevent 'dangerous climate change'. This also includes risks (regulatory, physical and other) perceived by companies with regard to climate change. When asked whether emissions were reported in relation to a specific unit of production, Mr. Fröhlich explained that this was only the case where a life cycle analysis approach was taken. Generally, the approach under the CDP – which is closely related to the GHG Protocol methodology – can be compared to the layering of an onion: to begin with, companies focus on MRV for scope 1 (direct emissions) and 2 (indirect emissions) and then go on to include further emissions under the influence of the company, e.g. business travel (scope 3).

He also gave insight into MRV procedures under the EU Emissions Trading System, which combines elements from the GHG Protocol, ISO 14064 and the IPCC Guidelines.

Download the presentation [here](#).

### Matthias Wolf (German Emissions Trading Authority): EU-ETS MRV: lessons learned and best practices in Germany

Mr. Wolf from the German Emissions Trading Authority gave insights into experiences from the implementation of MRV under the EU Emissions Trading System in Germany. He highlighted the importance of devoting enough time to activities such as training operators and validating inspectors for emission reports and also of preparing emission reports diligently. Clarity in the steps necessary to achieve compliance is indispensable, and ideally the system focuses its administrative attention on the largest emitters. The use of IT supports authorities, as it reduces potential for errors, increases comparability and allows simple validation activities to be carried out on the data. Nevertheless, manual validation of reported data is always still necessary. A challenge for authorities is the need to have both detailed technical and juridical knowledge. Mr. Wolf emphasised that the system cannot work if the data received by the operator is not trustworthy. The third party validation helps to establish trust, but additional validation by the authorities is still necessary. An issue that should not be underestimated is the need for a strong enforcement system which is strictly implemented and in which the risk of prosecution outweighs the benefits of non-compliance.

Download the presentation [here](#).
The CDM provides a number of best practice examples which can be relevant for the MRV of domestic measures; this applies particularly to CDM programmes of activities (PoA). CDM methodologies can have quite varied MRV requirements – in some cases, provisions are strict, while in others there is considerable room for interpretation. Whether MRV is already required during project implementation or only after the implementation phase also depends on the methodology. Successful monitoring has to be developed during the design stage of a PoA. This is even more important where many small activities are included which cannot all be monitored separately. In this case, sampling can be a solution (e.g. cook stoves). The CDM Executive Board has approved a sampling standard. Standardised baselines and benchmarking are approaches aiming to simplify MRV in CDM projects, but can be difficult to set up due to a lack of data. Mr. Wentrup pointed out that a balance between accuracy and workability has to be achieved. In contrast to CDM projects, which are designed to be well delineated, certain policies and measures can raise difficulties in MRV with regard to issues such as boundaries, data collection and attribution.

Download the presentation [here](#).
Markus Kurdziel (Programme Office of the International Climate Initiative - ICI): The German Energiewende

Energiewende (energy transition) is a term used to express the strategic aim of Germany’s current energy policy to phase out nuclear and fossil power in Germany. The energy transition is driven by the fact that EU-wide dependence on energy imports is expected to increase considerably by 2030, while the expanded use of renewable energy and improvements in energy efficiency can contribute towards sustainable development and climate change mitigation. The energy transition rests on three pillars: renewable energy, grid expansion and energy efficiency. For each of these pillars, quantitative targets have been set for each decade between 2020 and 2050. The policy poses a number of challenges, e.g. ensuring supply security during times of low availability of electricity from renewable sources. Co-benefits are seen in technological innovation and job creation: nearly 400,000 people were employed in the renewable energy sector in 2011.

Download the presentation here.
Ms. Eisbrenner introduced the issue of NAMAs, which she defined as a voluntary intervention by a developing country's government. Among other things, it has an effect on reducing GHG emissions directly or indirectly and is MRVable. She categorised NAMAs into three types: strategies, policies and programmes/projects. Depending on the type of NAMA, a GHG reduction might be expected only in the longer term, e.g. where measures aim to remove barriers to emission reduction. While unilateral NAMAs only receive domestic financing, supported NAMAs may also receive private international, bilateral or multilateral financing. Different requirements apply to the MRV of unilateral and supported NAMAs. Supported NAMAs are subject to international MRV, while unilateral NAMAs are MRVed at national level. Nevertheless, there are opportunities for synergies between the MRV of supported and unilateral NAMAs which should be considered at the time of setting up an MRV system for NAMAs.

In the discussion following the presentation, participants pointed out that there is a need for stakeholder involvement in the development of NAMAs and that ownership at the national level, which can be promoted, for example, by pointing out development benefits, is absolutely essential for a successful NAMA. Furthermore, they emphasised that stakeholder involvement is critical to develop a shared vision and support for NAMA implementation. It was highlighted that NAMAs also have economic potential and that it is in the interest of the country to carry out NAMA MRV itself, because it is an investment decision and MRV should be carried out as part of any good project.

Download the presentation here.
GIZ has developed a tool aimed at supporting NAMA development. The tool outlines ten steps to progress from the mitigation idea to a NAMA concept ready for implementation. These are the following:

1. assess framework conditions, analyse policy gaps and identify the measures needed;
2. evaluate technical emission reduction potential and co-benefits;
3. identify potential NAMAs;
4. define baselines;
5. design MRV plan;
6. detail NAMA planning;
7. identify support needs;
8. submit to NAMA registry;
9. implement and MRV;
10. best practice.

In addition, it lists success factors for NAMA development based on experience so far. Furthermore, the tool presents the relevant roles in NAMA development, lists exemplary NAMAs for various sectors and provides checklists, e.g. for baseline design or knowledge sharing.

In the discussion following the presentation, a participant mentioned that baseline setting seems critical in the overall NAMA process and also to prevent leakage. Another participant mentioned that it seems good practice to first develop a basic idea for a NAMA to be presented to various donors and only develop the NAMA in detail when donors have been found, so that donor expectations can be incorporated. In relation to the
NAMA registry of the UNFCCC, concerns were shared that it remains unclear whether or not there will be future binding conditions for registered NAMAs. Some participants pointed out that in their countries they do not use the term ‘NAMA’, but prefer to call them national plans, programmes or flagship projects with the objective of reducing emissions in the country. The involvement of the private sector was also discussed. To facilitate its involvement, Ghana’s Government developed an information document on NAMAs for the private sector. The question of whether NAMAs that are supported by the private sector would also receive finance from other sources was raised.

Sebastian Wienges (GIZ): Support project for the International Partnership on Mitigation and MRV

The MRV Autumn School is part of a support project for the International Partnership on Mitigation and MRV carried out by GIZ. Sebastian Wienges introduced the participants to the aim and activities of this support project. The project includes activities related to inventory and data analysis (e.g. gap analyses), knowledge management (e.g. NAMA tool) and capacity building (e.g. workshops). The website provides an insight into the project activities and supports knowledge sharing. Follow-up to the Autumn School will also be supported through the website with:

- knowledge management: member countries could provide relevant publications, information on events, documents on lessons learned, good practices, success stories;
- capacity building and networking, e.g. member countries could share good practices with other members;
- website resources: threads, documents;
- website protected area: opportunity for networking.

The participants of the Autumn School were cordially invited to take an active part in these activities.

Download the presentation here.
Claudio Forner (UNFCCC): The UNFCCC NAMA registry

Mr. Forner gave an overview on the new UNFCCC NAMA registry, including screenshots of the platform itself. The registry contains information on NAMAs seeking support or recognition and details of support available and supported NAMAs. Access is password protected and only one focal point per country will receive full access rights. He remarked that the registry is not currently open to the public due to security concerns. To ensure the comparability of data entries, templates are provided for guidance, establishing categories for types of activities, sectors and technologies. The registry is not intended as an MRV instrument; responsibility for data quality lies solely with the providers of the information. Mr. Forner emphasised that the information entered in the registry is not binding and can be edited or even deleted by the provider of the information at any time.

In the discussion following the presentation, Mr. Forner clarified that it was unlikely that NAMAs would become binding, as this would require a decision at the UNFCCC negotiations. This is not expected. It was discussed whether some countries will be benefitting more from NAMAs than others, as in the case of the CDM. There was general agreement that this is less likely because NAMAs are run by the government and not linked to carbon markets. Access to the NAMA registry was discussed in more detail. Mr. Forner clarified that there are different levels of access to the registry for governments and supporters. Levels of access for supporters still need to be defined in further detail.

Download the presentation [here](#).

Jenny Mager (Climate Change Office, Ministry of Environment): NAMA experiences in Chile

Chile is currently developing several NAMAs, one of which is for electricity self-sufficiency through biogas in the agricultural sector. The NAMA proposal is expected to be completed in the first half of 2013. Estimated cost of implementation is 60 million US dollars to which Chile will contribute several million. One key challenge of the project is to align the MRV approach of the institutions and partners involved in the project. To streamline this approach, a study is being carried out to design the MRV system, including suitable indicators. The goal of the study is to support a common tracking approach and indicators for GHG reductions and co-benefits. Lessons learned from the CDM MRV are considered in the design of the MRV approach for the NAMAs. It was observed that co-benefits might include
job creation and technology transfer. To facilitate project management, an electronic platform for the tracking of the NAMA indicators in Chile is currently under development.

Fatima Lopez (Ministry for Environment and Natural Resources): NAMA experiences in Mexico

In Mexico there are currently three NAMAs under development or in implementation: one in the building sector, one in the transport sector and a third related to appliances. In principle, the introduction of an emissions trading system was desirable, but blocked by strong political resistance. NAMAs are now used as a transitory approach for a sectoral trading scheme. Mexico has established a NAMA office, which is also responsible for MRV capacity building. A national registry for domestic measures is under development. The approaches taken aim to retain control over mitigation actions at the domestic level, avoid double counting and create sustainability. Experience with NAMA MRV shows that the MRV component has to be designed once the NAMA has been finalised, establishing which indicators are appropriate and feasible for data availability, for example. In one case, data on landfill emissions was not accessible by the public administrations, and suitable indicators now have to be redesigned.

Boubacar Sidiki Dembele (Environment and Sustainable Development Agency): NAMA experiences in Mali

In his presentation, Mr. Dembele reported that in Mali several NAMAs have been proposed to the Registry. They comprise a list of 14 activities across the country with a total abatement potential of 1,285,034 tCO2/year in sectors such as small hydro, wind, biomass and solar PV. The estimated full cost of preparation is USD 840,000. In the forestry sector, a list of ten activities that could be considered NAMAs has been defined, including afforestation, reforestation and carbon sequestration, with a total abatement potential of 12,000,000 tCO2/year. The estimated full cost of preparation is USD 840,000 for energy efficiency measures and USD 200,000 for forestry measures.
Diana Barba (Ministry of Environment and Sustainable Development): NAMA experiences in Colombia and MRV of support

Colombia has developed a low-carbon development plan into which the design and implementation of NAMAs is integrated top down on the basis of sectoral plans. At the same time, bottom-up development of NAMAs through the sectors can take place. In this case, NAMAs have to comply with national development objectives. Lessons learned so far include the fact that the detailed assessment of emissions and mitigation options at sectoral level provides a better overview and supports the development of NAMAs. Feasibility studies for mitigation actions should not be limited to mitigation potentials and costs, but encompass further key aspects, e.g. political, cultural and methodological aspects, in order to ensure successful implementation.

Colombia requires all potential mitigation measures to have been presented to a Committee for Financial Management, which is under the Inter-institutional Commission for Climate Change (COMICC). This ensures consistent decisions and makes tracking easier, as there is a common 'point of entry' for initiatives. The Committee for Financial Management assesses the financial feasibility and financing options for initiatives and supports efforts to secure suitable funding. Furthermore, it manages the budget resources for national policies and programmes related to climate change adaptation and mitigation. The Committee consists of representatives of relevant ministries, e.g. environment, foreign affairs, finance and public credit, and of other institutions including the National Planning Department and the Adaptation Fund management team.

Download the presentation [here](#).
Ms. Pretlove first highlighted the connection between national development planning, low-carbon development plans and NAMAs: national development planning might include low-carbon development plans, which might include NAMAs and which might take the form of a project or a policy. The development of NAMA MRV is complex, due to the many potential sectors to be covered and the rapid development of international discussions. This raises the need for frameworks that are modular, flexible and scalable. Existing MRV systems already provide many elements and a common basic process – e.g. definition of a baseline, monitoring, reporting, and verification steps. For NAMA MRV, both MRV methods and MRV capacities are required. Countries can build on existing MRV experiences and their MRV capacities and move towards the desired level of capacity step by step. In doing so, they have to consider what type of NAMA has to be MRVed, e.g. unilaterally supported or credited. Minimum requirements for NAMA MRV also differ, depending on the type, e.g. whether the verification is carried out by a first, second or third party. NAMAs are likely to have indirect effects on GHG emissions and other impacts such as co-benefits. Ms. Pretlove presented a number of potential qualitative and quantitative (financial, process and technical) metrics which might be used in this case. The GEF approach of combining a bottom-up with a top-down estimation makes it possible to roughly assess the range of potential long-term emission reduction resulting from indirect GHG effects such as barrier removal. With regard to co-benefits, Ms. Pretlove pointed out where co-benefits should be achieved. This would require setting targets/indicators and government commitment. A one-off measurement at the approval stage would not be sufficient.

Download the presentation [here](#).
Wolfgang Sterk (Wuppertal Institute): Assessing sustainable development impacts

Using the example of sustainable transport, Mr. Sterk showed that mitigation measures can contribute substantially to sustainable development. Sustainable development impacts can be positive or negative, which means that not only co-benefits, but also so-called 'co-costs' have to be considered. In identifying and MRVing sustainable development impacts of mitigation projects, a targeted approach using criteria and indicators is needed. In selecting an MRV approach, the aim of MRV, the available capacities and the quantifiability of impacts should be taken into consideration. Where outputs are difficult to MRV, using input-related indicators can be a solution, when there is a clear causal connection between input and output, e.g. for capacity-building measures, the number of workshops, participants, average evaluation scores, etc. Relevant complementary elements for the MRV of sustainable development impacts are safeguards and stakeholder involvement. Safeguards aim to avoid co-costs, while stakeholder involvement can also help to avoid co-costs, identify and maximise co-benefits, identify/avoid potential barriers and create trust and ownership for a project.

In the discussion following the presentation, participants expressed considerable interest in including co-benefits in NAMA development and MRV. Colombia includes sustainable benefits in selecting domestic mitigation actions, but encounters difficulties in assessing and comparing certain benefits, e.g. benefits to health. Mr. Sterk pointed out that comparability was only possible when the same criteria and indicators were used, but that in the end, the decision on certain measures would be a political one. Asked what role environmental impact assessments could play in the assessment of sustainable development impacts for NAMAs, Mr. Sterk indicated that these might be used as a basis and developed further to cover other impacts as needed amongst other existing systems.

Download the presentation [here](#).
Kristina Juhrich (Federal Environment Agency): The German energy inventory

Relevant national circumstances to consider with regard to the German energy inventory include the federal structure and the geographical location of Germany. Due to the federal structure, energy data is first collected at regional level and reported at the federal level. Due to Germany’s geographical location in the middle of Europe, there is considerable natural gas transit activity, which adds complexity to the natural gas statistics. Energy data is confidential, leading to problems of data accessibility, e.g. in industry when there are only a few players in a given sector. The German energy inventory is based on a national energy balance. Special consideration is needed for energy emissions in the iron and steel industry and in the refinery sector. In both cases, a carbon balance is needed to avoid double counting or underestimation, and the refinery sector also requires an energy balance. For iron and steel, detailed statistics for each steel-making production process are needed in order to set up the carbon balance. Statistics providing this information in the past were discontinued, but a bilateral reporting agreement between the steel industry and the Federal Environment Agency was set up. Difficulties in the iron and steel industry and the refinery sector also arise from waste gases and waste oils, which vary in their composition.

Download the presentation here

Robert Kludt (Federal Environment Agency): Examples of process-related emissions: approaches and ongoing development

Mr. Kludt presented the case of the German cement industry, which shows that installation-specific data does not always provide the most accurate emission estimate. In the case of cement, statistical data is similar in quality to plant-specific data, but is available with much less effort in terms of data collection and review. Uncertainty assessments of cement industry data also showed that accuracy would not improve if the plant-specific data available under the EU Emissions Trading System was used. Data on process-related emissions are partly provided through bilateral agreements with industry. Asked by a participant how
data quality can be ensured through bilateral reporting agreements with the industry, Mr. Kludt explained that the data provider fills in a QA/QC checklist based on inventory quality standards. The data is further validated by staff at the Federal Environment Agency, e.g. through comparison with other years in the time series.

Download the presentation here.

**Michael Kotzulla (Federal Environment Agency): Estimating emissions from mobile sources**

In the transport sector, emission determination approaches vary greatly depending on the specific category. While in principle activity data is mostly multiplied by an emission factor, the approaches for determining these factors are quite diverse.

An example for a rule-of-thumb approach for a rather small source is the German deep-sea fishing fleet. Here emissions are estimated using installed engine power per ship and average factor [kg/kWh] for diesel oil consumption, taking the highly conservative assumptions that the ships are operated 24 hours a day every day.

An elaborate approach is used for road transport: emissions are estimated using the TREMOD model (transport emission model). Within TREMOD, a sophisticated framework is administered, including data on annual fleet composition, mileage and very specific emission factors (for certain types of passenger cars, light duty vehicles, etc., with or without mitigation technologies, on urban and rural roads or autobahns). This data allows the calculation of technology-specific activity data and emissions per kilometre.

Download the presentation here.
As an introduction to an exercise, Ms. Wartmann gave a brief overview on biennial update reports (BURs). Based on the Durban Decisions, developing countries have to hand in a BUR every two years, starting in December 2014. The aim of the BUR is to provide updated information on National Communications, which – again after Durban - have to be submitted by developing countries every four years. Required updates include information on national circumstances, the national inventory, mitigation actions and their effects, domestic MRV approaches and support needed and received.

Download the presentation here.

The International Climate Initiative (ICI) by the German Environment Ministry finances projects in developing countries, emerging economies and countries in transition in the areas of mitigation, REDD+, adaptation and biodiversity. The ICI aims to MRV structural changes, emission reductions and co-benefits. For this purpose, an elaborate MRV system is currently under development and likely to be finalised in the first half of 2013. The MRV approach is based on the logical framework methodology. Indicators have to be developed for project outputs and outcomes. The ICI itself has set specific desired outcomes for the different funding areas: for mitigation (the outcomes are emission reduction and improved mitigation capacity), for adaptation action (specific activities supporting adaptation) and for adaptive capacity improvement. Mitigation capacity is a concept that relates to the ability of a country to reduce emissions (regardless of funding) and mitigation capacity improvements related to structural changes which remove barriers to emission reductions: e.g. capacity building, improved institutional structures, improved policy frameworks, etc. The ICI requires project developers to provide an MRV approach with the project application. Project results are reported via a standardised reporting format, with annual interim reports and a final report after project closure.

Download the presentation here.
Ms. Breisinger suggested aligning NAMAs to the criteria of programme-based approaches (PBA) in order to shift away from project-based approaches, allow for leadership by the host country and have a single comprehensive programme and budget framework. Under the PBA framework, KfW considers three types of activities: projects as part of a coordinated programme, basket-financing / common pooled funds / multi-donor trust funds and budget support and policy loans.

KfW suggests the following criteria for financing NAMAs: level of ambition, maturity and bankability, national interest and ownership and an MRV plan. KfW has set an internal agenda for financing NAMAs, which focuses first on building capacity, implementing pilot projects, establishing a project pipeline and finally participating in the international standardisation process. A focus also exists with regard to regions (starting with Latin America) and sectors (energy efficiency: SMEs and housing, municipal public transport, waste and renewable energy). With regard to MRV, KfW suggests international standards for unilateral and supported NAMAs and the CDM PoA rules for credited NAMAs. The WRI is currently developing a standard for mitigation actions, which is due to become final in early 2014. For KfW, the ‘Mexican Ecocasa Programme’ is an ideal example: there is strong national ownership and high modularity of activities, and the measure is sufficiently mature to be bankable. Where flexibility was needed in terms of timelines, e.g. because political decisions on NAMAs had to be taken first, Ms. Breisinger suggested treating this phase as a separate step with separate financing (e.g. technical assistance funds). KfW would only finance NAMAs considered bankable. Download the presentation [here].
Ms. Wilkinson started by giving an overview on international climate finance flows. A difficulty in estimating these flows is the lack of a common international definition and the rapid development of discussions on climate finance. She defined climate finance flows as dedicated to mitigation and adaptation, covering various geographical configurations, including public, private, and public-private flows, for incremental and investment costs and counted gross and net. Total annual global climate finance flows (i.e. not only flows from Annex I to non-Annex I countries) reached approximately USD 288-356 billion in 2010-2011, of which direct public investments amounted to USD 73-85 billion and private finance to USD 177-231 billion. While this result reflects better data availability and higher coverage than previous studies, the overall amount remains insufficient for a low-emissions transition.

Ms. Ellis continued with an overview on tracking climate finance. Currently around USD 70-120 billion flow north-south annually, with public flows registering the highest figure (bilateral and multilateral funds), while uncertainty decreases for public-private investments and is low for private flows (e.g. philanthropy and private investments). Typical barriers for tracking include lack of data, disparate and overlapping sources, unclear definitions, double counting and unsuitable reporting mandates (e.g. national vs. international). UNFCCC requirements for reporting on support focus on public support and developed countries, while limited information is available on private flows, flows from multilaterals and domestic flows in developing countries. There is also no common definition on what are considered 'new and additional' funds. Ms. Ellis stated that, for these reasons, tracking climate finance was not straightforward. Improved transparency would be an important interim step. For developing countries, national coordination to identify funding required and tracking funding received is essential.

Ms. Grüning addressed the issue of tracking climate finance flows at national level. Reports of developed countries vary in detail, completeness and timeline – a standard format on support provided would help to improve comparability. Developing countries face a different situation: lack of capacity (institutional arrangements, procedures and systems) to
register, monitor and report finance received. So far there is no guidance on how to report on climate finance received. Ideally, one common MRV system for climate finance would be used, allowing information on financing received to be matched with information on financing provided.

Download the presentations here: Jane Wilkinson, Jane Ellis, Christine Grüning.

Farhan Helmy (National Council on Climate Change, Indonesia): Example Indonesia: MRV of support

Indonesia has published an assessment for a potential institutional structure related to MRV in April 2012. A clear need is seen to designate or establish an agency/department responsible for the oversight of the MRV processes of the national inventory, mitigation actions and tracking support as well as overall QA/QC. Three core options are under discussion:

- establish a new independent MRV agency in charge of the oversight of BURs, the National Communication process and overall responsibility for V (or QA/QC);
- establish a new MRV agency under the Ministry of Environment, widening the responsibility of the current Agency of Inventories under the Environment Ministry;
- establish a new MRV agency under the National Planning Agency.

The second option seems most favoured at the moment. Indonesia aims to reach a decision by the end of 2012.

Download the presentation here.
Daniel Tutu (Energy Resources and Climate Change Unit, Environmental Protection Agency): Example Ghana: MRV of support

Ghana has conducted climate change expert mapping in order to identify and profile the available climate change expertise. Climate-related initiatives in Ghana are recorded in the 'climate dashboard'. The dashboard also includes information on the amounts of support for each initiative/project. Initiatives/projects are categorised (e.g. adaptation, energy efficiency, social development, forestry and land use, etc.) in order to evaluate the amounts of funding provided for each category. Currently each project/initiative is MRVed individually, but Ghana would like to develop one common MRV approach.

Ghana has already developed a draft domestic MRV system which is integrated into its development policy. With regard to development, health and water are priorities and would therefore be considered as relevant co-benefits expected from mitigation measures. Funding for the MRV system will be provided by the World Bank for two years. Resources for future years still have to be found.

Woranuch Emmanoch (Office of Natural Resources and Environmental Policy and Planning): Example Thailand: institutional structure for MRV

In the past, Thailand has tasked academic institutions with the development of the national inventory. The disadvantage was that knowledge and data were not available within the governmental structure after the inventory compilation had been finalised. Thailand has now suggested a structure for data collection and evaluation for the inventory sectors by the respective ministries (Ministry of Energy, Industry, Transport, etc.). The sectoral data would then be validated by a QA/QC Committee and compiled under the overall inventory. NAMAs should also be covered by this decentralised structure, i.e. allocated to the respective ministries. This also applies to tracking the respective financing. Selection of NAMAs would take place through a centralised approach, using a NAMA screening committee composed of representatives of the relevant ministries.

Download the presentation here.
Annex I – Agenda

### Sunday, 14 October 2012

**Travel day and arrival of workshop participants and organisers at the Hotel Müggelsee**

### Monday, 15 October 2012 – Introduction and setting the scene

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td>Introductory session on the MRV Autumn School and its objectives</td>
<td>Julia Wolf (BMU)</td>
</tr>
<tr>
<td>10:45</td>
<td>Introductory round, expectations of participants, logistics, groundbreaking rules</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch</td>
<td></td>
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<tr>
<td>14:00</td>
<td>MRV requirements under the UNFCCC</td>
<td>Yamide Dagnet (WRI)</td>
</tr>
<tr>
<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>15:30</td>
<td>Exercise on domestic MRV systems</td>
<td>Sina Wartmann (Ecofys)</td>
</tr>
<tr>
<td>16:30-16:45</td>
<td>Wrap-up of the day</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>18:30</td>
<td>Welcome dinner</td>
<td></td>
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</tbody>
</table>

### Tuesday, 16 October 2012 – MRV of national inventories

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Start of the day: summary of previous day and preview of the day’s programme</td>
<td>Albert Eckert (denkmodell) + group of participants</td>
</tr>
<tr>
<td>09:15</td>
<td>Introduction to national inventories and inventory review, Q&amp;A</td>
<td>Anke Herold (Öko-Institut)</td>
</tr>
<tr>
<td>10:20</td>
<td>Coffee break</td>
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<tr>
<td>10:50</td>
<td>The German national inventory, including sample case from Switzerland</td>
<td>Dirk Günther (UBA)</td>
</tr>
<tr>
<td>12:45</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:45</td>
<td>Exercise on setting up an MRV system for mitigation measures based on inventory data</td>
<td></td>
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<tr>
<td>16:30-16:45</td>
<td>Wrap-up of the day</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
<td>Speaker(s)</td>
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<tr>
<td>09:00</td>
<td>Start of the day: summary of previous day and preview of the day’s programme</td>
<td>Albert Eckert (denkmodell) + group of participants</td>
</tr>
<tr>
<td>09:15</td>
<td>Exercise: What is a NAMA?</td>
<td>Katja Eisbrenner (Ecofys)</td>
</tr>
<tr>
<td>09:30</td>
<td>NAMA overview</td>
<td>Katja Eisbrenner (Ecofys)</td>
</tr>
<tr>
<td>9:45</td>
<td>NAMA development process</td>
<td>Sebastian Wienges (GIZ)</td>
</tr>
<tr>
<td>10:15</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>Exercise in break-out groups: build a NAMA</td>
<td>Katja Eisbrenner (Ecofys), Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>12:00</td>
<td>Input from Chile, Mexico, Colombia and Mali: examples of NAMA development</td>
<td>Selected participants</td>
</tr>
<tr>
<td>12:30</td>
<td>Questions and answers on NAMAs</td>
<td>Katja Eisbrenner, Gesine Hänsel (Ecofys), Sebastian Wienges (GIZ)</td>
</tr>
<tr>
<td>12:45</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:45</td>
<td>The UNFCCC NAMA registry</td>
<td>Claudio Forner (UNFCCC Secretariat)</td>
</tr>
<tr>
<td>14:15</td>
<td>MRV of NAMAs – more than monitoring direct emission reductions</td>
<td>Bente Pretlove (DNV)</td>
</tr>
<tr>
<td>15:15</td>
<td>Coffee break</td>
<td></td>
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<tr>
<td>15:45</td>
<td>Assessing NAMA co-benefits: how to identify and MRV relevant co-benefits and potential negative impacts, including examples from selected participants</td>
<td>Wolfgang Sterk (Wuppertal Institute)</td>
</tr>
<tr>
<td>16:45-17:00</td>
<td>Wrap-up of the day</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>19:00</td>
<td>Cultural evening: English theatre in Berlin</td>
<td></td>
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</tbody>
</table>
### Friday, 19 October 2012 – Excursion day

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>Travel to the German Environment Agency (UBA), Dessau</td>
</tr>
<tr>
<td>10:00</td>
<td>Tour of the German Environment Agency (30mins.)</td>
</tr>
<tr>
<td>10:30</td>
<td>Discussion with the inventory department at the Agency on their lessons learned and best practices in inventory development and operation</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:00</td>
<td>Travel to Feldheim</td>
</tr>
<tr>
<td>15:00</td>
<td>Presentation and tour of Feldheim (energy autonomous village)</td>
</tr>
<tr>
<td>19:00</td>
<td>Arrival back at hotel</td>
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</tbody>
</table>

### Saturday, 20 October 2012 – Day off

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>10:00</td>
<td>Bus to Berlin (optional)</td>
</tr>
<tr>
<td>18:00</td>
<td>Bus back to hotel (optional)</td>
</tr>
</tbody>
</table>

### Sunday, 21 October 2012 – Biennial update reports and preparation of MRV country scenarios

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td>Start of the day: summary of previous day and preview of the day’s programme</td>
<td>Albert Eckert (denkmodell) + group of participants</td>
</tr>
<tr>
<td>10:15 (incl. coffee break)</td>
<td>Exercise in break-out groups on setting up a biennial update report: data, capacities, structures and processes needed</td>
<td>Albert Eckert (denkmodell), Sina Wartmann (Ecofys)</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>13:30 (incl. coffee break)</td>
<td>Participants start to set up their MRV country scenarios: What steps could be taken to set up a national MRV system? What capacities and structures are needed?</td>
<td>Albert Eckert (denkmodell), Sina Wartmann (Ecofys), Christine Grüning &amp; Johannes Berliner (Frankfurt School – FS, UNEP)</td>
</tr>
<tr>
<td>16:30–16:45</td>
<td>Wrap-up of the day</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>19.00</td>
<td>Farewell dinner</td>
<td></td>
</tr>
</tbody>
</table>

### Monday, 22 October 2012 – Expectations of donors and MRV of support

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
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<tr>
<td>09:15 (incl. coffee break)</td>
<td>MRV expectations on the financing side: presentations on expectations from KfW and the International Climate Initiative</td>
<td>Milena Breisinger (KfW), Sina Wartmann (Ecofys)</td>
</tr>
<tr>
<td>10:40</td>
<td>Coffee break</td>
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<tr>
<td>11:00</td>
<td>Group discussion on how to integrate expectations from various donors</td>
<td>Albert Eckert (denkmodell), Sina Wartmann (Ecofys)</td>
</tr>
<tr>
<td>11:30</td>
<td>MRV of support: overview</td>
<td>Jane Wilkinson (CPI), Jane Ellis (OECD), Christine</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
<td>Presenter(s)</td>
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<tr>
<td>12:30</td>
<td>Lunch</td>
<td>Grüning (FS, UNEP)</td>
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<tr>
<td>13:30</td>
<td>Exercise on climate finance</td>
<td>Christine Grünig &amp; Johannes Berliner (FS, UNEP)</td>
</tr>
<tr>
<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>15:30</td>
<td>Presentations on support MRV approaches by Colombia, Ghana and Indonesia</td>
<td>Selected participants</td>
</tr>
<tr>
<td>16:15</td>
<td>Wrap up in the form of a quiz</td>
<td>Christine Grünig &amp; Johannes Berliner (FS, UNEP)</td>
</tr>
<tr>
<td>17:00</td>
<td>Options for follow-up communication through the website of the Partnership for Mitigation and MRV</td>
<td>Sebastian Wienges (GIZ)</td>
</tr>
<tr>
<td>17:15-17:30</td>
<td>Wrap-up of the day</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
</tbody>
</table>

**Tuesday, 23 October 2012 – MRV country scenarios and best practice domestic MRV system**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Start of the day: summary of previous day and preview of the day’s programme</td>
<td>Albert Eckert (denkmodell) + group of participants</td>
</tr>
<tr>
<td>09:15 (incl. coffee break)</td>
<td>Second session on setting up the MRV country scenarios, focusing on MRV of support.</td>
<td>Albert Eckert (denkmodell), Sina Wartmann (Ecofys), Christine Grünig (FS, UNEP)</td>
</tr>
<tr>
<td>11:30</td>
<td>Discussion on MRV in negotiations: Doha and beyond</td>
<td>Carolin Zerger (BMU)</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch</td>
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</tr>
<tr>
<td>13:30</td>
<td>Overview on main findings during the Autumn School.</td>
<td>Sina Wartmann (Ecofys), Christine Grünig (FS, UNEP), Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>15:00</td>
<td>Coffee break</td>
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<tr>
<td>15:30</td>
<td>Feedback and evaluation session</td>
<td>Albert Eckert (denkmodell)</td>
</tr>
<tr>
<td>16:30-16:45</td>
<td>Closing session</td>
<td>BMU</td>
</tr>
</tbody>
</table>
Annex II – Exercises

15.10.2012, 15:30 | Exercise on domestic MRV systems

| Format: Discussion in break-out groups. Task: What would you like to see in domestic MRV guidelines in order to help you with setting up and operating your domestic MRV systems? |

Group 1 (part 1)

- NAMAS
- Sectoral indicators (examples)
  - intensity
  - qualitative
  - quantitative

- Tool to evaluate NAMA's against the national & international goal

- To identify overlapping effects of actions/policies

- Sensitivity analysis

- How to align bottom-up data with down national statistics

- Regional companies
- Sub-national sectorial
Group 1 (part 2)

2) GHG Inv.
   > ex-post analysis:
      trend inventory → match policy/action’s effect
      baseline (harmonization)
      real emissions vs. relative reduction

3) Support
   > harmonization of requirements
      from donors
   > matching donations
Group 2

LCDS = UMBRELLA CATALYST ENABLING

⇒ NAMAS + SUPPORT < DOM INT

GHGs ⇒ IPCC GUIDELINES
Group 3

- Baselines
  - Set domestically (year)

- Methodologies
  - Less complicated than CDM

- Institutional Arrangements
  - For quality of data
  - Comparable

- Political Guidelines
  - Roadmap to implementation

- To help overcome
  - Barriers
    - Institutional
    - Tech
    - Info

Objective
- Help countries succeed in implementing MRV
- Broad to fit different needs

Quality Assurance
- Information
Tuesday, 16.10.2012, 13.45

Exercise on mitigation measures

Format: Discussion in break-out groups.

Task (Groups 1-3)

- Groups 1-3: Germany would like to report internationally on one of its policy measures for the reduction of fossil fuel consumption for heating in buildings. Please help them in setting up the MRV.
- Group 4: Costa Rica has developed a NAMA in the coffee sector. Please help Costa Rica to set up an appropriate MRV system.
- All groups: In order to help Germany and Costa Rica set up the appropriate MRV systems, please answer the following questions – trying to use inventory data as much as possible:
  - What data should be collected in order to show the measure was a success?
  - How could a baseline be set?
  - How could data be collected?
  - How could it be validated?
  - What data should be reported internationally and how?
  - Which institutions could best take the responsibility for data collection, validation and reporting?
  - Which other institutions would need to be involved and how?
  - Are other institutions needed?
Group 1: Energy efficiency in buildings

Baseline
- Type of boiler technology (efficiency)
- Type of fuel
- Q fuel
- Q boilers
- Cost of fuel/household

Policy
- Insulation
- Fuel switch
- Change of fuel awareness

MRV
- CO2 emission reduction/capita m2, USD
- Budget
- Fuel consumption
- Qualitative information

Institutions
- Statistical office
- Universities
- Department
- Ministry of Social Affairs
- Fuel suppliers
- Contractors

Assumptions
- Target population already selected based on specific criteria
- Climate variation
- Costs of fuel variations
- Methodology assumptions
- Population growth
- Economic growth
Group 2: Energy efficiency in buildings
Group 3: Energy efficiency in buildings (part 1)

Data
- type
- number
- consumption patterns
- rate of refurbishment
- current & historical (BAU)
- projected current efficiency
- energy use

how?
- Building Federation
- Studies

Validate
- cross check worker teams
- check benchmarks
- historical data
- understanding methodology
- match inventories

Sampling of energy use

Compare
- top-down
- bottom-up

Indicators
- energy consumption
- GHG emissions

Report Internationally
Group 3: Energy efficiency in buildings (part 2)

Institutional Structures

Data Collection—Fed Env Agency (Agreement w)
Gas Companies (already have data) Housing/Building Agency
Regional land planning institutions

Validations—Academic Institutions
Group 4: Coffee NAMA (part 1)

1. Land use - Identified

2. Coffee process

Goal: Reduce 50% and ownership/tenure

Data types

Benefits

Baseline

Area
- Yield
- Type of soil

Weather conditions
- Topography, rainfall

How?

Participatory
wrapping to the data

Suitability
Map

Who can collect the data (compile)?

Gaps and capacity building needs

Data validation
- Academics
- Verification by Government
- International level reporting

Exciting things by whom

Availability
Timeframe
Group 3: Coffee NAMA (part 2)
Format: Work in break-out groups using the World Café method with rotating groups.

**Task**

Each group is asked to develop one of the following NAMA options:

- **Energy**: How can a country increase the share of renewable energy in the national energy mix?
- **Buildings**: What can a country do to increase energy efficiency in the private building sector?
- **Agriculture**: How can emissions from land use change be reduced?
- **Waste**: How can GHG emissions in a municipality’s waste sector be reduced?

To this end, each group should describe the following in relation to the NAMA:

- What is the NAMA?
- Barriers
- Policies
- Finance
- MRV
Group 1: Energy NAMA

Energy NAMA

How can a country increase the share of renewables in the national energy mix?

What is the NAMA?

Increase the share of renewable energy from 10% by 2030 in the national energy mix.  

"Electricity installed by 2030:  

- Wind energy = 1000 MW  
- Solar PV capacity = 500 MW  

Barriers

1) Lack of technical capacity and knowledge  
2) Non-existence of policy and strategy to develop RE  
3) Non-existence of financing mechanisms  
4) Technical barriers and insufficiencies

Finance

Defining the NAMA

Defining the NAMA

- Technical support from Germany  
- Investment in renewable energy  
- Additional financing

MRV

Indicators

1) Capacity installed (MW)  
2) Energy produced by RE (MWh)  
3) Total energy produced by renewable sources

Policies

1) Breakdown of a national RE policy  
2) Fix the target by 2030  
3) Get institutional agreement  
4) Decide the instruments  
5) Tariffs in sectors  
6) Tax Exemption

Actions:

- Adoption of the grid (off-grid)  
- Expanding building  
- Promotion of RE (MWh)

Energy
Group 2: Buildings NAMA

**Buildings NAMA**

What can a Country do to increase energy efficiency in the housing sector?

**What is the NAMA?**

- Replacement of inefficient bulbs and air conditioning units (scraping phase)
- Updating building regulation for new buildings

**Focus on lowest income Replacement**

- Cost barriers
- Waste problem (emissions from replacement)
- Setting up of criteria & methodology (choosing households, etc.)
- Control and data processes
- Lobbying from construction industry
- Barriers in enforcement (existing policies legislation in conflict w/ NAMA)

**Policies**

1. Send old electronics to collection points
2. Implement schemes
3. Companies must sell appliances responsible for power use
4. Defining conditions for a recycling system
5. Standard for quality of products
6. New construction codes
7. Policy of tax relief for constructors
8. Tax relief

**MRV**

- Establish baseline based on electricity bills (sampling)
- Technical details of new appliances (e.g., air-cons)
- Identifying # of appliances replaced, will do
- Identifying # of buildings built with new regulation
- Registry needed

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Group 4: Agriculture NAMA

Agriculture NAMA

How can emissions from land use change be reduced?

Barriers
1) Funding
2) Ownership of land
3) Lack of knowledge & tools, skills, expertise, awareness

Policies
Land planning program support to replenishing:
- training farmers
- cash farming from banks
  (e.g., Subsidy, LT Fou)
- big campaigns, awareness

Finance
Public & private banks → FUND
70% improve soil
30% more time to pay back

MRV
1) Establish baseline:
   - producer / type of activity
   - extent of land area
   - condition / soil characteristics
2) Indicators:
   - area harvested / year
   - quality of soil
   - quality of site / socio-economic indicators (gh-generator, income, productivity of the land)

REPORTING:
- Monitoring
- Verification & party verification
  give reporting of accomplishments

What is the NAMA?
ESTIMATES OF GHG EMISSIONS BY 2020:
750 MILLION TON CO2e
NAMA = RECOVER 15 MILLION HECTARES OF DEGRADATION AREAS
Group 5: Waste NAMA

Waste NAMA

How can emissions in the waste sector of a municipality be reduced?

1) Waste separation
   - recyclable materials
     - paper / metal / glass / plastic
   - household for rural areas

2) Organic waste
   - landfills / city recovery
   - composting
   - anaerobic digestion (biogas)

3) Government
   - waste national regulation
   - enforcement or modification of waste regulation
   - environmental tax

4) International finance for technology
   - governmental incentives
   - precautionary program (NP)

5) MRV indicators

Baseline indicators
- Landfills
- Volume of gas
- Number of households involved
- Recycling material
- Co-benefits
- Per capita

Tools / technologies
- Surveys
- Sampling
- Monitoring on site (remote sensors)
- Financial
- Education and capacity building program

Barriers

Policies

Finance
Exercise: Biennial update reports

Format: Discussion in break-out groups.

Task
The country Philonesia has to prepare its first biennial update report. Please help Philonesia to set up:
- a list of activities necessary for the development of the BUR;
- an efficient institutional structure;
- a timeline ensuring that the BUR is ready in time.

Please consider the following information on Philonesia:
- Philonesia is a developing country with strong population and economic growth.
- It has submitted a first national inventory for the year 2004 and a first National Communication in 2006.
- The national inventory has been set up by a consortium of consultants, and the project was overseen by the Ministry of Environment. The relevant staff members have left the Ministry in the meantime.
- The Ministry of Economy developed detailed projections on economic and population development in 2010.
- The Ministry of Transport is currently developing a NAMA in the public transport sector, which will be implemented from mid-2013 onwards.
- National statistics on energy consumption and industrial production are available, but only at an aggregated level. Detailed data is made available only to the Ministries of Energy and Industry for reasons of confidentiality.
- The ministries traditionally compete for budget and responsibilities.
Group 1

- Template design
- Data Collection
- Data Analysis
- Report Writing
- Validation
- Submission
- 1st ICA

Presidential Decree

National Council Focus Point (Submission to UNFCCC)

Min. Planning

Committee

Energy

Transport

Technical Support consultants
Group 2

- National system in place
- Design protocol
- Collect data
- National Circumstances
- Mitigation actions and their effects
- Domestic MRV approaches
- Support needed and received

Institutional Structure:

- Interministerial Committee
- STC Information Team
- Design and implementation of MRV system
- Agreements, workshops, flexible
- National inventory for mitigation actions

End of 2014
Group 4

- Establish Not/1 Committee
- Compilation of GHG inventory
- List of Mitigation Actions
- Report on domes: tick MRV Approaches
- Compilation
- QA/QC
- Report on Support
- Approval/ Submission

END 2014

Institutional structure

Nat. committee

Ministry of Environment/Res. Agency

Ministry

Ministry

Agriculture (Agriculture)

Nuclear Industry

Transport Energy Industry
<table>
<thead>
<tr>
<th>21.10.2012, 13:30</th>
<th>Exercise on climate finance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Format:</strong> Work in break-out groups.</td>
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<tr>
<td><strong>Task</strong></td>
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<tr>
<td><strong>Group 1</strong></td>
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</tr>
<tr>
<td>1. What is needed in-country in order to identify and quantify needed climate support?</td>
<td></td>
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<tr>
<td>2. What climate finance tracking is currently in place?</td>
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<tr>
<td><strong>Group 2</strong></td>
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<tr>
<td>3. When to track (commitments, disbursements)?</td>
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<tr>
<td>4. Are systems in place to systematically track inflows from Annex I parties, Global Environment Facility (GEF), Green Climate Fund (GCF) and multilaterals? If not, how can we achieve this?</td>
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<tr>
<td><strong>Group 3</strong></td>
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<tr>
<td>5. How do you ensure consistency between information on inflows and outflows?</td>
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<tr>
<td>6. How can we make data comparable?</td>
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</tr>
</tbody>
</table>
Group 1

1. What is needed in-country in order to identify and quantify needed climate support?
2. What climate finance tracking is currently in place?

- Identify:
  - Public expenditure review
  - Capacity needs assessment
  - Technology needs assessment
  - Financial constraints assessment
  - (National Communication/BUR chapter)
  - Study on mitigative/adaptive potentials
  - Coordination plan
  - Linkages

- Quantify:
  - Plan on LEDS/NAPA
  - Action plans identify activities w/ cost
  - National expenditure report
  - Prioritization depends on national circumstances

- Climate finance tracking
  - National expenditure tagging
  - Institutional arrangement on tracking
  - Mainstreaming of climate financing
  - Indicators on effectiveness of climate support
  - FDI tracking
Group 2

1. When to track (commitments, disbursements)?
2. Are systems in place to systematically track inflows from Annex I parties, Global Environment Facility (GEF), Green Climate Fund (GCF) and multilaterals? If not, how can we achieve this?
Group 3

5. How do you ensure consistency between information on inflows and outflows?
6. How can we make data comparable?

5. How do you ensure consistency between information on inflows and outflows?
   a) Define the scope
      • Need for recognition
   b) Guidelines
      • Who set them
      • UNFCCC
      • Common reporting format
   c) Need for a centralised system to track
   d) One entity
   e) Verification of inflow and outflow
   f) Agreements between public and private entities
   g) Improve/use existing system

6. How can we make data comparable?
   1. Same timeframe
   2. Guidelines needed (indicators)

<table>
<thead>
<tr>
<th>23.10.2012, 13:30</th>
<th>Main findings during the Autumn School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format: Work in break-out groups.</td>
<td></td>
</tr>
<tr>
<td>Task: What were the main findings of this Autumn School for you?</td>
<td></td>
</tr>
</tbody>
</table>
Group 1: Main findings

- Urgency to start acting
- Urgency to create NAMA financing framework
- How to support MRV systems in non-Annex I countries
- Some MRV elements are already set up in the country but have a "name"
- Involvement of all stakeholders!
- Development of a portfolio of NAMAs
- Low-emission Dev't: Plan for developed countries
- MRV of co-benefits (maximize mitigation opportunities)
- Importance of sustainability and ownership of GHG inventory
Group 2: Main findings

- From a Technical Side:
  - Improved knowledge of the situation in developing countries
  - It's difficult and it's important to have MRV!
  - Importance of leadership
  - Improved knowledge on financial schemes

- From a Negotiator Side:
  - Listen more to practitioners
  - Non-participation of capacity builds
  - Use negotiations for bilaterals

- Set up a network:
  - Combining existing tools
  - We know where to start from

- Develop a progress matrix:
  - No tools and back to home

- Start with NW/AP and learn:
  - Establish interministerial DMT
  - Workshop organization

- Replicate workshops at home:
  - Participate in technical training
  - Complement to CGE

- More support for capacity builds
Group 3: Main findings

- Simplification of concept for implementers
  - Need for institutional arrangements for MRV
- Assigning responsibilities for MRV to institutions & policies
- Urgency of BUR
  - Short timeline
- Using existing reports as basis for BUR
- Tracking, get support, credibility
  - Need to demonstrate continuity of projects - clear steps/benefits
- Ownership
  - In our interest, assessment of domestic policies, efficiency, co-handled
  - Build on current institutional arrangements
- Start now with what you have
- Networking from Partnership
  - Wider participation - major emitters, major economies
  - Move forward in tech cooperation, guidelines/best practices
Annex III - Participant list

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Surname</th>
<th>First Name</th>
<th>Institution</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ms</td>
<td>BARBA PATINO</td>
<td>Diana</td>
<td>Ministry of Environment and Sustainable Development</td>
<td>Colombia</td>
</tr>
<tr>
<td>3.</td>
<td>Mr</td>
<td>DEMBELE</td>
<td>Boubacar Sidiki</td>
<td>Environment and Sustainable Development Agency</td>
<td>Mali</td>
</tr>
<tr>
<td>4.</td>
<td>Dr</td>
<td>EMMANOCH</td>
<td>Woranuch</td>
<td>ONEP (Office of Natural Resources and Environmental Policy and Planning)</td>
<td>Thailand</td>
</tr>
<tr>
<td>5.</td>
<td>Ms</td>
<td>GAN</td>
<td>Ann</td>
<td>National Climate Change Secretariat</td>
<td>Singapore</td>
</tr>
<tr>
<td>6.</td>
<td>Mr</td>
<td>HELMY</td>
<td>Farhan</td>
<td>National Council on Climate Change, Indonesia</td>
<td>Indonesia</td>
</tr>
<tr>
<td></td>
<td>Ms</td>
<td>KAI</td>
<td>Lea</td>
<td>Ministry of Environment, Climate Change Programme</td>
<td>Lebanon</td>
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<tr>
<td>8.</td>
<td>Mr</td>
<td>KAMINAGA</td>
<td>Kaminaga</td>
<td>Office of Environmental Planning and Policy Coordination, Office of the President</td>
<td>Marshall Islands</td>
</tr>
<tr>
<td>9.</td>
<td>Ms</td>
<td>LEE</td>
<td>Eun Hee</td>
<td>Greenhouse Gas Inventory and Research Center of Korea (Ministry of Environment)</td>
<td>South Korea</td>
</tr>
<tr>
<td>10.</td>
<td>Ms</td>
<td>LIHIDHEB</td>
<td>Kawther</td>
<td>National Agency for Energy Conservation (ANME)</td>
<td>Tunisia</td>
</tr>
<tr>
<td>11.</td>
<td>Ms</td>
<td>LÓPEZ SOLANA</td>
<td>Fátima</td>
<td>Ministry for Environment and Natural Resources (SEMARNAT)</td>
<td>Mexico</td>
</tr>
<tr>
<td>12.</td>
<td>Ms</td>
<td>MAGER SANTOS</td>
<td>Jenny</td>
<td>Climate Change Office, Ministry of Environment</td>
<td>Chile</td>
</tr>
<tr>
<td>13.</td>
<td>Mr</td>
<td>MANTLANA</td>
<td>Brian</td>
<td>Department of Environmental Affairs</td>
<td>South Africa</td>
</tr>
<tr>
<td>14.</td>
<td>Ms</td>
<td>MEIDAV</td>
<td>Neta</td>
<td>Department of Energy &amp; Climate Change (DECC)</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>15.</td>
<td>Mr</td>
<td>MOISÉS ÁLVAREZ</td>
<td>Julio</td>
<td>National Council for Climate Change and CDM</td>
<td>Dominican Republic</td>
</tr>
<tr>
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<td>Gender</td>
<td>Name</td>
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<tr>
<td>16.</td>
<td>Mr</td>
<td>PHAM Nam Hung</td>
<td></td>
<td>Ministry of Natural Resources and Environment</td>
<td>Viet Nam</td>
</tr>
<tr>
<td>17.</td>
<td>Ms</td>
<td>PHUA Lee Choon</td>
<td></td>
<td>Ministry of the Environment and Water Resources</td>
<td>Singapore</td>
</tr>
<tr>
<td>18.</td>
<td>Mr</td>
<td>PROAKTOR Gil</td>
<td></td>
<td>Ministry of Environmental Protection</td>
<td>Israel</td>
</tr>
<tr>
<td>19.</td>
<td>Mr</td>
<td>RODRIGUES MENDES Mario Henrique</td>
<td></td>
<td>Ministry of Environment</td>
<td>Brazil</td>
</tr>
<tr>
<td>20.</td>
<td>Ms</td>
<td>RODRIGUEZ TAYLOR Camila</td>
<td></td>
<td>Climate Change Unit, Ministry of Environment and Sustainable Development</td>
<td>Argentina</td>
</tr>
<tr>
<td>21.</td>
<td>Ms</td>
<td>SESO Rachael</td>
<td></td>
<td>Climate Change Commission</td>
<td>Philippines</td>
</tr>
<tr>
<td>22.</td>
<td>Mr</td>
<td>TSCUMI CANOSA Xavier</td>
<td></td>
<td>Swiss Federal Office for the Environment</td>
<td>Switzerland</td>
</tr>
<tr>
<td>23.</td>
<td>Mr</td>
<td>TUTU Daniel</td>
<td></td>
<td>Energy Resources and Climate Change Unit, Environmental Protection Agency</td>
<td>Ghana</td>
</tr>
<tr>
<td>24.</td>
<td>Mr</td>
<td>URENA Angel</td>
<td></td>
<td>Panama Canal Authority</td>
<td>Panama</td>
</tr>
<tr>
<td>No.</td>
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