Ministerio del Medio Ambiente
Gobierno de Chile

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Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

REPORT OF FIRST CAPACITY BUILDING MISSION IN CHILE

GIZ-BMUB Project "Information Matters": Capacity Building for Ambitious Reporting and Facilitation of International Mutual Learning through Peer-to-Peer Exchange

Santiago, May 26th to 30th, 2014




Sponsor:
Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)

Organizer:
Deutsche Gesellschaft für international Zusammenarbeit (GIZ)

Co-organizer:
Climate Change Office of the Chilean Ministry for Environment (OCC-MMA)

Information Matters
Transparency through Reporting

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TABLE OF CONTENTS

TABLE OF FIGURES

INDEX OF TABLES

Ministerio del Medio Ambiente
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ABBREVIATIONS AND ACRONYMS USED

AFOLU	Agriculture, Forestry and Other Land Uses
BMUB	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (Federal Ministry for the Environment, Nature Conservation, Building and Nature Safety of Germany)
BUR	Biennial Update Report
CER	Centro de Energías Renovables (Center for Renewable Energy)
CONAF	National Forestry Corporation
CPL	Consejo de Producción Limpia (Clean Production Council)
CPA	Acuerdo de Producción Limpia (Clean Production Agreement)
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIZ	Deutsche Gesellschaft für international Zusammenarbeit (German Society for International Cooperation)
FAO	Food and Agriculture Organization of the United Nations
BUR	Informe Bienal de Actualización (Biennial Update Report)
ICI	International Climate Initiative
IM	Information Matters
INE	Instituto Nacional de Estadísticas (National Statistics Institute)
INFOR	Instituto Forestal (Forestry Institute)
INGEI	Inventario de Gases de Efecto Invernadero (Greenhouse Gases Inventory)
INIA	Instituto de Investigaciones Agropecuarias (Institute for Agricultural Research)
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product use
ISGEI	Inventario sectorial de gases de Efecto invernadero (Sectorial Inventory of Greenhouse Gases)
LTO	Landing and Take Off
MINAGRI	Ministerio de Agricultura (Ministry of Agriculture)
MINENERGIA	Ministerio de Energía (Ministry of Energy)
MMA	Ministerio del Ambiente (Ministry of Environment)
MRV	Measurement, reporting and verification
NAMA	Nationally Appropiate Mitigation Action
NCRE	Non-Conventional Renewable Energies
OCC	Oficina de Cambio Climático (Climate Change Office)
ODEPA	Oficina de Estudios y Políticas Agrarias (Agricultural Studies and Policies Office)
ODS	Ozone Depleting Substances
QA/QC	Quality Assurance / Quality Control

REDLA-INGEI	Red Latinoamericana de Inventarios Nacionales de GEI (Latin American Network of National GHG Inventories)
SAG	Servicio Agrícola y Ganadero (Agricultural and Livestock Service)
SNICHILE	Sistema Nacional de Inventarios de GEI de Chie (National GHG-Inventory System of Chile)
UNFCCC	United Nations Framework Convention on Climate Change
ZLEV	Zero Level Emission Vehicle

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SUMMARY

From May 26th to May 30th, the Deutsche Gesellschaft für international Zusammenarbeit (GIZ), alongside its sub-contractor, the British consulting agency Ricardo-AEA, carried out in Santiago, Chile, the first capacity building mission under the framework of the Information Matters Project. This project, which is sponsored by the International Climate Initiative (ICI) of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) of Germany, is also being developed in Ghana, the Philippines and the Dominican Republic. Its primary goal is to strengthen the national capacities to allow nations to provide accurate and high-quality information to the United Nations Framework Convention on Climate Change (UNFCCC). In the Chilean case, its counterpart is the Climate Change Office of the Ministry of Environment (OCC-MMA).

This first training workshop in Chile, which took place in the premises of the Ministry of Environment and the Diego de Almagro Hotel in Santiago, was primarily focused on training key players on topics concerning the Measurement, Report and Verification (MRV) of Nationally Appropriate Mitigation Actions (NAMAs) and the MRV of Greenhouse Gas (GHG) Inventories. However, it also addressed, on a less detailed level, topics surrounding MRV of Financial and Technical Support and the preparation of a Biennial Update Report (BUR). In the workshops, presentations regarding the most relevant individual and cross-cutting issues were carried out. There were also activities that allowed the participants to put these topics into practice and, therefore, to fully understand their applicability.

The documentation of the activities executed in this first capacity building mission led to the creation of this report, which has been divided in chapters according to each key training topic: MRV of NAMAs, MRV of GHG Inventories, MRV of Financial and Technical Support and the preparation of a Biennial Update Report.

FIRST CAPACITY BUILDING MISSION OF THE INFORMATION MATTERS PROJECT IN CHILE

1. INTRODUCTION

As commissioned by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and with funding from the International Climate Initiative (ICI), the Deutsche Gesellschaft für internationale Zusammenarbeit(GIZ), through the technical support of the sub-contracted British consultant agency Ricardo-AEA, is providing technical assistance to four countries (Chile, Ghana, the Philippines and the Dominican Republic) through the Information Matters Project. This assistance translates into supporting national governmental institutions in charge of monitoring and reporting relevant climate data; improving the aforementioned processes, as well as elaborating national reports. The primary goal of this project is to strengthen in-country capacities for ambitious reporting to the Secretary of the United Nations Framework Convention on Climate Change (UNFCCC).

Working alongside the counterpart organization, i.e. the Climate Change Office of the Ministry of Environment, the specific needs and priorities of MRV and GHG monitoring systems were identified by conducting a gap analysis in January of 2014. It is expected that these gaps will be bridged by participating in tailored in-country activities and workshops created for capacity building. Moreover, it is also expected that the peer-to-peer exchange and learning from past experiences will support this process. Throughout these training and capacity-building workshops, the partner countries should be able to define procedures, methodologies and responsibilities in order to institutionalize their reporting system with special focus on the requirements for reporting national-level mitigation-related information to the UNFCCC.

From May 26th to May 30th of 2014, the first capacity building mission was held in Chile by the BMUB-GIZ “Information Matters” Project. The key topics addressed were the MRV of NAMAs and the MRV of GHG Inventories; nevertheless, other themes addressed, but on a briefer and less detailed note, were the MRV of Financial and Technical Support and the production of the Biennial Update Report. Table 1 shows the activities scheduled for the first capacity building mission in the country. Later on, in the next chapters, a connection between the activities is presented and the appendix displays the list of participants.

Those in charge of registering and keeping track of every scheduled activity during the capacity building mission were Paulina González M. and Pablo Perry C., both Renewable Natural Resources Engineers of the Agriculture and Environment Center (AGRIMED) of the Universidad de Chile.

Table 1. *Agenda of first capacity building mission in Chile, "Information Matters" Project (from May 26th to May 30th).*

	MONDAY, 26.05.2014	TUESDAY, 27.05.2014	WEDNESDAY, 28.05.2014	THURSDAY, 29.05.2014	FRIDAY, 30.05.2014
9:30		**Workshop "MRV of Nationally Appropriate Mitigation Action (NAMAs)"** *Location: Diego de Almagro Hotel (Alameda 1485, Santiago)*	**Workshop "MRV of emissions" (addressing cross-cutting themes: gathering and generating activity, paperwork and files data, uncertainty.** *Location: Diego de Almagro Hotel (Alameda 1485, Santiago)*	**Consolidation of conclusion and future actions** *Location: GIZ (Federico Froebel 1776-1778, Providencia)*	**Practical exercise to create BUR templates** *Location: Ministry of Environment (San Martín 73, 8th floor, Santiago)*
10:30	**Reception at the CCO-Ministry of Environment. Coordination of activities to develop during the week. Discussion on remote backstopping so far** *Location: Ministry of Environment (San Martín 73, 8th floor, Santiago)*				
11:30					
12:30				**Meeting at ECLAC, to address "Green Cost")**	
14:30	**Workshop "MRV of Nationally Appropriate Mitigation Action (NAMAs)"** *Location: Diego de Almagro Hotel (Alameda 1485, Santiago)*	**Workshop "MRV of emissions" SNICHILE meeting** *Location: Diego de Almagro Hotel (Alameda 1485, Santiago)*	**Workshop "MRV of emissions"** *Location: Diego de Almagro Hotel (Alameda 1485, Santiago)*	**Bilateral meetings for NAMA discussion: CER, Green Zone and INIA** *Lugar: Ministerio del Medio Ambiente (San Martín 73 piso 8, Stgo)*	**Final meeting for presentation and discussion of conclusions and future plan of action** *Location: Ministry of Environment (San Martín 73, 8th floor, Santiago)*
15:30					
16:30					
17:30					

2. ACTIVITIES

2.1 KICK-OFF COORDINATION ACTIVITY

Activity 1: Kick-off Coordination Meeting

Date: Monday, May 26th (morning)

Location: Ministry of Environment

Objectives:
(1) To coordinate activities to develop during the first capacity building mission.
(2) To check the timetable for these activities.
(3) To discuss the progress of remote backstopping, starting from the launch of the Project in Chile.

Development of the activity:
The meeting was attended by professionals from the Climate Change Office of the Ministry of Environment (OCC-MMA) and from the GIZ, from both Chile and Germany, as well as by members of the consulting agency Ricardo-AEA, which is the project subcontractor in charge of developing every training activity for "Information Matters".

After introducing the participants, the Focal Point of the project in Chile, Sergio González, explained the list of activities scheduled for each day (see Table 1) and also the primary objectives for every activity.

Afterwards, the consulting agency Ricardo-AEA, represented by Sina Wartmann, presented their activity program with the specific themes to be addressed on each training session. The discussion of the program with the participants allowed underlining or modifying certain aspects, such as the need for training about concepts related to transformational changes and co-benefits, as well as defining a concept of non-GHG-related impacts.

Apart from coordinating the plan of action for the capacity building mission, the progress of the remote backstopping[1] activities so far was discussed. A summary of the activities programmed for the second semester was also elaborated.

During the discussion, a meeting with the recently designated responsible for climate change issues of the Ministry of Finance was suggested. Until now, there has not been any established protocol contact between the Climate Change Office of the Ministry of Environment (OCC-MMA) and this official; although this meeting should take place in June.

Lastly, the person in charge of Mitigation from the OCC-MMA, Jenny Mager, made a brief presentation about what was agreed for the BUR, defining each chapter included in this report. These chapters are the following: National Situation, GHG Inventory, Mitigation, Funding and Capacity Building. Later on, the discussion focused on different approaches to be developed during the scheduled meeting on May 30th; these included the possible creation of templates for each BUR chapter.

[1] Referred to the support through remote action provided by Ricardo AEA, before, between and after the training missions developed in the country.

2.2 ACTIVITIES RELATED TO MRV OF NATIONALLY APPROPIATE MITIGATION ACTION (NAMAS)

Activity 2: NAMA Indicators

Date: Monday, May 26th (afternoon).

Location: Diego de Almagro Hotel, Santiago.

Objectives:

(1) To create a common understanding about the indicator concept in order to facilitate the MRV of NAMAs process.
(2) To generate solid information basis for the mapping of a NAMA's impact chain[2].
(3) To define and classify indicators that allow to monitor the accomplishment of an objective.

Picture 1. *NAMAs indicators workshop.*

Development of the activity:

After introducing the participants, the training session started with a review of their expectations. Once the activity was over, Sina Wartmann made her first presentation in order to explain to the participants the concept of NAMA indicators. In this presentation, Ms Wartmann described the challenges posed by the MRV of NAMAs, gave solid information to map the NAMA impact chain and defined the concept of indicators and their requirements; she also gave two examples regarding the use of indicators for the UK and Wales Carbon Budget. The contents of this presentation can be summarized as follows:

- **Challenges for the MRV of NAMAs:** the major difficulty of the MRV of NAMAs is that this is a complicated process that tries to identify changes; however, often these changes can be caused by non-NAMA-related factors. A NAMA is ultimately a political measure with a wide range of results that can cause both wanted and unwanted impacts. Another important challenge in the process is the difficulty of calculating accurate emission reduction values for a NAMA, since there is always a high level of uncertainty and, therefore, it is not easy to know if a specific NAMA has actually made a change or if this change has been provoked by the impact of other political actions or socioeconomic changes.

[2] Sequence of impacts that results from an applied action.

- **Impact Chain Mapping:** due to the array of factors that interact in a NAMA, a task that streamlines the MRV process is the mapping of the impact chain. It consists in identifying the direct, indirect, wanted and unwanted impacts in both the short and the long term. These impacts may result from implementing one or several NAMAs (See **Fehler! Verweisquelle konnte nicht gefunden werden.**).

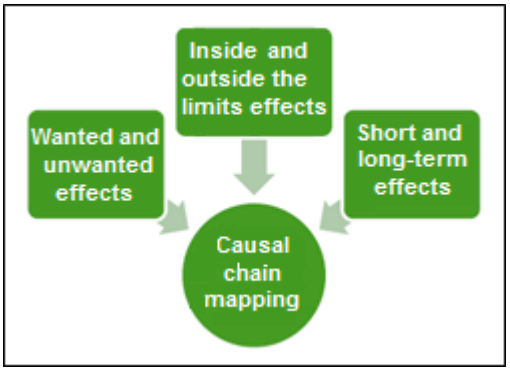


Figure 1. *Factors in the impact chain mapping.*

- **Indicators:** indicators serve as a way to show every successful objective, in order to quantify the possible impacts of a NAMA. The selected indicators must be significant so as to evaluate what we really want to measure and, for that matter; they must be defined using the SMART criteria (See Table 2)

Table 2. *SMART concept.*

The "SMART" concept	
S	Specific
M	Measurable
A	Achievable
R	Relevant
T	Time –bound

There is a hierarchy of mitigation indicators. They are, in increasing order, the following:

- Input: low strategic level; little processed and short-term indicators (from few months up to a year). These indicators could be the budget, technology, capacities, etc. (E.g. money spent on a given task).
- Activity: medium strategic level, moderately processed and short-term indicators (from 1 to 3 years). These indicators correspond to the activities carried out during the project, such as training, construction, investment in technology, etc. (e.g.: MW of renewable electricity produced).

- Output: medium strategic level; moderately processed and short to medium-term indicators (from 1 to 5 years). Indicators used to measure intermediate impacts, such as having a larger renewable energy production. (e.g.: number of households with higher energy efficiency).
- Outcome: high strategic level; highly processed and long-term-goals indicators (from three to twenty years or more). These indicators correspond to high level impact, such as becoming potential sustainable economies with low emission rates. (e.g.: limited or zero increase of emissions as a result of economic development).

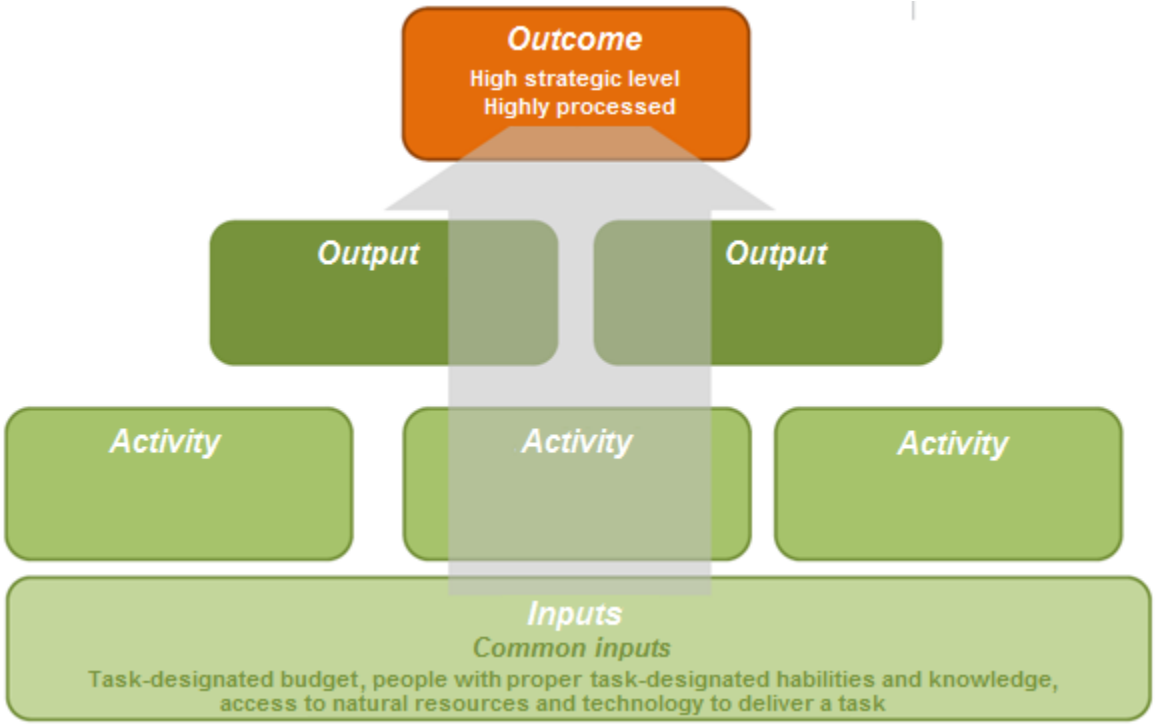


Figure 2. *Hierarchy and flow of mitigation indicators.*

Exercises on Impact Chain

The first exercise focused on applying the newly acquired knowledge about the impact chain. The participants were divided into two groups. The first one addressed the Clean Production Council NAMA (CPL) and the other one addressed the Green Zone NAMA[3]. The goal of the exercise was to identify, in 30 minutes, the impact chain of each NAMA in order to determine the short, medium and long-term impacts, as well as to determine which impacts would require evaluation indicators. Once they finished, each group had 5 minutes to present their results.

1. Green Zone NAMA

[3] The CPL - NAMA is already in implementation, while the NAMA Green Zone is currently under preparation

The first step was to identify the primary objective of the NAMA, which was to reduce the GHG emissions in a central area of Santiago city. Afterwards, it was agreed that the scope of the exercise should be narrowed down, since the Green Zone NAMA is formed by four components: light vehicles (cabs and municipal vehicles), urban transport (Transantiago), non-motorized transport (pedestrians and bicycles) and management/promotion of all transportation systems in the historic district; and each and every one of them may have its own impact chain. Given the limited time, only one of the components was analyzed.

The component selected was the technological improvement, associated to the implementation of electric cabs and the technological improvement of buses. Three direct impacts were identified: 1) the increase of ZLEV vehicles, 2) changes in the road infrastructure for new technology implementation and 3) a larger initial investment cost. **Fehler! Verweisquelle konnte nicht gefunden werden.** shows the impact chain created by the Green Zone NAMA team.

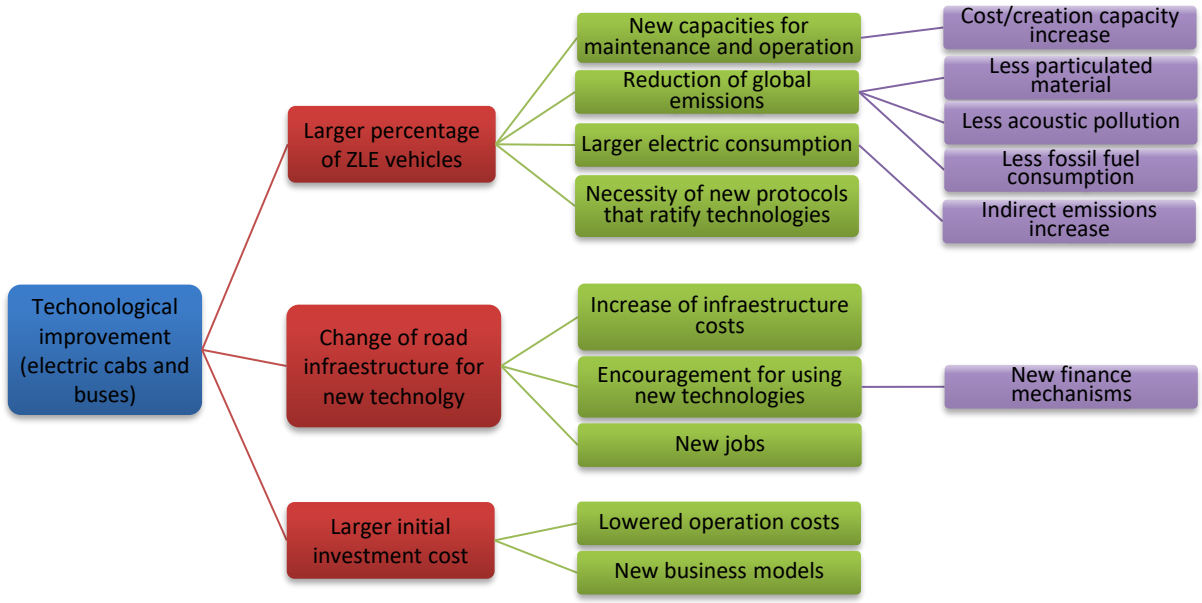


Figure 3. *Impact Chain of the Green Zone NAMA.*

As the figure above shows, the team identified four impacts that may result from the increase of ZLE vehicles. Since it is a brand new technology for the country, this would create the need for new capacities, in both maintenance and operation. At the same time, the use of these vehicles would favor the reduction of global GHG emissions, which would be the most desired impact of this NAMA. This would also entail a series of co-benefits (such as lower emission rates of particulate material, lower noise pollution and lower fossil fuel consumption). Another expected impact is an increased electricity consumption which is an unwanted impact that leads to the potential increase of indirect

emissions. Another mentioned impact would be the need to establish new protocols that would ratify these new technologies on a ministerial level.
Regarding road infrastructure, there would be an increase in the infrastructure investment costs, the public would feel encouraged to use these new technologies and, moreover, it would create new jobs, since there would be a higher demand for capacities associated to these technologies.

Despite the fact that the implementation of these measures would result into larger initial investment costs, the expenses related to the maintenance of electric vehicles would be considerably lower than the current cost of conventional vehicles. This would also contribute to the creation of new business models, since the idea of incorporating this new technology into other services would become more and more attractive.

2. CPL NAMA

The incorporation of Clean Production Agreements (CPA) into the industry allows the inclusion of a more sustainable management to their processes. This has led many institutions signing a CPA, to invest in such a way that improves their own production management. This entails a variety of positive and/or negative impacts. Thanks to this discussion, a causal chain presented in Figure 4 was created**.**

Investments and the incorporation of management into the processes improve resource efficiency. If we add a solid waste management and implement good agricultural practices, the result is a reduction of GHG emissions, which proves the effectiveness of this NAMA. Taking into account the implicit fulfillment of the existing regulations, staff training, air and water quality improvement and diverting waste from illegal landfills to solid waste treatment plants, the result is a stimulation of local development, facilitating the access to more demanding markets in terms of social-environmental measures, and to improve the corporate image of the industry that, ultimately, may increase its production and therefore its revenues. This last aspect may cause a potential increase of GHG emissions, which is to be considered as a negative consequence when quantifying the complete NAMA system. Uncertainty is another ever present factor that deserves attention.

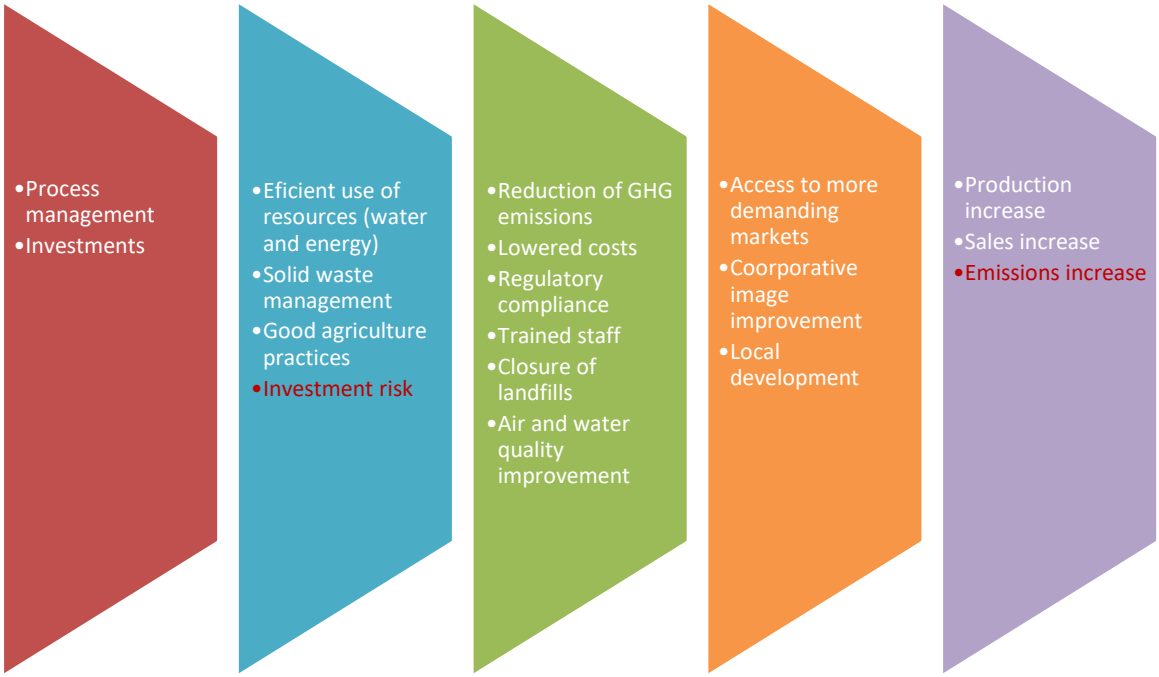


Figure 4. *Impact Chain of CPL NAMA.*

Activity 3: Baselines for Indicators

Date: Monday, May 26th (afternoon).

Location: Diego de Almagro Hotel, Santiago.

Objectives:

(1) To create a common understanding about the concept of baselines in order to facilitate the MRV of NAMAs process.
(2) To distinguish the different complexity levels for each baseline.

***Picture 2**. Training workshop on indicator baselines*

Development of the activity:

Sina Wartmann made a presentation about NAMA indicator baselines and explained that a baseline is basically a combination of assumptions and data that represent the most probable development without adaptation measures or policies (See Figure 5).

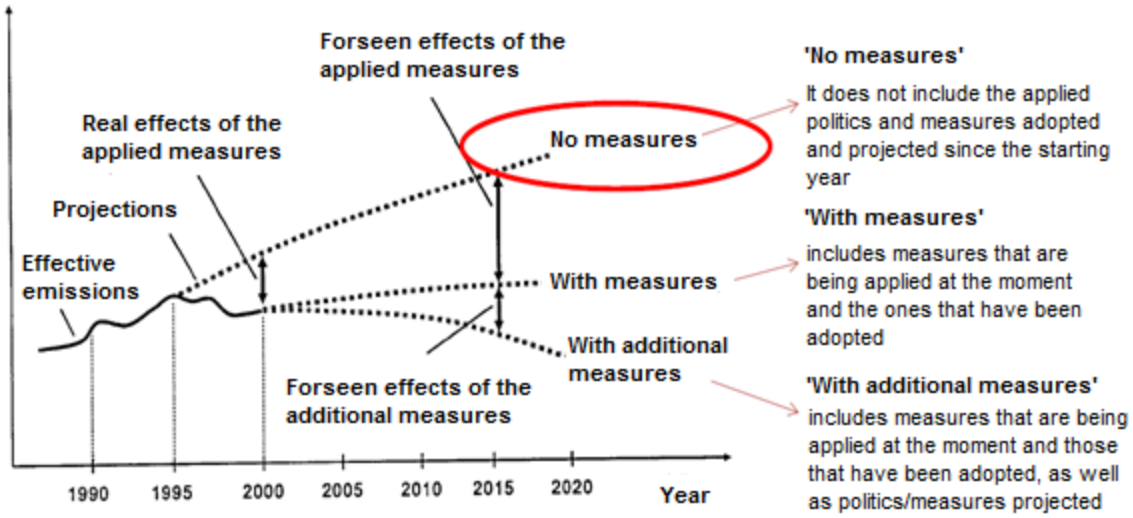


***Figure 5.** Baseline projection.*

The level of complexity of a baseline will depend on the available information, technological improvements and growth projections of the activity, which allows the possibility to classify them into three different levels (See Table 3).

Table 3. *Complexity levels of a baseline.*

Degree / Level	Activity data	Emission factors
1	• Projection studies at a national level • Assumption that activity rate will remain unchanged	• The same FE used in the last inventory could be used FE level 1
2	• Projection studies at a national level • As an alternative, generic growth factors or proxies to project activity rates	• FE must show the technological evolution of the ones independently produced and also the ones originated from policies and measures -> levels 2 or 3 for emission factors
3	• Activity data that should be projected following a sophisticated model and in a transparent, comparable, consistent and complete way.	• FE must show the technological evolution of the ones independently produced and also the ones originated from policies and measures -> levels 2 or 3 for emission factors

Exercise on indicators and baselines

A group activity was carried out. The same groups from the previous impact chain activity picked two chain indicators and discussed the most relevant factors to create a baseline, as well as potential assumptions and information sources for the task at hand. Pictures 6 and 7 show both teams in action.

1. Green Zone NAMA

The indicators chosen by the Green Zone NAMA were the number of vehicles incorporated and energy consumption per sector.

- Energy consumption per sector:
  - Factors: these include Gross Domestic Product (GDP), Gas prices and both national and international political variables.
  - Assumptions: it was determined that, for this indicator, no assumptions would be needed.
  - Information sources: The National Energy Balance and the Emissions Inventory of the Minsitry of Energy were selected as primary information sources.

- Number of vehicles incorporated:
  - Factors: the factors or drivers would be the same as in the previous indicator (GDP, gas prices and political variables) but also technology price was considered as the fourth factor.
  - Assumptions: there are two possible assumptions for this indicator: anual mileage per vehicle and their performance.
  - Information sources: the information sources were the national car licence records, the sales register of the National Automotive Industry of Chile (ANAC), the bus and taxis database of the Ministry of Transport and Telecommunication (MTT), the Vehicle Inspection Plants (PRV),

the Urban Public Transport Board (DTPM) and the Vehicle Regulation and Certification Center (3CV).

2. CPL NAMA

The indicators selected were energy consumption (KwH) and waste mass (t), both per product unit.

- Energy consumption:
  - Factors: as a result of the discussion of the group, the indicator-related variables obtained were available technology, consumption habits, energy prices and employment rates.
  - Sources: the employment rate data could be obtained from an average of previous year records or it can be provided by trade associations. The energy price can be measured using projections from either the Ministry of Energy or existing international projections. Lastly, the data for available technology can be obtained from international and national studies or it could be provided by trade associations.

- Waste mass (t):
  - Factors: the related variables to these indicators are the disposal cost, the recycling rates, the available technology and the population habits.
  - Sources: the data for the disposal costs and recycling rates can be obtained from national goals and projections, while the most suitable option to retrieve data for available technology are the trade associations.

Activity 4: Non-GHG-related Impacts of NAMAs

Date: Tuesday, May 27th (morning).

Location: Diego de Almagro Hotel, Santiago.

Objectives:

(1) To establish technical definitions of key concepts related to non-GHG-related impacts.

(2) To establish a relationship between transformational changes, sustainable development and climate change mitigation actions.

Picture 3. *Non-GHG-related impacts workshop.*

Development of the activity:

The activity started with a presentation of Ricardo-AEA's consultant, Sina Wartmann, in which she explained the key concepts regarding non-GHG-related impacts, which are listed below:

- Co-benefits of NAMA are defined as the additional benefits, apart from GHG emissions reduction, which is ultimately the main goal of a NAMA.

- Transformational changes are long-term changes in society within a sustainability framework. These can be portrayed as a pyramid (See **Fehler! Verweisquelle konnte nicht gefunden werden.**), where each project serves as the base, while the transformational changes are at the top. All of these changes relate to each other, so that they can be permanent and also have solid foundation.

- Finally, the concept of sustainable development was presented, which is defined as the commitment that societies make towards the future generations, their commitment of preserving the environment and of becoming a strong, clean and fair society.

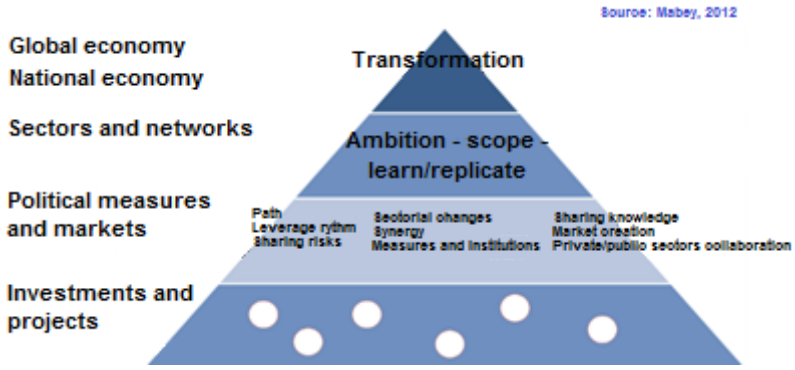


Figure 6. *Pyramidal structure of transformational changes.*

Exercise on Concept Development

This exercise focused on discussing the relationship between the previously presented concepts (sustainable development, transformational changes, co-benefits and climate change mitigation) and how they can be applied to the MRV of NAMAs in Chile. This time, the consulting agency Ricardo-AEA was in charge of dividing the groups. The key aspects of this discussion are presented below.

1. Working Group 1

Everyone agreed that the concept of sustainable development is too general and that it has a rather holistic nature; that not only centers on climate change, but also on each core aspect of national and international development. The concept of transformational changes serves as a global approach that not only relates to climate change. However, mitigation is a much more specific concept and it is actually a part of the climate change question. Lastly, co-benefits are a specific concept, since they result from particular activities related to climate change mitigation.

These concepts overlap in a non-lineal way, in which all concepts (mitigation, co-benefits and transformational changes) interact retroactively. When mitigation actions are developed, both economic and environmental co-benefits emerge. This also leads to transformational changes; nevertheless, this does not always happen in the same order nor there is always a feedback among them.

The concepts deemed as the most important for MRV development in Chile are the creation of co-benefits and to keep track of CO_2 emission reductions. However, it is certainly going to depend on the NAMA and the context, since some co-benefits are cross-cutting and others are also NAMA-specific. It is relevant to consider the current national interests, as well.

2. Working Group 2

The Group described the concepts as in a cycle that goes from the most specific aspects (mitigation) to the most global ones (sustainable development). Mitigation would be the first leading factor in a hypothetical NAMA, from which co-benefits result and then generate transformational changes; which would set the country on the track towards sustainable development.

For the MRV of NAMAs, the Group decided that the most relevant concept are transformational changes, since this is one of the most specific concepts and the most easi to define, plus it helps to reach the objectives behind a NAMA's implementation. Therefore, it is crucial to clearly define the expected transformational changes when designing a NAMA; as they basically are the objectives that should be reached. The importance of designing indicators in order to measure, report and verify the transformational changes was also mentioned, as well as the relevance of making sure that the course of the original task does not divert.

3. Working Group 3

The group started the discussion by identifying the potential overlaps and differences among the concepts of sustainable development, transformational changes and co-benefits. Furthermore, it was clarified that both sustainable development and transformational changes are long-term goals and require a strategy that turns them into a NAMA's primary goals.

Among the addressed differences, the group stated that co-benefits are quantitative, while sustainable development is a qualitative aspect; both areas, however, will always have a positive connotation, unlike transformational changes, that may be negative in some cases. In fact, transformational changes could represent a limiting factor for a NAMA's success.

Regarding the most important concepts for NAMA development in Chile, the group concluded that they depend on the NAMA's objective, unlike sustainable development, which is a cross-cutting goal. Moreover, the discussion focused on the importance of identifying a NAMA's co-benefits and eventual non-GHG-related impacts at an inter-ministerial level and also between sectors. This aspect is relevant, because the wider the outreach of a NAMA is, the more support its mitigation proposal will obtain.

Exercise on indicators for non-GHG-related impacts

The second exercise was carried out after presenting a series of indicators and MRV of non-GHG-related impacts and consisted in picking two of the impacts from the Green Zone and CPL NAMAs impact chain in order to identify indicators and evaluate in what way NAMAs contribute to non-GHG-related impacts. The next step was a discussion about the most important factors of each indicator in order to establish a baseline and to determine the assumptions for their further development and the sources of information needed. Pictures 12 and 13 show both Green Zone and CPL NAMA teams respectively.

1. Green Zone NAMA:

For this exercise a group working with the Green Zone NAMA's MRV picked two medium-term impacts, namely air quality improvement and the creation of an enabling environment that would result from the introduction of a new market, from which the necessary technology for this NAMA's implementation could be obtained (mainly electric cars), and therefore the demand for funding, capacity building, etc. would increase. The list below shows a series of indicators selected for each impact and describes their corresponding factors and possible baselines and information sources:

- Air quality improvement
  - MP/NO_X concentration: the values for this indicator are explained by the meteorological conditions and existing emissions,
  - MP/NO_X emissions: these factors are the activity level and relevant emission factors,
  - Hospital admission rates for ARI (Acute Respiratory Infections): these factors are the number of critical episodes of ARI and the meteorological conditions, particularly temperature.

The general assumptions for determining the baseline are the number of vehicles in the area, number of critical episodes of ARI, extreme conditions due to climate change and emission factors resulting from technological improvement. Among the information sources we can find the Chilean Meteorological Directorate (DMC), the Air Pollution Monitoring Network for the Metropolitan Region (Red MACAM), the GHG National Inventories, the Chilean Ministry for Transport and Telecommunications (MTT), the Chilean Health Ministry (MINSAL), as well as universities and technical colleges.

- Creation of an enabling environment
  - New Jobs: the factors are the increasing demand for services related to ZLEVs and public policies (incentives).
  - New related products and services: the factors are an increase in local demand and public policies.

- Funding for related services and technologies: the factors are financial risk, public policies (incentives) and technological knowledge of the banking system, so that funding can be granted.
- Trained staff: the factors are the implemented public policies, a demand for specialized staff and the number of specialization courses available

The baseline assumptions for this indicator are the possible lack of political measures that incentivize the introduction of electric cars into the market and an increase in technology development driven by a reduction of technological costs. The information sources would be the National Statistics Institute (INE), the Chamber of Commerce of Santiago, the Chilean National Automobile Association (ANAC), the Chilean Superintendency for Banks and Financial Institutions (SBIF), as well as universities and technical colleges.

2. CPL NAMA:

The CPL NAMA team picked out two long-term impacts, namely management culture and the company's corporate image, and also waste management as a medium-term impact. Quantitative factors were prioritized, unless they did not match the selected impacts, in which case qualitative indicators were used (e.g. in the case of corporate image). The different impacts and their indicators are listed below:

- Management culture (capacity to register information):
  - Variation in the number of businesses that keep a register of their activities

- Corporate image:
  - Approval rating: estimated by public opinion measuring methods.
  - Local development: based on the variation in the number of local suppliers and taking the baseline at the beginning of the Clean Production Agreement (CPA) as a reference.

- Waste management:
  - Waste volume
  - Amount of value given to recycling or reusing

The information will be taken from the data collected in the Clean Production Agreements (CPAs). There is no information available for the "approval rating" indicator, so a further study is required for its evaluation.

Activity 5: Bilateral Meeting for Discussion on MRV of NAMAs

Date: Thursday, May 29th (afternoon).

Location: Ministry of Environment, Santiago.

Objectives:

(1) To determine the current state of the ongoing MRV of NAMAs in the country.
(2) To create a space for collaboration among the different stakeholders.

Picture 4. *Bilateral meeting for discussion on MRV of NAMAs.*

Development of the activity:

The aim of this meeting was to analyze the current state of MRV of both ongoing NAMAs and those that are still under planning. For that reason, the discussion was attended by professionals from the ongoing NCRE NAMA (Non-Conventional Renewable Energy NAMA) and from the Green Zone and Agriculture NAMA, which are expected to be implemented in the future.

- **NAMA on Self-Supply NCRE**

  The NAMA of the Center for Renewable Energy (CER) aims to search for projects centered on self-supply non-conventional renewable energies (NCRE) and it targets industrial and commercial activities. So far, the work consists in detecting the technical, financial and diffusion hurdles and to design a program to tackle them and to create a solid foundation for NCRE projects in the country.

  Another issue is the lack of information on private self-supply NCRE projects that currently do not feed electricity into the grid. This is why many projects have not been registered by the MRV of this NAMA.

  Furthermore, the co-benefits bound to this NAMA were determined. One of them is the long-term positioning of NCRE in the industrial and commercial sector as a feasible opportunity and, at the same time, the image improvement experienced by businesses that adopt this sort of technologies.

In order to bridge the diffusion gap, the group envisioned the creation of various technical support platforms for the private sector, including web platforms, tailored consulting and a hot-line, for everyone interested to access detailed information.

- **Green Zone NAMA (under planning)**
  Its goal is to implement a new transit management plan for Santiago's historic city, which is home to the Presidential Palace (Palacio de La Moneda) and several other ministries and historical monuments. It is also the workplace of a large number of people who commute every day from other districts. This plan is being implemented by the Municipality of Santiago in collaboration with the Ministry of Transport and it consists in improving the public transportation system in order to reduce GHG emissions and the promotion of non-motorized vehicle use (bicycles) and pedestrian access by redesigning the space for motorized vehicles.

  One of the main issues for this NAMA is the disconnection among the four components comprising the Green Zone NAMA as each requires a specific MRV. These components include light vehicles (taxis and municipal vehicles), urban bus management (Transantiago), non-motorized vehicles (bicycles and pedestrians) and management/promotion of all transportation systems in the historic district. During the discussion, all of these components were suggested to be included into a single MRV in order to facilitate and streamline the process. This measure would also solve the problem that poses the emissions calculation for this NAMA, since it would allow to focus on the emissions reduction of the entire Green Zone and not on the emissions of each component.

  Another challenge for the MRV of this NAMA lies in the difficulty to obtain the required information, because it is supplied by different public and private institutions. Moreover, the lack of studies on the transportation system's quality and on bicycle use within this historic area poses another challenge and makes it difficult to evaluate the influence of this NAMA in the district.

- **Agriculture NAMA (proposal)**
  Agriculture is a GHG-intensive activity due to the methane and nitrous oxide emissions that come from processes like fertilization, stubble burning and livestock production. Soils are also one of the largest carbon reservoirs, which could be beneficial if they are managed ecologically and the organic carbon level in the soils increases.

  Currently in Chile, the State promotes ecological practices applied to degraded soils by granting money to farmers. Nonetheless, no increase in the organic carbon level has been observed so far and there is a lack of knowledge of the impact that these soil management practices could have on the amount of carbon that can be captured. Since there is a need for backup information in order to create a new NAMA for the agricultural sector, the Chilean Institute for Agricultural Research (INIA) submitted a research project to the research fund INNOVA and

applied for funding. The call for projects closed out in May this year. This possible NAMA could evaluate various agricultural methods in different parts of the country regarding:

- No-till farming,
- Stubble incorporation into the soil, hence preventing stubble burning,
- carbon capture from meadows,
- organic agriculture instead of using hydrocarbon derivatives,
- the National Incentive System for Agricultural Soil Sustainability and its contribution to soil carbon capture.

All of this will allow us to evaluate the benefits and co-benefits of incorporating ecological measures into agricultural activities and practices that preserve the carbon levels in the soil and hence lead to improving the entire biotic and abiotic system.

Finally, an evaluation of the amount of fully recovered soils for permanent use by means of agriculturally sustainable measures and methods was suggested.

2.3 ACTIVITIES RELATED TO MRV OF GHG-INVENTORIES

Activity 6: Third Meeting on the National GHG-Inventory System in Chile (SNICHILE)

Date: Tuesday, May 27th (afternoon).

Location: Diego de Almagro Hotel, Santiago.

Objectives:

(1) To link the third meeting of the National GHG Inventory System (SNICHILE) and the Information Matters Project.

(2) To inform about the progress in terms of inventories.

Picture 5. *SNICHILE meeting.*

Development of the activity:

The third work meeting of the National GHG Inventory System (SNICHILE), directed by the National Coordinator, Paulo Cornejo, took place at the beginning of the workshop on the GHG Inventory on Tuesday, 27th May. The objective of these SNICHILE meetings is to report on the progress and the actions taken so far to meet their commitments. This time, there was an attempt to link this event to the Project. A presentation about the progress of the National Inventory System was carried out for this purpose, addressing the following aspects:

- Current State of the SNICHILE
  The SNICHILE focuses on 5 strategic fields. Each field and its progress are listed below:
  - Updating of the Chilean National GHG Inventory (INGEI): the updating of the National-GHG-Inventory sectors is virtually finished.

  - Capacity Building and Support: A Google group was created to maintain contact and exchange experiences with the Latin American Network of National GHG Inventories (REDLA-INGEI). There is also a FAO online discussion group on agriculture-related emissions. Professionals from the SNICHILE have already reviewed the National GHG Inventory and also Biennial Reports of developed countries (AI-parties) and new Chilean professionals from the SNICHILE have been included in the UNFCCC Roster of Experts.

  - Continuous Improvement System: the emission factors for fossil fuels used in Chile have been updated and, in terms of waste management, there have been modifications in the record of municipal solid waste for the period 1990-2012.

- Institutionalization of the SNICHILE: the main stakeholders that are needed to reach work agreements have been identified (MMA, MINENERGIA, MINAGRI, CONAF, INE and others) and the implementation of those agreements is expected in the short-term

- SNICHILE Diffusion: the website of the Chilean Ministry of Environment has been updated and now incorporates information about the SNICHILE. Brochures explaining the National GHG Inventory and informing about the updates of the National GHG Inventory and the SNICHILE have also been elaborated.

- Preliminary results of the National GHG Inventory 2014: the current organic structure of the SNICHILE was presented via a block diagram, as well as the national inventory team, which is made up of the Climate Change Office of the Environment Ministry and the teams from the Energy, Waste Management, IPPU and AFOLU sectors. The preliminary results of the inventory's update were presented shortly after.

- Expert review of the GHG Inventories for each Sector: the expert review, as a QA process, is destined for the inventories of each sector. The inventories of two sectors have already been reviewed: IPPU and AFOLU. On the one hand, a remote review was carried out for the IPPU sector, but its report is yet to be submitted to Chile. On the other hand, two expert reviewers visited the country and have already presented their report for the AFOLU sector. The general evaluation states that the work done by this sector is of high quality and it highlights the Chilean efforts to report information in a transparent, consistent and meticulous way. The Energy and Waste Management sectors have not been yet reviewed as the final reports of the corresponding GHG Inventories for each of these sectors are still unfinished.

- Next steps:
  - To finish compiling the GHGI by sector and to work on certain critical national aspects, such as uncertainty calculation, timeline consistency, QA/QC development, etc.
  - To elaborate a template for the National GHG Inventory Chapter in the Biennial Update Report (BUP) in order to determine what this chapter should really include.
  - To complete the template with the information from the inventory by sector.
  - Expert review of the National GHG Inventory Chapter by RICARDO-AEA.
  - To include Chilean professionals from the SNICHILE in the UNFCCC Roster of Experts, namely Marta Alfaro from the Chilean Institute for Agricultural Research (INIA), Carlos Bahamondez and Yasna Rojas from the Forestry Institute (INFOR), who will soon be able to participate on the Inventory Review Training for Annex I to the Convention (2nd half of the year).
  - To consolidate the Latin American Network of National GHG Inventories (REDLA-NGEI).
  - To launch an online SNICHILE platform that provides general and statistical information.
  - To carry out training workshops and workshops at a national level to inform about the results. One of them in Santiago and other two in some other regions.
  - To elaborate an executive summary for National GHG Inventory and Inventories by Sector.

A complete list of items presented by the speaker during this meeting is given in the appendix..

Activity 7: Cross-cutting Issues of the GHG Inventory and Data Availability

Date: Wednesday, May 28th (morning).

Location: Diego de Almagro Hotel, Santiago.

Objectives:

(1) To train the different parties on cross-cutting issues of the GHG Inventories.
(2) To provide training on management of the available data.

Picture 6. *Workshop on cross-cutting issues of the GHG Inventory*

Development of the activity:

The first activity on Wednesday, 28th May was Sina Wartmann's presentation about cross-cutting issues of GHG Inventories and data availability. The main contents of this presentation were key recommendations for data use, data gathering (taking the UK Inventory as an example) and the challenge posed by the lack of data.

The first cross-cutting issues presented addressed the fact that every country working on an inventory must face the challenge of data availability, but at the same time they must ensure that the available data is adequate, has a good quality and a low uncertainty level. Getting the most out of the available data is key and all countries should start an inventory, even though their data is not adequate yet, because they can improve the information quality in time.

A model of data collection in the UK was presented afterwards. This is a very complete model and has gathered information from more than 80 organizations. The most important sources of data for this country are national statistics, but they also use data from research and national studies, for example from the agriculture and forestry sectors, as well as data from companies, especially from the energy and industrial sectors. In some cases they use the default emission factors from the IPCC. Very efficient and well preferred tools are the so-called Data Supply Agreements, which allow the continuous and systematic data obtaining from many companies, for example from the energy and industrial sectors. During the final part, the main data sources for the UK were presented, along with some examples of data challenges and their corresponding solutions, so as to set an example for the Chilean experts.

At the presentation, some recommendations were offered to bridge the information gap or to overcome barriers like the obtaining of data that companies consider "confidential". These recommendations would be, in chronological order: a systematic review of all available data so as to define all existing gaps and to determine who may provide the missing information, to create a group with key data suppliers, to sign Data Supply Agreements with key data suppliers in which they describe what kind of information they will share and when, and finally to enter the data in such a way that emission from individual companies are not differentiated, as in the case of commercial companies that would rather keep their data confidential. This is a way to reach a more transparent calculation and, at the same time, to report emission data while still respecting the confidentiality that many companies demand.

At the end, some methods were presented to fill the gaps left by missing information for certain years in a series of records. These methods, which are present in the 2006 IPCC guidelines for national GHG inventories are listed below:

- Superposition: applicable when we want to use a time record as the base to fill in the missing data from another incomplete record and both data are related in a stable and consistent way (a more or less linear relationship).

- Substitute data: applicable if we lack data from a certain activity, but we have other related data that can replace it somehow (e.g. a vehicle's mileage can be used to estimate transport emissions).

- Interpolation: when you get an incomplete series of data, but there is a clear trend, this method can be used to complete the time record with a simple linear interpolation.

- Trend extrapolation: this approach is used when we want to complete data for coming years based on a clear trend that should remain over time. It is applicable when the trend is consistent and not irregular. It is not recommended for longer time periods, because otherwise the uncertainty increases.

Exercise on the difficulty of data collection

To close the workshop on data availability, a practical exercise was carried out. The attendants were divided into groups according to their sector, namely Waste Management, Energy and Industrial Processes, and AFOLU. There were also groups of "data doctors", made up by (1) Jenny Mager and Oscar Zarzo and (2) Sergio González and Sina Wartmann, who were supposed to assist each group. Each team had 15 minutes to create a list of the 5 types of missing or low quality data that needed improvement. Once the time was up, each team was assisted by the "doctors" and they discussed about the most suitable way to complete the missing data or to bridge the information gaps. For this stage there were two rounds of 15 minutes for each for the "doctors" to consult every working

team. In the end, each group got 5 minutes to present the results to their peers. The most relevant findings and the doctor's recommendations are listed below:

1. Waste Management, IPPU and Energy

- The Waste Management group identified key obstacles when collecting information. On the one hand, the data for landfill site emissions is insufficient and on the other hand, the IPCC emission factors for waste water do not represent the national reality.

  The "doctors" recommended working on the medium-term regulatory enforcement, so that regular landfills are transformed into sanitary landfills. They also should work on municipal staff training, as well as provide training for medium-term information suppliers and finally, that they work on the development of national specific emission factors.

- The Energy group recognized the need for an improvement in the "copper sector", due to a series of inconsistencies between the data reported by the Chilean Copper Commission (COCHILCO) and the National Energy Evaluation (BNE). Another issue lies on the need to disaggregate information on air traffic emissions in terms of Landing and Take-off cycles (LTO).

  The "doctors" recommended to create a link and to reach institutional agreements between the Ministry of Energy (MINERGIA), the Ministry of Environment (MMA) and the Chancellor's Office, in order to disaggregate data on air traffic. In the case of data inconsistency, the doctors advised the formation of Groups to agree on common methodologies.

- The Industrial Process group pointed at three main issues: the difficulty to identify the use given to Ozone-depleting Substances (ODS), the difficulty to gather level-2 emission data from the concrete industry (since it is a key category) and the difficulty to bridge information gaps, because in many cases there is no correlation in the data or they do not have a clear trend.

  The "doctors" highlighted the importance of associating with ODS information suppliers and including the data in a model. Moreover, they recommended to reach agreements with the companies from the concrete sector to favor the supply of data that these companies may deem "confidential".

Besides all of the aforementioned issues, all groups identified as a common challenge the inconsistency between the data published by the National Statistics Institute (INE) and those gathered by their specific inventory. This problem would be due to the fact that the INE aggregates data in a different way.

The "doctors" recommended that all three sectors reach an agreement in conjunction with the information suppliers, that they develop country-specific emission factors and expand the inventory team in order to break down these barriers.

2. AFOLU

There is an inconsistency in Native Forest Management between the data supplied by the National Forest Corporation (CONAF), since the information available accounts only for approved forest management plans but not for data on their implementation. Therefore this data have a great uncertainty.

> *The "doctors" recommended the creation of cooperation protocols in conjunction with the information suppliers, so as to systematize the information.*

For Waste Management from animal farming there are no statistics on the various types of management applied in the country, which leads to a need for this kind of information, according to the experts.

> *The "doctors" recommend to add new questions in the Census of Agriculture (which takes place every 10 years) in order to get this information and, at the same time, to start conversations with trade associations, so as to reach an agreement.*

There is currently heterogeneous data on land-use change due to the different ways the CONAF has been working in every region of the country.

> *The "doctors" recommend to carry out studies on land-use more frequently, every 5 years at the latest. For this purpose, the obtaining of international funding to improve the frequency is in the works.*

It is difficult to quantify the national amount of nitrogen fertilizer use and the data on their local production is unknown. We only have information on the volume of total domestic imports, however there is no data on where and what these imports are used for.

> *The "doctors" recommend to start a Group in conjunction with the National Statistics Institute (INE) and other information supplying institutions to gather data base.*

Activity 8: Quality Assurance and Quality Control (QA/QC)

Date: Wednesday, May 28th (afternoon).

Location: Diego de Almagro Hotel, Santiago.

Objectives:
To carry out a workshop on QA/QC for Chilean inventory experts.

Picture 7. *QA/QC Workshop.*

Development of the activity:
On Wednesday, May 28th in the afternoon, a workshop on QA/QC was carried out. According to the IPCC 2006 guidelines Quality Control is defined as a system of routine technical activities to assess and maintain the accuracy and it is conducted by the personnel in charge of the inventory compilation, while Quality Assurance is a planned system of review procedures conducted by personnel not directly involved in the inventory compilation/development process.

The core issues addressed at this QA/QC workshop were (1) the German QA/QC Plan and Program of GHG Inventories, (2) the UK QA/QC Plan and Program of GHG Inventories, (3) the specific quality control checks for a GHG Inventory, (4) how to deal with documentation and reference data, (5) approaches for confidentiality and (6) QC activities.

The workshop started with a presentation by Oscar Zarzo from the German GIZ about the QA/QC of the German National Inventory System developed by the German Federal Environment Agency. The presentation included a brief description of the German Quality System on Emissions (QSE), in which both the roles and responsibilities of the system's instruments were explained (verification lists and inventory plans).

Later, the QA/QC Plan developed in the UK was presented along with the following activities: (1) documentation and archive; (2) data control check systems for data sources towards a Common Review Format (CRF) and the National Inventory Report (NIR); (3) data review and improvement, as well as new methods and calculations; (4) evaluation of uncertainty and priorities for improvement; (5) validation and verification of data and methods; and finally (6) external review of the inventories. The key elements of this plan are the use of data reference, then documentation in order to know how to use these data (and if suppositions are required), and the control checks that allow to verify if the results are reliable.

The key objectives of the UK QA/QC plan are to ensure that the transparency, completeness, consistency, comparability and accuracy requirements are met, which are also known as TCCCA principles. During the presentation, various aspects of the UK QA/QC Plan were explained, for example, the roles and responsibilities that QA/QC entails, the main activities involved in the process and their corresponding participants, the set of key procedures of the plan, control checks and flows involved in the process, bi- and trilateral reviews, confidentiality agreements and developed improvement programs.

Exercise on QA/QC

An exercise where the experts from each sector had to make a list of the QA/QC approaches used for each inventory was carried out. They had 20 minutes to make the list and then 5 minutes to present their results. The attendants were split into two groups: one for AFOLU and another one for the Waste Management, IPPU and Energy sectors.

1. Waste Management, IPPU and Energy

- Energy:
  State-related sources were used for the activity, i.e. the National Energy Evaluation of the Ministry of Environment and processed information supplied by the National Copper Commission (COCHILCO) and the National Customs Service.

  In order to verify the information taken from the calculation software for GHG Inventories supplied by the IPCC, the original data sources were reviewed and some emission factors were added. In the end the final results were compared with the information generated in the second report.

- IPPU:
  A consistency analysis of the data delivered by associated companies, the National Statistics Institute and the National Customs Service was conducted by using different sources. Whenever an inconsistency appeared, the data were corrected and reviewed once again. The spreadsheets were then reviewed as well and the required unit conversions were added, followed by a second review, which included an expert review in order to validate the information.

  The results delivered by the IPCC software were compared to the data gathered for the second report and then the differences between both results were assessed.

- Waste Management:
  The data supplied by municipalities, the Ministry of Health and the Superintendency of Health Services was used as an information source. During the GHG Inventory elaboration for the 1990-

2010 series, many data inconsistencies were identified. Expert consultancy and a statistical analysis were necessary to detect errors and then correct them with the aid of statistical tools.

Moreover, a unit and spreadsheet review was conducted in parallel, so as to compare the results with the second report.

2. AFOLU

This group was in charge of external consultants, who gathered the required data. All these data went first through a quality control in order to get an internal institutional review from all parties involved. Later, the external consultants estimated the GHG emissions and GHG capture rates per activity.

Institutional counterparts served as proof readers during this stage, including the General Coordinator's review (Sergio González, Focal point for the Information Matters Project). Along the process some general meetings called by the Ministry of Agriculture took place. At the meetings each consultant reported their progress and compared the original data with data from previous inventories in order to validate them. These consultants continued later on with the inventory compilation and emission calculation processes, during which each institution and the senior consultant had to proof read the inventory spreadsheets again. The final report was allocated a new reviewer: Paulo Cornejo, Head of the SNICHILE from the Ministry of Environment.

The QA/QC process developed rather intuitively without any written records. From this observation, the group concluded that an "umbrella or centralized system" was required to formalize the process, considering quality plans and QA/QC for every sector, in order to work in more systematic way.

Activity 9: Uncertainty in the GHG Inventories

Date: Wednesday, May 28th (afternoon).

Location: Diego de Almagro Hotel, Santiago.

Objectives:
To train GHG Inventory participants on uncertainty calculation for the GHG Inventories.

Picture 8. *Uncertainty workshop.*

Development activity:
During the workshop, a training activity on uncertainties in the GHG Inventory was conducted, since uncertainty estimation is critical for an extensive inventory. Uncertainty calculation allows the future improvement of the inventories' accuracy and to optimize decision-making about the methodologies that should be used.

Some of the basic ideas stated that uncertainties could be presented as a percentage value with a confidence interval of 95%, although it is also possible to just classify them as high, medium or low. The IPCC 2006 Guidelines display wide and updated information about uncertainty analysis. Later on, some examples of density curves for uncertainty likelihood both as a normal (symmetric uncertainty) and a log-normal distribution (asymmetric uncertainty) were presented.

Some uncertainty sources were also identified, such as (1) intrinsic uncertainty generated by activity data, which also relate to the uncertainty produced by either emission factors selection, (2) definitions that could be interpreted differently by users, (3) natural variability of production, ecological, agricultural processes, etc. and finally, (4) process or quantity evaluation, which may be due to the quantification methods or measurements, the sampling (a data sample may not always represent an entire population), the references that are being used and the expert's bias.

To analyze and calculate uncertainties manually, the first step is to collect the data to be analyzed, then develop empirical distribution functions; select the most suitable density distribution model; identify the uncertainty in the mean of the selected variability distribution method and, after defining the uncertainties correctly, they could be used to carry out a probabilistic analysis. Due to the uncertainties' complexity, it is advisable to turn to an expert (a statistician or mathematician), who could calculate the uncertainty. Another option is to resort to an expert's opinion. This is a very suitable option, since the data needed for an uncertainty analysis is usually not available.

At the end of the workshop, an example of uncertainty calculation in the UK for the solvents industry, specifically for printing inks, was presented.

2.4 ACTIVITY RELATED TO THE MRV OF TECHNICAL AND FINANCIAL SUPPORT

Activity 10: Meeting on MRV of Technical and Financial Support

Date: Thursday, May 29th (morning).

Location: Economic Commission for Latin America and the Caribbean (ECLAC), Santiago.

Objectives:
To discuss about the ways of monitoring, reporting and verifying the funding of Green Expenses in Chile.

Development of the activity:
On Thursday, May 29th, and as part of the workshop on the MRV of support, an ECLAC meeting was conducted to discuss Green Expenses in Chile.

The Head of the ECLAC Unit of Policies for Sustainable Development delivered an overview of the current problematic due to the lack of suitable budget classification methods and the disaggregation of financial data on environmental topics, particularly on climate change, both at a national and an international level. As for the funding granted in Chile, there are no records on who is funding what Climate Change Project/initiative or how much money is being provided. The work is currently based on the amount of money spent (expenditures), although that could lead to some risks, such as double flow accounting.

During 2014, the ECLAC will publish two studies; on the one hand a methodological guide for environmental expenses and on the other hand a regional diagnose. The latter is a rather methodological document that includes survey-based data. Jillian Van der Gaag (connected by Skype from Germany) mentioned that there is a current GEF/LAC Project that aims to review CC-related funding flows in Mexico, Argentina, Chile, Peru and Ecuador. A further and more detailed discussion on this project's methodology was agreed, as well as the review of the *Climate Policy Initiative's* activities.

2.5 ACTIVITY RELATED TO THE BIENNIAL UPDATE REPORT (BUR)

Activity 11: Meeting on Template Elaboration for the BUR

Date: Friday, May 30th (morning).

Location: Ministry of Environment, Santiago.

Objectives:
(1) To discuss the structure and contents of the BUR
(2) To analyze the resulting templates for their integration in the BUR.

Development of the activity:
On Friday the work focused on the structure and contents of the Chile BUR 2014. The first agreement was to divide the document in 5 chapters: National Situation, GHG Inventory, Mitigation Actions, Funding and Technology Transfer and Capacity Building. The next step was to discuss in more depth the most suitable way to present the contents and structure for our Mitigation Actions. The document should show the updated policies presented in the Second National Report as well as all NAMAs. For this purpose all indicators and guidelines to be submitted to the UNFCCC were reviewed and the Spanish BUR was taken as an example.

Moreover, the templates elaborated by the Consultant Maricel Gibbs upon request of the Ministry of Environment's Climate Change Office (OCC-MMA) in order to systematize the data on NAMAs. These templates got a very positive evaluation due to their completeness and organization and for providing all data required by the UNFCCC.

Finally, the GHG Inventory Chapter was discussed. The issues that the UNFCCC Guidelines consider for this chapter were defined and the group concluded that it is absolutely possible to include them all, both as text and as tables. There is a possibility of using the same structure of chapter 2 from the national inventory report as a model for its counterpart in the BUR, although this is yet to be decided and must be evaluated by the Coordinator of this chapter.

2.6 FINAL MEETING AND CONCLUSIONS

Activity 12: Final Meeting and Elaboration of a Work Plan for the Second Half of 2014

Date: Friday, May 30th (afternoon).

Location: Ministry of Environment, Santiago.

Objectives:
(1) To evaluate the first training workshop.
(2) To elaborate a work plan for the second half of the year.

Picture 9. *Final Meeting of the capacity building mission.*

Development of the activity:
The closing activity for this first capacity building mission as part of the Information Matters Project in Chile was a final meeting held on Friday, May 30th, in the afternoon. The objective was to discuss the workshops and meetings carried out in that week, to draw conclusions and to coordinate future planning.

The general evaluation for this capacity building mission was very positive, since it brought a high level of interest and interaction from all participants in the different MRV workshops (Inventories and NAMAs). This proves their disposition to learn more about the subject. Unfortunately, not all sectors were represented to the same extent during the activities and exercises for the MRV of Inventories, since they were attended by many people from the AFOLU sector, but no one from the Energy sector. Although the methods and processes for MRV are already well known, these workshops were very useful for the participants to learn how to target their corresponding tasks in a practical way, which seem to be quite broad at first. The exercises that related to each sector in the inventory and the NAMAs that are being implemented in Chile were also deemed very useful.

The evaluation was followed by a discussion about the upcoming plan for the second half of 2014. The first week of October was set as a tentative date for the second training-week. The focus for this second workshop should be on the MRV of Support, which is the least developed aspect so far. Furthermore, a draft review of the BUR chapters for each subject could be integrated to the training sessions. See Table 4 for a tentative planning for this second capacity building mission.

Table 4. *Tentative program for the second workshop.*

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning	Workshop 1 MRV of Support	Workshop 3 MRV of Inventories (QA/QC)	Inventory meetings BUR Chapters	Workshop 3 NAMA-MRV (general framework)	Workshop 2 MRV of Support BUR Chapter
Afternoon	Workshop 1 MRV of Support	Workshop 3 MRV of Inventories	Workshop 3 NAMA-MRV BUR Chapters	Workshop 3 NAMA-MRV (general framework)	Consolidation Meeting

3. ANNEXES

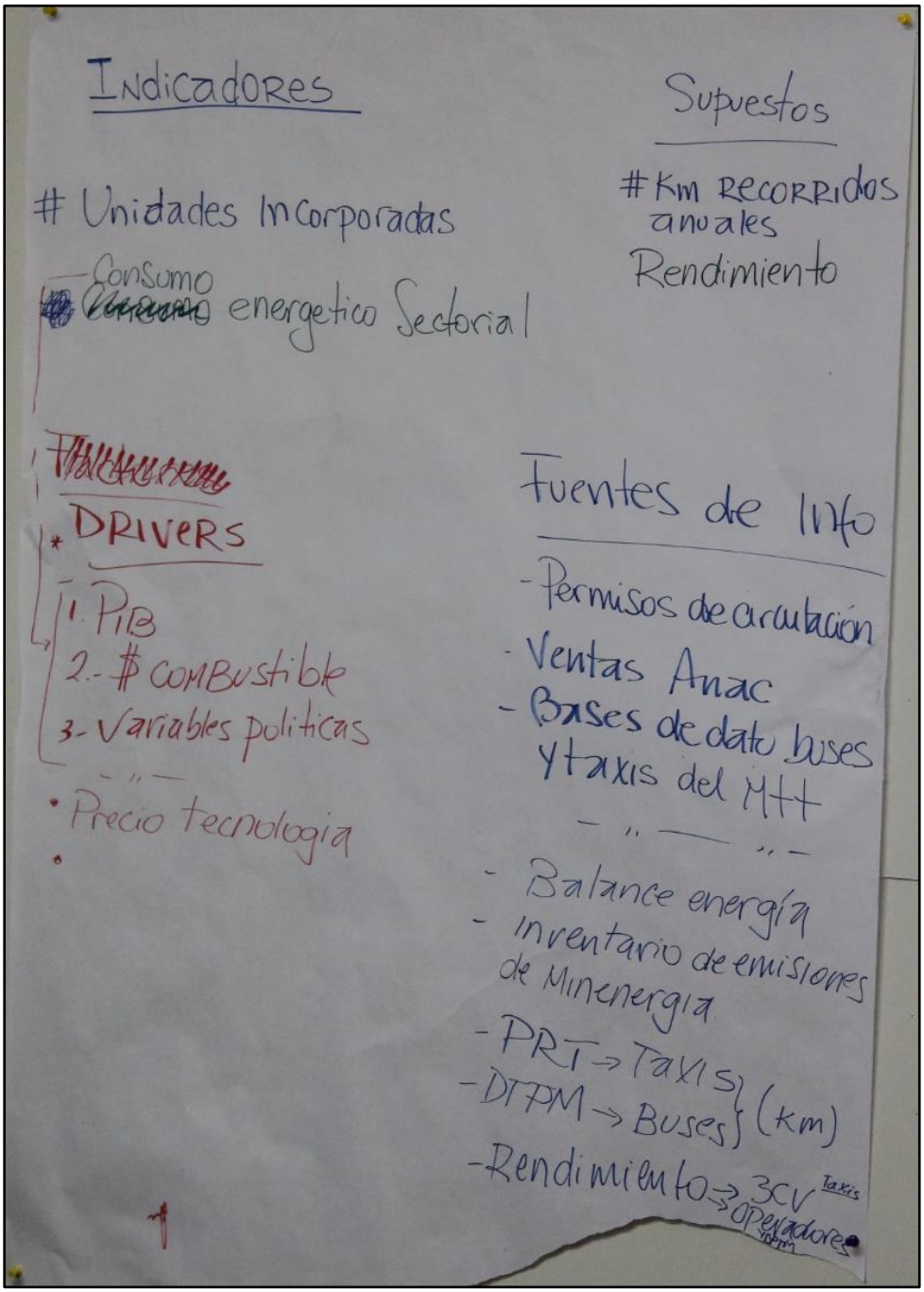
3.1 WORKSHOP RESULTS

Impact Chain Exercise

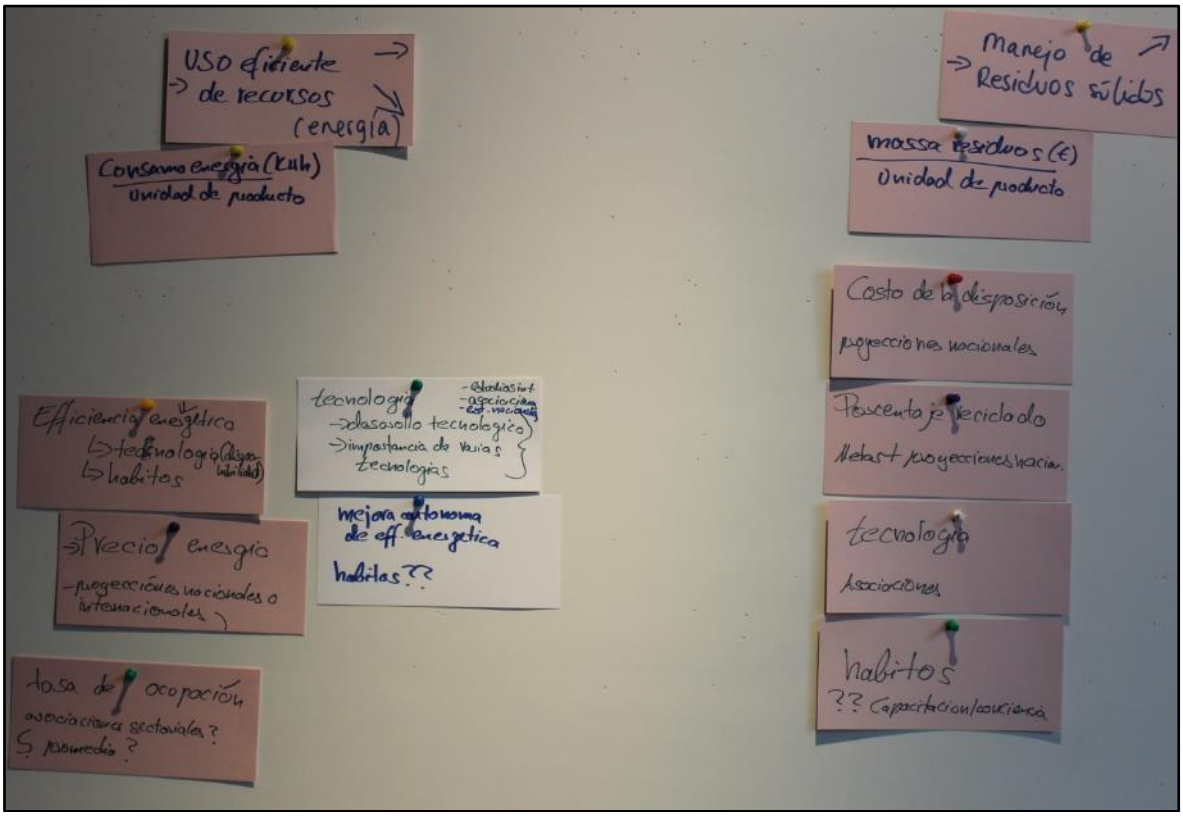
Picture 10. *Impact chain exercise – CPL NAMA.*

Picture 11. *Impact chain exercise – Green Zone NAMA.*

Indicators and Baselines

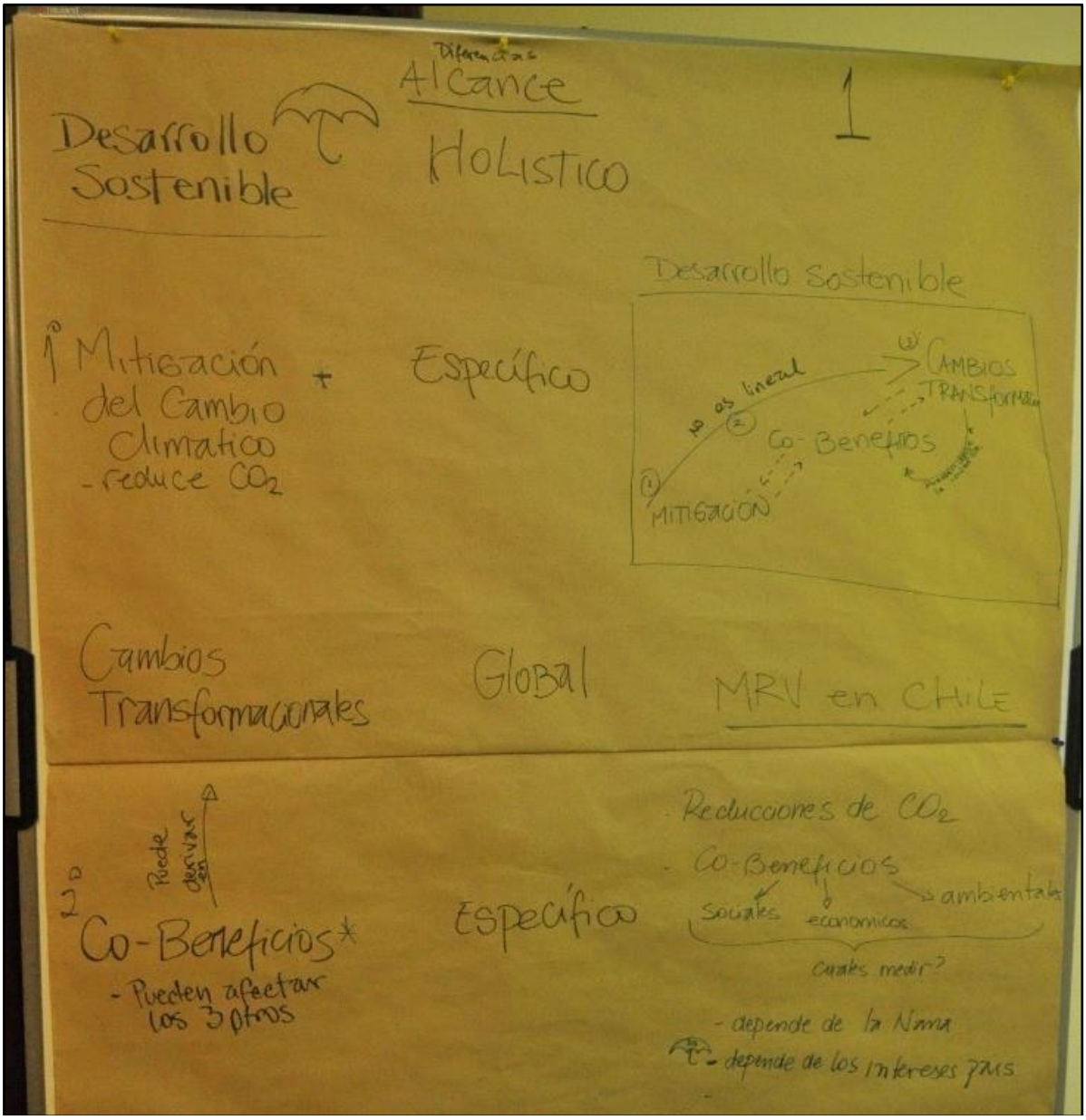


Picture 12. *Indicators and baselines exercise – Green Zone NAMA.*

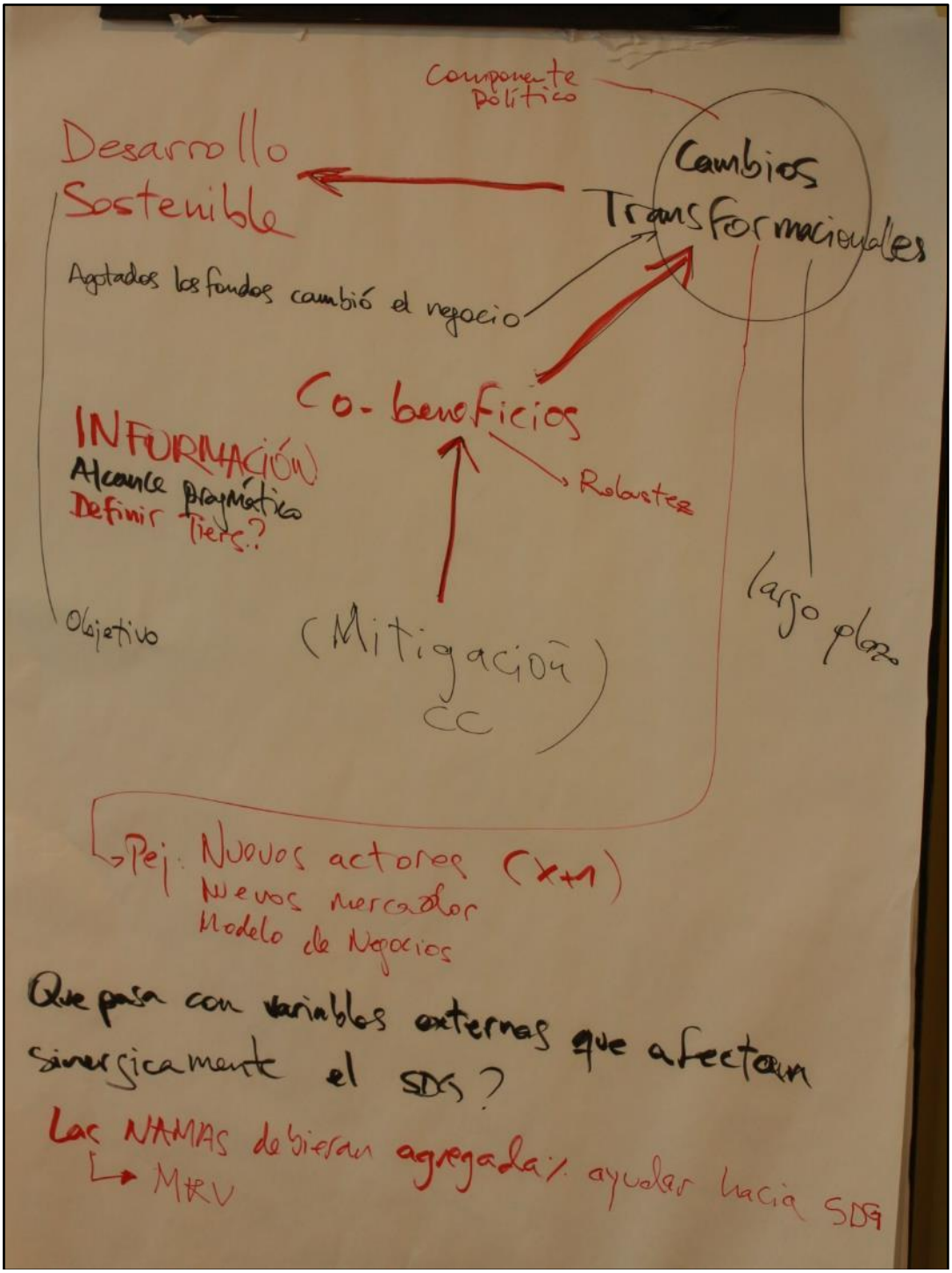


Picture 13. *Indicators and baselines exercise – CPL NAMA.*

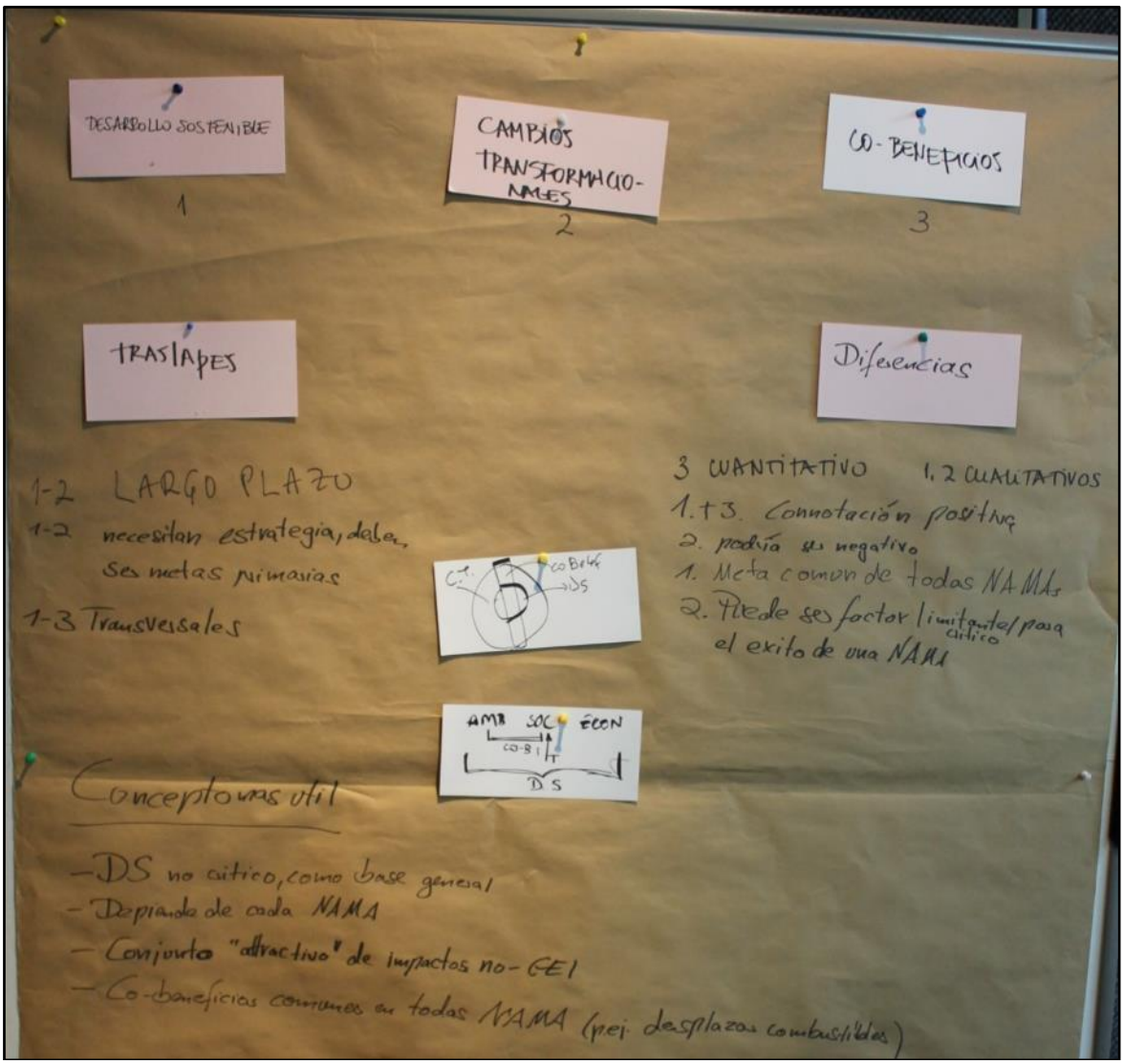
Concept Development Exercise



Picture 14. *Concept development exercise – Group 1.*

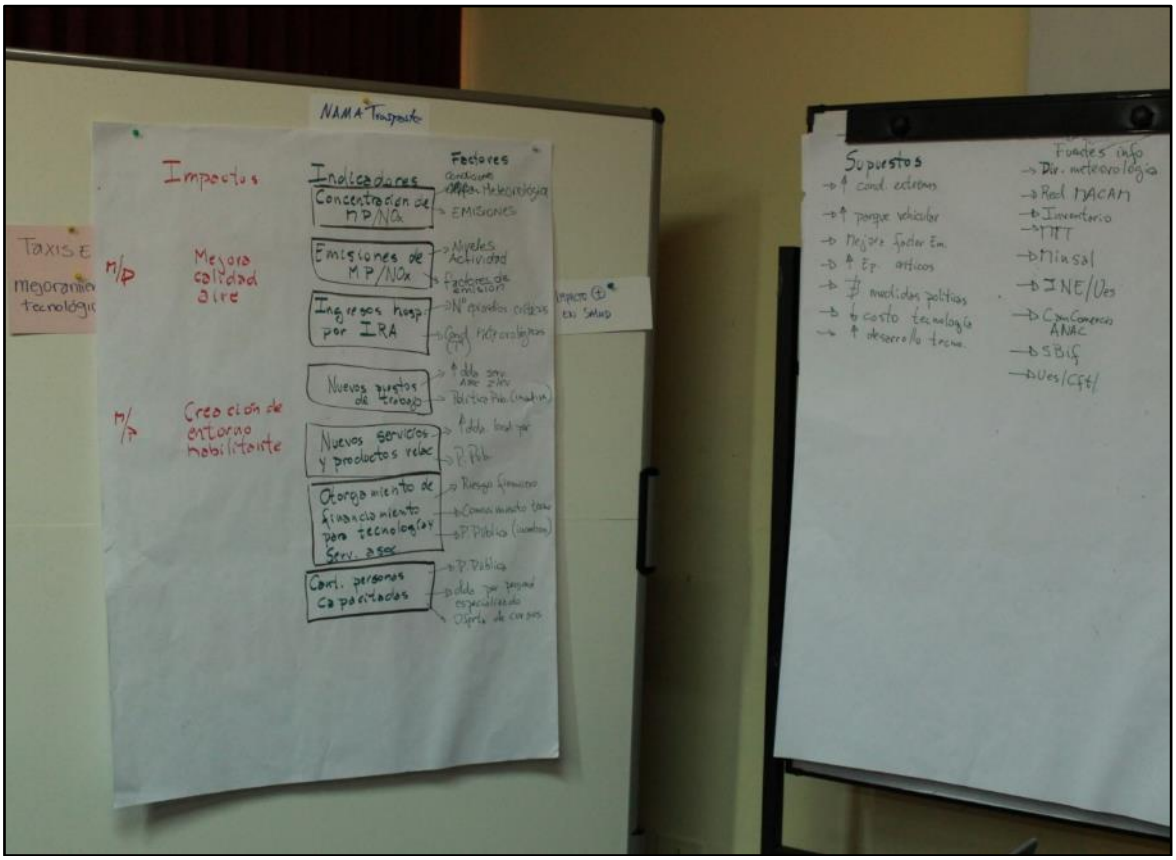


Picture 15. *Concept development exercise – Group 2.*



Picture 16. *Concept development exercise – Group 3.*

Indicators for Non-GHG-Related Impacts Exercise



Picture 17. *Indicators for non-GHG-related impacts exercise – Green Zone NAMA.*

Picture 18. *Indicators for non-GHG-related impacts exercise – CPL NAMA.*

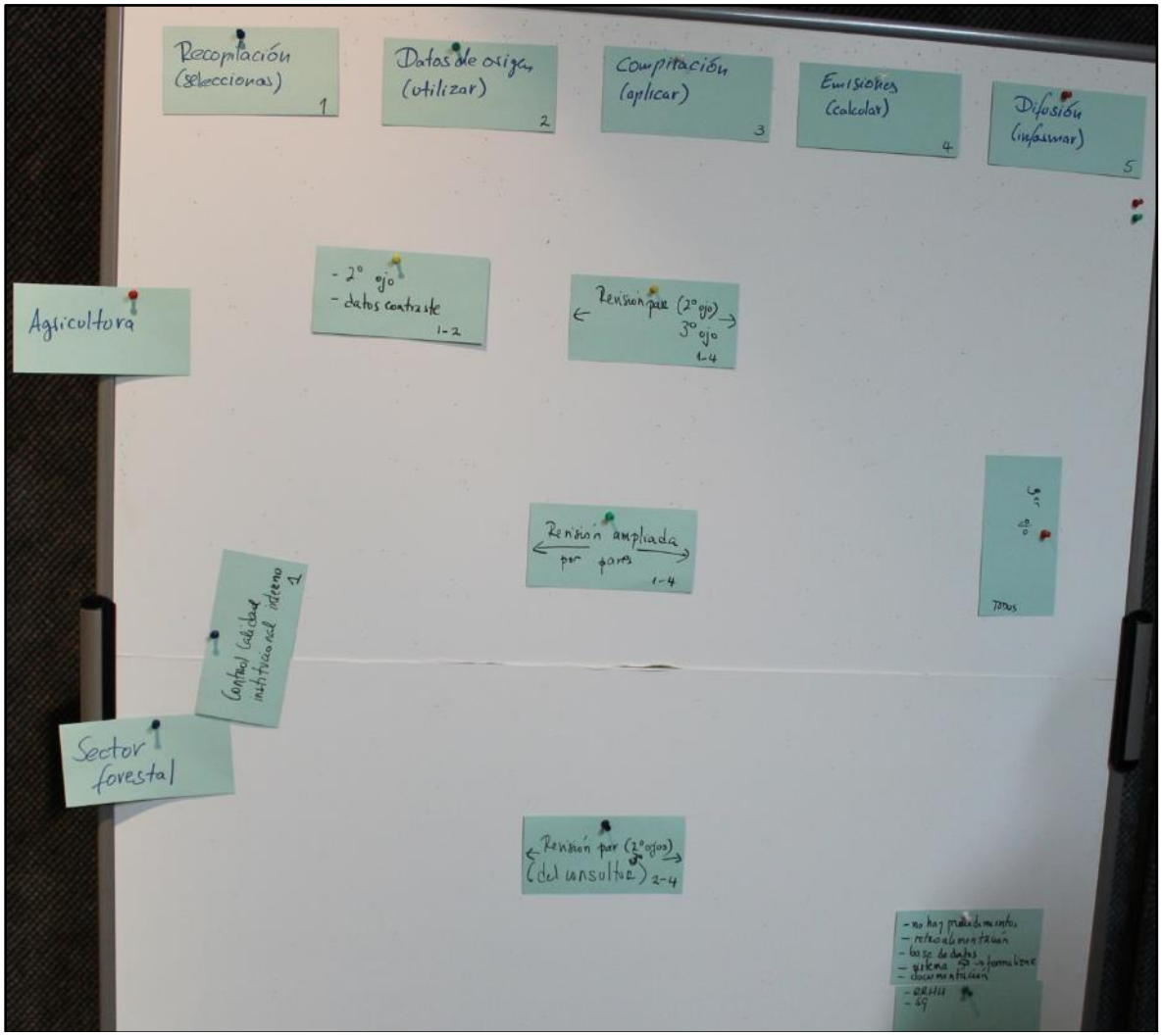
Difficulty of Data Collection

Picture 19. *Difficulty of data collection exercise – Waste management, IPPU and Energy team.*

Picture 20. *Difficulty of data collection exercise – AFOLU team.*

QA/QC Exercise

Picture 21. *QA/QC exercise – Waste management, IPPU and Energy.*



Picture 22. *QA/QC exercise – AFOLU.*