Facilitating the development of transport NAMAs in Mexico

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Netherlands’ Ministry of Infrastructure and the Environment
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Summary

This report details the work done for the project “Facilitating the development of transport NAMAs in Mexico” which was elaborated in conjunction with the Mexican Secretariat of Environment and Natural Resources (SEMARNAT) and funded by the Dutch Ministry of Infrastructure and the Environment. The goal of the project was to identify a suitable program or policy that mitigates greenhouse gas emissions and to explore how the program could become a Nationally Appropriate Mitigation Action.

Nationally Appropriate Mitigation Actions (NAMA) have been actively discussed in the international climate negotiations. NAMAs can be unilateral, supported and credited.¹ In a supported NAMA, a developing country undertakes mitigation actions that are partly supported by funds from developed countries. The framework by which NAMAs are developed, funds are procured and distributed and mitigation actions are measured, reported and verified is still being defined. There is a need for “on-the ground” pilot projects to see how such an international policy framework might function within the institutions and governance structures of developing countries. Against this background, the current study aims at developing a pilot project or program in the transport sector in Mexico which could apply for NAMA funding available at the international level.

This project focused on the transport sector because is the largest and fastest growing sector in Mexico. The country has one of the highest motorization rates in Latin America which places high pressures on the local population and on the environment. Transport is also of interest to the Mexican Government in its efforts to combat climate change under Mexico’s Special Climate Change Program (PECC in Spanish). At the same time, improvements in the transport sector can provide substantial co-benefits.

After screening potential NAMA ideas, the project team in consultation with the Mexican Government picked the Federal Mass Transit Program (PROTRAM in Spanish) for a pilot study to determine the feasibility of a supported NAMA. The process by which the program was picked as a NAMA is described in detail in the report along with a description of the components, guidance on MRV methods and suggestions for proposing the program for NAMA financing. The project team recommends that a NAMA based on the existing PROTRAM/UTTP is brought forth for NAMA financing.

¹ Not considered as a NAMA in the Cancun Agreements. Some Parties suggest that some NAMAs may generate credits (under market-based mechanisms in the negotiation text)
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1 Introduction

All countries will need significant efforts to reduce greenhouse gas emissions in order for temperature increases from global warming to remain below 2° C. A likely chance (>66% probability) of reaching this level implies a reduction in global GHG emissions of between 50-60% below 1990 levels by 2050 (UNEP, 2010). Reducing emissions at these levels will be an enormous challenge which will need contributions from developed and developing countries alike.

Mexico pledged in the Copenhagen Accord to reduce emissions by 30% below business-as-usual conditional to “adequate financial and technological support from developed countries as part of a global agreement” (Climate Action Tracker, 2011). One of the mechanisms being discussed to provide this kind of support are Nationally Appropriate Mitigation Actions (NAMAs). Through a NAMA, a developing country can receive financial, capacity building and technological support to undertake mitigation actions according to international agreements (UNFCCC, 2011).

However, many issues with NAMAs remain unsolved. The framework by which NAMAs are developed, funds are procured and distributed and mitigation actions are measured, reported and verified is still being defined. There is a need for “on-the-ground” pilot projects to see how such an international policy framework might function within the institutions and governance structures of developing countries.

1.1 Project Goals

The project aims at developing at least one realistic NAMA proposal based on an existing transport project. By doing so, the project aims at:

- Supporting the preparation of concrete transport NAMA proposals for Mexico
- Raise awareness and build capacities among national stakeholders and involve them in the NAMA development process
- Linking the national transport issues with the international discussion on NAMAs
- Feeding the lessons learnt from this project back into the UNFCCC process

1.2 Nationally Appropriate Mitigation Actions

The concept of Nationally Appropriate Mitigation Actions has been evolving since it was brought forth in paragraph 1(b)(ii) of the Bali Action Plan which called for "Nationally Appropriate Mitigation Actions by developing country Parties in the context of sustainable development supported and enabled by technology, financing and capacity building, in a measurable, reportable and verifiable manner.” NAMAs emerged as a way for countries to meet their “common but differentiated responsibilities” and to enable developing countries to receive support in mitigating greenhouse gas emissions.

Two years later, under the Copenhagen accord, NAMAs gained additional momentum with a commitment by developed countries to provide new and additional resources of
USD 30 billion in fast-track financing between 2010 and 2012 and USD 100 billion per year by 2020 to address the needs of developing countries in undertaking adaptation and mitigation actions. When developing countries submitted their Copenhagen pledges, a great majority submitted unilateral pledges with a possibility for greater reductions that are conditional to support from Annex I countries.

The concept of NAMAs has progressed along with the negotiations. In Cancun, key modalities were agreed upon. There was a decision to establish a registry to record NAMAs and to establish a Green Climate Fund as an operational entity of the financial mechanism of the Convention. Durban finally saw this process completed with the approval of the governance instrument of the fund.

1.2.1 Type of NAMAs

Countries that submitted NAMAs in Appendix II of the Copenhagen Accord included these types of NAMAs (Jung et al. 2010a):

- Unilateral NAMAs – mitigation actions undertaken by developing countries on their own
- Supported NAMAs – mitigation actions in developing countries supported by direct climate finance from Annex I countries.
- Credited NAMAs – mitigation actions in developing countries, which generate credits to be sold in the carbon market (e.g. sectoral crediting).

Since Copenhagen, the concept of unilateral NAMAs has shifted and is now discussed in terms of “country pledges” and separate from NAMA discussions. Credited NAMAs have been assimilated into the negotiations on new market-based mechanisms. Currently, the term NAMAs is now used synonymously with “supported NAMAs”. This report reflects these developments in usage and terminology.

1.3 Process of NAMA development

NAMA development is a process, just like the development of any other (mitigation) policy or program at government level. In general, it consists of the steps shown in Figure 1. The process starts with an assessment of the technical and political context of the target country with the goal of understanding the main drivers behind greenhouse gas emission trends. From here, specific activities can be identified which could become NAMAs. Through a stakeholder-driven process, the NAMA is selected and further developed. Finally, it is implemented and it undergoes measurement, reporting and verification of its emissions reductions and financing.
1.3.1 Assessment of technical and political context

The assessment covers technologies responsible for emitting and abating GHG emissions and also the social and political drivers behind emission trends.

This phase can include the following activities (Jung et. al 2010).

- Studies on mitigation potential and costs
- Emission scenarios
- Barrier analysis
- Assessments of existing policies and measures
- Needs assessment (policies and measures needed to tap the mitigation potential)

1.3.2 Identification and selection of NAMAs

The identification and selection of NAMAs is typically a government-led process with relevant agencies and other stakeholders involved. Participatory methods for stakeholder involvement are desirable to achieve local ownership. Once an initial list of potential NAMAs has been identified, criteria can be used to make a selection.

Some of the following could be selection criteria for a ‘good’ NAMA:

- The NAMA is developed from within the country in a participatory process
- The NAMA fits within relevant existing policies and strategies, e.g. development plans, energy strategies, etc.
- It fits into the national implementation structure
- A clear boundary can be drawn and impacts (GHG and others) can be measured, reported and verified
- Financing needs can be determined
- Leverage of private investments is high
- Sustainable development benefits are positive

1.3.3 Detailed NAMA development

In this phase, the general planning and development of the NAMA is conducted. Such a planning will include a specification of the most important element of the NAMA, as
required by rules and modalities at the international level. This step is very much in line with the logical framework approach used in development cooperation.

Within the NAMA development process, the respective institution might need support in preparing the NAMA which might include external support and capacity building on:

- technical aspects (e.g. GHG estimation)
- design of policies and measures
- governance issues
- coordination and dialogue of stakeholders
- preparation of MRV-concept etc.

1.3.4 NAMA implementation

In this phase, the NAMA is implemented. Depending on the type and scope of the NAMA, implementation can mean quite different things, for example:

- Introduction, implementation and enforcement of a new policy or program
- Capacity building (as a component of the NAMA)
- Implementation of an investment project "on the ground"

1.3.5 Evaluation and MRV

During implementation, monitoring must be conducted according to guidelines to be decided at the international level. Despite measurement and reporting and especially verification being a contentious issue within the climate negotiations, it is likely that some form of third party evaluation will need to take place at specified regular intervals. The framework should provide certainty that:

- A certain magnitude of GHG emission reductions is achieved.
- The developing country uses the financing for the stated purpose
- The proposed actions are actually undertaken
- The implementation is done effectively

1.4 Project scope

This project will comprise the following steps in the NAMA development process:

1. Assessment of technical and political context
2. Identification
3. Detailed NAMA development (to some extent)

The goal of this project will be to present a proposal for a NAMA that can be brought forward for climate financing. The Mexican government can then use the outcome of this project in order to continue with development and implementation of the NAMA, if desired.

2 These GHG impacts might however rather be in the mid- to long-term in some cases.

10-Jan-2012
This report will share the results of this project within the same structure as has been presented starting with an assessment of the technical and political context of the country. The report ends with lessons learnt within this project which can help to shape the NAMA implementation framework at the international level.
2 Background and Context

2.1 Past and present situation of the country

Mexico, or the United Mexican States, as the country is officially known is a federal republic composed of 31 states and a Federal District. Mexico is considered a newly industrialized country and an emerging power. Trends in emissions of greenhouse gases reflect this fact with the main drivers over the last two decades being population growth and economic development.

In 2010, the population of Mexico reached 112 million (UNdata, 2011). Approximately 78% of the population lives in urban areas and 23% in rural zones. Urbanization is a major trend in Mexico with large numbers of people emigrating from the countryside to urban areas in search of better economic opportunities. Rapid urbanization has created social and environmental pressures as cities have struggled to manage rapid growth. This is evident in major Mexican cities which are plagued by problems like pollution and traffic congestion.

Mexico has undergone significant economic growth in the last decades but an estimated 47.4% of the total population still lives in patrimony poverty. Mexico reported a Human Development Index (HDI) of 0.750 in 2010, which ranked the country in 56th place out of 179 countries (UNDP, 2011). The challenge of economic and social development in light of climate change is present just like in other developing countries.

In the years between 1990 and 2008, the economy grew at an average rate of 5.4%. The contribution of different sectors to GDP was as follows: the service sector contributes 59% followed by industry (37%) and agriculture (4%). The Mexican economy is deeply connected to its neighbours in the North through the North America Free Trade Agreement (NAFTA). The United States is the destination of approximately 80% of Mexican exports and the origin of 50% of Mexican imports (Mexico, 2009).

Between 1990 and 2008, greenhouse gas emissions increased by 61%. The top three emitting sectors were: transport 20.4%, electricity generation 21% and waste 14.1% (Figure 3). By the year 2020, emissions are projected to reach around 900 Mtons (Hagemann et al., 2011).
Climate Policy

Mexico has taken strong initiatives with regards to climate change both domestically and at the international level. Since its foundation in 2005, the Inter-ministerial Commission on Climate Change (CICC, Comisión Intersecretarial de Cambio Climático) has been coordinating the activities of the Federal ministries in charge of formulating and implementing national policies for prevention and mitigation of GHG emissions and for adaptation to climate change impacts.

Mexico acknowledges the importance of undertaking actions that contribute to the efforts of the international community in reducing GHG emissions. The Mexican Government has put into force the Special Program on Climate Change 2009-2012 (PECC, Programa Especial de Cambio Climático), which seeks to demonstrate that GHG emissions mitigation is possible without jeopardizing economic development (SEMARNAT, 2010).

Compliance with the PECC is projected to reduce 50 million tons of CO₂e by 2012. This means a 6% deviation from the baseline estimate (786 million metric tons CO₂e) as a consequence of the implementation of a series of unilateral actions in sectors such as energy (including transport), agriculture, forestry and land use, and waste.

In the long-term, the PECC aims to reduce 50% of GHG emissions by 2050, as compared to 2000 levels, and reach a flexible convergence towards global average per capita emissions of 2.8 tones of CO₂e/yr. This target is conditional to the availability of sufficient incentives and international support as part of a new financial architecture for climate change of which NAMAs are an important component.
2.2 Past and present situation of the transport sector

2.2.1 General description of the transport sector

Urban transportation is a necessary element for the growth of a country. It promotes the increased competitiveness of localities and regions, bolsters economic activity and promotes social interactions. Transportation systems that are efficient and friendly to the environment, release human resources for the development of productive activities, personal enrichment and competitiveness in cities.

In Mexico, the economic and social benefits of mobility often come with negative impacts such as traffic congestion, social exclusion, accidents, air pollution and climate change. The negative impacts are particularly visible in urban areas. Transport in Mexico is characterized by its inefficiency and irrational use of economic resources. This is further complicated by the lack of integration of transport planning and urban development (Iracheta Canecorta, 2006).

Over the next 25 years, Mexico’s motorization rate is projected to continue to increase. Factors contributing to this include rising per capita income, the availability of inexpensive vehicles (used), and the relatively low cost of transportation fuels. The deteriorating quality of public transportation, the inadequate enforcement of vehicle emission standards, the neglect of transportation needs in urban development plans, and the lack of regulation of freight transport will contribute to increasing energy use and GHG from the transport sector in the years to come (World Bank, 2009).

![Figure 4 Total projection of vehicle fleet](source: Centre for Sustainable Transport, Mexico, 2009.)

2.2.2 Emissions and reduction potentials in transport

According to the last GHG emissions inventory published by The Ministry of Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT) and The National Institute of Ecology, (Instituto Nacional de Ecología, INE), the transportation sector emits 20.4% of total greenhouse gases. Broken down by
subsectors, the road transportation subsector is responsible of 19.04%, aviation of 0.77% and rail and maritime are responsible for 0.07% (INE-SEMARNAT, 2009).

In 2006, the transport sector emitted 145 MtCO2e. It is estimated that emissions in the sector will grow at an annual rate of 5.1% until the year 2030. According to data from the Low Carbon Growth for Mexico (MEDEC), in 2030 the transport sector will emit around 413 MtCO2e, mainly due to fleet growth and a lack of improvement in the overall energy efficiency of the fleet. Projections suggest that by 2030, the vehicle fleet will reach 70 million, almost triple the vehicles in 2008 (Figure 5).

![Projected GHG emissions in transport to 2020](source: CTS Mexico (2009))

### 2.2.3 Drivers

In Mexico, road transportation is the largest consumer of fossil fuels and the second largest emitter of greenhouse gases. This is largely due to:

1. A rising motorization rate
2. A rapid urbanization bringing more people and economic activities into already congested areas
3. An aging public transport vehicle fleet consisting primarily of smaller-capacity vehicles
4. Inadequate fuel specifications to improve energy efficiency and control airborne pollutants.

As a result, the transportation sector needs actions aimed at reducing energy use, their associated emissions and externalities through sustainable projects and public policies. Interventions in transport are often based on the so called “Avoid -Shift-Improve” approach which combines measures aimed at:

- Avoiding or reducing trips through integration of land use and transportation planning,
• Shifting to more energy efficient modes which in most cases will be either non-motorized or public transport
• Improving vehicle and fuel technology (Dalkman, 2009).

2.2.4 Relevant political and institutional framework

The Federal Government put into force the Special Program on Climate Change 2009-2012. It seeks to demonstrate that GHG emissions mitigation is possible without jeopardizing development. Compliance with PECC goals would result in a reduction of 50 million tons of CO\(_2\)e by 2012.

The following table presents the different mitigation action contemplated in the PECC for the transport sector. The federal government has the objective to reduce 11.35 MtCO\(_2\)e by 2012 in transportation sector (Table 1).
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Goal</th>
<th>GHG mitigation until 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthen energy savings in the transport sector through technology</td>
<td>1. Reduce GHG emissions from fuel consumption through a fuel efficiency standard for new vehicles</td>
<td>-</td>
</tr>
<tr>
<td>improvements and application of energy efficiency standards.</td>
<td>2. Reduce GHG emissions from savings in diesel and gasoline consumption equal to 16 PJ from the Transport Program of the National Commission for the Efficient Use of Energy (CONUEE)</td>
<td>1.20 MtCO2e (2008-2012); 0.40 MtCO2e/year (in 2012)</td>
</tr>
<tr>
<td>Reduce the energy consumption in passengers and freight transport</td>
<td>1. Reducing GHG emissions with the implementation of the Smartway Program.</td>
<td>2.70 MtCO2e (2008-2009); 0.90 MtCO2e/year (in 2012)</td>
</tr>
<tr>
<td>Modernize and increase the kilometres of the federal highway network</td>
<td>1. Reduce yearly GHG emissions by constructing 38 new road segments to improve emissions per km/travelled.</td>
<td>1.20 MtCO2e/year (in 2012)</td>
</tr>
<tr>
<td>Enforce renovation program for the actual vehicular fleet</td>
<td>2. Reduce yearly GHG emissions by constructing 18 new bypasses.</td>
<td>0.10 MtCO2e/year (in 2012)</td>
</tr>
<tr>
<td>Improve rail infrastructure to support multimodal schemes and reduce fossil fuel consumption.</td>
<td>1. Reduce GHG emissions by improving the share of railways in freight transport (from 26% to 28.3% in term of tons-km)</td>
<td>3.90 MtCO2e (2009-2012); 1.60 MtCO2e/year (in 2012)</td>
</tr>
<tr>
<td>Sustainable public urban transport in cities of more than one hundred thousand inhabitants.</td>
<td>1. Under Protram-Fonadin, increase urban areas with modern transport systems from 36% in 2006 to 100% in 2012 for cities with more than one hundred thousand inhabitants.</td>
<td>-</td>
</tr>
<tr>
<td>Promote public transportation in suburbs</td>
<td>1. Suburban Metropolitan Train systems.</td>
<td>0.42 MtCO2e (2009-2012); 0.17 MtCO2e (in 2012)</td>
</tr>
<tr>
<td>Promote higher energy efficiency in the fishery sector by the replacement of motors and shrimp ship.</td>
<td>1. Remove 400 shrimping vessels for a savings of 77.3 million litres of diesel/year.</td>
<td>0.60 MtCO2e (2009-2012); 0.22 MtCO2e (in 2012)</td>
</tr>
<tr>
<td></td>
<td>2. Support the replacement of the motors of 15,500 fishing vessels with a yearly savings of 53.3 million litres of gasoline.</td>
<td>0.13 MtCO2e (2009-2012); 0.05 MtCO2e(2012)</td>
</tr>
</tbody>
</table>

Table 1 Mitigation actions in transport under the PECC
Source: CTS Mexico, with information of Special Program on Climate Change, 2011.
From the twelve transport mitigation actions of the PECC, ten of them address mitigation of emissions from road transport by promoting a shift to more efficient modes, both for public transport and freight and by improving technologies through establishing energy efficient standards and supporting financial schemes and programs for the renewal of the fleet.

Achieving each reduction goal is responsibility of different institutions like the Ministry of Communications and Transport, the Ministry of Energy, the National Commission for the Efficient Use of Energy, National Developments Banks, while the Ministry of Environment and Natural Resources only acts as the verifying entity of these reductions. Table 2 describes the role of the main institutions of the country involved in the subjects of transport and climate change.

<table>
<thead>
<tr>
<th>Federal level</th>
<th>Entity</th>
<th>Role</th>
</tr>
</thead>
</table>
|               | Ministry of Finance  
(\textit{Secretaria de Hacienda y Credito Publicos}) | Dictates fiscal policy (incentives, disincentives, etc.).  
Develops the financial operation rules of FONADIN. |
|               | Ministry of Commerce  
(\textit{Secretaría de Economía}) | Support the competitiveness of the different economic sectors. |
|               | Ministry of Environment and Natural Resources  
(\textit{Secretaría de Medio Ambiente y Recursos Naturales}) | Establish the regulations on mobile sources regarding air quality, climate change, noise, etc.  
Responsible for the climate change policies of the country. |
|               | Ministry of Energy  
(\textit{Secretaria de Energia}) | Establish regulations regarding quality of fuels and energy use. |
|               | National Commission for the Efficient Use of Energy  
(\textit{Comision del Uso Eficiente de la Energia}) | Promote energy efficiency and sustainable use of energy. |
|               | Ministry of Social Development  
(\textit{Secretaria de Desarrollo Social}) | Promote urban mobility projects, by establishing mechanisms for their operation, strengthening, restructuration and technical assistance. |
|               | BANOBRAS/FONADIN  
(\textit{Banco Nacional de Obras y Servicios Públicos}) | National development Bank that host that FONADIN.  
FONADIN: National fund for investment on infrastructure in the areas of communication, transport, water, tourism and environment. |
|               | NAFIN  
(\textit{Nacional Financiera}) | National development Bank that leads the scrapping program |
### Table 2 Public entities involved in transport and climate policy in Mexico

<table>
<thead>
<tr>
<th>State level</th>
<th>Entity</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State government</td>
<td>Planning and management of public services including public transport (there is a small number of states that manage this at a municipality level)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Municipal level</th>
<th>Entity</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Municipal government</td>
<td>Planning and management of public services including public transport</td>
</tr>
</tbody>
</table>

Although the Government has set important steps toward a low carbon development for Mexico through the PECC, targeted support through climate financing can help to foster these developments, e.g. with regard to transport cities need to build institutional capacity - strengthening planning units, establish transport management entities in order to move toward a more sustainable mobility. Schemes and tools need to be developed in order to support states and municipalities in these areas.

The next section will look at various transport activities and programs in Mexico and evaluate on how an internationally supported NAMA could help to expand, complement and/or accelerate the mitigation actions currently taking place.
3 Program Selection

As a starting point for the selection of a potential NAMA, we scoped for transport programs and activities which were reducing greenhouse gas emissions and had the potential to be structured as a NAMA. Potential sources for projects included federal and municipal programs and those of multilateral and development banks.

The next step was to evaluate these activities against a set of criteria. The main criterion was GHG mitigation potential. In addition, we considered the transformative nature of the action and feasibility criteria for converting the program into a NAMA (Local ownership, leverage of private investment as well as co-benefits).

3.1 NAMA Options

Five programs were pre-selected based on the criteria above. Table 2 shows this list. The possibilities ranged from specific projects (a BRT system in Mexicali) to national level vehicle energy-efficiency standards. This reflects the wide-range of options that would be eligible under the current negotiating texts. After some discussion, we narrowed our choices to the Federal Mass Transit Program (PROTRAM) and the Mexico City School Transport Program (PROTE). We felt that these had long-term potential to decrease GHG emissions, that they met our selection criteria, that there was strong interest and that there were enough studies to work from.

<table>
<thead>
<tr>
<th>Project name</th>
<th>Location</th>
<th>Description</th>
<th>Responsible Entities</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRT System</td>
<td>Mexicali, Baja</td>
<td>A BRT Corridor for Mexicali with a length of 19.4 km and 35 stops.</td>
<td>Municipal government</td>
<td>Several existing studies and data are available.</td>
</tr>
<tr>
<td></td>
<td>California Norte</td>
<td></td>
<td></td>
<td>Interest from stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Several existing studies and data.</td>
</tr>
<tr>
<td>PROTRAM</td>
<td>Federal program</td>
<td>Program within FONADIN of BANOBRAS financing mass transit projects within</td>
<td>BANOBRAS, Federal Government</td>
<td>Strong link to sustainable development.</td>
</tr>
<tr>
<td></td>
<td>for mass transit</td>
<td>Mexico</td>
<td></td>
<td>Mitigation goals included.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Highly scalable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Link to private sector.</td>
</tr>
<tr>
<td>School Transport</td>
<td>Mexico City (D.F.)</td>
<td>Program designed by the local government with the objective to reduce</td>
<td>Municipal Government</td>
<td>Several existing studies and data are available.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the emissions of private vehicles. The program applies to primary,</td>
<td></td>
<td>Interest from private sector and from government.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>elementary and high schools with more than 1000 students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard for Sustainable</td>
<td>National level</td>
<td>An Integrated and Sustainable Urban Development (DUIS, Desarrollo Urbano</td>
<td>Federal Government</td>
<td>Several existing studies and data are available.</td>
</tr>
<tr>
<td>Land Use Planning</td>
<td></td>
<td></td>
<td></td>
<td>Unclear on</td>
</tr>
</tbody>
</table>

A SUSTAINABLE ENERGY SUPPLY FOR EVERYONE

10-Jan-2012
3.1.1 PROTE

The School Transport Program (PROTE) is an initiative being piloted in Mexico City as a way to deal with traffic congestion. At the times when school starts and school ends for the 5,340 schools in Mexico City, as many as 25% of the vehicles circulating are parents taking their children to and from school. A study showed that, on average, each vehicle transports only 1.3 students (Secretaria del Medio Ambiente, 2011). The large number of vehicles contributes to traffic and causes disturbances in local neighbourhoods.

A school transport program was implemented by the government as a way to reduce traffic and emissions of air pollutants and CO₂. PROTE was introduced in 2009. It prohibits parents from dropping their children at school in private vehicles under most circumstances and makes it obligatory to enrol in private transport programs that bring children in school buses. The program will be deployed in five phases from 2009-2014 and will eventually cover all schools with more than 490 pupils (Secretaria del Medio Ambiente, 2011).

![Figure 6 Average improvements in local emissions from Phase I of PROTE](source_data)

In the first phase of the program, studies showed significant reductions in the annual emissions footprint of transporting students. The Ministry of Environment compared emissions attributed to five pilot schools over a year’s time. The study showed across-

### Table 3 List of pre-selected activities for a potential NAMA

<table>
<thead>
<tr>
<th>Energy efficiency standard</th>
<th>National level</th>
<th>Federal Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>The aim of the standard is to improve the energy efficiency of the new vehicles incorporating to the national fleet. The draft proposed standard as for an average of 16 Km/let for 2016.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>stakeholder interest for NAMA.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Several existing studies and data are available.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Very broad and hard to define boundaries for financing and MRV.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
the-board reductions in four air pollutants and CO$_2$ after the program was implemented (Figure 6).

While the program has been very effective at reducing emissions, it has faced strong opposition from parents who have resisted the requirement to enrol their children in a mandatory transport service. Parents have complained of the costs of the transport services and of the loss of their freedom to drive their children to school (Archundia, 2010). There is a strong lobby to get the program cancelled.

**3.1.2 PROTRAM/UTTP**

The Mexican Government launched the Federal Mass Transit Program (PROTRAM) in 2009 to help improve urban transport in Mexico. The program provides funds for investments in mass-transit infrastructure, particularly Bus Rapid Transit (BRT) lines. The funds originate from the National Infrastructure Fund (FONADIN in Spanish) and are managed by the National Works and Public Services Bank (BANOBRAS in Spanish).

PROTRAM promotes investments in mass transit through direct federal financial participation and provision of federal loans and guarantees. The program will partially support planning studies and infrastructure investments that incorporate private sector participation or have important environmental and social benefits.

In 2009, The Clean Technology Fund (CTF) and the IBRD provided a loan for USD 350 million to BANOBRAS to be used as a complement to PROTRAM for integrated mass transit projects. This loan was packaged to support a set of measures under a separate Urban Transport Transformation Project (UTTP) designed by the World Bank. The UTTP can finance projects which PROTRAM could not finance, for example complementary infrastructure like pedestrian and bicycle facilities and multimodal transfer stations (The World Bank, 2009).

The objectives of the UTTP include explicit climate elements. The project development objective is “to transform urban transport in Mexican Cities to a lower carbon growth path” and one of the key performance indicators to be used to measure overall project performance is “1.96 million tons of CO$_2$ emissions avoided per year once all the proposed investments enter into operation at $30$ dollars of CTF per ton” (The World Bank, 2009). Components for the UTTP are described in Table 4.

The World Bank picks up on the potential climate benefits of PROTRAM and includes measures to enhance the mitigation potential of the program. Investing in transfer stations, bicycle paths, public parking, etc. works synergistically with a BRT investment. It enhances the value of the BRT line for the user by making it more accessible and at the same time encourages wider adoption. This results in enhanced mitigation potential of the BRT line.
### Table 4 UTTP components (BIRF, 2010)

<table>
<thead>
<tr>
<th>Component</th>
<th>Action(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Institutional Strengthening</strong></td>
<td>Developing or updating Integral Plans for Sustainable Urban Mobility (PIMUS in Spanish) which incorporates actions for mitigating climate change.</td>
</tr>
<tr>
<td></td>
<td>Develop programs to modernize transit management and the efficient allocation of space for public and non-motorized transport.</td>
</tr>
<tr>
<td></td>
<td>Institutional strengthening of the institutions and agencies responsible for urban transport.</td>
</tr>
<tr>
<td></td>
<td>Capacity building of the staff of local authorities focused on planning, regulation, management, formulation and evaluation of transport projects and urban roads.</td>
</tr>
<tr>
<td><strong>2. Development of integrated transport systems to reduce CO₂ emissions.</strong></td>
<td>Develop integrated transport corridors.</td>
</tr>
<tr>
<td></td>
<td>- Design, construction and maintenance of trunk corridors and feeder roads.</td>
</tr>
<tr>
<td></td>
<td>- Construction of terminals, bus stations and transfer stations.</td>
</tr>
<tr>
<td></td>
<td>- Construction of roads with mixed traffic terminals adjacent to the corridor.</td>
</tr>
<tr>
<td></td>
<td>- Signalling, traffic lights and traffic control devices.</td>
</tr>
<tr>
<td></td>
<td>- Control centres, IT systems and ticketing and control systems.</td>
</tr>
<tr>
<td></td>
<td>- Environmental monitoring equipment</td>
</tr>
<tr>
<td></td>
<td>- Acquisitions of low emissions transport units.</td>
</tr>
<tr>
<td></td>
<td>Complimentary investments in low carbon transport.</td>
</tr>
<tr>
<td></td>
<td>- Design and construction of bike paths and facilities.</td>
</tr>
<tr>
<td></td>
<td>- Renewal of urban public spaces with sidewalks and pedestrian facilities.</td>
</tr>
<tr>
<td></td>
<td>- Facilities for universal access for public transport.</td>
</tr>
<tr>
<td></td>
<td>- Public parking and transfer stations.</td>
</tr>
<tr>
<td></td>
<td>- Urban densification plans.</td>
</tr>
<tr>
<td><strong>3. Acquisition of transport units with low-carbon technology and scrapping of old transport units.</strong></td>
<td>Up to 100% financing for low-carbon vehicles.</td>
</tr>
<tr>
<td></td>
<td>Scapping of old and highly polluting vehicles including, among other actions:</td>
</tr>
<tr>
<td></td>
<td>- Institution building for developing and adopting scrapping strategies</td>
</tr>
<tr>
<td></td>
<td>- Buying scapped units</td>
</tr>
<tr>
<td></td>
<td>- Financing for the scrapping process, including the collection, destruction, recycling and disposing of non-recyclable material.</td>
</tr>
</tbody>
</table>

Another aspect of the UTTP is the recognition that the private sector has an important role in bringing the large flows of funds needed to undertake mass-transit projects. For the UTTP, the World Bank has set as an objective to leverage an additional $1,825 million of investment from other public and private sources of financing, representing 82% of total cost (The World Bank, 2009).
For matters of simplicity, we considered PROTRAM and UTTP as a single entity when we considered the programs for a NAMA. They operate together, are managed by the same entity and are complementary programs. Thereafter we refer to them as PROTRAM/UTTP.

PROTRAM support to public entities or private investors

- Grants for planning studies of up to 50% of total cost.
- Grants for infrastructure investments of up to 50% of total investment
  - Private sector participation of at least 34%
- Recoverable support for investments (guarantees and subordinated debt)

UTTP credits to public entities or private investors (USD $350 M)

- Capacity building (US$10M)
- Credits for integrated mass transit corridors (US$216M)
- Credits for low carbon vehicles (US$111M)
- Credits for low-carbon vehicles
- Vehicle scrapping (US$13M)

Eligible Projects

- Cities with more than 500k inhabitants
- Integrated Public Transport Systems in:
  - 9 Metropolitan Areas of +1 Mill people.
  - 22 cities between 500k and 1 Mill

Technological Options

- Integrated transport solutions through:
  - Bus Rapid Transit (BRT)
  - Light rail and trams
  - Suburban trains and metros
  - Multimodal integration
  - Signaling, traffic lights and transit management

Figure 7 Structure and project eligibility of PROTRAM/UTTP

Source: Adapted from: (Mier y Teran, 2010) and (BIRF, 2010).

### 3.2 Selected NAMA

The final choice of a program was between the school transport program (PROTE) and the mass transit program (PROTRAM/UTTP). We thought that PROTE was an interesting concept against the background of NAMA development, but the resistance to the program was certainly a downside and a complex issue best resolved through the political process. This fell out of the scope of our work and increased risks to the project. PROTRAM/UTTP was eventually selected to take part in this study to explore the possibility of converting it into a NAMA. This decision was made in conjunction with stakeholders from BANOBRAS, the Mexican Environment Ministry (SEMARNAT) and Netherlands’ Ministry of Infrastructure and the Environment.

PROTRAM/UTTP have strong advantages which make them well-suited given our criteria. The World Bank and the Mexican Government have already spent significant resources in defining the programs and have well-defined measures targeted at the multifaceted barriers in Mexican mass-transit. These programs operate at the national level which
gives them significant scaling-up potential. In addition, PROTRAM is an integral part of Mexico’s special climate change program (PECC) which gives it a strong link to national and international climate policy. All these factors provide a good basis for using PROTRAM/UTTP as a basis for NAMA development.

Once a program for a NAMA had been identified and selected, the next step was to detail how the NAMA would be developed. We started the process by holding a stakeholder roundtable to gain more insights on PROTRAM/UTTP, inform stakeholders of the project as well as collect input from stakeholders.

### 3.3 Stakeholder roundtable

A roundtable was held with representatives from BANOBRAS, the Environment Ministry (SEMARNAT), the Finance Ministry (Hacienda) and other major stakeholders on November 25th, 2010. The roundtable offered an opportunity for stakeholders to learn about the latest developments in NAMAs, to gain a deeper understanding of the functioning of the programs and to identify gaps that could be filled with NAMA financing. The format of the roundtable was a participatory session which allowed participants to appraise needs through structured exercises and to contribute ideas on how the mitigation potential of PROTRAM/UTTP could be increased.

Some of the main findings of the roundtable included:

1. **Capacity-building is needed at two levels.** There are specific capacity building needs that could help the program function better. One need is at the local level. There are capacity constraints for making proposals for projects at the municipalities and Mexican states that apply for funds. A NAMA that would support pre-feasibility studies for transport projects could help more project ideas get off the ground, leveraging additional funds from PROTRAM/UTTP and removing a barrier to additional mitigation.

   Another need for capacity building is internal to PROTRAM. There are some capacity constraints in processing funding applications and support could be given in order to accelerate the processing of funding requests and speed-up the implementation of the program.

2. **Need new methodologies** to take into account co-benefits of transport projects like climate change, pollution reduction and social development when a financing decision is made. A better understanding of these contributions helps to justify the case for projects which have co-benefits outside of financial benefits.

3. **Need better coordination with other agencies.** There needs to be better coordination between local and federal agencies to develop integral transport plans.

4. **Incorporate new components** NAMAs could incorporate different technologies and fuels that are not economically feasible without a (supported) carbon component.
5. **Assure long term financing** The UTTP will expire in 2016 and this presents an impending problem because many important activities that complement PROTRAM are financed through it. A NAMA could continue financing the components of the UTTP program after it expires.

The workshop was very informative and helped to gain a deeper understanding of the functioning of the programs as well as to envision the activities that a NAMA could support. A summary of the workshop is included (in Spanish) in Appendix I.

After the workshop, we sought to examine how the NAMA could best contribute to increasing the mitigation potential of the existing program. The method we used was a barrier and gap analysis. By examining gaps and barriers, and evaluating how a supported NAMA could remove them, we assessed how it might enhance the mitigation potential of the program.

The barriers and gaps identified were:

- Long cycles and application processes.
- Capacity limitations of the regulatory body in processing applications for projects.
- Lack of coordination between federal, state and municipal authorities\(^3\).
- Not all technologies for green transit covered
- High barriers (financial and human resource) for small municipalities in drafting the PIMUS\(^4\) (Sustainable Integral Mobility Master Plan).

The next step was to assess how a NAMA might be structured to help overcome these barriers.

\(^3\) (Cervantes, 2010)

\(^4\) A completed PIMUS is a requirement to apply for financing under the program.
4 Detailed NAMA proposal

This section describes in detail the set of activities that are suggested as part of the NAMA. The activities are focused on those areas with the maximum impact on GHG mitigation. The objectives and details of the NAMA were designed based on the outcomes of the stakeholder workshop and discussions with PROTRAM and the Environment Ministry (SEMARNAT).

4.1 Objective

The NAMA has two objectives. The medium term objective is to provide complementary support to PROTRAM/UTTP by financing capacity building and the development of assessment methodologies. It is expected that this will enable PROTRAM/UTTP to widen its reach and speed-up mitigation actions that are already taking place. The long term objective is to ensure the continuity of the programs with long-term climate funds that go beyond the expiration period of UTTP in 2016. These funds will allow the activities that are being carried out through the UTTP to continue as long as they contribute to GHG mitigation.

International donors can invest in this NAMA through different financing windows which will be connected to specific MRV components. There is a medium-term window which focuses on capacity building and methodology development. Funding is needed in the amount of 30 million USD to undertake capacity building activities in up to 20 municipalities and for the development of methodologies assessing co-benefits of urban transport projects. There is also a long term window to finance the continuation of the UTTP after 2016. The total amount needed for this is USD$350 million.

The components being proposed for the NAMA are listed in Table 5 and further explained below.
### 4.2 Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Action(s)</th>
<th>Phase</th>
<th>Status of Financing</th>
<th>Responsible institution(s)</th>
</tr>
</thead>
</table>
| **Capacity building** | **On-the-ground capacity building**  
- Identification of projects at the local level  
- Capacity building to enable municipalities to develop Integrated Sustainable Mobility Master Plans  
- Identification of projects at the local level  
- Capacity building to enable municipalities to develop Integrated Sustainable Mobility Master Plans | 2012-2016 for cities which are not be currently covered  
2016-2020 to replace UTTP funds | (Some) Financing through UTTP, until 2016 | IMPLANES estatales (State-level urban planning institutes), FONADIN |
| | Internal:  
- Creation of mechanisms/processes to improve the execution of projects  
- Internal capacity development to accelerate the evaluation and implementation of projects  
- Development of guidelines for the processing of funds  
- Improvement of institutional coordination to enable the development of integrated transport plans | 2012-2020 | Not funded | FONADIN, SCT, Hacienda |
| | Methodology development  
(Requested USD$ 10 million)  
- Development of general methodologies (project evaluation, processing of funds)  
- Development of specific methodologies that focus on externalities (cost-benefit analysis, health and environmental impact assessment) | 2012-2016 | Not funded | FONADIN, SEMARNAT, SEDESOL |
| | **Integrated transport systems**  
(Requested USD$ 350 million)  
- Development of an integrated mass transit corridors (BRT+)  
- Multimodal integration  
- Low-carbon technologies  
- Vehicle scrapping | 2016-2030 | Without funding from 2016 onwards | FONADIN (Involucramiento de SCT, SEMARNAT, SHCP, BANOBRAS) |

Table 5 Components of the NAMA
4.2.1 Costs

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost to be covered by international (climate) support</th>
<th>Type of financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of cost-efficient measures</td>
<td>Full cost (USD Millions)</td>
<td>Grant</td>
</tr>
<tr>
<td>Capacity building</td>
<td>20</td>
<td>X</td>
</tr>
<tr>
<td>Methodology development</td>
<td>10</td>
<td>X</td>
</tr>
<tr>
<td>Securing long-term finance</td>
<td>340</td>
<td>X</td>
</tr>
</tbody>
</table>

4.3 Type of instrument

The instrument considered for financing this NAMAs is a “supported NAMA” which seeks direct contributions of international climate finance either through grants or loans. One or more supported NAMAs could be established to undertake the activities in this proposal.

Another possibility is a credited NAMA where activities that are appropriate could be used to generate carbon credits and sold in the carbon market. In general, these activities are those that lead to direct emissions impacts such as BRT line construction. BRT line construction already has methodologies that have been approved by the Executive Board of the CDM. The Mexican Government is pursuing this possibility by structuring a Programme of Activities (POA) to generate carbon credits from BRT projects under PROTRAM. This is expected to be finalized in 2012.

The infancy of discussions of market-based mechanisms and the uncertainties regarding the continuation of carbon markets after the Kyoto Protocol calls for considering multiple options. This proposal focuses on a supported NAMA as a way to provide an alternative for financing if a crediting approach is not available. In addition, structuring the project as a supported NAMA allows the consideration of activities that would not qualify under the strict accounting required for the carbon market. These are much-needed activities like capacity building which mainly have indirect GHG impacts.

4.4 Detailed actions

This NAMA proposal consists of three main components:

1. Capacity-building
2. Development of assessment methodologies
3. Integrated transport systems

The first two components will support PROTRAM/UTTP in the medium term and help achieve greater GHG reductions by leveraging activities already taking place. They would also prepare PROTRAM to receive larger-scale climate funds in the future by instituting new capacities and MRV methods that would be prerequisites for large-scale NAMA financing.
The third component will allow donors to contribute funds on a larger scale after the year 2016 when the funding of the World Bank’s UTTP expires. These funds would support the continuation of activities already present in the UTTP. We believe that the UTTP program could become a NAMA with some minor modifications, mainly to enable monitoring, reporting and verification on an international basis. Long-term financing within the same structures as UTTP has many advantages due to the fact that the program is already running and there is solid experience with its implementation.

4.4.1 Component 1: Capacity building

Capacity building focuses on removing obstacles and increasing the capacities of the home country’s people and institutions to tackle climate change. Capacity building can improve the mitigation potential of PROTRAM by helping the program function more effectively and by expanding participation in the program.

Our research showed that capacity building is needed in two areas. One is “on-the-ground” to help the states and municipalities that are eligible to apply for funds under the program identify their needs and undertake sustainable mobility planning. It is also needed within PROTRAM to develop the human resources needed to process and evaluate mitigation projects. A NAMA could support these activities and contribute to enhanced GHG mitigation. The funding requested for undertaking these activities is USD$20 million.

On-the-ground capacity building

The NAMA would provide funds to support municipalities and states in the development of transport research studies and project proposals and to undertake Integrated Sustainable Mobility Master Plans (PIMUS in Spanish). The PIMUS is a study that is a prerequisite to applying for funds for PROTRAM. The document frames overall transport policy and provides a comprehensive approach to transport planning at the city level.

The PIMUS can present a barrier to applying for funds because it requires a sizable initial investment by the municipality to complete it. Another issue might be that there is not enough local knowledge to carry out the study. The NAMA can finance these studies in cities which do not have one and which have not received financing. By financing the PIMUS in more municipalities and providing expert support we hope to increase the utilization of funds from the program, improve the quality of project proposals and ultimately contribute to mitigation of greenhouse gas emissions.

It is expected that this NAMA can finance the PIMUS and provide expert guidance in 11 to 20 municipalities. The cities where funds could potentially be used are listed below. PROTRAM has already provided resources for some cities to undertake a PIMUS but in these cities, resources are still missing. These cities have seen continued growth in population and automobile use, making them good candidates for the program.

- Morelia
- Toluca
- San Luis Potosí

- Merida
- Durango
- Torreon

10-Jan-2012
Activities would be carried out by local institutions including urban planning institutes and state universities. These activities should lead directly to new proposals for funding under PROTRAM/UTTP.

**PROTRAM (internal capacity building)**
The planned activities seek to strengthen capacities within PROTRAM, including supporting human resources and the improvement of internal processes to evaluate projects.

The funding requested will be used to optimize the project evaluation process of PROTRAM. NAMA financing will be used to hire and train additional staff to shorten the project evaluation period and accelerate the disbursement of funds. Timing is important in transport mitigation projects as transport stock has long lifetimes and thus a high potential for technological lock-in. Improvements that can be made in speeding up the deployment of low-carbon technologies would be beneficial.

### 4.4.2 Component 2: Methodology improvement

It is recognized that the notion of externalities should play a bigger role in project evaluation in PROTRAM but the methodology to do so is lacking. New methodologies can help understand the economic, social and environmental impacts of mass transit projects. At the moment, there is a very limited ability to quantify these impacts. PROTRAM only evaluates one type of co-benefit: time savings. There is no formal consideration of social or environmental aspects. Financial decisions in the program need to take into account co-benefits like air pollution, road safety and climate change. Based on the above, the NAMA could finance the development and integration of a series of methodologies that cover the social benefits of transport projects. Some of the methodologies that could be developed in this NAMA are:

- Baseline methodology for social and environmental aspects (air quality, road safety, climate change).
- Methodology for criteria air pollutants and health: for improvements in air quality due to a new mass transit system, quantification of emissions, as well as for the impacts on health due to the reduction in air pollutants concentration.
- Methodology for GHG mitigation: measurement, reporting and verification methodology (MRV) to quantify the mitigation potential of the mass transit system.

The benefit of methodology development is that it will increase the understanding of the impacts of transport projects on GHG emissions, economic development and the environment. It will also help more beneficial projects move forward and show the true costs of transport alternatives. Having a clear picture of benefits and costs allows for a more efficient allocation of funds.
4.4.3 Component 3: Long-term financing of UTTP

The UTTP provides complementary support to PROTRAM and allocates funds for undertaking integration activities with mass transit projects. These funds will expire in 2016 and there will not be an option to continue its activities under the current funding structure. NAMA funding will be used to give continuity to UTTP activities focused on:

- Development of integrated mass transit corridors (BRT)
- Multimodal integration
- Low-carbon technologies
- Vehicle scrapping

The UTTP has many advantages due to the fact that the program is already running and there is strong experience with its implementation. Therefore, we would suggest keeping the existing structure of the program and providing additional support for the period 2016 to 2030. Support is needed in the amount of USD $350 million. By 2030, this is expected to lead to the construction of 320 km of new BRT lines with 2280 buses and 15,500 million passenger trips. Besides construction of new BRT lines, funds will be used to incorporate integral features not financed by PROTRAM like feeder roads, bicycle lanes, multimodal stations, etc.

Scraping of old buses would also be supported with these funds. Currently, the UTTP has allocated USD$13 million to scrap vehicles in the systems financed by PROTRAM. We propose an additional sum of USD $25 million to be allocated to finance scrapping. Estimations show that this is enough to scrap 3000 buses assuming a scrapping cost per vehicle of 7100 dollars.

4.4.4 Benefits

Calculations for GHG reductions are based on projections from the Centre for Sustainable Transport (CTS Mexico). It was calculated that for the requested amount of USD$ 350 million, 320km of BRT lines can be built by 2030. This leads to 6.4 MtCO$_2$ reduced in the period of 2016-2030. The emissions benefits of capacity building and methodology development are indirect and have not been quantified.

<table>
<thead>
<tr>
<th>Emissions reductions</th>
<th>Main Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,415,705.86 tCO$_2$ (6.4 MtCO$_2$)</td>
<td>- 320 km of BRT lines built with 2280 buses working at the end of 2030 and 15,500 millions of passengers transported in the 15 year period</td>
</tr>
<tr>
<td></td>
<td>- Diesel bus technology with emissions of 1.901 kgCO$_2$eq/km</td>
</tr>
<tr>
<td></td>
<td>- Annual travel per bus of 70,200 km</td>
</tr>
<tr>
<td></td>
<td>- 9.5 passenger boardings per Bus-km and average occupation per bus of 100 passengers of which 15% would use private cars and 85% traditional public transportation if the BRT system wasn't available.</td>
</tr>
</tbody>
</table>
Additional assumptions:

- Kilometres travelled per BRT bus 192 km/day: based on data from the Instituto Mexicano del Petroleo (IMP)
- Emissions per BRT bus per km 1.90079276 kgCO2eq/km: Calculated by CTS and based on (Sanchez Catano et al., 2009).
- Passengers per km-bus 9.5. This is the average for Optibus, Macrobus y Metrobus (in 2009) according to (Hidalgo & Carrigan, 2010).
- Passengers/day per kilometre of line 13,012.31: This is the average of 12 cities according to (Hidalgo & Carrigan, 2010).

There are additional benefits of BRT line construction which have not been quantified. These include:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>• Reduced travel times</td>
</tr>
<tr>
<td></td>
<td>• More reliable product deliveries</td>
</tr>
<tr>
<td></td>
<td>• Increased economic productivity</td>
</tr>
<tr>
<td></td>
<td>• Increased employment</td>
</tr>
<tr>
<td></td>
<td>• Improved work conditions</td>
</tr>
<tr>
<td>Social</td>
<td>• More equitable access throughout the city</td>
</tr>
<tr>
<td></td>
<td>• Reduced accidents and injuries</td>
</tr>
<tr>
<td></td>
<td>• Increased civic pride and sense of community</td>
</tr>
<tr>
<td>Environmental</td>
<td>• Reduced emissions of air pollutants</td>
</tr>
<tr>
<td></td>
<td>• Reduced noise</td>
</tr>
<tr>
<td>Urban form</td>
<td>• More sustainable urban form, including densification along major corridors.</td>
</tr>
<tr>
<td></td>
<td>• Reduced cost of delivering services such as electricity, water and sanitation.</td>
</tr>
</tbody>
</table>

Source: (INE, 2006)
5 MRV Framework

According to international climate agreements, supported NAMAs will be “subject to international measurement, reporting and verification (MRV) in accordance with guidelines adopted by the Conference of the Parties” (COP13, 2007). So far, an international MRV framework has not yet emerged from the negotiations. There are no agreed-upon guidelines and many basic questions remain.

Against this background, we assume a certain framework to evaluate performance of the PROTRAM NAMA along two dimensions: GHG impacts (direct and indirect) and co-benefits. At the same time, project implementation would be monitored on an ongoing basis according to specific milestones for the project and other performance criteria which can be defined at a later stage.

GHG impacts and co-benefits would be monitored based on pre-defined indicators. The aim is to conduct an integral assessment within a flexible framework which permits monitoring activities that result in direct and indirect GHG impacts as well as the social, economic and environmental impacts of transport projects.

In the following, we present a framework for measurement, reporting and verification. The sections are subdivided according to the components of the NAMA. Indicators for each of the dimensions monitored will be presented.

Measurement would involve taking stock of indicators mentioned in this framework. Measurement, Reporting and Verification (MRV) should not place too high of an administrative burden on developing countries. Data should be made available publicly and transparently. It is still unclear how MRV of NAMAs as described here will relate to the discussion on MRV (e.g. International consultation and analysis, ICA) currently taking place within the UNFCCC negotiations.
5.1 Component 1 and 2 - capacity building and methodology development

5.1.1 GHG impacts

The first two components of the NAMA are evaluated together because they share the characteristic that they will mostly have indirect impacts on greenhouse gas mitigation. Indirect impacts may be large but they cannot be measured easily for a variety of reasons. An example is capacity building of city planners in sustainable mass transit. Undertaking this activity can lead to better planning for mass transit which can lead to decreases in GHG emissions. However, the impact of this cannot be measured directly for two reasons:

1. *The cause-and-effect relationship is not clear.* How can the actions of the city planners be attributed to the capacity building they received?
2. *The project boundary cannot be defined in time or in space.*

These factors limit our abilities to make a quantified assessment of GHG emissions for this type of impact of the NAMA.

An alternative is to use proxies. Proxy indicators are used to represent a phenomena or condition for which data cannot be collected. An example of a proxy indicator is the number of people trained. By counting the number of people trained, we have an (imperfect) indication of the influence of our program. It can be reasonably expected that training more people will lead to better planning which will lead to reduced CO$_2$ emissions. However, this is not entirely certain and it should be assessed with care. When using proxy indicators, the rationale as well as the main assumptions and risks should be made clear.

Capacity building and methodology development will result in GHG impacts with unclear boundaries in time and space and uncertain cause-and-effect relationships. Therefore, for the purposes of this NAMA, proxy indicators should be used to assess GHG impacts.

We provide an initial assessment of the types of indicators that could be used. They are listed in the table below organized by component. The indicators were selected based on the assumptions listed.

<table>
<thead>
<tr>
<th>Component</th>
<th>MRVable outcome/output indicator</th>
<th>Assumptions and risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity building</td>
<td>• Number of cities with PIMUS&lt;br&gt;• Number of city planners trained to develop PIMUS (Sustainable Integral Mobility Master Plan)</td>
<td>The assumption is that cities with PIMUS will apply to PROTRAM and introduce sustainable mass transport measures.&lt;br&gt;The risk is that this correlation does not apply and that measures are not implemented leading to less impact on GHG emissions.</td>
</tr>
</tbody>
</table>
Not all of the indicators are equally weighted. Depending on the needs of the donor and recipients, weighting can be adjusted for each indicator and a composite score calculated.

The other dimensions we consider are the social, economic and environmental co-impacts of transport projects. These are often high as transportation is central to the functioning of a city and the economic activities within it. The co-benefits of a NAMA should be aligned with the sustainable development goals of a country.

### 5.1.2 Co-benefits

Table 7 Co-benefit indicators from capacity building and methodology development

<table>
<thead>
<tr>
<th>Type of indicator</th>
<th>Indicator</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Number of city planners trained to develop PIMUS (Sustainable Integral Mobility Master Plan)</td>
<td>Building capacities in sustainable transport may bring additional benefits to city planners in terms of career and economic opportunities.</td>
</tr>
<tr>
<td>Social</td>
<td>Number of city planners trained to develop PIMUS (Sustainable Integral Mobility Master Plan)</td>
<td>Methodologies can be published and contributed to other regions and countries undertaking transport NAMAs.</td>
</tr>
<tr>
<td></td>
<td>Methodologies distributed and applied to transport projects in other countries</td>
<td></td>
</tr>
</tbody>
</table>
5.2 Component 3: Integrated Transport Systems

Next we review the MRV framework for Integrated Transport Systems. The aim of this component is to support:

- The construction of 300km of BRT Lines
- Scrapping 3000 old and inefficient buses
- Low carbon bus technologies
- Integration of BRT lines with other modes of transport i.e. Bicycle paths, feeder roads.

Integrated Transport Systems would receive the largest share of financing with this NAMA. Activities could be measured, reported and verified according to the framework below.

5.2.1 GHG Impacts

Projects within this component will mostly have direct impacts on GHG emissions. Direct impacts occur within the project boundary and can be measured quantitatively.

The largest block of financing will be used for constructing 320 km of new BRT lines and for scrapping 3000 buses as part of integrated transport systems in Mexican cities. The impact of these activities can be assessed using standard methodologies. There are several options. One is to apply methodologies at the project level like what is done with the Clean Development Mechanism. There are two existing methodologies which would be applicable listed in Table 8. These methodologies have been approved by the CDM Executive Board and have already been applied to projects.

Table 8 Methodologies to measure GHG impacts of integrated transport systems

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Methodology for Bus Rapid Transit Projects (AM0031).</td>
<td>The methodology is applicable to project activities that reduce emissions through the construction and operation of a Bus Rapid Transit (BRT) system for urban road based transport. The methodology is also applicable for extensions or expansions of existing BRT systems (adding new routes and lines).</td>
</tr>
</tbody>
</table>
This methodology applies to project activities that establish and operate a rail-based MRTS or segregated bus lanes in urban or suburban regions, including BRTs.

For BRTs with feeder plus trunk routes the methodology AM0031 is recommended as AM0031 is for BRTs where passengers can realize their entire trip on the project system. BRTs without feeder lines (i.e. passengers realize their trip partially on the project system and partially on conventional buses) cannot use AM0031 but can use this methodology.

The choice is based on the specifics of the project. **AM0031** is used when passengers use the BRT line exclusively and realize their entire trip on the project system. **ACM0016** is used when passengers use the BRT system as part of an integrated transport system and combine travel with other forms of transport like conventional buses.

CDM methodologies provide a framework for the evaluation of BRT projects. However, the CDM has had limited success in the transport sector. Part of the reason was the complexity of methodology implementation to transport systems. NAMAs are not necessarily focused on crediting which would allow for a simpler approach to MRV. This should be considered in the case of NAMAs. With regard to the approach used for GHG impact estimation, a balance will have to be struck between the effort to estimate the GHG impact and the accuracy needed in estimating this impact for NAMAs.

### 5.2.2 Co-benefits

Indicators that can be used for the component of integrated transport systems are listed in Table 9

<table>
<thead>
<tr>
<th>Type of indicator</th>
<th>Indicator</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Economic          | • Change in property values in surrounding areas after BRT line construction.  
                   • Changes in travel times  
                   • Employment and job creation | It has been observed that new BRT lines have a positive impact on the property values of surrounding neighbourhoods. |
| Social            | • Number of passengers  
                   • Number of BRT lines constructed  
                   • Quality of service compared to baseline  
                   • Changes in accidents and injuries | The social aspect of transport projects is very important. Improvements in transport systems directly benefit the population. |
The projects planned in this NAMA have the potential to provide significant co-benefits to Mexican cities. This potential is one of the key reasons why the NAMA monitoring framework should look at this impact closely.

Indicators have been presented which address the “measurement” part of MRV. Details for reporting and verification will have to be agreed-upon by donors and recipients in light of the advances on this topic at the UNFCCC.
6 Lessons learned

NAMAs are new mechanisms under the international climate policy negotiations with procedures and guidelines yet to be defined. Current NAMA activities within countries are based on learning-by-doing with the aim to support the development of a NAMA framework at the international level. Therefore, one of the objectives of this project was to gather lessons learned and feed them back to the UNFCCC process. This chapter shares some of these lessons.

6.1 On project/program selection

This project required selecting an ongoing initiative for a NAMA. This was challenging in the sense that there was a need to fit a project to a NAMA rather than starting from scratch with the objectives of it in mind. Doing this would require reorienting existing objectives and introducing new requirements like MRV.

The NAMA would need to be designed to ensure that it interfered with the existing program as little as possible but still fulfilled basic requirements. Project developers are used to dealing with a certain set of variables like prices and interest rates. Introducing a new variable like CO₂ emissions accounting requires a shift in thinking. We tried to reduce overlap as much as possible and simplified the activities to reduce the risk that by introducing new components and MRV requirements, the NAMA would further complicate the project cycle and this would act to the detriment of the program.

6.2 Stakeholder engagement and ownership

Another important aspect in the selection process is the engagement and ownership of stakeholders in the selection of the NAMA to be financed.

There are different roles and different interests amongst stakeholders. Stakeholder workshops can help align these interests around a common cause and encourage collaboration and negotiation on contentious issues. It is important that a NAMA development process is transparent and inclusive. One of the main questions that should be asked when undertaking a project is who will make the decision on the NAMA and/or components that will be financed. To avoid conflicts, the selection process should be clear from the beginning and the parties responsible for making the selection identified and communicated to stakeholders.

Ownership at every step of NAMA development is important in achieving the momentum to bring a NAMA to implementation. Ownership is achieved when the local party makes the choices, leads the action and takes responsibility for the success of the NAMA. Ownership takes time and is a process rather than an end-result.

Ownership is especially difficult with NAMAs at this point of time, partially because the mechanism is quite removed from the normal workings of governments both for donor and recipient countries. A lot of work needs to be spent communicating with institutions about NAMAs, the current status of climate policy and the ambiguities still present in the
international climate negotiations. Partner institutions who are not accustomed to dealing with (international) climate issues can be reluctant to invest the time and effort necessary to take ownership of a NAMA. However, we have seen that there is a great interest in NAMAs in developing countries and over the course of this project we saw the topic gain prominence in the country.

6.3 Boundary issues

A clear boundary is important to measure the impact of a given intervention. Ideally the boundary of the selected NAMA should be well demarcated but in practice this is not often the case.

PROTRAM presented many challenges in this respect. From the beginning, the program, was designed so that interventions would be integral in nature. The urban transport sector should be viewed as a system of interacting components and activities financed should fit within a larger scheme. This is evident in the requirement that all applicant cities to PROTRAM submit a document known as an “Integral Plan for Sustainable Urban Mobility” (PIMUS in Spanish) as a precondition to apply for financing.

The integral nature of existing programs turned out to be a challenge as boundaries become blurry. Take the example of capacity building. A component of the NAMA is to provide additional funds for capacity building in municipalities that enabled them to complete the PIMUS and become eligible for financing from PROTRAM. The reasoning being that by removing this barrier, it would increase the reach of the program and accelerate mitigation activities. However, the boundary issue eventually became a contentious point. Clearly, the benefits of such a component in the NAMA would only exist in conjunction with PROTRAM. There was also the fact that one is a unilateral component (PROTRAM) combined with international NAMA financing. Allocating the benefits of each and the contribution of each component to mitigation would be very difficult. A boundary could not be determined.

This highlights the need for a flexible MRV approach for NAMAs. Eligibility should include activities that have indirect impacts to mitigation and unclear boundaries.

6.4 MRV

There is still a lack of clarity in the climate negotiations regarding MRV of NAMAs. This void leaves much uncertainty on how to move forward. One option is to approach MRV with carbon market logic, and borrow methods from the Clean Development Mechanism. This is possible with direct emission reductions, for example the construction of one BRT line. Nonetheless, there are particular challenges when MRVing programs. NAMAs can include activities with indirect impacts (e.g. capacity building) that are not easy to measure. A capacity building program in urban planning and a new fund for financing clean mass-transit investments are complementary activities. However, the impacts of each cannot be measured as the benefits of one would not exist without the other.

So far, there has been a focus on direct, short-term GHG reductions in the MRV of NAMAs which may exclude supporting transformational activities that have large but mostly
indirect impacts. We recommend that proxy indicators for GHG emissions, indirect GHG effects and transitional impacts be included in the MRV framework.

Without more guidance on how to approach these issues, it is very difficult to determine the types of activities that would qualify for NAMA financing. The process of how these reductions come about is also important, and the MRV framework should not only take account of the outcomes but also there should be indicators for the quality of implementation of programs. In this sense, we think that big strides could be made by learning from existing tools in mature fields like official development assistance (ODA).

6.5 Need to make NAMA finance tangible

NAMA finance is far from being tangible. Significant sums have been pledged in the international climate negotiations. However, the majority of this money is not yet available.

Of the donors that are actively funding NAMAs, requirements and guidelines are still not complete as they await the outcomes of negotiations. There is little guidance on the types of activities that would be eligible for NAMA financing. Thus, much of the work going on at this time is at the pilot stage and there is significant uncertainty over the large flows of funds that are needed to make a sizeable impact on GHG emissions.

At the same time, the people of the ground that will be implementing mitigation projects and programmes have difficulty understanding the uncertainty, ambiguity and abstractness of the negotiations and the NAMA mechanism. When we consulted with stakeholders regarding this, we were often asked questions like: "At what interest rate are you offering loans?" Decision makers are reluctant to spend time to make (concrete) proposals for NAMA funding unless financing becomes more concrete. At the same time, funders want concrete proposals before they will start financing NAMAs. This is a barrier that must be overcome.

While the international NAMA framework is still developing, provision of funding for pilot NAMA activities via bilateral and multilateral channels will make NAMA financing more tangible and will be able to provide opportunities for developing countries to gain experience with this new mechanism.
7 Conclusions

This project framed a NAMA proposal for the Federal Mass Transit Program in Mexico (PROTRAM). A PROTRAM NAMA has the potential to make a significant contribution towards reducing GHG emissions in Mexico while providing substantial co-benefits. There is a clear need for financing and the local institutions and partners are there to deploy the funds. This makes a PROTRAM NAMA a strong candidate for financing.

The next step would be for PROTRAM and SEMARNAT to make a proposal for international financing based on input from this project. Although, the Green Climate Fund is not yet operational, there are existing bilateral and multilateral channels that have made funds available for NAMAs which could be explored.

The international discussions on NAMAs need to quickly advance in order for this and other projects to move towards implementation. Over the past year, the framework for NAMAs has become more concrete and more countries are moving towards drafting financing proposals. However, there are still some key questions that remain unsolved before NAMAs can be implemented on a wider scale, most notably:

- Financing – What are the institutions and instruments that will be used to deliver climate financing?
- What share can be covered by international climate financing and what should be covered by other sources?
- MRV – More guidance on the level of MRV is needed in order to define concrete proposals. The MRV framework has a lot of impact on the activities that can be proposed.

In this context, PROTRAM could work with funders to define answers and specify the options available to move towards financing and implementation. Much of the institutional structure is already present for a PROTRAM NAMA. Implementing the components specified in this report would make a sizeable contribution in reducing Mexico’s GHG footprint and at the same time, improving the environment and the quality of life of its citizens.
8 Reference sources


Appendix I: Conclusiones del taller “Acciones Nacionales Apropiadas de Mitigación en el Transporte Masivo en México”

9.1 Objetivo
Generar la discusión entre los actores relevantes, de las oportunidades de las Acciones Nacionales Apropiadas de Mitigación (NAMAs) en el transporte masivo en México y facilitar la selección de una NAMA para complementar el Programa de Transporte Masivo (PROTRAM).

9.2 Resultados del Taller
El taller presentó antecedentes sobre los conceptos de las NAMAs y sobre el Programa de Transporte Masivo, para posteriormente pasar a la discusión de cuál podría ser una posible NAMA que complemente al programa actual. Como parte de la dinámica del taller se generaron tres grupos de trabajo que buscaron identificar los componentes de esta NAMA.

9.2.1 Grupos de trabajo
Se crearon tres grupos de trabajo donde los participantes identificaron puntos importantes sobre el PROTRAM y llenaran una plantilla, previamente desarrollada por ECOFYS, la que permitió identificar elementos importantes para la definición de una NAMA. Los puntos relevantes identificados en la dinámica fueron los siguientes:

1. **Capacitación a dos niveles.** Uno a nivel local, dentro de municipios y estados que no tienen la capacidad para hacer propuestas de proyectos concretas, esto traería una mejor planeación e identificación de proyectos. El segundo nivel sería dentro del PROTRAM con el objeto que mejorar la capacidad de evaluar y aprobar proyectos.

2. **Coordinación de instituciones y procesos.** Se requiere mejor comunicación entre las instituciones locales y federales para desarrollar planes integrales de transporte.

3. **Metodologías.** Desarrollar nuevas metodologías para tomar en cuenta beneficios fuera de los que sean estrictamente económicos. Por ejemplo beneficios ambientales y sociales.

4. **Incorporar otros componentes.** Por ejemplo, hay requerimientos para reestructurar rutas y alimentadoras que no están incluidas en PROTRAM. Otro componente podría ser el uso de otro tipo de combustibles o tecnologías que ayuden en la disminución de los niveles de emisiones de los autobuses.

9.3 Componentes de la NAMA
La dinámica busca también identificar los posibles componentes de la NAMA, los componentes propuestos se enlistan a continuación.

1. **Apoyos en capacitación**
   a. Apoyar estudios de pre-factibilidad de proyectos a nivel local.
b. Crear planes integrales de movilidad sustentable
c. Mejorar el proceso y capacidades para evaluar proyectos en PROTRAM.
d. Desarrollo de metodologías generales y específicas, entre ellas las de evaluación ambiental.
e. Aprovechar las estructuras existentes a nivel local para la capacitación, como serían los instituto de planeación urbana municipal, observatorios y agencias HABITAT. Con el fin de crear capacidades locales.
f. Análisis de barreras (legales, normativas, etc.)

2. Apoyos para equipo
   a. Autobuses híbridos
   b. Otros combustibles con mayor rendimiento ambiental
   c. Renovación de flotas/chatarrización

3. Reestructuración de rutas

4. Sistemas de transporte a largo plazo
   a. Innovación y desarrollo de tecnología

9.3.1 Otros puntos discutidos

Durante la discusión se hizo la observación que los apoyos monetarios que se reciban por las NAMA deben de ser medidos, reportados y verificados. Estos procesos deben de ser lo más simples posible, lo que nos permite pensar en algún tipo de indicador. La metodología tiene que ser robusta pero no tan compleja como la del MDL.

9.4 Recomendaciones para generar una NAMA

Una de las conclusiones del taller se relaciona con el desafío que PROTRAM enfrenta a corto plazo, ya que necesita utilizar los fondos existentes (PROTRAM y PTTU) de una manera eficiente y con la suficiente rapidez. Adquirir nuevos fondos para la ejecución de los proyectos integrados de transporte masivo sería relevante una vez que la capacidad y los problemas estructurales de PROTRAM se hayan abordado. Por lo tanto, recomendamos los siguientes pasos (en el orden respectivo).

a. Crear los mecanismos necesarios dentro del PROTRAM para ampliar su alcance.
b. Desarrollar capacidades a nivel local.
c. Adicionar fondos climáticos para apoyar la ejecución de proyectos integrales (a futuro, extender el PROTRAM).

Los dos primeros puntos serian requisitos para preparar al PROTRAM hacia un futuro de financiamiento climático. El tercer punto es más que nada un reto a largo plazo que dependería en la disponibilidad de fondos climáticos.

La discusión generada en el taller y el análisis respecto a las propuestas de los participantes, nos lleva a proponer que los posibles componentes de una NAMA de vía de rápido acceso podrían ser los descritos en la siguiente figura:
Figure 1: Posibles componentes de un NAMA

A continuación se describen de manera breve los elementos dentro del recuadro amarillo de la figura:
9.4.1 Mejorar los procedimientos y desarrollar metodologías:

Este componente podría incluir acciones como:
- Mejorar los procesos de evaluación de proyectos.
- Integrar normas de financiamiento de NAMAs en el manual de operación de PTTU
- Desarrollar metodologías (por ejemplo, análisis de costo-beneficio, MRV de los proyectos, incluyendo los aspectos relacionados con cambio climático)

9.4.2 Adaptar la estructura de PROTRAM/PTTU:

Este componente tiene una perspectiva a mediano plazo y puede incluir acciones como:
- Establecer una estructura que permita la integración del PROTRAM, PTTU y otras posibles fuentes de financiamiento en el futuro.
- Elaborar normas para incluir otros elementos en el PROTRAM (e.g. optimización de rutas, combustibles con menor contenido de carbono, etc.) y su integración en la nueva estructura de PROTRAM.
- Mejorar la coordinación entre las entidades.

Estas acciones se deberán definir en cooperación con PROTRAM y otros actores relevantes.

9.5 Próximos Pasos

1. Obtener retroalimentación sobre estas recomendaciones por parte de SEMARNAT y PROTRAM.
2. Con base en sus recomendaciones elegir el componente adecuado y preparar una propuesta básica de NAMA.
3. De estar interesados tanto PROTRAM como SEMARNAT en llevar al proyecto hacia su instrumentación, se exploraría la posibilidad de hacer propuesta para recaudar fondos de vía rápida (fast-track) que permitan la implementación de dicha NAMA.
## Appendix II Workshop agenda

“Acciones Nacionales Apropiadas de Mitigación en el Transporte Masivo en México” - Taller Técnico, Jueves 25 de Noviembre del 2010

**Objetivo del taller:** Generar la discusión entre actores relevantes de las oportunidades de las Acciones Nacionales Apropiadas de Mitigación (NAMAs) en el transporte masivo en México y facilitar la selección de una NAMA para complementar el Programa de Transporte Masivo (PROTRAM).

**Audencia:** Las Secretarías y tomadores de decisiones involucrados en el PROTRAM y en el Proyecto de Transformación del Transporte Urbano (PTTU), así como otros actores relevantes.

**Estructura y duración:** El taller es un evento de medio día y constará de dos partes. La primera de ellas estará enfocada al desarrollo de conceptos básicos de las NAMAs y de Mecanismo para un Desarrollo Limpio (MDL). La segunda de ellas será una sesión de participación donde los actores seleccionarán una de varias opciones para ser desarrollada en una propuesta completa de NAMA. El trabajo realizado en el taller será presentado en un evento paralelo en Cancún durante la COP 16.

<table>
<thead>
<tr>
<th>Horario</th>
<th>Coordinador</th>
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<tbody>
<tr>
<td>09:00 – 09:30</td>
<td>Registro</td>
</tr>
<tr>
<td>09:30 – 10:00</td>
<td>Apertura. Introducción a cargo de:</td>
</tr>
<tr>
<td></td>
<td>- Juan C. Mata Sandoval – Director General de Políticas de Cambio Climático, SEMARNAT</td>
</tr>
<tr>
<td></td>
<td>- César R. Chávez Ortiz – Director General de Fomento Ambiental, Urbano y Turístico, SEMARNAT</td>
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<tr>
<td></td>
<td>- Carlos Mier y Terán. Encargado del Programa de Transporte Masivo, FONADIN</td>
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<tr>
<td></td>
<td>- Reginald Hernaus – Director de Asuntos Internacionales, Ministerio de Infraestructura y Medio Ambiente, Gobierno de Holanda</td>
</tr>
<tr>
<td>10:00 - 10:20</td>
<td>Introducción al PROTRAM/PTTU</td>
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<td>10:20 – 10:40</td>
<td>Introducción al MDL</td>
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<td>- Estado actual de las negociaciones climáticas</td>
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<td>- ¿Qué es el MDL?</td>
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<td>- Preguntas</td>
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<tr>
<td>10:40 - 11:10</td>
<td>Introducción a las NAMAs</td>
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<td>- Preguntas</td>
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<tr>
<td>11:10 - 11:30</td>
<td>Posibles componentes de una NAMA</td>
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<td></td>
<td>- Presentación de opciones</td>
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<td>- Preguntas</td>
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<td>11:30 – 11:50</td>
<td>Instrucciones para la sesión de trabajo</td>
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<tr>
<td>11:50 - 12:15</td>
<td>Coffee break/refrigerio</td>
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<tr>
<td>12:15 - 13:45</td>
<td>Sesión de trabajo en grupos pequeños para evaluar los componentes de la NAMA.</td>
</tr>
<tr>
<td>13:45-14:15</td>
<td>Presentaciones de resultados de los grupos de trabajo por los actores y preguntas.</td>
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