

NAMA Information and Guidebook

Enabling implementation of NDCs through NAMAs

NAMA Information and Guidebook

Enabling implementation of NDCs through NAMAs

Authors

David Ryfisch, UNEP-DTU Partnership
Federico A. Canu, UNEP-DTU Partnership
Tim Reutemann, UNEP-DTU Partnership
Søren Lütken, UNEP-DTU Partnership
Miriam Hinostroza, UNEP-DTU Partnership

Review and Coordination

Roberto Borjabad, UN Environment

Reviewers

Dr. Harald Diaz-Bone
Gisela Campillo, OECD

Acknowledgements

UN Environment ROLAC Financing

April 2017

UNEP DTU Partnership
UN-City Copenhagen
Denmark

ISBN: 978-87-93458-19-2

Design and layout: Magnum Custom Publishing, New Delhi, India

The Low Carbon Development Programme of the UNEP DTU Partnership (UDP), Centre on Energy, Climate Change and Sustainable Development, contributes to the international debate and free to access information flow in emerging topics. The aim is to advance the development and consolidation of the knowledge, the understanding and ease application of new methodologies, instruments and mechanisms.

With this objective and to advance knowledge by helping close the informational gaps, UDP with UN Environment's Regional Office for Latin America and the Caribbean and its regional climate change network REGATTA, present this publication hoping that it will reach the audience and achieve its objective. This publication is made possible by the generous support of the Spanish Agency for International Development Cooperation (AECID) to the REGATTA network.

The authors welcome any comments and feedback from readers and users of this publication, which will help enrich and continuously advance the ideas shaped here.

Foreword

The Paris Agreement and the implications for the NAMA

At the 21st Conference of the Parties (COP 21), the Parties to the UN Framework Convention on Climate Change (UNFCCC) formulated the Paris Agreement with the aim to pursue efforts at limiting global average temperature increase to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C. Now that the threshold for the Agreement's entry into force has been achieved by a surprisingly swift ratification by the Parties to the Convention, focus has started shifting towards the implementation of the Intended Nationally Determined Contributions (INDC) by countries, which will enable achieving the Agreements overall targets. The appearance of the INDC term has created some uncertainties regarding the need for new implementation modalities to reach national mitigation targets. In this context and given the need for urgency in implementing national mitigation actions, the utilization of an existing concept which evolved through the UNFCCC process stands out as a natural candidate for the implementation structure for INDCs.

The concept of Nationally Appropriate Mitigation Actions (NAMAs) has evolved substantially since its establishment under the international climate regime through the Bali Action Plan in 2007. With innovative ideas reflected on bottom-up participatory approaches, developing country governments have been utilizing NAMAs as instruments to drive their countries towards low carbon development pathways. Yet the expectations are that NAMAs will be one of the crucial modes to implement the Nationally Determined Contributions (NDC) by developing countries to the UNFCCC.

A number of technical and financial support initiatives have been mobilized from a diversity of donors and organizations to facilitate the increase of capacities and readiness for NAMAs in developing countries. Likewise, a number of guidance literature has been produced to advance the knowledge and understanding of different definitions and concepts related to NAMAs. However, it is perceived that there is a need for deepening the discussions on certain areas related to NAMAs, in order to improve not only its adequate formulation but also its successful implementation, which includes facilitated access to finance.

Aiming at closing the information gaps that hinder smooth and informed national processes to formulate and plan the implementation of NAMAs in a way that facilitates attracting climate finance, this publication consolidates existing scattered and critical information, while linking it with the latest available climate finance support information. The publication addresses fundamental issues related to the integration of NAMAs and mitigation actions in general into national development and climate change policies and actions. It presents practical ways to conduct barrier analysis that will lead and facilitate an adequate formulation of NAMAs and mitigation actions. Likewise, enabling environments and risk analysis are elaborated and presented in an easy-to-read language for NAMA practitioners in order to support them in successfully leveraging local investment and accessing international finance. The publication is illustrated with practical examples of best practices and success stories in different areas and sectors in developing countries, with a focus in Latin American countries.

The Low Carbon Development Programme of the UNEP DTU Partnership (UDP), Centre on Energy, Climate Change and Sustainable Development, contributes to the international debate and free access information flow in emerging topics. The aim is to advance the development and consolidation of the knowledge, the understanding and ease of application of new methodologies, instruments and mechanisms. With this objective and to advance knowledge by helping close the informational gaps, UDP with UN Environment's Latin America and the Caribbean Office and its regional climate change network REGATTA (supported by the Spanish Agency for International Development Cooperation, AECID), present this publication hoping that it will reach the audience and achieve its objective.

The authors welcome any comments and feedback from readers and users of this publication, which will help enrich and continuously advance the ideas shaped here.

Leo Heileman
Regional Director
Latin America and the Caribbean Office
UN Environment

Contents

Foreword – The Paris Agreement and the implications for the NAMA	2
Contents	3
List of Tables and Figures	5
Glossary	6
Introduction	7
1. Background and Basics of NAMAs	9
1.1 The historic role of NAMAs in the international climate agenda	9
1.2 The links between NAMAs, NDC, and LEDS	10
1.3 Nationally Appropriate Mitigation Actions – working definitions	11
1.4 Nationally Appropriate Mitigation Actions – seeking international support	11
1.5 Nationally Appropriate Mitigation Actions – from concept to preparation and implementation	12
2. Embeddedness of NAMAs	15
2.1 Embeddedness concept in international climate finance	15
2.2 Practical implications on embeddedness	16
2.3 Approach to establishing embeddedness	17
2.3.1 Leadership	17
2.3.2 Coordination	17
2.3.3 Identification	18
2.4 Case studies for embeddedness	18
2.4.1 Colombian Transit-oriented Development (TOD) NAMA	18
2.4.2 Mexican Sustainable Housing NAMA – ECOCASA	20
2.4.3 Urban NAMA Costa Rica	24
2.5 Conclusions on embeddedness	27
3. Barrier Analysis	28
3.1 Organizing the process	30
3.2 Identification and classification of barriers	31
3.3 Analysis, decomposition and prioritization of barriers	32
3.4 Translation of barriers into actions	34
3.5 Development of a plan to create enabling environments	36
3.6 Conclusions on barrier analysis	36

4. Enabling Environments	39
4.1 Concept of enabling environments in international climate finance	39
4.2 General observations on enabling environments	39
4.3 Enabling environments to overcome political barriers	40
4.3.1 Institutional and organizational structures and coordination	41
4.3.2 Policies and regulatory frameworks	43
4.4 Enabling environments to overcome economic barriers	44
4.4.1 Economic	45
4.4.2 Financial	46
4.4.3 Market	50
4.5 Enabling environments to overcome capacity barriers	50
4.6 Enabling environments to overcome social barriers	53
4.6.1 Cultural and common practices	53
4.6.2 Public awareness and behaviour	53
4.7 Conclusions on enabling environments	54
5. Risks	55
5.1 Principal risk types	55
5.2 Risk presentation in funding proposals	56
6. An Introduction to the GCF	57
6.1 Relation NAMAs – GCF	57
6.2 Access	57
6.3 Project submission	58
6.4 Project focus areas	58
6.5 Funding instruments	58
6.6 Evaluation criteria	59
Concluding Remarks and Recommendations	61
Bibliography	62

List of Tables and Figures

Tables

Table 1: Timeline of UNFCCC frameworks	9
Table 2: List of activities in NAMA preparation	12
Table 3: Policy documents or other relevant elements to embed NAMAs	17
Table 4: NAMA ECOCASA international financing	20
Table 5: Potential financial instruments used by NAMA Trust Fund	49
Table 6: Measures to create an enabling capacity environment in the Mexican Housing NAMA	52

Figures

Figure 1: Relationship of LEDS, NDC and NAMA	10
Figure 2: Stages of NAMA development	13
Figure 3: The guidebook narrative – NAMAs from past to future	14
Figure 4: Embeddedness concept in the national, sectoral, and sub-national context	16
Figure 5: Relevant sectorial policies and projects according to their heading institutions	23
Figure 6: Structural embeddedness for the Costa Rican Urban NAMA	24
Figure 7: Organizational structure for PlanGAM	26
Figure 8: Simple visualization of barrier problem for a generic solid waste NAMA example	32
Figure 9: Decomposition of barriers	33
Figure 10: Policy and regulatory barrier for decentralized solar PV	34
Figure 11: Simplified example of barriers turned to actions within a NAMA	35
Figure 12: Institutional capacity and budgetary constraints for developing The railway system in the greater metropolitan region	36
Figure 13: Typology of enabling environments	40
Figure 14: Unification of existing housing programmes	42
Figure 15: Structure of CIUDAT	43
Figure 16: Mexican Housing NAMA financing mechanism	47
Figure 17: NAMA Trust Fund within CIUDAT/FINDETER	48
Figure 18: Financial Flows for Colombian Waste Management NAMA	50
Figure 19: Colombian Waste NAMA – Pilot Case Cali Financing Structure	51
Figure 20: Risk categories for post-implementation NAMAs	56

Glossary

BAU	Business-as-Usual
BRT	Bus Rapid Transit
CBA	Cost-Benefit Analysis
CDM	Clean Development Mechanism
COP	Conference of Parties
ECDBC	Colombian Low-Carbon Development Strategy (for its Spanish acronym)
EE	Energy Efficiency
GCF	Green Climate Fund
GHG	Greenhouse Gas
INDC	Intended Nationally Determined Contributions
LEDs	Low-Emission Development Strategy
MRV	Monitoring, Reporting and Verification
M&E	Monitoring and Evaluation
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contributions
NPV	Net Present Value
PAS	Sectorial Action Plan (for its Spanish acronym)
RE	Renewable Energy
TNA	Technology Needs Assessment
TOD	Transit-Oriented Development
UNFCCC	United Nations Framework Convention on Climate Change
V-NAMA	Vertically-Integrated NAMA

Introduction

Since its introduction in the international climate regime in 2007, Nationally Appropriate Mitigation Actions (NAMAs) have been evolving as bottom-up and country-driven initiatives in developing countries, currently being perceived as an important instrument for low carbon transformation and innovation. NAMAs are designed and formulated considering development priorities that allow economies to deviate from business as usual (BAU) scenarios towards sustainable development pathways. Not only are NAMAs leading national actions towards the global efforts to reducing greenhouse gas (GHG) emissions in a flexible and inclusive way, but they are also facilitating the penetration of clean technologies, creating jobs, improving local living conditions and protecting local environments.

As the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) have come to agree to pursue efforts aimed at limiting global temperature increase to 1.5 °C and at least holding increases within 2°C, the expectation is that NAMAs will play an important part in the implementation of intended nationally determined actions (INDC) and plans communicated to the UNFCCC as Nationally Determined Contributions (NDCs) once countries ratify the Paris Agreement¹. However, international NAMA practitioners and domestic experts have expressed their perception in that the lack in NAMA financing presents the most critical barrier to NAMA implementation, aside from domestic capacity and coordination gaps (Averchenkova, 2014). Meanwhile, international donor financing seems to be readily available. This contradictory perception of available financing reflects a donor-recipient gap in the understanding of what is necessary to access the financing.

A number of technical and financial support initiatives have been mobilized from a diversity of donors and organizations to facilitate the increase of capacities and readiness for NAMAs in developing countries. Likewise, a number of guidance literature has been produced to

advance the knowledge and understanding of different definitions and concepts related to NAMAs. However, it is perceived that there is a need for deepening the discussions on certain areas related to NAMAs, in order to improve not only its adequate formulation but also its successful implementation, which includes facilitated access to finance.

Due to the critical role of NAMAs in implementing NDCs and the evident donor-recipient gaps in the implementation of NAMAs, this publication analyses the state of the art of NAMA design while deepening the discussions on crucial issues relevant to NAMA financing by presenting real and practical success stories of existing NAMAs. Focusing on national processes and current practices the authors analyse relevant and crucial knowledge developed during the last years. By presenting cutting-edge information and analysis on NAMAs, the authors hope to provide a better understanding to the NAMA community, as well as help consolidate the concepts and definitions, while NAMA application paves the way to sustainable development by facilitating transformation.

Aiming at closing the informational gaps still hindering smooth and informed national processes to formulate and plan the implementation of NAMAs in a way that will facilitate attracting climate finance, this publication consolidates existing scattered and critical information, while linking it with the latest available climate finance support information.

The first best practice during NAMA development processes has been the recognition of and the establishment of logical links between NDCs, Low Emission Development Strategies (LEDS), and NAMAs². LEDS are under development in many countries and ought to create a strategic frame for integrating NAMAs. NDCs on the other hand have been the dominating component of the international climate agenda in 2015. They present overreaching national mitigation goals presented as contributions to the UNFCCC. It is broadly perceived and expected that NDCs might be achieved through the implementation

¹ The Intended Nationally Determined Contribution is a term which indicates that the targets specified in the document are "intended". The targets become an NDC, or binding, when the country ratifies, accepts and approves the Paris Agreement. I.e. agrees to the terms of the Agreement and ratifies it, committing itself to achieve the targets specified in its INDC and to the international mechanisms established to achieve the goal set by the Convention on limiting a global temperature increase to maximum 2 degrees, aiming to achieve a maximum of 1.5 degrees.

² In this publication, LEDS refers to any strategy that focuses on the transition from a high-carbon to a low-carbon pathway. Other commonly used acronyms for similar concepts include LCDS (Low-Carbon Development Strategies), LECRDS (Low-Emission Climate-Resilient Development Strategies), CCDP (Climate Compatible Development Plan), and LCGS (Low-Carbon Growth Strategies).

of NAMAs; thus, they are intrinsically linked to both LEDS and NAMAs.

The linkage between NAMAs and existing strategies, plans, and projects will vary across NAMAs and it should be understood that NAMAs do not require a perfect embeddedness³ to be financeable. Nonetheless, a strong embeddedness will facilitate the NAMA process from concept, through design and implementation. Three case studies are presented to support this argument by exemplifying the differences in embeddedness across six categories (national development strategies, climate change strategies, sectorial strategies, local policies, existing institutions, and existing projects).

The second crucial issue when developing NAMAs is the identification of barriers, which are perceived as the defining element of clarifying why a country, sector, or sub-sector is locked in increasing GHG emissions practices and paths. Barrier analysis, therefore, is at the heart of achieving transformational change through the implementation of NAMAs. This importance is reflected in the demands by international finance providers including the Green Climate Fund (GCF) and the NAMA Facility. Both require the identification of barriers as part of the baseline scenario and the description of the envisioned responsive actions to overcome barriers, in order to contribute to market transformation or paradigm shift. This publication puts the barrier analysis at the core of defining the actions required to implement a NAMA. Recognizing that there is no single and direct way on how to perform a barrier analysis, building on current practices, this publication suggests a set of steps that can serve as a guideline to structure the process, concluding with a recommendation for how a barrier analysis should result in an action plan and a log-frame, which should be part of the implementation plan of the NAMA.

Another critical concept presented in this publication is the notion of enabling environments. The term has been broadly used across the NAMA community without a specific definition in existing literature⁴. The lack of clarity in the conceptual understanding of enabling environments in NAMAs has led to the interchangeable usage of enabling environments as pre-conditions for the development of NAMAs, as well as the measures entailed in the NAMA that will be conducive to the aspired paradigm shift. This

publication considers enabling environments to be the latter, and pre-conditions for the NAMA to be the conditions in which the NAMA can be embedded. As the present guidebook shall enable practitioners to advance towards high-quality NAMA proposals that can readily be submitted to the GCF and other financing sources, enabling environments are here described as the outcome of those actions that are implemented to overcome barriers, minimizing risks of failed implementation and ensuring the transformational impact of NAMAs.

The issue of potential risks for failed NAMA implementation is discussed departing from the fact that risks arise from a set of more or less predictable factors. Within the existing NAMA design, an incomplete barrier removal or the insufficient creation and execution of enabling environments substantially increase the risk of failure. While a thorough consideration of the different elements in this publication can provide a substantial hedge against many of these causes, other risk factors will remain. For example, unforeseen internal dynamics that develops internally through the implementation of activities, but also external factors difficult to predict, like shifting political priorities, which are difficult to insure against regardless of the comprehensive measures taken. Overall, and more importantly, a NAMA will only reach its full transformational potential if the NAMA is able to minimise the risk perception of the private sector by designing the right incentives so that international source funding can leverage substantial private sector investment.

Finally, in order to close the cycle, the publication dedicates the last chapter to present an overview of the current status of the GCF as a major source of finance for NAMAs and related activities.

3 Embeddedness in this context is used as similar concept as integration of climate change mitigation actions into development planning in general.

4 The authors recognize that other guidelines, publications, etc. use enabling conditions, enabling frameworks, and enabling environments interchangeably. It is considered that they refer all to the same term, here determined as enabling environments.

1. Background and Basics of NAMAs

This chapter establishes the institutional and logical links between NDC, LEDS, and NAMAs. LEDS are under development in many countries and ought to create an institutional frame for embedding NAMAs. NDCs on the other hand have been the dominating component of the international climate agenda in 2015. They present overreaching national mitigation contributions and might be achieved through the implementation of NAMAs; thus, they are intrinsically linked to both LEDS and NAMAs. This subsection concludes with LEDS potential role in facilitating NAMAs, and NAMAs potential role as implementation framework for both NDCs and LEDS.

1.1 The historic role of NAMAs in the international climate agenda

Since the establishment of the UNFCCC in 1992, the international climate agenda has made efforts to reach the Convention's goal; the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (UNFCCC, 1992).

Since then, the Convention has introduced a number of concepts and frameworks in the efforts to mitigate climate change. The concepts such as LEDS, NDC and NAMAs are not setting new goals in themselves, but are rather approaches to ensure

the implementation of the goals of the Convention as formulated and agreed upon in 1992.

In its inception document, the Convention identifies the world's common obligation to mitigate climate change, while recognizing the differences in responsibilities across countries in accordance with their developmental circumstances and priorities (UNFCCC, 1992). Following this paradigm, in 2007 as part of the Bali Action Plan, the Convention introduced "nationally appropriate mitigation actions" by developing countries, which shall enhance mitigation efforts in the context of sustainable development (UNFCCC, 2007). To achieve these efforts, developing countries shall receive support through the provision of technology, financing, and capacity building. Clarifying on the notion of international support, the Copenhagen Accord in 2009 differentiates supported NAMAs from overall developing countries' mitigation actions, suggesting that some developing countries have the capacity to implement NAMAs without any international support, too (UNFCCC, 2009).

Meanwhile as part of the Cancun Agreement in 2010, the Convention invited all Parties to develop LEDS, which are in line with the countries' aims, circumstances, and capacities (UNFCCC, 2010). Thereby, LEDS become the tool to define overreaching national goals and strategies for climate change mitigation.

Table 1: Timeline of UNFCCC frameworks

Timeline	1992-1997	1997-2010	2010-2020	Post 2020
Annex I	Limit GHG Emissions	Economy Wide Reduction Targets		NDC NAMAs
Non-Annex I	Take measures to mitigate emissions through the Clean Development Mechanism		NAMAs	NDC NAMAs

Source: adjusted from Boos et al., 2015

1.2 The links between NAMAs, NDC, and LEDS

NAMAs, NDC, and LEDS relate to each other both conceptually and technically, forming a reciprocal relationship between each other.

The Convention encourages establishing LEDS to decouple emissions intensity from economic growth. As an overarching framework to address climate change mitigation, they can be used to frame and implement the NAMA development process (Lütken et al., 2011). On the other hand, NAMAs provide the implementation framework to achieve the objectives determined in the LEDS. The NDCs establish the goals or ambitions of countries to address climate change and they are presented as (mitigation and adaptation) contributions to global efforts. NAMAs can equally be used as a means of implementation to achieve the targets presented in the NDCs.

From a technical perspective, NAMAs, NDC and LEDS link in two possible ways: through a top-down or a bottom-up process. Both processes have been observed and the selection of the most indicated will inherently depend on the country's previous advancements.

NAMAs as individual bottom-up actions can be aggregated and create a base to design tangible overall targets and strategies as NDC and LEDS. Colombia issued in 2011 its "institutional strategy for the articulation of policies and actions in climate change", proposing that national climate change initiatives will be built in a bottom-up approach; however, it has not come in effect at the lack of a presidential decree (Nachmany et al., 2015). In effect, Colombia has simultaneously taken a top-down and a bottom-up approach. While parting from its National Development Plan, it developed its Low-

Emission Development Strategy (ECDBC) in 2014 and corresponding sectorial action plans (PAS). The Colombian INDC built on the efforts undertaken as part of the elaboration of the ECDBC. However, simultaneously, Colombia had already started developing various NAMAs despite the ongoing elaboration processes of its strategy and action plans. The PAS reflect this existing ongoing work with NAMAs feeding into the sectoral level by explicitly stating the objective of implementing the existing designed NAMAs.

Alternatively, and as it has mostly been observed, they can stand at the end of a top-down process. In this case, existing high-level National Development Strategies, Sectoral Development Plans, LEDS and NDC provide the framework to design the NAMAs, or in other words the policy structure in which the NAMAs are embedded (see chapter 2 on embeddedness). Mexico, which has widely been lauded for its advancements in domestic climate change frameworks and policies, chose this approach, building on its relatively long record of climate change management. The Mexican institutional and policy milestones consist of the elaboration of the First National Communication to the UNFCCC (1997), followed by the creation of an Inter-Ministerial Climate Change Commission (2005), the publication of the Climate Change National Strategy (2007), its Special Climate Change Programme (2009), the issuance of the General Climate Change Law (2012), and its National Strategy of Climate Change (2013). Evidently, Mexico has been able to embed its portfolio of NAMAs in a comprehensive frame of regulations and policies.

Regardless of the approach, NAMAs will ultimately be a central tool to implement LEDS and NDCs (van Tilburg et al., 2015).

Figure 1: Relationship of LEDS, NDC and NAMA



1.3 Nationally Appropriate Mitigation Actions – working definitions

The present guidebook focuses on NAMAs that constitute a tool for developing countries to attract international support for domestic GHG emission reductions, integrated in the national context, i.e. domestic sustainable development priorities, and targeting barriers that have constituted a past lock-in in high-carbon development pathways. While we are not excluding unilateral NAMAs for recognition, our conclusions only partially apply for them. This working definition reflects the gradual transition in the understanding of NAMAs from an “anything goes” to a focus on transformational concepts. Despite this gradual concept clarification, NAMAs continue including everything from full-fledged programmes to individual projects.

The initial “anything goes” definition resulted from the absence of a clear definition of NAMAs by the COP, leading to many developing countries submitting NAMAs containing mitigation pledges in the form of national goals to reduce emissions below the BAU scenario, or lists of actions and policies to address GHG emissions. This understanding of NAMAs being pledges is widely acknowledged to be outdated, however (Boos et al., 2015).

By now, a variety of registered NAMAs has been published in the UNFCCC NAMA Registry. Illustrative examples of the ends of the whole NAMA spectrum are the NAMAs seeking support for implementation from Dominica and Serbia (UNFCCC, 2015a and 2015b). While the former envisions the implementation of its Low-Carbon, Climate-Resilient Development Strategy not specifying any particular action, the latter seeks support in expanding the existing heating network in an individual city. Arguably, these two are extreme examples but they give an idea of the wide variety of different envisioned actions in between in terms of scope and size.

As indicated above, the interpretation of NAMAs has shifted over time, with most NAMAs currently in the registry representing development policies and programmes. This is reflective of the increasingly prominent requirement for NAMAs to achieve a transformational change or paradigm shift in our economies to move towards a low-carbon sustainable development model (Olsen and Fenhann, 2015). While the concept of NAMAs allows for individual projects, it is debated whether they have the potential to trigger a shift from the business-as-usual high-emission pathway to one of lower emissions (Van Tilburg and

Bhasin, 2014). Meanwhile, some argue that short term programmes for the phasing out of certain technologies can still be transformational, likewise, larger scale projects as large renewable energy capacity additions that significantly change the energy mix of a country can also be transformational.

The term *paradigm shift* is defined by the GCF as the lasting impact, which is catalysed by and exceeds the one-off impact of the funded activities (GCF, 2015b). The activities with the potential for a paradigm shift should show potential to be scalable and replicable, to generate or strengthen knowledge, to develop and transform markets, and to strengthen regulatory frameworks and policies. This new definition as part of the GCF Investment Framework is closely aligned with the concept of *transformational change* commonly used in the NAMA lingo. A working definition for transformational change established the NAMAs’ role in disrupting status-quo high-carbon pathways, the introduction of innovative practices and actions followed by broader adoption and the lock-in in a low-carbon state by overcoming existing barriers to low carbon development and introducing new barriers for high-carbon technologies (Mersmann et al., 2014).

1.4 Nationally Appropriate Mitigation Actions – seeking international support

The Copenhagen Accord introduced the term “supported NAMA” referring to NAMAs seeking international support for implementation, suggesting that developing countries may also implement NAMAs without support. This created a distinction between NAMAs seeking support and NAMAs submitted to the UNFCCC for recognition of the country's efforts to mitigate climate change. While the guidance we propose also makes sense for unsupported NAMAs, we focus on the supported type.

As to the NAMAs seeking support, there is an implicit understanding that financial assistance for NAMAs will depend on the countries’ specific capabilities, and that financial support will only partly be provided by international sources. The GCF as financing source and multiple developing countries’ NDCs on the recipient side reflect this common understanding concerning NAMA financing. The GCF assesses the “needs of the recipient” as a core category within its investment framework, recognizing the differences in economic and social development across countries, the absence of financing sources other than the GCF, and the lack of institutional and implementing capacity

and, yet, it asks the applicants to list sources of co-financing (GCF, 2015a). Meanwhile, several of the potential beneficiaries of international financial support have made their national contributions to global climate change mitigation efforts conditional on financing. For example, Mexico states in its NDC that it is willing to reduce its GHG emissions by 25% compared to the BAU based on domestically-financed efforts, and an additional 15% conditional on international support (Government of Mexico, 2015). Similarly, Peru intends to reduce its domestic GHG emissions in 20% compared to the BAU by 2030 if no external financial is provided; however, conditional on international support Peru is willing to contribute with a reduction of 30% compared to its BAU (Government of Peru, 2015). Concluding, both donors and beneficiaries recognize that it is expected that developing countries and economies in transition, which have greater capacities, will also implement NAMAs using mostly or only their own resources (Boos et al., 2015). Moreover, the private sector will play a fundamental role in financing the transformational impact of government-induced NAMAs, longing for new profit sources.

1.5 Nationally Appropriate Mitigation Actions – from concept to preparation and implementation

Independent of the type of mitigation action and its links to LEDS and NDC, a government entity is ultimately responsible for the endorsement or approval of NAMAs. In the NAMA Registry by the UNFCCC, each country has assigned a 'NAMA approver' who is responsible for reviewing and approving all NAMAs submitted by NAMA developers before they are published on the Registry.

In practice, the approval process and designation of the approving entity will depend on the country's prerogative and type of action envisioned. In most cases, the NAMA approver is centralized in a certain Ministry (mostly the Ministries for Environment), or

consists of an inter-ministerial steering committee. The approval process can involve inputs and coordination across sectors. For instance, a NAMA needing to introduce new legislation will also need to go through an approval process involving parliament. A NAMA for the installation of solar water heaters on buildings might require approval from the Ministry of Energy, an entity responsible for building codes and standards, and possibly the Ministry of Finance. The relevant entity for building codes might be sub-national and differ from state to state or even between municipalities. This illustrates how a NAMA needs to be supported by a diverse set of actors, and for that matter integrated in the national policies and priorities in its preparation, as a pre-requisite to the successful implementation. Not surprisingly, these nationally important pre-requisites are considered pre-conditions to receive financial support for implementation as evidenced by the requirements of NAMA Facility and GCF (see chapter 2 for more detail on integration respectively embeddedness).

In presence of this congruent support from all relevant stakeholders and the integration in policies and national priorities, the conceptualization of a NAMA will most likely involve a range of needed initial activities that will come about in chronological order (see Table 2 below). These activities may or may not be in need of seeking international support.

Following the steps outlined above will allow describing and presenting the concept of the NAMA when approaching relevant stakeholders. It is important to remember that during NAMA preparation, the concept will serve as an entry point for discussion when approaching other stakeholders. The final NAMA structure and the detailed description of the components listed in Table 2: List of activities in NAMA preparation (Canu et al., 2015) Table 2 shall be the result of a multi-stakeholder process, and will probably go through extensive changes and review before the final NAMA design.

Table 2: List of activities in NAMA preparation

1.	Visualise the mitigation actions (installation of technologies, waste management systems, transport systems etc.)
2.	Describe possible policy instruments or measures required to implement the actions
3.	Conduct initial cost estimates
4.	Consider aspects of budgets and means of diverting existing funding or obtaining new funding
5.	Identify probable stakeholders, including possible financiers, and ways of engaging them
6.	Establish preliminary BAU and mitigation emissions scenarios
7.	Describe the NAMA's prime benefits and co-benefits
8.	Outline a system for measuring, reporting, and verification (MRV) of the progress and impacts of the actions

Figure 2: Stages of NAMA development



When moving from concept to NAMA preparation, it is prudent for NAMA developers to describe the engagement of all relevant stakeholders, in particular those relevant for financial options, and the responsibilities of each of them. Further, the NAMA documentation should also describe the institutional arrangement and corresponding legal frameworks for their implementation, ensure governmental review and approvals, and describe eventual needs for financial support, technical support and capacity building.

National approvers and potential financiers will then be able to analyse the proposal against the political, economic, social and technical realities of the country. This will allow assessing the country's readiness for the implementation of the specific NAMA.

In order to complement the assessment of the NAMA against the country's realities, a barrier analysis should be performed that indicates potential reasons why the country remains in the status quo despite the favourable presented conditions. A well thought through barrier analysis will ensure financiers that the NAMA developers are aware of the realities of the country and that there is a sound project management behind the preparation of the NAMA. In fact, the current and future dominating financial sources for NAMA implementation, the NAMA Facility and the GCF, consider a proposal without a barrier analysis incomplete. While there is a general tendency to identify the barriers through an unstructured, rather ad-hoc process, countries are well advised to execute a proper barrier analysis. A more detailed description for conducting barrier analysis of NAMAs is presented in chapter 3.

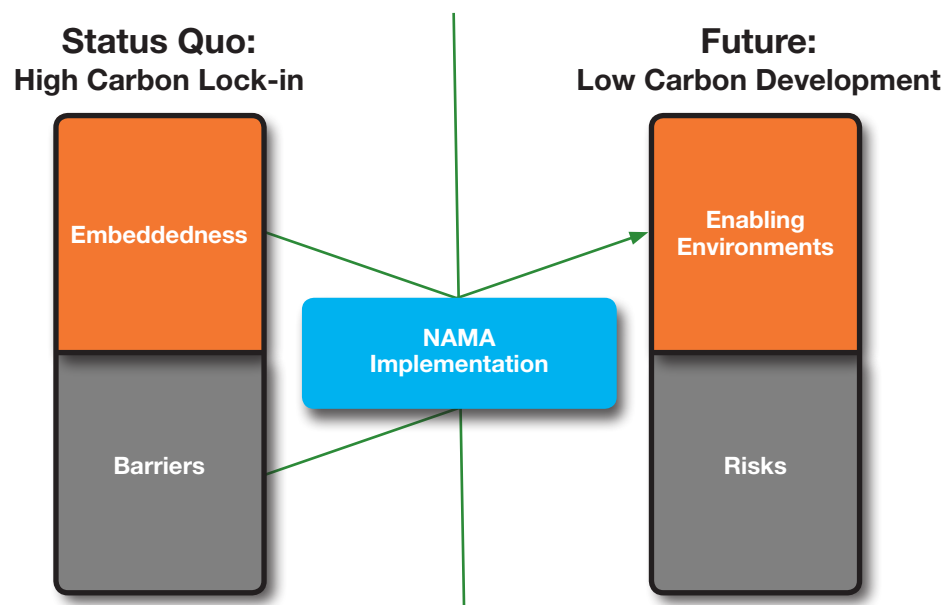
The foundations laid through such a barrier analysis in the NAMA preparation will help structuring an implementation plan to remove barriers and create enabling environments for the implementation of the NAMA. Enabling environments can be described as conditions conducive to the intended transformational change. These can be manifested through a high degree of political commitment, a facilitative regulatory framework, favourable market conditions and access to finance, capacity improvements and/or public awareness. The description of the needed enabling environments should be a part of the NAMA

preparation. The creation of enabling environments for a NAMA will in many cases constitute the backbone of the NAMA activities in its implementation, facilitating a successful achievement of the NAMA's goals. A more detailed description and cases presenting how enabling environments can be created is presented in chapter 4.

The process of performing a barrier analysis, identifying barriers and the description of measures to overcome them to create enabling environments will provide NAMA developers with a strategic overview of the many factors which can influence the planned actions. This overview will allow visualizing eventual remaining uncertainties with regard to the NAMA's success, and mapping potential risks for failed implementation throughout the NAMA's implementation and life-time (see chapter 5 for an introduction on risks in NAMAs). Having and presenting the whole overview of barriers, measures to create enabling environments, and an understanding of and measures to address potential risks to support providers will ultimately ensure potential financiers, like the GCF (see chapter 6 for an overview on the GCF status) of the NAMA's readiness and increase its chances to receive funding.

Concluding, this publication targets four key elements that can significantly improve a NAMA's likelihood to obtain international financial support while simultaneously increasing its prospects of succeeding in achieving transformational change: integration respectively embeddedness, barriers, enabling environments, and risk. The four concepts are related and can be considered elements along the temporal spectrum (see Figure 3 below). At the beginning of NAMA preparation, factors favourable of its implementation are considered the framework for embeddedness. Barriers are then factors that so far have prevented the country from transitioning to a low-carbon pathway despite these favourable conditions. Similarly, this guidebook shall help practitioners to identify the future enabling environments to include in the NAMA preparation to overcome the barriers and allow for transformational change during NAMA implementation, while recognizing that some risks prevail or new ones may arise despite the implementation of enabling conditions.

Figure 3: The guidebook narrative - NAMAs from past to future



Source: own elaboration

2. Embeddedness of NAMAs

Embeddedness⁵ refers to the integration of NAMAs in established structures and institutions. These are typically laws or governmental strategies, but it can also refer to embeddedness in non-political terms, such as building on a particularly strong sector in the country (e.g. widespread use of mobile money facilitating the introduction of renewable energy services in rural areas, strong tradition of agricultural cooperatives or similar) or as scaling-up of a successful existing project. The inclusion in climate change strategies and plans alone is a good start, but may not be sufficient. Climate change strategies are often found less well integrated and inclusive than economic development strategies. Climate change also typically has lower priority for national decision makers. The buy-in from different groups, obtained through jointly-developed strategies, as well as budget allocation to the NAMA and political leadership are critical to show embeddedness to donors (Hänsel et al., 2013).

As to the allocation of budget, donors commonly require national co-financing; however, this tends to be a chicken-and-egg problem. A common issue with budget allocation is that ministries in charge of a NAMA cannot acquire budget allocation from the finance ministry without a firm confirmation of international donor support, while the donors expect such allocation prior to confirming financial support. This issue is best overcome by building a NAMA around improving the climate impact of previously existing efforts that already have budget allocated to them.

2.1 Embeddedness concept in international climate finance

Embeddedness is a crucial criterion for international climate finance donors, as the lack thereof will automatically increase the perceived risk of a NAMA. This is evident both from their project evaluation criteria as well as from the high degree of embeddedness of those NAMAs successful in acquiring international

finance. This holds for both policy and project NAMAs. In particular national/local co-finance is important, as it is one of the strongest signals for country ownership to potential donors. Closely related to this buy-in is the necessary endorsement of the NAMA proposal by multiple entities, namely implementing ministries, respective subnational governments, and, ideally, the private sector e.g. in the form of business- or consumer associations. Binding commitments by the private sector to investment in a NAMA are rare, but considered one of the strongest propositions for international donors.

The NAMA Facility (2015) includes the embeddedness in the national development plans as part of their NAMA definition⁶. It considers embeddedness as given if the NAMA is aligned with national development strategies and sectorial strategies, and prioritized in the national government emission reduction goals. The Guidance Document further adds the need for clear government support, including financial support, reflecting the ownership component, as well as the usefulness of a prevailing legal framework that supports the NAMA.

The GCF in its Investment Framework (2015b) does not use the term “embeddedness”; however, the criterion “country ownership” can be considered synonymous with “embeddedness” as used in this publication. This criterion explicitly requires the funded project or program to be aligned with the countries’ national priorities, for which it specifically considers national climate strategies and plans, as well as the Technology Needs Assessment (TNA)⁷. It also demands coherence with existing national policies and institutional frameworks and asks for national co-finance.

5 The notion of embeddedness, originating from international climate finance sources, means essentially the (horizontal) integration of NAMAs into existing policies, efforts, and structures. In this publication we use embeddedness and integration alternatively to be consistent with the international NAMAs jargon.

6 The NAMA Facility is an international climate financing vehicle originally established in 2013 by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the Department of Energy and Climate Change (DECC) of the United Kingdom (UK). For the third call for proposals in 2015, the Danish Ministry of Climate, Energy and Building (MCEB) and the European Commission joined the NAMA Facility to extend the available financing.

7 Technology Needs Assessments (TNAs) are a set of country-driven activities that identify and determine the mitigation and adaptation technology priorities of countries, and is a part of the objectives and commitments regarding the transfer of technology under the UNFCCC.

Consequently, NAMA practitioners aspiring to obtain international climate financing are clearly advised to embed their NAMA concept in the existing policies, legislation, and strategies not only to improve implementation success, but also to mitigate risk perception and facilitate access to funding.

2.2 Practical implications on embeddedness

Country ownership is central to the NAMA concept. Accordingly, they are expected to be embedded in the context of national development priorities. Typically, such priorities are documented in long-term planning documents. In particular when developed with a participatory approach such long-term plans can ensure the succession of programs across legislative periods by creating strong extra-political support (Brown et al., 2013).

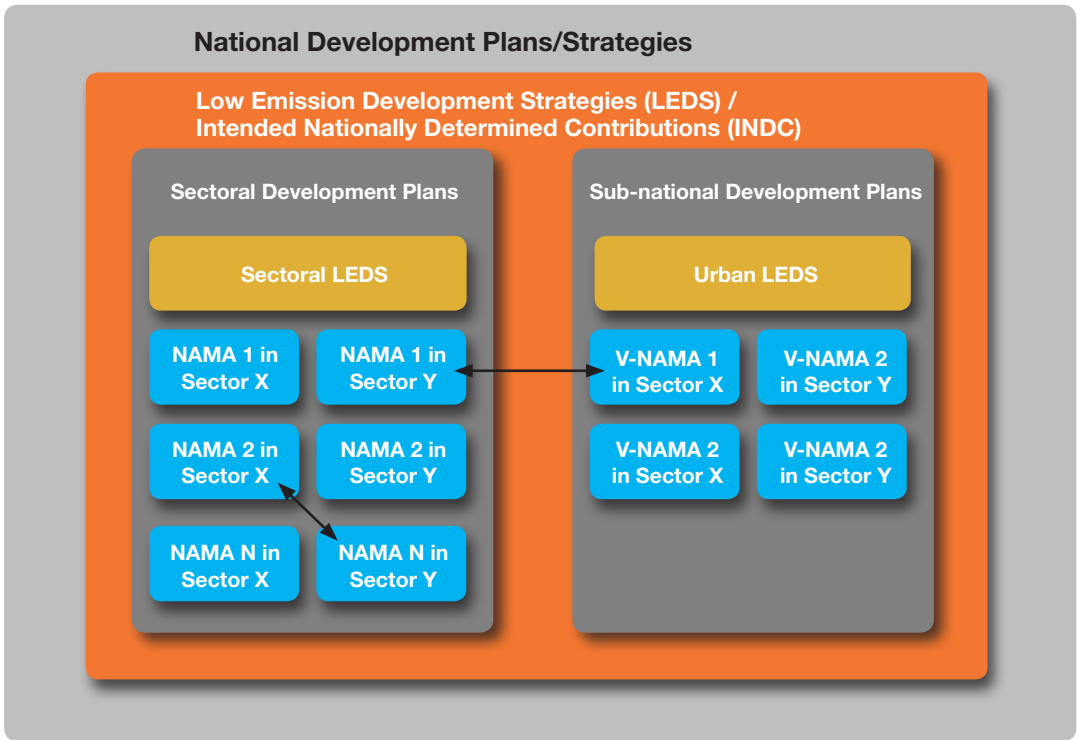
National and sectoral development strategies provide the overarching frame in which NAMAs should be embedded (see Figure 4). While NAMAs can in theory be directly aligned with the national sustainable development strategy, a logical intermediate step is the overall LEDS or the country’s NDC for which the NAMAs provide a means to implementation. The LEDS and NDC provide the framework through priority areas, policies or particular measures, in which the NAMAs are embedded (Hänsel et al., 2013).

LEDS and NDCs may also provide BAU scenarios on which the NAMAs contribution to emission reductions can align with. If an NDC for instance presents a specific BAU scenario for a given sector, a NAMA in the same sector could provide a detailed overview of how these emission reductions will be achieved, partially or in its entirety. The embeddedness of NAMAs in the existing LEDS/NDC will therefore also enable the host country and the international community to analyse if the established national/sectoral BAU scenarios are realistic, achievable or overinflated.

Additional intermediary frameworks, like sectoral and sub-national LEDS can further improve the embeddedness of NAMAs. The buy-in from key actors can be improved if the guiding framework is elaborated specifically for an individual sector and with participation of key actors from the sector.

Sub-national governments can have a substantial role in NAMAs. NAMAs in transport, buildings, waste, and land-use are likely to be designed and coordinated at the national level, but largely implemented on the sub-national level and, thus, require a vertical integration across governmental levels. These V(ertically integrated)-NAMAs have a higher complexity and require additional coordination across governmental entities (GIZ, 2014). On the other hand, such V-NAMAs also have strong appeal as they promise lasting

Figure 4: Embeddedness concept in the national, sectoral, and sub-national context



Ssource: own elaboration

Table 3: Policy documents or other relevant elements to embed NAMAs

(Intended) Nationally Determined Contributions
National (sectorial) Development Strategies
National Investment Policies
Existing Pilot Projects with Potential for Scaling-up
Regulatory Framework like Climate Change laws, Municipal Climate Change Bills, and sector-relevant laws
National Climate Change Strategy or Action Plans
Low-Emission Development Strategies (LEDS), Sectorial LEDS, and Urban LEDS
Technology Needs Assessment (TNA) and Technology Action Plans (TAP)
CDM Project or Programme of Activities
National Communications to the UNFCCC, in particular their sections on national GHG inventories and mitigation assessments, Biennial Update Reports (BUR), and NDCs

Source: own elaboration

change once implemented across levels. National governments can support the development of V-NAMAs through appropriate national legislation and facilitating channels of finance to the subnational level (Gouldson et al., 2015).

NAMAs from different sectors or different governmental levels can significantly overlap or even interfere with each other. Therefore, it is advised to consider the synergies across NAMAs in order to maximize efficiency, sustainability, and attractiveness to international funds. An example for such a cross-sector, cross-governmental level concern is the interaction between a NAMA in the cement sector and a NAMA in the waste sector. The use of dry municipal waste as a fossil fuel substitute for cement plants has significant potential to reduce GHG emissions (Aparcana Robles and Hinostroza, 2015). Simultaneously, absorption rates of waste as fuel for cement plants may be high enough to make alternative low-carbon waste technologies economically non-viable, which may have been viable in the absence of waste demand from cement plants.

Table 3 displays an exemplary list of plans and strategies in which actions can be embedded.

2.3 Approach to establishing embeddedness

2.3.1 Leadership

The development of a NAMA and the establishment of the corresponding embeddedness require strong leadership by a governmental entity, an implementing organization or other relevant institutions⁸. While initially

⁸ It should be noted that NAMAs are essentially government-driven and, therefore, in case of non-governmental leadership, the leader requires a strong endorsement by the corresponding governmental entities.

the process was predominantly driven by the national Ministries of Environment, the UNFCCC focal points or international delivery organisations, an increasing number of other Ministries and non-governmental institutions have started developing NAMAs. The engagement of a strong leader increases the willingness of other actors to contribute to the NAMA's development and identification of its embeddedness in existing plans, strategies, and projects. The leader's guidance is required to coordinate efforts in a funding application process. The Dominican Republic provides an example of strong national leadership on climate change; it created the National Council for Climate Change and Clean Development Mechanism in 2008 as an initiative to coordinate policies and climate change actions. This Council is led by the President. Results achieved by the Council include the formulation of the Climate-Compatible Development Plan (CCDP), five NAMAs in the UNFCCC Registry and fourteen Clean Development Mechanism (CDM) projects.

2.3.2 Coordination

The NAMA leader should utilize pre-existing committee structures for communication and coordination with different sectors and actors. Potential existing structures can either be classical sectorial associations and fora with no previous relation to climate change or the ones established in the process of developing national strategies, development plans, sectorial strategies and plans, the NDC, the TNA or of implementing them as in the case of Costa Rica's urban development plan for the Greater Metropolitan Area of San José (see below). These pre-existing structures will substantially shorten the time needed to identify the different elements to embed the NAMA, and can potentially leverage on trust, networks, etc.

2.3.3 Identification

The identification process is two-folded - the identification of all relevant actors and the identification of relevant strategies, plans, and projects. The identification and subsequent involvement of relevant actors is not only essential to determine the NAMA's embeddedness but also to ensure their buy-in and adjust the NAMA to their needs, which is critical for the NAMA. Once these structures are established, the leader needs to continuously motivate the relevant actors and engage in due diligence of their contribution. The following case studies exemplify the embeddedness in projects and strategies, as well how they made use of pre-existing structures.

2.4 Case studies for embeddedness

The detailed presentation of three case studies illustrates the advantages of a well-embedded NAMA apart from the facilitated access to international climate financing. While not all NAMAs may reach this high level of embeddedness and still succeed, the case studies presented here provide a level of embeddedness that other NAMAs should aspire to reach.

2.4.1 Colombian Transit-oriented Development (TOD) NAMA

The notion behind TOD is that well-designed land-use around transit hubs, will result in a higher-density, mixed-use development conducive to walking, increased real estate values, the usage of public transport, and other alternative modes of transportation.

The baseline in Colombia is a fourfold increase in car driving over the next thirty years, resulting in congestion and urban air pollution. At the same time, energy consumption is growing fastest in the transport sector and both public transport and non-motorized ridership are declining in Colombian cities, resulting in difficulties for operators to cover their costs (GIZ, 2014). The TOD approach is expected to counteract this development by discouraging private car ridership through measures in high-density development, high-quality transit, and appealing public spaces. If successful in its implementation, the NAMA is predicted to mitigate up to 5.4Mt of CO₂e annually through altered travel behaviour and land use by 2040, corresponding to a reduction below baseline of up to 22% (MinTransport, 2015). The Colombian NAMA on Transit-Oriented Development (TOD) successfully obtained EUR 14.7 million (~USD 15.9 million) from the NAMA Facility.

The NAMA builds upon major existing national investments in urban mass transit and low-income housing. The Colombian government requested USD 20 million of financial support to cover costs of staff, consultants and data improvements. The Center for Clean Air Policy (CCAP) announced in partnership with the Colombian Development Bank, Findeter, that it would deliver the technical and financial expertise for the NAMA. Following the pre-selection for funding worth EUR 14.7 million (~USD 15.9 million) by the NAMA Facility in November 2013, CCAP and Findeter will receive support from GIZ and the German Development Bank (KfW) with regard to the technical and financial components, respectively. The NAMA aims to develop and execute a financial sustainability plan to identify additional funding sources beyond the NAMA Facility support and develop a plan to continue its operations beyond the first three years. The TOD NAMA starts off from a very strong position:

1. National Development Strategy

The Colombian National Development Plans for the period of 2010-2014 (DNP, 2011) and 2014-2018⁹ (DNP, 2015) both define the successful integration of land-use development and urban transport as a key element to trigger an increased usage of non-individual motorized transport. The plans further specify that this should be achieved through inclusive, extensive, and sustainable modes of transport, implicitly demanding TOD. The Plan for the period 2014-2018 specifically states that efficient public transport systems are strategic elements, allowing for a higher densification in proximity to the public transport systems. Therefore, the implementation of the TOD concept is a top-level Colombian development priority included in the over-arching national development plan, which consequently lifts the element beyond the climate change mitigation arena towards a more comprehensive, trans-sectorial issue.

2. Climate Change Policy

The Colombian Climate Change Policy builds on four pillars, one of them the ECDBC (MADS, 2013). The ECDBC has three main objectives, namely the identification of actions that allow delinking the growth in GHG emissions from sectorial economic growth, the design of sectorial mitigation action plans, and the creation and promotion of implementation tools. As to the second objective, the design of mitigation

⁹ Note that the TOD project financed by the NAMA facility was accepted in 2013, being prior to the publication of the 2014-2018 national development plan. Even though, this implies that the project has been receiving international climate financing in absence of this additional element of embeddedness, it still contributes to the specification of an ideal way to embed the NAMA.

action plans in multiple sectors, the mitigation action plans specified and ranked the potential mitigation policies, programs, and actions in accordance to a set of weighted criteria. The PAS in the transport sector specifies the establishment of TOD Centres as a priority, in particular in terms of the coordination between transport and housing (Min Transporte, 2014).

3. Sectorial Policy

The sectorial policies that support the TOD NAMA date back to 2002. While the policies implemented as of 2002 did not explicitly include the concept of TOD, they mark the transition towards the widespread adoption of mass public transit systems, and thus are a cornerstone for TOD in Colombia. Starting with the *National Policy to Improve Public Urban Transport* in 2002 (DNP, 2002) and the *National Policy on Urban Mass Transport* in 2003 (DNP, 2003), the concept of bus rapid transit (BRT) systems spread successfully across the country. Within the latter, the implementation of integrated mass transit systems had already been associated with an integral, coordinated urban development within the reach of the transit systems. Moreover, it specifically considered the recovery of public urban spaces.

Concerning the housing and land-use component of TOD, a policy has been in place since 2004 – *Guidelines to Enhance Urban Development Policy* (DNP, 2004). These guidelines state that densification should occur, including the setting-up of public spaces, the establishment of infrastructure to link the development to mass transit systems, and private sector involvement in urban and mass transit development. Consequently, the Guidelines have provided a policy tool that practically introduced the concept of TOD to the Colombian urban space.

Two lessons can be learned for the embeddedness of sectorial policies from the Colombian TOD NAMA. First, while a sectorial policy may date back considerably and not explicitly reflect the objective of the NAMA, it still has the potential to embed the NAMA nicely by incorporating key elements of the NAMA. Since the inclusion of sectorial policies proves highly favourable for the development and implementation of NAMAs, the lack of a perfect link should not cause the sectorial policy to be disregarded. Second, it can prove very useful to examine the sectorial policies of sectors' closely-related to the NAMA's primary focus.

4. Local Policy

Since the concept of TOD is intrinsically related to the urban space, local policies can equally provide a

good ground to embed the NAMA. In the Colombian case, several cities have developed Urban Mobility Plans (DNP, 2015) and Land Use Master Plans (POT) (GIZ, 2014). These plans, if designed prior or simultaneously to the NAMA, can provide a significant level of embeddedness as they reflect and guarantee the municipalities' ownership of the NAMA. While many cities are currently still developing both plans, some others have developed the plans before the TOD NAMA. The inclusion of the TOD concept in these plans is not uniform across the different municipalities; however, the plans from Medellín provide an excellent example. The POT Medellín of 2006 highlights the establishment of integrated mass transit systems that form the backbone of the cities transport system as one of the main components of the future city (Municipality of Medellín, 2014).

5. Existing Institutions

Prior to the establishment of the TOD NAMA, the Colombian Ministry of Housing, City and Land, the Ministry of Transportation, and Findeter (the national development bank) had individual programs and corresponding financing that relates to TOD; however, they had not been synthesized in any way. The Ministry of Housing, City and Land had funds available for low-cost housing, the Ministry of Transportation had made substantial investments in BRT systems across the country, and Findeter's Sustainable Cities Initiative provided a valuable platform and funding. Therefore, one of the key components of the TOD NAMA was to unify these different elements to ensure an effective usage of resources.

In addition, since the TOD concept aspires to motivate private sector agents to invest, amongst other forms through public-private partnerships, the National Planning Department's (DNP) Public-Private Partnership (PPP) framework from 2012 is another key ingredient to the NAMA's embeddedness. Through this incentive structure, long-term investors shall be identified with the capacity to construct, operate, and maintain the infrastructure (DNP, 2015). Through the co-financing incentive structure involving public and private sector, the TOD NAMA may benefit through increased available financing accelerating project implementation pace and increasing the potential scale.

Arguably, not every envisioned NAMA will be able to count on previously available funds; however, such internal funds can substantially increase the institutions' ownership and is also very useful to show national co-financing to the donors.

6. Existing Projects

The Colombian experience in integrated mass urban transit systems for the past fifteen years is a valuable component to the TOD NAMA. The bottom-up process initiated in the city of Bogota through the implementation of its BRT System “Transmilenio” is a successful example of a local transport policy applied and replicated in other cities in the country, and scaled up into national transport policy. Colombia’s total intervention in public transportation during the first decade of the century has amounted to USD 7 billion, building on public and donor funding (MinTransporte, 2015). While the NAMA TOD is more comprehensive than a single transport system, the successful introduction of widespread mass urban transit systems in Colombia has already brought about a NAMA-style transformational change (Olsen and Fenhann, 2015). Considering that the TOD concept extends beyond the pure notion of transport, the pre-NAMA investments in social housing of USD 2.3 billion during the past years is also highly relevant as Colombia signals its willingness to dedicate public funds to the objective of the NAMA (MinTransporte, 2015).

7. Conclusions on Embeddedness in Colombian TOD NAMA

The Colombian TOD NAMA has benefitted from a strong embeddedness in national development policy,

sectorial policies, and climate change action plans. The policy background was further strengthened through the existence of various publicly- and donor-funded projects closely related to the NAMA and the experience of past transit projects. While not all past municipal policies embraced the concept yet, the current updating process can make up leeway. The latter also shows that the embeddedness does not need to be all inclusive right away; however, it should be well-developed to succeed in obtaining international climate financing and to be able to implement the NAMA successfully.

2.4.2 Mexican Sustainable Housing NAMA – ECOCASA

The Mexican NAMA on Sustainable Housing, popularly called ECOCASA, was the first NAMA to receive international climate finance for development. The NAMA constitutes a scale-up and complementation of pre-existing efforts, and has received funding from a range of different sources, including grant financing from the NAMA Facility and the Latin American Investment Facility funded by the European Commission (see Table 4 below).

The Mexican Sustainable Housing NAMA aims at upscaling national efforts for sustainable, energy efficient housing, leading to a sectorial transformational

Table 4: NAMA ECOCASA international financing

Funding Source	Amount (million)	Funding Type	Funding Purpose
German Development Bank (KfW), German Ministry for Economic Cooperation and Development (BMZ)	USD 105.55	Concessional Loan	Financing for housing developers
Clean Technology Fund	USD 49.5	Concessional Loan	Financing for housing developers
	USD 2.1	Grant for Technical Assistance	Technical Assistance
Inter-American Development Bank	USD 25	Market Rate Loan	Ordinary Capital for Green Mortgages
European Commission	USD 9.3	Grant for Investment and Technical Assistance	Subsidy for Passive Houses
NAMA Facility	USD 13.3	Loan Guarantees, Investment Grants and Technical Assistance	Financial Cooperation for a sector-wide NAMA implementation

Source: Sociedad Hipotecaria Federal, n/a

change. The ECOCASA programme supports this objective through the increased provision of mortgages and financial incentives for investments in energy efficient technologies in housing (Martin et al., 2013). The NAMA includes three different housing types with corresponding efficiency standards. Housing developers have the possibility to apply a “whole house approach”, and through their choice of combination of different technologies, e.g. insulation in roof and walls, reflective painting, solar water heater, etc. achieve one of three efficiency standards. To showcase financial and technological feasibility, the NAMA is piloting the housing types across the different climatic regions in the country.

The Mexican residential housing sector is responsible for 7% of the national GHG emissions (SEMARNAT, 2012). At the same time, Mexico has been suffering from an estimated deficit in available housing, which is unlikely to be fully alleviated as demand is projected for additional 11 million new housing units and the refurbishment of 9 million units (SEMARNAT, 2012). Under the baseline scenario without energy efficiency improvements this would lead to an increase in emissions of 25 MtCO₂e by 2020 (Ashden, 2015). The ECOCASA NAMA promises a significant reduction on that amount.

At the heart of the ECOCASA NAMA is the achievement of transformational change in the sector by upscaling existing efforts. Framing and coordinating existing efforts as part of a NAMA provides the advantage of facilitated embeddedness as starting conditions are clearly framed, while allowing the participating entities to overcome former barriers that have impeded reaching proper scale beforehand. Further, a successful pilot removes a number of uncertainties and risks associated with NAMAs. The success in obtaining international climate financing and the case of upscaling existing initiatives make the ECOCASA NAMA a good example for embeddedness:

1. National Development Strategy

The need for sustainable housing has featured prominently recent Mexican National Development Plans (PND). The PND 2007-2012 states that an estimated 650,000 new residential units will be needed annually until 2030 (Government of Mexico, 2007). For this purpose, the PND 2007-2012 declares the need to increase financing for low-cost housing as part of the efforts to develop organized and sustainable settlements. Moreover, it explicitly demands the promotion of energy efficient technologies that

offer cost-savings for end-users. Similarly, the PND 2013-2018 reiterates that the backlog in housing development and refurbishment shall be reduced by focussing on economically, ecologically, and socially sustainable housing (Government of Mexico, 2013). Therefore, the focus on promoting sustainable housing has been a prominent element throughout the past PNDs, suggesting that there is transversal awareness of the need; the potential for transformational change is elevated, and the project continuity is guaranteed beyond an individual governmental period, as the governing party changed after the 2012 elections.

2. Climate Change Policy

Climate Change is strongly anchored in the Mexican Legislation, including through a national Climate Change Law (SEMARNAT, 2012). The law determines that reductions in direct and indirect GHG emission in the housing sector should be supported through the development of policies and instruments for planning and construction. Prior to the introduction of the Climate Change Law, Mexico had already presented its first Special Climate Change Programme 2009-2012 (PECC), including efficient housing and green mortgages amongst over 100 identified GHG mitigation actions (SEMARNAT, 2009). Closely aligned with the goals of the PND, the PECC 2009-2012 specifically names amongst its objectives the promotion of energy-efficient housing construction. It sets a goal of financing 800,000 new energy-efficient housing units through the green mortgage scheme (“hipotecas verdes”). The current PECC 2014-2018, though published during the ongoing implementation of the NAMA, still makes a relevant contribution to the overall process by stating that stimulus should be given for the Housing NAMA (SEMARNAT, 2014).

3. Sectorial Policy

The Mexican Housing NAMA is strongly embedded in the sectorial policy framework and previously existing projects (see below). Concerning the policy framework, the NAMA builds in equal terms on the housing and the energy legislation. Starting with the Mexican Housing Law in 2006, sustainability in the development of housing opportunities has become a central factor in national housing policies (Fundación Idea, 2013). The National Housing Programme 2007-2012 is aligned with this focus area, requiring the establishment of certification schemes and flagship-style housing including efficient equipment. The National Housing Programme objectives are clearly reflected in the NAMA and, thus, provide an immediate embeddedness to the Mexican Housing NAMA.

In 2009, the National Programme for the Sustainable Use of Energy (Programa Nacional de Aprovechamiento Sustentable de la Energía, PRONASE), set a target to include all current Mexican Minimum Energy Performance Standards (MEPS) into local building codes by 2012. In addition PRONASE is promoting the standard installation of thermal insulation for homes in relevant climatic areas (SEMARNAT, 2012).

The energy legislation provides an additional ground, on which the NAMA is built on. The National Commission on the Efficient Usage of Energy (CONUEE) comprises amongst its responsibilities the development of an energy efficiency scheme and the subsequent awarding of the certification, as determined by the Law on the Sustainable Use of Energy issued in 2008. CONUEE has developed the Programme to Promote Product, Process and Services Certification ("Programa de Fomento a la Certificación de Productos, Procesos y Servicios") (CONUEE, 2011). As part of the Programme, the certification of energy efficiency in new housing is advanced, by awarding a distinctive energy efficiency symbol to those who have engaged in energy efficiency efforts.

The Secretary of Energy (SENER), the Secretary of Environment and Natural Resources (SEMARNAT), and the National Council on Housing (CONAVI) started the joint coordination of the Transversal Sustainable Housing Programme in 2008 ("Programa Transversal de Vivienda Sustentable"), aimed at transforming the social housing sector in terms of construction practices.

Through the sectorial policies outlined above, it becomes evident that the Mexican Housing NAMA builds in equal terms on policies in both the housing and energy sector. As most NAMAs will have a cross-sectorial impact, it is of utmost importance to consider all sectors that are affected, ensuring the recognition and inclusion of the NAMA across sector lines. The design of a national cross-sectorial programme prior to the establishment of the NAMA, the Transversal Sustainable Housing Programme, showcases the Mexican awareness of transversality when it comes to climate change mitigation.

4. Local Policy

Local governments were able to participate in the Municipal Climate Action Plan Programme (PACMUN), a programme established by ICLEI - Local Governments for Sustainability, with the technical support of the National Institute on Ecology and

Climate Change, and financed by the British Embassy in Mexico between 2011 and 2015. PACMUN enabled 280 municipalities to develop guidelines for municipal climate actions and built capacities to identify climate impacts and responses at local level. Although not been an initiative that illustrates embeddedness by the national government, it shows embeddedness through the existence of climate change initiatives at the local level, proving the existence of local awareness and capacities.

5. Existing Institutions

The Mexican Housing NAMA builds on the experience of various existing institutions and their corresponding projects. By its legal mandate, CONAVI leads the coordination of federal public policies related to the housing sector (Fundación Idea, 2013). In particular, it supports low-income groups to purchase housing. Amongst its activities in recent years it has developed the national strategy for sustainable housing, as well as the inclusion of sustainability criteria in its housing subsidy programme "Ésta es tu casa" (This is your house).

On the funding side of the housing sector are the Institute of the National Housing Fund for Workers (Instituto del Fondo Nacional de la Vivienda para los Trabajadores) (INFONAVIT) and the Federal Mortgage Society (Sociedad Hipotecaria Federal) (SHF). Roughly three quarters of accredited participants of INFONAVIT have incomes lower than four times the national minimum wage. INFONAVIT accounts for nearly 70 percent of the national mortgage market, providing roughly 500,000 mortgages per year. Through its programmes on green mortgages (see next point on existing projects) and sustainable housing, INFONAVIT has been directing the housing market towards more energy efficient options since 2008. SHF is a second floor development bank created in 2001 to target the financing market for lower cost housing¹⁰. Through credits and guarantees, SHF makes housing finance accessible to the Mexican lower income classes, ensuring their right of dignified living conditions. In addition, through the ECOCASA programme, SHF makes energy efficient housing solutions available to groups with reduced purchasing power.

CONUEE has a set of tools to promote energy efficient solutions at their disposal (Fundación Idea, 2013). In the housing sector, CONUEE promotes solutions concerning the whole house, including appliances, housing envelopes, etc. Amongst its responsibility

¹⁰ A second floor bank does not engage directly with household or firm-level customers but allocates the target-specific funds through day-to-day business commercial banks.

is the oversight of the Mexican Minimum Energy Performance Standards (MEPS).

The presentation of relevant entities reveals that the Mexican NAMA in Sustainable Housing has benefitted from previous efforts towards energy-efficiency in the sector. The partners benefited from an elevated market penetration giving them the leverage to bring about transformational change.

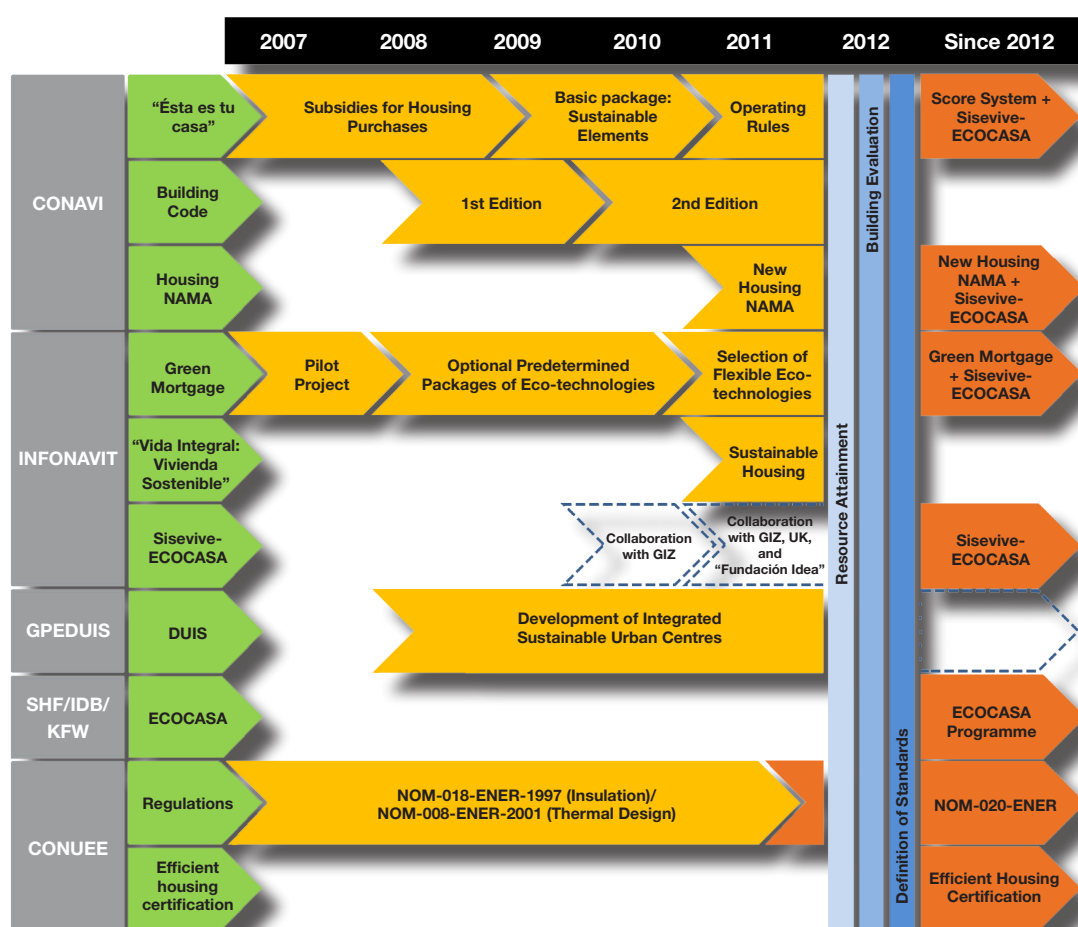
6. Existing Projects

Two projects have been the forerunners of the Mexican Sustainable Housing NAMA – the programme “Ésta es tu casa” (This is your house) implemented by CONAVIT and “Hipoteca Verde” (Green Mortgages) under the auspices of INFONAVIT (Figure 5 for a timeline of relevant institutions and corresponding programmes for the Mexican Housing NAMA). Since 2007, “Ésta es tu casa” has been providing subsidies for housing to low-income households. As of 2009, the programme started including sustainability guidelines

to improve energy and water efficiency in subsidized residential buildings. In 2012, CONAVIT introduced new operating rules to the programme that defined ecological and efficiency criteria, which define whether the subsidy is granted to the applicant. Since its inauguration in 2007, INFONAVIT’s green mortgage programme has been intended to include technologies that foster a more sustainable use of resources in the housing sector. Moving from the piloting phase to a more general operationalization, INFONAVIT included pre-packaged sets of eco-technologies that could be chosen by the housing purchasers. By now, the programme allows for flexible technology solution as long as a certain efficiency goal is attained.

The overview of programmes and projects makes evident the strong embeddedness of the NAMA in previously existing structures. Experience with the application of efficient technologies and their providers had been available before, leading to strong capacities that allow for the scale-up by the NAMA.

Figure 5: Relevant sectorial policies and projects according to their heading Institutions



Source: Fundación Idea, 2013

7. Conclusions on Embeddedness in Mexican Sustainable Housing NAMA

The success of Mexico's Sustainable Housing NAMA in being the first internationally-funded NAMA is evidently based in a system of climate change strategies, plans, sectorial programmes, institutions, and importantly, pre-existing programmes. The scale-up and improved coordination of existing efforts as envisioned by the Mexican NAMA are more readily embedded than NAMAs that focus on introducing a completely new technologies, ideas, knowledge, etc. to a country. Consequently, the Mexican case showcases that scaling-up existing pilots and projects can provide an ideal ground to design a NAMA for transformational change, as strong supporting mechanisms and initial experience have been obtained. As countries aim for obtaining international financing for a NAMA, it can be beneficial to initially focus on the scale-up and coordination of existing efforts.

2.4.3 Urban NAMA Costa Rica

Different from the previous two case studies, the Urban NAMA in Costa Rica is still in the preparation phase. The inclusion of a NAMA in its design phase provides a useful contrast to the other NAMAs that have already received implementation finance and to show how far a NAMA in the design phase can already be embedded. Since the urban environment is a very transversal area, the envisioned Urban NAMA is more comprehensive than the previously presented ones, as it comprises a large subset of different sectors, in which actions are to be undertaken. The NAMA includes an overarching Urban Low-Emission Development Strategy (Urban LEDS), has a very comprehensive approach and is very well embedded (see Figure 6 for an illustration).

Through different international climate support programmes, including UNEP DTU Partnership's FIRM project, Costa Rica has identified a set of potential mitigation actions in the sectors of transport, land-use, housing, waste management, and energy (MINAE, 2014). The Urban NAMA is considered a tool to transform the Greater Metropolitan Area (GAM) of the conurbation of San José, Alajuela, Cartago and Heredia into a climate-smart city (MINAE, 2014).

1. National Development Strategy

The official goal of carbon neutrality by 2021 makes Costa Rica a forerunner in integrating climate change into its overall development strategy. The current National Development Plan 2015-2018 (PND) specifies amongst its strategic actions the need to create enabling environments to achieve emissions reductions, and the negotiation and implementation of sectorial emission reduction goals (MIDEPLAN, 2014). As to the latter, the PND is more precise by concentrating on agriculture, energy, and transport in a first phase. In addition to the focus on sectorial emission reduction targets in the energy and transport sector, the PND stresses the importance for integrated urban solutions, emphasizing in particular densification, urban planning, and public transport. Urban planning and public transportation are in two of the core aspects of the Urban NAMA, but the NAMA also includes energy, solid and liquid waste.

Arguably, the key elements of the Urban NAMA do not find extensive recognition in the development strategy. Yet, some components are included, land-use planning in the GAM in particular. Efforts to display the NAMA's embeddedness in the national development strategy should emphasize these elements, while

Figure 6: Structural embeddedness for the Costa Rican Urban NAMA



Source: MINAE, 2014

relying on other strategies to prove the embeddedness of other components. Consequently, while the whole NAMA's embeddedness in the development strategy is desirable, when this is not given, NAMA developers need to emphasize a very-targeted type of embeddedness by specific reference to other documents.

2. Climate Change Policy

Costa Rica's strategic planning in climate change is documented in the National Climate Change Strategy (ENCC) dating back to 2009 and the ENCC's Action Plan (Plan de Acción de la Estrategia Nacional de Cambio Climático) from 2012. The latter defines strategic actions for three time periods, 2014, 2018, and 2021, year in which Costa Rica is aspiring to reach carbon neutrality.

The ENCC defines energy, transport, and solid waste amongst its strategic sectors (MINAE, 2009). Further, it defines that actions shall not be taken merely on the national level but that subnational and municipal level can equally strive to become carbon neutral. As to its relevance for the Urban NAMA, the ENCC focuses heavily on the transport sector, due to its dominant role in the national GHG emissions. It emphasizes the potential for public transport infrastructure and incentives for its use, infrastructure for non-motorized transportation and increased vehicle efficiency.

Following the guidelines of the ENCC, the National Climate Change Action Plan (MINAE, 2012) stresses the importance of sustainable mobility, which can be achieved through a more effective integration of transport and urban land-use planning. Additional consideration is granted to the need of integrated public transit systems, in particular for actions in the GAM.

The presented strategy and action plan are more closely related to specific components of the Urban NAMA. On the other hand, housing and waste management components of the Urban NAMA are not highly represented in the strategies and, thus, lack embeddedness, reflecting the difficulty of showing embeddedness for all the aspects of a very trans-sectorial NAMA. While NAMAs often require a cross-sectorial focus in order to reflect the inter-sectorial relationship and the bilateral interaction, a too comprehensive approach may sacrifice embeddedness on parts of the NAMA. This trade-off needs to be carefully examined in NAMA design.

3. Sectorial Policy

The Urban NAMA envisions a diverse set of policies in the four sectors, energy, transport, land-use, and waste management. For example, Costa Rica's NDC depicts the National Land Use Policy (Politica Nacional de Ordenamiento Territorial 2014-2040) as one of the policies that include strategic areas that will be critical to national GHG emissions reductions (MINAE, 2015).

The Costa Rican National Land Use Policy and corresponding Plan (Plan Nacional de Ordenamiento Territorial 2014-2020) provide a strong ground to embed most of the components considered in the Urban NAMA. The National Land Use Policy specifically aims at promoting the development of compact, sustainable cities through urban reorganization that favours the intensive use of urban space and the determination of settlements through planning (MIVAH, 2012). The National Land Use Plan specifies the need for guidelines that fortify the creation of compact cities, incorporating an urban densification process, urban renewal, reconstruction of urban space, and the promotion of mixed use concepts (MIVAH, 2013). In line with the NAMA's priority areas, the National Land Use Plan promotes pilot housing projects that showcase the verticalization of urban space and the utility of mixed-use concepts, as well as the implementation of massive transit concepts and the creation of disincentives for individual, motorized transport.

The top-down linkage from the NDC through the sectorial policy and plan to the Urban NAMA makes a strong case for the measures embeddedness. The Costa Rican case exemplifies how the lack of embeddedness in the national climate change strategies can to certain extent be compensated by sectorial policies and plans. In fact, the sectorial incorporation can be even more important since the success in climate change mitigation measures will often require a transition in responsibilities from the environmental sphere to the sectorial sphere, or ideally involve a strong cooperation.

4. Local Policy

Costa Rica is currently taking a set of fourteen different steps to reduce the country's carbon footprint, including the elaboration of an Urban LEDS (NDC, 2015). These efforts can complement the existing Regional Urban Plan for the Greater Metropolitan Area (Plan Regional Urbano del Gran Área Metropolitana or PlanGAM 2013), which dictates the development aspirations for GAM within the next one and a half decades.

PlanGAM 2013 essentially comprises all the components of the Urban NAMA, newly reflecting the need for densification and advanced urban planning, improvement in urban mobility through public transport and non-motorized individual transport modes, and the inclusion of sustainability parameters in the housing sector (MIVAH et al., 2013). Transport and land use/housing elements are promoted predominantly as indicated in the ten projects that ought to establish a structure in the process towards a climate-smart city (Martínez Balderas, 2014).

The Costa Rican case displays how the different elements of a V-NAMA can be embedded in the subnational or municipal planning process. As a plan that is designed for a multi-decade timeframe, it is highly relevant for the planning process, and provides credibility to its planned initiatives. The Urban NAMA, therefore, has a strong national and subnational backing, which is very important for V-NAMAs.

5. Existing Institutions

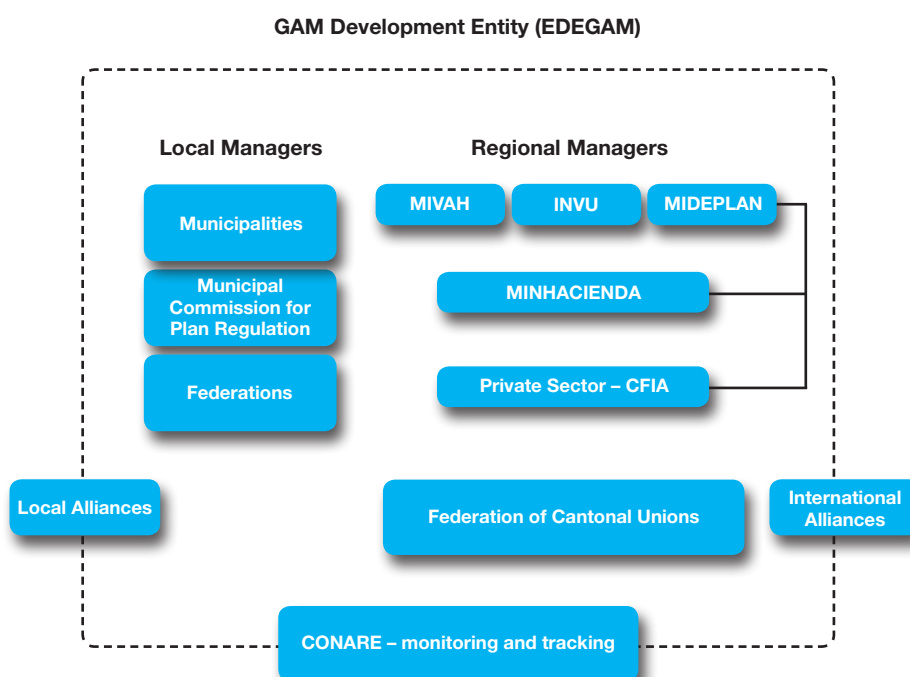
In a trans-sectorial NAMA like the Urban NAMA, it will be straightforward to rely on existing relevant institutions like the Ministry of Housing and Human Settlements (MIVAH), the Ministry of Public Works

and Transport (MOPT), the Ministry of Health (MINSa), and the Ministry of National Planning and Political Economy (MIDEPLAN) on the federal side, and relevant municipalities and corresponding local agencies on the local level. These existing institutions can further comprehend private sector associations, civil society organizations, and education entities, amongst others.

In the Costa Rican case, structures have been created that ought to guarantee the successful implementation of the PlanGAM 2013 (see Figure 7) (MIVAH et al., 2013). The structure entails institutions at the local and regional level, including federations and municipalities as well as ministries and the National Institute for Housing and Urbanism (INVU). These entities are complemented by local alliances, international partners and the National Council of Principals (CONARE). These structures are united under the umbrella of the GAM Development Entity (EDEGAM).

While these structures are imperfect for the implementation of the Urban NAMA due to the lack of an environmental representation, the adaptation of existing structures can facilitate the establishment of structures substantially and make them readily applicable to the case at hand.

Figure 7: Organizational structure for PlanGAM



Source: simplified from MIVAH et al., 2013

6. Conclusions on Embeddedness in Costa Rican Urban NAMA

The Costa Rican Urban NAMA takes on a very comprehensive approach by including transport, urban planning, buildings, energy and waste management elements. This comprehensiveness faces a significant trade-off by ensuring the inclusion of trans-sectorial issues on the one hand, while being challenged by the variation in sectorial preparedness reflected in the strategies and plans or the lack thereof. At the same time, the Urban NAMA showcases how a locally-focussed NAMA can be embedded in local policies and institutional setting and, thus, will not face any disjunction between the federal and sub-national level.

2.5 Conclusions on embeddedness

Embeddedness is one of the crucial elements when developing a NAMA and aiming for international climate finance. To establish embeddedness, NAMA developers will require leadership and strong communication and coordination capacities since most NAMAs will be cross-sectorial. These qualities will facilitate establishing stakeholder ownership and, thus, improve the access to relevant information. It also means that NAMA design may need to be adapted to better match existing policies.

The linkage between NAMAs and existing strategies, plans, and projects will vary across NAMAs and it should be understood that NAMAs do not require a perfect embeddedness to be financeable.

Nonetheless, a strong embeddedness will facilitate the NAMA process from planning, through design to implementation.

The three case studies support this argument by exemplifying the differences in embeddedness across the six categories (national development strategies, climate change strategies, sectorial strategies, local policies, existing institutions, and existing projects).

The NAMA's embeddedness in the development strategy is desirable as it will facilitate obtaining political support that extends beyond the climate change-related entities and those sectors that will immediately implement it. It is also more likely to attract national co-financing when fully aligned with developmental priorities. Further, as development plans are often designed as long-term strategies, its inclusion in development plans increases its likelihood of being supported across individual governmental periods. In addition, the inclusion in the development strategies lifts the NAMA out of the climate change niche onto a broader political spectrum, which is necessary

to obtain sufficient support to exhaust the NAMA's potential for transformational change.

Climate change plans and strategies, LEDS and NDC guide the overall activities in the national climate change arena and, thus, ensure that the NAMA is considered critical to the countries' efforts in reducing its impact on the climate. The capacities and information generated through the elaboration of plans, strategies and NDC can facilitate the NAMA elaboration. While such legislative backing is desirable, often the sectorial embeddedness is more critical to the NAMAs success as expertise and execution will be located in these entities.

In the Costa Rican case, the top-down linkage from the NDC through the sectorial policy provides strong foundations for the NAMA. It reflects sectorial awareness that extends beyond the sector into the environmental sphere and, thus, is able to ease the lack of an inclusion of the NAMA components in the climate change strategy and plans. The Mexican case illustrates how transversal awareness can be created, exemplified through the Transversal Sustainable Housing Programme and the Round Table for Sustainable Housing in Mexico. As sectorial awareness and cross-sectorial coordination rely on a lasting capacitation process, it will be favourable to the development of any future NAMA or project to engage in these activities.

Local strategies and plans in relation to climate change are just emerging and, thus, cannot yet provide a foundation for V-NAMAs. Nonetheless, the Costa Rican case displays how an existing local plan or strategy can comprise the necessary actions that will make part of the V-NAMA and provide a vital embeddedness. In absence of this legislative guidance on the subnational level, coordination requirements across governmental levels will be even higher.

Previously existing projects are not a necessary for NAMAs in their preparation phase, as many NAMAs include piloting new technologies as one of their principal components. However, NAMAs aiming at receiving support for implementation will need to show that relevant projects have been carried out to provide a proof of concept, and valuable insight for the development of the NAMA.

3. Barrier Analysis

Barriers are the defining element with regard to why a country, sector, or sub-sector is locked into a development path towards increasing GHG emissions. Thereby, overcoming barriers is at the heart of achieving transformational change through the implementation of NAMAs. This importance is reflected in the demands of international donors of climate financing.

For example, the GCF requires the identification of barriers as part of the baseline scenario and the description of the envisioned actions of how they will overcome these barriers (GCF, 2015a). Within the core category of paradigm shift, the GCF evaluates proposal against the activities capacity to overcome systematic barriers to allow for market development and transformation (GCF, 2015b). In the context of the GCF, the definition of barriers receives particular importance related to the envisioned financial structure and instruments; and to what extent envisioned financial structure and instruments can help overcome these barriers (GCF, 2015a). The NAMA Facility in its requirements resembles the GCF as to the comprehensive description of how barriers can be overcome, and liberate the market transformation (NAMA Facility, 2015). Hence, while most international donors mandatorily require a barrier analysis in their application procedures, many NAMA development processes continue identifying barriers in an ad-hoc fashion, resulting in an inconclusive selection and identification of the barriers presented.

This Guidebook therefore puts the barrier analysis at the core of defining the actions required to implement a NAMA. Once a potential NAMA is identified, embedded in national development priorities, and endorsed by the relevant national institutions, their actual implementation typically faces a number of barriers. Barriers that in the past have prevented the implementation of relevant measures and that have thus deterred the country from transitioning towards a development pathway that is lower in carbon emissions.

A barrier can be described as any condition that substantially reduces the probability of adoption of mitigation measures. It is therefore crucial to analyse those barriers and devise an action plan for barrier

removal. The central activities in a NAMA frequently consist of activities that create enabling environments which are meant to overcome the barriers identified in the analysis.

Barriers should be identified proactively in the preparation of a NAMA, and reactively throughout NAMA implementation. It is important to consider a barrier analysis as a set of steps that are explicitly integrated in the planning and design of a NAMA, and not only as a stand-alone process to be carried out once and independently. By presenting a comprehensive barrier analysis and actions for barrier removal, NAMA developers can also show stakeholders and potential supporters that they are knowledgeable of the sector, technologies and/or national circumstances, in control of the process and dedicated to the NAMA's implementation.

The primary goal of the barrier analysis is to understand the nature of the barriers and their interrelation, to determine which barriers are central to the lock-in situation, to identify which ones are likely to remain as risks after implementation since they are not fully within the developer's control, and how to address the identified barriers. There is no exact way on how to perform a barrier analysis, and the process will vary depending on the envisioned activities, the NAMA stakeholders and the local context, but the set of steps suggested here can serve as a guideline to structure the process:

1. Organizing the process
2. Identification and classification of barriers
3. Analysis, decomposition and prioritization of barriers
4. Translation of barriers into actions, and
5. Development of a plan to create enabling environments

Example: Low Carbon Development Strategy – Urban NAMA in Costa Rica

The case of Costa Rica is an example of a v(ertical)-NAMA with an urban focus. This introduces an additional level of complexity, as the actions are not structured around one single sector and administrative level, but addressing several issues, technologies and systems simultaneously. The four main areas of interest are transportation, buildings and housing, energy, and waste management, including solid waste and waste water.

Initially a list of GHG mitigation measures was drafted based on research and consultation with experts, then a series of thematic workshops for each area of interest was held. During the workshops, multiple organizations and institutions evaluated the measures using multi-criteria analysis. They also made use of decision trees and discussion groups to determine the impacts and implications of each measure.

Five priority actions were identified for transport:

1. Intermodal public transport system
2. Efficient vehicles
3. Development railroad system in the Greater Metropolitan Area
4. Non-motorized mobility
5. Urban densification - integrated transport and land-use planning

Five priority actions were identified for buildings and housing:

1. Active design (Eco technologies)
2. Reduction of carbon intensity in building materials
3. Bio-climatic design
4. Assessment and reduction of construction waste
5. Urban densification - vertical housing in vicinity of services, jobs and commerce

Five priority actions were identified for energy:

1. Use of renewable energy for electricity production
2. Regulation and incentives
3. Urban densification - electricity districts
4. Decentralized electricity generation - individual power generation
5. Use of biofuels for vehicles

Five priority actions were identified for solid waste and waste water:

1. Reduction of waste water generation
2. Reuse and recycling
3. Composting and bio-mechanical treatment
4. Methane capture in waste water treatment plants
5. Solid waste for energy generation

Once measures were prioritized, the working groups in thematic workshops identified barriers in the legal frameworks, institutional management capacities, market and financing barriers, existing technical capacities, and social acceptance towards the implementation of the actions. Building on this analysis, they set up an action plan to remove barriers and initiate the execution of the strategy. Source: (MINAE, 2014)

3.1 Organizing the process

The first step involves a consideration on how to organize the process of the barrier analysis, given the envisioned actions and the national context. A starting point is a preliminary desk study that should complement the national literature and information explored as part of the embeddedness process by researching policy papers and other relevant documentation related to the envisioned actions, such as economic assessments, feasibility studies, environmental impact assessments or similar documents.

Further, barriers are frequently identified during other ongoing NAMA related processes in a semi-structured way, e.g. in sectoral focus groups, ministerial or

inter-ministerial NAMA committees, NAMA working groups, or any other forum in which the NAMA has been discussed or prepared. Following this approach, NAMA developers should ensure to use minutes from such meetings and discussions as an important source of information for the barrier analysis.

For a more thorough barrier analysis organizing dedicated expert and stakeholder interviews or focus group sessions with an expanded typology of stakeholders is helpful. Two elements are crucial in the selection of these stakeholders, namely to aim for a balanced representation of the interests, and to consider the second round effects of a NAMA, i.e. the cross-sectorial impact such as the one of a NAMA in the solid waste sector on the cement

Example: Technology Needs Assessment

A central part of the Technology Needs Assessment process is the identification of barriers hindering the transfer, adoption and diffusion of prioritized technologies in developing countries. In most cases, out of the 36 countries that have already performed a TNA process, technologies have been selected through a multi-criteria analysis and barriers have been identified by sectoral working groups including all relevant stakeholders.

In general, a participatory approach to the stakeholder consultation was recommended to strengthen the understanding and identification of barriers and to improve the appropriateness of barrier removal measures. Depending on the tradition and culture of the country different forms of stakeholder consultation like written feedback, bilateral discussions between consultants and main decision-makers, and the use of questionnaires, combined with stakeholder workshops were found most appropriate.

The approach used in the Peruvian TNA process was using workshops to brainstorm the potential barriers, followed by expert interviews.

In Bhutan, a stakeholder workshop was organized where TNA Task Force members provided inputs on key barriers and the enabling framework. Based on this input, focused sector specific roundtable discussions on barriers and enabling measures for each technology were held and market mapping was applied for technologies classified as consumer and capital goods.

The TNA process in Mauritius used a different approach with the application of the Logical Problem Analysis to identify the root causes of main barriers identified. In the analysis, the barriers were decomposed using a problem tree, which was later translated into an objective tree to identify possible measures to overcome the root causes.

In Zambia there was a focus on the use of market analysis to identify barriers, as the prioritized technology were mostly marketed goods; biomass gasifiers, energy management systems, improved charcoal utilization, biofuels and geothermal power generation.

In the case of Rwanda, particular attention was given to barriers related to the national macroeconomic conditions, like inadequate financial options, high initial investment costs, importation duties, limited access to loans and high interest rates. A cost-benefit approach was used to compare the costs and benefits of the application and diffusion of different technologies.

Source: UNEP Riso Centre, 2012

industry, or the potential conflict between initiatives to expand the central heating system in a city and the dissemination of solar water heaters for households. The consideration of these elements will reduce the probability of obtaining biased results.

As a logical continuation to the NAMA embeddedness identification process, the barrier analysis can build on the coordination structures established for that process. Since the barrier analysis is an iterative process that should not stop after a single elaboration, the continuous investment of time and commitment in stakeholder processes is well-advised. To ensure this continuity as well as to build trust and generate process' efficiency, the stakeholder representatives or participants in the working group should remain the same throughout the process, from the embeddedness identification through the barrier analysis to the formulation of actions to create enabling environments for the NAMA. Desk studies, interview and/or focus groups can help identify not only the barriers but eventual opposing stakeholder interests and concerns.

The step taken to organize the barrier analysis shall clarify the NAMA developers' understanding of the expected outcome and depth of the barrier analysis process, the approach or methodology to be taken to identify the barriers, the timeframe for the analysis, the stakeholder involvement, and the resources available. As mentioned above, ideally the NAMA developer can build on the previously used structures; however, it should be clear that along the process of the NAMA development changes in the stakeholder composition, the availability of resources and time frequently occur.

3.2 Identification and classification of barriers

In the identification and classification of barriers, the stakeholders can be guided by departing from a very generic list of barrier types before decomposing the barriers in a second step:

- Political
 - This category comprises all elements within the political sphere, ranging from the regulatory framework, legislation and policies over the more practical elements like broad, cross-party support and cross-governmental coordination to the day-to-day work with the public sector, e.g. issuing permits, etc.
- Economic
 - This category extends from the firm-level, at which the technology may be too costly,

the sectorial lobby too strong or the power concentrated by a few, over the financial sector, which relates mostly to commercial banks, to political economy issues that provide incentives to remain in the status quo.

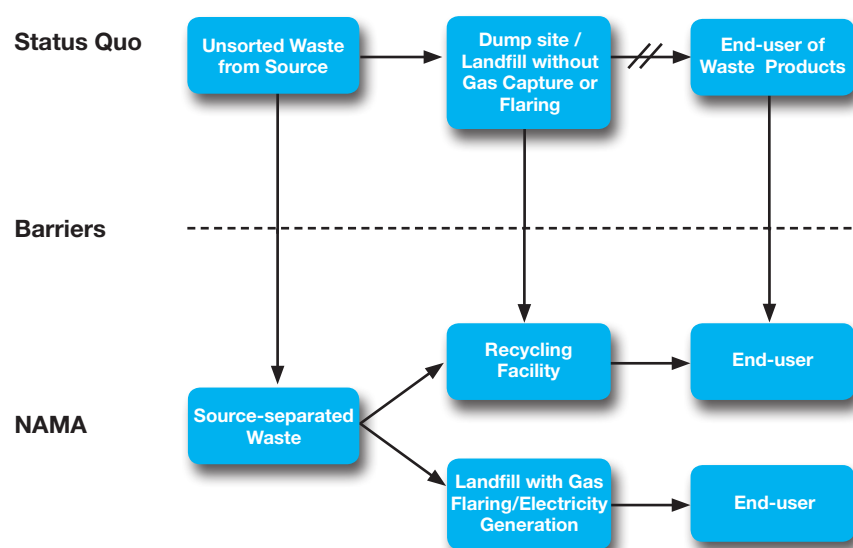
- Social
 - This category develops along the lines of cultural and educational awareness and behaviour, creating pre-conditions which do not allow end-users to obtain an unobstructed view on the beneficiary components of the NAMA.
- Capacities
 - This category is composed of technical capacities which include the absence or lack of experience with a technology and, consequently lack in corresponding human capacities within the labour force and public sector regulators; and spans to incomplete and non-accessible data needed to feed relevant models.

A simple visualization can help the stakeholders to increase their awareness of what to consider (see Figure 8 for an example). As part of this process, the NAMA developer should guide the stakeholders by identifying where barriers can occur and clarifying the expected outcomes.

This visualization will clarify to stakeholders that different kinds of barriers will arise for a different set of actions along the whole process chain as part of the overarching NAMA. A general separation can occur along the line of new hard and soft technologies that are introduced as part of the NAMA process.

Following the simple example presented, hard technologies like the equipment needed for the beneficial usage of landfill gas or the recycling of waste are usually diffused under market conditions, and consequently fall within the generic barrier grouping corresponding to economics. A cost-benefit analysis (CBA) is useful to analyse the investment needs, comparing them to the annual revenues from selling the product or service, and subtracting the annual operation and maintenance costs. Not only can the CBA inform the barrier analysis process but provide a valuable argument in the NAMA developers' proposal to obtain international financial support. The CBA calculation should cover the cash flow over the lifetime of the technology, and annual gains or losses need to be discounted by calculating the Net Present Value (NPV) using an appropriate discount rate. This type

Figure 8: Simple visualization of barrier problem for a generic solid waste NAMA example



Source: own elaboration

of economic assessment will enable to identify the potential creation of enabling actions, e.g. needs for a subsidy, eventual to lower interest rates on capital to enable an attractive Internal Rate of Return (IRR) for investors. Note that when performing CBA for individual consumers, non-exponential (hyperbolic) discounting may apply and liquidity constraints may further influence the calculation. Such constraints need to be identified in interviews or focus groups. Following the generic barrier grouping, hard technologies are likely to face other non-economic barriers as well, such as the lack of capacities needed for implementation, usage, and maintenance.

As visualized in the example, activities taking place along the value chain influence each other throughout the process. In order to identify these activities, associated hard and soft technologies, and corresponding barriers, it is important to study all linkages and transactions between actors, institutions, and processes involved in bringing a product or service from production to the end-users.

Analysing the transactions and processes will allow identifying potential opposing interests hindering the introduction of new activities. By including all relevant stakeholders of the value chain in the planning of the NAMA, it is more likely that these opposing interests will be identified, can be mitigated as part of the NAMA activities, and create mutually beneficial solutions post-implementation. For example, a simple barrier analysis and CBA do not prepare the NAMA developers to

barriers like political pressure from industry, civil society and other interest groups.

The outcome of this first exercise is a very preliminary list of barriers under the four generic barrier groupings presented. Essentially, it is a brainstorming of factors, which have kept the country at the status quo vis-à-vis, prevented it from transitioning to the NAMA outcome scenario so far.

3.3 Analysis, decomposition and prioritization of barriers

The initial list of barriers should be analysed and filtered according to their significance. This enables the NAMA developer to keep barriers that are crucial for the success of the NAMA and disregard those of lower importance for the main objective of the NAMA. The process of screening should be a continuation from the identification process, using the same working groups and stakeholders. The relative relevance of barriers should ideally be decided by consensus, where participants engage in an open discussion. The process could also include a voting system.

Barriers are frequently composed of other, more detailed barriers. Decomposing the barriers at different levels of detail allows finding root causes. Root causes enable a specification of the barrier, clarify the reason for its existence, and identify potential ways to remove the barrier. This can also be used as a method to exclude non-crucial barriers; if a barrier category does not have components at lower levels,

the identified barrier might not be a crucial barrier for implementation. An example of barrier decomposition is given in Figure 9.

In view of that each NAMA and country will face differing main road blocks that impede the implementation of the NAMA, the Guidebook illustrates the idea of decomposing the barriers by using just a subset of barriers to exemplify.

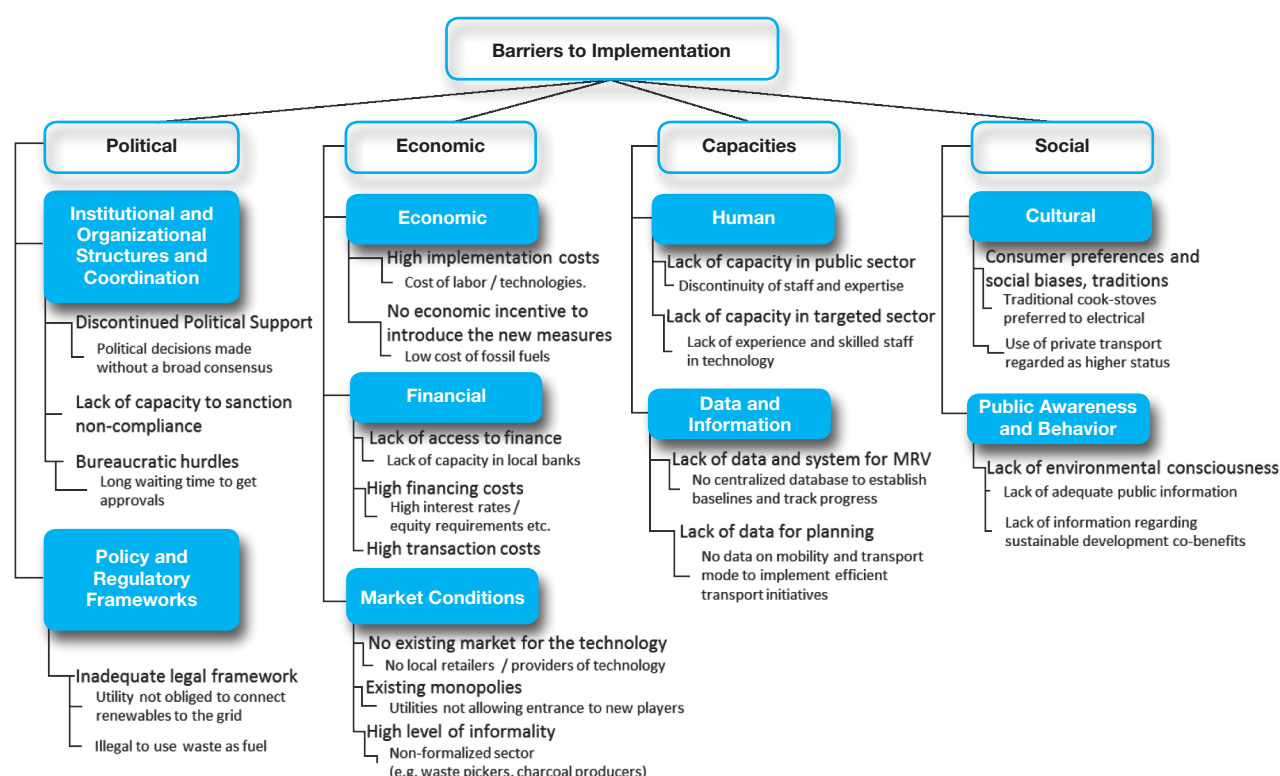
Take for example the political barriers in Figure 9: within the sub-grouping of political barriers, the NAMA stakeholders can newly identify various sub-divisions of barrier categories. A recurring but very difficult to address barrier is the lacking capacity of regulatory authorities to sanction the non-compliance of the private actors to established standards. In the given decomposition example, the lacking capacity to sanction does not have any underlying root causes, which could facilitate the identification of enabling environments to overcome this barrier. At the same time, within the same subgrouping, bureaucratic hurdles, commonly known as “red tape”, can be broken down further to “the long waiting time to get approvals”. This barrier is comparatively easier to address by simplification and prioritization in the corresponding approval body. While this barrier might

not be endemic to the NAMA, it is evident that this barrier has impeded transformational change. In not being endemic in fact, the overcoming of barriers for a NAMA can alleviate obstacles in other areas at the same time.

Another example could be the introduction of a non-proven technology in order to part from the high emissions level. Domestic financiers will have difficulty to associate a level of risk to the application of this technology. In absence of the capacity to assess the risk of applying the technology, no financier will be willing to invest or emit a loan to the borrowing entity and, thus, no investments will be undertaken. And even if the technology is proven, commercial banks may not have acquired the necessary knowledge in that field in order to provide a loan and, therefore, shy away from providing the necessary financing. In some fields, in which loan size is low, banks will find that the transaction costs are too high for them to enter the potential area of investment.

Along the same lines as the financial barrier example, the introduction of a new technology will evenly challenge the human and technical capacities within a country. Assuming that the technology was previously not available, there will be a lack of technology

Figure 9: Decomposition of barriers



Source: own elaboration

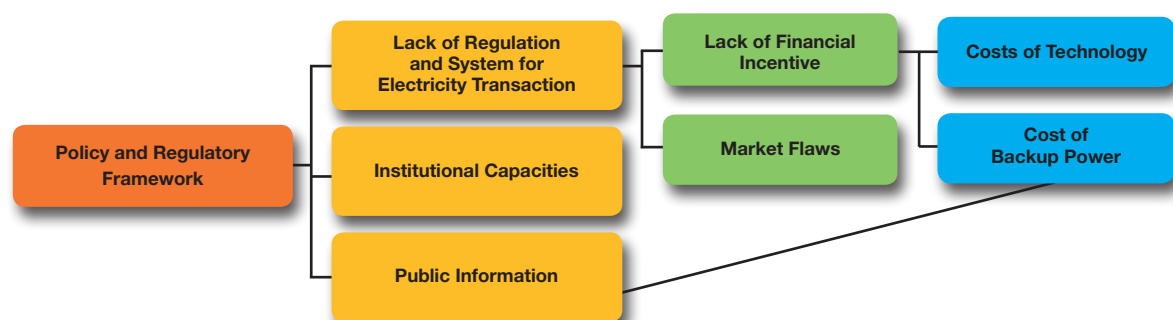
Example: Low Carbon Development Strategy – Urban NAMA in Costa Rica

- In the Costa Rican case, two methodological approaches were used to identify barriers. Initially, electronic questionnaires were sent to relevant stakeholders related to the different scopes of transport, buildings and housing, energy, solid waste and waste water. At a later stage, workshops were organized for each scope, to identify barriers, present examples and analyse the root causes of the central barriers for each scope. Several barriers, for example the lack of institutional capacity, were found to be recurrent for different scopes. The initial types of barriers were classified as follows: Institutional and organizational capacities
- Political and regulatory
- Technical capacities
- Economic and financial
- Market
- Information and awareness
- Others

The barrier analysis went on to decompose the barriers and identify their root causes for each of the 20 identified NAMA actions under the 4 main areas of transportation, buildings and housing, energy, and solid waste and waste water.

An example of a barrier analysis for an action related to a market good/hard technology is the promotion of decentralized energy generation through solar PV and mini wind turbines under the main area of energy. The main barrier identified was related to the political and regulatory frameworks, and was decomposed as follows:

Figure 10: Policy and regulatory barrier for decentralized solar PV



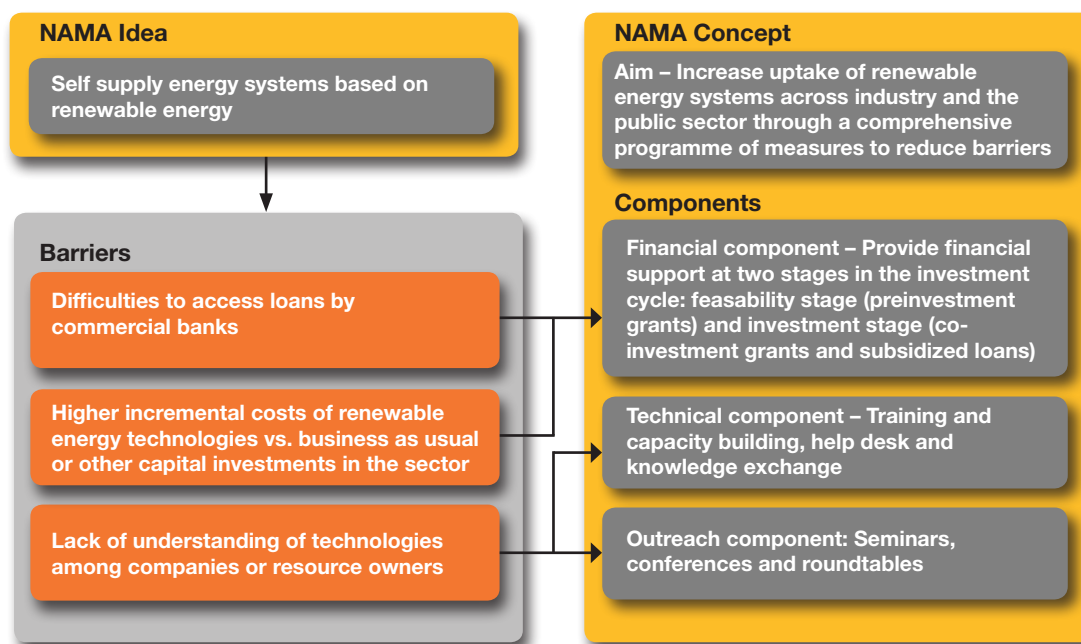
Source: (MINAE, 2014)

providers in the country and, correspondingly, the capacity for installation and maintenance. On the end-user side, no previous knowledge will be available in terms of operation. This lack of knowledge can impede the implementation since it will entail potentially significant upfront costs to the firms. Even if implemented in the private sector, the public sector will need to have sufficient oversight capacity, both in terms of knowledge and time. This exemplifies how the barriers to the implementation of a NAMA have to be examined from a diverse set of angles in order to minimize post-implementation risks.

3.4 Translation of barriers into actions

When the critical barriers and their causal factors have been identified through a decomposition of the barriers, the barrier analysis should go on to translate the barriers into actions to overcome them. Barriers can be transformed into solutions by transforming the negative statements into positive statements, and identifying their causal relationship. This will translate the barriers' causes into measures to overcome the identified barriers and will be the first step to identify; what kind of enabling environments needs to be created as part of the NAMA.

Figure 11: Simplified example of barriers turned to actions within a NAMA



Source: CCAP, 2013

Measures to overcome barriers can roughly be divided into financial and technical measures, which will often require one or several forms of source financing. Financial measures entail those actions that are directly associated with the availability of financing to the implementer or end-user, like subsidies, power purchase agreements and loan guarantees. Technical measures tend to have a wider range, including everything from legal and regulatory interventions, over demonstration projects to capacity building, and educational and awareness campaigns. Hence, even though donors tend to differentiate between financial and technical components, everything that is evidently non-financial is considered technical. There is not necessarily a direct correspondence between financial / technical measures and market / non-market barriers. For example, a barrier for a hard technology, e.g. the reluctance of households to install solar PV, might be overcome by a mix of financial and technical actions. Depending on the identified decomposition of barriers, there might be a need for a solar PV feed-in-tariff, legislation requiring the electricity utility company to buy electricity and bear the cost of connection to the grid in addition to information campaigns and training.

The decomposed barriers in the financial sector can potentially be confronted through technical and financial measures. As to the financial measure, a mechanism is likely required as part of the NAMA to de-risk the provision of finance. These financial mechanisms need to be elaborated on as part of the

enabling environments of the NAMA. Meanwhile, if the lack of technological knowledge in the financial sector is the constraining element, capacity building and the information obtained through a pilot case may help change the financiers' perception of risk with regard to the NAMA-related investments.

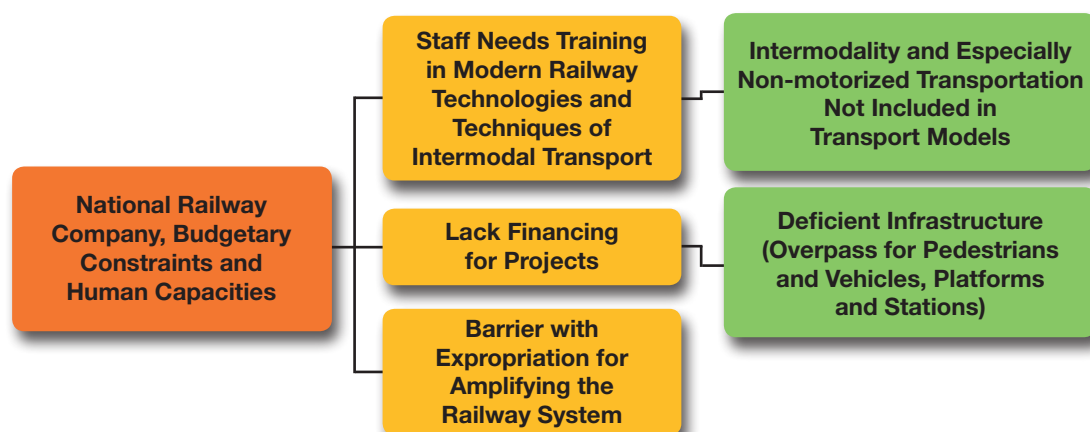
The barrier in human and technical capacities involves both a resource perspective and a time perspective. The most straightforward action to overcome lacking capacities is capacity building which is designed to train personal that can implement the NAMA. It is important to consider that capacity building can be undermined by high staff turnover and, therefore, it is crucial that the technical capacities developed as part of the NAMA also remain in the institutions and private sector companies involved. It is particularly important to plan for how to keep the capacities gained through capacity building programs in the institutions when the funds from the programmes' run out. If those capacities are crucial for the continuation of the NAMAs, a budget from internal resources should be allocated to maintain the resources and ensure the long-term sustainability of the NAMA.

When actions to create enabling environments for the NAMA have been identified, the proposed actions need to be assessed in order to define their feasibility. In their assessment a range of criteria should be taken into consideration before deciding on the specific actions; the actions' costs and cost-effectiveness,

Example: Low Carbon Development Strategy – Urban NAMA in Costa Rica

In the Costa Rican Urban NAMA, the following decomposition of the identified barrier of significance was made for the envisioned non-market good activity of developing the Railway system in the Greater Metropolitan Region.

Figure 12: Institutional capacity and budgetary constraints for developing the railway system in the greater metropolitan region



The barrier analysis went on to translate the identified decomposed barriers into actions, relating the specific identified barriers into changes needed to overcome them. The needed actions were formulated as follows:

- Legal changes for the National Railway Company, and the elaboration of a clear public policy related to the metropolitan rail system facilitates the strengthening and building of institutional capacities.
- Technical capacities depend directly on the institutional capacities.
- Financial barriers can be overcome by strengthening institutional capacities and its capacity to present projects to financing institutions.
- Barriers related to infrastructure can be overcome when financing barriers are eliminated.

Source: (MINAE; 2014)

their potential social and environmental impacts, the interdependencies between different actions, the institutional feasibility and their complexity should be considered before deciding on the specific actions.

3.5 Development of a plan to create enabling environments

When all actions to overcome barriers and priority actions have been identified, they should be organized in a plan. This plan should be part of the implementation plan of the NAMA. It should include a description of the proposed measures and their rationale, the stakeholders or actors responsible for its execution, the timing and a preliminary assessment of available resources and indicators of successful implementation. The plan should be the result of a

thorough stakeholder engagement process, and all stakeholders involved in the barrier analysis at previous steps should have been able to study, comment and propose changes to the plan. Universal endorsement of the plan is pivotal to ensure that there is a common agreement and understanding of the specific roles and responsibilities of the stakeholders, to ensure buy in and commitment to the agreed plan.

3.6 Conclusions on barrier analysis

Overcoming barriers is at the heart of NAMA implementation. This is also reflected in the demands of international donors, as most of them require a barrier analysis in their application procedures, including a description of how barriers can be overcome. The barrier analysis is in fact defining the

Example: Low Carbon Development Strategy – Urban NAMA in Costa Rica – Plan for Decentralized Energy with Solar PV and Mini Wind Turbines

Barrier: Institutional and Organizational Capacities Mechanism: Institutional capacity building and training	Responsible Entities	Year
Electricity Companies must strengthen tariff structures and accommodate users to allow decentralized electricity generation.	Electricity Companies	2015
Build capacity in electricity companies to design regulation for clients and companies to enable decentralized electricity generation.	Electricity Companies	2015
Strengthen tariff structures for the Public Service Regulating Authority and electricity companies with models incorporating variables for decentralized electricity generation.	Public Service Regulating Authority (ARESEP)	2015
Barrier: Policy and regulatory barrier Mechanism: New legislation and regulation		
Definition and inclusion of decentralized electricity generation incorporated in the National Energy Plan.	Ministry of Environment and Energy (MINAE)	2014
Elaboration of clear regulation that includes transaction costs for electricity companies and clients.	Electricity Companies, ARESEP	2015
Barrier: Economic and financial Mechanism: Novel financial mechanisms		
Establishment of special credit lines for the technology for home owners.	Private and Public Banks	2015
Benefits for households that contribute with own generation on energy costs or other from the electricity companies.	Electricity Companies, ARESEP	2016
Analysis of duties on the technology (PV and wind turbines).	Ministry of Housing, MINAE	2015-2016
Implement net metering for those who provide and receive electricity from the net.	ARESEP, Electricity Companies	2016
The model for transaction costs must include costs of energy back ups	Electricity Companies	2015-2016
Barrier: Economic and financial Mechanism: Novel financial mechanisms	Responsible Entities	Year
Establishment of special credit lines for the technology for home owners.	Private and Public Banks	2015
Benefits for households that contribute with own generation on energy costs or other from the electricity companies.	Electricity Companies, ARESEP	2016
Analysis of duties on the technology (PV and wind turbines).	Ministry of Housing, MINAE	2015-2016
Implement net metering for those who provide and receive electricity from the net.	ARESEP, Electricity Companies	2016
The model for transaction costs must include costs of energy backups.	Electricity Companies	2015-2016
Barrier: Public Information and Awareness Mechanism: Information campaigns		
Information campaigns to customers on advantages and benefits of own generation.	ARESEP, Electricity Companies	2015-2016
Barrier: Market Barriers		
Regulation and design of clear rules for decentralized electricity generation.	ARESEP, Electricity Companies	2015-2016

Source: (MINAE, 2014)

actions required to achieve the goal of a NAMA, and, thus, end up defining the nature of the NAMA actions themselves.

When initiating a barrier analysis it is important to organize the process given the envisioned actions and the national context. Sectoral focus groups, ministerial or inter-ministerial NAMA committees, NAMA working groups, or other fora in which the NAMA idea has been defined can be used as a starting point. It is also advisable to apply additional efforts through dedicated expert and stakeholder interviews or focus group sessions, with an expanded typology of stakeholders, to ensure that all relevant stakeholders and their interests are represented.

When stakeholders aim to identify and classify barriers, they can depart from a generic list of barrier types of political, economic, social, and capacity barriers before decomposing the barriers further. The initial list of barriers should then be filtered according to their significance. This enables to keep barriers that are crucial for the NAMA's success, and disregard those of lower importance for the main objective of the NAMA. For instance, NAMAs introducing technologies or services diffused under market conditions will naturally meet barriers related to the economic category. In these cases, a cost-benefit analysis can be used to analyse investment needs, identify investment barriers and provide a valuable argument to obtain international financial support. Decomposing the barriers at different levels of detail allows finding root causes, clarifies the reason for the barrier's existence, and assists in identifying ways to remove the barrier and create enabling environments.

When critical barriers and their root cause have been identified, barriers should be translated into actions to overcome them. Measures to overcome barriers are roughly divided into financial measures that are associated with the availability of financing to the implementer or end-user, and technical measures, like legal or regulatory interventions, R&D and information and education. Technical measures will in most cases also require some source of financing.

The barrier analysis should result in an action plan and a log-frame which should be part of the implementation plan of the NAMA. It should include a description of the proposed measures, their rationale, the stakeholders or actors responsible for its execution, the timing and a preliminary assessment of available resources and indicators of successful implementation.

4. Enabling Environments

4.1 Concept of enabling environments in international climate finance

The concept of enabling environments has been broadly used across the NAMA literature, but remains only vaguely defined in the NAMA context¹¹. This lack of clarity has led to different uses of the term “enabling environments”- either as pre-conditions for the development of NAMAs (NAMA Facility, 2015) or as the measures entailed in the NAMA that will be conducive to the aspired paradigm shift (GCF, 2015a). This guidebook considers enabling environments to be the latter, namely the environments to be created by the NAMA going forward¹².

This interpretation originates from the sphere of technology transfer, in which the term “enabling environments” has most frequently been used. In this context, the UNFCCC defined enabling environments as government actions that are conducive to the uptake and deployment of technologies through the removal of barriers to the transfer of technology, sound economic policy, regulatory frameworks, and transparency (UNFCCC, 2001). The GCF sees the creation of enabling environments as an important element to ensure a lasting and sustainable impact of the actions, contributing to the development and transformation of markets (GCF, 2015b). It specifies that in its assessment of proposals, it will examine intended measures’ potential to reduce costs and risks as well as eliminate barriers to create incentives for local, national, and international market participants. In the GCF context, the term enabling environment is mainly used in relation to economic and knowledge/ learning aspects. However, it also comprises an assessment of the need for measures related to the regulatory framework and policies and can also include cultural and social aspects. Extending these initial elements, enabling environments comprise every structure and institution that influences the successful outcome of the NAMA.

Following these definitions, enabling environments shall build on existing institutions identified in chapter 2 on embeddedness and help overcome the barriers identified in the barrier analysis.

4.2 General observations on enabling environments

The creation of enabling environments is the core activity of NAMAs. They can both facilitate activities conducive to the goal of the NAMA, or restrict activities counterproductive to it. In most cases, the main focus will be on facilitating private sector investments in the NAMA, when these are necessary to scale-up and achieve a paradigm shift.

Enabling environments are the future conditions which are created through the measures implemented as part of the NAMA. To ensure that the NAMA’s objective is achieved, the measures creating enabling environments need to build on the existing pre-conditions identified in the chapter on embeddedness and fill any gaps by overcoming the identified barriers. Therefore, it is straightforward to follow the same typology as used in the barrier analysis when identifying the enabling environments and the corresponding measures (see Figure 13 for our example).

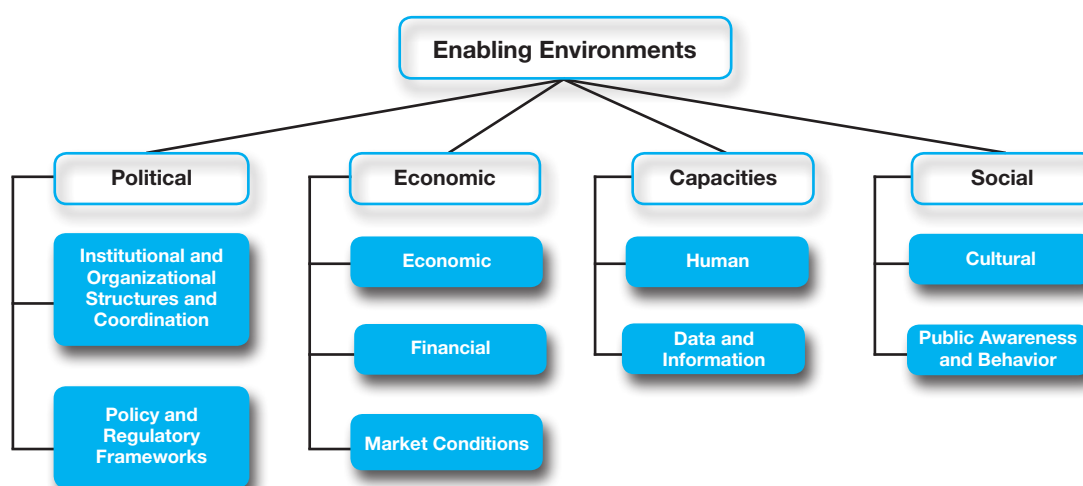
There is no fixed chronology on which enabling environments should be addressed first, as they will differ from case to case, and in accordance to the pre-condition in which a NAMA is embedded. In addition, enabling environments are often interlinked. For example, public awareness can spur political action, political and regulatory changes can create enabling economic conditions, and capacities and technological knowledge and innovation can create marketable solutions.

The private sector needs positive expected returns on investments to become active in investing. The expected returns depend on stability and continuity in regulatory conditions. This usually starts in the political domain. Long term policies and strategies, coupled with public budget allocation and security of policy continuity provide a strong signal to the private sector, reducing their perceived risk. Coupled with enabling regulatory frameworks, establishing the “rules of the

¹¹ The authors recognize that other guidelines, publications, etc. use enabling conditions, enabling frameworks, and enabling environments interchangeably. It is considered that they refer all to the same term, here determined as enabling environments. There is a UNFCCC definition for enabling environments in the context of technology transfer (UNFCCC 2001) that is used as guidance for this chapter for the wider NAMA context.

¹² When discussing the former definition used by the NAMA Facility, we instead use the term “pre-conditions” - in which the NAMA can be “embedded” -, as presented in chapter 2.

Figure 13: Typology of enabling environments



Source: own elaboration

game” under which the private sector operates, will ensure the private sector that investments aligned with these policies are secure and likely to be profitable.

Even when policies and regulatory frameworks are in place, the economic conditions might still not favour the intended investments. This could be due to past investments in old technologies, high up-front costs for the intended interventions, high interest rates, etc. In these cases, financial engineering might be needed to change the market conditions and/or the access to finance for the private sector.

When the enabling political and economic conditions for the NAMA are in place, there could still be a lack of capacities hampering the implementation of the measures. This could be in the form of insufficient data and information to plan and execute the activities, or the lack of technological and organizational human capacities. Capacities to implement and manage the planned actions and operate technologies are needed, and without the appropriate know-how, there will be a need for capacity building to create an enabling environment for NAMAs.

Lastly, even in the existence of political, economic and capacities enabling environments, the intended actions might still meet barriers for implementation. For example, the introduction of new waste management systems dependent on source-separated waste might be held up by the lack of awareness and behavioural patterns in households; cultural aspects related to transport mode and social status might obstruct

planned implementation of public transport systems, as car ownership might be perceived as a status symbol; energy efficiency measures might be seen as low-quality services. In these situations, interventions for behavioural change, like information campaigns, marketing and awareness raising will have to be employed to create enabling social environments.

4.3 Enabling environments to overcome political barriers

Based on the existing structures identified in the embeddedness process and the barriers determined in the barrier analysis, measures to create enabling environments shall build on underlying structures and overcome the barriers. Following the idea of barrier decomposition, political enabling environments can be differentiated into institutional and organizational structures and coordination and policies and regulatory frameworks.

Having sound and dedicated institutional and organizational structures as well as coordination is important, given the multi-stakeholder nature of NAMAs. The NAMA’s organizational structure may require a management unit consisting of an inter-ministerial and inter-institutional steering committee, supported by technical working groups, designated focal points in relevant economic areas or sectors, advanced coordination mechanisms and decision-making tools, and the adoption of a Monitoring and Evaluation (M&E) approach in order to track and evaluate outputs (Hinostroza et al., 2014).

The final institutional and organizational structures for NAMA coordination will vary from country to country and potentially between NAMAs in a country, depending on existing institutions, their roles and responsibilities, and the envisioned actions, but two main approaches to organize the coordination can be suggested:

- (i) Distributed responsibility of development and implementation to a NAMA Coordinating Authority for each NAMA with central coordination to provide guidance at national level; or
- (ii) A central NAMA Coordinating Authority responsible for the identification, development and implementation of all NAMAs.

Policies set the goals for the medium to long term and provide a coordinating framework for various climate change related actions in different sectors and at different levels of government (Hinostroza et al., 2014). It is therefore important to design the climate change policies with the involvement of the relevant sectors and stakeholders that will be affected by them to ensure their success. Regulatory frameworks set the frame in which citizens and private sector agents can operate, and if properly enforced, provide efficient tools to influence behaviour and cash flows. The review of existing regulatory frameworks and design of new ones is one of the central aspects of many NAMAs. Due to their efficiency and impacts, it is therefore also important that they are carefully designed to limit eventual adverse impacts, e.g. a ban on incandescent bulbs might force retailers out of business or cause environmental problems if no period is granted for stores to sell their remaining stocks or if no collection and recycling facilities exist.

4.3.1 Institutional and organizational structures and coordination

Institutional structures and coordination between the relevant entities is crucial to ensure that policies are streamlined and the efforts are coordinated toward reaching a common goal. In addition, the relevant institutions and organizations will be responsible for the overall management of the measures that the NAMA consists of. The following presents a set of identified barriers in different NAMA cases, and the envisioned or applied measures to achieve enabling environments in the institutional and organizational structures and coordination.

4.3.1.1 Mexican Housing NAMA

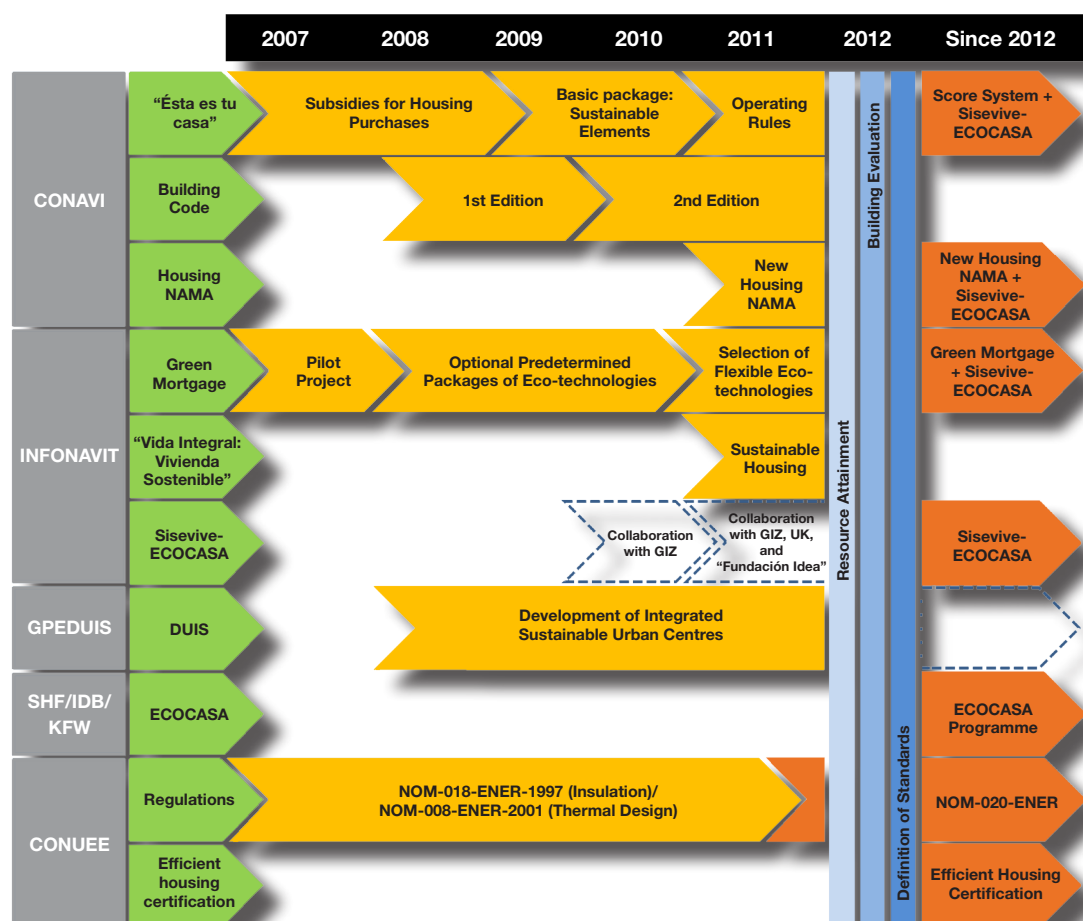
- Separated housing initiatives without coordination
- The Mexican Housing NAMA is a prime example of how to create an enabling environment

for increased institutional and organizational coordination. Prior to the NAMA, there was a range of separated housing initiatives related to both the increased need for affordable housing and the need to introduce energy efficient building practices. CONAVI managed the housing subsidy programme “Ésta es tu casa”. INFONAVIT led the Green Mortgage programme, and provided funding for the Sustainable Housing and the ECOCASA initiative, targeting private sector employees. FOVISSSTE, the housing fund for public sector workers had its own initiatives. SHF targeted independent workers, workers in informal sectors, and private and public sector employees through INFONAVIT and FOVISSSTE, focusing on the lower middle class and poor. To respond to the need to unify and streamline the scattered housing initiatives in the Housing NAMA, the different initiatives were unified under one scope through the ECOCASA initiative. The Mexican Housing NAMA developed an action plan, including measures to remove political barriers and create the needed enabling institutional and organizational structures and coordination, embedded in the pre-conditions given by these existing programs. The plan lays out the following actions (SEMARNAT, 2012):

- Develop Sustainable Housing Steering Committee and Technical Working Groups
- Designing, establishment and operation of “NAMA Programme Office Unit”
- Technical Assistance to FOVISSSTE and SHF in the establishment of their institutional set-up for the implementation of the NAMA

With the Mexican Housing NAMA, two institutions have been established to unite and coordinate the different actors involved in the housing sector in Mexico – the Round Table for Sustainable Housing in Mexico and the Association for Sustainable Housing and Surroundings. The former is an inter-institutional platform where government, private sector and social organizations collaborate to implement the different programmes under a unified strategy for sustainable housing, resulting in harmonized rules, indicators and tools. The latter provides a forum for key public entities presented above and the main housing developers in the country. With the increased coordination of the country’s housing initiatives, several of the previously independent actions are now unified and coordinated under the ECOCASA programme (see Figure 14).

Figure 14: Unification of existing housing programmes



Source: Fundación Idea, 2013

Since local governments have the authority to enforce building codes, another important part of the housing sector, outreach actions are underway to streamline the NAMA standards to the local level. A coordinating Mexican NAMA Office has in addition been established to coordinate actions and provide funding for NAMA initiatives. The roles and responsibilities of federal authorities, housing developers, and regional governments are under development with the aim to give all stakeholders a clear understanding of their roles and responsibilities.

4.3.1.2 Colombian TOD NAMA

- Insufficient institutional coordination between public entities like MinVivienda, MinTransporte, and Findeter.
- Lack of policy continuity - national and local policies change when new administrations come into office.
- Limited public-private collaboration.

The different public entities have individual programs and corresponding financing that relate to TOD, resulting in potential overlapping jurisdictions, conflicting guidance and/or inefficient execution. Consequently, the unification of different programs and coordination of the entities' actions to ensure effective resource usage is a key enabling environment created by the TOD NAMA. Also, through the barrier analysis, the lack of policy continuity was identified, potentially interrupting policy progress and forfeiting institutional experience and knowledge acquired. Limited public-private collaboration is also identified as a barrier for implementation, with the need for the public and private sector to work together to align policies and regulation, with site-specific considerations and real estate market demand.

On the other hand, there were also a number of pre-conditions for embeddedness of the NAMA. The existing programs and financing mechanisms as well as the independence of the national development bank

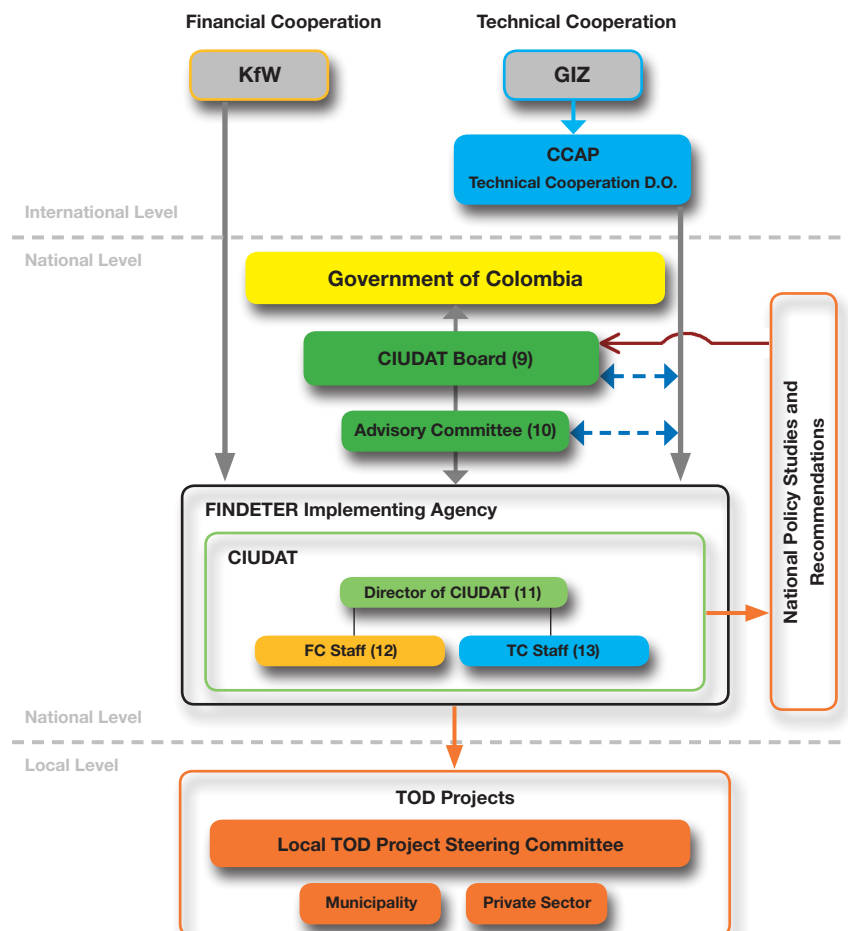
(Findeter) policies from short-term political cycles have been successfully leveraged to create the following enabling environment: CIUDAT, an independent centre within Findeter was established to enhance the institutional and organizational capacity of the NAMA. CIUDAT is formed by a Steering Committee and an Advisory Committee. The Steering Committee consists of representatives from the relevant ministries, the National Planning Department (DNP), Findeter and from the Centre for Clean Air Policy (CCAP), the entity implementing the technical components of the NAMA. The Advisory Committee will consist of technical staff from the Board's organizations and the Director of CIUDAT. The Director and a team of experts will maintain the daily functions of CIUDAT. CIUDAT also plays a role in promoting public-private partnerships, engaging the private sector through proposal requests and collaboration agreements on TOD implementation. CIUDAT and the strong involvement of Findeter

will thus create the enabling environment needed to overcome the identified barriers on institutional coordination and segregated transport initiatives.

4.3.2 Policies and regulatory frameworks

Policies and regulatory frameworks provide the anchor conditions, on which the NAMA can develop. This links directly to the need for a NAMA to be embedded in the regulatory framework and policies from the chapter on embeddedness (see chapter 2). A lack of these will make most other measures obsolete. It is crucial to recognize that policies need a regulatory framework to be functional, as it is the translation of a policy into a law or standard that empowers it to act as enabling environment. The following presents barriers identified for different NAMAs, and the response to create enabling environments in the policy and regulatory frameworks embedded in the existing pre-conditions.

Figure 15: Structure of CIUDAT



Source: MinTransporte, 2015

4.3.2.1 Mexican Housing NAMA

- Lack of enforcement of building codes

Despite having national MEPS, they are not sufficiently adopted at the municipal level. Consequently, there is a need to monitor and enforce building codes to ensure that energy efficiency measures are implemented in the housing sector. Local governments and existing organizations at state and municipal level with a mandate and the experience of work in housing will receive technical assistance for the introduction of a minimum energy performance standard, the whole building approach and target values for primary energy consumption, as well as sustainability criteria (SEMARNAT, 2012). The NAMA is also developing a national guideline for building code adaptation which will help to streamline efforts across the country. Moreover, trained auditors will ensure that houses are built according to design specifications, and ensure that the enforcement of the standards is uniform.

4.3.2.2 Colombian TOD NAMA

- Absence of policies, strategies and regulations to implement TOD
- Lack of a mechanism to capture value to finance TOD initiatives
- Lack of regulatory certainty and policy continuity

In the case of the Colombian TOD NAMA, several policy and regulatory barriers were identified: the absence of policies, strategies and regulations to create higher density neighbourhoods along transit corridors and high-quality urban spaces; the lack of a mechanism to capture value from increased land value derived from accessibility and urban renewal benefits in order to finance public transit and public space infrastructure; and the lack of regulatory certainty and policy continuity, required by the private sector, in order to make real estate investments in TOD areas.

To overcome these policy and regulatory barriers, one of CIUDAT's main functions will be to analyse current policies and provide guidance to connect national and local policies on transport, land use and housing with private sector TOD efforts. The Center will apply advanced policy instruments and provide land-based instruments to create articulated densities, opening the possibility to capture land value increments spurred by investments in transit developments. CIUDAT plans also to provide guidance on TOD PPPs, develop the national public space policy, and integrate national

policies and plans with local government instruments (MinTransporte et al., 2013).

As a separate NAMA, Colombia is also proposing a new policy to promote mechanical-biological treatment (MBT) facilities, to divert waste away from landfills, and instead produce commodities such as recyclables, compost, and refuse derived fuel (RDF) in the cement sector. The following barriers were identified:

4.3.2.3 Colombian Waste NAMA

- Illegal to use waste as fuel
- Waste handling tariff biased towards landfill disposal

The use of RDF from solid waste meant to replace natural gas and coal in the cement industry is hindered by legislation banning the burning of waste, a law originally established for environmental protection. In addition, both private and public operators are prone to send waste to landfills instead of investing in and operating alternative treatment facilities, as the current waste handling tariff is biased toward landfill disposal.

The Ministry of Environment and Sustainable Development and the Ministry of Housing, Cities and Territory is currently in the process of changing the regulation to allow the use of RDF in the cement industry, and is also reforming the tariff structure to incentivise alternative treatment methods such as recycling, composting and production of RDF. This will create the right regulatory enabling environment for private companies to invest in MBT facilities, incentivized by the outlook of capitalizing on the commodities produced by waste.

4.4 Enabling environments to overcome economic barriers

Economic enabling environments are meant to create incentives for private actors for two purposes: to steer them towards actions that are aligned with the NAMA objectives or to deter them from engaging in activities which are counterproductive to achieving the NAMA's goal. The measures that create enabling environments can abolish existing disincentives (e.g. fossil fuel subsidies), alter existing incentives (e.g. redefinition of a law) or introduce new ones (e.g. new loan scheme).

The ultimate success of many NAMAs will depend on its ability to mobilize the private sector. For this to happen, it is crucial to get the incentives right and, thus, trigger a scale-up in investment with transformational impact. The private sector requires

a predictable investment climate that makes positive expected returns on investment possible. In line with the barrier decomposition, these incentives will largely depend on actions that create stable economic, financial, and market enabling environments.

In providing these favourable conditions, the sector targeted by the NAMA, the financial sector, and the public sector can play fundamental roles. As NAMAs often include the introduction of new technologies, the private sector will need to incur substantial investment costs and potentially render its established business models obsolete. First and foremost, the investment costs for the new technology may be too high making it difficult for the private sector to shoulder them due to limited access to capital. Secondly, businesses have previously invested based on the existing regulations and markets; hence, the new business models will put returns from past investments at risk. In the same line, businesses accommodated and well-established in the existing business models will likely lobby to avoid any changes as they fear the loss of market share or revenues. Some NAMA interventions will create whole new products or alterations to established products, for which no domestic market has previously existed. A situation like that raises uncertainty concerns for businesses with regard to their expected revenues and, thus, makes them reluctant to invest, potentially requiring initial grant-finance.

From a financial perspective, private actors often face high interest rates in developing countries, which make investments that can in principle be profitable financially non-viable. In addition, the financial sector faces a fundamental challenge in providing their services when it comes to a NAMA: the lack of knowledge of the new business models and corresponding lack of knowledge on returns and default risks. The lack of models, data, and, thus, knowledge make the financial sector reluctant to provide loans for investments in the NAMA-relevant fields. Moreover, some NAMA projects will occur on a highly localized level, on which banks have neither the financial nor the technical capacity. Other projects will entail high transaction costs. Therefore, typical financial measures will entail interest subsidies, investment guarantees, exchange rate insurance, etc. and the creation of capacities in the financial sector. For the purpose of reducing the cost of financing and making the NAMA financially sustainable, actions often entail the creation of a revolving fund or an equity fund, which can then be used to reduce interest costs, provide concessional financing and leverage private

sector investments. Additional financing mechanisms comprise guarantees and special purpose vehicles. Overall, the financial sector plays a fundamental role in making the scale-up and, thus, transformational change through a NAMA possible. The GCF recognizes this need for these various financial instruments and offers a variety of options, including the above mentioned concessional loans, equity and guarantees.

The public sector regulates markets, which in the case of NAMAs can either lock-in the status-quo and constitute a barrier or provide the pre-conditions to embed new investments. While creating the economic enabling environments, the public sector needs to revisit all relevant existing incentives like subsidies, tax breaks, tariff structures, market regulations, etc. in order to identify those incentives that are favourable for the NAMA and those that will foster the status quo. Existing distortions, in particular fossil fuel subsidies, can render new investments into low-carbon technologies deficient as they make high-carbon options artificially cheaper or more profitable. Moreover, the lack of market incentives that support the new investments can also impede successful economic enabling environments.

In addition to taking into consideration the financial and market conditions provided by the banking sector and the public sector, it is also crucial to include private sector stakeholders from the targeted sector in the NAMA planning process. That way it can be ensured that businesses trying to maintain their business model or being required to incur the investments can articulate their challenges and be part of the solution. It is fundamental to the success of the NAMA that the private sector supports the endeavour and acts based on the provided incentives.

The remainder of this chapter will focus on the economic enabling environments created in the Mexican Housing NAMA, the Colombian TOD NAMA and those envisioned as part of the Colombian Solid Waste NAMA.

4.4.1 Economic

The following subset of economic barriers was identified for the individual NAMAs that were analysed (the approach to identify the specific barriers might differ, depending on the nature of the NAMA). These subset of economic barriers need to be overcome through the design of an appropriate set of enabling instruments.

4.4.1.1 Colombian TOD NAMA

- Local Investment Gaps
- Imperfect public-private collaboration
- Limited value capture mechanisms

Historically, the Colombian public sector has taken the investment lead in urban transport infrastructure, incurring most of the costs. While the Colombian public sector, with the support of international donors, has funded projects in public transportation worth USD 7 billion over the past decade, a significant local investment gap remains (Diaz, 2015). Often, these public investments coincide with positive changes in land value, appropriated by those who own the land within the investment's influential range (AFD, 2015). In the case of Bogota, where the Transmilenio has already had a truly transformational impact, the substantial gains in land value associated with the public investment were largely absorbed by private agents (Pardo, 2014). To ease the fiscal pressure due to the investment and accelerate infrastructure investments, Bogota had already introduced three new instruments to finance this type of projects, amongst them a betterment levy (Olsen and Fenhann, 2014).

In order to overcome these barriers, the TOD NAMA is building on recently introduced mechanisms (public-private partnership) and aiming at creating new mechanisms (value-capture mechanisms) that serve as enabling environments to foster TOD investments through a transformation in public investments, the inclusion of a larger variety of investors in public transportation and improved incentives for private real-estate investments (CCAP, 2014; GIZ, 2014). Through the 2012 Law on Public-Private Partnership, additional incentives can be created for private actors to invest in public transportation but also urban development (DNP, 2015a), and it can help addressing the profitability gap often associated with new transport systems (GIZ, 2015). The Law targets long-term investors that have the financial capacity to build, operate, and maintain large-scale infrastructure. The PPP initiatives can originate both from the public and private side; however, different requirements apply. A few projects relevant to the notion of TOD under the PPP initiative are in the pre-feasibility stage: implementation and operation of Bogota's Public Biking System, two light rail corridors in Bogota, etc. (DNP, 2015b).

The mechanism to capture some of the increase in land value as a second measure to create enabling environments is still in the design stage. The TOD

NAMA has different concepts at their disposal, which have been applied elsewhere, for example, the application of betterment levies as applied in Bogota, the engagement of the transit developers in purchasing and selling the adjacent land at profit, and the charge of an annual tax based on the increase in property value (AFD, 2015; Huizenga et al., 2014).

4.4.2 Financial

Following the barrier analysis this subset of financial barriers was identified, which needs to be overcome through the design of an appropriate set of enabling environments:

4.4.2.1 Mexican Housing NAMA

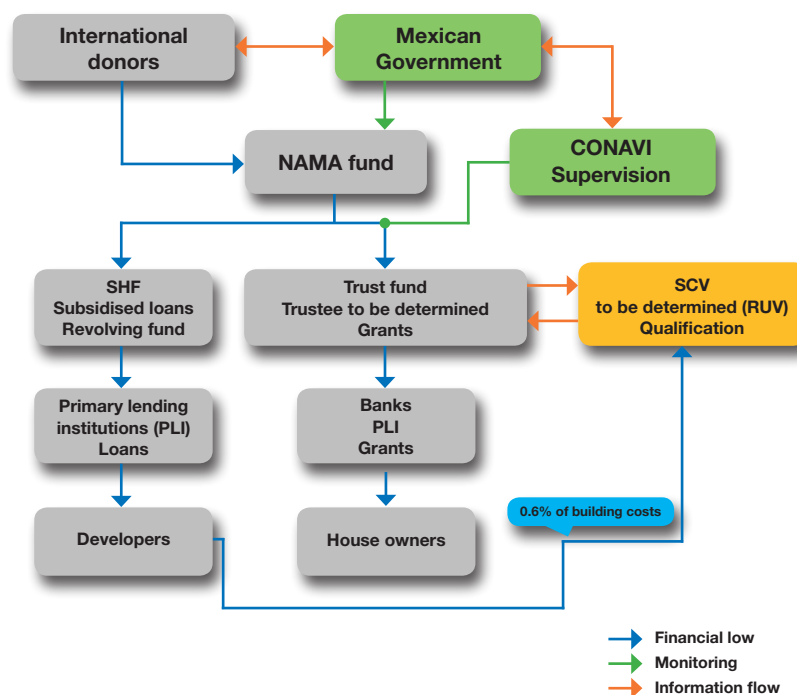
- Diverse set of financial energy efficient housing support schemes.
- Access to preferential mortgage conditions only to a select group through CONAVI's "Esta es tu casa" programme and INFONAVIT's Green Mortgage programme.
- Energy efficient homes require additional upfront costs for the developers, who may not be willing to take the risk that these homes will not be sold.
- Economic benefits of energy efficiency for homeowners accrued over the medium to long term. However builders and buyers focus on up-front acquisition costs and not on life-cycle economics.

The Mexican Housing NAMA targets the same group of potential homebuyers for energy efficient housing as does the conventional housing sector. Energy efficient housing however requires higher up-front investments. The additional costs are covered through reduced energy costs through the building's lifecycle, but the higher up-front costs deter both developers and buyers from investing in energy efficient buildings. Therefore, the Mexican Housing NAMA needed to create an enabling environment, in which an energy efficient property could be obtained at the same price as the conventional housing option. The measure ensuring this enabling environment is the creation of a beneficial interest rate scheme that housing developers can obtain access to, in case of the verifiable inclusion of energy efficiency measures (SHF, 2015). Through the preferential interest rate, the overall loan cost is reduced and can compensate the additional cost incurred through the application of energy efficient technologies. This example showcases how economic barriers may be addressed not only through economic enabling environments but also others, for example financial enabling environments like interest subsidies.

Before the implementation of the Mexican Housing NAMA, INFONAVIT and CONAVI concentrated the energy efficient mortgage market by attending the needs of their members and low-income groups, respectively. While INFONAVIT is financed through a 5% salary deduction on its members' salary, CONAVI relies on the public budget to provide the energy efficiency subsidies. In order to substantially up-scale the programmes and ensure a deep penetration of energy efficient technologies in the housing sector, Mexico required additional funding. As part of the NAMA, Mexico created the NAMA Fund, which has the special purpose to receive and disburse

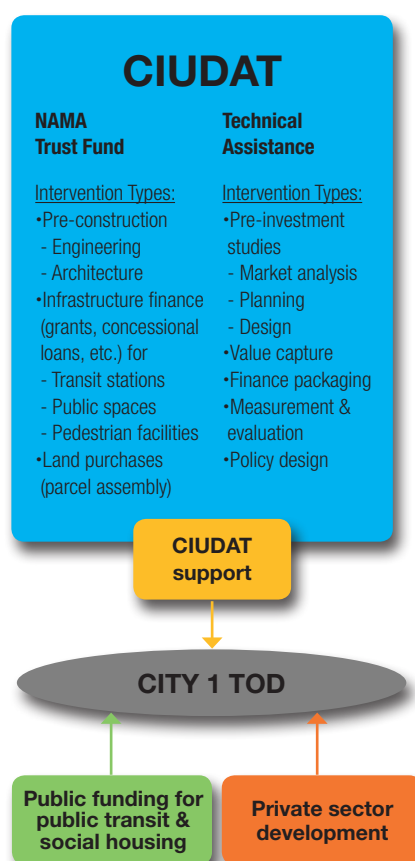
SHF channels the concessional funds to primary lending institutions (commercial banks) or directly to housing developers. SHF credit line passes on the beneficial interest rate to the financial intermediary, which then provides the funds to the housing developer at favourable conditions (SHF, 2013). Adding a market typical fee for financial intermediation, the commercial banks provide developers with a bridge loan for construction, which is located at roughly 2% below the typical market rate, to absorb the additional costs for the minimum efficiency requirements obtained through bioclimatic design and energy

Figure 16: Mexican Housing NAMA financing mechanism



Source: CONAVI, SEMARNAT; 2011

Figure 17: NAMA Trust Fund within CIUDAT/FINDETER



Source: Diaz, 2015

efficient technologies.¹³ Whether the developer's envisioned project complies to the ECOCASA efficiency requirements and, thus, is eligible for the preferential interest rate depends on the successful assessment of external consultants (SHF, 2015). In case of non-compliance to standards, the consultants provide improvement suggestions to the developer. The SHF funds can account for up to 65% of the capital costs of the project (SHF, 2013). Just like any other construction loan, the housing developers will pay back the loan as housing sales develop (SHF, 2015). Then, the revolving fund structure within SHF will ensure the long-term sustainability of the project.

Moreover, the inclusion of SHF in the energy efficiency housing segment was of fundamental importance to extent the potential clientele beyond those included in CONAVI's and INFONAVIT's schemes. Further, as a second tier bank, SHF has been able to provide a platform to channel significant funds to allow for a deep penetration of energy efficiency in the Mexican housing market, by extending the scope of green

mortgages by making them available to a larger segment of the population.

4.4.2.2 Colombian TOD NAMA

- Lack of finance mechanisms to mobilize private investments

The shift in investments in public transportation in Colombia from public funds to a more mixed public-private structure requires enabling environments in the form of financial mechanisms that channel and leverage funds towards TOD. To maximize the funds available for the NAMA, CIUDAT will source funds from local governments, development banks, etc. to obtain the largest possible leverage (Diaz, 2015). Potential relevant additions may come from IDB-FINDETER's Sustainable and Competitive Cities programme, which focusses on long-term planning combined with actions in the short-term, worth USD 500 million (Diaz, 2015), and additional funds from the German Development Bank KfW (CCAP, 2014).

Within FINDETER and CIUDAT, a NAMA Trust Fund shall be established that centralizes the international funding earmarked for the NAMA (see Figure 17).

¹³ The reference for the market rate is the 28-day Mexican Equilibrium Interbank Interest Rate (TIIE) (SHF, 2013). As a bridge loan, the credit line is designed to be disbursed in one or various payments during a period of 2 years after the contract signature.

The NAMA Trust Fund is overseen by the CIUDAT Board. The funds available at the NAMA Trust Fund are indicated for different interventions: pre-construction, infrastructure, and land purchases. Pre-construction interventions comprise both engineering and architectural activities, while the infrastructure investments can include transit stations, public spaces, and/or pedestrian facilities. The staff at the CIUDAT NAMA Trust Fund will receive proposals that have previously been defined as high-quality by the technical group, and merely require additional expertise on the most appropriate financial mechanism (CCAP, 2014).

The design of the financial instruments most suited to the purpose of the TOD is within FINDETER's annual goals for 2015 (FINDETER, 2014). Hence, the instruments that shall create the enabling conditions are not yet clear; however, the potential instruments comprise grants, concessional loans, equity, guarantees, and subsidies on interests (CCAP, 2014). The most adequate financial instrument will depend on both the investment type and the recipient of the funds (see Table 5).

4.4.2.3 Colombian Solid Waste NAMA

- Colombian commercial banks have minimum equity requirements of 30% when considering the issuance of a loan
- Limited equity capacities of municipalities and private sector agents
- Private sector is reluctant to invest equity in new business models

Municipalities and private agents have limited budgets and equity at their availability to incur high onetime upfront investment costs for new waste technologies. Combined with the commercial banks' reluctance to finance new, domestically unknown technologies, and their equity requirements of minimum 30% make it

very difficult for interested municipalities and private agents to invest. Financial institutions suggest that, even at affordable rates, a general reluctance to take the risk of using equity for new business models and technologies that have not been domestically proven exists in the private sector (CCAP, 2014b). To overcome these barriers, Colombia requires an adequate financial mechanism that provides leverage to the limited public funds, and incentivizes the private sector to take the risks of investing in new technologies. The Colombian Solid Waste NAMA envisions the establishment of a revolving NAMA Equity Fund (CCAP, 2014a).

The revolving NAMA Equity Fund shall be replenished in at least 50% through international donor financing (Maldonado, 2014). Combined with domestic funding and incentives structures like the DNP PPP framework, it will provide enough concessional equity financing to incentivize private sector equity, and make commercial debt financing viable (see Figure 18) (CCAP, 2014b). Through the repayment of project funds, the fund should operate sustainability without additional international donor replenishment (CCAP, 2014a).

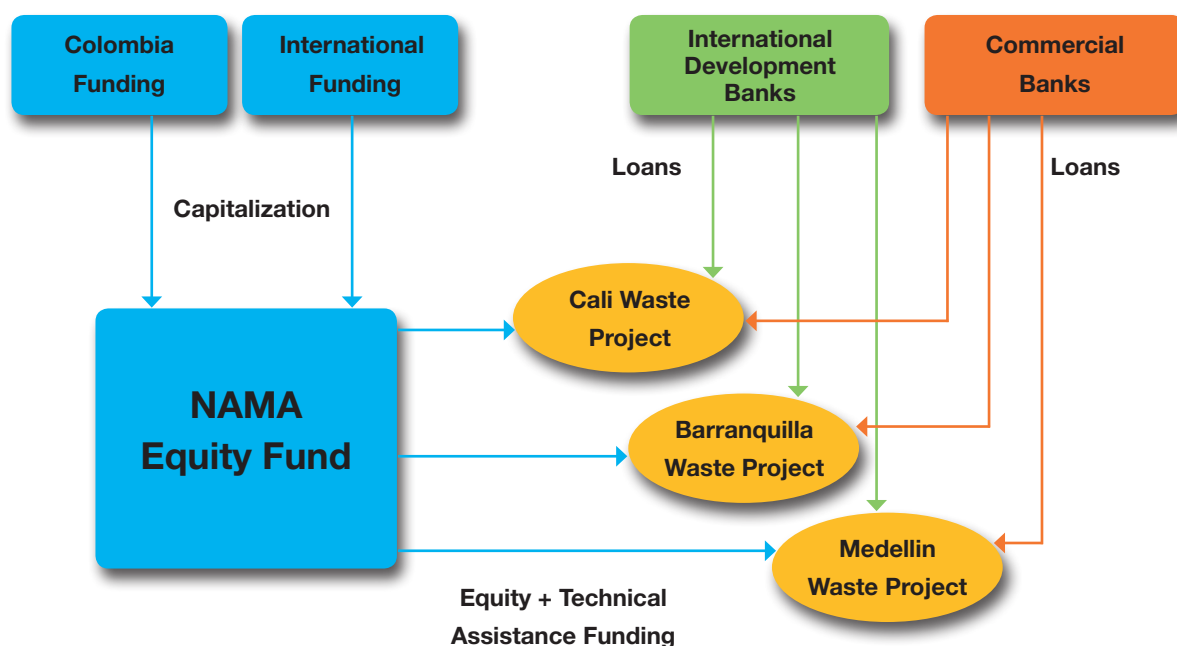
The Cali pilot case gives a good indication of how the envisioned financing mechanism can create an enabling environment that helps overcoming barriers and transforming the Colombian waste sector (see Figure 19). 34% of the financing is guaranteed through equity in equal shares from domestic sources, both public and private, and international cooperation (Maldonado, 2014). The remaining 66% is debt financing, of which merely half is provided by domestic commercial banks. This financing structure showcases how the private sector can be incentivized to invest in new technologies, while leveraging the limited available public funds. Therefore, the implemented financing structure has created an enabling environment that allowed for the construction of a MBT pilot plant in

Table 5: Potential financial instruments used by NAMA Trust Fund

TOD NAMA potential financial assistance mechanisms			
Public Sector		Private Sector	
To Local Special Service Entity (SPE)	Concessional loans	To private company	Project equity
	Loans		Grant – incentive
	Grants		Bridge loans
To city projects	Concessional loans	To private bank	Guarantees
	Loans		Interest subsidy
	Grants		

Source: CCAP, 2014

Figure 18: Financial Flows for Colombian Waste Management NAMA



CCAP, 2014a

Cali (see Figure 19). Moreover, it displays the different income sources generated for the investors through this new business model: sales from RDF, compost and recyclables combined with general waste tariffs. The new multi-sourced revenues can potentially help companies overcome the sunk costs incurred through the investments made under past regulations.

4.4.3 Market

Following the barrier analysis, this subset of market barriers was identified, which needs to be overcome through the design of an appropriate set of enabling environments:

4.4.3.1 Mexican Housing NAMA

- Insufficient demand to attract potential investors and drive down costs.
- Highly subsidized energy prices, especially for the lower-income groups, do not incentivize homeowners to look for more energy-efficient solutions.

As explained in the financial enabling environments, the financial mechanisms allow channelling funds to NAMA developers, resulting in energy-efficient housing options at zero additional costs to a wider target audience. A significant additional element to capitalize on the NAMA's potential for transformational change is the transition from demand-side to supply-side policies. Instead of providing mortgages dependent on housing buyer demands, funds are made available to

developers that develop larger-scale housing projects, resulting in a significant supply of energy efficient housing.

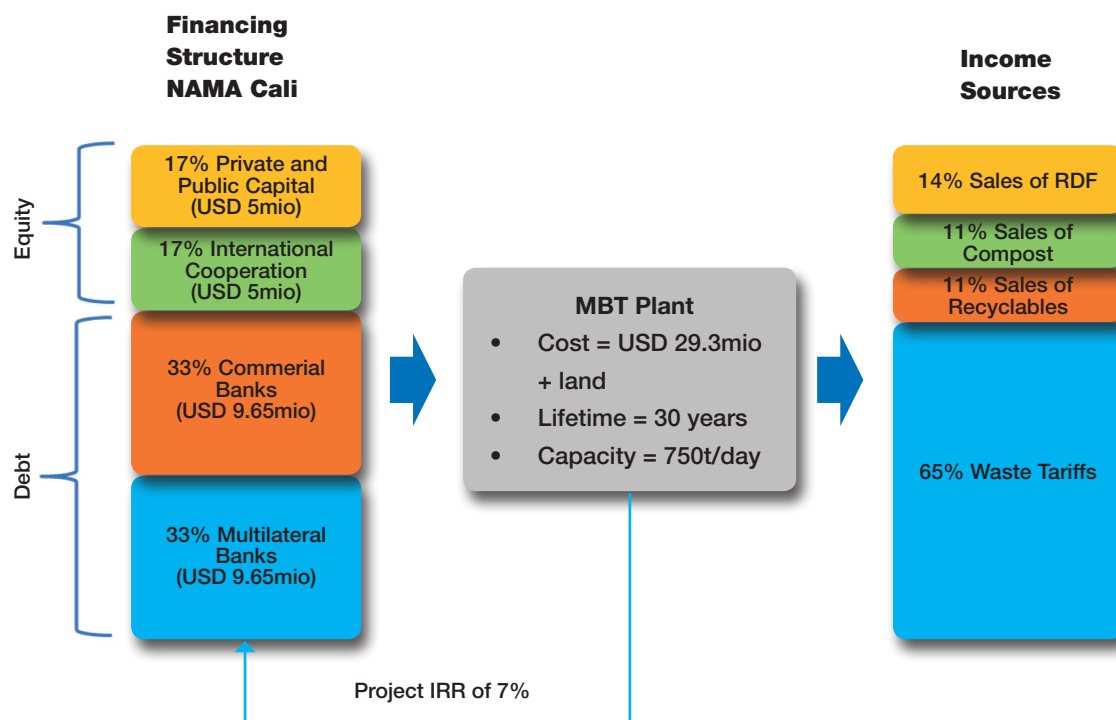
4.5 Enabling environments to overcome capacity barriers

Countries can meet barriers in implementing NAMAs in the form of lack of skilled labour and limited awareness of technology to implement the initiatives, both at the institutional level and at individual level. Many NAMAs, largely independent on the level of embeddedness, will require the creation of additional human capacities and improved accessibility and quality of data to plan and monitor. The introduction of technologies and activities in a country will require skilled staff for their application and operation, which might be missing or not be sufficient if these are novelties or significant upscaling efforts. The following are examples of how NAMAs have addressed human and data and information capacity barriers and initiated actions to create enabling environments.

4.5.1.1 Mexican Housing NAMA

- Lack of capacities for MRV
- Lack of technological capacities in EE building materials and technologies
- Limited experience to plan and assess EE measures

Figure 19: Colombian Waste NAMA – Pilot Case Cali Financing Structure



Source: Maldonado, 2014

In Mexico, there is a need for increased capacities and improvement of data measurement and monitoring. Apart from improved access to data, there is a need to improve the sourcing of materials and technologies for energy efficient building and the expertise to install them. In addition, building professionals, developers and local authorities have limited experience with energy efficiency measures in buildings, and lack the knowledge to assess the impact of features, or be able to choose between alternatives in an informed manner.

The NAMA Office is structuring the set-up and operation of the MRV system, including the development of data-collection systems, relevant data bases, and capacity building for monitoring and verification at the national level. More closely related to the Housing NAMA, the 'Mesa Transversal' has included a formal process for the registering of efficiency technologies and features in the Unified Housing Registry (RUV) as part of the MRV design.

To improve capacities, the "Mesa Transversal" is developing a simulation tool (SISEVIVE) to assess the energy impact of efficient housing design. 40 instructors have been trained in the application of the tool, aiming to disseminate the skills to use it to 400 professional across the country. As an initiative to increase capacities, CONAVI has launched pilot

projects to measure and compare the performance of specific materials, technologies and designs in the different climate zones, to provide real experience for developers and local governments, and generate empirical data that will be used to calibrate the applied models. In addition, a long list of capacity related activities are planned to be rolled out to secure the needed enabling capacities for the NAMA's success, as listed in Table 6.

4.5.1.2 Colombian TOD NAMA

- Lack of information about TOD, and how it can benefit urban development in Colombia
- Lack of technical capacity for planning, designing, financing, implementing and evaluating TOD
- Lack of technical expertise and institutional capacity to coordinate TOD interventions with local governments and the private sector

The existing BRT initiatives in Colombia spurred the creation of human capacities and data generation, but the initiatives have mainly focused on meeting existing traffic demand, without looking to accommodate future population growth and development. TOD is trying to address this issue, but at the local and sub-national level there is still limited technical capacity for planning, designing, financing, implementing and evaluating TOD

Table 6: Measures to create an enabling capacity environment in the Mexican Housing NAMA

Overview supportive and administrative actions	Costs 2012-2016
Development of data-collection systems to accurately measure, report and verify emissions: Set up and operation of a comprehensive data base (baseline and MRV) of houses and energy consumption and demand	290.000 USD
Capacity building and capacity build-up for monitoring and auditing Establishment of a professional and specialized inspection and supervision system	200.000 USD
Comprehensive household monitoring and auditing surveys (i.e. simulation using data base and detailed surveys)	1.190.000 USD
Technical Assistance to FOVISSSTE and SHF in the establishment of their institutional set-up for the implementation of the NAMA	180.000 USD
Technical Assistance to local governments and organizations at state and municipal level for introduction of a minimum energy performance standard, the whole building approach and target values for primary energy consumption as well as sustainability criteria. Development of a national guideline for Building Code adaptation	910.000 USD
Translation and adaptation of European/ Passive House Institute training material to Mexican climate and Building tradition; check after experience	172.000 USD
Scaling up of university/commercial school curricula on EE buildings and RE in buildings with focus on supporting for the NAMA implementation and operation	329.000 USD
Training through a 'Train the trainer approach' with local partners. The local partners consecutively, provide training and design of energy-efficient buildings (eco-casa, PHPP) for developers and planners throughout Mexico and special training for construction workers	250.000 USD
Production of a manual for house-owners/users in order to understand and optimize the use of energy efficient houses	150.000 USD
Monitoring of Beacon Projects and transfer of results and lessons learned into capacity building, demonstration projects and dissemination	1.000.000 USD

Source: SEMARNAT, 2012

projects and policies. Findeter, where the CIUDAT will be based, lack the technical expertise and institutional capacity to advance TOD implementation by designing coordinated interventions with local governments and the private sector.

CCAP provided support to local and national technical staff on TOD by circulating information, addressing technical experts in Colombia and visiting local authorities. CCAP also arranged international meetings for ministerial staff, and facilitated a study tour on TOD to Washington for high level officials, to further develop skills and knowledge on TOD (International Partnership on Mitigation and MRV, 2015). An additional source of municipal and private sector capacitation has been the PPP initiative, which has made guiding information available on the potential of PPP and the corresponding structured approbation process. To increase the data capacities for planning, the Ministry of Transport uses a real-time information

system to register and validate information on vehicles, drivers, licenses, fatalities, driving penalties, etc. In addition, a monitoring system has been established, the Information, Evaluation and Monitoring of Urban Transport System (SISSETU), reporting on 34 indicators of transport systems performance. Lastly, the Bogota District Department of Transportation conducts mobility surveys where several mobility indicators are tracked to model trip generation and attraction in the region. Together, these data tools create an enabling environment for the TOD NAMA to overcome information barriers.

The lack of technical and institutional capacity is addressed by CCAP guiding CIUDAT staff in developing strategic interventions in target cities, provide expert input on GHG calculations, and ensure that the M&E plan meets NAMA requirements and best international practices (NAMA Facility, 2014).

4.6 Enabling environments to overcome social barriers

Social enabling environments are related to cultural conditions influencing consumer preferences, social biases, and public awareness and behaviour. Consumer preferences are often dictated by economic factors, but social biases and perceptions also play an important role. The successful implementation of new actions, especially if they require behavioural changes in the population, depends greatly on the public's acceptance of and compliance with the planned actions.

The simple unacquaintance with new technologies can create a perception of risk that the technologies cannot deliver the same services as conventional solutions. Traditions and established practices can also play a role; in a NAMA aimed at reducing deforestation, the traditional use of charcoal and acquaintance with the taste created by smoke from wood fuels can be in conflict with the need to switch cleaner fuels. In the case of public transport initiatives, social status related to car ownership can be a barrier refraining potential users to switch to public alternatives, associated with lower social status. If a strong socio-cultural bias exists, the usual "hard measures" such as legislation, enforcement and economic incentives can be surprisingly inefficient in changing behavior. In such cases, soft interventions can help create enabling social environments, like projects for proof of concept, public awareness and information programs, etc. The private sector also has a role to play in applying soft measures, primarily through marketing. The following illustrates how social barriers were addressed by different NAMAs to create enabling social environments.

4.6.1 Cultural and common practices

4.6.1.1 Colombian Waste NAMA

- Waste pickers are not formalized and depend on waste recycling activities
- Households are not used to waste separation

In Colombia's waste sector, informal waste pickers have traditionally been recycling municipal waste from landfills, estimated to provide half of the recycled materials in the country. Waste pickers already live in poor conditions, and the introduction of MBT facilities can potentially take away their sole source of income, leading to increased poverty and potential social unrest. Another social aspect of the introduction of MBT facilities is that the generation of high quality

recyclables, compost and RDF are dependent on an efficient separation at source. Habits in households can be hard to change, why it is important to involve the citizens to secure that a proper source separation is made.

To create enabling social environments for the waste NAMA, municipalities are encouraged to formally integrate waste pickers into the NAMA activities to the extent possible. Formalizing their work by employing them in MBT facilities will allow them to receive an income and social benefits previously not accessible to them. In addition, national and city-level awareness and education programs are planned to provide the needed information and awareness to households on waste separation.

4.6.2 Public awareness and behaviour

For the Mexican housing NAMA, the introduction of energy efficient housing is a fairly new activity, and the following social barriers were identified in the barrier analysis:

4.6.2.1 Mexican Housing NAMA

- Lack of familiarity with energy-efficient buildings
- Methods and tools for planning of EE buildings not adjusted to the Mexican context

Home-owners, developers, planners and local administration lack information about energy-efficient buildings, how to assess them, and the benefit of sustainable housing alternatives and energy efficient appliances. Also, the EE building methods are adopted from European standards made by the Passive House Institute, and are not directly aligned with Mexican climate and building traditions.

A range of activities are planned to increase the public awareness of the NAMA initiative, and promote the benefits of energy efficiency measures in buildings. A website for the initiative will be launched, a media campaign and promotion brochures will be disseminated to promote participation to the programme, and demonstration and dissemination of the projects will make their success visible (SEMARNAT, 2012). Home-owners will be provided with manuals in order to understand and optimise the use of the energy efficient houses, and there will be campaigns to increase the consciousness of energy efficiency for buildings and the use of efficient appliances. To adjust the European Passive House Institute standards to the Mexican context, the Housing NAMA plans to translate and adapt training

material from the Passive House Institute to Mexican climate and building traditions, and see if additional changes are needed after the first experience with the pilot projects (SEMARNAT, 2012).

4.7 Conclusions on enabling environments

A key concern when creating enabling environments should be the sustainability of these environments. For example, capacity building activities should be designed in such a way that they have a sustainable effect even in a political system or economic sector with relatively high workforce turnover. In other words, a capacity enabling environment should always ensure a knowledge penetration that is solid enough to persist past changes in the workforce and might also need to include the creation of institutional knowledge management systems. Similarly, economic enabling environments shall minimize the dependence on public budgets and/or the macroeconomic environment to be sustainable.

Enabling environments created by several measures can target the same single barrier, while a measure can also target multiple barriers. As to the former, the transformational change in the waste sector requires the introduction of new revenue sources; however, the market for composting lacks demand. To attend the barrier of lacking demand, the authorities can foster the market through regulatory and or economic incentives while, simultaneously, running awareness campaigns. This demonstrates how different measures targeting the same barrier can potentially reinforce each other. As to the latter, the Mexican Housing NAMA showcases how the introduction of a single well-planned financial mechanisms can target the increased upfront cost for energy efficient technologies, extend the scope of the mortgage programme and, thus, the market penetration of energy efficient technologies, and improve the coordination of different programmes.

The previous examples also display how, barriers identified under a specific category (e.g. economic “Imperfect public-private collaboration”), require measures for the creation of an enabling environment to overcome the identified barrier in a different category (e.g. policy and regulatory frameworks “Law on Public-Private Partnership”). Due to this cross-category connection, it is of the utmost importance that the NAMA developer thinks out of the box to identify the most suited measures, independent of the grouping categories. This underlines once more the necessity to include all relevant stakeholders in the process, as

they can significantly contribute to finding also the non-intuitive measures.

These non-intuitive measures also comprehend activities that at first sight may not directly target barriers or build on pre-conditions but work as facilitating mechanisms. Typical for these activities are the establishment of coordinating entities and NAMA-specific funds. Both are highly relevant to the success of the NAMA but do not directly create enabling environments. The out-of-the-box thinking extends to creative measures, for example, the inclusion of energy efficiency concerns in popular TV shows in order to maximize awareness raising or target particular societal groups.

The introduced examples give a good overview of the measures taken as part of the first NAMAs in the Latin America and Caribbean Region in order to create successful and sustainable enabling environments. As more NAMAs are designed, implemented, and prove their concept, NAMA practitioners will be able to take more lessons learnt and adapt concepts to their national circumstances and particular NAMAs. The few presented NAMAs seem to have an overlapping emphasis on entity coordination, the introduction of a NAMA coordinating fund and corresponding mechanism, as well as the creation of technical capacities in the public and private sector.

As a concluding remark, the NAMA practitioner should remember that the better and more carefully designed the measures creating the enabling environments, the likelier the achievement of transformational change respectively the reduction of risks that the NAMA will not take off. However, as introduced in the next chapter, risks can never be fully eliminated.

5. Risks

Embedding NAMAs in the national circumstances and removing barriers through enabling environments shall put the country in the condition to successfully implement the NAMA. Yet, uncertainty will remain regarding the NAMA's success since measures are merely able to minimize but not fully eliminate risks.

NAMA implementation risks arise due to a set of more or less predictable factors. Within the existing NAMA design, an incomplete barrier removal or the insufficient creation and execution of enabling environments substantially increase the risk of failure. While a thorough consideration of the different elements in this Guidebook can provide a substantial hedge against many of these causes, other risk factors will remain. For example, internal dynamics that develop as an outcome of the implementation of enabling instruments but jeopardize the impact are difficult to predict and, thus, to insure against through comprehensive measures. An additional poorly predictable risk source is human behaviour, which does not always react to the incentives set. Hence, the questions arise how to present these issues, what can be done in case they occur, and are they relevant for the elaboration of proposals to international funding sources?

As to the international funding sources, risk mitigation is receiving increasing attention as witnessed in the NAMA Facility General Document and the GCF Proposal Template. The NAMA Facility requests the applicant to identify and assess the risks associated with the planned financial and technical component activities (NAMA Facility, 2015). Given these risks, it further requires the applicant to provide measures that will mitigate these risks and minimize the risk of the NAMA Support Project not to be successfully completed. The GCF proposal template puts substantial weight on an elaborate risk assessment by not only requiring information on how risk mitigation measures can reduce the financial, technical and operation, social, and environmental risks of the project but also on the risks that may arise during the proposed project's lifetime (GCF, 2015a). As to the latter, the GCF refers to risks that at the current stage do not pose a threat to the project's success yet but may arise somewhere on the horizon and, therefore, needs to be monitored.

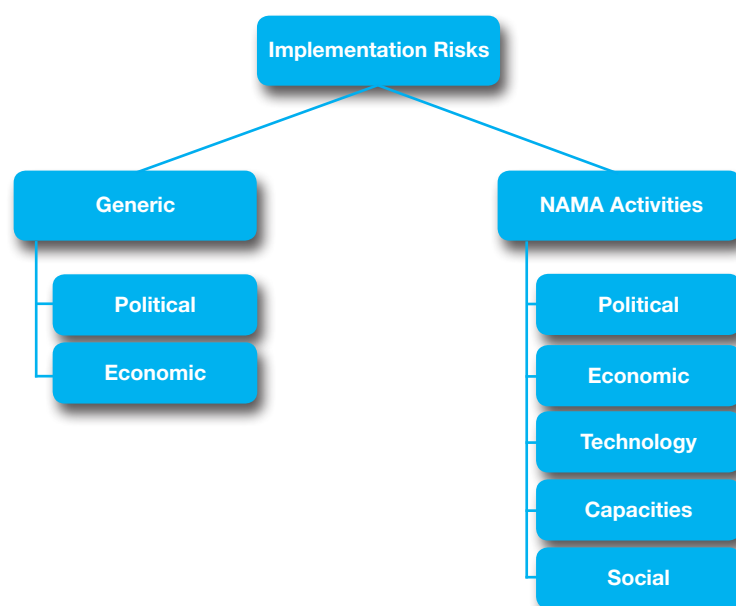
Most importantly, a NAMA will only reach its full transformational potential if the NAMA is able to get the incentives right for the private sector so that international source funding can leverage substantial private sector investment. However, the private sector entirely relies on an adequate risk-return ratio and, therefore, the mitigation of risks is critical to the long-term involvement of the private sector and accordingly the transformational change.

5.1 Principal risk types

The general categorization of risks for NAMA implementation develops along the same lines as the previously introduced generic barriers. While some risks may be relevant across similar NAMA from different countries, some risks may only arise in the specific context of one country developing a particular NAMA. Therefore, the risk groupings provided here can only provide a preliminary introduction to the issue and demand thorough analysis within each case. The implementation risks can broadly be divided into generic risks that apply to every investment independent of the context and those that are specific to the NAMA and its different activities (see Figure 20).

Generic risks arise mostly due to sovereign issues of political and macro-economic stability. Any investment will become more costly or deterred if the macro-political and –economic conditions are perceived as carrying additional risks, e.g. through political instability and changes in the political climate due to unforeseeable circumstances on the political side, and sluggish economic prospects, foreign exchange rate risks, and energy and resource prices on the economic side. These risks determine overall implementability and cannot be mitigated at the project/NAMA level. Both risk categories, political and economic, also feature amongst those risks that are specific to the NAMA activities. As to the political sphere, one can envision that through a change in government, the political backing of the NAMA will vanish and, thus, regulations, policies, and incentives will be cut to a non-sustainable degree. The embeddedness of the NAMA should therefore aim to prevent potential shifts in political support for the NAMA due to changes in government or the political climate. From a project-specific economic perspective, one can envision that some NAMAs may require the development of new

Figure 20: Risk categories for post-implementation NAMAs



Source: own elaboration

markets for products or technologies, which might be exposed to the risk of not being capitalized as envisioned. A plausible reason for the lack of market development can in some cases be within the social risks, in which cultural traditions and customs may prevent citizens from changing their consumer behaviour. Since awareness campaigns largely depend on the responsiveness to them by the targeted group, it is not guaranteed that they will obtain that aspired shift. Similarly, capacity building measures within public and private sector can fail in delivering through poorly disseminated knowledge within firms, high turnover rates or the lack of organisational capacity in the public sector due to an inadequate budget allocation. Lastly, since new technologies, or technologies that have not been proven in the national context, tend to be introduced through NAMAs, there is an associated risk of negative returns on investment. These can arise through a slower than expected learning curve, performances that do not reach projected levels or similar. Pilot demonstrations and experiences from other countries in similar contexts should minimize these costs as well as the feasibility and CBA studies carried out previously. Overall, it is very important and decisive for a proposal approval to address these risks as comprehensively as possible.

5.2 Risk presentation in funding proposals

The NAMA developer shall maximize the transparency with regard to these risks associated with the NAMA project for three reasons:

- A comprehensive and in-depth risk analysis showcases the NAMA developers awareness, knowledge and high-level of preparation.
- A full disclosure of the risks reduces the apparent magnitude of risks compared to those risks that are not presented and discovered afterwards.
- A proper risk assessment and risk mitigation management plan shall complete the NAMA preparation package in order to maximize its international attractiveness and likelihood of success.

Therefore, an excellent NAMA proposal will have carried out a risk assessment as part of its preparation. This risk assessment shall lead the NAMA proponent to develop a risk mitigation management plan, a “plan B”, that explains how the NAMA can still be a success even though the risks materialize. The authors of this Guidebook strongly encourage NAMA developers to make the effort, believing that “risks” are likely to be the next most important issue to arise as part of the climate change financing arena.

6. An Introduction to the GCF

The GCF directly provides extensive guidance documents. This chapter is meant to only draw together a series of publications, summarize and offer practical advice. We direct the reader to the relevant GCF documents whenever appropriate and encourage regular visits to the GCF website and the publications thereon. In particular the “Elements” series offers both practical and background information.

Further, it is important to understand that this guidance is written in February 2017 and reflects the state of the GCF by this date. There are a number of open questions on opportunities, some of them particularly relevant for Latin America such as the funding modalities for REDD+.

The GCF offers funding for both adaptation and mitigation projects. As this chapter is part of a guidebook on NAMAs, with focus on climate change mitigation, we do not discuss issues particular for adaptation projects. Note that cross-cutting projects, addressing both adaptation and mitigation, are considered as particularly interesting by the GCF.

6.1 Relation NAMAs – GCF

The GCF does not specifically refer to NAMAs in their documentation. Still, this is mainly a language issue, as the criteria and project goals implicitly ask for NAMAs and are almost identical with existing guidance on NAMAs. The GCF uses slightly different terminology than most of the NAMA discourse used in several chapters of this guidebook, e.g. “paradigm shift” instead of “transformational change” (see box in chapter 1.3) or “country ownership / coherence with existing policies” instead of “embeddedness” (see chapter 2). Still, the indicators used in their “investment framework” show that those differences are primarily of semantic nature, as they are fully in line with the use of the terms in the NAMA literature.

6.2 Access

In order to submit a concept note or a proposal to the GCF, prior accreditation is required. The accreditation process is lengthy and requires extensive due diligence

on fiduciary standards, social, environmental and gender management frameworks, etc., as well as a track-record of previous projects. These standards are currently based on the International Finance Corporation (IFC) standards. The GCF offers a fast-track accreditation for entities already accredited under the Global Environmental Facility (GEF), the Adaptation Fund or the European Commission’s Directorate General for Development and Cooperation (DEVCO).

Recognizing the different capabilities of entities requesting accreditation, ranging from national NGOs to multinational financial institutions like the World Bank, respectively from small impact investors like Acumen Fund to major institutes like Deutsche Bank on the private sector side, the GCF allows for different levels of accreditation:

First, accreditation is differentiated by scale. The GCF differentiates between Micro (<10 mil USD), Small (10-50 mil USD), Medium (50-200 mil USD) and Large-Scale (>200 mil USD) accreditation. Gaining Micro Scale accreditation requires significantly less effort and management frameworks in place than Large-Scale accreditation. Scale of accreditation determines the maximum size of projects an entity can apply for. There is no limit on the number of proposals that can be submitted per entity, but each proposal requires significant effort in preparation to have a chance for success.

Second, accreditation is differentiated by risk for adverse environmental and / or social impacts. For example, a program aiming to utilize hazardous waste as fuel has a higher environmental risk than an energy efficiency program, while a policy aiming to reduce illegal deforestation by subsistence agriculturalists faces higher social risks than a program for solar rural electrification. There are three categories of risk (A,B,C), which are described in general terms only. So the GCF risk accreditation sets limits to the type of projects that a proponent can present. Note that risk accreditation is neither about risks of program failure as discussed in chapter 5 nor about financial risk. The

accreditation level depends on the safeguards in place. The category can be different for projects implemented directly and projects where the entity only acts as intermediary.

Further, entities can seek sector-specific accreditation. For example, a multinational cement company may be eligible to apply for large-scale low carbon cement projects, but not for reforestation activities.

Accreditation levels can be upgraded over time in all three categories.

While accreditation can be gained by any entity fulfilling their requirements, the GCF has a special focus on so called “direct-access” entities. These are national entities from developing country partners. Accreditation of direct access entities also requires endorsement by the national focal point / national designated authority (NDA). As country ownership is a major goal of the GCF, every developing country partner is invited to set up such a NDA. The GCF offers readiness support of up to one million USD per country per year in capacity building of these entities. Proposals to the GCF mandatorily require endorsement by the NDA and proposals with significant involvement of the NDA or other national ministries are preferred and rated higher in the “country ownership” category, which corresponds to the embeddedness concept described in chapter 2 of this publication.

Accreditation of private sector entities, as well as proposal evaluation for private sector applicants, are handled by a dedicated “private sector facility” within the GCF. It is one of the major goals of the GCF to be catalytic in the mobilization of private finance into low emission technologies, including de-risking and public private partnerships (PPP).

6.3 Project submission

The GCF offers to provide early stage feedback to proposals based on a “Concept Note”. The concept note template is a reduced version of the main proposal template and can be submitted to the GCF by any accredited entity. The GCF provides feedback on every concept note submitted. The timeline for feedback depends on the workload and human resource availability at the GCF, which in its initial years, can be a challenge.

For the second stage, the GCF “Project Preparation Facility” offers support. While the Facility was announced at COP21 in Paris, the modalities and

details are not yet defined and we need to refer the reader to the GCF homepage for the details.

Full Proposals can be submitted directly or after any of the above-mentioned support processes. The proposals are evaluated first for completeness, and if found complete, evaluated by the GCF technical review committee. Proposal approval can happen three times per year on the GCF board meetings.

6.4 Project focus areas

The GCF currently has four “strategic impact areas” for mitigation projects:

1. Energy generation and access
2. Forests and land use
3. Transport
4. Buildings, cities, industries and appliances

For examples and more detail, please refer to the “Elements 02” publication by the GCF.

6.5 Funding instruments

The GCF offers a range of financial instruments. The project applicant is requested to supply a comprehensive justification why this particular instrument is suitable for the project. The instruments are listed in order of their level of Concessionality. Concessionality refers to the similarity of the instrument to a donation, respectively to the expected loss the GCF is making compared to a market rate loan.

- Loan (Concessional) – The GCF offers reduced interest rate loans or loans with delayed / extended payback times compared to the general market.
- Subordinate Loan – A subordinate loan, also known as “first-loss” loan, is a useful instrument to encourage other investors to provide further loans. By offering to be the first investor not to receive payback in case of a partial default, the GCF can reduce the risk for other parties.
- Guarantees – With a guarantee alone, the GCF does not provide a loan itself, but only guarantees the full payback for other investors in case of the applicant defaults. It thus not only takes the first loss, but the full default risk. A loan guaranty can thus reduce the default risk of other investors dramatically.
- Equity – another option offered by the GCF is to take an equity stake in applicants’ projects. With equity, the GCF does not get a fixed repayment as with a loan, but rather participates in potential profits made proportionally to their stake or might

profit from selling their stake later on. In case of default / bankruptcy, the GCF takes the full loss.

- Reimbursable Grant – a reimbursable grant is used when a grant is required initially, but there is a chance that the project leads to profit in the long term. In case profits are made, the applicant is required to repay the grant, typically without interest.
- Grant – The GCF also offers regular grants, common to traditional development aid agencies.

While many adaptation proposals use pure grants and are encouraged to do so by the COP (Article 9, Paragraph 4 of the Paris Draft Agreement), mitigation proposals are expected to use a wider spectrum of financial instruments and asks applicants to “provide strong economic and financial justification for the concessionality that GCF provides, particularly in the case of grants”. The applicants are required to provide an extensive justification why the instrument chosen is most suitable for the project proposed. In particular, a justification that the instrument enables the project at “Least Concessionality” is crucial for the evaluation. For example, an applicant needs to justify why they need a grant and cannot achieve the same outcomes with an equity investment. Even for the least concessional instrument offered, concessional loans, the applicants still need to justify why they cannot develop their program at market terms and interest rates.

Proposals can also include several instruments, e.g. a grant for fund management combined with equity as anchor for an investment fund. The KawiSafi Fund in East Africa, one of the successful first round proposals, used this structure and received a USD 5 million grant and USD 20 million of equity investment from the GCF. The initial USD 20 million equity provided by the GCF is supposed to leverage approximately USD 100 million in equity from other sources into the fund, investing into solar off-grid businesses in East Africa. The grant was required for technical assistance in a highly scattered and under-developed market, in particular for creating a capital reserve to finance consumer protection interventions if a company goes bankrupt and training women to be solar technicians.

The GCF has a mandate to develop other instruments, in particular results-based payments. Nevertheless, the strategy and modalities for these instruments are not yet defined. The GCF emphasises their appetite for risk and financial innovation, so it seems possible to propose and discuss other financial instruments with them. They also frequently mention their goal of

disruptive and “game-changing” applications and their flexibility to support those appropriately.

The applicant also needs to show that the support they seek only covers the “incremental costs” over a baseline. The remaining difference between the incremental and baseline costs should be covered from regular investments, either public or private.

6.6 Evaluation criteria

The GCF publishes their investment framework, including individual indicators for project evaluation. The six core categories are:

1. Impact Potential

This category primarily focuses on mitigation potential, but also includes indicators such as the number of households affected.

2. Paradigm Shift Potential

This category evaluates what was called “transformational change” throughout this publication (see box in chapter 1.3), including the “Theory of Change” of the proposal.

3. Sustainable Development Potential

Evaluates the expected co-benefits of the project along the traditional sustainability dimensions (ecological, social and economic). The GCF further includes “gender” as a fourth dimension of benefits. It was frequently emphasised by the GCF that gender has a particular high relevance, which is also reflected in their requirements for gender safeguards in the accreditation procedure.

4. Needs of the Recipient

The GCF offers higher degrees of concessionality and easier access for countries and country sub-populations affected by the project based on need. The absence of alternative sources of financing is evaluated under this criterion and also required in the justification of the choice of financial instruments.

5. Country Ownership

Country ownership for the GCF should go beyond a letter of no objection by the national NDA. While such a letter is the only requirement regarding country ownership in terms of eligibility, the investment framework has a host of other indicators related to country ownership and embeddedness.

6. Efficiency and Effectiveness

Investments are evaluated on efficiency with two main aspects: Total USD per tCO₂ investment needed, and

USD per tCO₂ for the investment by the GCF alone – for example in the proposal by the Inter-American Development Bank approved in the first round, the total investment requirement was estimated at 60 USD per tCO₂, but the GCF only invested 10 USD per tCO₂, while the rest came from other sources. There are also a number of other financial indicators for efficiency and effectiveness listed in the GCF investment framework. The weighting and aggregation rules of the different categories and indicators are currently not public. Further, while playing a central role in the evaluation, the methodologies for estimating the emission reductions associated with a project are not strictly defined. In particular, it is not required to use a CDM methodology, even if there is one available for the proposed project type. Instead, the calculation methodologies for emission reductions are currently discussed on a case-by-case basis. The criteria for MRV are also far less stringent than for the CDM and more akin to project M&E procedures of multilateral financial institutions.

Concluding Remarks and Recommendations

There is an increasing perception that NAMA development is comprised of three elements: concept, design, and implementation. This can be witnessed in the suggested support provided by the GCF, offering in a first stage feedback to proposals based on their Concept Note and in a following stage support through the “Project Preparation Facility”. The authors believe that everything stands and falls with the NAMA’s design stage and, thus, the publication focuses on the key elements of that NAMA segment. Therefore, while the publication narrative intends to help NAMA practitioners in achieving their goal of designing successful NAMAs that have the potential to obtain international climate financing, the design stage will be indispensable for any well-structured, unilateral NAMA that aspires to achieve transformational change as well. This is best practice independent of a country’s income level.

As to international finance, the lingo used in its current description has often prevented NAMA practitioners from developing successful proposals in line with the expectations of donors. The publication provides relevant insight into the concepts of embeddedness respectively integration and country ownership, barriers and the analysis thereof, enabling environments, and risk. By providing a narrative of elements favourable or harmful to the intended NAMA, the publication provides an illustrative guide for NAMA practitioners.

The four presented elements interchangeably belong together and, due to their link, no NAMA design will ever be complete without a suitable analysis of all four elements. The disintegrated approach, that is the consideration of not all four elements, will always bring about insufficient results and immediately elevate the risk of failure. However, included all four elements, the NAMA will be able to provide a convincing narrative of its “theory of change”.

Special attention was given to the GCF as it has the mandate to be the largest supplier of climate finance. Though, as indicated, the four elements will be equally useful for all other international climate financing

sources, it is the object of this publication to prepare NAMA developers for an application to the GCF based on the Fund’s requirements as of 2016. Following the Paris Agreement, new financing alternatives may arise that widen the opportunities for well-developed NAMA proposals even further.

In addition, with the introduction of the 5 year review mechanism of the NDCs as part of the Paris Agreement, NDCs and the implementation thereof through NAMAs will remain relevant in the future and will likely even see a strengthening as current contributions are insufficient of the aspired goal of limiting the temperature increase to 1.5°C. Therefore, NAMA practitioners should invest on strengthening their capacity in embedded actions, barrier analysis, the creation of enabling environments, and risk assessments in order to develop NAMAs that will obtain international financing, achieve transformational change, and contribute to achieving the goals set as part of the Paris Agreement.

Bibliography

- Aparcana Robles, S. R., & Hinostroza, M. L. (2015) Guidebook for the Development of Nationally Appropriate Mitigation Actions on Sustainable Municipal Waste Management, UNEP DTU Partnership.
- Averchenkova, A. (2014) Barriers in developing national mitigation strategies and actions in developing countries: Lessons learned from the UNDP's low emission capacity building programme, United Nations Development Programme, June 2014.
- Boldt, J., I. Nygaard, U. Hansen, and S. Trærup (2012) Overcoming Barriers to the Transfer and Diffusion of Climate Technologies, UNEP Risø Centre on Energy, Climate and Sustainable Development, Risø DTU National Laboratory for Sustainable Energy, (TNA Guidebook Series).
- Boos, D.; Broecker, H.; Dorr, T.; von Luepke, H.; and S. Sharma (2015) How are INDCs and NAMAs linked? A discussion paper on the links between INDCs, NAMAs and LEDS by the GIZ TUEWAS NAMA Working Group in collaboration with the UNEP DTU Partnership, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and UNEP DTU Partnership.
- Brown, L., C. Polycarp, and M. Spearman (2013) Within Reach – Strengthening Country Ownership and Accountability in Accessing Climate Finance, World Resources Institute, November 2013.
- Canu, F. A.; Zaballa Romero, M.; and S. Lütken (2015) NAMAcademy e-learning course, UNEP DTU Partnership, <http://namacademy.org/>
- CCAP (2013) NAMA Proposal Executive Summaries - Prepared for the Global NAMA Financing Summit. Center for Clean Air Policy.
- DNP (2011) Bases del Plan Nacional de Desarrollo 2010-2014 – Prosperidad para Todos, Departamento Nacional de Planificación, Bogotá, Colombia.
- DNP (2015) Bases del Plan Nacional de Desarrollo 2014-2018 – Todos por un nuevo País, Departamento Nacional de Planificación, Bogotá, Colombia.
- GCF (2015a) Annex III: Initial investment framework: activity-specific sub-criteria and indicative assessment factors, *GCF/B.09/23*, Green Climate Fund, Songdo, Republic of Korea.
- GCF (2015b) Funding Proposal Version 1.1, Green Climate Fund, Songdo, Republic of Korea, <http://www.greenclimate.fund/>.
- GIZ (2014) Vertically Integrated Nationally Appropriate Mitigation Actions (V-NAMAs) Policy recommendations, case studies and tools for the integration of sub-national actors in national mitigation actions, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- Government of Mexico (2015) Intended Nationally Determined Contribution, March 2015.
- Government of Peru (2015) Intended Nationally Determined Contribution, September 2015.
- Gouldson, A., S. Colenbrander, A. Sudmant, N. Godfrey, J. Millward-Hopkins, W. Fang, and X. Zhao (2015) Accelerating Low-Carbon Development in the World's Cities, Contributing paper for Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate. New Climate Economy, London and Washington, DC.
- Hänsel, G., F. Roeser, N. Höhne, X. Van Tilburg, and L. Cameron (2013) Annual Status Report on Nationally Appropriate Mitigation Actions, Mitigation Momentum.
- Lütken, S. (2014) Financing Nationally Appropriate Mitigation Actions, UNEP DTU Partnership.
- Lütken, S.; Fenhann, J.; Hinostroza, M.; Sharma, S.; and K.H. Olsen (2011) Low Carbon Development Strategies - A Primer on Framing Nationally Appropriate Mitigation Actions (NAMAs) in Developing Countries, UNEP Risø Centre.
- Lütken, S.; Dransfeld, B.; and Wehner, S. (2014) Guidance for NAMA Design – Building on Country Experiences

MADS (2013) Estrategia Colombiana de desarrollo Bajo en Carbono ECDBC, Colombian Ministry of Environment and Sustainable Development, July 2013.

MINAE (2014) Analisis de barreras, Facilitating Implementation and Readiness for Mitigation, UNEP DTU Partnership, Ministerio de Ambiente y Energía, Costa Rica, September 2014.

MINAE (2015) Contribución Prevista y Determinada a Nivel Nacional de Costa Rica, Ministerio de Ambiente y Energía, Gobierno de Costa Rica

Mersmann, F., K. Holm Olsen, T. Wehnert, and Z. Boodoo (2014) From theory to practice: Understanding transformational change in NAMAs, UNEP-DTU Partnership and Wuppertal Institute, November 2014.

Municipality of Medellín (2014) Plan de Movilidad Segura de Medellín 2014-2020.

NAMA Facility (2015) General Information Document, German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), the UK Department of Energy and Climate Change (DECC), the Danish Ministry of Climate, Energy and Building (MCEB) and the European Commission, April 2015.

Olsen, K. H., and J. Fenhann (2015) Transformational Change for Low Carbon and Sustainable Development, UNEP-DTU Partnership, May 2015.

SEMARNAT (2012) Supported NAMA for Sustainable Housing in Mexico - Mitigation Actions and Financing Packages, Mexican Federal Government

UNFCCC (1992) United Nations Framework Convention on Climate Change, United Nations Environment Programme and World Meteorological Organization.

UNFCCC (2007) Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007, United Nations Framework Convention on Climate Change.

UNFCCC (2009) Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009, United Nations Framework Convention on Climate Change.

UNFCCC (2010) Report of the Conference of the Parties on its sixteenth session, held in Cancun from

29 November to 10 December 2010, United Nations Framework Convention on Climate Change.

UNFCCC (2001) The Marrakesh Ministerial Declaration, *Conference of the Parties VII*, United Nations Framework Convention on Climate Change, November 2001.

UNFCCC (2015a) NS-47 - Low Carbon Climate Resilient Development Strategy, United Nations Framework Convention on Climate Change NAMA Registry, http://www4.unfccc.int/sites/nama/_layouts/un/fccc/nama/NamaSeekingSupportForImplementation.aspx?ID=34&viewOnly=1.

UNFCCC (2015b) NS31 - Expansion of existing heating network in Valjevo, United Nations Framework Convention on Climate Change NAMA Registry, http://www4.unfccc.int/sites/nama/_layouts/un/fccc/nama/NamaSeekingSupportForImplementation.aspx?ID=22&viewOnly=1.

van Tilburg, X. and S. Bhasin (2014) Status Report on Nationally Appropriate Mitigation Actions (NAMAs) - Mid-year update 2014, Mitigation Momentum, ECN and Ecofys.

van Tilburg, X.; Cameron, L.; Harms, N.; Esser, L.; and A. Afanador (2015) Status Report on Nationally Appropriate Mitigation Actions (NAMAs) - Mid-year update 2015, Mitigation Momentum, ECN and Ecofys.

