

Navigating Transport NAMAs

A practical handbook on Nationally Appropriate Mitigation Actions (NAMAs) in the transport sector

On behalf of:



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

giz

Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

of the Federal Republic of Germany

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Background Information on the TRANSfer Project

The handbook was prepared by the TRANSfer Project. The TRANSfer project is run by GIZ and funded by the International Climate Initiative of the German Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). Its objective is to support developing countries to develop and implement climate change mitigation strategies in the transport sector as „Nationally Appropriate Mitigation Actions“ (NAMAs).

The project follows a multi-level approach:

- At country level, TRANSfer supports selected partner countries in developing and implementing NAMAs in the transport sector. The NAMAs supported by the project cover a broad variety of approaches in the partner countries Indonesia, South Africa, Philippines, Peru and Colombia.

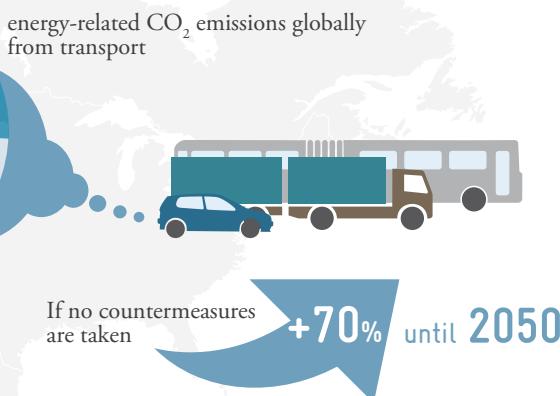
- At international level and closely linked to the UNFCCC process, the project helps accelerate the learning process on transport NAMAs with a comprehensive set of measures (events, trainings, facilitation of expert groups, documents with guidance and lessons learned such as the transport NAMA handbook and a database).

Activities at country and international level are closely linked and designed in a mutually beneficial way. While specific country experience is brought to the international stage (bottom-up) to facilitate appropriate consideration of transport sector specifics in the climate change regime, recent developments in the climate change discussions are fed into the work in the partner countries (top-down).

For more information see: www.transport-namas.org

Foreword

Transport systems do not automatically develop into sustainable low-carbon pathways. Rising prosperity and economic growth typically lead to a significant increase in transport demand and motorisation, along with the associated traffic congestion and noise, local air pollution, regional and global environmental impacts, high energy demand and traffic accidents. The health effects of toxic vehicle emissions are additionally compounded as urban populations are expected to rise. As estimated by Replogle and Fulton (2014) the number of premature mortalities caused by air pollution worldwide could roughly quadruple by 2050: “Emission standards requiring vehicle technology and fuels equivalent to Euro 6/VI or better could prevent an estimated 1.36 million premature deaths annually – equivalent to 19 million years of life lost – in 2050.”



In 2011, transport was responsible for 27% of global fossil-fuel-related carbon dioxide emissions, the second largest polluting sector (IEA, 2012). More than 80% of the sector's emissions growth over the last four decades came from road transport, mainly passenger light-duty vehicles, and are projected to almost double by 2050 (IEA, 2013). Most of this increase is projected to happen in the developing world, stemming from a large increase in freight transport and the rapidly growing number of passenger cars, coupled with declining shares of the more efficient modes of rail, public and non-motorised transport.

Transport is the end-use sector that has seen – by far – the most rapid increase in emissions over the last twenty years. CO₂ emissions in the sector increased by 2.2 Gt CO₂ from 1991 to 2011 – or by almost 50%. Reducing transport emissions thus forms a crucial element for any comprehensive strategy to reduce global CO₂ emissions. Quoting Yvo de Boer, the former executive secretary of the UNFCCC, “If you do not tackle transport, you cannot tackle climate change.”¹

Road transport accounts for about three-quarters of global transport emissions and a diverse set of mitigation measures will be required in this sub-sector. Up to 2020 the most effective means of abatement will be lower vehicle usage, fuel efficiency gains and an increase in the use of alternative fuels. Over the longer term, improvements in vehicle fuel economy represent the most important abatement measures, accounting for 51% of cumulative savings in the transport sector from 2011 to 2035 as projected by the International Energy Agency (IEA, 2012).

A transition towards sustainable low-carbon transport systems requires a shift in current policy making and investment decisions. This requires substantive capacity building for policy design and planning in order to stimulate sectoral transformation. The good news is that a number of sustainable low-carbon transport solutions are available and have proven effectiveness worldwide.

Nationally Appropriate Mitigation Actions (NAMAs) provide the opportunity for ambitious greenhouse gas reduction activities in developing countries under the United Nations Framework Convention on Climate Change (UNFCCC). It may also open up opportunities to boost domestic support as well as for bilateral and multilateral cooperation in terms of technology, finance and capacity development. A NAMA is considered to be any mitigation action tailored to the national context, characteristics and capabilities, and embedded in national sustainable development priorities. In order to achieve the goal of keeping the global temperature increase below 2°C, Nationally Appropriate Mitigation Actions (NAMAs) are a good opportunity for developing countries to reduce emissions significantly from Business-As-Usual (BAU) scenarios. Many countries are already taking steps to use NAMAs as instruments for participating in the global mitigation agenda and as a means of leveraging national and international support for more effective and transformational climate actions.

¹ Yvo de Boer, previous Executive Secretary of the UNFCCC.

NAMAs are a very promising instrument to gain international support and/or recognition for the transport sector. NAMAs in the transport sector not only contribute to reduced greenhouse gas (GHG) emissions – they also provide further benefits to the economy, society and the (local) environment. The implementation of transport NAMAs has the potential to combine climate change mitigation with economic growth, poverty eradication and improved quality of life.

The UNFCCC Secretariat supports intergovernmental climate change negotiations as well as an increasing number of constituted bodies that serve the process. In order to facilitate matching of capacity-building, technology transfer and financial support for their implementation, the Parties to the UNFCCC have established a registry to help other countries learn from previous NAMA experiences, which may help boost the adoption of successful measures. The registry already includes a large number of NAMAs. The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) is supporting the development and implementation of NAMAs and respective learning and knowledge sharing through the International Climate Initiative (IKI). The GIZ TRANSfer project, funded by BMUB, aims to support NAMA development in the transport sector around the globe and to contribute to international transport related learning.

The purpose of this handbook is to provide transport policy-makers around the globe with practical guidance on steps to identify, design, implement and monitor mitigation actions in the transport sector that are nationally appropriate.



Christiana Figueres

UNFCCC Executive Secretary



Dr. Barbara Hendricks

German Federal Minister for the Environment,
Nature Conservation, Building and Nuclear Safety

A handwritten signature in black ink, appearing to read "Christiana Figueres".A handwritten signature in blue ink, appearing to read "Barbara Hendricks".

How to use this handbook

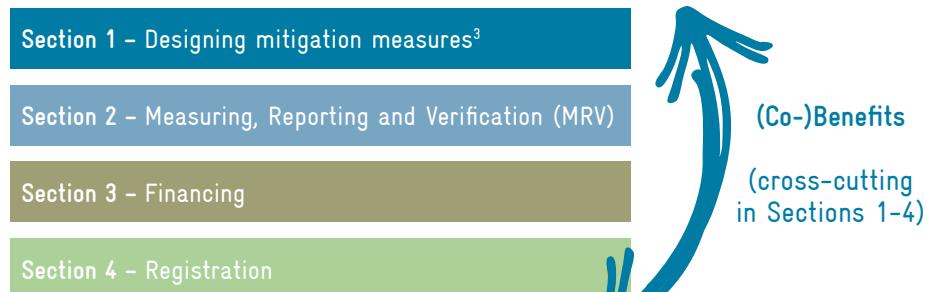
About this Handbook

This handbook provides conceptual background information and practical guidance on transport NAMAs. Its objective is to facilitate the preparation and implementation of Nationally Appropriate Mitigation Actions (NAMAs) in the transport sector to increase the sector's contribution to mitigate climate change. The handbook was developed over a period of several years in an iterative, participatory process closely linked to a broad range of activities of the GIZ TRANSfer Project, including a broad review process with a large group of NAMA practitioners. It presents practical experien-

ce with transport NAMAs, including GIZ's vast field experience in a concentrated and action oriented way, in order to support and stimulate the development of further transport NAMAs. The handbook is complementary to the UNFCCC NAMA Guidebook², which gives more general guidance on NAMAs without a particular sectoral focus, while this handbook elaborates further on transport sector specific issues. The focus of this handbook is on NAMA preparation. Some additional information is given on the implementation of NAMAs.

The logic behind the Handbook

The handbook is based on the experience that every NAMA development is a genuine process. Since the conditions for developing a NAMA differs from country to country, every NAMA is tailor-made. Nevertheless, based on international experience, the ingredients for a NAMA are quite uniform. The following four elements form the main building blocks of any NAMA in the transport sector.



Decision makers aiming to design transport NAMAs can use these five elements as an orientation to "what is needed to design a transport NAMA". It is important to note that these elements are connected and influence each other, i.e. a NAMA preparation is not a routine process that starts with one of these elements and moves in a fixed sequence through the others. To the contrary, sound NAMA development is driven by the principle of "national appropriateness." This is why every NAMA development process is different. It depends on the specific circumstances: on available information and resources, whether a NAMA focuses on a new field for the country (Green Field NAMA), whether the NAMA is intended mainly for international recognition of an ongoing initiative in the country (NAMA Label) or is aiming to up-scale an existing measure (up-scaling NAMA). Many other factors influence the process. In the end, any NAMA needs to be tailored to the specific circumstances, and the success of any NAMA development process depends to a large extent on putting the "pieces of the puzzle" together in an efficient and targeted manner.

²Available at: www.namapipeline.org/Publications/Guidance_for_NAMA_Design_2013_.pdf

³The term "policy" covers strategy, policy, program, project as well as combinations and packages of these. In general terms, we refer to these as measures.

Box 1:**Sustainable development benefits/Co-benefits:**

The natural focus of those in the transport sector usually lies on air quality and associated health costs, lost time due to traffic congestion, reduction of noise, accidents and corresponding fatalities. While these benefits are the main driving force from a transport perspective to develop and implement a sustainable transport measure, those with a climate change perspective consider these as sustainable development benefits or so called co-benefits, i.e. additional benefits on top of the primary benefit of greenhouse gas mitigation. Since these benefits normally represent the main driving force for those in transport, they are considered in every chapter of this handbook as an important symbiotic issue.

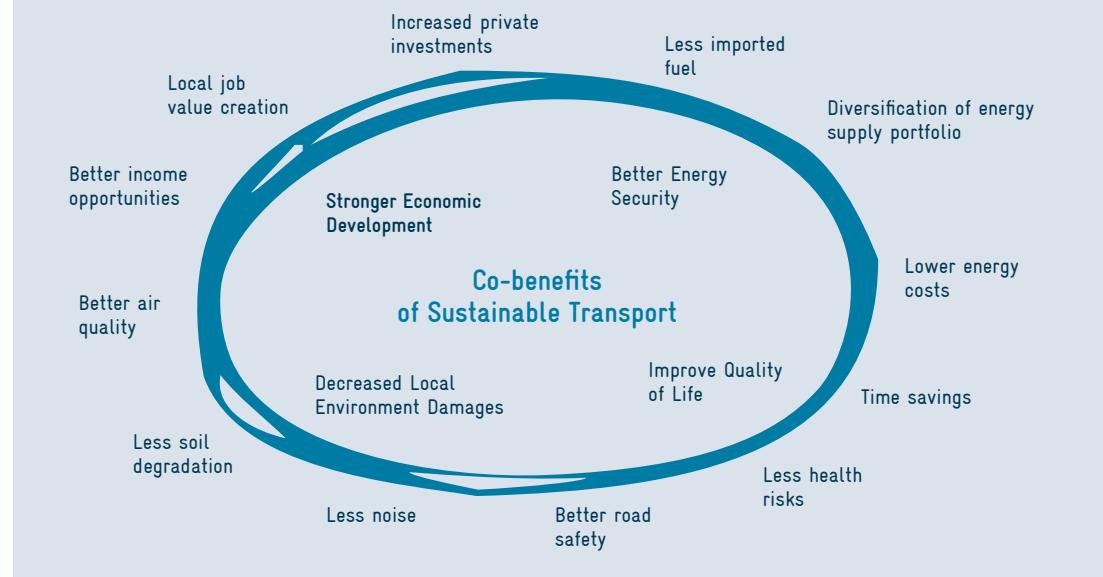


Figure 1: Benefits of Sustainable Transport

Content covered in this handbook

This handbook provides practical guidance for each of the main building blocks, which can be summarised as follows:

**Section 1:
Designing mitigation measures**

Section 1 gives an overview of options for possible mitigation measures in the transport sector and illustrates the process of how to identify, set priorities and further specify these measures for a particular transport NAMA.

**Section 3:
Financing**

Section 3 describes how to set up an economically and financially feasible NAMA, including estimation of costs and revenues, assessment of the financial and economic viability, design of the financial structure and a fundraising strategy.

**Section 2:
Measuring, Reporting and Verification (MRV)**

Section 2 provides more detailed information on how to measure, report and verify the climate change mitigation effect and wider sustainable development benefits of a transport NAMA.

**Section 4:
Registration**

Section 4 of this handbook guides users through the steps required to register a transport NAMA with the Secretariat of the United Nations Framework Convention for Climate Change (UNFCCC).

Each of the sections is structured in the same way to facilitate the practical use of the handbook:

- **Introduction and overview of tools:** Each section starts by introducing the topic to the reader and gives an overview of the main elements and relevant tools in a table.
- **More detailed description of main elements:** The main elements of each section are described in more detail, including specific guidance, practical tips, illustrations and references to examples and useful tools.
- **Checklist and tips for further reading:** Each section closes with a checklist that shows the main elements of each building block at a glance and facilitates on-the-job use of the handbook. The sections close with a list of references where additional information can be found.

The handbook is complemented by a number of practical tools. An overview of the tools is presented in the section [Getting started](#).

Furthermore, the different sections directly refer to specific tools that are gathered in a Transport NAMA Toolbox.

All tools are available at:

www.transport-namas.org/resources/toolbox.

Icons used in this handbook

The following icons are used throughout this handbook, and refer to the following:



Definition of a term



Important tip or remark



Tools



Sustainable Development Benefits



Further reading

Glossary

Annex I Parties to the UNFCCC Annex I Parties include the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

Link to country list: www.unfccc.int/parties_and_observers/parties/annex_i/items/2774.php

Non-Annex I Parties to the UNFCCC Non-Annex I Parties are developing countries. Certain groups of developing countries are recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Others (such as countries that rely heavily on income from fossil fuel production and commerce) feel more vulnerable to the potential economic impacts of climate change response measures. The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology transfer.

Link to country list: www.unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php

A-S-I Avoid-Shift-Improve. The objective of the A-S-I approach is to promote low carbon mobility and to develop sustainable transport systems. Avoid or reduce the need to travel. Shift to or maintain the share of more environmentally friendly modes. Improve the energy efficiency of transport modes (vehicle technology and fuels).

ASIF framework Activity (trips in km per mode), Structure (modal share), Intensity (energy intensity by mode in MJ/km), Fuel (carbon intensity of the fuel in kg CO₂/MJ) are the four different components that determine the transport sector's GHG emissions. The ASIF Framework helps to capture the characteristics of the current transport system. It can be used for emission calculation and measurement.

Baseline emissions The emissions that would occur without any intervention in a business-as-usual scenario (i.e. case without a potential NAMA). Baseline estimates are needed to determine the effectiveness of emission reduction measures.

BAU Scenario Business-as-usual is a phrase that aims to describe what would happen if nothing changed from the current status quo. The intention is to show the difference compared to the situation when a strategy, policy, program or project were to be introduced. The BAU scenario serves as a reference scenario (baseline emissions), which illustrates the results of current trends often in contrast to alternative scenarios that take into account specific interventions.

Capacity Building Capacity Building, also referred to as Capacity Development, is the process of strengthening the abilities of individuals, organizations and systems to make effective use of their resources in order to achieve their goals on a sustainable basis.

Co-Benefits Official documents of the UNFCCC distinguish between 'GHG benefits' and 'co-benefits'. Co-benefits are intended or unintended positive side-effects of a mitigation measure. There are synergies with other objectives, such as air quality, productivity, road safety etc. associated with greenhouse gas emission reductions. This handbook refers to them as 'benefits'.

IPCC The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. In the same year, the UN General Assembly endorsed the action by WMO and UNEP in jointly establishing the IPCC.

Measures In this handbook used as the overarching term for sustainable transport measures, which may be a strategy, policy, programme or project.

Mitigation Action	A measure or package of measures (e.g. strategies, policies, programs or projects) that helps reducing greenhouse gas emissions.
MRV/MRV-able	<p>“Measuring”, “Reporting” and “Verifying” are important aspects of turning for example a policy, program or project into a NAMA.</p> <ul style="list-style-type: none"> • Measurement: collect relevant information on progress and impacts • Reporting: present the measured information in a transparent and standardised manner • Verification: assess the completeness, consistency and reliability of the reported information through an independent process.
National Reporting	Parties to the United Nations Framework Convention on Climate Change (UNFCCC) must submit national reports on implementation of the Convention to the Conference of the Parties (COP). Furthermore, it is a formal requirement to report on planned, current and implemented NAMAs within biennial update reports (BURs).
National Communications	The core elements of the national communications for both Annex I and non-Annex I Parties are information on emissions and removals of greenhouse gases (GHGs), and details of the activities a Party has undertaken to implement the United Nations Framework Convention on Climate Change (UNFCCC). National communications usually contain information on national circumstances, vulnerability assessment, financial resources and transfer of technology, and education, training and public awareness.
National Focal Point	A person and the respective Ministry/Organisation responsible for country communications to UNFCCC
Registration	The Parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to establish a registry to record Nationally Appropriate Mitigation Actions (NAMAs) and to facilitate matching of capacity-building, technology transfer and financial support for their implementation. The registry helps other countries to learn from previous experience, which may boost the adoption of successful measures. It contains a brief description of the registry, including its sections and functions, and presents an overview of the information on NAMAs and support to be submitted by the National Focal Points or representatives from other stakeholders.
UNFCCC	<p>The United Nations Framework Convention on Climate Change entered into force on 21 March 1994. Today, it has near-universal membership. The 195 countries that have ratified the Convention are called Parties to the Convention.</p> <p>The UNFCCC is a “Rio Convention”, one of three adopted at the “Rio Earth Summit” in 1992.</p>
Unilateral and supported NAMAs (Domestically-supported and internationally-supported NAMAs)	Unilateral NAMAs are exclusively domestically financed voluntary mitigation actions as opposed to bilaterally or internationally supported NAMAs which contain both domestic and international financing elements. MRV is at the discretion of the respective countries. Guidelines are expected to be developed under the climate convention. In the case of supported NAMAs, MRV is expected to be conducted domestically, but with international oversight and subject to international MRV procedures. International MRV can be mandated by donors/investors. Financial and technical support is expected to be recorded as well.

Navigating the NAMA Landscape

NAMA Registry

The UNFCCC agreed to establish a NAMA Registry to record NAMAs and to "...facilitate matching of finance, technology and capacity building support for their implementation." At COP 17 (2011) it was decided to develop the registry as a dynamic, web-based platform and the Secretariat was requested to develop a prototype for trial. The NAMA Registry was operationalised in October 2013, and can be used to record NAMAs for recognition, NAMAs seeking international support for preparation or implementation, and support that is available at www.unfccc.int/cooperation_support/nama/items/7476.php

NAMA Database

Ecofys has developed a database that contains information about NAMA activities that are taking place economy-wide. It contains details of NAMA proposals and feasibility studies that have been published and that indicate specific actions which are either supported or have specified a clear finance, technology or capacity building need. Its aim is to share information about NAMA activities, enabling countries to learn from these experiences and gain insights into how mitigation activities can be undertaken within the NAMA framework. The Database is regularly updated and features publicly available data across all sectors.

www.nama-database.org/

NAMA Pipeline

UNEP Risø Centre has developed a NAMA pipeline which provides an informal overview of activities submitted to the UNFCCC as NAMAs. The NAMA pipeline contains details of all communications to the UNFCCC from developing countries for Nationally Appropriate Mitigation Actions, even where these communications have not yet been formalised.

www.namapipeline.org/

Transport NAMA Database

It is an interactive web-based portal that provides details of transport NAMAs that are in all stages from initial concept to implementation with the aim of improving knowledge management, supporting the identification of capacity building needs, the matching of financial and technical support, and the establishment of contacts and networks for the transport NAMA community. It has been developed by GIZ within the framework of the International Climate Initiative (IKI) supported by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and WRI/EMBARQ. The Database contains a wide range of information about each NAMA that is presented in three 'Levels'. They collectively give users an in-depth insight into the main characteristics and processes behind each transport NAMA feature, including the policy identification process, mitigation actions, co-benefits, MRV, financing and the registration process.

www.transport-namadatabase.org.

NAMA Partnership

The NAMA Partnership is an example of a recent initiative that was created in recognition of both, the demand from developing countries for support with preparing and implementing NAMAs and the uncoordinated nature of support that is available. Launched at COP18 in Doha (Qatar), it is an international partnership of multi-lateral organisations, bilateral cooperation agencies and think tanks co-ordinated by the UNFCCC Secretariat. The partnership is working on NAMAs to enhance collaboration and make use of synergies of activities that the different organisations are involved in, identify best practices, and facilitate the preparation and implementation of NAMAs in developing countries.

www.namapartnership.org

Partnership for Mitigation and MRV

The International Partnership on Mitigation and MRV, which was launched to support practical exchange on mitigation related activities and MRV between developing and developed countries, supports the effective implementation of LEDS, NAMAs and MRV systems. As a partnership it brings climate experts together from a variety of countries to identify best practices, support learning between members, establish a shared mitigation related knowledge base, and disseminate lessons learnt. It has 40 members and conducts technical as well as capacity building activities seeking to co-ordinate national implementation and international negotiations.

www.mitigationpartnership.net

NAMA Facility	The NAMA Facility was launched by the UK Department of Energy and Climate Change (DECC) and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) in December 2012. It was established to support developing countries that show leadership on tackling climate change and that are willing to implement ambitious climate protection measures. www.gov.uk/government/publications/information-about-the-nationally-appropriate-mitigation-actions-nama-facility
LEDS Global Partnership	LEDS is a partnership founded to use coordination, information exchange and cooperation between programmes and countries to advance climate-resilient low emission development. It was launched in 2011, has 113 members, and it is comprised of a number of work streams that include a Transport Working Group, which is led by WRI/EMBARQ in partnership with UNEP and NREL (the USA's National Renewable Energy Laboratory). This Working Group capitalises upon its broad membership to support the realisation of common goals by encouraging exchange of, and engagement with, diverse perspectives, fostering open peer to peer learning and exchange, including sharing and collaborating on development of methods and tools and on innovative approaches being considered and adopted. www.ledsgp.org/home
International Climate Initiative (IKI)	The International Climate Initiative, the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) finances national climate change mitigation projects. BMUB created the National Climate Initiative in 2008 to support projects in Germany that contribute to the successful transformation of Germany's energy system, while harnessing existing potentials for cost-effectively reducing emissions. Several IKI projects support NAMA development and implementation such as TRANSfer, the Mexican-German NAMA programme and the main dialogue. www.international-climate-initiative.com/en/about-the-iki/

Getting started

What is a NAMA?



Greenhouse gas emissions from transport are projected to increase rapidly unless ambitious actions are taken to curb this trend. A large number of possible measures are readily available (see the Factsheet compilation and Overview table in the [TRANSFER Toolbox](#)) that can reduce CO₂ emissions and short-lived climate pollutants, while also generating sustainable development benefits, such as improved air quality and road safety, higher productivity and energy efficiency. There are a multitude of reasons to strive towards sustainable mobility – not only for climate change mitigation.

This handbook aims to facilitate the development of ready-to-implement measures to mitigate greenhouse gas emissions in the transport sector as NAMAs. These NAMAs might be funded purely domestically or receive international support. Support might be provided for preparation and/or implementation and can be provided as capacity building, technological and/or financial support.



Jakarta, Indonesia; Photocredit: Daniel Bongardt/2010

NAMAs are voluntary measures taken by developing countries that are reported by national governments to the United Nations Framework Convention on Climate Change (UNFCCC). The concept of NAMAs was introduced in the Bali Action Plan (2007) and is seen as a useful instrument for mitigation action in developing countries under the UNFCCC.

Why develop a NAMA?

You might be wondering what the difference is between a “traditional” sustainable transport measure and a transport NAMA and why you should go for a NAMA? In fact, the same measure or combination of measures could be dealt with as a NAMA or not. However, there are some differences:

- NAMAs need to have a MRV concept;
- developing a sustainable transport measure as a NAMA may allow accessing climate finance;
- the stakeholder setting tends to be different (involvement of Ministries of Environment in many cases).

Treating the sustainable transport measures as a NAMA offers several benefits, amongst others:

- international recognition for the mitigation action(s); as well in the negotiations in the UNFCCC context;
- access to support (capacity building, technology transfer, financial support);
- improved management of sustainable transport measures through dedicated monitoring and reporting (and eventually verification).

Box 2:

Key characteristics of NAMAs



The UNFCCC's understanding on NAMAs can be broken down into the following elements (see also UNDP, UNFCCC, UNEP Risø, 2013):

- NAMAs are voluntary actions taken by developing countries to reduce GHG emissions.
- Their aim is to assist developing countries that wish to reduce emissions to a level below that of business-as-usual (BAU), but they do not represent a legal obligation under the UNFCCC.
- Determining which actions to take under a NAMA is each country's sovereign right, since the definition of “appropriate mitigation action” is relative to a party's particular national circumstances. In general, NAMAs are designed to support efforts towards sustainable development, as interpreted by the host country.
- Negotiations have resulted in the NAMA concept underpinning diverse approaches host countries use to identify, prepare for and implement development strategies that are sustainable and lower their GHG emission paths as well.
- NAMAs allow developing countries to address high-priority national goals such as improved transportation systems, energy security and public health, and couple these with GHG emissions reduction objectives.
- GHG emission reductions resulting from NAMAs are to be transparently measured, reported and verified. MRV requirements are not part of the definition of NAMAs, but by their nature, they must be considered throughout NAMA development and implementation.

How to prepare a NAMA?

As mentioned above, the process of developing a NAMA is like a puzzle. The main sections of the handbook describe the individual puzzle pieces in more detail. Table I-1 gives an overview of:

- **main elements** in NAMA development (Design of mitigation measures, MRV, Financing, Registration)
- **main phases** of a NAMA cycle (from Scoping, Design, Appraisal to Implementation and Monitoring & Evaluation)
- **tools** that might help to perform a certain step in the NAMA development process.

The particular process and content addressed while developing a NAMA can vary widely, depending on the particular circumstances. In general, the level of detail and information as well as data and resources required and processed increases over time and along the cycle moving from Scoping, via Design and Appraisal to Implementation and M&E.



Lima, Peru; Photocredit: Carlos F. Pardo/2013



Bogota, Colombia; Photocredit: Carlos F. Pardo/2006

How to register a NAMA and where to find real world NAMA examples?

The motivation of developing countries to register domestic measures as NAMAs under the UNFCCC may be to demonstrate their contribution to climate change mitigation, to share their experience or to seek international support, for NAMA preparation and implementation. NAMAs can be strategies, policies, programmes and projects implemented at national, regional, or local level. Developing countries may prepare and implement NAMAs in all sectors, or even cross-sectoral. Initiatives that are developed as a NAMA can build on existing, planned or new measures.

NAMA developers may register their NAMAs at www4.unfccc.int/sites/nama. This site already provides an overview of NAMAs seeking support for preparation and/or for implementation, as well as NAMAs for recognition. To enhance accessibility, the UNEP Risø Centre has developed a less formal overview of NAMA activities, downloadable here www.namapipeline.org. Another website providing an overview of a number of NAMAs is available at www.nama-database.org by Ecofys. Moreover, GIZ has developed a database providing information on transport NAMAs, which can be accessed at www.transport-namadatabase.org.

The databases aim to provide an international overview of NAMAs, and to share experience on how mitigation actions can be undertaken within the NAMA framework. In addition to these databases, there are different partnerships to facilitate international learning and sharing of experience. See for example www.mitigationpartnership.net, which includes a list of initiatives which are currently working on NAMAs or www.namapartnership.org.



Lima, Peru; Photocredit: Carlos F. Pardo/2013



[www.transport-namas.org/
resources/toolbox](http://www.transport-namas.org/resources/toolbox)

NAMA cycle					
NAMA elements	Preparation			Implementation	M&E
	Scoping	Design	Appraisal	Construction/policy/ program implementa- tion	
Mitigation measures	<ul style="list-style-type: none"> Identification of possible measures for a NAMA (Tools: Overview table with possible measures; Fact Sheets on possible measures) Selection of a NAMA (Tools: NAMA Screening Tool) Initial description of the NAMA (Tools: Initial NAMA Concept Note template) 	<ul style="list-style-type: none"> Detailed design of direct mitigation measures, supportive and organisational measures (Tools: Identification of barriers & supportive measures; specialised consultancies, Stakeholder map; NAMA coordination (steering structure)) 	Decision making on resource allocation, MRV approach (including scope, frequency and responsibility for reporting) and financial structure and formalisation of commitments.		
MRV	<ul style="list-style-type: none"> How to define MRV objectives (Tools: Guidance for NAMA Design on MRV of NAMAs (Chapter 6)) How to Set-up National MRV Systems (Tools: GIZ MRV Tool) 	<ul style="list-style-type: none"> Definition of cause-impact chain, system boundaries, methodology Data collection & gap analysis, core assumptions Ex-ante estimation (Tools: MRV reference document and blueprints; models/software tools) 	A fully elaborated NAMA Concept Document facilitates receiving the required funds for implementation. (Tools: Full NAMA Concept template)	(Not part of this handbook. This handbook focusses on conceptual and practical guidance for NAMA preparation.)	
Financing		<ul style="list-style-type: none"> Cost and revenue estimation (Tools: Structured Table) Economic appraisal (Tools: Links to different methods) Financial structure (Tools: Financial flow charts; specialised consultancies) 	It is quite common to pass through an iterative process adjusted design of the measures/financial structure/MRV approach in order to allow for final appraisal.		
Registration	Registration with UNFCCC is voluntary, follows the procedure outlined on the UNFCCC NAMA registry website and can take place any time depending on the country's preferences. (Tool: UNFCCC NAMA Registry)				

increasing level of detail and required information, data and resources (over time)

Table I-1: NAMA Cycles

Section 1

Designing mitigation measures

1. Designing mitigation measures

Introduction

Generally speaking, any strategy, policy, programme or project that reduces greenhouse gas emissions in transport could become a Nationally Appropriate Mitigation Action (NAMA). This can include a range of actions at all levels of government or in the private sector including, for example, investments in freight and public transport infrastructure at a local level or the introduction of fuel or vehicle taxation at a national level. While this might be done for a multitude of reasons, including health, safety, better access and mobility or revenue generation, what makes a transport strategy, policy, programme or project a NAMA is its contribution to greenhouse gas emission reduction.

NAMAs are an opportunity to participate in the UNFCCC process and receive recognition for mitigation activities, as well as gather international support in the form of capacity building, technology transfer and/or financial resources. The selection of a mitigation measure can follow different approaches. In some cases national governments may pursue an initiative that has high priority within national development policy, while others may systematically analyse mitigation potential of different options in the transport sector and develop a NAMA based on high mitigation potential. Experience shows that a set of multiple criteria are the most effective means to identify and select the most suitable measure (or several) to be developed into a NAMA. In any case a selection process is required, followed by a more detailed specification and design of the selected measures. This handbook suggests a multi-criteria analysis for NAMA identification and gives guidance on the specification and design of the measures.



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Manila, Phillipines; Photocredit: Manfred Breithaupt/2013

	Elements and steps	Tools
Designing mitigation measures	1.1 Identify suitable measures	<ul style="list-style-type: none"> • Overview table with possible measures • Fact Sheets on possible measures
	1.2 Select preferred measures	<ul style="list-style-type: none"> • NAMA Screening Tool • Initial NAMA Concept Note template
	1.3 Design selected measures in more detail	<ul style="list-style-type: none"> • Identification of barriers and supportive measures • Realization of specialized consultancies • Full NAMA Concept template
	1.4 Involve relevant stakeholders	<ul style="list-style-type: none"> • Stakeholder map • NAMA Coordination (Steering Structure)

Table 1-1: Main elements and useful tools

1.1 Identify potential measures

Results of this step:

List of NAMA options



Overview table with possible measures;

Fact Sheets on possible measures

Transport is a key enabler of economic activity and social connectedness; demand for transport of passengers and goods is increasing rapidly along with economic and population growth. Different measures to reduce emissions in the transport sector can be considered to mitigate the effects of this rising demand for mobility. In the beginning of the NAMA preparation process it is important to understand which types of strategic approaches, measures and instruments can form part of a NAMA. Once a general understanding of what constitutes a NAMA is clear, relevant stakeholders should jointly come up with a **long-list of potential NAMA measure options**. After a subsequent priority setting process, a **short-list** is usually created or just

one specific NAMA option is selected for further development (see next subsection).

Mitigation measures in the transport sector can include measures to reduce or minimise and manage travel demand (Avoid), shift demand to low-carbon modes or maintain its share⁴ (Shift) and/or improving vehicle technologies and fuels (improve). This so-called **A-S-I approach** applies to passenger and freight transport and provides a useful way of classifying the spectrum of options in a systematic manner (see for a more detailed overview of possible measures “**Overview table with possible measures**” and “**Factsheets on possible measures**“ in the TRANSfer Toolbox.



Palembang, Indonesia; Photocredit: Manfred Breithaupt/2013

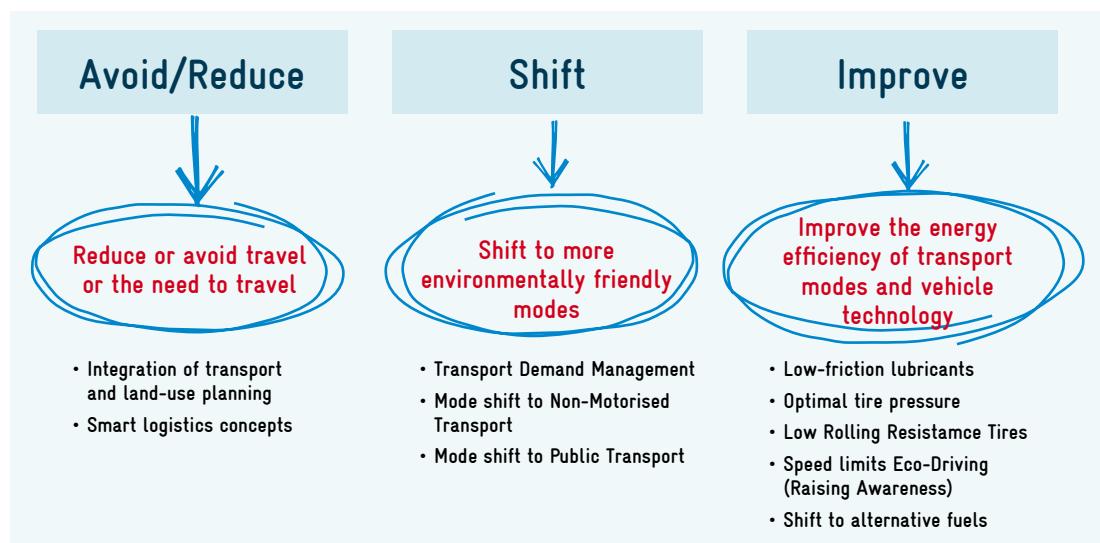


Figure 1-1: The Avoid-Shift-Improve approach (Source: GIZ)

⁴In many countries business-as-usual (BAU) scenarios show a steep increase in the modal share of motorised vehicles. Measures that slow or stop this trend contribute to GHG mitigation since the share of less carbon intense modes is maintained instead of a more carbon intense use of private vehicles as projected under BAU.

The **types of measures** that can form a NAMA can be classified as strategies, policies, programmes or projects. It is not always possible to clearly allocate a NAMA to one of these categories, since a NAMA might cover a combination of several possible types of measures:

- **Strategies** can constitute a comprehensive NAMA that starts with a common vision and specific targets and links those to concrete policies, programmes and projects to achieve these targets.
- **Policies** that can be developed into a NAMA can be a powerful tool to shape the development of the transport sector towards a sustainable, low-carbon sector at national, regional and local levels.
- **Programmes** are a combination of projects, such as a metro, bus lines and walking and cycling infrastructure and/or operation projects such as logistics concepts that are planned and implemented in an integrated way. Mostly developed on a city level, comprehensive programmes are a vital part of a transformational change, but require a policy framework that supports this change.
- **Project-based** NAMAs are usually limited to specific infrastructure investments, such as a metro or BRT line. While well-designed projects can improve specific aspects in the targeted area, they are unlikely to initiate a transformational change in the sector as a stand-alone measure and are therefore often combined with a package of measures promoting the effectiveness and potential scaling of the specific project.



Lima, Peru; Photocredit: Jeroen Buis/2013

Various **instruments to promote sustainable transport** at national and local government levels can be applied as part of a NAMA. The main instrument categories are summarised as follows:

- **Regulatory instruments**, such as vehicle fuel economy standards (national) or emission-related vehicle access restrictions for certain areas (local) can shape the fuel economy of the vehicle fleet and foster a shift to low-carbon vehicle technologies.
- **Planning instruments**, such as integrated urban and transport planning (local) that can foster mixed use, polycentric urban development, compact urban form and sustainable urban mobility planning (can be supported by national guidelines).
- **Economic/fiscal instruments**, such as fuel taxes, vehicle taxation linked to fuel economy standards or directly to CO₂ emission levels (national level), or congestion charges (local) that can discourage the use of motorised vehicles and promote the adoption of more fuel-efficient vehicles. Revenues generated by these policies can be redistributed to low-carbon transport modes and technologies.
- **Public spending/Investments** in infrastructure, such as walking, cycling and public transport improvements (local) and research and development of low-carbon fuels and vehicles (national).
- **Communication and information instruments**, such as vehicle fuel-efficiency labelling (national), driver training and information campaigns (local, regional, national), and multimodal journey planners (local).



Manila, Phillipines; Photocredit: Ko Sakamoto/2013

Type of instrument	Examples of possible instruments	Potential elements of NAMAs
Strategy/Policy	Planning	National: National urban policies and guidelines Local: Land-use plans, integrated urban and transport planning, urban mobility plans
Policy	Regulatory instruments	National: Fuel economy standards, speed limits Local: environmental zoning, bus-route optimisation, parking management, high-occupancy vehicle lanes
	Economic/fiscal instruments	National: Vehicle taxation and subsidies, fuel taxation Local: road pricing, bus ticket pricing, parking fees, sustainable transport fund
	Communication and information	National: Vehicle labelling
Programme	Public spending/investments	National and local: public spending in form of co-funding for local projects fulfilling sustainability criteria set out at national level e.g. in a National Sustainable Urban Transport Policy; co-funding of (pre-)feasibility studies and capacity building
	Communication and information	National and local: Public awareness campaigns for low-carbon transport modes, eco-driving schemes, promotion of teleworking
Project	Public spending/investments	National: Long distance rail (passenger or freight), inland waterways for freight Local: Logistic centres, Bus Rapid Transit, metro, walking and cycling infrastructure, electric vehicle charging stations

Table 1-2: Examples of instruments as possible centerpieces of NAMAs (Source: GIZ)

Transport decision makers can use and combine these instruments in strategies, policies, programmes or projects (see table 1.2) as centerpieces of their NAMAs. All of them are eligible to be registered as NAMAs, either individually or as a package (UNFCCC/UNEP/UNDP, 2013). The main motivation to develop these different types of measures and instruments into NAMAs usually includes a combination of interest in international recognition, need for technical assistance and/or a need for additional direct funding.

Ideally, multiple interventions and instruments should be developed and implemented in combination, in order for them to complement and reinforce each other, and also to seek synergies with other policy objectives, which may help to generate support and overcome implementation barriers.



Further Reading: Chapter 2 “Strategies and policies: Towards intelligent policy packages” in the book “Low-carbon Land Transport. Policy „handbook” provides a helpful overview and interesting details on the design of policy packages.

**Box 3:****Sector strategy: Sustainable Urban Transport NAMA – TRANSPeru**

The SUT NAMA in Peru comprises a comprehensive package of different measures. These measures range from activities with a countrywide focus aiming at improving overall framework conditions for sustainable urban transport in Peru, to measures targeting Lima/Callao as the main source of transport related GHG emissions in Peru, and others addressing medium sized cities with a considerable growth in transport demand. The NAMA introduces a programmatic approach using a comprehensive, multi-donor driven policy matrix to promote core policy reforms along the Avoid-Shift-Improve approach and across levels of government. Therefor the NAMA can be seen as a strategy to transform the urban transport sector in Per (sector strategy).

Further reading: www.transport-namas.org/projects/transfer-partner-countries/peru/

Policy and programme: Improvement of Road-based Freight sector, Colombia

The Colombian freight NAMA is based on three main elements: 1. The establishment of fuel and vehicle efficiency standards for new freight vehicles, 2. a scrapping incentive scheme for vehicles >25 years, and 3. the improvement of entrepreneurial and logistic organisation of the sector. With the objective of improving economic competitiveness and environmental performance of the sector, the Government of Colombia had implemented this mix of regulatory and economic incentives by means of three national policies, namely CONPES 3489, CONPES 3547, and CONPES 3759 on which the NAMA is based.

Further reading: www.transport-namas.org/projects/transfer-partner-countries/colombia/

Programme: Sustainable Urban Transport Programme Indonesia (SUTRI), Indonesia

NAMA SUTRI aims to transform urban transport in Indonesia with a mix of capacity-building and investment measures provided through a national urban transport programme. In the first phase this includes: (1) the establishment of a Technical Support Unit in the Ministry of Transport that will provide technical guidance and capacity development for local governments, and (2) the development of an effective funding mechanism to co-finance the implementation of public transport and transport demand management projects. In seven pilot cities, the NSP will (3) develop a project pipeline of eligible demonstration projects and (4) co-finance the implementation of demonstration projects in up to five cities (which might include bus fleet investment, improvement of public transport corridors, parking management and pedestrian programmes).

Further reading: www.transport-namas.org/projects/transfer-partner-countries/indonesia/

Programme: Energy Efficiency Programme for Freight Vehicles, Mexico

This NAMA aims to reduce GHG-emissions from the road freight transport sector via three main mitigation activities: (1) the introduction of energy-efficient driving courses as a mandatory part of the driver licence process (taken by road hauliers every two years), (2) massive implementation of fuel-saving technologies such as aerodynamics, Automatic Inflating Systems (AIS) and energy-efficient tires and (3) The improvement of existing emission standard regulation (NOM-044).

Further reading: www.transport-namas.org/projects/t-nama-countries-iki/mexico

Project: Passenger Modal Shift from Road to Rail – The Gautrain Case, South Africa

This NAMA covers the modal shift of private passenger vehicles to the Gautrain electric rail corridor directly, or through the feeder bus system. The programme is restricted to the Gautrain service corridor, which is itself an area of economic stimulus within the Gauteng Provincial Government. The NAMA is expected to be on-going, especially in light of Gautrain's expansion and integration into national mass transit networks.

Further reading: www.transport-namas.org/projects/transfer-partner-countries/south-africa/

1.2 Select most suitable measures



Jakarta, Indonesia; Photocredit: Manfred Breithaupt/2013

Results of this step:

List with priority
NAMA(s); Initial NAMA
concept note(s)



NAMA Screening Tool;
Initial NAMA Concept
Note template

The previous subsection showed that a wide spectrum of possible measures can be developed as a NAMA. In the preparatory stage of a NAMA, a first step is listing possible mitigation options. From such a list of possible measures, the most suitable option(s) need(s) to be selected – the focus of this subsection – and then designed in more detail, which will be discussed in the next subsection). Practical experience suggests that a set of multiple criteria should be considered in order to select the most viable option with good chances for implementation.

GIZ has developed a **NAMA Screening Tool to support this decision** (see [TRANSfer Toolbox](#)). The tool gives guidance to structure the process of screening and selecting potential NAMAs, rather than aspiring to lay out a template approach with objective outco-

mes. Methodologically, this tool follows a multi-criteria and multi-stakeholder approach. In addition to transport policy-makers, other stakeholders from government, private sector and consultancies/academics may also be involved. In the end, selecting potential NAMAs is a political decision. It is a flexible tool that can be adjusted to specific circumstances. It might be used in a rather quick and pragmatic process mainly based on expert judgement. It can also be applied as part of a longer term decision making process that includes more detailed analyses.

The following 5 key criteria are recommended for the NAMA screening and selection process. Acknowledging each country is unique and the framework for the NAMA selection process will differ, criteria can be added, deleted and/or modified to the specific context.

The following **4 key criteria** are recommended for the NAMA screening and selection process. Acknowledging each country is unique and the framework for the NAMA selection process will differ, criteria can be added, deleted and/or modified to the specific context.

Criterion 1: **Likelihood of successful implementation**

- Development status of the measure: idea, existing regulation, included in budget, implementation started, etc.
- Number and diversity of stakeholders, social acceptance
- Technical and operational feasibility taking capacity of main stakeholders into account
- Commitment of core decision makers
- Potential to overcome any further barriers to implementation

Criterion 2: **GHG mitigation potential**

- Direct emission reduction potential of the measure
- Indirect or long-term mitigation impacts

Criterion 3: **Further benefits for sustainable development/co-benefits**

- Social: access to transport, road safety, comfort increase
- Economic: economic growth, job creation, congestion reduction, security of energy supply
- Environmental: local air quality, noise reduction
- Institutional: improved institutional set-up and framework conditions

Criterion 4: **Economic and financial feasibility**

- Abatement cost per tonne of CO₂-eq
- Relation of costs⁵ and expected benefits
- Cost of MRV (complexity in methodology; data availability & need for new data; technical capacity of core stakeholders)
- Feasibility to close funding gaps with public resources (domestic or international)
- Access to finance (domestic and international, public and private)
- Financial risks

⁵ Consider all costs: technical design, construction, enforcement, operation and maintenance, capacity building, MRV.



Manila, Philippines, Photocredit: Manfred Breithaupt/2013

The selection process should involve consultation between several governmental departments/ministries and further government stakeholders (depending on the case, this might also include different levels of government), as well as the private sector and consultancies/academia. Examples of matrices that can be used to perform this process are presented in the GIZ NAMA Screening Tool and further tools for NAMA screening (see [TRANSfer Toolbox](#)).

We have found that it is quite helpful to develop an „Initial NAMA Concept Note“ (up to 5 pages long) for the most promising NAMA(s) to facilitate mutual understand of the NAMA(s) being considered by all stakeholders. Such an initial concept note describes key features of the proposed NAMA (see textbox on Key elements of an Initial NAMA Concept Note/NAMA Factsheet)



The TRANSfer Toolbox offers a template that facilitates the development of such a note (see [TRANSfer Toolbox](#)). Depending on the specific circumstances (number of potential NAMAs, number of institutions involved, familiarity with the NAMAs, etc.), it may be appropriate in some cases to develop the initial concept notes at an earlier stage, while in others it might be at a later stage of the selection process. In any case, practical experience shows that these notes can help clarifying conceptual aspects and structure the NAMA(s).

Box 4:

Key elements of an Initial NAMA Concept Note/NAMA Factsheet



- **Objective:** facilitate mutual understanding of the main ideas of the NAMA among key stakeholders; support initial discussions with possible funders
- **Recommended length:** up to 5 pages
- **Recommended contents:**
 - rationale for the NAMA
 - planned measures
 - involved stakeholders
 - main barriers and support needs
 - costs and financing
 - expected impacts (GHG and further benefits)
 - schedule for NAMA preparation and implementation



Medellin, Colombia, Photocredit: Carlos F. Pardo/2013

Box 5:**Targeting sustainable development benefits**

Parties to the UNFCCC have repeatedly highlighted that the NAMA concept is designed to foster both climate change mitigation and sustainable development. Climate change is only one of many aspects that drive policy change towards sustainable mobility. Other sustainable development aspects are often of more immediate importance, some of which are explored in the following section. Climate change mitigation can be considered a co-benefit of sustainable transport measures, even though in UNFCCC terminology it is defined the other way around.⁶ Whatever the angle under which a measure is developed, it is vital for its long-term success that economic, social and environmental aspects are not only taken into account, but also given equal weight.

From a transport NAMA perspective, this means that along with GHG mitigation, the following benefits should be targeted in its development:

- **Economic benefits:** travel time savings, travel money savings, system reliability, revenues from fees, charges and tickets, job creation, energy security
- **Social benefits:** health, traffic safety and security, access to affordable and clean mobility, social cohesion and equity, passenger comfort, urban-rural connectivity, gender equality
- **Environmental benefits:** air quality, resource consumption, noise, water quality and quantity, soil condition, energy use, biodiversity

These benefits are often the driving factors for policy intervention, particularly at the local level. As transport relies almost entirely on petroleum products, energy security is a major issue for the sector. There is a direct link between energy security and climate change mitigation actions that focus on fuel-switch options, such as biofuels and electrification. Demand side measures, such as fuel efficiency, shifting to more efficient transport modes and compact urban design, are likely to improve access to mobility services and reduce transport costs, and thus positively affect productivity and social inclusion and provide better access to jobs, markets and social services. Improved access is likely to have a positive impact on employment. A major cost factor generated by inefficient transport systems is congestion. Time lost in traffic was valued at 1.2% of GDP in the UK, 3.4% in Dakar, Senegal, 4% in Manila, Philippines, 3.3% to 5.3% in Beijing, China, 1% to 6% in Bangkok, Thailand and up to 10% in Lima, Peru. Another major factor where climate change mitigation actions can offer synergies with other objectives is related to the various health impacts of transport activities, such as air pollution, noise, vibration and road safety.⁷



Approach	Area of focus	Energy savings with GHG mitigation potential	Sustainable development benefits
Avoid	Activity (reduction and management: short distances, compact cities and mixed use)	Potential to reduce energy consumption by 10% to 30% (TFL 2007; Marshall 2011)	Reduced travel times; improved air quality, public health, safety and more equitable access
Shift	Structure (shift to more energy efficient modes)	Potential for energy efficiency gains varies greatly, 10% to 30% reductions (IEA 2012, Fulton et al. 2013; Replogle et al. 2014) Fulton et al. 2013; Replogle et al. 2014)	Reduced urban congestion and more equitable access
Improve	Intensity (vehicle fuel efficiency)	Efficiency improvement of 40% to 60% by 2030 feasible at low or negative costs (IEA 2012; GEA 2012)	Improved energy security, productivity and affordability
	Fuel (switch to electricity, hydrogen, CNG, biofuels and other fuels)	Changing the structure of the energy consumption, but not necessarily overall demand.	Diversification of the fuels used contributes to climate, air quality and/or energy security objectives

Table 1-3: Greenhouse gas mitigation potential and co-benefits potential (adapted from IPCC 2014 and Figueroa Meza et al. 2014)

⁶Official documents of the UNFCCC distinguish between 'GHG benefits' and 'co-benefits'. The former term refers to climate change mitigation effects, the latter to any other effects related to sustainable development. From a climate perspective, co-benefits are additional to the objective of reducing GHG emissions.

⁷ For an overview of synergies and co-benefits see Sims et al. 2014.

1.3 Design selected measures in more detail

Results of this step:
 technical studies; appraisal
 mission reports; barriers
 identified; direct mitigation,
 supportive and organisational
 measures defined



Identification of barriers
 and supportive measures;
 realization of specialized
 consultancies; Full NAMA
 Concept template



Jakarta, Indonesia; Photocredit: Manfred Breithaupt/2013

After the identification of potential measures for development as a NAMA (subsection 1.1) and a more detailed screening, culminating in the selection of the most suitable measures by involved stakeholders (subsection 1.2), this subsection deals with the next step to build a solid NAMA concept: the more detailed design of the selected measures.



According to GIZ's experience, measures of a NAMA are usually of three types, which must be specified before moving on to its detailed design.

- (1) **Direct mitigation measures**, i.e. measures that ultimately reduce GHG emissions, such as a new fuel economy standard, introduction of low carbon vehicles or equipment like low resistance rolling tires, an improved public transport system that shifts demand from private vehicles to public transport, etc.
- (2) **Supportive measures**, i.e. measures intended to strengthen individual or institutional capacities and to improve the framework conditions required for the implementation of the direct mitigation measures, such as training courses, support in setting up a public transport authority for improved planning, activities to improve enforcement of existing regulation, etc. Activities like data collection and processing and further activities required to set-up and operate the MRV system belong to this category as well.
- (3) **Organisational measures (process coordination and management)**, i.e. measures for sound management and coordination of the overall NAMA process, such as the establishment and operation of a Steering Committee or a Working Group, including development and regular monitoring of a work-plan, operation of an online platform for knowledge management, reporting and public relations related to the NAMA, etc.



Lima, Peru; Photocredit: Jeroen Buis/2013

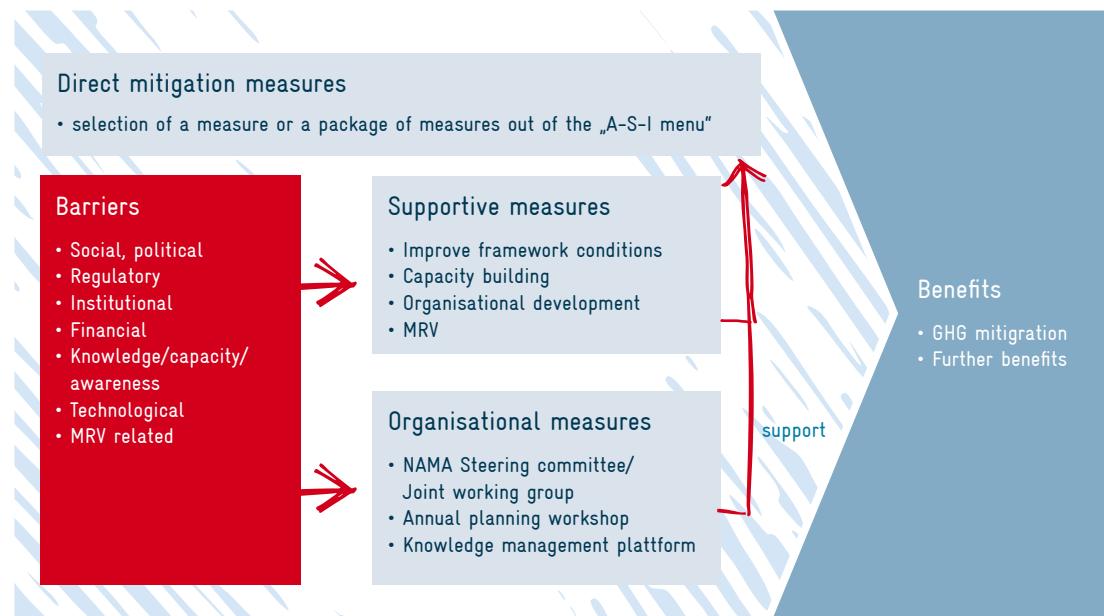


Figure 1-2: Relationship of NAMA measures, barriers and benefits (Source: GIZ TRANSfer Project)

Type 1: Direct mitigation measures:

The specification of the **direct mitigation measures** depends on the type of the particular measures chosen for the NAMA and their stage of development in the country as well as already available information. In most cases it will be necessary to contract **specialised consulting firms** that can carry out and advise on the detailed technical design. Core stakeholders should play an active role in TOR development and accompanying technical studies during their elaboration. For “project NAMAs” this step usually results in technical design/engineering studies. In the case of “policy or programme NAMAs” the focus is rather on designing new regulation and incentive schemes; consensus building among relevant stakeholders is often an important co-benefit of this.

A lack of domestic institutional coordination can be overcome through a working group for NAMA development and implementation ([see next subsection](#)). If a country has set up such a group, it could become a long-term catalyst not only for NAMA development, but also for successful policy preparation and implementation in general.



Developing countries might also identify a need for technical support to prepare and implement NAMAs. Capacity development and other supportive measures can address the institutional or individual capacity of an implementing agency, e.g. through policy advice, organisational development or training measures. Capacity development may also be required in order to improve data availability, to provide knowledge on a certain technology or to facilitate complex stakeholder-coordination processes.

Capacity building can include:

- MRV methodologies
- Data collection and analysis (e.g. vehicle data validation, household travel surveys);
- Development of transport models;
- Training for transport planners and engineers;
- Development of local, regional or national low-carbon transport plans;
- Forming or strengthening institutions that develop, implement and evaluate strategies for low-carbon transport.

Type 2: Supportive measure:

In many cases, the implementation of direct mitigation measures is not straightforward. Typically, certain barriers stand in the way, which transport policy-makers pushing a NAMA should pay particular attention to. A barrier analysis is a useful tool for assessing the current situation and to help define activities to clear these hurdles. A **barrier analysis** compares a vision of the future with the current scenario and identifies the key variables that prevent a future scenario from becoming a reality (TNA 2013). Some potential barriers to effectively and efficiently implementing transport policies and projects are: lack of institutional coordination and political support, lack of finance, lack of technical capacity, behavioural issues (individual and corporate) that affect take-up, geographical and environmental issues (e.g. hot climate, mountainous region), etc.





Palembang, Indonesia; Photocredit: Manfred Breithaupt/2013

The barrier analysis helps to identify means to overcome the barriers and facilitate the implementation of a NAMA's direct mitigation measures that ultimately lead to the expected benefits in terms of GHG mitigation and further sustainable development benefits. These measures are referred to as **supportive measures**. Table 1.4 and the associated tool can support this process (see as well [TRANSfer Toolbox](#)). You might use table 1.4 to specify supportive and organisational measures for your particular case.

You might have noticed that this is linked to the development of the MRV approach and NAMA financing ([Sections 2 and 3 of this handbook](#)). More detailed information that might be generated in dedicated work on MRV or financing can feed into the barrier analysis and/or the other way round. In the end, it is important to give the barrier analysis the attention that it deserves, to consider financial and MRV aspects

in the process and to derive actions that are required to overcome identified barriers. In the financing section, all these measures will be broken down into activities including cost estimations ([see Section 3](#)).

Box 6:

Appraisal process for supported NAMAs



In the case of supported NAMAs, such as those that receive funding from the NAMA Facility, an important part of the detailed design of selected measures is the in-depth appraisal process, which international donors require to formally approve a NAMA proposal in order to provide co-funding for its implementation. Have a look at the procedures and required documentation that the NAMA Facility requires here:

www.nama-facility.org/downloads.html

Types of barriers	Identified barriers for NAMA implementation	Required action (=supportive and organisational measures)
Social and political		
Regulatory		
Institutional		
Financial		
Lack of knowledge/capacity/ awareness		
Technological		
MRV related barriers		

Table 1-4: Barriers and supportive measures

Type 3: Organisational measures:

Regarding the specification of the **organisational measures** it is necessary to agree upon a mechanism and structure for overall stakeholder coordination and all other aspects related to NAMA management during its development and implementation. The next subsection illustrates what stakeholder involvement can look like and gives a real-world example of a steering structure.

Once the main stakeholders have specified and agreed upon the different types of measures, the next step is to expand the “Initial NAMA Concept Note” into a **“Full NAMA Concept”**. This full NAMA concept describes the NAMA in more detail on approximately **30 to 50 pages** and might be accompanied by technical appendices with details on specific design aspects of the mitigation measures and ex ante GHG mitigation estimations.

A Full NAMA Concept Document can be used to **facilitate discussions with possible funders** (domestic and international, public and private) and can help **fine-tune NAMA concepts** to meet the eligibility criteria of international donors. Such a document gives a comprehensive overview of the NAMA and presents information on the mitigation measures, MRV and financing. The current and forthcoming sections of this handbook help you to generate the content. Typical elements covered in a Full NAMA Concept Document are described in the following textbox on Key elements of a Full NAMA Concept Document.



Some examples of Full NAMA Concept Documents can be found in the [Transport NAMA Database](#)⁸ and as well on the [TRANSfer Project website](#)⁹. To facilitate the development of a full NAMA concept, the TRANSfer Toolbox offers a template – which can be adapted to your specific needs. The template contains an annotated outline indicating what content is useful to present in each section (see “Full NAMA Concept template” in the [TRANSfer Toolbox](#)).



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Manila, Phillipines; Photocredit: Ko Sakamoto/2013

Box 7:

Key elements of a Full NAMA Concept Document



- **Objective:** fine tune NAMA concepts; comprehensive overview of the NAMA; support discussions with possible funders and related proposals/applications
- **Recommended length:** 30 – 50 pages plus technical appendices
- **Recommended content:**
 - Executive summary for decision makers
 - Overview of the sector
 - Barriers
 - The NAMA: Potential, measures, targets & expected impacts
 - MRV approach
 - Financing the NAMA: required resources and financing mechanisms and structure
 - Technical annexes (e.g. on technical design and ex ante GHG mitigation estimations)

⁸ See www.transport-namadatabase.org

⁹ See the country sections on: www.transport-namas.org/transfer-partner-countries

1.4 Involve relevant stakeholders

Results of this step:
Overview of key stakeholders and their relationships; NAMA Working group or Steering Committee structure clearly defined



Stakeholder map; NAMA Coordination (Steering Structure)



The previous subsections ([subsections 1.1 to 1.3](#)) gave an overview of the main steps toward properly designed mitigation measures; this subsection draws attention to the issue of **stakeholder involvement**. Adequate stakeholder involvement is an important factor for success throughout the entire NAMA cycle and can be considered a **cross-cutting issue**, which is relevant not only for the design of the mitigation measures ([section 1 of this handbook](#)), but also during the development of the MRV approach and the process to structure the financial side of the NAMA. This subsection illustrates the kind of main stakeholder groups that might be of relevance, show ways how to scope them and highlights examples of possible steering structures to coordinate and manage a NAMA.

While governments tend to be the driving forces behind the development and implementation of NAMAs (UNEP Risø Centre, 2014) a NAMA development process should be based on a **broad coalition of key stakeholders** including public sector, private sector and specialized experts from academia, consultancies, and NGOs. Public sector participation is important to ensure the long-term commitments and stability that are required to deliver and achieve a transformational change to sustainable low-carbon mobility.

As the name indicates, a **Nationally Appropriate Mitigation Action**, i.e. a NAMA, at least requires the support of **national governments**, even if they do not lead the NAMA development when the initiative comes from a local or regional government or even from the private sector. However, in many cases the initia-



Jakarta, Indonesia; Photocredit: Manfred Breithaupt/2013

tive does come from the national level, and Ministries of Transport (or their equivalent) are well positioned to coordinate the development and implementation of transport NAMAs that fit the context of the country's sector.

In most cases, countries select one government entity and assign to it the overall, cross-sectoral coordination of a country's NAMA pipeline, for example the Climate Change Commission in the Philippines, the National Planning Ministry in Indonesia or the Ministry of Environment in Colombia. These "**NAMA focal points**" are usually responsible for coordinating the national climate change policy agenda and serve as the link to the UNFCCC process. They assume a **general coordination role**.



Palembang, Indonesia; Photocredit: Manfred Breithaupt/2013



The actual responsibility for the design and implementation of a NAMA is normally with the relevant **line-ministries**. Mitigation actions that are implemented at local or provincial level require the additional involvement of the **sub-national government and local authorities**. The **National Focal Point for Climate Change** can undertake the submission of a NAMA proposal to the **UNFCCC registry**, but other parts of government can also be designated to do so.

During NAMA development **additional government agencies** should be involved, particularly the ministry of finance and/or the ministry in charge of economic development and ideally the prime ministers or president's office. Close collaboration between several national levels, and – as the case may be – entities at sub-national levels, is recommended from an early stage to ensure widespread political endorsement. For the development of a supported NAMAs it may [?] be crucial to find an **international donor** willing to contribute to NAMA financing. To grow support it is important to involve potential funders at an early stage of NAMA development in order to consider their requirements at the outset.

A helpful tool to get an overview of the different stakeholders and their relationships is the “**Stakeholder Map**” (see [TRANSfer Toolbox](#)) and figure 1-3 below. A stakeholder map for a particular project can be easily developed and provides a visual overview of the stakeholder landscape. In case of NAMAs with a very broad scope (e.g. entire (sub-)sector reforms) it might be helpful to come up with individual stakeholder maps for certain elements of a NAMA.

Box 8:

NAMAs at local level

Local Mitigation Actions at sub-national levels require different forms of stakeholder involvement. Depending on the administrative structure and distribution of responsibilities in a country, transport and planning authorities at local and provincial levels may be best positioned for the process of NAMA development and implementation. In any case, it is recommended that the national focal point to the UNFCCC is involved from an early stage of the process.



Lima, Peru; Photocredit: Carlos F. Pardo/2013

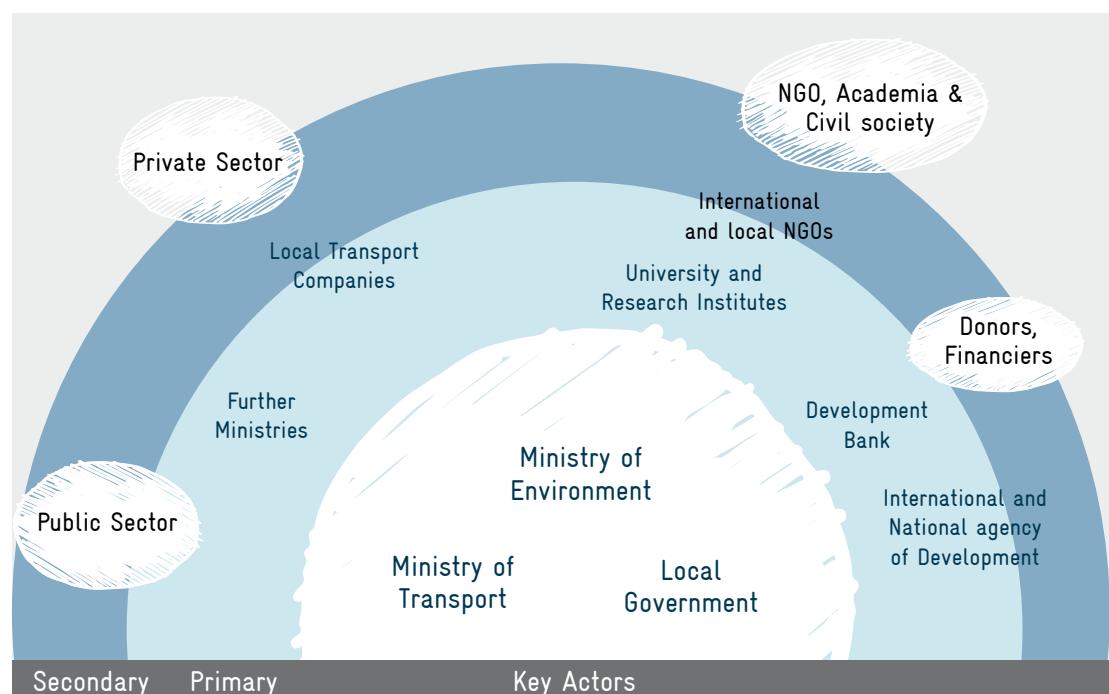


Figure 1-3: Generic example of a stakeholder map (Source: GIZ TRANSfer Project)

Structured stakeholder coordination is strongly recommended to facilitate NAMA development and implementation, either in the form of a **joint working group** or a **steering committee**. A stakeholder map can provide useful input for the design of a NAMA's overall stakeholder coordination and management structure. The establishment of a joint working group can help the development of a NAMA as several departments will usually be required for the implementation of the selected measures.



We suggest that a **joint working group is established at an early stage** of the development process for a NAMA proposal. For the constitution of a working group **existent mechanisms or structures must be considered** – and whenever possible – used to avoid overlapping or multiple efforts. Such working groups normally hold meetings at regular intervals until the concept for the transport NAMA is developed into a full grown NAMA proposal. Its activities might also extend well into the implementation stage of the transport NAMA.



The **membership** of the joint working group is subject to the governance process of each country. Such a joint working group may include experienced technical experts or decision-makers from the relevant de-

partments who, by virtue of their position, are able to promote the outcomes of the working group within their departments. In addition to national government representatives, it is recommended to include local governments, NGOs, research institutes and private-sector representatives (e.g. business associations) as guests or full members in the group, depending on the scope of the planned activities. Continuity is key to success and effectiveness. Therefore, it is helpful if at least a core group of the same individuals participate in the entire process.

Successful examples show that it is important to find a way for efficient and effective involvement of **decision making and working/technical level**. Working/technical levels are normally well-represented and actively taking part in regular meetings of a joint working group or steering committee. Involvement of high-level decision makers and approval procedures of certain elements of a NAMA can take place in various forms. They vary depending on the decision-making structures and practices in a country. In NAMA examples from Mexico and other countries, high-level decision makers are involved via individual meetings and participation in the joint working group in particular sessions for decision makers.

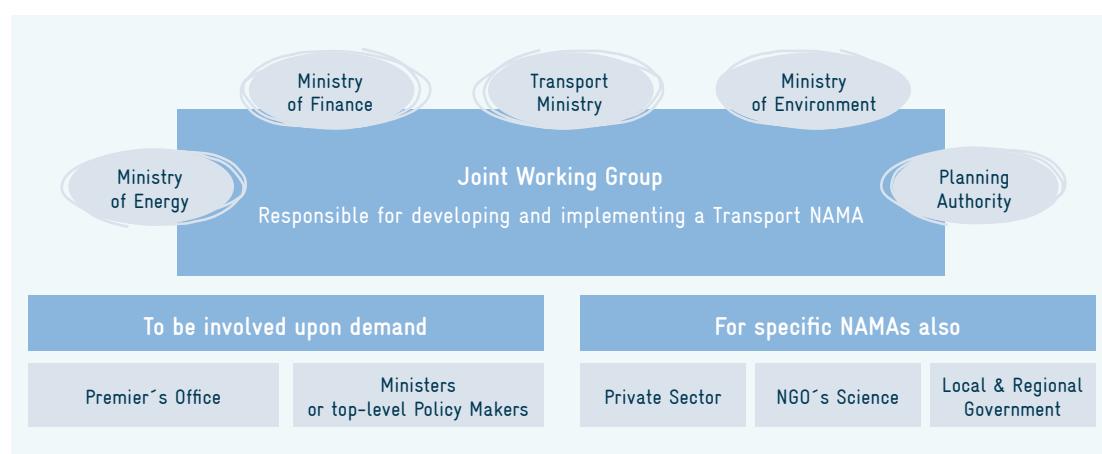


Figure 1-4: Structure of Joint Working Group for NAMA development (Source: Wuppertal Institute)

Typical elements of a joint working group or steering committee that should be defined and agreed upon by the stakeholders when setting up such a structure are listed below; further details can be found in the respective TRANSfer Tool: “[NAMA Coordination \(Steering Structure\)](#)”:

- **Objectives and functions:** serve as platform for discussion and decision making for the design and implementation of the NAMA; report to ministers/vice-ministers about NAMA progress; coordinate the planning and implementation of specific activities and create synergies between the members and further stakeholders; develop an annual work plan and monitor its fulfillment.
- **Structure:** organisational chart with a brief explanation.
- **Description of specific functions of the Coordinator, the Technical Secretariate and the Members** of the working group/committee and the responsible institution and individual(s).
- **Meetings:** including a specification of program/scope (e.g. a standard meeting agenda), frequency, meeting minutes and venue.



Mexico City, Mexico; Photocredit: Carlos F. Pardo/2006

Box 9:

Steering Committee for the Urban Transport NAMA in Peru (TRANSPerú)



The Steering Committee is tasked to effectively and efficiently develop and implement the NAMA. The Committee consists of the most relevant national and sub-national public entities and institutions, private sector and international partners. It serves as a common discussion and decision-making platform, reports to the vice-ministers, coordinates the activities within the framework of the NAMA, and identifies synergies among the partners. The Committee meets on a bi-monthly basis and follows an annually established joint work plan. Working rules have been established in order to facilitate the meetings.

The role of the coordinator to invite and guide through meetings is assumed by the Ministry of Transport (MTC). The Committee is supported by a Technical Secretariat, which supports the preparation, realisation and follow-up of all meetings. Additionally, it monitors the joint work plan. The members of the Committee each assume an active role in at least one of the activities under the NAMA.

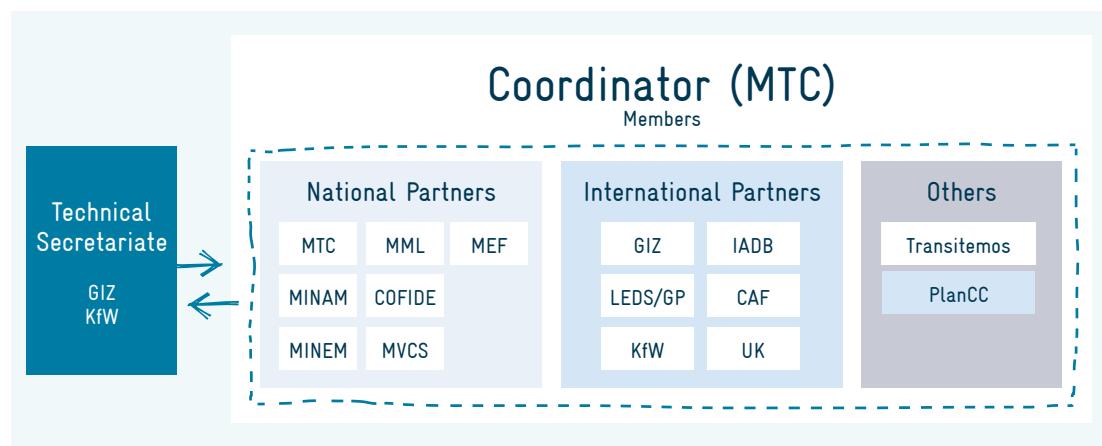


Figure 1-5: Steering Committee of Peruvian Sustainable Urban Transport NAMA (Source: GIZ TRANSfer Project)

1.5 Checklist and tips for further reading

The steps outlined in this handbook only describe one possible way to approach the development of a NAMA. In reality, this process will have to be adapted to the national circumstances and corresponding decision-making processes. Nevertheless, the major steps of the process presented in the handbook can be used as guidance, as they constitute the key elements that enable successful development. They are vital to receive the necessary political, technical and financial support to endure after implementation.

Checklist: Designing mitigation measure(s)	<input checked="" type="checkbox"/>
Key stakeholders actively participate in the process.	
Long-list with potential NAMA options is developed.	
Short-list with top priority NAMA options(s) agreed among key stakeholders.	
Initial NAMA Concept Note is developed and agreed among stakeholders.	
Main conceptual, information and data gaps for detailed design identified.	
Detailed conceptual/technical design studies/consultancies carried out.	
Mitigation measures clearly specified (direct mitigation measures, supportive measures, organisational measures).	
Capacity building needs identified (at individual, organisational and system levels).	
A mechanism for coordination/steering structure for NAMA development and implementation is designed, accepted by core stakeholders and operational.	

Tips for further reading

GIZ TRANSfer Project “Transport NAMA Toolbox”

- Factsheets on different sustainable transport measures for potential NAMAs, transport-namas.org/resources/toolbox/

GIZ Sourcebook for Decision-Makers in Developing Cities

All modules available online in several languages at: www.sutp.org/en-sourcebook/

- Module 1d. ‘Economic Instruments’ (Manfred Breithaupt)
- Module 1g. ‘Urban Freight in Developing Cities’ (Bernhard O. Herzog)
- Module 2a. ‘Land Use Planning and Urban Transport’ (Rudolf Petersen)
- Module 5e. ‘Transport and Climate Change’ (Holger Dalkmann and Charlotte Brannigan)
- Module 5h. ‘Urban Transport and Energy Efficiency’ (Susanne Böhler-Baedeker and Hanna Hüging)
- Module 5g. ‘Urban Transport and Health’ (Carlos Dora, Jamie Hosking, Pierpaolo Mudu, Elaine Ruth Fletcher)

Additional sources

- Bongardt, D *et al.*, (2013) *Low-Carbon Land Transport - Policy handbook. Chapter 2*.
- Bongardt, D, Breithaupt, M, and Creutzig, F (2010) *Beyond the fossil city: Towards low carbon transport and green growth, Sustainable Urban Transport Project (SUTP)*, GIZ, Eschborn, Germany. Available at www.sutp.org/component/phocadownload/category/67-td6?download=135:td-lct-en
- Sakamoto, K, Dore, C and Jinca, A (2011) *NAMA Guidance Document for the Transport Sector*. Available at <https://docs.google.com/file/d/0B45swsIR-HujVdGJEdTdURVA5T1k/edit>
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Section 2

MRV: Measurement, Reporting, Verification

2. MRV: Measurement, Reporting, Verification

Introduction

A vital step for successful implementation of a strategy, policy, programme or project is the assessment of its impact. When developing sustainable transport measures as a NAMA certain aspects have to be measured, reported and verified – or MRVed.

Measurement, reporting and verification can be defined in the context of NAMAs as follows (UNFCCC/UNEP/UNDP, 2013: 53):

Measurement	Collect relevant information on progress and impact.
Reporting	Present the measured information in a transparent and standardised manner.
Verification	Assess the completeness, consistency and reliability of the reported information through an independent process.

Table 2-1: Measurement, Reporting and Verification



Generally speaking, impact assessment methodologies currently used for most transport project appraisals are already well placed to meet the MRV needs and a thorough impact assessment (Measurement) can be a powerful tool for effective policy making. Transport data collected to measure the impact of NAMAs can also improve future transport planning. At the same time, this information helps provide a better picture of the overall global progress towards reducing greenhouse gas emissions. Reporting on progress and impact is particularly relevant for NAMAs that seek international financial support, as donors are concerned with the effectiveness of their investments.

MRV is beneficial for three main reasons:

1. MRV helps to understand the effectiveness of measures and to improve the efficiency of their implementation (Monitoring & Evaluation). The impact of a NAMA is not only relevant for GHG mitigation; it also demonstrates a country's contribution toward meeting its development objectives.

2. MRV shows donors what their funding has achieved. It may be a requirement of donors to determine the impact of the support provided. In addition to the mitigation impact of policies, programmes or projects, the sustainable development benefits may also be part of bilateral MRV agreements between NAMA host countries and their financial supporters.

3. MRV increases transparency about climate change mitigation strategies and helps to share experiences internationally.

The following sub-section (2.1) explains the basic MRV concepts for NAMAs and how NAMA MRV relates to already established monitoring procedures. Subsequent sub-sections of the handbook provide guidance of each step of the MRV process, including the identification of impacts, how to set up a monitoring plan and how to assess GHG and other impacts of transport NAMAs step by step.

Steps	Tools
MRV	Define MRV Objectives
	Identify effects of the NAMA and define boundaries
	Develop a monitoring plan
	Measure NAMA impact
	Report on GHG impact
	Verify GHG impact

Table 2-2: MRV steps and useful tools

2.1 MRV basics

Results of this step:
Understanding MRV rationale, what to MRV and which types of indicators can be used.



Guidance for NAMA Design on MRV of NAMAs (Chapter 6), GIZ MRV Tool

Measurement, reporting and verification is part of everyday life: when we are seriously ill, we measure our body temperature, report it to the doctor and in some cases the doctor makes an independent measurement to verify our report. When we set goals, such as "I want to lose weight," we define indicators, which we can measure. However, many aspects that may be important to us, like happiness, security, or friendship, may not have quantitative indicators. Here it is only possible to make a qualitative assessment.

It is quite similar in the transport sector. Some key indicators can be quantified (e.g. travel speed, energy consumption, emissions, expenses) while other aspects need to be assessed qualitatively (e.g. passenger satisfaction). Quantitative indicators can be measured in units such as kilometres, litres or inhabitants. In order to measure qualitative indicators, it can be useful to design a scale (e.g. five levels from fully satisfied to unsatisfied) to allow comparison and determine average values. Both quantitative and qualitative assessments are important for good decision-making.

In the UNFCCC context, the emphasis of monitoring is on greenhouse gas (GHG) emissions, which are primarily responsible for global warming, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and short-lived climate forcers such as black carbon (soot). While there are great opportunities to reduce black carbon emissions from transport in the short-term, the biggest climate change mitigation potential in the transport sector lies in reducing carbon dioxide (CO_2).



MRV requirements for NAMAs are different from already established monitoring methodologies and procedures that exist for national inventories or the Clean Development Mechanism (CDM; see table 2-3). In fact, there are no formalised UNFCCC rules, and any guidance given to date is either voluntary or based on donor requests if NAMAs are internationally supported. Consequently, there is a lot of flexibility when it comes to the design of MRV for transport NAMAs. Nevertheless it is helpful to understand the differences of NAMA MRV and other monitoring methodologies, and to learn from established procedures.

CDM projects generate carbon credits that can be purchased by other countries to offset domestic emissions. This means that for each carbon credit, buyer countries can emit an additional tonne of CO_2 . Therefore, strict MRV rules have been developed by the CDM Executive Board (<http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf>) to verify the exact amount of CO_2 -equivalents reduced by a specific acti-

Box 10:

Greenhouse gas emissions at a glance



Carbon dioxide (CO_2) is a gas derived from the combustion of fossil fuels, which represents the bulk of anthropic GHG emissions (about 55%). Taken as the reference greenhouse gas, it has a global warming potential (GWP) of 1.

Methane (CH_4) accounts for about 15% of anthropic GHG emissions. Two-thirds of methane emissions result from human activities such as crop farming, the extraction of natural gas and prairie activities (pasture systems and tallgrass burning). The remaining third is of natural origin (fermentation of plant or animal matter). Methane's impact on climate change is 25 times higher per tonne than that of CO_2 and it has a global warming potential (GWP) of 25.

Nitrous oxide (N_2O), which represents 5% of anthropic GHG emissions, has a GWP 298 times greater than CO_2 . The largest human-related sources of nitrous oxide are crop farming (nitrogen fertilizers), biomass combustion and industrial activities.

Halocarbons and other synthetic fluoro compounds (HFC, PFC and SF6) derive from human activities, as they do not exist in nature. They are used in refrigeration and cooling systems as well as aerosols. These gases account for 15% of GHG emissions and their respective GWP varies substantially (from 140 to 23,900).

Nearly 10% of GHG gases result from tropospheric ozone (O_3), i.e. the effect of solar radiation on other atmospheric pollutants, such as nitrogen oxide or carbon monoxide. Sources include human transport systems.

Source: Panorama 2009: Greenhouse gas emissions and the transport sector http://www.ifpenergiesnouvelles.com/content/download/67679/1470180/version/2/file/Panorama2009_07-Gas_emissions_transport.pdf.

on. NAMAs have a much broader scope than the project-based CDM and accuracy requirements for MRV are not as high. Nonetheless, for some project-type measures, such as for BRT developments or fuel switch projects, suitable CDM methodologies may be used or adapted (Sharma/Desgain, 2013, p.22).



For measurement, reporting and verification (MRV) of a country's national or sectoral emissions, elaborate rules and guidelines have been developed to set-up emission inventories. The purpose of an inventory is to gain an overview of all emissions in a sector, country or city.



Inventories	NAMAs	CDM
What is the status of emissions now and how have they developed over time?	What is the mitigation impact of a NAMA (policies or projects)?	Exactly how many tons of CO ₂ eq were reduced by this specific project?
GHG inventories provide a snap shot of national (or urban) GHG emissions at a point in time and are normally aggregated by sectors. Time series of GHG emissions can give a historic GHG emissions trend of countries (or cities). Countries are encouraged to use more detailed data (called tier 3 in the IPCC guidelines) for estimating emissions with higher accuracy. Inventories do not explain the reasons for changes in emissions (which could be due to economic development or successful mitigation actions).	MRV of NAMAs aims at estimating or measuring the contribution towards mitigation through policies, programmes or projects. Thus attribution to actions is important (in contrast to MRV of inventories). There are no formalised rules on UNFCCC level. Any guidance given to date is fully voluntary or based on donor requests if NAMAs are internationally supported.	MRV rules for CDM projects are very strict to ensure high accuracy with respect to the mitigation impact. Methodologies are approved top-down on UNFCCC level to set a common framework, which allows offsetting or trading of certified emission reductions (CERs).
Inventories can deliver relevant information for identifying mitigation potentials in the NAMA selection process. This is especially true if emissions are attributed to specific users (e.g. vehicle types, or sub-national regions). Data from inventories can inform MRV of NAMAs, depending on the type of NAMA as well as the level of detail of the inventory.		CDM MRV methodologies may be helpful for some project-type measures. For policy NAMAs CDM methodologies cannot function as blueprints. The CDM Executive Board has published two methodological tools for baseline establishment that can inform MRV of NAMAs. One is for modal shift in passenger transport and one is for modal shift in inter-urban cargo transport.

Table 2-3: Different MRV for different purposes (Source: Wuppertal Institute)



In contrast to inventories, the purpose of MRVing NAMAs is to assess the impact of an individual policy, programme or project. Nevertheless, **data from transport emission inventories can be used for or linked to NAMA MRV, if inventories are built on bottom-up data based on transport activity**, not only on overall fuel consumption data. The approach and values used for NAMA MRV should be consistent with national transport inventories, especially regarding the data structure (how data is organised) or country specific default values. Figure 2-1 illustrates how bottom-up transport inventories can interlink with NAMA MRV.



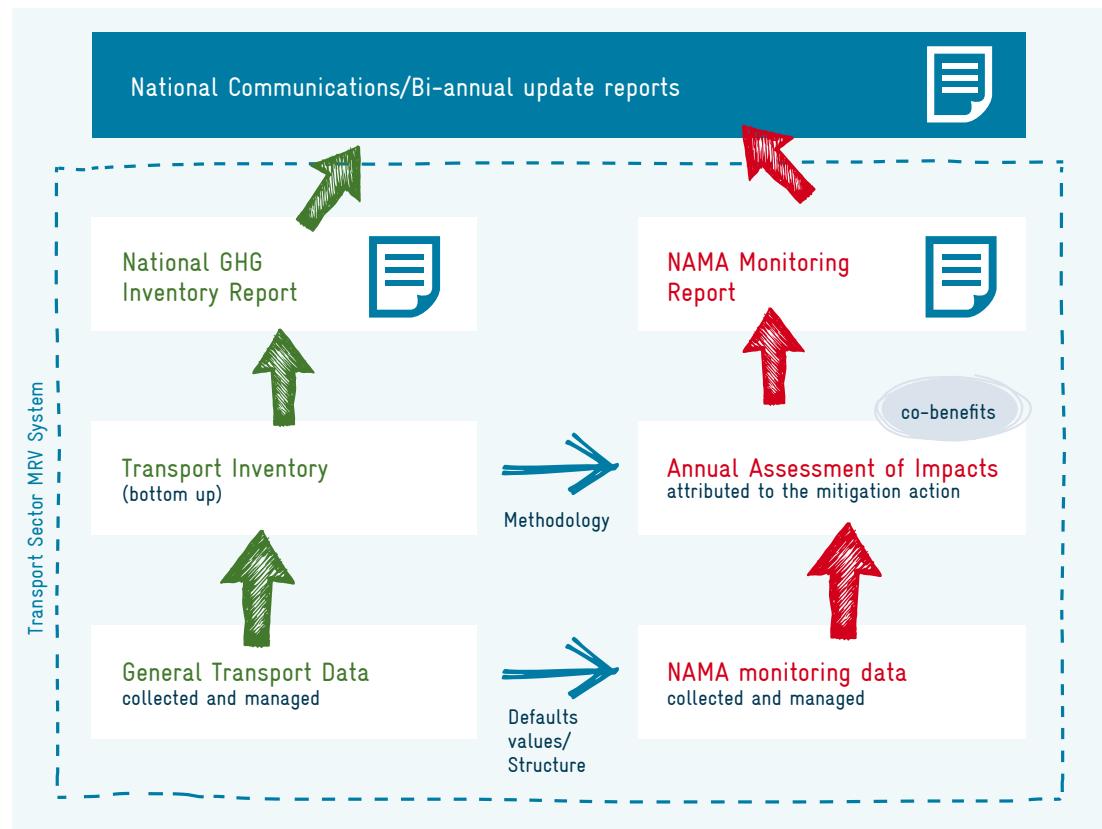


Figure 2-1: Links between NAMA MRV and bottom-up transport inventories

Unlike national inventories or CDM projects, there are no fixed rules for MRV of NAMAs. This flexibility in developing an MRV concept allows for consideration of the local conditions and data availability, and the needs and expectations of the host country, NAMA developers or donors (which information should it deliver?). The main benefits of MRV are illustrated in Figure 2-2. The MRV approach of the “Road-Based Freight Programme” in Mexico illustrates how MRV has identified significant opportunities to improve the programme (see Textbox 11).

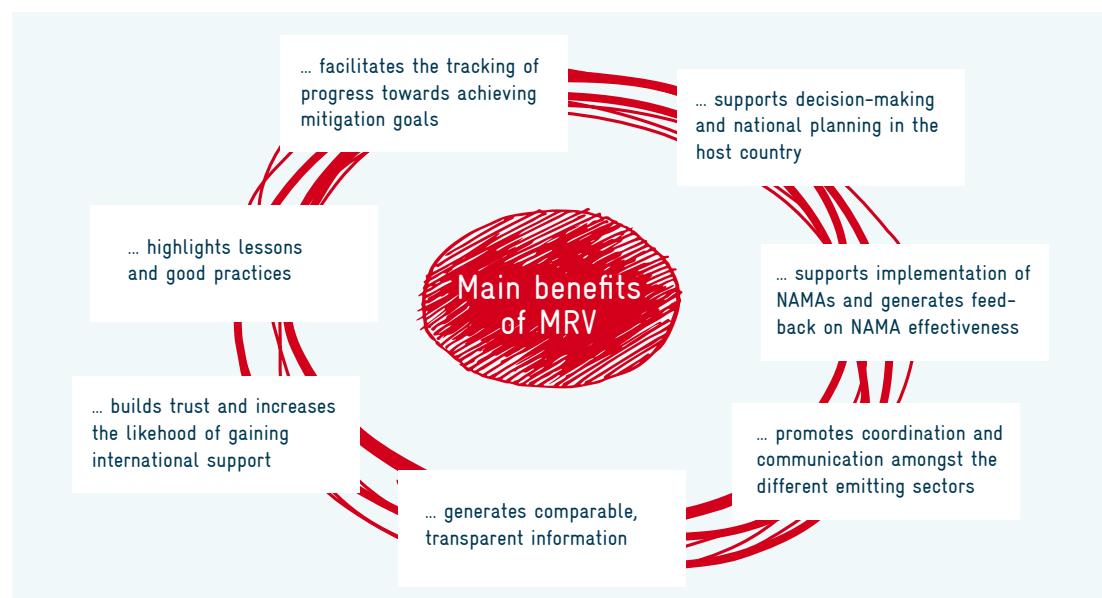


Figure 2-2: Main benefits of MRV

What to MRV

The impact assessment – the core element of a NAMA MRV process – is very similar to assessment, monitoring and evaluation processes that are already in place in many national and local administrations. While this handbook focuses mainly on measuring greenhouse gas emission reductions, it also touches on other sustainable development benefits that can be generated by a NAMA. The following sub-sections provide an overview of different MRV aspects to show the linkages between what is already being done in transport ministries and local administrations (regardless of NAMAs) and what is needed to turn an existing mitigation action into a NAMA.

Why to MRV

Although NAMAs are strongly associated with reducing **GHG emissions**, other sustainable development benefits, such as productivity, air quality and health may be equally or even more important in a national context. Thus, MRV of **sustainable development benefits** may be of particular interest for national and local governments. A major benefit of the NAMA concept is the ability to give sustainable development objectives a more prominent role in the assessment of measures. Impact assessment of sustainable transport policies, infrastructure and operations measures has a long history and a variety of tools are already available (see sub-section 2.5). In several developing countries and cities, impact assessment and monitoring approaches are already more elaborate than required for estimating GHG emissions for certain transport specific impacts, such as local air pollutants or road safety. Such models can provide useful data and experiences for MRV of transport NAMAs. A few studies provide some MRV advice specifically for NAMAs (e.g. Cerqueira, 2012 and NAMA Partnership, 2013).

During the implementation phase of a mitigation action, **progress needs to be monitored**, especially for internationally supported NAMAs, where donors may require periodic updates on implementation development. Thus, MRV of implementation needs to be negotiated with national institutions and donors who support NAMAs.

Finally, industrialised countries have an interest in accounting for the **climate finance** being provided to support developing countries in their mitigation actions. MRV of finance is very simple for an individual NAMA: received funds and general investments need to be accounted and reported. Setting up institutions and effective processes to gather and aggregate climate finance data on a national level is an unsolved issue in many countries (Clapp et al., 2012). Indonesia has developed the Indonesian Climate Change Trust Fund (ICCTF) to facilitate climate financing ([more information online](#)).

Box 11:**Example 1**

MRV of the Road Freight Transport NAMA in Mexico identifies potential for policy improvement MRV findings included:

1. There is a "perfect vehicle scrap age"
2. Among the different types of trucks the most significant mitigation potential lies in scrapping vehicle type C3
3. Fleet renovation is more effective than scrapping alone
4. Environmental impact of scrapping alone is relatively small
5. Environmental impact of fleet renewal with new trucks is significantly better than renewal with 3-4 year-old vehicles
6. Data needs to be collected and updated, but expenses for MRV approach in general are limited.

Recommendations based on these findings:

- Do not only focus on the scrapping; complement it with further measures (quality standards, driver trainings etc.).
- MRV can be built and improved step-by-step.
- Increase incentive for scrapping; most scrapped vehicles are currently about 30 years old, because the incentive to scrap typically accounts for the value of a 30-year-old truck. However, the perfect scrapping age in Mexico would be between 10 and 20 years.
- Newly entering trucks must comply with most efficient technology available.
- When designing a vehicle scrapping programme, analyse the mitigation potential of different scenarios in advance to achieve high mitigation impacts through the incentive measures.



Mexico City, Mexico; Photocredit: Carlos F. Pardo/2006

GHG emission reduction	Assessment of <ul style="list-style-type: none"> • direct emission reductions (quantitative) • indirect emission reductions (mostly qualitative) • contributions towards transformational change (qualitative)
Non-GHG impact/sustainable development benefits	Contributions towards sustainable and national development, such as local air quality or road safety etc.
Progress of implementation	Is the action (policy or project) on track? Is progress being made according to plans and expectations? Where would adjustments be deemed necessary? Should finance/support by donors (domestic and international, public and private) proceed as planned?
Climate finance	Finance channelled towards sustainable development and GHG reduction measures implemented by a NAMA. International and national climate finance data is easily available at the level of the individual NAMA – the challenge is to provide national processes and institutions which collect, aggregate and report information of all funding received.

Table 2-4: What can be measured: an overview of MRV aspects (Source: Wuppertal Institute)



More information can be found in the MRV Tool developed by GIZ, which provides step-by-step guidance and concrete examples for setting up national MRV systems ([MRV Tool](#)). The tool is available in English, Spanish and French.

How to MRV

In order to quantify emission reductions of a NAMA, different types of indicators may be considered, including:

- **Direct indicators** describe a NAMA impact which can be directly translated into GHG mitigation (e.g. reduced fuel consumption, reduced travel activity).
- **Indirect (or proxy) indicators** describe changes in the transport system that are not directly linked to GHG emissions (e.g. kilometres of new railway lines, fuel taxes received).
- **Process indicators** describe activities that aim to initiate an emission reduction (e.g. implemented policies, regulation passed).

A wide range of indicators best suits many transport NAMAs because they may not result in immediate, direct emission reductions, but may rather lead to indirect emission reductions in the long-term (e.g. fuel savings due to technical improvements can be quantified but the mitigation impact of non-motorised transport promotion can only be proven over the long term).

Depending on the nature of the NAMA and the data available, a combination of different types of indicators can be used to develop an MRV approach for both GHG mitigation effects and other sustainable development benefits. Huizenga and Bakker (2010:

55) assert: “because of the huge costs of accurate data collection, as well as the variety in local conditions, the monitoring of GHG impacts in the transport sector lends itself to a mixture of actual calculation of GHG emissions reductions, indirect or proxy indicators and, in some cases, process indicators.”

See also sub-section 2.2.3 for an example on indicators to MRV the sustainable urban transport programme in Indonesia (Box 14).

In order to define the right mix of indicators for a specific NAMA, the exact objectives of MRV need to first be explicit (what am I conducting MRV for and what information do I need to report to whom?). This is discussed in sub-section 2.2.1. Then, potential effects of the NAMA need to be identified and MRV boundaries set (sub-section 2.2.2). Once the effects of the NAMA that should be covered in the MRV approach are known, one can define an adequate indicator mix and develop a monitoring methodology and plan (sub-section 2.2.3). On this basis, the impact of NAMAs can be quantified (sub-section 2.2.4) and reported (sub-section 2.3). Sub-section 2.4 briefly discusses verification of GHG impacts. The last sub-section (2.5) provides a checklist and information on additional literature and tools on MRV of transport NAMAs.

Indicator types	Process indicators to monitor implementation and performance		Direct and indirect impact indicators	
Objective	Change	Quality of change	Direct indicators on GHG emission reduction (Outcome Indicator)	Indirect indicators on Transport data (Output Indicator)
What do they describe?	Progress on steps taken to implement a NAMA	Quality of NAMA implementation to ensure that the NAMA initiates a transformational change	Tonnes of abated CO ₂ equivalent and subordinated direct GHG impact indicators to calculate emission reductions	Impact on certain conditions of the transport system or of the traffic situation achieved by a NAMA
Examples	<ul style="list-style-type: none"> • Policy or regulation passed • Number of capacity building workshops organised or number of people trained • Budget allocated and spent 	<ul style="list-style-type: none"> • Cooperation between stakeholders is improved • Demonstration projects selected based on an integrated urban mobility plan • Implemented measures fulfil a certain standard, such as BRT Gold Standard etc. 	<ul style="list-style-type: none"> • Carbon content of fuel • Emission savings of a fleet operator • Changes in modal share • Changes in travel activity 	<ul style="list-style-type: none"> • Kilometres of new bicycle lanes; • Number of newly registered vehicles with new fuel efficiency standard

Table 2-5: Different types of indicators for MRV of transport NAMAs (Source: Authors' compilation based on Huizenga and Bakker 2010)

2.2 Measurement

Results of this step:
MRV objectives and boundaries are set.
Effects of measures are identified and assessed.
A monitoring plan is in place.



Reference Document on Monitoring Systems for the Transport Sector (forthcoming)

Similar to “traditional” impact assessments, an analysis of the emission reduction potential is a vital element for a NAMA. The following sub-sections introduce the required steps to define the boundary and approach to NAMA measurement and explain how emission reductions of transport NAMAs can be quantified.



Johannesburg, South Africa; Photocredit: Jonas Bleckmann/2012

2.2.1 Define objectives of the MRV approach

Results of this step:
A clear picture of what MRV is conducted for in order to consider related requirements.



Case studies of TRANSfer partner countries

Before starting to evaluate its (GHG) effects, a NAMA has to be characterised. This includes a general description of the NAMA and its measures, regional and temporal scope, main objectives, target groups and how the NAMA affects the target groups.

In order to develop a suitable MRV approach it is recommended to define the objectives of the GHG assessment. Having clear objectives is necessary to determine the required level of accuracy and completeness. Examples of objectives are listed below (WRI GHG Policy and Action Standard).

This sub-section focuses on GHG emissions, but the MRV framework should also cover sustainable development goals so that the objectives of the MRV concept include the contribution of a NAMA towards these non-GHG impacts.

Box 12:

Example 2 of objectives for MRV of NAMAs



Before policy implementation:

- Choose among policy options based on their expected GHG effects
- Improve the design of policies by understanding the effects of different design choices
- Define GHG reduction goals based on potential GHG reductions from policy options
- Report on expected future GHG effects of policies and actions being considered or implemented (for domestic or international purposes)
- Attract and facilitate financial support for mitigation actions by estimating potential GHG reductions

During or after policy implementation:

- Understand whether policies and actions are effective in delivering the intended results
- Inform and improve policy implementation
- Decide whether to continue current activities or implement additional policies
- Learn from experience and share best practices
- Evaluate the contribution of policies and actions toward broader GHG reduction goals
- Ensure NAMAs are cost-effective and that limited resources are invested efficiently
- Report on the GHG effects of policies and actions over time (for domestic or international purposes)
- Meet funder requirements to report GHG reductions from mitigation actions

Source: WRI's Policy and Action Standard

2.2.2 Identify the effects of a NAMA and set MRV boundaries

Develop Cause-Impact Chains

Results of this step:
List of impacts that should be measured, reported and verified.



Cause-Impact Chains

In order to estimate GHG effects of a policy or action, both intended and unintended effects of a NAMA should be taken into account. **A useful instrument to identify a NAMA's effects is to map a causal chain of how the mitigation action will lead to a reduction of GHG emissions and to other sustainable development benefits** (see Example 2-3 below). The causal chain should include all expected effects, including both positive and negative and major and minor impacts. Developing such a cause-impact chain is not trivial, but the process facilitates a discussion between relevant stakeholders in order to create a common understanding of the adequate scope for MRV. It can also help to establish the adequate scope of the NAMA itself.

In order to identify a measure's potential impacts, the cause-impact chain can help break down the NAMA into individual outputs/activities. Depending on the objectives of the MRV approach, the NAMA developer may include GHG effects as well as Non-GHG effects:

- Outputs: Deliverables that will be implemented within the scope of a NAMA (e.g. provision of incentives, implementation of an efficiency standard, infrastructure development)
- Intermediary effects: Changes in transport behaviour, vehicle technology, processes, or practices that result from the NAMA
- GHG effects: Changes in GHG emissions as a result of intermediate effects
- Non-GHG effects: Changes in environmental, social, or economic conditions



Further information how to develop cause-impact chains can be found in GIZ's Reference Document for Transport Sector Monitoring Systems (forthcoming) or in WRI's Policy and Action Standard, Chapter 6.



Bogotá, Colombia; Photocredit: Gerhard Menckhoff/2005

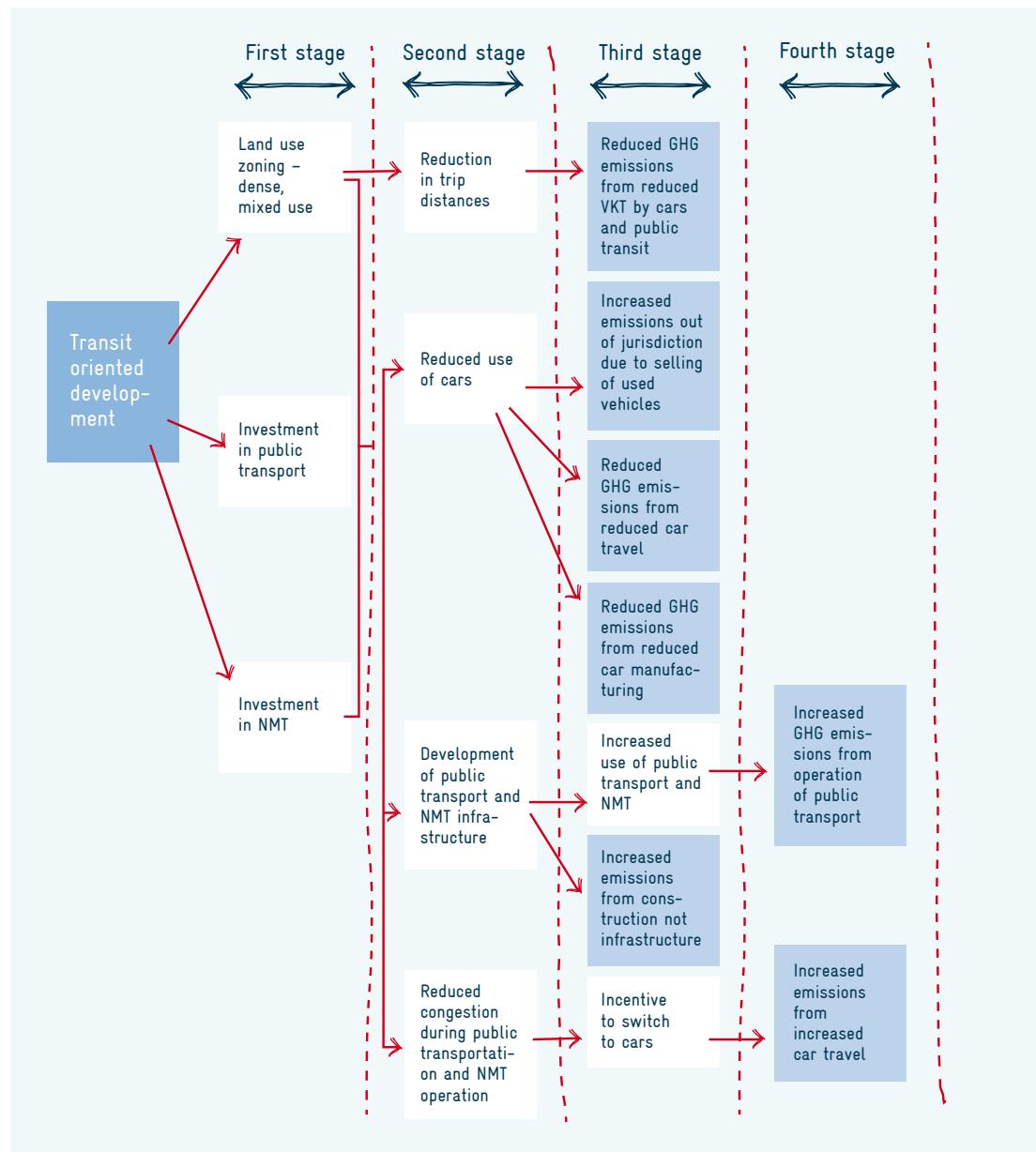


Figure 2-3: Causal Chain Map for Transit Oriented Development (Source: Sectoral GHG Protocol Policy and Action Standard. Transport Sector Guidance; Draft for pilot Testing, 2013)

Causal chains help to define the boundaries for MRV by assessing the identified effects according to their likelihood and relevance. The relevance depends on the expected size of the impact, but also on the objectives of MRV (see more in the next chapter).

Define assessment boundaries

Important aspects for defining the assessment boundaries are the consideration of direct GHG effects within the regional and temporal scope of the measure, indirect GHG effects outside this scope, coverage of rebound effects and the assessed time period after implementation of the measure (please see Box 13 for definitions).

In order to decide which GHG effects are considered directly, and which indirectly, a definition of the scope is required. **The scope depends on the objectives of the GHG assessment** as defined beforehand, and the identified effects. Many measures cause strong short-term effects directly after implementation (e.g. implementation of national speed limits). On the other hand, several measures will lead to a long-term mitigation impact only after the implementation of the NAMA. This is especially true for NAMAs that initiate a potentially transformational change (e.g. transit-oriented development policies or comprehensive sustainable urban transport programmes). In consequence, the time period has to be adequately defined for comprehensive assessments of short-term reactions, as well as long-term effects.



Box 13:

Definition of different GHG effects of a NAMA

Depending on the defined regional and temporal boundary, emission impacts can be distinguished as follows:

- **Direct GHG effects:** effects on GHG emissions resulting from intended impacts of the measure, i.e. all concerned transport modes and mechanisms of action within the regional and temporal scope of the measure.
- **Indirect GHG effects:** Many measures do not only affect activity data or emission factors of transport activities within the regional and temporal scope of the measure ("in-jurisdiction"), but may also have indirect impacts on transport activities lying outside its scope ("out-of-jurisdiction"). For example, a car driving ban will reduce road traffic directly within the prohibitive zone, but it may cause indirect GHG effects due to diverted car traffic around the zone or an increase of public transport into the zone. These indirect GHG effects can partially offset the direct GHG effects, or they might amplify the GHG effects. Indirect GHG effects often relate to other transport modes and mechanisms of action than the direct effects.
- **Rebound effects:** So-called rebound effects are often overlooked, and can be of particular importance. For example, improved energy efficiency often reduces costs for the car user, which can induce additional travel that can partially offset efficiency gains.

To define the boundaries of the GHG assessment using causal chain maps, it is necessary to estimate:

- The **likelihood of each GHG effect** occurring, ranked at one of five levels (very likely, likely, possible, unlikely, very unlikely).

- The **relative magnitude of each GHG effect**, distinguished between three levels from major (>10%) to moderate (1%-10%) and minor (<1%) with regard to the overall impact of the NAMA. This assessment can be done based on rough estimations.

The following approach may be considered as an indication when defining the boundary:

Magnitude Likelihood	Minor	Moderate	Major
Very likely	May be excluded	Should be included	May be excluded
Likely			
Possible			
Unlikely			
Very unlikely			

Table 2-7: Decision matrix for which effects to be included in the NAMA boundary

Depending on the MRV objectives, additional impacts may also be covered.

- When carefully considering all effects of infrastructure investment NAMA types, **construction emissions** should be included in the causal chain map. Their inclusion in the MRV boundary, however, will ultimately be up to the NAMA developer. Clean Air Asia (2013) found that emissions from low-volume road and at-grade road construction are a small fraction of total lifetime emissions; whereas construction emissions from rail and metro projects are substantial when compared to at-grade roads (e.g. construction emissions of a metro project in Cairo equals 28 years of operation emissions). This may be

an argument for including construction emissions of future metro projects in the emission assessment, but construction emissions of alternatives would then also have to be included.

Setting the boundary should also define which part of fuel and vehicle life-cycles are considered in the assessment. In the transport sector, analysis is often broken down into „well-to-tank“ (or „well-to-station“), and „tank-to-wheel“ (or „station-to-wheel“) emissions (see figure 2-4 below). The first stage, which incorporates fuel production, processing and fuel delivery (or energy transmission in the case of electricity) is called the „upstream“ stage, while vehicle operation itself is called the „downstream“ stage (California

Energy Commission, 2007). Depending on the expected effects of a NAMA, it may be necessary to include the full well-to-wheel cycle. For NAMAs promoting the use of electric vehicles, there are no direct emissions from the vehicles, as all GHG emissions result from the upstream energy supply. Thus, complete well-to-wheel emissions should be considered in the GHG emission factors when assessing electricity-based transport.

There are emission factors for different fuel types to calculate tank-to-wheel and well-to-wheel emissions, and values vary between different countries and regions due to fuel quality and fuel production. It is therefore recommended to apply the emission factor provided by the relevant national authority, such as the Environment or Energy Ministry.

Once the boundary is set, indicators for all effects covered by the boundary can be defined (see table 2-7 above and next sub-section) and a suitable methodology for the quantification of impacts can be chosen.

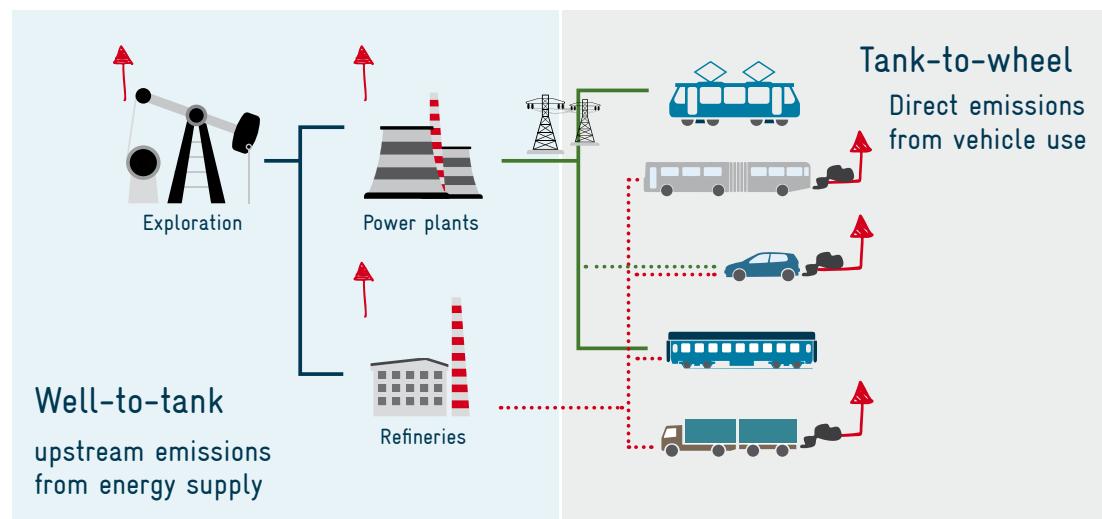


Figure 2-4: Well-to-tank and tank-to-wheel emissions (Source: Ifeu, 2012)

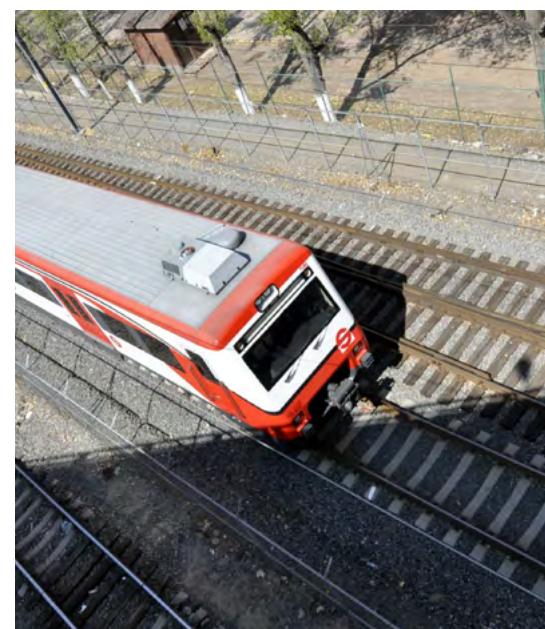
2.2.3 Develop a monitoring plan

Results of this step:
Monitoring plan and data collection requirements are in place

Responsibilities for MRV are defined.

Based on the MRV boundary suitable indicators to monitor the included effects must be identified so that a monitoring plan can be set up. The monitoring plan facilitates the process of annual monitoring and recording of the key parameters. According to the Guidance for NAMA design (UNFCCC/UNEP/UNDP, 2013) this monitoring plan should specify:

1. Assumptions and default values used and relevant data sources;
2. Frequency of monitoring and reporting of monitored parameters;
3. Description of data storage plan (e.g. use of existing Geo Information Systems (GIS));
4. Responsibilities of specific actors with regard to monitoring and reporting;
5. Methodologies used to calculate mitigation benefits;
6. Level of accuracy to be applied (e.g. scope of a survey).



Mexico City, Mexico; Photocredit: Carlos F. Pardo/2009

Identify key indicators for monitoring

Adequate indicators have to be identified for each of the effects covered by the MRV boundary. Sub-section 2.2.4 describes which transport data is necessary to quantify the GHG emission impacts of transport activities. In addition to indicators for quantifying GHG emission impacts, MRV can also include measurement of implementation and further sustainability impacts as well. Since some GHG effects may only be possible to measure after the timeframe of implementation, it is important to inform national stakeholders and international donors about the progress of implementation.

Process indicators can involve relatively low effort and occur shortly after implementation. Measuring the impact of implementation is relevant to demonstrate how the NAMA contributes to the envisaged change process longer term. If a NAMA aspires to initiate a transformational change (e.g. formulated by the NAMA Facility), it should include indicators that demonstrate whether the NAMA is “on-track” towards achieving a transformational change.

The following table summarises which indicator types can be used to assess different effects of the NAMA.

Category	Process Indicators		Impact Indicator	
Type	Activity or change initiated	Quality of change	Direct indicators on GHG emission reduction (Outcome Indicator)	Indirect indicators on Transport data (Output Indicator)
Description	What has been implemented in the context of the NAMA	What has been achieved in the system (e.g. improved coordination, increased capacity)	How has the NAMA influenced GHG emissions (e.g. reduced fuel consumption, changed modal share)?	What outputs have been achieved by the NAMA, e.g. increase capacity of public transport, changed fleet composition
Effort	low	medium	high	medium
Timeframe	Short-term	Short-term	Medium/long-term	Medium-term

Table 2-8: Indicator types and characteristics



Beyond the GHG emissions mitigation effects, most transport NAMAs will likely lead to other benefits. These benefits contribute to sustainable development by supporting the economy (e.g. increase in number of jobs), environment (e.g. reduction in air pollution) and public health (e.g. less fatalities due to accidents).



In the interest of the host country, such sustainability benefits are recommended to be included in the monitoring plan and will thus help to increase transparency on the overall effectiveness of public spending. It is expected that this increases the attractiveness for potential donors and also supports domestic political endorsement.



Iquitos, Peru; Photocredit: Alejandro Garcia/2012

Box 14:

Example 3 Indicators to MRV the Sustainable Urban Transport Programme in Indonesia



The monitoring plan of NAMA SUTRI includes indicators to measure the progress of implementation (process indicators), the direct GHG impact, and the sustainability benefits of the NAMA. The GHG impact will be assessed at city level. In order to estimate the mitigation impact, annually monitored emissions will be compared against baseline scenarios developed ex-ante. Throughout the implementation of NAMA SUTRI, the data collected will be used to validate and update the assumptions made in the scenarios. This will give insights into emission trends and show the actual impact of the measures.

This approach will, however, not allow the attribution of the impact of a specific measure to emission trends at city level. Additional qualitative information will therefore be used to identify how specific measures contribute to a certain change (table 2-9). To reflect achievements of the whole programme certain indicators will also be assessed at the national level (see table 2-10).

Sustainability benefits are measured for specific measures on city level by the following indicators:

- Allocation of public road space for different transport modes
- Household spending on transportation
- Accessibility and quality of public transport:
 - Level of service (capacity and frequency) of public transport
 - Comparison of travel speed between different transport modes
 - Coverage and connectivity of the pedestrian network
- Air quality at main transport corridors

Public transport surveys, household surveys, traffic counts, and air quality measurement will be used as data sources.

Parameter	Indicators	Data Source
Transport Data		
City level	<ul style="list-style-type: none"> • Vehicle mileage • Fleet composition/energy efficiency of vehicle fleet • Modal share • Motorisation rate (cars, motorcycles) 	GHG inventory for transport, Traffic surveys, household surveys, statistical data of the police
Measure specific	<ul style="list-style-type: none"> • Public transport capacity • Specific indicators that indicate emission reduction (e.g. PT users, parked cars, PT occupancy rates, fuel consumption of new buses etc.) 	Public transport survey
Process Indicators		
City level	<ul style="list-style-type: none"> • Measures selected based on integrated urban mobility plan • Quality standards for planning are applied • Budget allocation • Institutional cooperation for planning and data management 	Annual report of pilot cities and the Technical Support Unit
Measure specific	<ul style="list-style-type: none"> • Capacity of local planners • Capacity of local transport consultancies • Upscaling of project is planned • Documentation of high-quality project is available and promoted 	Project monitoring survey by delivery organisation (GIZ), Technical Support Unit and the pilot cities

Parameter	Indicators	Data Source
Transport Data		
Activity data	<ul style="list-style-type: none"> Transport performance of different vehicle categories differentiated by vehicle size, age and fuel type (vehicle numbers, average annual mileage (VKT), and vehicle load rates) Passenger numbers of public transport 	National vehicle statistics, trip surveys
Specific fuel consumption	<ul style="list-style-type: none"> Emission factors by vehicle type and for different traffic situations Detailed data for the vehicle fleet (size, age, fuel type) 	
Process Indicators		
Allocation of funding	<ul style="list-style-type: none"> Amount of funding allocated for SUT projects by the MoT 	Annual budget plans of the MoT
Pipeline of projects	<ul style="list-style-type: none"> Number of 'high-quality' project proposals seeking support 	Project list of the technical support unit
Access to finance for SUT measures	<ul style="list-style-type: none"> Programmes and funding schemes available 	Published documents describing the funding mechanisms and how to access them
Support structures	<ul style="list-style-type: none"> Consultancy services provided to local governments 	Documentation of the Technical Support Unit

Table 2-9: Indicators for GHG Impact at local level

Availability of quality data is crucial for the application of MRV. In any case, data will have to be generated, gathered and updated. These activities have a value beyond MRV; detailed and reliable data on transport characteristics is key for all kinds of transport policies and strategies, such as road safety and air quality enhancements. Valuable guidance on indicator choice for policy making and planning is available from the Victoria Transport Planning Institute (<http://www.vtpi.org/wellmeas.pdf>).



MRV of NAMAs will require setting up a data collection process in most cases. Such activities can be costly and time-intensive, and might need additional expertise on the measurement methodology to be applied, for example. Therefore, data collection processes should be considered along with the technical support provided by partnering developed countries in the context of a supported NAMA. In the future, climate-technology centres¹ might be in a position to provide support in terms of capacity building in the context of multilaterally supported NAMAs.

In conclusion, it is important to reiterate that the stringency of the MRV approach will largely depend on requirements as defined by the financing partner. Most importantly, the methodologies for the estimation of mitigation effects of transport NAMAs should suit the specific needs and conditions of the developing country.

Identify data needs

The availability of transport data in developing countries varies from one to the other. A basic distinction can be made between data that is routinely monitored through enforcement and regulation (e.g. vehicle registration by type of vehicle, fuel or technology), data that is surveyed on demand for monitoring and evaluation of policy and planning (e.g. average frequency of busses, average load factor, passenger load vs. capacity), and data that is gathered ad-hoc (e.g. vehicle population, trips length, travel speed, trip mode share). Very often there is a lack of harmonized methodologies and limited data sharing between different institutions of the private and public sector. MRV planning should take these factors into account and include procedures that encourage cooperation between different institutions.

¹ The Climate Technology Centre shall facilitate a network of national, regional, sectoral and international technology networks, organizations and initiatives with a view to engaging the participants of the Network in the field of Technology development and transfer. For more information see: <http://unfccc.int/ttclear/jsp/CTCN.jsp>



In order to ensure a certain level of data quality, the following five factors that contribute to high quality data should be observed:

Relevance	Consistency	Verifiability	Transparency	Reliability
Collected data is relevant to the information required.	Data gathering methodology is consistent in order to create comparable information.	Data is verifiable (through datasets, official documents or interview records, for example).	Data is comprehensible and clear (includes list of abbreviations and sources default data, for example).	A trustworthy institution carries out the data gathering and processing, and technical instruments are tested to be in working order.

Figure 2-5: Factors that contribute to high quality data

However, a lack of data or poor data quality should not be viewed as a barrier for NAMA development. The MRV process can be improved over time and contributes to improved transport data availability and quality, paving the way for better policy making in the future.

Define Responsibilities

Clear responsibilities for MRV are necessary to ensure efficient and reliable processes for data collection, quality control and management, as well as emission calculation and reporting. The monitoring plan should therefore assign clear mandates to organisations participating in the development and implementation of the NAMA.

For national NAMA oversight across sectors, a Central Coordinating Unit may be required to (UNEP Risoe 2013) :

- incorporate reporting from all line ministries and their regulatory bodies, and keep an updated registry of relevant policies and projects;
- report financial flows to policy schemes from both national and international sources (e.g. the Green Climate Fund), including actual disbursements;
- collaborate with the line ministries and record the effects of regulatory initiatives compared to the baseline.



Manila, Philippines; Photocredit: Christina Mettke/2014

2.2.4 Quantify the GHG effects of a NAMA

The previous sub-sections showed how to identify the effects of a NAMA and the related indicators that should be measured, reported and verified in the chosen MRV approach. This sub-section describes how to quantify the GHG effects of a transport NAMA.

Ex-ante and ex-post

Results of this step:
GHG impact is estimated.



Reference Document on
Monitoring Systems for the
Transport Sector
(forthcoming)

Blueprints for MRV of
transport NAMAs
(forthcoming)

Quantifying emissions in the transport sector is required to estimate the impact of an intervention before its implementation (ex-ante) and to assess the impact during and after the implementation (ex-post). The purpose of ex-ante estimations is to obtain information on the expected contribution towards GHG reduction, which may be important to policy makers during the NAMA identification process and to potential donors.

It is very common to work with scenarios in order to estimate the effect of individual policies and actions in advance. This is especially important for NAMAs that avoid emissions relative to a baseline scenario but do not lead to absolute reductions in emissions (see sub-section on baseline estimation further below for more details). In this case the impact may not be visible in the GHG inventory.

The following figure illustrates the different methodologies for inventory and NAMA accounting:

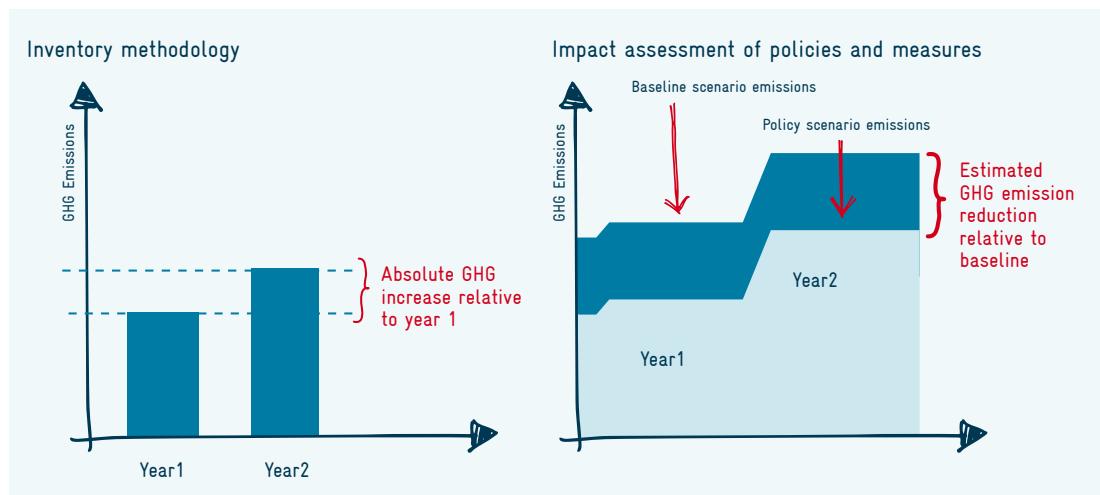


Figure 2-6: Comparison of methodologies for GHG assessment (Source: WRI: GHG Policy and Action Standard; June 2014)

It may be necessary to develop different scenarios in a NAMA impact assessment that describe the development of emissions with or without the implementation of the NAMA. Scenarios are often used for measures or policies, such as urban transport programmes or policy regulations, which have an impact that cannot be assessed or isolated due to interferences (compare Box 17) on the MRV approach of the Sustainable Urban Transport Programme in Indonesia). However, it is not

necessary to develop different scenarios if a NAMA's impact can be directly attributed to a specific emission reduction, such as fleet rejuvenation. In this case it may be sufficient to compare fuel consumption before and after. As a rule of thumb, it is recommended to keep the assessment simple yet solid. Increasing complexity also leads to more assumptions on future development, which adds uncertainty.

The purpose of ex-post evaluation is to assess the mitigation impact of a NAMA during and after implementation, which can a) help to adjust the project/policy to maximise the mitigation impact (along with other objectives) and b) provides information on achievements that can be communicated to administrations, donors and the public.

In order to obtain comparable information, it is important to use consistent data and methodologies for both ex-ante and ex-post assessments. In some cases, however, an improvement of the input data or methodologies might be possible to achieve better results. This could be the case if a country introduces a comprehensive travel survey that provides better input data. In such situations, the more accurate data should be used, but reporting must be transparent about this change and try to assess the impact of the changed input data compared to earlier years.

The following table summarises the difference between ex-ante and ex-post approaches.

Box 15:

Scenarios – instruments to assess the mitigation impact of a transport NAMA



- A NAMA scenario describes developments and effects expected or caused by a NAMA. It includes the effects of the measure, and also other interacting or overlapping policies and actions and general development trends (non-policy, e.g. socio-economic drivers).
- The baseline scenario describes what would most likely happen in the absence of the policy or action assessed, including the development of GHG emissions if the NAMA was not implemented.

The net GHG effect of the evaluated measure is the difference between the emissions forecasted in the policy and baseline scenarios.

	Ex-ante impact assessments of NAMAs	Ex-post impact assessments of NAMAs
Definition	...estimate the expected future GHG effects resulting from the policy or action.	...determines the (GHG) effects of a policy or action by comparing real emissions development based on observed data to baseline emissions describing the situation without intervention.
Purpose	Policy makers need to know the expected effects of a policy or project before its implementation as a basis for decision making. This information matters for national decision makers designing or choosing a NAMA as well as for donors who select a NAMA from a number of proposals support.	The ex-post assessment provides transparency about the actual impacts of a NAMA compared to the expected impacts in the baseline scenario. This information is important for evaluation and adjustment of a mitigation action and for monitoring.
Considerations for implementation	It is often difficult to clearly attribute a certain development to the impact of a NAMA since there can be several interferences and synergies within the transport system. In order to increase the transparency of these uncertainties it is important to <ol style="list-style-type: none"> use the same boundaries and methodologies for ex-ante and ex-post assessment validate the ex-post assessment with additional references (e.g. expert interview, passenger survey) 	
Example:	Evaluation of the implementation and effects of EU infrastructure charging policy since 1995 http://ec.europa.eu/smart-regulation/evaluation/search/download.do?documentId=10296156	

Table 2-11: Comparison of ex-ante and ex-post assessment



Box 16:

Example 4 Ex-Ante: Assessment-Mitigation Potential of the Urban Transport NAMA in Peru



The Sustainable Urban Transport NAMA in Peru (TRANSPerú) covers six measures, including the introduction of efficient technologies and the qualitative improvement of public and non-motorised transport. In a first attempt to quantify the GHG mitigation impact of the six measures a possible mitigation effect in the range of 2.2 to 4.3 MtCO₂, accumulated over the period of 2012 to 2022, was identified. Please note that only parts of the measures were considered and the final potential will be higher.

The estimation follows a bottom-up approach and is based on the creation of three scenarios (BAU –pessimistic – optimistic), where the Business-As-Usual scenario reflects a mere continuation of current political efforts, while the other two scenarios are based on different assumptions regarding their respective level of ambition. The BAU scenario represents the baseline against which the pessimistic and optimistic scenarios are compared.

The six measures, included in the NAMA, cover a broad spectrum in terms of geographical scope, characteristics and data availability. Two clusters reflecting similar characteristics were formed, for each of which a different methodology was applied. For the capital region, given better data availability, the following calculation approach was adopted:

$$\text{Emissions} = \text{No.of persons} * \sum_{i=1}^n \text{no.of trips} * \frac{(P - \text{km})}{\text{trip}} * \frac{\text{Veh - km}}{P - \text{km}} * \frac{\text{EFi}}{\text{Veh - km}}$$

Where i refers to the respective transport mode, P-km/trip is the average distance of a person trip, Veh-km/P-km reflects the inverse of the occupation rate of the vehicles, and EFi/veh-km reflects the emissions per transport mode and kilometre.

Given the lack of data, a simpler approach is applied to measures being implemented outside of the capital area:

$$E = \text{Veh} * \text{VK} * \text{EF}$$

Where VK refers to the average vehicle-kilometres and EF to the average emission factor for all vehicles.

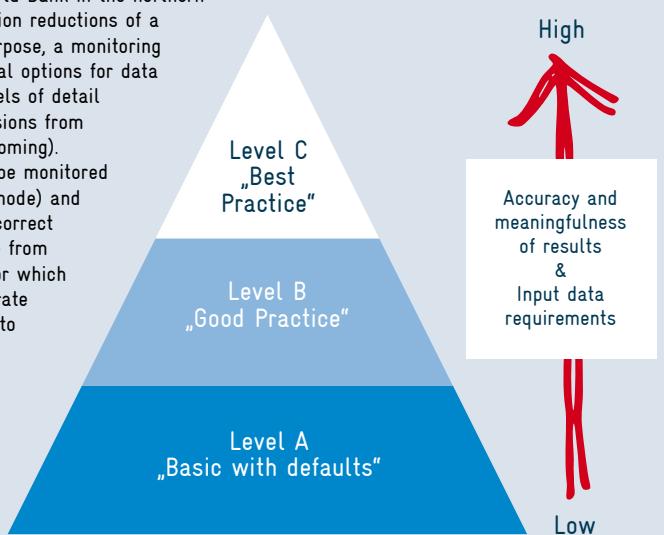
Box 17:

Example 5 Ex-Post: Monitoring transport emissions in Chinese cities



In China, the GIZ Sustainable Transport Programme on behalf of the German Ministry for Environment, Nature Conservation, Building and Nuclear Safety cooperates with several Chinese cities to improve their transport emission accounting. To assist in this, the European handbook Emission Factors for Road Transport (HBEFA), was adapted for Chinese traffic situations, resulting in a Chinese emission factor data set for road transport. Similar adaptation is now also planned for other Asian countries. The matching emission model (HBEFA-China expert version) is applied to calculate both current transport emissions and future policy scenarios. It can also be used for monitoring.

In this context, GIZ cooperates with the World Bank in the northern Chinese city of Harbin to monitor the emission reductions of a GEF project using HBEFA-China. For this purpose, a monitoring guide is being developed that include several options for data collection and data sources at different levels of detail (Guide on "Monitoring greenhouse gas emissions from transport activities in Chinese cities" forthcoming). The two main data categories that need to be monitored annually are travel demand (total VKT per mode) and changes in fleet composition (to apply the correct emission factors). The levels of detail range from basic calculations with defaults (level A) for which only rough data is needed, to a more elaborate calculation called "good practice" (level B) to very detailed calculations based on disaggregated data titled "best practice" (level C). HBEFA-China can be used for all three approaches. It thereby provides consistency across different aggregation levels and allows improvement over time without a need to change the methodology.



Top-down vs bottom-up approach



GHG emissions from the transport sector are mainly caused by the combustion of fuels. In principle, transport emissions can be estimated based on two independent sets of data – “fuel consumed” and “vehicle kilometres travelled”, also called the top-down approach and bottom-up approach, respectively (2006 IPCC Guidelines for National Greenhouse Gas Inventories).

The top-down approach uses the energy consumption of a country or region as a data basis. In the transport sector, the key information for the top-down approach is fuel sales or fuel consumption of public transport or logistics fleets. The top-down approach is often applied to monitor emissions in the transport sector over time in emission inventories for national reporting.² Top-down data can also be used to assess the emission impact of NAMAs if the NAMA leads to a significant impact in a regional or national inventory or in the fuel consumption of public or private fleets.

Thus, it may be relevant for sectoral policies, such as fuel efficiency standards or economic instruments (e.g. fuel taxes).

Transport emission calculation using the top-down approach is often considered to be more reliable than the bottom-up approach, as the number of assumptions and the complexity of data requirements is less. However, a top-down approach neglects fuel adulteration, the use of fuel for non-transport purposes such as diesel generators and fuel smuggling, i.e. fuel purchased in one country and used in another. In addition, data on fuel consumption does not provide any insights in the specifics of the transport system, such as the type of motorized mode. Therefore, bottom-up measurements are required to assess the impacts of policies and projects. Ideally, top-down data can be used to validate and cross-check bottom-up calculations.

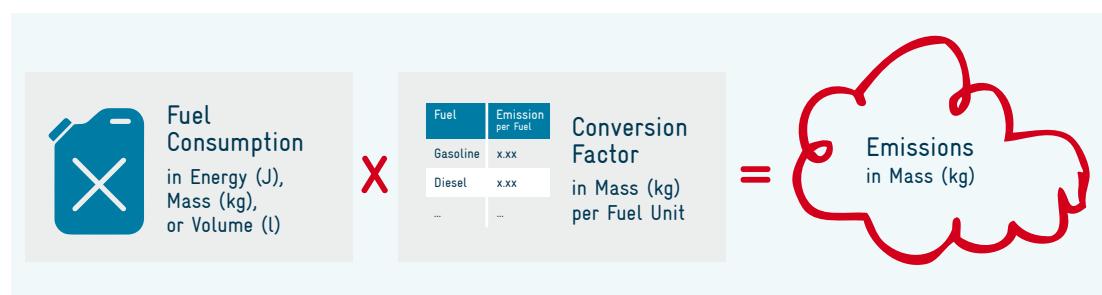


Figure 2-7: Cross-check bottom-up calculation



Jakarta, Indonesia; Photocredit: Andrea Henkel/2013

² National Communications and Biannual Update Reports (IPCC Methodology).

Box 18:

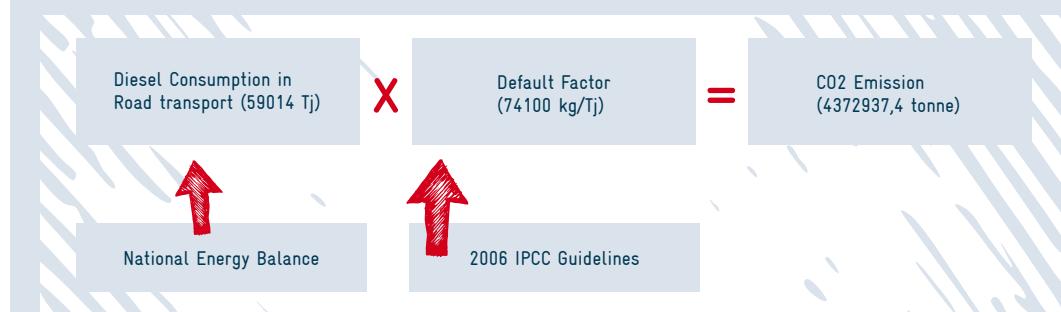
Example 6 Tunisian GHG inventory (Road Transport, 2010)

The methodology for calculating emissions for the Tunisian GHG emission inventory is based on the 2006 IPCC Guidelines. The road transport activity appears in the energy sector and belongs to the emissions from mobile combustion. The emissions due to this activity are estimated according to the tier 1 approach of IPCC guidelines.

The following table summarizes data activity, emissions factors and the data source used:

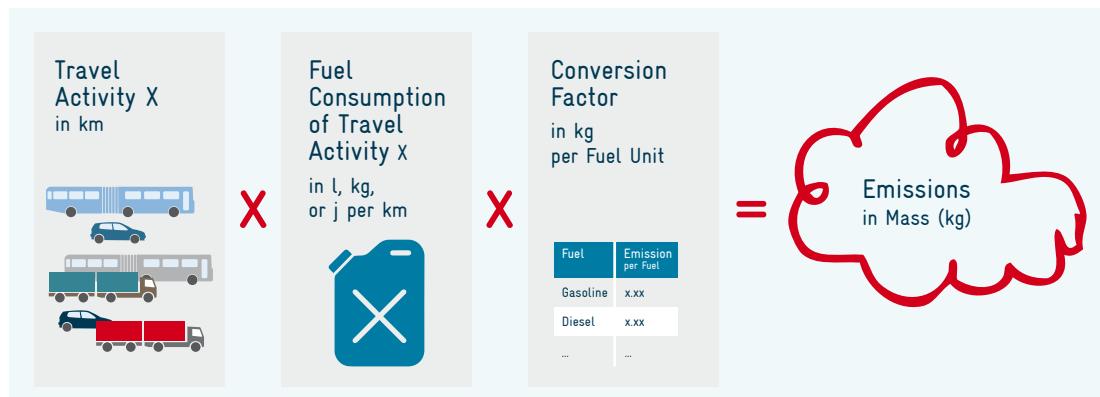
	Data	Data source
Fuel Consumption	Consumption of Diesel (59014,3 Tj) Consumption of LPG (1479 Tj) Consumption of Gasoline (20955 Tj)	National Energy Balance Ministry of Industry National Energy Observatory
Factor	Emission factor (kg/Tj) by Fuel (CH ₄ , N ₂ O, CO ₂ , ...)	IPCC guidelines 2006 National Agency of Environmental Protection Air pollutant Emission Inventory

Table 2-12: data activity, emissions factors and the data sources

Figure 2-8: Example to estimate CO₂ emission due to diesel consumption

The **bottom-up approach** uses transport activity data in combination with specific emission factors to calculate emissions. In the transport sector, the main parameters are:

- **Transport activity:** characterized by vehicle kilometres travelled (VKT) or transport performance (passenger-kilometres, ton-kilometres) of different vehicle types.
- **Specific emission factors:** GHG emission per transport demand (e.g. CO₂/veh. km), depending on the specific final energy consumption of individual vehicles and on the specific GHG emissions of the final energy carriers used.





The GHG calculation has to be done separately for each emission source affected by the measure. Usually, each particular transport mode (cars, trucks, subway, passenger train, inland vessels, etc.) can be handled as an individual emission source. For modal-shift measures from cars to public transport, for example, an aggregation of different public transport modes (bus, subway, regional train) to one single emission source might be appropriate, depending on data availability. However, other levels of differentiation may be requi-

red in some cases; a measure to promote alternative car technologies (hybrid, electric, fuel cell) might require an additional breakdown of emission calculations for car traffic based on engine technologies (GIZ, IFEU, 2014). A more detailed differentiation into sub-segments is also possible, such as passenger cars or buses based on vehicle size. The adequate level of aggregation depends on the objectives of MRV as well as on the data availability.

Box 19

Example 7 Calculating Urban Transport Emissions for the city of Sfax, Tunisia



Transport activities of freight and passenger transport within the territory of Sfax were considered as part of the city's efforts to balance their carbon footprint.

A summary of the data used in this methodology is shown in the following table:

	Data	Data source
Road transport (Passengers)	Total distance travelled in vehicle-km Breakdown by mode of transport	Municipality of Sfax
Freight transport	Freight volume in tones-km Breakdown by mode of transport	Municipality of Sfax
Emission factor		Data base of Bilan Carbone®

Table 2-13: Data and data source for road transport, freight transport and emission factor in Sfax, Tunisia

Based on this approach road freight emissions were calculated as follows (example):

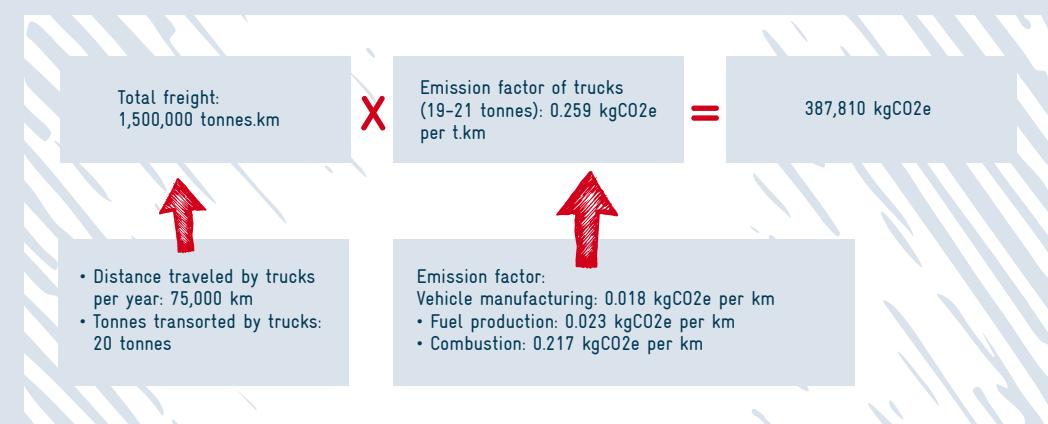


Figure 2-9: Example calculation of freight transport emissions in Sfax, Tunisia

In this case the emission factor also includes upstream emissions of vehicle manufacturing and fuel production.

Box 20:
Example 8 Road Freight Activity Data, Mexico



	C2	C3	T2	T3
Number of vehicles in 2013	75,293.00	64,582.00	2,276.00	238,390.00
Fuel Type	>75% Diesel >20% Gasoline 1% Gas >1% Gas & Gasoline	>75% Diesel >20% Gasoline >1% Gas >1% Gas & Gasoline	> 99% Diesel	> 99% Diesel
Average fuel Consumption, total fleet (l/100km)	31.00	35.1	45.4	46.3
0-6 years	28.28	30.15	43.3	43.73
7-11 years	29.72	32.68	44.4	45.08
12-20 years	31.6	36.28	45.86	46.77
>20 years	38.42	35.26	50.27	52.16
Average KM, total fleet (km/year)	47,129.00	83,674.00	108,811.00	108,811.00
0-6 years	65,968.90	102,513.90	NA	127,650.90
7-11 years	55,692.70	92,237.70	NA	117,374.70
12-20 years	43,703.80	80,248.80	NA	105,385.80
>20 years	18,013.30	47,707.50	NA	72,844.50

Sources:

Ministry of Communication and Transportation, 2013

SEPSA "Diagnóstico sobre la Situación Actual del Sector del Autotransporte de Carga con un Enfoque Específico al Hombre-Camión y Pequeña Transportista", 2014



C2 = Number of axles: 2, Number of wheels: 6



C3 = Number of axles: 3, Number of wheels: 8-10



T2 = Number of axles: 3-5 , Number of wheels: 10-18



T3 = Number of axles: 4-6, Number of wheels: 14-22

As introduced in section 1, there are four types of measures that can be developed into a NAMA, including strategies, policies, programmes, and projects. The methodology to assess a NAMA's mitigation impact is directly linked to its type. The following table gives an overview of the different types of NAMAs and the measurement approach that is most applicable:



Type of mitigation plan/action	Reporting format	Measurement approach	Further guidance
Low Emission Development Strategies (LEDS) ³	National communications/Biannual Update Reports	Top-down	IPCC Guidelines
Sector Strategy/sector target (national)	Transport Sector Inventory	Top-down/bottom-up aggregated	Report on GHG Reporting and Inventorying in Germany Reference Document for Transport Sector Monitoring Systems (forthcoming)
Policies/Programmes	Monitoring & Evaluation Plan	Mix of top-down and bottom-up aggregated	MRV Blueprints for Transport NAMAs (forthcoming)
Specific action or project	Monitoring & Evaluation Plan	Bottom-up detailed	MRV Blueprints for Transport NAMAs (forthcoming)

Table 2-14: Types of NAMAs and suitable measurement approaches

Estimate Baseline Emissions

As mentioned earlier, it is necessary to understand what would have happened in the absence of a policy or project in order to estimate its net GHG effect. The baseline, or business-as-usual scenario, is a reference case against the NAMA implementation case. If the assessment concerns an on-going policy or a project that has already been implemented, the baseline should reflect a realistic back-casting scenario that would have been implemented alternatively.



Baselines can be either static or dynamic. A **static baseline** assumes that any changes reflected at the start of the project would remain constant (e.g. composition of the vehicle fleet, motorisation rate). A dynamic baseline reflects changes in various macroeconomic factors and policies over the course of the project life. Therefore, dynamic baselines are more accurate than static baselines since they reflect changes that influence emissions over time. For NAMAs that have a longer monitoring period (more than 5 years), **it is recommended to develop a dynamic baseline that allows for adjustments throughout the monitoring period.**



Among other factors, the following parameters may be considered for adjustment in a dynamic baseline:

- Trends in motor vehicle ownership and use
- Composition of the motor vehicle fleet,
- Changes in fuel quality
- Changes in vehicle technology and emission factors
- Transport mode shares,
- Changes in public transport patterns,
- Changes in trip lengths

Proper estimation of baseline emissions is a critical step, since it has a direct and significant impact on the estimated GHG effect of the NAMA. Baseline establishment partly relies on political negotiations involving different interest groups, private sector stakeholders and academia. The key assumptions should ideally be agreed upon by a broader group of stakeholders.

In any case, baseline establishment must account for other on-going or planned activities to avoid double counting. NAMA developers may decide on one of the following options to avoid double counting:

- a) If different NAMAs are relevant within the same boundary, NAMA developers must consider other NAMAs in the baseline scenario.
- b) NAMA developers may decide to monitor the whole bundle of NAMAs within the boundary.

³ LEDS are the general framework of a country's climate change policy.

Box 21:

Example 9 Ex-ante business-as-usual scenario NAMA SUTRI

Between the base year 2011 and the target year 2030 key developments reflected in the BAU Scenario of NAMA SUTRI are population growth combined with increased motorisation. For most cities, a high increase in the number of passenger cars (PCs) is assumed. In addition, it is assumed that motorcycles (MCs) will have the highest share in overall vehicle numbers in the target year (2030). The BAU Scenario for the NAMA SUTRI further assumes an increasing demand in individual transport performance (Pass.km) compared to 2013, as well as a modest increase in bus size and fuel efficiency.

CO₂ emissions from passenger transport in the pilot cities

Figure 2-10: Passenger transport CO₂ emissions of the pilot cities in 2011 and 2030 (BAU)

In 2013, the CO₂ emissions from passenger transport in the cities ranged from 185 kt CO₂ in Yogyakarta to 1,264 kt CO₂ in Medan. In all cities, individual transport with passenger cars and motorcycles caused the highest share of CO₂ emissions. Despite assumed fuel efficiency gains (10% lower fuel consumption in l/km for all vehicle categories) transport-related CO₂ emissions will increase roughly by a factor of 2 until 2030 in the BAU scenario due to the growing vehicle population and transport demand.



There is no strict regulation on the process of setting up baseline scenarios. For project-type mitigation actions, the CDM [methodological tools](#) provide guidance for baseline setting for mode shift in cargo and passenger transport. For other NAMA types, it is recommended to refer to studies and evaluation reports of policies and programmes implemented worldwide.

Calculate the NAMA impact

Depending on the nature of a NAMA, efforts to quantify its emission impact can vary largely. The NAMA impact estimation is based on a scenario “with intervention”. This scenario considers the effects that have been identified in the causal-chain map and selected to be considered within the assessment boundary.

For transport NAMAs it can be useful to assess the impact of policy packages instead of isolated measures. In many cases a change in transport patterns or

technology penetration results from a mix of different interventions (push and pull factors). It is up to the NAMA developer to decide on a reasonable combination of measures to be assessed comprehensively. The following figure shows two examples to illustrate how different policies and measures can be clustered into packages in order to assess their impacts.

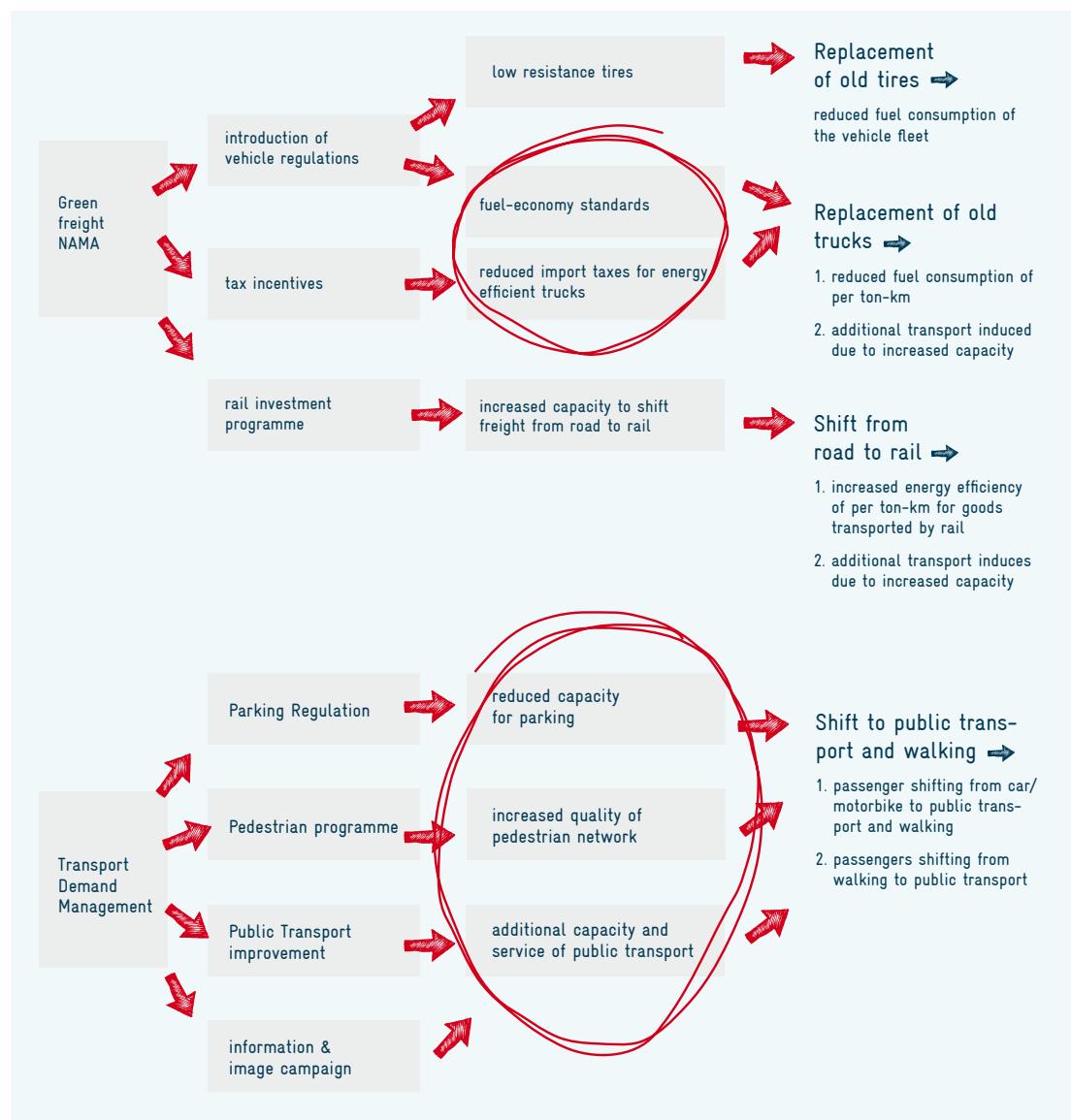


Figure 2-11: Examples of packaging impacts for GHG assessment

The most common approach for bottom-up calculations of emissions in the transport sector is the ASIF framework (Schipper et al, 2000), in which the total emissions are the product of the Activity, Structure, Intensity, and fuel mix. To estimate the emission impact of a measure, or package of measures, these four elements have to be assessed:

- **Activity:** Does the measure lead to reduced travel activity compared to the baseline scenario? Reducing motorized transport activity data, measured in VKT, directly reduces energy consumption and GHG emissions (e.g. by reducing trip distances or avoiding trips completely). An increase of vehicle load factors will also reduce VKT, though transport performance (e.g. passenger km) remains constant.
- **Structure:** Does the measure lead to a modal shift of passengers or goods? Shifting of transport demand to low-emitting transport modes (e.g. freight from

road to water) reduces activity data of those emission sources with high emission factors. Instead, activity data of emission sources with lower emission factors increase.

- **Intensity:** Does the measure lead to an increased energy efficiency of passenger or freight transport? GHG emission factors can be reduced at first by improving energy efficiency of the vehicle fleet (introduction of more fuel-efficient new vehicles, improved operating conditions of the vehicles) and, thus, lowering the specific energy demand.
- **Fuels:** Does the measure lead to a different carbon content of the fuel used for transportation? Switching to alternative drive concepts (e.g. natural gas, electricity) affects energy efficiency as well as specific GHG emissions per energy demand.

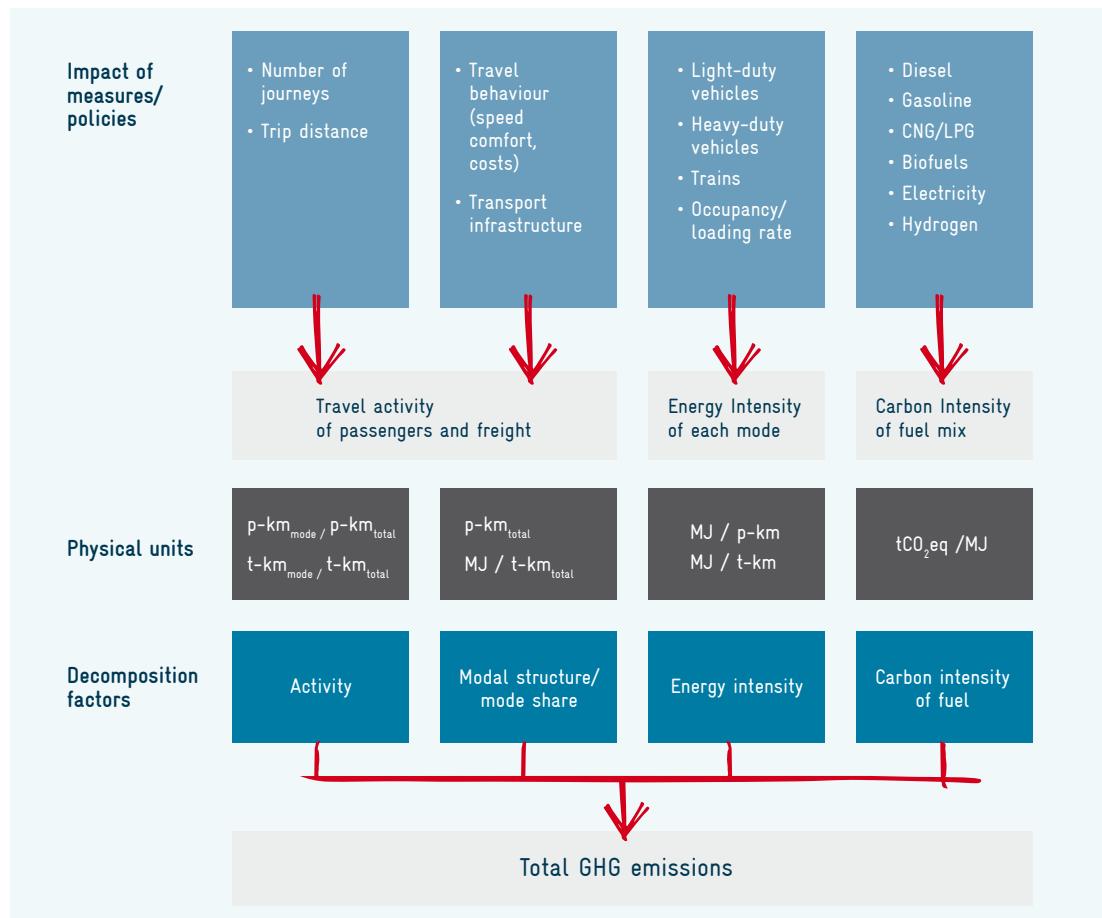


Figure 2-12: Approach to describe the GHG emissions from transport (ASIF) (Source: adapted from Schmied; INFRAS)

For each of the ASIF factors, the impact on the different indicators that describe a certain change should be estimated. Due to the variety of possible NAMA types, the approach to estimate the impact on each of the factors can be defined individually as appropriate. In order to develop a solid methodology, it is recommended to involve transport experts who are experienced with the specific types of policies and measures. It can be useful to do a desk study of reports and evaluation data of similar projects to get an understanding about the potential impact and calculation method.

There are several tools available that may help to approach the impact assessment, especially for project-type NAMAs, including:

- CCAP: Transport Emissions Guidebook and Calculator including policies on land-use, transit and travel demand management and vehicle technology and fuels. (http://www.ccap.org/safe/guidebook/guide_complete.html)

- TNT- UNEP: Toolkit for Clean Fleet Strategy Development (<http://www.unep.org/tnt-unep/toolkit/index.html>) A series of tools and guidance to outline practical and cost-effective solutions available to fleet managers, helping to assess the impacts of a fleet, and develop and implement a strategy to minimize emissions while improving fuel efficiency.

- ADB, ITDP, Clean Air Asia: “Transport Emissions Evaluation Models for Projects” (TEEMP) The TEEMP tools are sketch models that enable the estimation of emissions in both “project” and “no-project” scenarios and can be used for evaluating short to long term impacts of projects. The excel-based, free-of-charge spreadsheet models are mainly for project-type activities. If embedded default factors are used without adapting to local conditions, the accuracy of the calculation is typically not as high. (<http://cleanairinitiative.org/portal/TEEMPTool>).

The GIZ TRANSfer project together with several other organisations is currently developing “Blueprint” documents for MRV of different transport NAMAs which can be used and adopted according to the national conditions and the specific design of a NAMA (available from early 2015 at www.transport-namas.org).

Assess uncertainty

All parameters for GHG emission calculations should be determined as accurately as possible to get the most reliable results on the real emissions development. Ideally, parameters can be taken directly from a measure-associated monitoring programme. If no monitoring data is available, other data sources (e.g. models, statistics, surveys) are needed, which can provide the required parameters directly or enable their estimation.

However, data availability (type, quantity, quality, and resolution of data) is often limited. Capabilities to collect and process additional data are also limited in most cases, depending on capacity, resources, and the level of expertise available to carry out the assessment. Consequently, simplified assumptions or rough estimates might be the only options for determining the parameters needed for GHG emission calculations.

Different guidebooks recommend indicating the quality of assessment by determining a tier of assessment, which considers data intensity, resolution of analysis

and the level of accuracy evaluation. The IPCC introduced a tiered approach with rougher estimates where less accuracy is needed (or available) and more sophisticated methodologies when higher accuracy is necessary. This approach is used for inventory reporting under the UNFCCC and has been taken up by other guidelines such as the GHG Protocol. As illustrated in figure xy, bottom-up calculations are also feasible if the data availability is limited. Instead of detailed values for travel activity data (number of trips, specific emission factors, etc.), the calculation can also be based on average values for the region, where available. In any case, consistency of data is important for reliable results and comparisons.

Unlike the CDM methodologies, which are defined by the UNFCCC, the accuracy of NAMA MRV methods can be defined by the national government and/or international donors (for supported NAMAs).

2.3 Reporting

Results of this step:

Contents and procedures for reporting to the UNFCCC and donors (if applicable) are in place so that impacts and progress can be adequately conveyed.

When designing an MRV system for NAMAs, it is important to first ask, “Who needs to receive what kind of information?” (see sub-section 2.2.1). Mitigation actions in the transport sector that qualify as a NAMA may need to be reported to three different audiences:

- domestic stakeholders, including the national government and general public;
- the UNFCCC; and
- any financial institution or donor that finances or supports a NAMA, including national banks, or international donors like the Green Climate Fund or the NAMA Facility.

Each of these audiences may require different information (Table 2-15). GHG emission reduction is certainly one key element, but some institutions may be more interested in other information. Costs typically rank high for national governments and financial institutions, while progress on contributions to sustainable development are of interest to national stakeholders, including the government, the media, the public and NGOs.



San José, Costa Rica; Photocredit: Florian Kopp/2012

Forum "Who to report to?"	Objective "Why to report?"	Required Information "What to report?"
Domestic	Inform domestic planning and decision-making processes; respond to stakeholder demand	Based on objectives and standards of country. Impacts towards sustainable development could be of higher importance than estimation of emission reductions (ex-ante and/or ex-post)
International donor	Attract climate finance (ex-ante) Account for successful implementation (ex-post)	Estimated emission reductions of NAMAs as well as costs & support needs are key elements in any proposal for NAMA support (ex-ante). Based on donor requirements, other impacts may also need to be included, such as contributions towards sustainable development, long-term & transformational potential towards low-carbon development, innovation ambition etc.) Ex-post estimates and implementation progress reports are important during implementation to receive on-going finance.
UNFCCC NAMA Registry	Gain international recognition for efforts and potentially attract climate finance	Estimated emission reductions (ex-ante) are necessary, in addition to general information on the action and cost estimates.
UNFCCC Biennial Update Reports (BURs)	International reporting on efforts to address climate change	Information on NAMAs in design and implementation phases both have to be reported. In the design phase, the estimated emission reductions of each NAMA (ex-ante and ex-post) must to be provided. In the case of NAMAs already being implemented, information on current progress and impacts must also be reported.

Table 2-15: Reporting requirements for NAMAs (Source: Wuppertal Institute, adapted from Agarwal et al. 2013: 46)

2.3.1 Reporting to the UNFCCC

The first mention of the term NAMA in an official UNFCCC document was the Bali Action Plan 2007.⁴ It was immediately agreed upon that NAMAs should be MRVable, partly as the Parties to the UNFCCC want to gain knowledge on how GHG emissions could develop in the future. Thus, in addition to GHG inventories (information on historic emissions), countries should report on the activities they plan and implement to limit or reduce future emissions. Consequently, it was agreed that countries are requested to report on their mitigation actions within their Biennial Update Reports (BURs).⁵

In 2013, “general guidelines for domestic measurement, reporting and verification of domestically supported nationally appropriate mitigation actions by developing country Parties” were adopted.⁶ However, these guidelines for NAMA MRV are fully voluntary and general in nature – the responsibility for implementation and monitoring of NAMAs lie with the host country. One reason for this is that NAMAs encompass a wide variety of possible actions, and a

Box 22:

Non-Annex 1 countries should report in their Biennial Update Reports on their mitigation actions. Specifically they should provide the following information in tabular format:

- (a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and process indicators;
- (b) Information on methodologies and assumptions;
- (c) Objectives of the action and steps taken or envisaged to achieve that action;
- (d) Information on the progress of implementation of the mitigation actions and the underlying steps taken or envisaged, and the results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;
- (e) Information on international market mechanisms.

Source: <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>



⁴ Further information: [Bali Action Plan](#)

⁵ General decisions on the content of biennial update reports were made in Durban, 2011: <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

⁶ Read more: Decision 21/C.P.19 (Document FCCC/CP/2013/10/Add.2) available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf>

one-size-fits-all approach to MRV is not realistic. The primary objective is to engage countries on a broad scope of mitigation actions and not to limit NAMAs through rigid (and expensive) MRV regulations. The UNFCCC has recently clarified that both supported and domestic NAMAs will be MRVed domestically, but the supported NAMA also has to be MRVed through International Consultation and Analysis (ICA).⁷

It must be reiterated that this handbook focuses only on strategy, programme, policy and project NAMA types. NAMAs constituting mitigation targets (e.g. 20% reduction by 20xx) are beyond our scope.

For policy and project NAMAs, we don't anticipate any strict, mandatory rules for NAMA MRV in the foreseeable future. Instead, a set of good practice standards is likely to emerge based on experiences gained in the current bottom-up process of NAMA development.

The responsibility for NAMA reporting lies within the national government, which must draft and submit the UNFCCC National Communications and Biennial Update Reports. In most countries this is a unit within the Environmental Ministry. However, the necessary data must come from transport experts, mainly within the Transport Ministry or other institutions charged with implementing NAMAs. Thus, the UNFCCC reporting requirements call for new or extended communication between departments and ministries of a country.

For further reading on the UNFCCC reporting requirements, we recommend the GIZ MRV tool, which gives an overview of the different MRV requirements within the UNFCCC process and has a dedicated section on MRV of NAMAs.⁸



2.3.2 Reporting to donors

For internationally supported NAMAs, information must be provided to institutions that provide capacity development, technology or financial support. Estimates of costs and impacts (ex-ante) are part of any NAMA proposal. During implementation, information on the action's status will need to be communicated (e.g. length of railway lines built to date). During and after implementation, actions undertaken, costs and impacts will have to be documented (ex-post). This is similar to many grants or support given for transport measures in the past by development banks. The key difference is that donors also require information on a NAMA's GHG impact. The kind of information requested varies from donor to donor and even from

programme to programme. For example, the NAMA Facility, an early funder of NAMA implementation, requests an assessment of the impact of any individual NAMA on the greater transformation towards a low-carbon society, in addition to quantified GHG emission reduction impacts. At present, most donors do not have fixed requirements regarding the methodological approach towards MRV.

Many NAMA experts suggest that donor requirements on MRV for internationally supported NAMAs serve as good practice for NAMA MRV in general (CCAP, 2012). From these good practice examples, templates could be developed for UNFCCC reporting.

2.4 Verification

Results of this step:
Information to support calculated GHG impacts
and other reported sustainability benefits are available to verify NAMA achievements.

Information reported to the UNFCCC or to international donors must be verifiable. It is not enough to merely claim that a NAMA reduces GHG emissions by x tons of CO₂eq – supporting information must be given so that an external reviewer can judge the validity of such claims. This includes a description of the methods used to calculate emission reductions, as well as key assumptions made. For example, to estimate the mitigation effect of a scrapping program of old vehicles, it is necessary to make certain assumptions on the reduction in fuel consumption per vehicle and km, and on the average km travelled per vehicle per year.

Within the UNFCCC there will be a review process for Biennial Update Reports called International Consultation and Analysis (ICA). International donors will have a range of different auditing procedures, which they can apply to verify given information. It will be important to provide information on NAMAs and specifically their GHG impact in such a way that the quality of this information can be assessed and verified by external reviewers. This transparency is key to increasing a NAMA's credibility.

⁷ This distinction is in line with the UNFCCC NAMA Guidebook – see UNFCCC/UNDP/UNEP, 2013, p. 10

⁸ Read more: <http://mitigationpartnership.net/mrv-tool-how-set-national-mrv-systems>

2.5 Checklist and tips for further reading

The steps outlined in this handbook describe one possible approach for the development of a NAMA. In reality, this process must be adapted to national circumstances and decision-making processes. Nevertheless, the major steps of the process presented in the handbook provide guidance, as they constitute the key elements that enable successful development and are vital to receive the necessary political, technical and financial support to endure after the implementation.

Checklist for MRV	<input checked="" type="checkbox"/>
Objectives of the MRV approach are defined.	
Effects of the NAMA are identified (cause-impact-chain).	
Scope of the MRV approach is set (assessment boundaries) and MRV methodology defined.	
Data needs and collection methods have been identified and agreed by relevant stakeholders.	
Responsibilities for MRV have been assigned.	
A monitoring plan has been developed.	
Baseline emissions have been estimated and assumptions are agreed upon among relevant stakeholders.	
GHG Impact of the NAMA has been calculated (ex-ante or ex-post).	
Limitations of the GHG emission quantification are described (uncertainties).	
Sustainability benefits and process indicators have been assessed.	
Contents and procedures for reporting to the UNFCCC (and donors if applicable) are in place.	
Supporting information to verify the GHG impact can be provided.	

Tips for further reading**GIZ TRANSfer Project**

- **Reference Document on Monitoring Systems for the Transport Sector** will be a sourcebook for the development of national monitoring systems in the transport sector. It will further elaborate and provide guidance on the different elements of inventories and ex-post assessments of transport activities. Forthcoming. Available in 2015 at <http://www.transport-namas.org>
- **Blueprints for MRV of transport NAMAs** will provide a concise description of MRV methodologies for different types of transport NAMAs, forthcoming. Available in 2015 at <http://www.transport-namas.org>

Further GIZ sources

All sourcebook modules available online in several languages at: <http://www.sutp.org/en-sourcebook/>

- **Report on GHG Reporting and Inventorying in Germany** describes the methodology and institutional cooperation for GHG inventorying of transport emissions in Germany. <http://sustainabletransport.org/newly-released-report-on-ghg-reporting-and-inventorying/>
- **The MRV Tool** provides developers and implementers of NAMAs with brief step-by-step instructions on how to develop a MRV-System. The tool navigates users to the relevant information, knowledge, instruments and publications available http://mitigationpartnership.net/sites/default/files/mrv_tool_4.1.pdf

Additional sources**MRV of GHG emissions**

- **The WRI Greenhouse Gas Protocol** - Policy and Action Accounting and Reporting Standard is a very detailed background document, which helps to design an MRV system for mitigation policies and actions. It spells out key principles and concepts related to MRV of NAMAs, specifically for top-down approaches. The Protocol was developed by World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). The Final Draft for Public Comments (2014) is available at <http://www.ghgprotocol.org/mitigation-accounting>. A “Transport Sector Guidance” is under development and will include a detailed overview of sector specific tools, methodologies and databases.

• **IPCC** has developed “Guidelines for National Greenhouse Gas Inventories.” Chapter 3 of Volume 2 deals with “Mobile Combustion.” Non-Annex I Parties are expected to use these for estimating and reporting their national GHG inventories. The guidelines also give insight on the “tier approach.” Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>

- **The Transport Emissions Evaluation Model (TEEMP)** Tool provides free-of-charge, easy-to-use, excel-based spreadsheet models that calculate CO₂ emission impacts of (mainly urban) transport projects. TEEMP encompasses a general emissions estimation manual, as well as project-specific emissions estimation tools for a wide variety of standard transport projects. The tool is designed to be usable with limited available data. TEEMP was developed by CAI Asia, together with ITDP, ADB, Cambridge Systematics and UNEP-GEF, and is available at <http://cleanairinitiative.org/portal/TEEMPTool>. TEEMP is also at the heart of the GEF Manual for Calculating GHG Benefits of GEF Transportations Projects. Available at <http://www.thegef.org/gef/node/4638>.
- **World Bank** has designed ROADEO (Road Emissions Optimization), a software program for calculating GHG emissions at the planning, design, and construction phases. It includes a calculator user manual, and a report on GHG emissions generated by road construction and rehabilitation activities, which is classified by work categories and includes analysis of local and international best practices. Available at: <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPASTAE/0,,contentMDK:21261950--menuPK:6328348--pagePK:64168445--piPK:64168309--theSitePK:2822888,00.html>

- **Clean Technology Fund (CTF)** co-financed operations in transport will be required to calculate GHG emissions reductions resulting from the investment. Therefore, CTF has published “Guidelines for Calculating GHG Benefits from Clean Technology Fund Investments in the Transport Sector.” Annex 3 in this document summarizes the guidelines to be applied in CTF co-financed operations. Available at <http://www.slocat.net/sites/default/files/slocatfiles/contentstream/ctfresultsmeasurement.pdf>
- **UNEP** has launched a cleaner fleet management toolkit that evaluates the impact of vehicle fleets on the environment, including climate change, and human health. It can also be used to develop and assess the impact of corrective actions. See <http://www.unep.org/tnt-unep/toolkit/drivingstrategy/drivingclean.html>.

- **Bongardt, D et al.**, (2013) *Low-Carbon Land Transport- Policy handbook. Chapter 3*.
- **SLoCaT** summarises more guidelines and provides corresponding links at <http://www.slocat.net/?q=content-stream/187/ghg-assessment-tools>.

MRV of non-GHG benefits

- **IGES** has been working closely with researchers at Nihon University in Tokyo, Japan and associated organizations in Thailand and the Philippines to develop a tool on co-benefits: “Mainstreaming a Transport Co-benefits Approach: A Guide to Evaluating Transport Projects.” The guidelines or TCG, provide a set of user-friendly, step-by-step instructions for policymakers, transport planners, and development specialists interested in quantifying co-benefits of transport projects in Asia. Available at: http://pub.iges.or.jp/modules/envirolib/upload/3209/attach/transport_co-benefits_guideline.pdf
- The United Nations University, Institute for Advanced Studies (UNU IAS) has developed a Co-benefits Evaluation Tool for the transport sector, which reports local air pollution. Available at: <http://www.ias.unu.edu/transportDev/firstpage.html>
- The A network called “COST 356 ,EST” focuses on the definition of a measurable environmentally sustainable transport, and aims to contribute to the development of methods to integrate environmental issues into the assessment and decision processes in transport planning and policy. Available at: <http://cost356.inrets.fr>
- **The World Health Organization (WHO)** developed its Health Economic Assessment Tools (HEAT) for walking and for cycling. Available at: <http://www.heatwalkingcycling.org>
- **Todd Litman** from Victoria Transport Policy Institute has done comprehensive research on how to measure sustainable transport policy, including the following topics:
“Reinventing Transportation; Exploring the Paradigm Shift Needed to Reconcile Sustainability and Transportation Objectives” (<http://www.vtpi.org/reinvent.pdf>); and “Well Measured: Developing Indicators for Comprehensive and Sustainable Transport Planning” (<http://www.vtpi.org/wellmeas.pdf>).
- SLoCaT summarises more guidelines and provides corresponding links at <http://www.slocat.net/?q=content-stream/187/sustainability>

MRV of climate finance

- The **Climate Finance Impact Tool** developed by the Japanese International Cooperation Agency (JICA) covers various mitigation measures. A specific methodology sheet provides details on each calculation option. The formulas are implemented in ready-to-use excel sheets. For transport, guidance is given for railways (passenger & freight), mass rapid transit, monorails, light-rail and buses. The tools are available at: http://www.jica.go.jp/english/our_work/climate_change/mitigation.html

Further guidance

- **Discussion Paper: Measuring, Reporting and Verifying Nationally Appropriate Mitigation Actions** The objective of this paper is to identify issues for the MRV of NAMAs pertaining to key dimensions recognised in MRV literature and UNFCCC texts, namely: transparency, robustness and feasibility and cost-effectiveness. It pays particular attention to NAMAs with a supported component and reflects relevant experiences with developing NAMA proposals in selected countries http://www.mitigationmomentum.org/downloads/Mitigation_Momentum_MRV_Paper_JUNI2013.pdf
- Further information on the MRV concept for NAMAs can be found in the general publication ‘**Measuring, Reporting, Verifying. A Primer on MRV for Nationally Appropriate Mitigation Actions**’ http://mitigationpartnership.net/sites/default/files/2012_unep_risoe_mrv_a_primer_on_mrv_for_namas.pdf

Section 3

Financing

3. Financing

Note The chapter for the new financing section of this handbook is still being developed and will be added to the handbook in March 2015. After an international expert review of the draft outline in April 2014, it became obvious that there is a need for a more in depth discussion on financing of transport NAMAs and on the particular role that climate finance can play in this context. After quite some discussion, the GIZ TRANSfer project team decided to face this challenge by setting-up an [International Expert Group on Climate Finance for Sustainable Transport](#) and to postpone the finalisation of the financing section of this handbook. This allows incorporating first results of the Expert Group into the upcoming handbook chapter.

The International Expert Group was set up with the objective to help ensure that **climate finance is increasingly used for sustainable transport and in an effective way** to realise the large GHG emission reduction potential in the sector. To do so, there is a need for an increased mutual understanding between actors active in the areas of climate and transport finance.

The TRANSfer project intends to target both, the transport finance as well as the climate finance world, with the purpose to develop and distribute recommendations on transport and climate finance based on the following:

- **Better understanding of the characteristics of transport finance** to derive recommendations how climate finance can be used most effectively;
- Identifying entry points for climate finance that **trigger a shift to more sustainable transport investments** and thus to upscale mitigation efforts (and leverage public and private investments);
- **Address climate finance experts and institutions** as well as the transport community with the dissemination of the results.

The Expert Group will develop and discuss recommendations for the effective and efficient use of climate finance in the transport sector over the next 1.5 to 2 years. **First outputs of the Expert Group** are:

- **Background study** illustrating selected sustainable transport measures in form of a case study; analysis the corresponding financing mechanisms and deriving recommendations for the use of climate finance;
- **Policy note** for decision makers on the role of Climate Finance in scaling up of funding for sustainable, low-carbon transport.

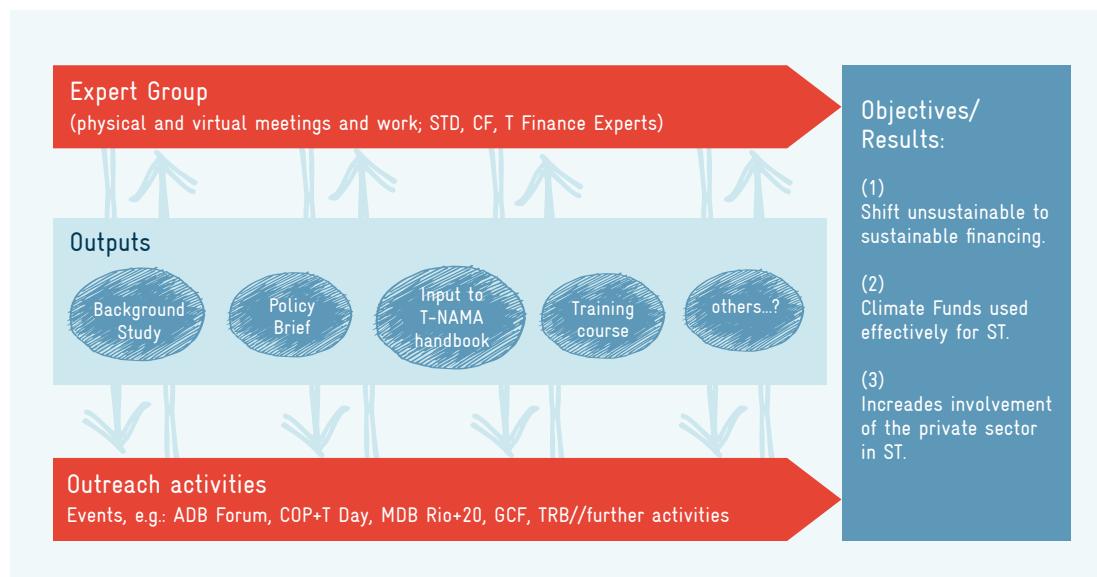


Figure 3-1: Illustration of the Climate Finance Workstream



Manila, Philippines; Photocredit: Christina Mettke/2014

Box 23:
New outline for the financing section of the handbook



- 3. Financing Transport NAMAs
 - 3.1. Analyse context and barriers
 - 3.2. Identify financial flows along the NAMA cycle
 - 3.2.1 Break down NAMA into individual activities
 - 3.2.2 Identify and categorise costs and revenues associated with each activity
 - 3.3. Realise the economic appraisal
 - 3.4. Design a feasible financial structure
 - 3.4.1 Policies and programs
 - 3.4.2 Investment projects
 - 3.4.3 Develop a funding / fund-raising strategy and get relevant players on board
 - 3.5. Checklist and tips for further reading

Section 4

Registration

4. Registration

Introduction

The NAMA registry is a key tool provided by the UNFCCC to share information on NAMAs. Registration is completely voluntary. The parties to the UNFCCC have developed the registry as a dynamic, web-based platform. It can be accessed at www4.unfccc.int/sites/nama. The UNFCCC 2014 registry was set up in order to:



- record NAMAs for which international support is sought,
- recognise other (unilateral) NAMAs, and
- facilitate the matching of finance, technology and capacity-building support with NAMAs.

In May 2014, Austria agreed to provide almost US\$ 2 million to Georgia to help the country restore the forests in its Borjomi-Bakuriani region. This matching of financial support with NAMAs was the first of its kind since the UNFCCC launched the registry in October 2013. This example shows that early registration of NAMAs facilitates their preparation and implementation.

Box 24:

The NAMA registry and reporting requirements of NAMAs



The NAMA registry is an effort to enhance knowledge on NAMAs and to support the matching of donors and applicants of climate finance, technology and capacity-building support. The formal requirement to report on planned, current and implemented NAMAs lies within biennial update reports (BURs). However, guidance is quite general on how exactly NAMAs need to be reported in BURs.

	Elements and steps	Tools
Registration	4.1 Get familiar with the NAMA registry	<ul style="list-style-type: none"> • NAMA registry user's manual • UNFCCC support website for registry users including e.g. a section with FAQ, webinars, demonstration of registry functions • Examples of registered NAMAs
	step by step	<ul style="list-style-type: none"> • List of registered NAMA approvers • Templates for email submission

Table 4-1: Main elements and useful tools

4.1 Get familiar with the NAMA registry



Results of this step:
Understanding of concept
and operation of the
NAMA registry



NAMA registry user's
manual;
UNFCCC support website
for registry users;
Examples of registered
NAMAs

Access rights to the Registry distinguish between NAMA approvers and NAMA developers. **NAMA approvers** are entities that centralise approval responsibility for all NAMAs in their country and have full access-rights to the registry system and all registered NAMAs in the country. There is only one NAMA approver per country. **NAMA developers** are granted rights to create NAMA entries and submit them for approval. Furthermore, they are mandated to edit, update or delete their own entries. There may be several NAMA developers per country and of different types (government, NGO, private sector, etc. as determined by national governments). The specific set-up and distribution of roles and responsibilities need to be specified by each country. Some countries have created their own national registry templates (this is the case for Colombia and Mexico).

Three electronic templates have been incorporated into the registry. NAMA developers must designate the NAMAs they register as one of the following three types:

1. **NAMAs seeking support for preparation:** As discussed in [Section 1](#), transport policy-makers may identify NAMAs in the form of policies to exploit known mitigation potential, and relevant domestic strategies. This template should be used if NAMA developers already have a clear idea of the type of NAMA (strategy, policy, programme, project or a combination of these) and its related activities and if they need financial or technical support for further elaboration.
2. **NAMAs seeking support for implementation:** This template should be used if the NAMA has been formulated already and it is ready to receive finance, technology and/or capacity building for implementation. It is recommended that such an entry be created after completion of the NAMA design process, when the scope and components of the NAMA have been defined and support needs have been identified.
3. **NAMAs for recognition:** This template should be used for NAMAs that will be implemented unilaterally by developing countries and, therefore, for those no support is being sought for.



Bogota, Colombia; Photocredit: Carlos F. Pardo/2006

The amount and detail of information to be provided is flexible and up to the country since the registry operates on a voluntary basis. However, a NAMA description should be as detailed as possible in order to be well supported or recognised. The three electronic templates differ primarily regarding information on costs (section E) and on support required (section F of templates for NAMAs seeking support for preparation or implementation). NAMAs seeking support for implementation should additionally contain information on their estimated emission reductions (section G of the template for NAMAs seeking support for implementation). Table 4.2 lists all sections of the registry on which NAMA developers can provide information.

Section	NAMA Seeking Support for Preparation	NAMA Seeking Support for Implementation	NAMA for Recognition
A	Overview		
B	National Implementing Entity		
C	Expected timeframe for the preparation of the mitigation action		
D	Currency		
E	Cost		
F	Support required to prepare the mitigation action	Support required for the implementation of the mitigation action	Estimated emission reductions
G	Relevant National Policies strategies, plans and programmes and/or other mitigation action	Estimated emission reductions	Other indicators
H	Attachments	Other indicators	Other relevant information
I	Support received	Other relevant information	Relevant National Policies, strategies, plans and programmes and/or other mitigation action
J		Relevant National Policies strategies, plans and programmes and/or other mitigation action	Attachments
K		Attachments	
L		Support received	

Table 4.2: Overview of the NAMA registry (Source: UNFCCC (2014))



The secretariat of the UNFCCC created a registry support website with information to facilitate understanding: www.unfccc.int/cooperation_support/nama/items/7598.php.

Along with other information, it contains the following features:

- NAMA registry manual;
- Frequently Asked Questions (FAQ);
- fact sheets;
- recorded webinars and power point presentations;
- demonstration of the registry functions.

The full list of NAMAs that have been registered can be accessed here: www4.unfccc.int/sites/nama

4.2 Realise the registration step by step



Results of this step:

NAMA is registered with UNFCCC and appears online in the NAMA registry.



List of registered NAMA approvers;
Templates for email submission

Guidance on "General Information"

The first important step is to identify the people and organisations assigned to approve and/or develop transport NAMAs in the respective country. It is worthwhile to speak with them about the NAMA and to listen to their experience and advice. It is especially important to agree on the NAMA content with the NAMA approver well in advance, as the approver will be in charge of finally submitting the registry document to UNFCCC.

To facilitate the preparation of information for the registration of a NAMA, guidance on selected elements of the registry templates is given below. It is not intended to cover all elements, but to give guidance on selected core elements and to clarify definitions used during the registry process.

In section A (Overview), NAMA developers must enter the implementing party (the country), summarise the action, provide information on the sectors, technologies and GHGs covered, and indicate the type of action. Except for the summary, the platform template provides a standardised multiple-choice menu for these. For instance, transport-related technology options to be ticked include 'Cleaner fuels' and 'Energy Efficiency'.

In section B (National Implementing Entity), NAMA developers indicate the implementing institution(s) (national and/or sub-national) and up to three contact persons.

Box 25:

National processes related to UNFCCC registry



As already indicated, some countries have their own national registration process that should be completed prior to recording in the NAMA Registry. This process should be understood before embarking on the creation of an entry in the NAMA Registry template. Its content is generally the same as the UNFCCC template, but national registration may require greater depth in some sections and might have additional subsections related to national low emissions development strategies or climate-change related policies.

UNFCCC has advised countries not to develop additional registration processes. They have indicated that the rationale of the registry is to create an opportunity for countries to easily present their progress on NAMA development, and that the UNFCCC NAMA registry is a universal format that should be applicable to any country.

The expected timeframe for the preparation or implementation of the mitigation action (section C) refers to the period in which activities are undertaken to initially implement a NAMA. It should not be confused with the period of monitoring GHG effects, which begins after successful implementation of the mitigation action.



Manila, Phillipines; Photocredit: Andrea Henkel/2013

Guidance on "Cost of preparation and implementation"



For NAMAs seeking support for preparation, the NAMA developer shall indicate the estimated full cost of preparation. For the other NAMA template types, the registry makes a distinction between **two types of implementation costs**:

- full implementation cost
- incremental cost of implementation

The **full implementation cost** (and closure cost) includes all expenses incurred during the lifetime of a NAMA, such as pre-operation activities (planning cost), construction, operation and maintenance, debt service and closure. The UNFCCC (2014) suggests limiting the costs “strictly” to those incurred by the implementing entities. Third party costs, that the NAMA might directly or indirectly cause, such as private expenses to comply with vehicle standards, should not

The **incremental cost** principle goes back to the United Nations Framework Convention on Climate Change, adopted in 1992. According to the Convention, the implementation of climate change mitigation measures by developing countries depends on the availability of finance provided for them by developed countries. Developed countries shall “provide such financial resources, including for the transfer of technology, needed by the developing country parties to meet the agreed full incremental cost of implementing measures [...]” (UNFCCC Article 4.3).

The underlying assumption of the incremental cost principle is that the relevant costs for complying with the Convention are relative rather than total. Any activity that is eligible to receive financial resources is compared to the baseline scenario, i.e. to the activity it replaces. The difference in cost between the two activities is the incremental cost. Incremental costs may not

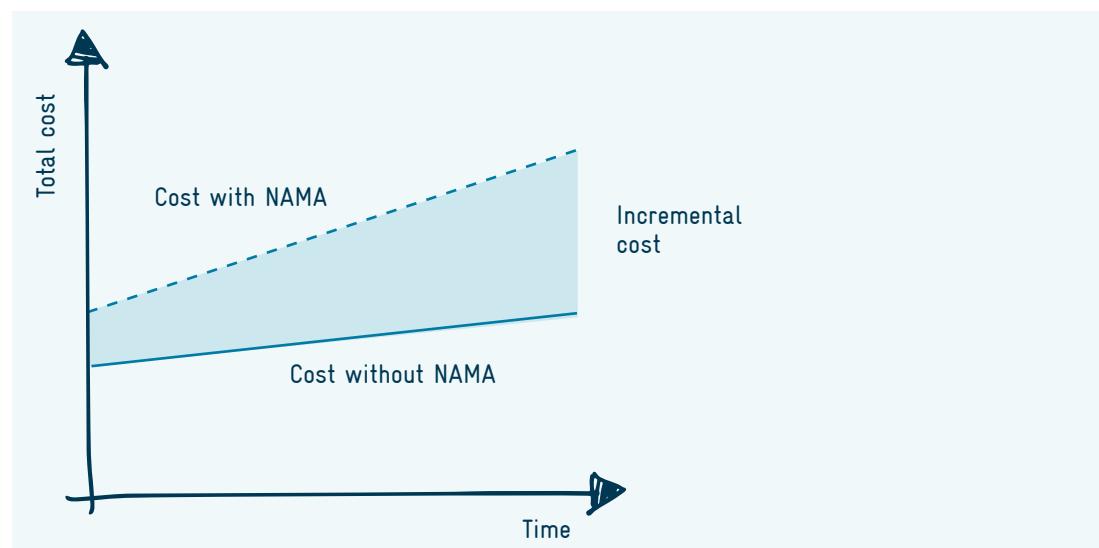


Figure 4.1: Incremental cost vs. total cost (Source: De Vit et al. (2012))

be included in the sum, but can be explained in the “Comments” section. NAMA developers following this advice may be able to reduce NAMA costs to a small amount – particularly in the case of policy NAMAs. For example, a vehicle emission standard may induce only minimal governmental expenses, whereas the manufacturing and purchase of energy-efficient vehicles could impose high upfront investments on manufacturers and users, albeit with significant long-term savings and thus long-term net benefits for all. It must be noted that in some cases these governmental costs may be highly scrutinised both by government and other parties, as the NAMA registration document will be a governmental statement related to funds and must be directly related to actual budgets or a policy document.

only include the measures for eligible NAMA funding; they are also associated with the global environmental benefits of an activity. It is important to note that **incremental costs do not include costs for NAMA preparation**.

No standard method exists for calculating incremental cost for NAMAs, and the calculation may be highly uncertain. According to the UNFCCC, NAMA developers “are invited to estimate the cost incurred in delivering mitigation outcomes and consider whether such cost could be treated as incremental costs.” (UNFCCC 2014). The Global Environmental Facility (GEF) defines incremental costs as costs associated with transforming a project with national benefits into one with global environmental benefits,¹ which is in line with the UNFCCC understanding.

¹ See www.thegef.org/gef/policy/incremental_costs



Several different tools for programme- or project-based NAMAs can be used to calculate incremental costs. As outlined earlier, such NAMAs may entail investment in (sustainable) infrastructure, vehicles or in other measures such as eco-driving schemes. NAMA developers may use the MRV-baseline to establish a reference case with which to calculate incremental costs. Potential donors may demand that NAMA developers disclose upfront investments, operational and maintenance costs as well as discount rates and other assumptions. Cost-Benefit Analysis (CBA) may be an appropriate tool to calculate incremental costs, as it is a well-known concept of evidence-based decision-making and widely used to assess transport measures, especially large-scale infrastructure projects (see Section 3).

In applying a Cost-Benefit Analysis (CBA), or any other method to calculate incremental costs, transport NAMA developers may face **three major challenges** (Würtenberger 2012):

- NAMA developers have to anticipate operational costs and revenues over a long lifetime. Incremental costs are therefore likely to be sensitive to the input parameters, leading to high uncertainty.
- Initiatives to foster modal-shifts to public transport usually involve public bodies with regard to infrastructure, vehicles and operation, whereas individual



Incremental costs of NAMAs are important for potential donors. However, the amount of support will depend on specific eligibility criteria and is negotiable. **Least-developed countries (LDCs) or NAMAs with large potential benefits which are “locked in” by a set of barriers, may even receive support for NAMAs with negative incremental costs (incremental benefits).** NAMA developers should estimate the incremental costs based on the calculations necessary to develop a financial plan (see Section 3).

transport investment decisions involve a mix of public (infrastructure) and private (vehicles and operation) decision makers.

- NAMAs may not only reduce GHG emissions, but also bring about other benefits, such as improved air quality or improved access to goods and services. These additional benefits should be subtracted from incremental costs. However, in many cases they may be challenging to monetise.

In contrast to project or programme based activities, policy based transport NAMAs do not necessarily require financial investment for implementation. Regulatory, economic and planning instruments instead modify the legal and fiscal framework to set rules and/or incentives for low-carbon, sustainable transport. Consequently, their implementation may even lead to incremental benefits, i.e. the mitigation measure is cheaper than the baseline alternative.

Developing countries might face situations where there are costs associated with NAMA preparation, but, once prepared, the NAMA leads to incremental benefits. **It is important to note that developing countries may apply for support for NAMA implementation whether incremental costs are positive or negative.** Regardless, support for implementation is a matter of negotiation and the eligibility criteria of the donor.



Medellin, Colombia; Photocredit: Carlos F. Pardo/2013



Manila, Phillipines; Photocredit: Manfred Breithaupt/2013

Guidance on "Support required for the implementation of the mitigation action"

The UNFCCC specifies that support for the preparation and implementation of NAMAs should take the form of **finance, technology and/or capacity building** (UNFCCC 2011). The financial plan can form the basis for an overview of these aspects. The categorisation of different cost items (see Section 3) allows quantification of the amount of support needed. Financial support may be provided by any of the following: developed countries, entities operating the financial mechanisms of the UNFCCC, multilateral, bilateral and other public donors, private and non-governmental organisations. It may be provided under different modalities and might also differ in terms of suitability for the preparation and implementation of specific NAMAs.



Technology transfer is defined as a broad set of processes involving the flows of knowledge, experience and equipment. It comprises the process of learning to understand, utilise and replicate technologies, and the capacity to choose and adapt them to local conditions and integrate them with indigenous technologies. The UNFCCC guidelines suggest that, for the purposes of providing information to the registry, technology-support relates only to equipment (hardware), while the processes of technological knowledge and education (software) are covered under capacity building. Technology transfer in the transport sector is mainly associated with (components of) low-carbon vehicles, but could also include, for example, traveller information systems.

Guidance on "Estimated emission reductions"

For NAMAs seeking support for implementation or for recognition, the developer estimates GHG emission reductions that will result from it. These estimations should be based either on ex-ante or on ex-post calculations (see Section 2). The estimates should be coherent and thorough, but in some cases support is sought especially because more data is needed in order to produce a more complete emission reduction estimate. Thus, in these cases it is feasible to produce a rough estimate that would improve based on additional support. The spirit of NAMAs is to provide a useful indication of how policies can improve in terms of creating mitigation potential, not to stall efforts from a lack of elaborate estimates or 100% solid data at the beginning. An entry in the registry can be written in such a way that the NAMA developer can specify that more work will be done in improving calculations.

Capacity-building is the development of technical skills and institutional capabilities. The UNFCCC distinguishes between **three levels of capacity building, namely individual, institutional and systemic**. Capacity-building may be required for NAMAs where support for either preparation or implementation is sought (see Section 1.3 on supportive measures). Transport NAMA developers may be particularly interested in systemic capacity building, which refers to the creation of enabling environments. NAMA preparation may also require reallocation of domestic finance or development of relationships and processes between institutions (see Section 1.4 on stakeholder involvement).



Mexico City, Mexico; Photocredit: Carlos F. Pardo/2006



Bogota, Colombia; Photocredit: Carlos F. Pardo/2006



Tunis, Tunisia; Photocredit: Cornie Huizenga/2013



Mexico City, Mexico; Photocredit: Manfred Breithaupt/2013

**Guidance to specify
“Progress on
implementation and
further benefits”**



If the NAMA is registered in order to receive support for either implementation or for recognition, the NAMA developer may designate indicators other than GHG benefits under “other indicators” and “other relevant information.” These may be indicators for (see Section 2, ‘what to be MRVed’):

- progress on implementation
- non-GHG impact

As discussed earlier, sustainability benefits beyond climate change mitigation may be an important motivation to implement transport measures as NAMAs. Accordingly, developing countries and donors may wish to record these impacts.

Box 26:

**Example registry entry:
Sustainable Urban Transport Programme
Indonesia (NAMA SUTRI)**



The NAMA SUTRI in Indonesia has defined the following indicators of progress: public transport quality, capacity and accessibility (e.g. ridership, travel speed, information, network coverage, level of service); quality of walking and cycling facilities (total length of high quality bicycle lanes, modal share, parking management, number of on-street/off-street parking spaces, regulation, enforcement); and emissions per vehicle and kilometre (to be completed).

Most of the sustainable development benefits of this programme are expected to fall in the following categories:

- Air quality
- Accessibility
- Equity
- Road safety
- City liveability

4.3 Checklist and tips for further reading

The steps outlined in this handbook only describe one possible approach for the development of a NAMA. In reality, this process will have to be adapted to the national circumstances and corresponding decision-making processes. Nevertheless, the major steps of the process presented in the handbook can be used as guidance, as they constitute the key elements that enable successful development and are vital to receive the necessary political, technical and financial support after implementation.

Checklist: NAMA Registration		<input checked="" type="checkbox"/>
Relevant stakeholders are familiar with the UNFCCC NAMA registry.		
Contact with the country's NAMA approver is established.		
NAMA developer rights are allocated.		
NAMA registration is prepared and content agreed upon with relevant stakeholders.		
The NAMA registration is approved by NAMA approver and submitted to UNFCCC.		

Tips for further reading

Additional sources:

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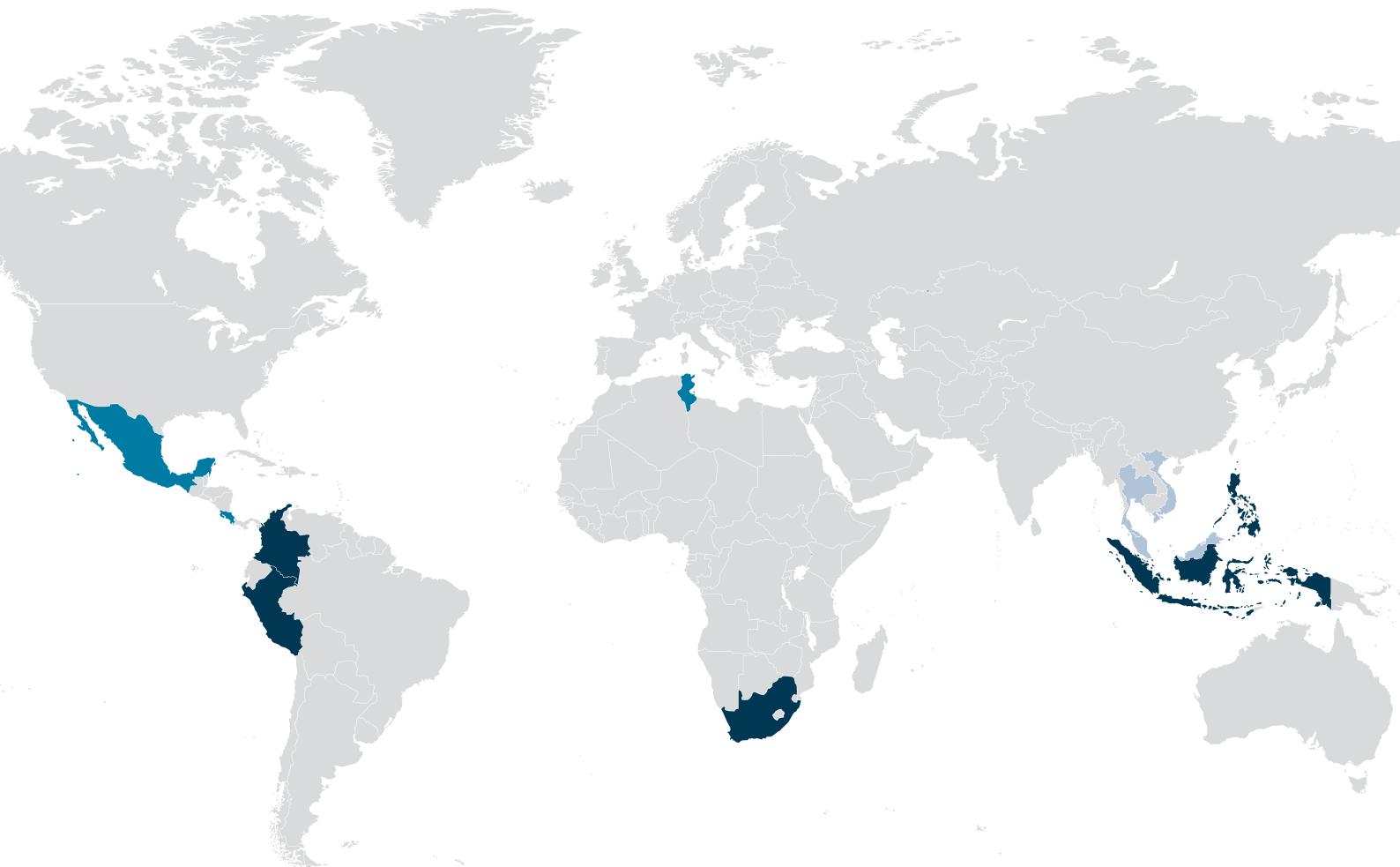
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