

Developing Financeable NAMAs A Practitioner's Guide

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1.0 INTRODUCTION

1.0 Introduction

Nationally Appropriate Mitigation Actions (NAMAs) are fast becoming the climate finance vehicle of choice for developing countries that wish to voluntarily implement greenhouse gas (GHG) mitigation actions in support of sustainable development. Developing countries, their development partners and other actors in and around the United Nations Framework Convention on Climate Change (UNFCCC) are working to operationalize the concept to leverage climate finance through bilateral and multilateral support, and through carbon markets.

NAMAs were introduced in the Bali Action Plan in 2007 as a key mechanism to increase mitigation action in developing countries.¹ The Cancun Agreements (2010) recognized two types of NAMAs—those developed with domestic resources (unilateral NAMAs) and those requesting international support in the form of financing, technology transfer or capacity building (supported NAMAs).² Credited NAMAs have also been discussed, whereby a developing country earns credits that can be sold in the global carbon market by reducing emissions below an agreed crediting baseline.

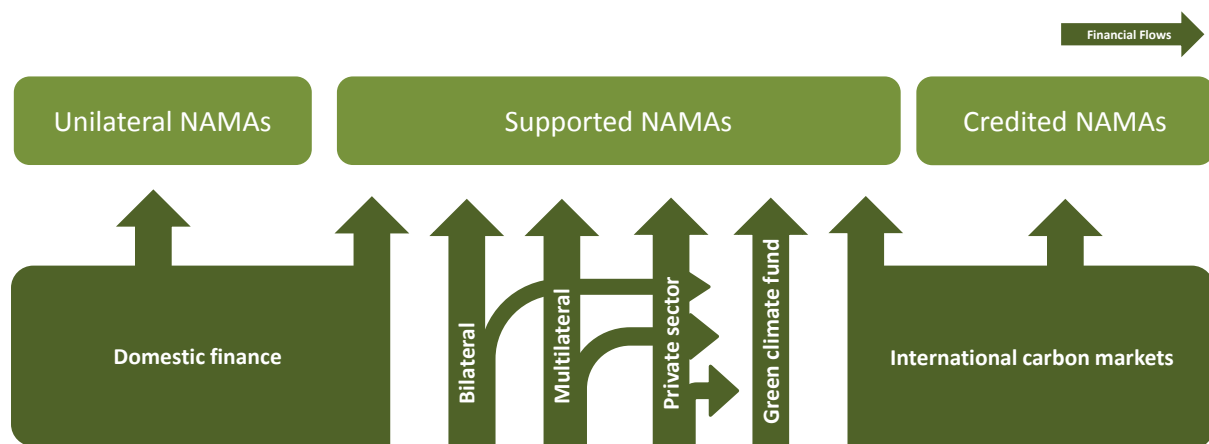


FIGURE 1: TYPES OF NAMAS

The Cancun Agreements also agreed to “set up a registry to record nationally appropriate mitigation actions (NAMAs) seeking international support, to facilitate the matching of finance, technology and capacity-building for these actions.”³ Progress was made on modalities and guidelines for NAMAs at COP 17 in Durban in 2011 and COP 18 in Doha in 2012, and steps were taken to develop a web-based registry for NAMAs. The NAMA Registry Prototype includes templates for:

- A NAMA concept (which it terms a “NAMA seeking support for preparation”), where a screening assessment indicates that there is merit in preparing a more detailed NAMA proposal.⁴

¹ Paragraph (b) (ii) of the Bali Action Plan called for “enhanced national/international action on mitigation of climate change, including, inter alia, consideration of: ... nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measureable, reportable and verifiable (MRV) manner.”

² UNFCCC (2010). *The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*, Decision 1/CP.16, FCCC/CP/2010/7/Add.1, paragraph 53.

³ Ibid.

⁴ See Appendix B for a NAMA concept template based on UNFCCC registry documentation.

- A NAMA proposal (which it terms a “NAMA seeking support for implementation”), where a pre-feasibility assessment indicates that there is merit in developing an implementation plan that can be financed.⁵
- NAMAs seeking support for recognition, where existing activities that could be considered NAMAs can be submitted.

As of January 2013, Mali, Ethiopia and Uruguay have made submissions seeking support for preparation of a NAMA; and Chile and Uruguay have made submissions for NAMAs seeking support for implementation. Ecofys has also established a NAMA database, which provides a collection of publicly available information. The database indicates a much broader involvement in NAMA development, with 35 NAMAs and 28 feasibility studies in 27 countries.⁶

The UNFCCC has not clearly defined the concept and modalities of NAMAs, but recent initiatives, such as the NAMAs registry, demonstrate a “learning-by-doing” approach to NAMA development. A lack of clarity is not necessarily negative at this stage, given that the NAMAs are inherently bottom-up mechanisms. As learning occurs and more NAMAs are developed, the UNFCCC NAMA architecture can be trued up. In the interim, sharing experiences and adding to the information base will contribute to the development of a robust and workable mechanism.

This document provides guidance for identifying and prioritizing NAMAs under two tracks:

- Identifying stand-alone NAMAs
- Identifying priority NAMAs through a process of low-carbon and climate-resilient development (or climate-compatible) planning

Within this context, this document contributes to the growing body of NAMAs learning by providing both:

- **A conceptual framework** for implementing low-carbon, climate-resilient development, under which NAMAs can be prioritized.
- **A step-by-step methodology** for screening NAMA opportunities, both within and outside a low-carbon development planning process, with the **Quick Screen** designed specifically for developing NAMA concepts and the **Deep Screen** for developing NAMA proposals.

The document is designed to be a simple, easy-to-follow guide for developing stand-alone NAMAs or NAMAs nestled within a low-carbon planning process, and for advancing potential NAMAs to the next stage of development. The document is organized as follows:

- Section 2 provides a conceptualization of NAMAS within low-carbon, climate-resilient development planning.
- Section 3 identifies the frameworks for developing NAMA concepts and NAMA proposals.
- Section 4 provides a detailed **Quick Screen** approach for NAMA concepts.
- Section 5 provides a detailed **Deep Screen** approach for NAMA proposals.

⁵ See Appendix C for a NAMA proposal template based on UNFCCC registry documentation.

⁶ These figures were accurate as of January 2013. See <http://www.namadatabase.org>.

**2.0 CONCEPTUALIZING
NAMAS WITHIN
LOW-CARBON,
CLIMATE-RESILIENT
DEVELOPMENT
PLANNING**

2.0 *Conceptualizing NAMAs within Low-Carbon, Climate-Resilient Development Planning*

Low-carbon, climate-resilient development (LCCRD) frameworks help national governments align development priorities with mitigation and adaptation aspirations. NAMAs are a central element of the LCCRD process in that they require a focused assessment to identify actions that align with development priorities, can be implemented within local realities and signal country-driven priorities for financing. In practice, NAMAs should be a distinct element of a larger development strategy, whether focused on GHG mitigation or not.

An LCCRD framework starts with a realization that development is the priority and that mitigation and adaptation efforts need to complement development actions. The approach aims to understand governance arrangements first, and then conduct detailed sector analysis using integrated economic, energy and emission tools to make recommendations that can be taken up locally and further refined to secure climate finance. The main elements of the overall approach include:

- **Understanding governance for low-carbon development.** Efforts to integrate low-carbon, climate-resilient considerations into development have demonstrated the need for high-level government leadership, effective stakeholder engagement, alignment with existing development plans and the involvement of relevant government ministries with clear delineation of roles and responsibilities.
- **Envisioning development to accommodate mitigation and adaptation aspirations.** The long-term, continual requirement to mitigate and adapt to climate change means that LCCRD considerations are most effectively addressed through integrating into routine planning processes. This planning effort to envision alternative development pathways involves the development and application of knowledge, tools and processes that help planners and decision-makers understand future risks and opportunities. Central to this is GHG emission inventory development and economic forecasting to determine realistic solutions that balance competing priorities, and bringing these outcomes into planning processes.
- **Planning for the transition to low-carbon, climate-resilient development.** Experience is beginning to emerge from the practical application of policies, programs and measures that facilitate climate-compatible development at different scales (from community to national levels). Learning from these experiences will increase capacity to identify appropriate actions within a given context, test the application of these measures, identify sources of needed financing, assess their success and communicate outcomes in a manner that promotes further change.

The focus of this document is primarily on methodologies useful for the second element above: envisioning development to accommodate mitigation and adaptation aspirations. Specifically, we present a standardized, country-driven process that identifies and prioritizes a list of NAMA opportunities that meet a country's specific needs, align with pre-existing policy frameworks, and are feasible to implement. The two methodologies include:

NAMA Concept Quick Screen – identifies promising NAMA options to be put forward for local validation, and produces information for the UNFCCC registry template for NAMAs seeking support for preparation (NAMA concept).

NAMA Proposal Deep Screen – analyzes priority NAMA opportunities using a variety of techniques and tools, and produces information on viable NAMAs that could be used for submissions to the UNFCCC NAMA registry, either as a NAMA seeking support for preparation (NAMA concept) or a NAMA seeking support for implementation (NAMA proposal).

Figure 2 provides a general overview of the approach to operationalizing these two methodologies. Both require local validation to ensure potential NAMAs are nestled in country-development priorities and reflect local input. If international consultants assist with the screening process, a sustained in-country presence, strong local partners, and open and collaborative relationships with key government officials are critical elements of success. It is also critically important to consult across various government ministries, as well as with stakeholders in business, academia and non-governmental organizations.

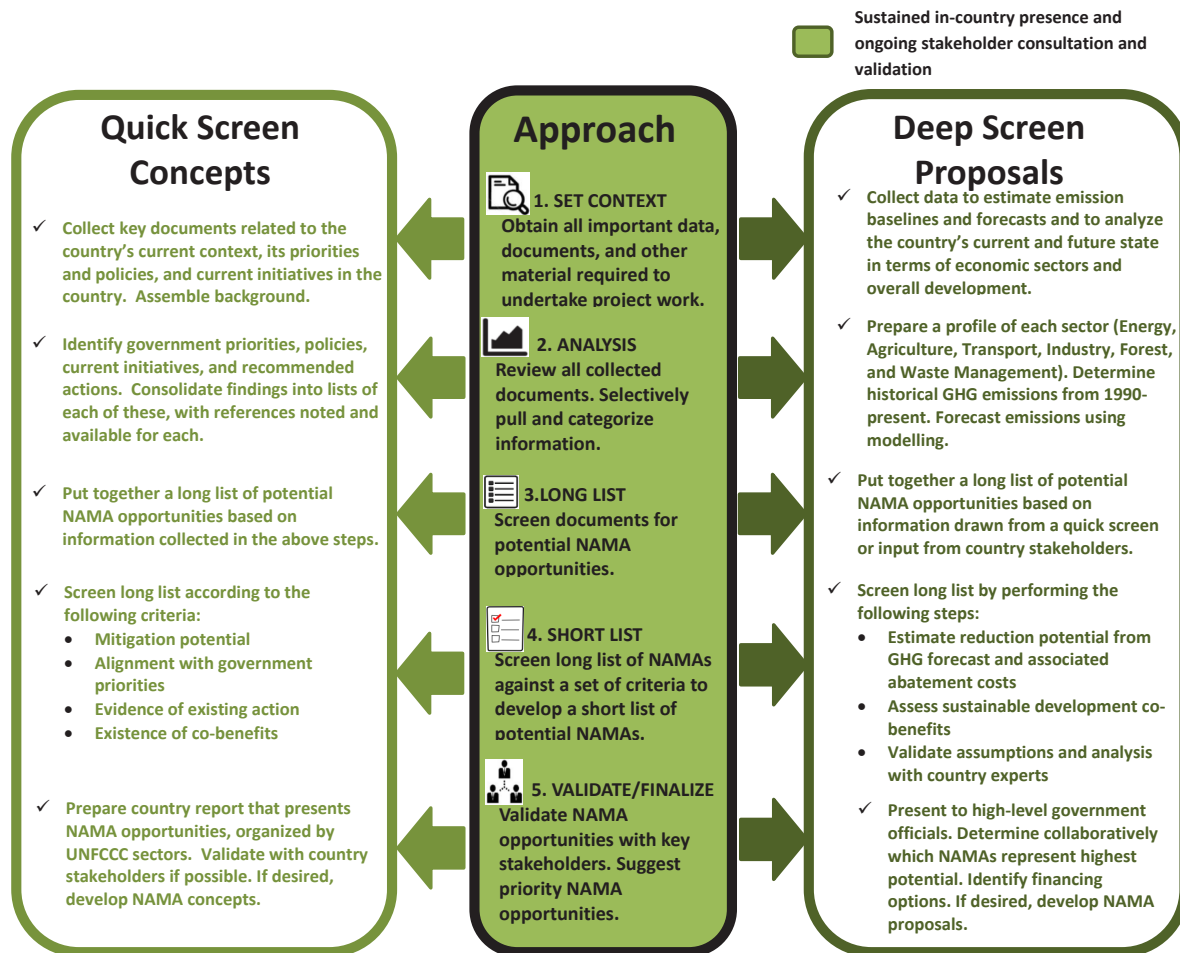


FIGURE 2: METHODOLOGICAL APPROACH

3.0 IDENTIFYING AND PRIORITIZING NAMA OPPORTUNITIES

3.0 Identifying and Prioritizing NAMA Opportunities

In this section, we identify two methodologies to help countries identify, prioritize and develop NAMA opportunities. The two methodologies are similar, but differ in the detail of analytical effort applied. Both methods build on work undertaken by IISD to screen for NAMA opportunities in Kenya, Trinidad and Tobago, Bangladesh and Rwanda, and are now being applied to various developing countries.

The NAMA **Quick Screen** is designed to complete a rapid assessment that identifies a list of NAMA opportunities to prioritize further analysis and catalyze dialogue, and its outputs can be used to develop NAMA concepts for submission to the UNFCCC registry. The NAMA **Deep Screen** is a more elaborate analytical effort to explore feasibility and possible outcomes of possible NAMAs; its outputs can be used to develop NAMA concepts or proposals for submission to the UNFCCC registry. The IISD NAMA methodology is intended to facilitate and guide the NAMA development process through each stage, from concept to proposal to implementation. More specifically:

- The NAMA **Quick Screen** is a qualitative assessment to identify a list of low-carbon interventions that could potentially be NAMAs, organized by the mitigation sectors in Article 4.1(c) of the UNFCCC (which are energy, transport, industry, waste, agriculture and forestry). The screen can also adopt other sector aggregations, such as those that may be used for national development planning. This screen is useful for policy-makers because it:

- ✓ Forms the basis of factsheets on high-priority NAMAs to begin discussions with potential donors and funders.
- ✓ Identifies sectors and technologies that require further investigation and information.
- ✓ Identifies information and data gaps for reporting on GHG emissions and climate change actions.
- ✓ Produces formal NAMA concepts that can be submitted to the UNFCCC registry to seek funding for further analysis.
- ✓ Raises awareness of NAMA opportunities with development partners.

- The NAMA **Deep Screen** identifies and elaborates on the most promising NAMA opportunities, quantitatively assessing abatement potential and calculating abatement costs, and qualitatively examining sustainable development and climate resilience co-benefits. The **Deep Screen** is useful to policy-makers because it:

- ✓ Provides the same benefits of the **Quick Screen**, but with more in-depth information.
- ✓ Informs the updating of the GHG inventory and provides information for reporting to the UNFCCC, including the biennial report to the UNFCCC.
- ✓ Provides the evidence base for the identification of priority NAMAs and the need for international support (including financing, technology transfer and capacity building), which is especially important to bilateral and multilateral donors.
- ✓ Produces NAMA proposals that can be submitted to the UNFCCC registry in order to seek funding for implementation.
- ✓ Raises awareness of NAMA opportunities with development and provides stakeholders with a detailed analysis of NAMA opportunities by sector.

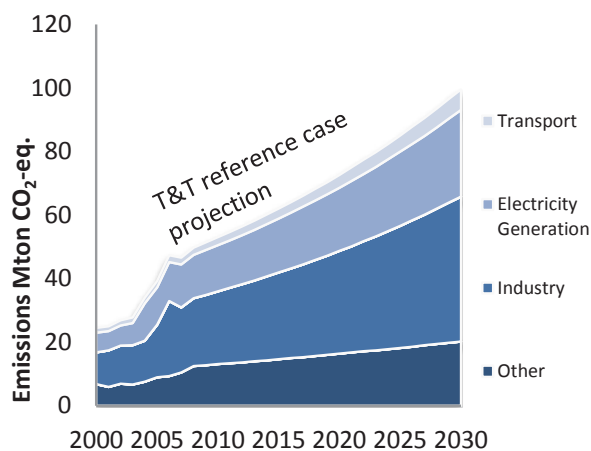
The two screening processes require different levels of expertise to complete. The NAMA **Quick Screen** can be undertaken by analysts with a solid understanding of climate change mitigation. The NAMA **Deep Screen** requires technical expertise in the calculation of GHG emissions, including familiarity with the guidelines of the Intergovernmental Panel on Climate Change (IPCC), as well as experience in the calculation of abatement costs and abatement potential of technologies and options. Familiarity with the assessment of sustainable development and climate resilience impacts is also required in the Deep Screen. Additionally, an on-the-ground researcher is helpful to track down unpublished documentation, access sector data, and liaise with key stakeholders to raise awareness and buy-in.

Below is an overview of the types of approaches and outputs that can be employed in identifying and prioritizing NAMA opportunities.

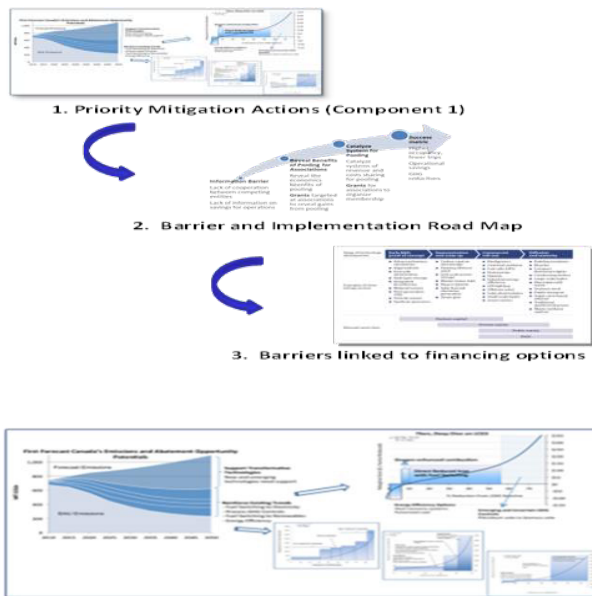
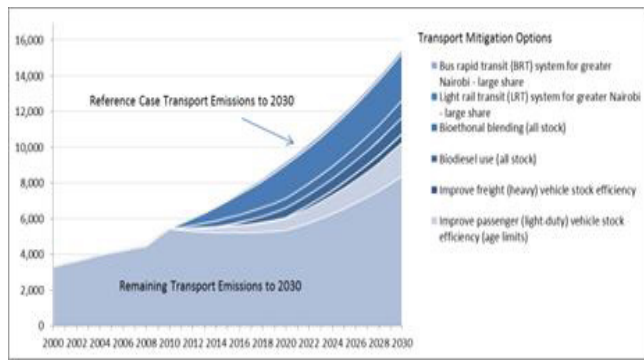
	Step 1: Set Context	Step 2: Analysis	Step 3: Long List	Step 4: Short List	Step 5: Validate
Approach	Obtain all important data, documents, and other material required to undertake project work.	Review all collected documents. Selectively pull and categorize information.	Screen documents for potential NAMA opportunities.	Screen long list of NAMAs against a set of criteria. Develop a short list of opportunity NAMAs.	Validate NAMA opportunities with key stakeholders. Suggest priority NAMA opportunities.
Identify Opportunities: Quick Screen	Collect key documents related to the country's current context, its priorities and policies, and current initiatives in the country. Prepare background information on the country.	Identify government priorities, policies, current initiatives, and recommended actions. Consolidate findings into lists of each of these, with references noted and available for each.	Put together a long list of potential NAMA opportunities based on information collected in previous stage.	Screen long list according to the following criteria: <ul style="list-style-type: none"> Mitigation potential Alignment with government priorities Evidence of existing action Existence of co-benefits 	Prepare country report that presents NAMA opportunities, organized by UNFCCC sectors. Validate with country stakeholders if possible.
Analyze Opportunities: Deep Screen	Collect data to estimate emission baselines and forecasts and to analyze the country's current and future state in terms of economic sectors and overall development.	Prepare a profile of each sector (Energy, Agriculture, Transport, Industry, Forest, and Waste Management). Determine historical GHG emissions from 1990-present. Forecast emissions using modeling.	Put together a long list of potential NAMA opportunities based on information drawn from a quick screen or input from country stakeholders.	Screen long list: <ul style="list-style-type: none"> Step 1: Analyse reduction potential Step 2: Estimate abatement costs Step 3: Re-assess co-benefits Step 3: Validate assumptions and analysis with country experts Step 4: Finalize 	Present to high-level government officials. Determine collaboratively which NAMAs represent highest potential. Develop detailed NAMA proposals. Identify financing options.

NAMA Concepts Identified. A long list of potential mitigation options are identified based on a review of policy documents and other key sector reports. A screening method identifies which of the long list has greatest potential, and a short list is developed for local validation. Mitigation opportunities are identified based on feasibility in current context, abatement potential, alignment with government objectives and co-benefits.

NAMA Proposals Developed. Based on local validation, a short list of proposals can then be developed. For NAMA proposals, the following process is relevant.



- **Reference Case/Business-As-Usual (BAU) GHG Forecast.** Two approaches can be used to translate historical emissions into a calibrated historical baseline and an emission and forecast of emissions to a future year, such as 2030. A detailed bottom-up assessment for sector GHG inventories using IPCC protocols, and top-down economy-wide tools can be applied, such as general equilibrium and emission models. The results of these two approaches are then put forward for local validation and assessment to ensure the forecast is realistic.



- **Detailed Sector Analysis Proposals.** For locally validated NAMA options, detailed technical assessments are conducted to estimate mitigation potentials, costs and co-benefits of the low carbon options. The NAMA information can then be aggregated into the sector wedge diagrams (adjacent) that indicate the pairings of reductions and costs relative to the forecasted BAU emissions. Detailed technical assessments highlight all calculations, including costs and benefits.
- **Unified Low-Carbon. Climate-Resilient Development Pathways, Financeable NAMA Opportunities.** With the technical work complete and locally validated, low-carbon scenarios are developed. A suite of abatement and cost information as well as implementation options is then used to develop the NAMA proposal or the main elements of a low-carbon, climate-resilient development pathway.
- **Implementing NAMAs and LCCRD.** The final step is to develop a financing proposal based on an implementation road map. The road map identifies implementation risks, synergies and barriers for priority mitigation actions. Financing channels are identified, such as grants for skills development and low-interest loans for technology deployment.

The specialized knowledge and skills required to conduct a **Deep Screen** is the primary motivator for dividing the methodology into two components. Practitioners may choose to develop NAMAs to the proposal stage should they wish, or to simply produce concepts for which they can then seek assistance to develop into proposals. Consequently, the two screening processes can be undertaken in sequence, using the results of the NAMA **Quick Screen** as the starting point for the NAMA **Deep Screen**; or they can be used individually. The screens can also be undertaken on a sector basis if a country desires a NAMA assessment in a specific sector. A decision tree outlining the possible uses of the screening methodology is presented in Figure 3.

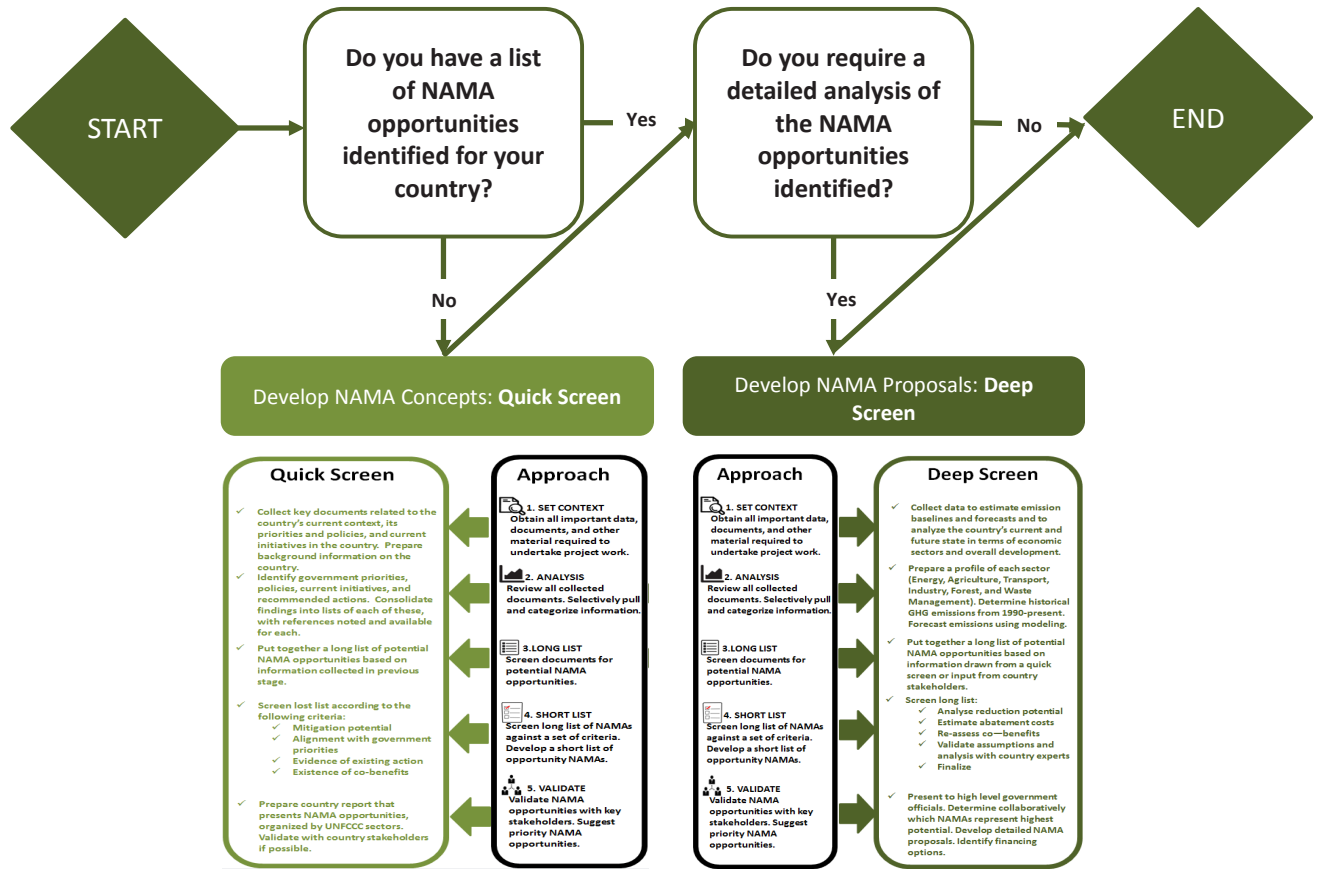


FIGURE 3: DECISION TREE FOR USING THE SCREENING METHODOLOGY

**4.0 DEVELOPING
NAMA CONCEPTS:
QUICK SCREEN
METHODOLOGY**

4.0 Developing NAMA Concepts: Quick Screen Methodology

Figure 5 below summarizes the five steps comprising the **Quick Screen** methodology, walking the analyst all the way through the process, from desk research to local validation. These steps are discussed in detail below.

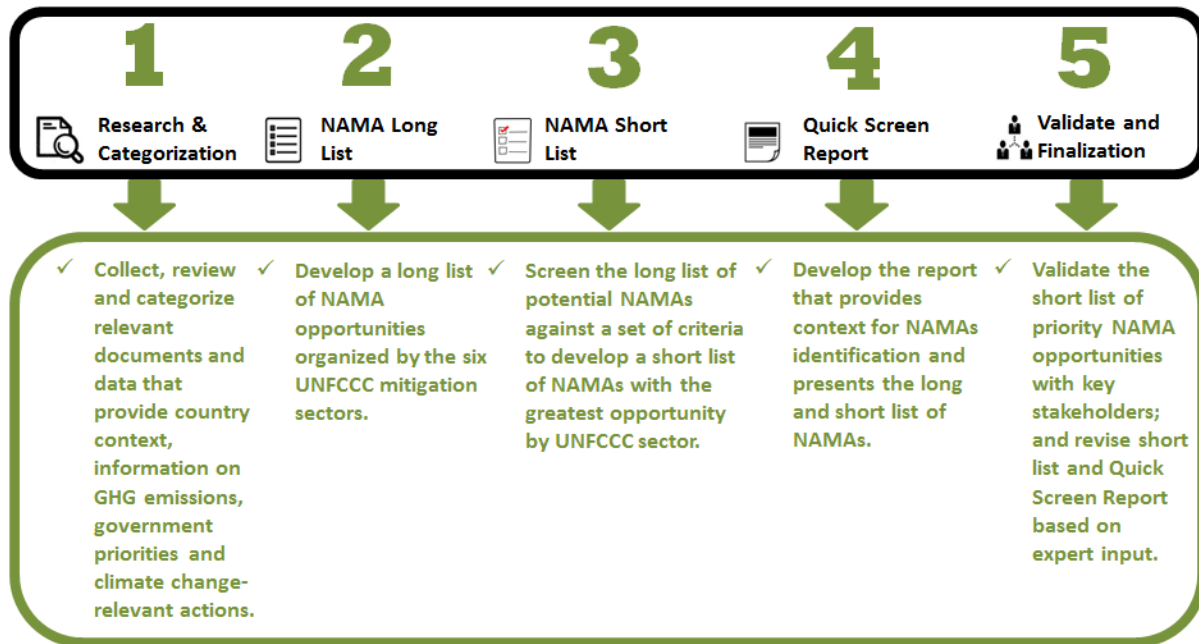
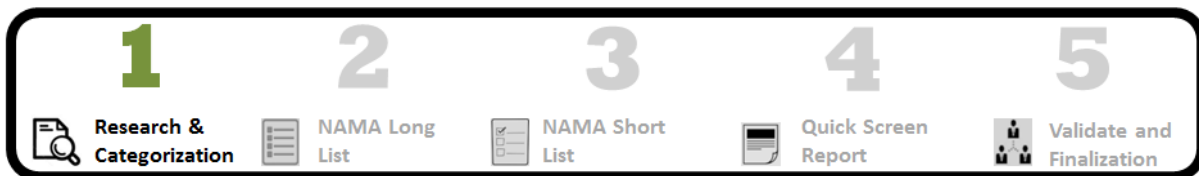


FIGURE 4: THE FIVE STEPS OF THE QUICK SCREEN METHODOLOGY

This process yields a long list of NAMA opportunities that can be developed into a shorter list of NAMA concepts. The information developed is oriented to provide information directly applicable to the NAMA seeking support for preparation (a NAMA concept). The UNFCCC submission template for a NAMA seeking support for implementation is included in Appendix C.⁷

Step 1: Research and Categorization



⁷ See: http://unfccc.int/files/cooperation_support/nama/application/pdf/registry_manual_25_oct.pdf

Objective

The first step is to collect, review and categorize the information that underlies the identification of NAMA opportunities. This includes relevant documents and data that provide country context, information on GHG emissions, government priorities, and ongoing and planned actions in the six UNFCCC mitigation sectors of agriculture, energy, forestry and other land use, industry, transport and waste.

Outputs

Step 1 develops a collection of relevant documents regarding the country's economy, development priorities, national and sectoral policies and priorities, and major initiatives, as organized by the six UNFCCC sectors. The collection and categorization process will also result in three lists of important information needed to identify potential NAMAs: government policies and priorities, current initiatives by sector and actions recommended in government documents.

Process

Collection. A desk review is undertaken to identify and access various information sources. The research will focus on assembling and categorizing information on the following topics:

- ✓ Economic growth and development (e.g., main economic sectors, growth trends)
- ✓ Social development (e.g., population and urbanization trends, percentage of rural population)
- ✓ GHG emissions inventory and forecast
- ✓ National government priorities and policies (e.g., from national development plans)
- ✓ Major government policies and priorities in the six mitigation sectors
- ✓ Sectoral context (e.g., trends, energy use and access to energy, modes of transport, forestry cover and rates of deforestation, main agricultural crops, technologies or interventions recommended for implementation)
- ✓ Major initiatives on the part of government, civil society, private sector, multilateral institutions and donors in the six sectors
- ✓ Any other information that is potentially relevant to NAMAs

Table 1 provides a list of typical information to be collected at this stage. This information should be organized by the six UNFCCC sectors, in addition to one general climate change category (e.g., national development plans, national economic reports, etc.). Alternatively, it can align with country-level planning groupings.

If the research team intends to also undertake a NAMA proposal **Deep Screen**, extra effort may focus on the underlying data to calculate GHG emissions and abatement potential. Researchers should note important documents that are not accessible at this stage, and major data and information gaps. There may be an opportunity to locate the information at a later stage in the research (for example, through the validation process in Step 5), or through in-country consultations with experts. Filling information gaps will be especially important if undertaking, or assessing the feasibility of, a NAMA **Deep Screen**.

The information collected during this stage will be used to develop the long list (Step 2), the short list (Step 3) and the **Quick Screen** Report (Step 4), and should be organized to allow researchers to find and access particular data and identify sources. Mindjet's MindManager software is one way to organize the documentation, but a range of other data management products or techniques could potentially be used. The resulting library of information can be a useful deliverable for the developing country.

TABLE 1: EXAMPLES OF DOCUMENTS COLLECTED IN THE FORESTRY SECTOR IN THE NAMA QUICK SCREEN FOR KENYA

TITLE	AUTHOR	YEAR
<i>An Assessment of Opportunities for Low Carbon Growth in Kenya</i>	Stockholm Environment Institute	2009
<i>Climate Change Adaptation in Kenya: What Organizations in Kenya are Doing</i>	Ochieng and Makoloo	-
<i>Economic Recovery Strategy for wealth and employment creation</i>	Government of Kenya, Ministry of Planning and National Development	2003
<i>First Medium Term Plan, 2008-2012: Kenya Vision 2030</i>	Government of Kenya, Ministry of Planning and National Development	2008
<i>Kenya Vision 2030 - Abridged version</i>	Government of Kenya	2007
<i>Kenya's Climate Change Technology Needs and Needs Assessment Report Under the UNFCCC</i>	Government of Kenya, Ministry of Environment and Natural Resources	-
<i>Climate Change Screening of Danish Development Cooperation with Kenya</i>	Danish International Development Assistance (DANIDA)	2007
<i>How Attractive are Short-Term CDM Forestations in Arid Regions? The Case of Irrigated Croplands in Uzbekistan</i>	Djanibekov et al.	2012
<i>IPCC Guidelines for National Greenhouse Gas Inventories: Agriculture, Forestry and Other Land Use</i>	Intergovernmental Panel on Climate Change (IPCC)	2006
<i>Identification Mission for a Climate Change Programme</i>	Agence Francaise Developpement and JICA	2010
<i>Estimation of Ex ante Forest Carbon Stocks and Projected Net CO₂ Change from Forest Again, Kakamega Forest, Kenya</i>	Eco2librium	2008
<i>Kenya Forestry Master Plan: Development Programmes 0-98</i>	Government of Kenya, Ministry of Environment and Natural Resources	1994
<i>Kenya Forestry Master Plan: Development Programmes 209-318</i>	Government of Kenya, Ministry of Environment and Natural Resources	1994
<i>Kenya Forestry Master Plan: Development Programmes 22-208</i>	Government of Kenya, Ministry of Environment and Natural Resources	1994
<i>Kenya Forestry Master Plan: Development Programmes 319-422</i>	Government of Kenya, Ministry of Environment and Natural Resources	1994
<i>REDD Readiness Preparation Proposal - Kenya- Annexes to R-PP</i>	Government of Kenya	2010
<i>REDD Readiness Progress Fact Sheet: Kenya</i>	-	2011
<i>Second National Communication to UNFCCC: Climate Change Mitigation Measures and Options</i>	Omondi	2010
<i>Tanzania CDM Project Note: Same and Mwanga CDM Forest Plantation Project (SMFP)</i>	-	-
<i>The Forest Carbon Partnership Facility (FCPF) Readiness Plan Idea Note (R-PIN) Template</i>	Government of Kenya, Ministry of Energy and Ministry of Mineral Resources	2008
<i>The Kasigau Corridor REDD Project Phase I: Rukinga Sanctuary</i>	Rukinga Ranching Co Ltd, Wildlife Works	-
<i>VCS Project Validation Report: The International Small Group and Tree Planting Program in Kenya</i>	Environmental Services Inc.	2011

Categorization. Categorization of information will be done concurrently with the document collection and review. To facilitate the identification of priority NAMAs, select information should be organized by the following categories:

- Government priorities, overall and by sector (see Table 2 for an example of a list of government priorities identified in the NAMA **Quick Screen** for Bangladesh)
- Ongoing initiatives and activities by UNFCCC mitigation sectors—including government, donor-funded, civil society and private sector
- List of planned or needed actions in the six sectors, as articulated in government and expert documents

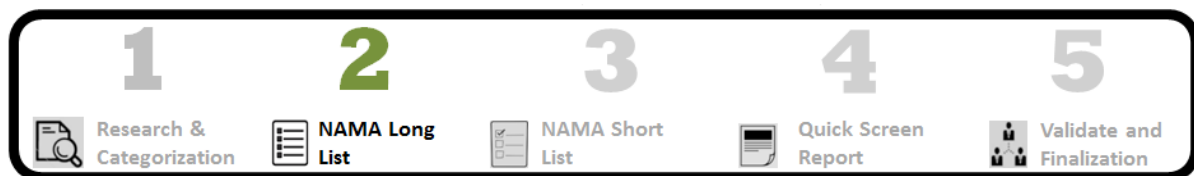
The initiatives and actions should be those that have the potential to reduce GHG emissions or enhance sinks from the BAU trajectory—that is to say, mitigation actions.

TABLE 2: GOVERNMENT PRIORITIES FOUND IN THE NAMA QUICK SCREEN FOR BANGLADESH

SOURCE	PRIORITY
<p>Overall Development Goals Sources:</p> <ul style="list-style-type: none"> • <i>Vision 2021</i> • <i>Bangladesh Climate Change Strategy and Action Plan 2008</i> • <i>Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 A Reality</i> • <i>SAARC Development Goals: Bangladesh Country Report 2011</i> 	<ol style="list-style-type: none"> 1. Employ low-carbon modes of development 2. Make climate strategy pro-poor 3. Reduce poverty 4. Increase employment 5. Have stable and sustainable economic growth 6. Make economic growth inclusive 7. Enjoy food security 8. Reduce hunger, improve nutrition
<p>Agricultural Sector Development Goals Sources:</p> <ul style="list-style-type: none"> • <i>Vision 2021</i> • <i>National Agriculture Policy 2010</i> • <i>Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 A Reality</i> • <i>The Millennium Development Goals: Bangladesh Progress Report 2009</i> • <i>SAARC Development Goals: Bangladesh Country Report 2011</i> 	<ol style="list-style-type: none"> 1. Increase agricultural productivity 2. Promote competitiveness of agricultural sector 3. Achieve self-sufficiency in food production 4. Improve irrigation 5. Diversify crops 6. Reduce/arrest/reverse land degradation 7. Make agricultural production sustainable 8. Preserve and enhance water and soil quality
<p>Energy Sector Development Goals Sources:</p> <ul style="list-style-type: none"> • <i>Vision 2021</i> • <i>Bangladesh Climate Change Strategy and Action Plan 2008</i> • <i>The Millennium Development Goals: Bangladesh Progress Report 2009</i> • <i>Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 A Reality</i> 	<ol style="list-style-type: none"> 1. Expand supply of energy/meet demand 2. Make energy sector financially viable 3. Increase the efficiency of the sector and of energy use 4. Enjoy energy security 5. Pursue sources of renewable energy
<p>Forestry Sector Development Goals Sources:</p> <ul style="list-style-type: none"> • <i>The Millennium Development Goals: Bangladesh Progress Report 2009</i> • <i>Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 A Reality</i> • <i>SAARC Development Goals: Bangladesh Country Report 2011</i> 	<ol style="list-style-type: none"> 1. Conserve biodiversity 2. Provide an acceptable level of forest cover 3. Use forest resources efficiently

<p>Transport Sector Development Goals Sources:</p> <ul style="list-style-type: none"> • <i>Vision 2021</i> • <i>SAARC Development Goals: Bangladesh Country Report 2011</i> • <i>Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 A Reality</i> 	<ol style="list-style-type: none"> 1. Expand and improve the railway system 2. Manage traffic more effectively 3. Provide an acceptable level of air quality 4. Provide improved transport services
<p>Waste Management Sector Development Goals Sources:</p> <ul style="list-style-type: none"> • <i>Bangladesh Climate Change Strategy and Action Plan 2008</i> • <i>Outline Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 A Reality</i> • <i>SAARC Development Goals: Bangladesh Country Report 2011</i> 	<ol style="list-style-type: none"> 1. Manage wastes to lower GHG emissions 2. Manage wastes to increase cities' and towns' livability 3. Manage hazardous wastes effectively

Step 2: NAMA Concept Long List



Objective

To develop a credible long list of possible NAMAs for the country. This long list is the basis for the short-listing of NAMAs that occurs in Step 3.

Outputs

The output of Step 2 of the **Quick Screen** is a comprehensive long list of potential NAMAs for a given country. Table 3 presents the long list of NAMA concepts developed through the NAMA **Quick Screen** for Trinidad and Tobago.

TABLE 3: LONG LIST FROM THE NAMAS QUICK SCREEN FOR TRINIDAD AND TOBAGO

NAMA OPPORTUNITY	UNFCCC SECTOR	SOURCE
Agroforestry	Agriculture	World Bank: Biocarbon fund website; US Environmental Protection Agency (2010)
Conservation agriculture	Agriculture	Government of Trinidad and Tobago (2010)
Integrated nutrient management	Agriculture	Government of Trinidad and Tobago (2010)
Livestock Management	Agriculture	Government of Trinidad and Tobago (2010)
Renewables - solar water heaters	Energy	Government of Trinidad and Tobago (2011)
Cogeneration	Energy	US Environmental Protection Agency (2010)
Renewables - wave	Energy	Government of Trinidad and Tobago (2011)
Renewables - solar - off-grid (solar street lights)	Energy	Government of Trinidad and Tobago (2011)
Phasing out incandescent light bulbs	Energy	Government of Trinidad and Tobago (2011)
Gas pricing policy	Energy	Government of Trinidad and Tobago (2010)
Renewables - wind	Energy	Government of Trinidad and Tobago (2011)
Renewables - solar - grid	Energy	Government of Trinidad and Tobago (2011)
Leak Detection and Repair Programs	Energy	US Environmental Protection Agency (2010)
Flare Gas Recovery	Energy	US Environmental Protection Agency (2010)
Carbon Capture and Storage	Energy	Economic Commission for Latin America and the Caribbean (2010)
Promoting energy-efficient appliances	Energy	Government of Trinidad and Tobago (2011)
Increase efficiency of natural gas generation plants	Energy	Government of Trinidad and Tobago (2011); Energy Policy Journal (2011)
Reforestation (in-land)	Forests	Government of Trinidad and Tobago (2010); US Environmental Protection Agency (2010)
Coastal reforestation	Forests	US Environmental Protection Agency (2010)
Waste Heat Recovery	Industry	US Environmental Protection Agency (2010)
Enhanced efficiency of production processes	Industry	Energy Policy Journal (2011)
Energy-efficiency and pollution audits	Industry	Government of Trinidad and Tobago (2011)
Greening of the priority bus route	Transport	Government of Trinidad and Tobago (2011); Government of Trinidad and Tobago (2011)
Promoting import of cars that run on alternative energy	Transport	Government of Trinidad and Tobago (2011)
Natural gas for private and public transport	Transport	Government of Trinidad and Tobago (2011)
Waste-to-energy technologies	Waste	Government of Trinidad and Tobago (2011)
Solid waste program	Waste	Government of Trinidad and Tobago (2010); Government of Trinidad and Tobago (2011)

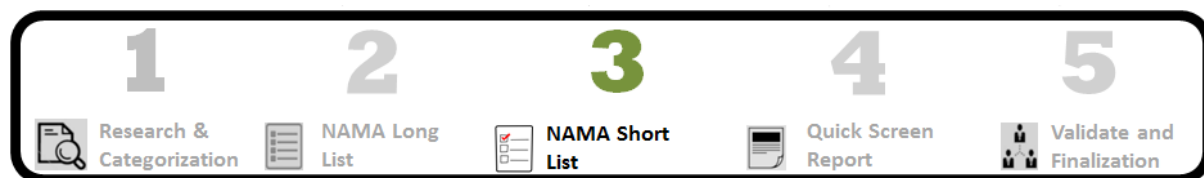
Process

The lists of current initiatives and recommended actions developed in Step 1 are examined for actions that could be NAMAs—that is, those that have the potential to lead to emission reductions or enhance the sequestration or removal of carbon from the atmosphere (sinks). The actions could be policies, programs or projects. Examples of potential actions are listed below by sector:

- **Energy supply:** renewable energy (hydro, solar, wind, geothermal), clean coal, biofuels, electricity generation from landfill gas.
- **Energy demand:** improved cookstoves, renewable lamps replacing kerosene, energy-efficient appliances, energy-efficient lighting, solar water heating, improved buildings, energy-efficiency improvements in industry, co-generation in agriculture.
- **Transport:** bus rapid transit, light rail transit, improved vehicle stock efficiency, improved heavy-duty vehicle stock efficiency, biofuel, shift of freight to rail, improved non-motorized transport.
- **Industry:** improved cement processing, improved charcoal production
- **Waste:** methane avoidance from landfill gas.
- **Agriculture:** conservation tillage, agroforestry, livestock management, reduced burning of grazing and cropland.
- **Forestry:** reducing deforestation and forest degradation, tree planting, restoration of degraded forests.

The list above is not complete and other options may be identified. Expert opinion is used to draw out the options from the lists developed in Step 1. The degree of specificity is also dependent on expert opinion. For example, public transport policies can be grouped as a single NAMA, or can be separated into different NAMAs to cover various programs and initiatives. Publication information is indicated for each identified NAMA.

Step 3: Short List of NAMAs



Objective

To filter the long list to develop a short list of NAMAs that are potentially implementable in the country.

Outputs

The output of Step 3 is a short list of NAMA opportunities that have medium to high mitigation potential, align with government priorities, are likely feasible to implement because of existing initiatives, and have sustainable development benefits.

Process

The NAMAs in the long list are analyzed against the following screening criteria:

- **Significant mitigation potential:** Defined as 0.1 percent of total 2010 emissions or large enough to have a notable mitigation impact on sector emissions at the national level. The mitigation potential is estimated at this **Quick Screen** stage, and elaborated in full during the NAMA **Deep Screen**. Those actions with low mitigation potential are removed from the list.
- **Alignment with government priorities:** Actions must build on or contribute to the government's national and/or sectoral priorities. Actions that are not in line with government priorities are removed from the list.
- **Evidence of existing action:** The NAMA should build upon and feed into existing initiatives to avoid duplication and demonstrate some in-country capacity to implement the action. Existing action could be enabling, planning or investment activities that directly relate to the NAMA. If there is no evidence of similar or complementary initiatives from either the government or major donors, the action is removed from the list.
- **Sustainable development and climate resilience co-benefits:** Recognizing that NAMAs are expected to contribute to sustainable development, and that development is a priority, all short-listed NAMAs are expected to have at least one clear economic, social, environmental or climate resilience benefit.
 - Economic benefits – economic growth, improved livelihoods, increased household income and improved energy security; negative impacts can be increases in prices of energy
 - Social benefits – enhanced food security, decreased time for fuelwood collection, improved indoor air quality; negative impacts can be displaced populations, lack of access to forest and grazing lands
 - Environmental benefits – improved local air quality, improved water quality, enhanced biodiversity; negative benefits can be flooding of land, monoculture in tree plantations
 - Climate resilience – improved water availability, reduced soil erosion, reduced deforestation and forest degradation.

The process screens out those actions that do not meet all of the above criteria. In other words, a short-listed NAMA has significant mitigation potential, aligns with government priorities, has sustainable development benefits, and there is evidence of similar action in the country.

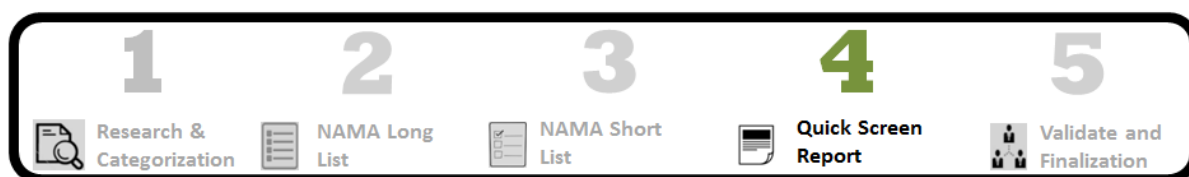
This is a high-level screen, where evidence of the above screening criteria is noted in the literature or understood through expert opinion. Analysts are not expected to undertake extensive additional research at this stage, but to use the understanding and knowledge gained in Step 1.

The results of the short list are organized by a UNFCCC mitigation sector, and can be displayed in an Excel spreadsheet. Table 4 provides an example of the short list of options in the energy sector in Rwanda

TABLE 4: SHORT LIST FOR THE ENERGY SECTOR FROM THE NAMA QUICK SCREEN FOR RWANDA

MEASURE	REDUCTION POTENTIAL (L/M/H)	GOV'T PRIORITIES	EVIDENCE OF EXISTING ACTION	CO-BENEFITS (-/NEUTRAL/+)			
				ADAPTATION TO CC	ECONOMIC DEV.	ENVIRONMENTAL	SOCIAL
High-efficiency furnaces and stoves	H	5d, 5e, 5f	GOR, MONR, 2011; GOR, MOI, 2009	+	+	+	+
Substituting other fuels for wood	H	5d, 5e, 5f	GOR, MONR, 2011; GOR, MOI, 2009	+	+	+	+
Hydro-electricity	M	1a, 5a, 5c	GOR, MONR, 2011; GOR, MOI, 2009	neutral	+	+	neutral
Geothermal energy	M	1a, 5a, 5c	GOR, MONR, 2011; GOR, 2011a	neutral	+	+	neutral
Biogas	M	1a, 5a, 5b, 5c	GOR, MONR, 2011; GOR, MOI, 2009	neutral	+	+	neutral
Methane capture	M	1a, 5a, 5c	GOR, MONR, 2011; GOR, MOI, 2009	neutral	+	+	neutral

Step 4: Draft Quick Screen Report



Objective

To prepare a report for country stakeholders that outlines the results of the analysis, including the short list of NAMAs.

Outputs

The **Quick Screen** Report is the output of Step 4. The report can be used for a variety of purposes, including:

- Forming the basis of concepts to submit to the UNFCCC's NAMA prototype registry (see Appendix B for a NAMA concept template)
- Raising awareness of NAMA opportunities by sector and raising awareness with sector experts

- Forming the basis of factsheets on high-priority NAMAs to begin discussions with potential donors and funders
- Identifying sectors and technologies that require further investigation and information
- Raising awareness of NAMAs and NAMA opportunities.

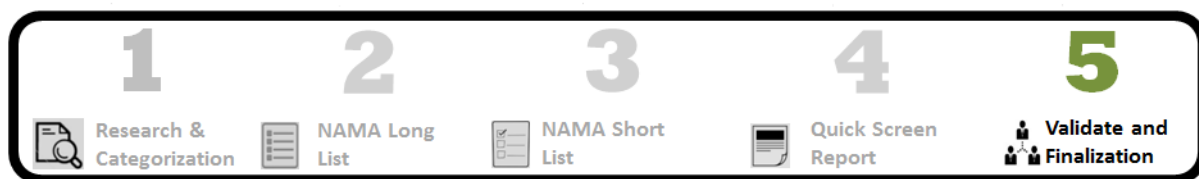
Process

The **Quick Screen** Report can be developed concurrently with the collection and organization of information (Step 1) and the development of the lists of NAMAs (Steps 2 and 3). The report brings together information and context about the country that is relevant to NAMAs. The outline of the **Quick Screen** Report is set out below:

1. Introduction
2. NAMAs: Quick Screen Methodology
3. Country Overview
 - a. National Economic Overview
 - b. National GHG Emission Overview
 - c. Overview of Vulnerability to the Adverse Effects of Climate Change
 - d. National Government Policies Priorities
 - e. Major Sectoral Policies and Priorities
 - f. Summary of NAMA Context
4. Results of NAMA Quick Screen
 - a. By UNFCCC Mitigation Sector (i.e., six sections)
 - i. Background
 - ii. Long List: Identification of NAMAs
 - iii. Short List of NAMAs
5. Conclusion

This report of approximately 15-20 pages is an overview of potential NAMAs in the developing country, providing context on the economy, government priorities and sectoral actions that inform the selection of priority NAMAs.

Step 5: Validation and Finalization



Objective

To validate the selection of potential priority NAMAs, including the analysis and assumptions, with country experts.

Outputs

The final **Quick Screen** Report, which is informed and improved by expert input, is the output of Step 5.

The report can also be used for a variety of purposes, including: to form the basis for factsheets on high-priority NAMAs to attract funding; to inform the development of a submission for a NAMA concept to submit to the UNFCCC's prototype registry (see Appendix B for the template); and to raise awareness of NAMAs and NAMA opportunities.

The analysis and outputs of the NAMAs **Quick Screen** form the basis for the NAMAs **Deep Screen**, which is elaborated in Developing NAMA Proposals: Deep Screen Methodology Section 5.

Process

There are various options for validating the NAMAs lists (Steps 2 and 3) and the **Quick Screen** Report (Step 4). The desired approach is through an in-country stakeholder meeting that includes experts from government, the private sector and civil society. Alternatives are reviewed by a select number of country experts or by government representatives from the climate change unit. A simple option is to discuss the results with officials from select ministries or the climate change unit. The method of validation should be noted in the **Quick Screen** Report.

Discussions with country experts through the validation process will help to determine if actions align with government priorities, if there is sufficient "readiness" to prepare and implement the NAMA, if there are barriers that affect the feasibility of NAMA implementation and if additional actions should be considered in the analysis. Country experts will identify potential priority NAMAs, an especially important step if the analysis continues to the NAMA **Deep Screen**.

The NAMA lists and the **Quick Screen** Report will be revised after local validation and the final lists and report developed. Once this is done, NAMA concepts can be prepared for submission to the UNFCCC registry, should the country desire.

Information and data gaps may also be filled at this stage, which can inform the final revision of the paper and the NAMA **Deep Screen**.

**5.0 DEVELOPING
NAMA PROPOSALS:
DEEP SCREEN
METHODOLOGY**

5.0 Developing NAMA Proposals: Deep Screen Methodology

The NAMA Deep Screen has seven steps. These steps are summarized in figure 5 below and outlined in greater detail in the rest of this section.

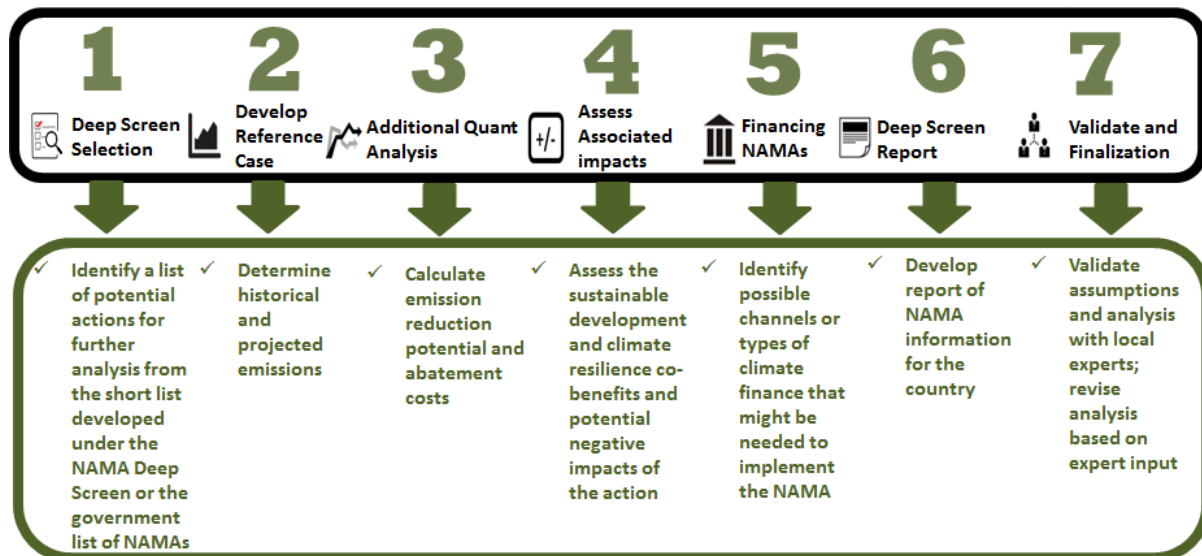


FIGURE 5: THE SEVEN STEPS OF THE DEEP SCREEN METHODOLOGY.

The NAMA Deep Screen exercise results in a detailed analysis of select NAMA opportunities identified in the NAMA **Quick Screen** or from a list already prioritized by the country. The proposal Deep Screen will provide for each selected NAMA an analysis of:

- ✓ Reference case GHG emissions
- ✓ GHG emission reduction potential
- ✓ Abatement costs
- ✓ Sustainable development and climate resilience co-benefits

The final **Deep Screen Report** provides the information required to develop a submission to the UNFCCC NAMA registry for a NAMA seeking support for implementation (a NAMA proposal). The UNFCCC submission template for a NAMA seeking support for implementation is included in Appendix C.

Step 1: Deep Screen Selection



Objective

To identify potential actions for further **Deep Screen** analysis from the short list developed under the NAMA **Quick Screen** or the government list of priority potential NAMAs.

Outputs

A manageable list of low-carbon options for further analysis, which is taken forward for further analysis under Steps 2, 3 and 4.

Process

If the NAMA **Quick Screen** has been undertaken, this short list is re-examined with country experts to identify priority NAMAs in each of the six sectors. If the government has provided a list, it is reviewed with country experts to identify a priority list in each of the six sectors. Depending on the country, there may be little opportunity in industrial processes or waste management, but very large opportunities in energy demand (e.g., improved cookstoves) or agriculture.

Step 2: Reference Case



Objective

To identify historical GHG emissions and removals, and project these out to a select date to form the reference case—or the baseline—against which to demonstrate the abatement potential of NAMAs (for example, to 2030, which is used in this description of Step 2).

Outputs

The work of Step 2 develops a reference base of historical and projected GHG emissions that is the baseline against which mitigation potential is measured. The reference case and underlying analysis, assumptions and calculations are developed in a report. This report can be a useful deliverable for the government, potentially providing an update of historical emissions, and input to GHG inventory development. The information may also prove useful for UNFCCC biennial reports, the first of which are due by January 1, 2014. Figure 6 below provides an example for Kenya.

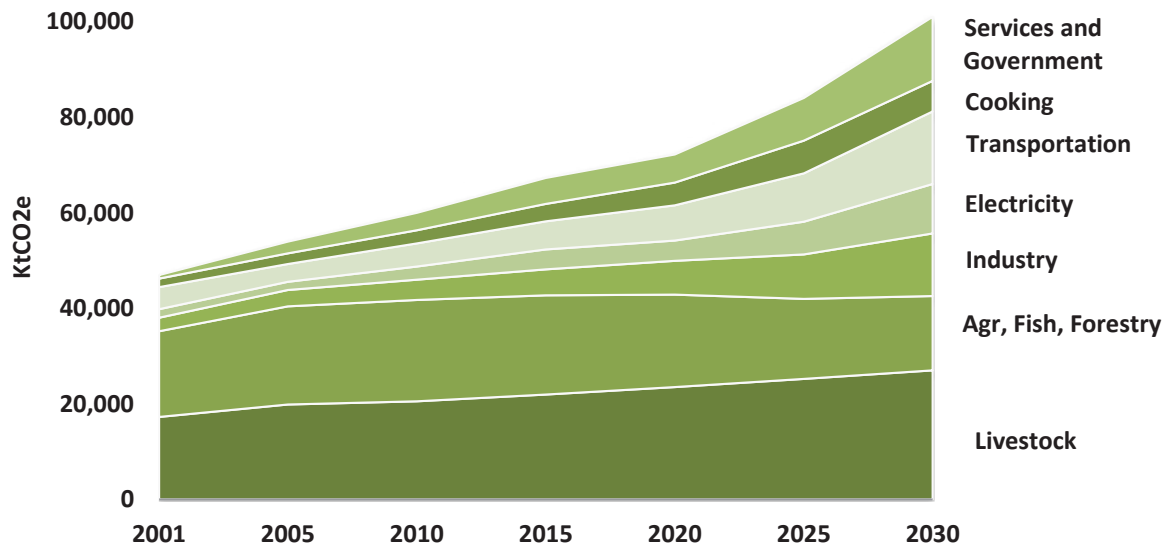


FIGURE 6: REFERENCE CASE PROJECTION TO 2030 (KENYA)

Process

The reference case includes the development of an inventory of historical GHG emissions, and the projection of emissions out to a select date (2030). IPCC guidelines are used to develop a preliminary inventory of historical GHG emissions. Emissions in this preliminary inventory are then allocated across the six mitigation sectors identified in Article 4.1(c) of the UNFCCC.⁸ The relationship between the six UNFCCC mitigation sectors and the IPCC guidelines is set out in Table 5 below.

TABLE 5: RELATIONSHIP OF EMISSION BASELINE REFERENCE CASE SECTORS TO IPCC GUIDELINE SECTORS

MITIGATION SECTORS (FROM ARTICLE 4.1 OF THE UNFCCC)	2006 IPCC GUIDELINE SECTORS	1996 IPCC GUIDELINE SECTORS
Energy	Energy	Energy
Transportation		
Industry	Industrial Processes and Product Use	Industrial Processes
		Solvent and other Product Use
Agriculture	Agriculture, Forestry and other Land Use	Agriculture
Forestry (and other land use)		Land-Use Change and Forestry
Waste	Waste	Waste

⁸ The terms of reference for the low-carbon scenario assessment specifically identified the six UNFCCC sectors as the starting point for the analysis.

Historical trends and projections of sector and economic growth are used to project annual emissions out to 2030. These projected emissions to 2030 form the reference case that is used as the baseline against which to demonstrate the expected abatement potential in the UNFCCC sectors dividing the energy sector into electricity supply, energy demand and transportation; and the agriculture, forestry and other land use sector into agriculture and forestry. The projections generally assume that historical trends in population, energy demand and economic growth will continue with constant relative growth rates, and no major structural changes in the economy will occur. The analysis generally assumes that ambitious goals set out in national policy documents are aspirational and unlikely to be achieved without outside financing, technology transfer and capacity building. This ensures that the developing country will not be penalized for ambitious and progressive policy goals when determining if a NAMA is additional to the GHG reference case.

A general description of the work of Step 2 is provided, recognizing that the tasks required to develop the historical inventory and projection of GHG emissions are highly technical and involve a number of distinct steps and calculations for each sector.⁹ A technical expert familiar with IPCC guidelines and experienced in developing GHG inventories should develop the reference case.

Step 3: Additional Quantitative Analysis



Objective

To identify measures and technology options to abate emissions, and calculate emission reduction potential and abatement costs. Ideally, the prioritized mitigation actions are identified from the NAMA concept assessment (described above) and locally validated.

Outputs

A series of reports or chapters are produced for each analyzed sector that includes information on the low-carbon scenario, the mitigation potentials and the abatement costs. These reports can also include information from the sustainable development and climate resilience analysis (Step 4).

Process

The NAMA assessment at the proposal stage includes the calculation of marginal abatement costs (MACs). This information signals what society gains in terms of emission reductions from climate investment and what it will cost.

⁹ An example of the detailed methodology to develop a reference case can be found in Chapter 2 – GHG Emissions Reference Case of the Mitigation report of Kenya’s *Climate Change Action Plan*, accessible at: http://www.kccap.info/index.php?option=com_phocadownload&view=category&id=6&Itemid=41

The MAC represents the cost of mitigating one tonne of carbon dioxide equivalent (CO₂e) in comparison to a reference case or technology. This determines cost-effectiveness or simply what NAMA opportunities can be achieved at least cost per tonne of CO₂ reduced. From marginal cost calculations, total carbon investment costs can be calculated.

The NAMA assessment ideally uses a bottom-up approach that considers abatement potential and cost for individual technologies and actions within the sector. These costs focus on technical and implementation costs incremental to costs that would be incurred in the baseline and do not include externalities such as valued health outcomes (i.e., limited societal costs included). These allied co-benefits are added in a later stage, and are important to track and communicate for the alternative mitigation options.

The general methodology to estimate NAMAs' MACs is to estimate the possible emissions reductions that could be achieved at some time in the future against a forecast of future emissions (reference case). Assumptions need to be made on the mitigation action's potential to reduce emissions compared to a baseline forecast of the technology or behavioural change that will happen absent the NAMA. Then, by considering new climate finance and actions to address barriers to implementation,¹⁰ a forecast of the penetration of the technology is made, with a corresponding improvement in emission performance in time. For example, the technical potential of replacing old equipment with new equipment that is more energy efficient depends on the relative emissions profile of the two, how often the equipment is used and what fuel is consumed. Barriers to mitigation technology penetration depend on factors such as lack of access to capital; insufficient human and institutional capabilities; risk aversion; and lack of data, information, knowledge and awareness.

The following six steps provide a generalized approach to estimate the cost-effectiveness and financing requirements of a NAMA, as well as the associated emission reduction potentials.

1. Information Review, Data Collection and Sorting. Information on priority mitigation actions needs to be identified and assembled in a new dataset, including capital and operating costs, GHG reduction efficiencies and co-benefit impacts on energy and co-pollutants. Country Clean Development Mechanism Project Design Documents provide a good starting point, for example. The cost data extracted needs to be representative of a base year, with care taken to express values in a common base year (and currency). Data gaps should be identified and reported where there was insufficient or inconsistent data to develop cost and reduction efficiency data.

Typically, areas of interest for mitigation include:

- Energy supply – available renewable energy resources, forecasts of installed capacity, transmission and distribution capacity
- Energy demand – potentials for efficiency improvements from current performance levels, choice of level of end user, upfront investment costs and payback time, emissions factor for biomass (for charcoal and fuelwood use)
- Transportation – mix and characteristics of vehicle fleet, public transport impacts of vehicle ownership and usage patterns

¹⁰ For example, consumer behaviour, cultural barriers, government policies and economic conditions.

- Industrial processes – types of kilns used to produce charcoal, changes in industrial processes driven by local environmental or economic considerations with potential abatement potential
- Waste – prevalence of waste collection and managed dump sites
- Agriculture – cultural barriers to uptake, data on agricultural and livestock rearing practices in rural areas
- Forestry – drivers and rates of deforestation and forest degradation

2. Develop Annualized Costs for Abatement Opportunities. All capital costs in the dataset should be annualized on a consistent basis using a capital cost recovery factor (e.g., 12 per cent). Added to the annualized capital costs are the yearly fixed and variable operating costs, and the net of any fuel savings that may be anticipated. This is then the annualized cost of the mitigation action. Figure 7 below provides an example for cookstoves in Kenya.

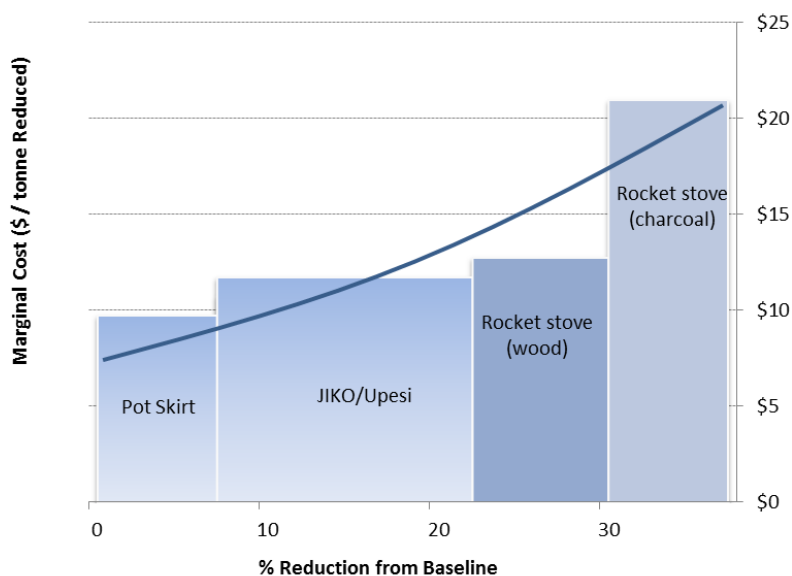


FIGURE 7: EXAMPLE OF A MAC CURVE FOR COOKSTOVES

3. Transform Facility and Process Data to a Sector Curve. All technically feasible mitigation actions would ideally be identified but the control options that are the most likely to be implemented or technically feasible should be prioritized. The mitigation actions need to be sorted by cost-effectiveness (e.g., dollars per tonne reduced) and then searched for dominance (i.e., dominant control options achieve the same reduction, say 30 per cent, but at a lower cost than an alternative). Then actions are removed from the data set that are dominated, as they would not be implemented given that less expensive and technically feasible options are available for similar reduction levels. The most cost-effective facility controls are then sorted or stacked from lowest cost to highest cost, ensuring that only the incremental costs and reductions are added to the stack.

The data points are then assembled into a single sector curve of emission reduction and cost pairings (Figure 8).

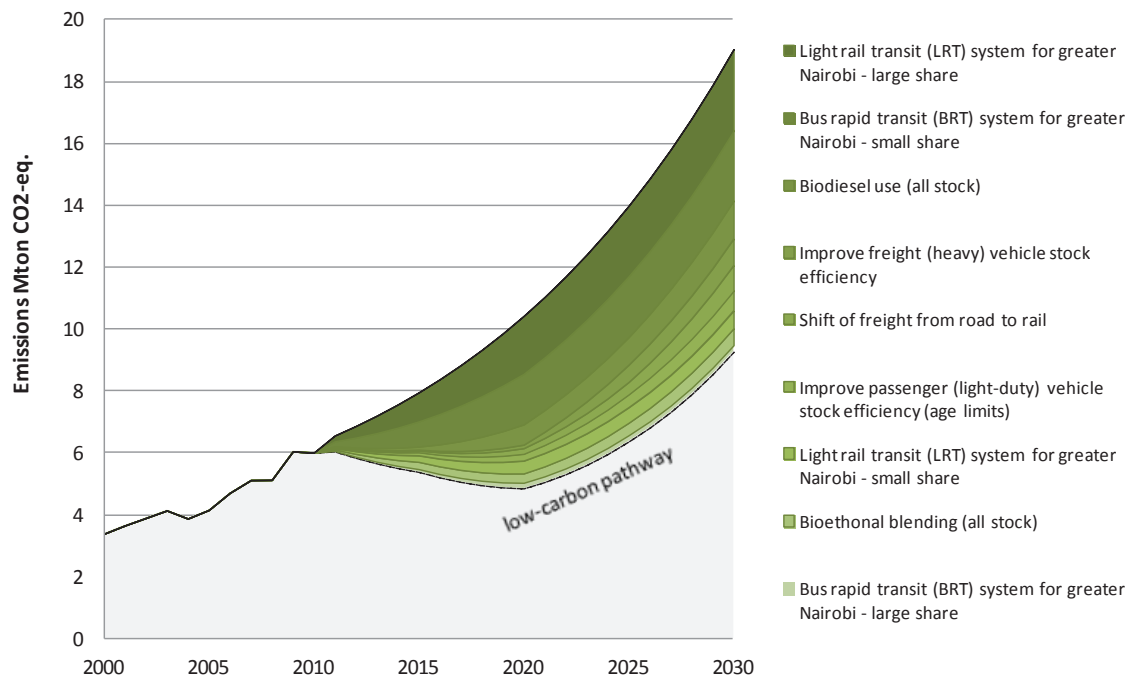


FIGURE 8: NAMA MITIGATION WEDGE FOR TRANSPORTATION (KENYA)

Source: *Transportation chapter of the Mitigation report of Kenya’s National Climate Change Action Plan, page 17.*

4. Best Practice: Probabilistic Cost Curve Estimation. The method for estimating the cost curve should ideally incorporate the uncertainty in the cost and pollutant removal efficiencies. For example, for a given action, the GHG reduction efficiency may be uncertain with a variance of +/-20 per cent and the annualized costs could vary by +/-30 per cent. Probability density functions (PDF) can use this uncertainty data to specify ranges that can then be used as the basis for the MACs. These distributions are then used to specify a cost curve mathematically:

- First, fit an exponential function (see the Growth function in MS Excel) to the cost and efficiency distributions for each data set (or input values for the Growth function). The resulting equation is a mathematical function representing a deterministic (simple) MAC based on costs (\$/tonnes reduced) and tonnes reduced in per cent. The curve is deterministic since it uses the central value of the distributions for the costs and efficiencies.
- The data points for each process and its associated controls are then sampled using the Monte Carlo technique in @RISK (an MS Excel add-in) within the defined distributions a large number of times (5,000) to estimate a range of outcomes for the exponential (growth) function. @Risk then produces an output distribution of costs and removal efficiencies for the growth function that is stratified by percentiles. This output is the PDF MAC that has been estimated through the sampling of the input distributions. The coefficient data for the exponential curves can then be used as the MAC curve, where y is the cost per tonne reduce and x is the percentage of the pollutant reduced.

5. Co-pollutant Releases. Co-pollutant impacts are related to changes in energy demand and co-pollutant emissions that are a result of specific mitigation actions. In industrial processes, energy requirements may change if the mitigation action impacts system pressures or efficiencies or requires additional energy to operate. This then will then have a net effect on GHG emissions as well as other co-pollutants such as particulate matter. Similarly, improved energy efficient cook stoves significantly reduce particulate matter, a major determinant of both morbidity and mortality outcomes in humans. Data collected on co-pollutants and energy impacts are useful for describing suitable development benefits or costs that may arise. Ideally, a link should be made between the mitigation action, the release of co-pollutants and any impacts on human or ecosystems. This information should then be recorded and carried forward to Step 4.

6. Finalize Wedge Diagrams. The mitigation actions need to be developed as wedges of GHG reduction relative to the forecast reference case GHG emissions. This then develops a cumulative reduction curve for the sector based on the mitigation actions (the cost-effective control options and their incremental costs and reductions). The resulting mitigation potentials then form the basis for NAMA scenarios, which can be illustrated as wedges of potential emissions reductions below reference emissions. These wedges indicate how the NAMA can reduce emissions from the reference case and at what cost. This approach is illustrated in Figure 9, which includes the overall economy-wide NAMA opportunities.

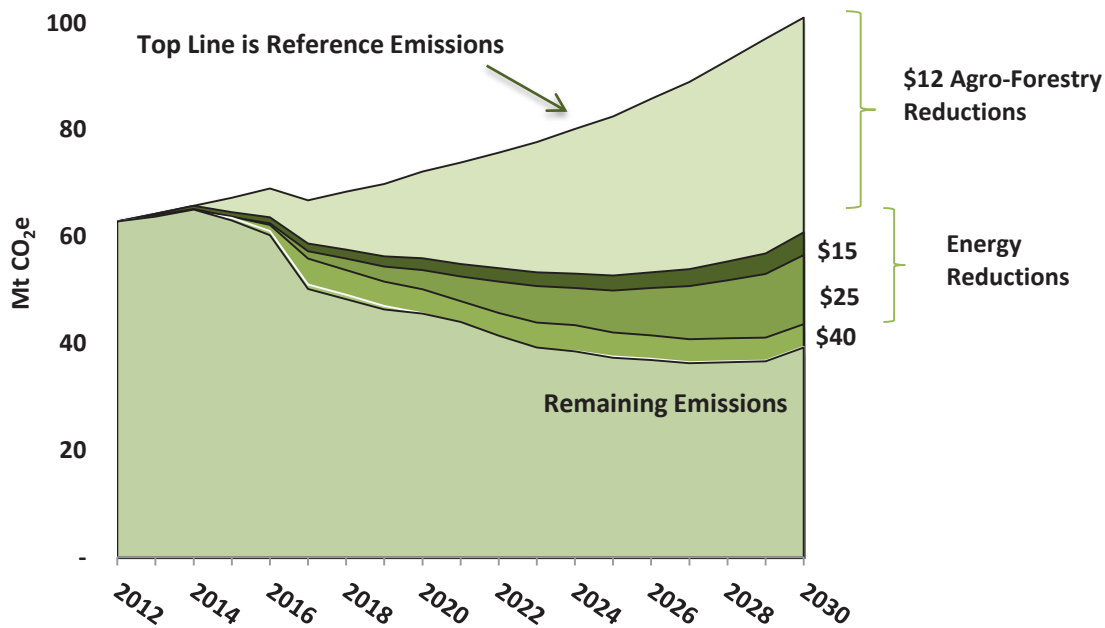
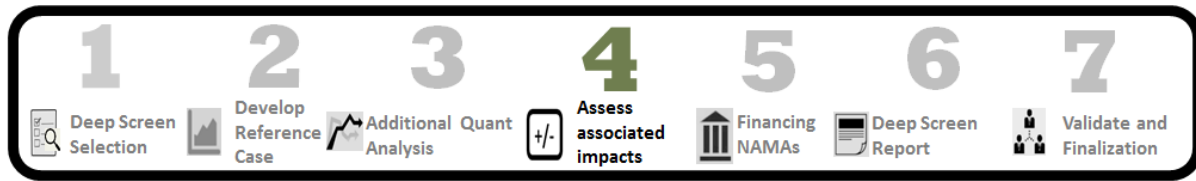


FIGURE 9: NAMA MITIGATION WEDGE DIAGRAM (KENYA): GHG REDUCTIONS SUPPLIED ECONOMY-WIDE RELATIVE TO REFERENCE EMISSIONS

Step 4: Assessment of Associated Impacts



Objective

To assess the sustainable development and climate resilience co-benefits and potential negative impacts of the identified NAMAs.

Outputs

Sections on sustainable development and adaptation benefits and impacts are produced for each analyzed sector. If desired, the narrative text can be complemented with a visualization of the impacts, for each sector, illustrated in Table 6 for the electricity sector in Kenya.

TABLE 6: OVERVIEW OF DEVELOPMENT BENEFITS OF LOW-CARBON DEVELOPMENT OPTIONS IN THE ELECTRICITY SECTOR IN KENYA

	Climate			Sustainable Development			
	Abatement potential 2030 (MtCO ₂)	Abatement cost 2030 (USD/tCO ₂)	Adaptation impact	Energy security	GDP growth	Employment	Improved waste management
Expanding geothermal power	14.1	-19.9	●	●	●	■	■
Expanding wind power	1.4	-36.7	◐	◐	◐	■	■
Expanding hydro power	1.1	-13.2	◑	◐	◐	■	■
Distributed solar photovoltaic	1.0	13.3	◐	◐	◐	◐	■
Landfill gas generation	0.5	-12.4	◐	◐	◐	■	●
Clean coal (ultra super critical)	1.1	-11.1	◐	■	◐	■	■

Source: Electricity Generation chapter of the Mitigation report developed for Kenya's Climate Change Action Plan, accessible at: http://www.kccap.info/index.php?option=com_phocadownload&view=category&id=6&Itemid=41

Process

The NAMAs are assessed for their contribution to sustainable development and climate resilience. This qualitative assessment is undertaken in each sector by an expert team, building on previous exercises and experience to qualitatively assess sustainable development impacts. Sustainable development indicators have been developed for each of the six UNFCCC mitigation sectors and are included in Appendix A.¹¹ The sustainable development analysis takes a sectoral approach, allowing comparability across NAMAs within a sector. The team identifies potential adaptation impacts, determining if the NAMA has positive, neutral or negative impacts on climate resilience.

Step 5: Financing NAMAs



Objective

To present an initial overview of the possible channels or types of climate finance that might be needed to implement the NAMA. This includes the sources of funding, the instrument and the barriers to be addressed to ensure successful NAMA implementation.

Outputs

At the NAMA proposal stage there is not a need for designing a detailed financing plan. However, some effort should be made to look ahead to NAMA implementation, where barriers to implementation are linked to sources of financing and the instruments to deploying that financing. More detailed design work for the NAMA proposals can be conducted in the future when a NAMA implementation roadmap is needed. Figure 10 provides a simple overview of linking NAMA opportunities to barriers and financing.

Process

This section provides a simplified conceptual approach to NAMA finance at the proposal stage. It does not provide guidance on conducting detailed NAMA design work required once financing is obtained and implementation will occur. The approach is to link the NAMA identified in the proposal stage above to implementation barriers, financing instruments and climate financing sources.

For each of the priority NAMAs, a two-part process can be followed to identify barriers that need to be addressed by the financing instrument(s):

¹¹ The sustainable development visualization tool was used in the Kenya low-carbon analysis, and was adapted from the visualization tool for sustainable development impacts developed by the LEDS Global Partnership.

1. **Barriers assessment** - identifies barriers to low-carbon technology deployment and behavioural change for the action
2. **Barriers linked to financing options** - a summary overview that identifies priority financing channels that address barriers

The **barriers assessment** is important because it points to channels of financing that are applicable to increasing technology deployment and behaviour change critical to NAMA success. For each technology option in the NAMA, a list of barriers would ideally be identified. The five types of barriers presented below are not meant to be an exhaustive list, but rather a profile of the most important and relevant barriers that exist in the literature.

1. **Information and behavioural patterns.** This includes barriers that exist in terms of the information available to the public, to business and/or to government, and barriers that may stem from behavioural patterns, usually on the part of consumers. Examples include:
 - *Aversion to new technologies:* Fear that new technologies will breakdown and increase costs.
 - *Lack of information:* Consumers and firms are frequently unaware of cost-effective practices and technologies available to save energy.
 - *Lack of cooperation:* Cooperative action may lead to innovations and cost-savings. Barriers to cooperating stem from concern over market share.
2. **Policy and regulation.** This type of barrier encompasses all the policy options that may or may not be being exercised by government, as well as the current configuration of policies that relate to low-carbon development in one way or another. These policies are generally under the purview of government policies. Examples include:
 - *Perverse incentives:* There may be policies in place that slow deployment, including subsidies to alternatives or tariffs on importing technology.
 - *Regulatory barriers:* Prohibitions on certain technologies, such as building codes limiting solar hot water.
 - *Lack of a price signal:* Energy priced below market rates, or below long-term cost of supply plus externalities.
 - *Incomplete markets and property rights:* There may be barriers to new entrants coming into a market, notably in the electricity sector (monopolistic utilities). This could manifest as discriminatory practices (grid access, etc.)
3. **Technology and resources.** Barriers of this type relate to the specific limits or characteristics of a given technology, or to the state of the resources that they rely upon, be it in terms of their availability or their state of development. Examples include:
 - *Lack of capacity:* Limited ability to deploy and/or operate the technology.
 - *Lack of dedicated energy management position:* Limited capacity to plan, implement, deploy or operate technology.
 - *Lack of performance benchmarking:* Limited understanding of the benefits that are achievable.
 - *Network failures:* Infrastructure costs may be too costly for the private sector to overcome, with high risks, indicating a need for public support to de-risk the infrastructure investment.

4. **Financing (both public and private).** Financial barriers relate to the capital costs associated with technology deployment, as well as its operational costs. These barriers can either involve levels and/or availability of public (i.e., government) or private finance (venture capital, equity, debt, etc.). Examples of relevant barriers include:
 - *Country indebtedness:* What is the ability of the country to secure international loans?
 - *Lack of investment capital for projects:* Is there evidence of a lack of capital for projects?
 - *Expectation for short payback periods:* Is the required payback period fast, as in less than two years, with discount rates in the 20 per cent range?
 - *Competing investment priorities:* Where does the mitigation action rate on a priority of investment needs?
 - *High transaction costs:* How much work is involved in implementing the measure?
5. **Institutional.** This type captures the barriers that relate to the state of readiness of governments to support technology deployment.
 - *Lack of leadership:* No clear expectations that there are policy priorities that will affect business at some future point.
 - *Limited ability to implement:* Short-staffed ministries and agencies may not have the resources to design and implement policy. A lack of capacity could manifest as a low degree of government-wide support.
 - *Weak enforcement:* Limited ability to enforce rules and set expectations that rules need to be followed.

Barriers Linked to Financing Options

With the barriers presented, we can now move on to the financing needs. For any priority NAMA and its associated mitigation options, there are multiple barriers to deployment that must be addressed. Not all barriers can be addressed with the same financing channel (or instrument), and as such there is a need to think about climate finance as a bundle of financing instruments.

Generally, there are *three sources* of climate finance:

- **International financing** – consisting of foreign direct investment and or bilateral and multilateral development assistance
- **Domestic financing** – consisting of internally generated sources of funding, including private sector and public sector financing
- **Hybrid financing** – A combination of domestic and international financing

With the broad financing envelopes identified (that is, where the initial financing is sourced from), the instruments for disbursement need to be identified. A broad range of financial instruments has been used to establish public sector support for climate investments. Each vary in their structure and focus; however, all broadly seek to provide support for public sector investment in low-carbon development, including:

- **Policy incentives** – includes resources directed at regulatory reform and fiscal mechanisms, such as tax incentives, levies and/or fees, and feed-in tariffs.

- **Carbon market financing** – seeks to create financial products that can convert carbon-linked cash flows into equity and debt funding. These also include proposals that guarantee carbon sales contracts to address the concern that carbon revenues will not contribute to the initial capital funding of low-carbon projects. Lastly, carbon financing refers to individuals, governments, companies or countries that purchase carbon offsets to mitigate their own GHG emissions.
- **Co-financing and loans** – provide debt capital at concessional and/or market interest rates. Examples include credit lines, project financing loans, co-financing agreements, structured financing, etc., as well as sovereign backed loans.
- **Grants** – transfers in cash and or loans where the recipient incurs no legal debt until projects demonstrate financial viability.
- **Voluntary** – philanthropic contributions or donations to climate change related interventions.

Usually, each financing instrument can be combined or “blended” into the same project or program to complement one another, reduce transaction costs, and increase their reach and impact. The need for blending flows directly from an understanding of the types of barriers that need to be addressed if NAMAs are to be successful. For example, training programs could ensure skilled labour is available to deploy the technology, while a technology subsidy de-risks the investment for the private sector.

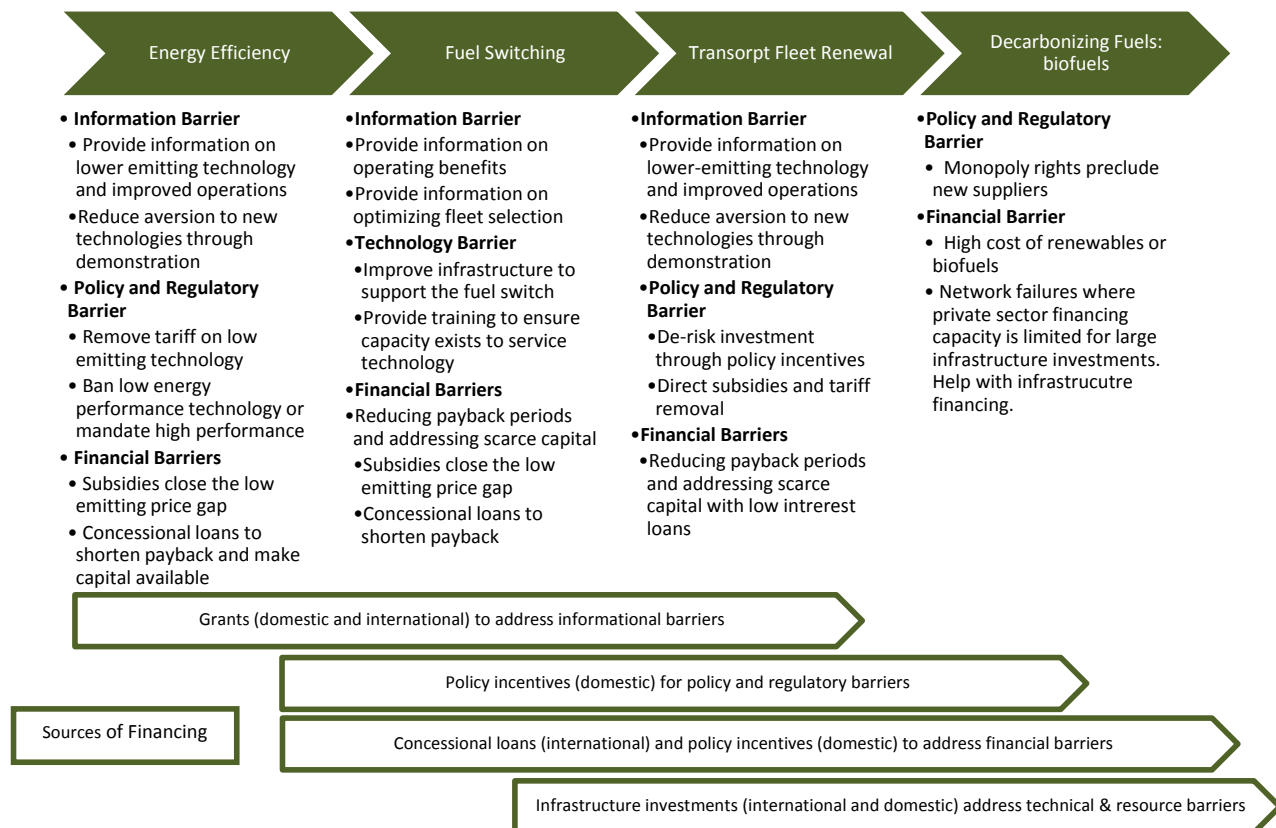
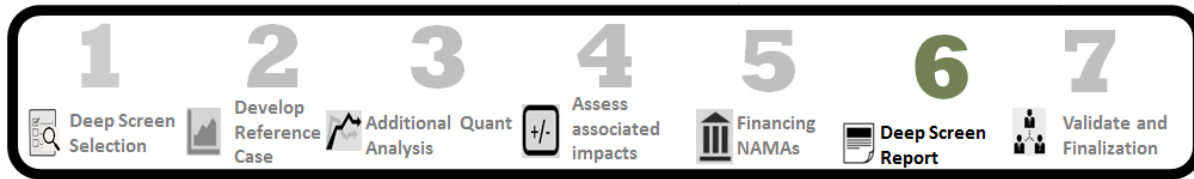


FIGURE 10: SUMMARY OF MITIGATION OPTIONS, BARRIERS AND FINANCING FOR A TRANSPORT NAMA

Step 6: Draft Deep Screen Report



Objective

To present the NAMAs' information in a comprehensive report with potential priority NAMA proposals identified.

Outputs

The **Deep Screen Report** is the output of Step 5. This can be produced as an overall NAMA report, or a series of sectoral reports.

Process

The report brings together the analysis developed in Steps 2, 3 and 4. A suggested outline of the **Deep Screen Report** is set out below. A chapter will be developed for each sector analyzed, and will have the following structure:

1. Introduction
2. Sector background and context, including development priorities
3. Reference case
 - a. Methodology
 - b. Data availability and quality
 - c. Historical emissions
 - d. Reference case
4. NAMA scenario analysis
 - a. Methodology
 - b. Data availability and quality
 - c. NAMA identification in the sector
 - d. Scenarios
 - e. Mitigation potential
 - f. Mitigation costs
 - g. Financing options
5. Development benefits
 - a. Sustainable development
 - b. Climate resilience
6. Conclusion

The **Quick Screen** Report, if developed, can be the starting point for the sector background and context, and sections 3, 4 and 5 will have been developed in the NAMA **Deep Screen** steps 3, 4 and 5. This work involves pulling together the various sections, and ensuring consistency across the sections, and across sectoral reports.

Step 7: Validation and Finalization



Objective

To validate assumptions and analysis with local experts, and revise analysis based on expert input.

Outputs

The final report, which is informed and improved by expert input, is the output of Step 5. The final report will consolidate the various sector reports into one overall **Deep Screen** Report. The report can be used for a variety of purposes, including:

- Forming the basis of proposals to submit to the UNFCCC's NAMA prototype registry (see Appendix C for a NAMA proposal template)
- Informing the updating of the GHG inventory
- Providing information for reporting to the UNFCCC, including the biennial report that is due to the UNFCCC by January 1, 2014
- Raising awareness of NAMA opportunities by sector and raising awareness with sector experts
- Providing the evidence base for priority NAMAs and for the need for support (financing, technology, capacity building), which is especially important to bilateral and multilateral donors
- Forming the basis of factsheets on high-priority NAMAs to begin discussions with potential donors and funders
- Identifying sectors and technologies that require further investigation and information
- Identifying information and data gaps for reporting on GHG emissions and climate change actions
- Raising awareness of NAMAs and NAMA opportunities

Process

A critical element of the NAMA analysis is the local validation processes that brings together local experts to ground-truth and inform the reference case and NAMA assessments. These consultations allow for testing assumptions, improving information sources and identifying potential viable NAMA opportunities. Discussions with country

experts through the validation process will help to determine if actions align with government priorities, if there is sufficient “readiness” to prepare and implement the NAMA, if there are barriers that affect the feasibility of NAMA implementation, and if additional actions should be considered in the analysis. The experts approve the data used, the underlying assumptions and the final recommendations. The broad consultations help to create buy-in and ownership with the various sectoral ministries, which will need to be engaged to move forward on NAMA actions.

There are various options for validating the reference case, NAMA analysis and the **Deep Screen** Report (Steps 2 to 5). The preferred approach is to validate the analysis by sector through in-country sectoral stakeholder meetings that include experts from government, the private sector and civil society. It is best to engage these experts throughout the analysis, rather than holding one consultation at the end of the analytical process. The first consultation is best held after the development of the draft reference case and identification of initial NAMAs in the sector. It is important to bring in sector experts, who can help to fill information gaps and provide context (e.g., feasibility of implementation) for NAMA selection. The final draft report, which builds on input gained in the first meeting, is presented at a second sectoral consultation.

A second option is to present the entire draft analysis (all sectors) at one large consultation. This helps to generate buy-in and raise awareness, and is also an effective means to improve the analysis.

Local validation can be improved through individual meetings and discussions with sector experts and advisors. Local experts can be engaged to review the draft sectoral chapters, which play an important role in verification of the analysis and results.

The NAMA analysis and the **Deep Screen** Report will be revised after the final local validation process and the final report developed. The method of validation should be noted in the **Deep Screen** Report. The final **Deep Screen** Report is published and presented to the government. Underlying data (e.g., data sheets for the calculation of the reference case and mitigation potential) should also be presented to the government.

APPENDICES A-C

Appendix A: Sustainable Development Indicators in the Six Mitigation Sectors

This preliminary suggested list of sustainable development indicators draws on the mitigation analysis completed for Kenya's National Climate Change Action Plan.¹²

AGRICULTURE	FORESTRY
<ul style="list-style-type: none"> ▪ Food security ▪ Energy security ▪ GDP growth ▪ Employment/rural livelihoods ▪ Improved land management ▪ Environmental benefits 	<ul style="list-style-type: none"> ▪ GDP growth ▪ Energy security ▪ Employment/rural livelihoods ▪ Environmental benefits ▪ Improved land management

ENERGY		
AGRICULTURE	FORESTRY	INDUSTRY ENERGY DEMAND
<ul style="list-style-type: none"> ▪ Food security ▪ Energy security ▪ GDP growth ▪ Employment/rural livelihoods ▪ Improved land management ▪ Environmental benefits 	<ul style="list-style-type: none"> ▪ GDP growth ▪ Energy security ▪ Employment/rural livelihoods ▪ Environmental benefits ▪ Improved land management 	<ul style="list-style-type: none"> ▪ Cost savings for companies ▪ Employment ▪ Energy security ▪ Reduced deforestation ▪ Sanitation/water pollution

TRANSPORT	INDUSTRY	WASTE
<ul style="list-style-type: none"> ▪ Congestion and road quality ▪ Road safety ▪ Air quality ▪ Energy security ▪ Food security 	<ul style="list-style-type: none"> ▪ Cost savings for companies ▪ Employment ▪ Energy security ▪ Deforestation ▪ Sanitation/water pollution 	<ul style="list-style-type: none"> ▪ Energy security ▪ Improved waste management ▪ Environmental impact

¹² Kenya's action plan is accessible at: http://www.kccap.info/index.php?option=com_phocadownload&view=category&id=6&Itemid=41

Appendix B: NAMA Concept Template¹³

United Nations Framework Convention on Climate Change

NAMA Seeking Support for Preparation

A.1 Party <Pls enter Name of the Party here>

A.2 Title of Mitigation Action <Pls enter Title of Mitigation action here>

A.3 Description of mitigation action <Pls enter Description of Mitigation Action here>

A.4 Sector

<input type="checkbox"/> Energy supply	<input type="checkbox"/> Transport and its Infrastructure
<input type="checkbox"/> Residential and Commercial buildings	<input type="checkbox"/> Industry
<input type="checkbox"/> Agriculture	<input type="checkbox"/> Forestry
<input type="checkbox"/> Waste management	

A.5 Technology

<input type="checkbox"/> Bioenergy	<input type="checkbox"/> Cleaner Fuels
<input type="checkbox"/> Energy Efficiency	<input type="checkbox"/> Geothermal energy
<input type="checkbox"/> Hydropower	<input type="checkbox"/> Solar energy
<input type="checkbox"/> Wind energy	<input type="checkbox"/> Ocean energy
<input type="checkbox"/> Carbon Capture and Storage	<input type="checkbox"/> Other: <Pls enter Other text here>

A.6 Type of action

- National/Sectoral goal
- Strategy
- National/Sectoral policy or program
- Project: Investment in machinery
- Project: Investment in infrastructure
- Other: <Pls enter Other text here>

NAMAs Seeking Support for Preparation: Title of Mitigation Action

Provide a short title for your NAMA that is descriptive enough to capture the attention of people browsing the registry. This title could, for example, mention the type of NAMA or the technology used.

1. Description of the Mitigation Action

Include the sector, type of action (refer to page 44 of the UNFCCC Manual), the technology and the greenhouse gases covered by the mitigation action.

The registry uses broad groups of technologies to enable the different search functionalities. If the technology to be used does not fit any of the categories listed, identify a new category under “other.” Note that a NAMA may be relevant for a technology even if the NAMA is not in itself a direct investment for that technology. For example, a policy to increase the share of wind energy relates to wind energy technologies although it may not include direct investments in wind turbines.

¹³ The information provided in this template is taken from the Draft Manual of the NAMA registry (Version of 21 November 2012) developed for the UNFCCC. The full manual can be accessed at: http://unfccc.int/files/cooperation_support/nama/application/pdf/registry_manual_25_oct.pdf.

Indicate the gas or gases whose emissions will be covered by the NAMA. The NAMA may lead to direct or indirect reductions of different greenhouse gases. The greenhouse gases covered by the mitigation action will depend on the sector and the specific activity. The following gases can be identified: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons and fluorinated gaseous compounds (HFCs, PFCs and SF₆). An option to identify other gases is also available.

2. National Implementing Agency

Provide full contact details of the entity in charge of preparing or implementing the NAMA.

3. Expected Time Frame for the Preparation of the Mitigation Action

Indicate the expected number of months that will be required to complete the preparation of the NAMA. In general terms, the process of preparation should deliver a NAMA that is ready to receive support and be implemented.

4. Used Currency and Estimated Full Costs of Preparation

Indicate the costs that will be associated with the preparation of the NAMA proposal. These costs should be specified in the currency selected and should include the costs of all activities involved in the conceptualization and preparation of a NAMA, for example:

- Background and feasibility studies
- Technical assessments and designs
- Consultations with stakeholders
- Selection and prioritization of NAMAs

When estimating these costs, users are encouraged to provide best estimates and, if possible, provide additional information on how these costs were determined.

Also, provide any other information considered relevant to understanding the calculation of costs for preparation, for example:

- Specific activities and related costs
- Time frame for each activity
- Studies and background information already available
- Other

5. Support Required to Prepare the Mitigation Action

5.1 Financial Support

Under “Amount of financial support,” indicate the total amount of financial resources that are needed to prepare the NAMA. The value should be in the currency that you have selected to use. Under “Type of financial support,” indicate the type of financial support that you require to prepare your NAMA. The definitions for each category are found in Annex II of the registry documentation. Under “Comments,” provide any other information that you consider relevant

to understanding the financial support needs; for example, details on the specific use of the resources and/or a rationale for the type of finance being sought.

5.2 Capacity Building/Technological Support

Under "Amount of capacity-building support," indicate the amount of capacity-building support required to prepare the NAMA (e.g., number of personnel trained, institutions strengthened or established, e-learning programmes developed, policy or scientific know-how shared, etc.). In addition, you may express the amount of support required in monetary or man/hour terms. Under "Type of capacity-building support," select the option that applies to the type of capacity-building support sought.

Under comments, insert any information considered relevant for the reader to better understand your needs for capacity-building support; for example, a rationale for the type and the level of capacity-building support required, or the preferred ways of delivery of this support.

6. Outcomes of NAMAs

Outcomes and benefits are measured through the use of indicators. Guidance in this regard is provided by paragraph 46 of decision 2/CP.17, which invites Parties to provide information on:

- Estimated emission reductions
- Other indicators of implementation
- Other relevant information, including co-benefits for local sustainable development

Indicators can be quantitative or qualitative. The selection primarily depends on the objective of the action, its scope and specific circumstances of implementation. Detailed background information on this matter is not required by the registry; however, users are encouraged to consider the benefits of providing additional documentation on the selection of indicators, methodologies used, assumptions and other relevant information.

6.1 Estimated Emission Reductions

"Emission reductions" is a quantitative indicator that provides information on the emissions of greenhouse gases that would be reduced if a NAMA were implemented. Provide an estimate of the emission reductions that the NAMA is expected to deliver during its lifetime. Estimates should be provided in megatonnes of CO₂ equivalent per year. An option to express these reductions in cumulative reductions for the lifetime of the project is also available.

The approach and methodologies used to determine emission reductions depend on the type of action to be implemented, as well as the objective set for the estimation of the emissions itself. In general terms, emission reductions can be estimated by comparing a scenario without the NAMA (business as usual) with one in which the NAMA is implemented.

6.2 Other Indicators of Implementation

"Emission reductions" is not the only indicator that can be used to provide information on the outcomes of a NAMA. Such outcomes may be directly relevant to mitigation or to benefits in other areas such as social development, health

and others. It is suggested that “other indicators of implementation” are used to convey information on mitigation outcomes (different from emission reductions) and that other types of indicators are addressed under “other information, including co-benefits for local sustainable development.”

6.3 Other Relevant Information, Including Co-Benefits for Local Sustainable Development

As with mitigation outcomes, the list of indicators on co-benefits can be extensive. Their identification and selection will depend on external factors and factors inherent to the NAMA. In broad terms, you may consider to use indicators relating to:

- Health, for example, percentage reduction in a specific lung disease
- Social and economic issues, for example, jobs generated
- Environment, for example, reduction in the levels of a given pollutant
- Other.

7. Links to National Policies and Other NAMAs

NAMAs submitted to the registry may have been formulated in the context of other initiatives such as national or sectoral policies or programs. These links should be made explicit.

7.1 Relevant National Policies

Include links or references to national or sectoral policies that are considered relevant for the NAMA that is being submitted. A description of these policies or a link where more information can be found can also be provided.

7.2 Links to Other Mitigation Actions

If the NAMA to be submitted is being implemented in the context of another NAMA that has been recorded in the registry, the user will have the option to identify that NAMA here.


8. Attachments

The template allows the user to upload accompanying documentation. There are no limits to the number of documents that can be uploaded; however, bear in mind that the size of the document may affect uploading and downloading times.

Documents that can be uploaded to provide further details may include:

- Available feasibility studies and/or background documentation
- Design documents and technical specifications
- Methodological basis used for estimating, for example, costs, needs for support or outcomes including emission reductions
- Memoires of meetings and consultations with various groups.

Appendix C: NAMA Proposal Template¹⁴

 United Nations Framework Convention on Climate Change

NAMA Seeking Support for Implementation

A.1 Party <Pls enter Name of the Party here>

A.2 Title of Mitigation Action <Pls enter Title of Mitigation Action here>

A.3 Description of mitigation action <Pls enter Description of Mitigation Action here>

A.4 Sector

<input type="checkbox"/> Energy supply	<input type="checkbox"/> Transport and its Infrastructure
<input type="checkbox"/> Residential and Commercial buildings	<input type="checkbox"/> Industry
<input type="checkbox"/> Agriculture	<input type="checkbox"/> Forestry
<input type="checkbox"/> Waste management	

A.5 Technology

<input type="checkbox"/> Bioenergy	<input type="checkbox"/> Cleaner Fuels
<input type="checkbox"/> Energy Efficiency	<input type="checkbox"/> Geothermal energy
<input type="checkbox"/> Hydropower	<input type="checkbox"/> Solar energy
<input type="checkbox"/> Wind energy	<input type="checkbox"/> Ocean energy
<input type="checkbox"/> Carbon Capture and Storage	<input type="checkbox"/> Other <Pls enter Other text here>

A.6 Type of action

- National/ Sectoral goal
- Strategy
- National/Sectoral policy or program
- Project: Investment in machinery
- Project: Investment in infrastructure
- Other: <Pls enter Other text here>

NAMA Seeking Support for Implementation

Title of Mitigation Action

Provide a short title for your NAMA that is descriptive enough to capture the attention of people browsing the registry. This title could, for example, mention the type of NAMA or the technology used.

1. Description of the Mitigation Action

Include the sector, type of action (refer to page 44 of the UNFCCC Manual), the technology and the greenhouse gases covered by the mitigation action.

¹⁴ The information provided in this template is taken from the Draft Manual of the NAMA registry (Version of 21 November 2012) developed for the UNFCCC. The full manual can be accessed at: http://unfccc.int/files/cooperation_support/nama/application/pdf/registry_manual_25_oct.pdf.

The registry uses broad groups of technologies to enable the different search functionalities. If the technology to be used does not fit any of the categories listed, identify a new category under “other.” Note that a NAMA may be relevant for a technology even if the NAMA is not in itself a direct investment for that technology. For example, a policy to increase the share of wind energy relates to wind energy technologies, although it may not include direct investments in wind turbines.

Indicate the gas or gases whose emissions will be covered by the NAMA. The NAMA may lead to direct or indirect reductions of different greenhouse gases. The greenhouse gases covered by the mitigation action will depend on the sector and the specific activity. The following gases can be identified: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons and fluorinated gaseous compounds (HFCs, PFCs and SF₆). An option to identify other gases is also available.

2. National Implementing Agency

Provide full contact details of the entity in charge of preparing or implementing the NAMA.

3. Expected Time Frame for the Implementation of the Mitigation Action

The time frame of the NAMA could be interpreted as the expected length of the project, starting from the initiation of activities (for example, construction works in the case of infrastructure investments) through to its closure. Indicate the total number of years as well as the expected starting year. If the NAMA is not attached to a time frame, you may decide to leave this field blank.

4. Used Currency and Estimated Full Costs of Implementation

Indicate the estimated total costs that would be incurred in the implementation of the NAMA during its entire lifetime. Such costs would generally include:

- Pre-operation activities (legal, administrative and other costs)
- Initiation of activities and/or construction works
- Operation and maintenance
- Debt service, if relevant
- Closure

Full costs of implementation should reflect the totality of expenditures required for the operation and closure of a NAMA. The approach to costing a NAMA depends on the type of action, its characteristics in terms of geographical and temporal boundaries, and scope. It is suggested that the costing of the NAMA be limited to the costs incurred strictly by the entity or entities in charge of implementing it. Costs incurred by the actors affected by the NAMA could be explained under “comments.”

It is also recommended that the different cost items are made explicit, in particular if support is being sought. The discrimination of these items may facilitate the assessment of support needs as well as the identification of potential sources.

There is also a field for any additional information relating to the costs of a NAMA. This additional information could include:

- Details of the different expenditures
- Timing of the different expenditures
- Information on the approach, data sources and methodologies followed to estimate costs
- Information on revenues: NAMAs may also receive revenues (for example, a solar plant may receive revenues for the sale of electricity). Being explicit about this revenue may also help you in estimating support needs and identifying support sources.
- Economic costs: the implementation of the NAMA may lead to broader costs to the national economy or to a group of third Parties. In general terms, sectoral and macroeconomic evaluations could be used to assess related costs for national and sectoral goals and strategies.

5. Estimated Incremental Costs of Implementation

In financial terms, incremental costs refer to the increase or decrease in cost as a result of one or more units of output.

A definition for incremental costs under the UNFCCC does not exist. Users of the registry are invited to estimate the costs incurred in delivering mitigation outcomes and consider whether such costs could be treated as incremental costs.

For the Global Environmental Facility incremental or additional costs are associated with transforming a project with national benefits into one with global environmental benefits; for example, choosing solar energy technology over coal or diesel fuel meets the same national development goal (power generation), but is more costly.

Incremental costs could be evaluated by comparing the costs of delivering a good or service under “business as usual” versus the costs of delivering the same good or service with extra mitigation outcomes.

Provide any other details you consider relevant for users of the registry to better understand your approach to estimating incremental costs, for example:

- The time frame for the calculation of incremental costs
- Methodological basis for the calculation
- Assumptions

6. Support Required to Implement the Mitigation Action

Indicate the total amount of financial resources, and the type of financial support that are needed to implement the NAMA. The value should be in the currency selected. The type and amount of financial support depends on several factors, including the type of action, the total cost of the NAMA and its overall budget (e.g., costs and benefits). A recipe for selecting types of financial instruments does not exist; however, it is likely that a combination of them be used, particularly for large infrastructure projects.

Please also provide any other information that you consider relevant to better understanding your needs for financial support. For example, you could provide details on the following:

- A rationale for the selection of the type of financial support
- The specific activities that will receive the finance
- The timing at which finance will be required during the lifetime of your NAMA finance
- Information relating the sustainability of the financial state of your NAMA
- If any, own contributions (and type, for example, financial or in-kind resources)

Financial versus other types of support: Generally, technology and capacity building support may be expressed in monetary terms. If this is the case, NAMA users may decide to include all types of support under “financial support” and include a single amount for all types. The details can be explained under “Comments on financial support” while the fields for other types of support are left empty.

6.2 Technological Support

The level and extent of technological support that the NAMA requires (if applicable) should be made clear.

6.3 Capacity Building

Capacities required to successfully implement the NAMA that are weak or lacking in the country should be listed here, and if possible, the plan for developing these capacities.

7. Outcomes of NAMAs

Outcomes and benefits are measured through the use of indicators. Guidance in this regard is provided by paragraph 46 of decision 2/CP.17, which invites Parties to provide information on:

- Estimated emission reductions
- Other indicators of implementation
- Other relevant information, including co-benefits for local sustainable development

Indicators can be quantitative or qualitative. The selection primarily depends on the objective of the action, its scope and specific circumstances of implementation. Detailed background information on this matter is not required by the registry; however, users are encouraged to consider the benefits of providing additional documentation on the selection of indicators, methodologies used, assumptions and other relevant information.

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“Emission reductions” is a quantitative indicator that provides information on the emissions of greenhouse gases that would be reduced if the NAMA were implemented. Provide an estimate of the emission reductions that your NAMA expects to deliver during its lifetime. Estimates should be provided in megatonnes of CO₂ equivalent per year. An option to express these reductions in cumulative reductions for the lifetime of the project is also available.

The approach and methodologies depends on the type of action to be implemented as well as the objective set for the estimation of the emissions itself. In general terms, emissions reductions can be estimated by comparing a scenario without the NAMA (business as usual) with one in which the NAMA is implemented.

7.2 Other Indicators of Implementation

“Emission reductions” is not the only indicator that could be used to provide information on the outcomes of a NAMA. Such outcomes may be directly relevant to mitigation or to benefits in other areas, such as social development, health and others. It is suggested that “other indicators of implementation” are used to convey information on mitigation outcomes (different from emission reductions) and that other type of indicators are addressed under “Other information, including co-benefits for local sustainable development.”

7.3 Other Relevant Information, Including Co-Benefits for Local Sustainable Development

As with mitigation outcomes, the list of indicators on co-benefits can be extensive. Their identification and selection will depend on external factors and factors inherent to the NAMA. In broad terms, indicators can be related to:

- Health, for example, percentage reduction in a specific lung disease
- Social and economic issues, for example, jobs generated
- Environment, for example, reduction in the levels of a given pollutant
- Other

8. *Links to National Policies and Other NAMAs*

NAMAs submitted to the registry may have been formulated in the context of other initiatives, such as national or sectoral policies or programs. These links should be made explicit.

8.1 Relevant National Policies

Include links or references to national or sectoral policies that you consider relevant for the NAMA that is being submitted. A description of these policies or a link where more information can be found can be provided.

8.2 Links to Other Mitigation Actions

If the NAMA is being implemented in the context of another NAMA that has been recorded in the registry, the user will have the option to identify that NAMA here.

9. *Attachments*

The template allows the user to upload accompanying documentation. There are no limits to the number of documents that can be uploaded; however, bear in mind that the size of the document may affect uploading and downloading times.

Documents that you may wish to upload to provide further details may include:

- Available feasibility studies and/or background documentation
- Design documents and technical specifications
- Methodological basis used for estimating, for example, costs, needs for support or outcomes including emission reductions
- Memoires of meetings and consultations with various groups

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