



Supported NAMA

Sustainable Urban Transport Programme Indonesia (NAMA SUTRI)

Pilot Phase



Ministry of Transportation
Indonesia



On behalf of:



of the Federal Republic of Germany



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List of acronyms and abbreviations

| | |
|-----------------|--|
| APBN | Anggaran Pendapatan dan Belanja Negara (National Budget) |
| ASEAN | Association of South East Asian Nations |
| Bappeda | Badan Perencanaan dan Pembangunan Daerah (Regional Development Planning Agency) |
| Bappenas | Badan Perencanaan Pembangunan Nasional (National Development Planning Agency) |
| BAU | Business As Usual |
| BMUB | Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety) |
| BMZ | Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung (Federal Ministry for Economic Cooperation and Development) |
| bn | Billion |
| BRT | Bus Rapit Transit |
| BSTP | Bina Sistem Transportasi Perkotaan |
| BUR | Biennial Update Reports |
| CC | Climate Change |
| CDIA | the Cities Development Initiative Asia |
| CH ₄ | Methane |
| CNG | Compressed Natural Gas |
| CO ₂ | Carbon dioxide |
| CSO | Civil Society Organisation |
| CSR | Corporate Social Responsibility |
| DAK | Dana Alokasi Khusus (Special Allocation Fund) |
| DAMRI | Djawatan Angkoetan Motor Repoeblik Indonesia (State Owned Enterprise - Motor Transport Republic Indonesia) |
| DECC | Department of Energy and Climate Change |
| DISHUB | Transportation Agency |
| DNPI | Dewan Nasional Perubahan Iklim (National Council for Climate Change) |
| ECN | Energy research Center of the Netherlands |
| EUR | Euro currency |
| FC | Financial Cooperation |
| FORCLIME | Forest and Climate Protection |
| G-20 | The Group of Twenty |
| GE-LAMA-I | Green Economy and Locally Appropriate Mitigation Actions in Indonesia |
| GHG | Greenhouse gas |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit |
| Gol | Government of Indonesia |
| GPC | Global Protocol for Community-scale |
| GTZ | the Deutsche Gesellschaft für Technische Zusammenarbeit |
| ICCSR | Indonesia Climate Change Sectoral Roadmap |
| ICCTF | Indonesian Climate Change Trust Fund |
| Ifeu | Institut für Energie- und Umweltforschung Heidelberg GmbH |
| ITDP | Institute for Transport Development Policy |

| | |
|------------------|--|
| JICA | Japan International Cooperation Agency |
| KfW | Kreditanstalt für Wiederaufbau |
| KLH | Kementerian Lingkungan Hidup (Ministry of Environment) |
| KPA | Kuasa Pengguna Anggaran |
| KT | Kilo Tonne |
| LECB | Low Emission Capacity Building |
| LEDS | Low Emissions Development Strategies |
| M&E | Monitoring and Evaluation |
| MAIN | Mitigation Action Implementation Network |
| MCs | Motorcycles |
| Mio | Million |
| MoE | Ministry of Environment |
| MoF | Ministry of Finance |
| MoPW | Ministry of Public Works |
| MoT | Ministry of Transportation |
| MRV | Monitoring Reporting and Verification |
| MRV | Measurement, Reporting and Verification |
| MTI | Masyarakat Transportasi Indonesia (Indonesia Transport Society) |
| N ₂ O | Nitrous oxide |
| NAMA | Nationally Appropriate Mitigation Action |
| NAMA SUTRI | National Appropriate Mitigation Action Sustainable Urban Transport Programme Indonesia |
| NAT COM | National Communication |
| NGO | Non-governmental Organization |
| NMT | Non-Motorized Transport |
| NS | NAMA Support |
| NSP | NAMA Support Project |
| PAKLIM | Policy Advice on Environment and Climate Change |
| PCs | Passenger Cars |
| Perpres | Peraturan Presiden (Presidential Regulation) |
| PKKPJT | Pusat Kajian Kemitraan dan Pelayanan Jasa Transportasi (Center for Studies of Partnership and Transportation Services) |
| PPP | Public Private Partnership |
| PREP ICCTF | Preparatory Arrangements For The Indonesia Climate Change Trust Fund |
| PT | Public Transport |
| PU | Pekerjaan Umum (Public Works) |
| R&D | Research and Development |
| RAN-GRK | Rencana Aksi Nasional Penurunan Emisi Gas Rumah Kaca (National Action Plan on Greenhouse Gas Emission Reduction) |
| Renstra | Rencana Strategis (Strategic Planning) |
| RPJMD | Rencana Pembangunan Jangka Menengah Daerah (Regional Medium-Term Development Planning) |
| RPJMN | Rencana Pembangunan Jangka Menengah Nasional (National Medium-Term Development Planning) |

| | |
|---------|--|
| SBCI | Sustainable Buildings and Climate Initiative |
| SUT | Sustainable Urban Transport |
| SUTIP | Sustainable Urban Transport Improvement Project |
| SUTRI | Sustainable Urban Transport Programme Indonesia |
| TC | Technical Cooperation |
| TCC | Transport and Climate Change |
| TDM | Transport Demand Management |
| TSU | Technical Support Unit |
| TTW | Tank to Wheel |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNFCCC | United Nations Framework Conventions on Climate Change |
| USD | United States Dollar |
| VKT | Vehicle Kilometers Traveled |
| V-NAMAs | Vertically integrated NAMAs |

Exchange rates

| IDR | EUR | USD | Date |
|------------|-------|-----------|------------|
| 14.883 IDR | 1 EUR | 1,179 USD | 14.01.2015 |

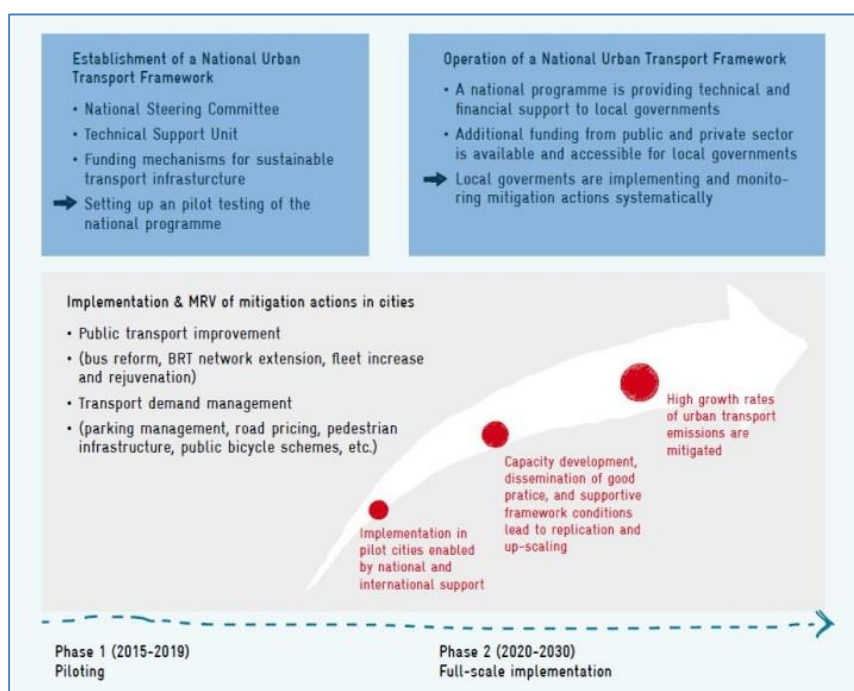
Executive Summary

Motivation and Objective

In 2009, the Government of Indonesia committed to a 26% greenhouse gas reduction by 2020 from 'business as usual' baseline levels, and to 41% with international support. Transport is the third largest source of energy-related CO₂ emissions in Indonesia (23%; equivalent to 68 MtCO₂-eq in 2005). Due to strong urbanisation and motorisation trends, transport has become a significant challenge for cities in Indonesia. Its car-oriented development is exacerbating air pollution, creating massive congestion and decreasing the quality of life. However, most cities lack capacity, policy guidance and access to sufficient financial resources to develop sustainable urban transport systems. NAMA SUTRI as registered with the UNFCCC aims to tackle this challenge by transforming urban transport in Indonesia with a mix of capacity-building and investment measures provided through a national sustainable urban transport programme.

The NAMA at glance

NAMA SUTRI's centrepiece is the establishment of a national sustainable urban transport programme. A NAMA Support Project (NSP) was selected by the NAMA Facility to support the implementation of the pilot phase of the Sustainable Urban Transport Programme Indonesia (NAMA SUTRI). The NSP includes (1) the establishment of a Technical Support Unit at national level that will provide technical guidance and capacity development for local governments, and (2) the development of an effective funding mechanism to co-finance the implementation of public transport and transport demand management projects. In seven pilot cities, the NSP will develop (3) a project pipeline of eligible demonstration projects and co-finance (4) the implementation of demonstration projects in up to five cities (e.g. bus fleet investment, improvement of public transport corridors, parking management and pedestrian programmes). In order to monitor and increase transparency of the achieved impacts, the NSP will establish (5) an MRV system that initiates systematic monitoring of urban transport development which is urgently needed for effective decision-making.



The NSP will pave the way for a transformational change in urban transport in Indonesia by creating effective ways for public and private investment in urban transport infrastructure and rolling stock, and by demonstrating good practice that can be up-scaled to further cities in Indonesia. GIZ is going to be the delivery organisation to provide the technical and financial assistance for the NSP which will run from 2015-2019.

| | | | |
|------------------------------|--|--|--|
| Type of action | National programme | Type of NAMA | Supported NAMA with unilateral elements |
| Subsector | Urban passenger transport | Geographical scope | National and subnational elements |
| National implementing entity | Ministry of Transport, Directorate "Center for Studies of Partnership and Transportation Services" (PKKPJT) | | |
| Timeframe | <ul style="list-style-type: none"> • Phase 1: Piloting in 7 cities until 2020 • Phase 2: Full-scale implementation in at least 10 cities from 2016 onwards | GHG mitigation effect and other benefits | <p>Direct impact: 7.2 – 14.1 MtCO₂ (cumulative 2015-2030)</p> <p>Indirect and direct impact: 18.6 – 73 Mt CO₂ (cumulative 2020-2030)</p> <p>Equitable access, reducing air pollution and improving the quality of life</p> |

The Sustainable Urban Transport Programme (NAMA SUTRI) addresses urban transport with specific focus on passenger transport. The following measures and technologies of urban transport are foreseen:

- Public Transport system improvements (system reform, network, management, operation)
- Investment in energy efficient vehicles (buses)
- Investment in infrastructure (e.g. bus stops, pedestrian infrastructure, parking meters)
- Integrated planning, parking management, informal bus-system / private vehicle regulation

The pilot phase does not cover large infrastructure investments e.g. rail projects, bridges, or road construction for road network extension. It may cover redesigning road space in urban areas in favour of public transport and non-motorized transport. Furthermore, the pilot phase of NAMA SUTRI does not include freight transportation as well as the development of land and sea ports. The integration of different transport modes and types however will be considered in the design of the demonstration projects. This covers for example bus-corridors to the airport, facilities for the integration of different public transport modes, e.g. rail and bus-systems. NAMA SUTRI will focus on the following cities during the pilot phase from 2015-2019: Medan, Palembang, Bogor, Batam, Solo, Yogyakarta and Manado.

The yearly direct mitigation impact of NAMA SUTRI implementation in the pilot cities is expected to reach between 0.7 - 1.8 Mt CO₂ in 2030. Considering that the measures are introduced starting from 2015 and that the CO₂ reduction per year increases linearly, the cumulative CO₂ emission reduction until 2030 accounts for 7.2 - 14.1 Mt CO₂. The indirect mitigation potential of NAMA SUTRI which considers upscaling to further cities is significantly higher but depends on various factors. It is estimated that the annual mitigation impact (including direct and indirect impacts) may range between 3.4 - 13.3 Mt CO₂ per year in 2030 or 18.6 - 73 Mt CO₂ emissions cumulative from 2020-2030. Estimated range of the direct CO₂ mitigation impact due to NAMA SUTRI in the 5 pilot cities:

| | high impact | low impact | Unit |
|---|-------------|------------|-----------------------------------|
| Inhabitants 2030 | 7,979,000 | 7,979,000 | number of people |
| Savings in CO ₂ emissions in 2030 | 1.8 | 0.9 | MtCO ₂ /year |
| Savings in CO ₂ emissions per inhabitant in 2030 | 0.221 | 0.113 | tCO ₂ /inhabitant*year |
| Savings in CO ₂ emissions 2015-2030 | 14.1 | 7.2Mt | MtCO ₂ |

Co-benefits

The NSP creates various co-benefits, including equitable access, reducing air pollution and improving the quality of life. The mitigation impact will be achieved through demonstration projects that encourage passengers to shift from private cars and motorcycles to buses and non-motorised transport and improve the energy efficiency of public transport systems. Further mitigation impacts can be expected though upscaling beyond the pilot cities.

Costs and Financing

The pilot phase of NAMA SUTRI will be implemented with support from the NAMA Facility provided through GIZ as the delivery organisation. GIZ will transfer the support to the Indonesian Government with instruments of technical and financial assistance. 14 million Euros are foreseen to support the implementation of technical and financial support.

- Final approval of the NSP by the NAMA Facility in order to enable the implementation of the pilot phase of the NAMA.
- Once approved, GIZ will provide the technical and financial assistance described above.

1 Introduction

At the G-20 Summit Meeting in Pittsburgh in 2009, Indonesia announced its commitment to reduce national emissions by 26% by 2020 from "business as usual baseline" levels as voluntary mitigation actions, and with international support, Indonesia will further reduce national emissions up to 41%. To achieve its pledge, the Government of Indonesia through the National Development Planning Agency (Bappenas) has launched Presidential Regulation 61/2011 on the National Action Plan for Reducing Greenhouse Gas Emission (RAN-GRK) that will provide the basis for ministries as well as regional governments to implement activities that will directly and indirectly reduce emissions. Such actions will be developed as unilateral or internationally supported NAMAs. The energy and transport sector has committed to reduce up to 56 MtCO₂-eq/yr in 2020 from business as usual levels according to its pledge to reduce 41% with international support as stated in RAN GRK.

The transport sector in Indonesia emitted 68 MtCO₂-eq in 2005, or 23% of all energy-related emissions, with road transport consuming 91% of primary energy. Over the next 25 years, vehicle ownership is projected to more than double, with the growth expected to be largest in two wheelers and light duty vehicles. Mobility is essential for economic and social well-being, but would come at the cost of increased congestion, air pollution, accidents, noise, vibration and higher fossil fuel dependence if business as usual trends are not altered. Experts estimate that traffic in Greater Jakarta causes economic losses of about \$1 billion per year¹. Urban transport accounts for a substantial part – around half – of total transport emissions in Indonesia².

The urban transport agenda is already linked to GHG mitigation: the RAN-GRK, as well as the Indonesian Climate Change Sectoral Roadmap (ICCSR, 2010) includes a large number of urban transport policies, covering avoid, shift and improve strategies, including bus or mass rapid transit improvement or expansion, more efficient public transport vehicles, fuel price reform, fuel switch to CNG, parking management, non-motorised transport, electronic road pricing, traffic impact control and intelligent transport systems. However, there is a lack of coordination and a common umbrella to move these "projects" to "programmes" that are (a) suitable for international support and (b) serve as a framework for measurement and reporting.

The NAMA "Sustainable Urban Transport Programme" described in this document aims at bridging this gap by establishing a supportive framework at national level that provides technical and financial support to local governments for planning, implementation and monitoring of sustainable urban transport measures in a comprehensive approach. The implementation will start in a pilot phase which foresees mitigation actions in selected pilot cities and at the same time the establishment of a national programme to systematically overcome the current barriers of sustainable urban transport policy and financing in Indonesia. This will help to increase the investment in sustainable transport measures from domestic public sources as well as from international donors.

Inter-ministerial coordination is ensured though a steering committee and pilot cities have already identified specific measures which are suitable to reduce emissions significantly and help to transform local transport development. This concept document offers different opportunities for international support including technical assistance, financial support and technology transfer. In order to achieve maximum impact, different measures have to be combined in an efficient manner based on the push- and pull-approach. This means for

¹ www.thejakartaglobe.com/jammedjakarta/will-jakartas-mrt-arrive/337367 (July 2012).

² ICCSR 2010.

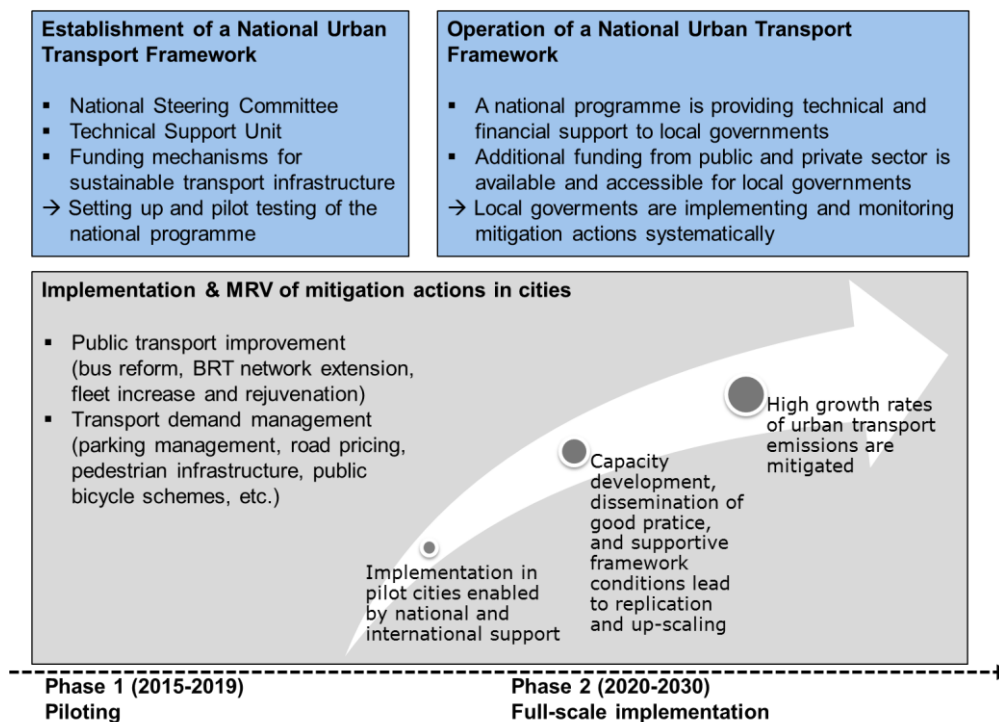
example improvement of public transport services and restricting private vehicle use at the same time, e.g. by providing park and ride facilities while introducing road user fees.

The NAMA concept has been developed by the Ministry of Transport with technical assistance through the GIZ TRANSfer project which is funded by the German Federal Ministry for the Environment (BMUB). The NAMA has been submitted to the UNFCCC registry (prototype) in November 2012 as a NAMA seeking support for implementation. Political support and high commitment for cooperation for the implementation have already been approved by the National Development Planning Authority Bappenas which leads climate change policy in Indonesia. In order to prepare the implementation, pilot cities have been selected and relations have been established in several formal meetings, the cooperation is legally confirmed and workplans and budgets are aligned.

In order to enable the implementation of the pilot phase of the NAMA, the Indonesian Government has applied for support by the NAMA Facility and was selected for an in depth appraisal which was conducted in past months. The results of the appraisal phase and a full NAMA proposal document were submitted to the NAMA Facility Board. GIZ is going to be the delivery organisation to provide the technical and financial assistance for the so-called "NAMA Support Project (NSP)", which will run from 2015-2019 given the approval by the board. This document describes the pilot phase of NAMA SUTRI which corresponds to the NAMA Support Project (NSP). In addition to the international assistance by the NAMA Facility the Indonesian Government invites further international partners to contribute additional support in order to leverage the impact of the NAMA and to enable the implementation of further projects and upscaling to further cities in Indonesia.

Full implementation of the NAMA will foster a paradigm shift in urban transport policy in Indonesian cities. Enabled by a national framework, transport infrastructure investment will be shifted from car-based and motorcycle oriented development towards more sustainable transport solutions (with a stronger role of eco-mobility modes such as public transport and non-motorised-transport). In addition to increased domestic funding, also the investment opportunities for the private sector and international partners will be improved.

Figure 1: Phase-in schedule of NAMA SUTRI



Source: GIZ

2 Overview of the Urban Transport Sector in Indonesia

2.1 The relevance of the urban transport sector

Indonesian total emissions are estimated to grow from 2.1 to 3.3 GtCO₂e between 2005 and 2030³. Transport caused about 23% of total energy-related CO₂ emissions in Indonesia in 2005, with emissions of 67.68 MtCO₂e in that year (Bappenas/GIZ, 2011: Indonesian NAMA Framework). Transport was the third largest source of energy-related emissions, and road transport was by far the largest component of transport emissions, representing around 89% of CO₂ emissions and 91% of energy consumption in the sector. Emissions from the transportation sector will increase seven-fold between 2005 and 2030 to 443 MtCO₂e in the business-as-usual scenario, driven by strong growth in the number of personal and commercial vehicles. As personal income levels triple over the next two decades, this will lead to a tripling in penetration of personal vehicles from 115 vehicles per 1,000 inhabitants today to 312 in 2030.⁴

With Indonesia's rapidly growing population (from 206 million in 2000 to 238 million in 2010) and strong urbanisation trends (from 50% in 2010 to an expected urban population share of 66.6% in 2035)⁵, cities are under pressure from massively increasing demand for transport capacity.

Although mobility is essential for economic and social well-being, these trends – following the current patterns – also lead to several negative impacts. They degrade local air quality to the extent that 60% to 80% of air pollutants in metropolitan cities are thought to be caused by transportation. Furthermore, they generate high levels of noise and vibration. The dominance of private vehicles also puts vulnerable road users at greater risk, especially pedestrians and cyclists. The heavy reliance on fossil fuels in the sector (which continue to be subsidised) puts pressure on the country's finances. Indonesia has started to limit and gradually reduce fuel subsidies. A reform of the transport sector will therefore become more and more important.

Apart from the climate change impact, this development will lead to gridlock in many cities in Indonesia (continuous queues of vehicles blocking an entire network of intersecting streets, bringing traffic in all directions to a complete standstill). Direct impacts to economic and social development will be significant and car-oriented development will be significantly even more costly over time than changing the course of urban transport development now.

Due to subsidised fuel prices, low quality of public transport and poor conditions for non-motorised transport, more and more passengers tend to use private cars or motorcycles. In order to significantly improve urban transport, cities need to manage the growing transport demand (e.g. through restrictions of vehicle use, road pricing, parking management) and improve public transport and non-motorised transport infrastructure. Successful strategies always include push-and-pull measures, which means reducing the attractiveness of energy-intensive private vehicles while increasing the quality of public transport and the attractiveness of walking and cycling.

Following the decentralisation process, which began in 1999, cities have been responsible for urban transport infrastructure and services. However, most local governments lack the required expertise in integrated transport planning as well as funding to develop sustainable transport systems (public transport infrastructure, parking management, inclusive street

³ DNPI, 2010: Indonesia's greenhouse gas abatement cost curve.

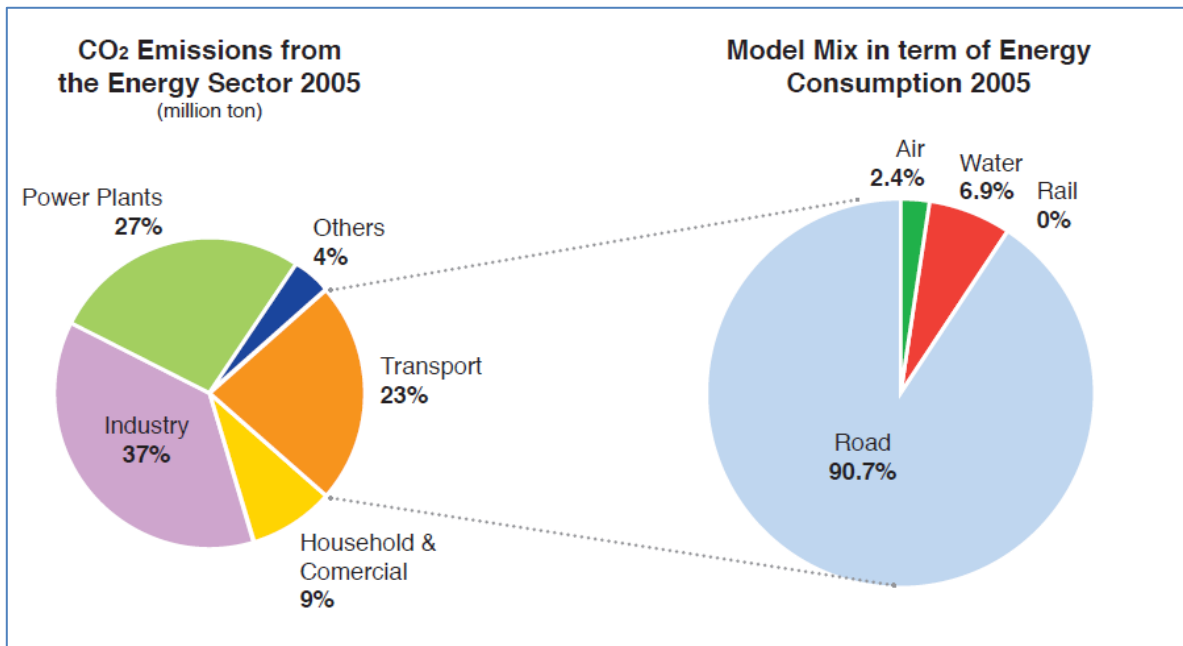
⁴ DNPI, 2010: Indonesia's greenhouse gas abatement cost curve.

⁵ Statistic Office of Indonesia (BPS), 2014: Percentage of Urban Population by Province, 2010 – 2035.

design). As of today, there is no structure in Indonesia to technically and financially support local governments in developing sustainable transport systems.

The current urban transport policy will in practice lead to a significant increase of greenhouse gas emissions. According to baseline calculations developed by the MoT in 2010, the emissions of the road transport subsector were estimated at between 69 and 75 MtCO_{2e} in 2009. Estimates of future emissions vary among different studies. A 2010 study by the MoT predicted that emissions from road transport will nearly triple between 2008 and 2030.

Figure 2: CO₂ Emissions from Transport in Indonesia



Source: Indonesian Climate Change Sectoral Roadmap, 2010

2.2 Relevant stakeholders and their linkages

The following stakeholders are relevant for the successful implementation of NAMA SUTRI. The project will build on existing, well-functioning cooperation structures and establish and improve cooperation between different ministries / entities where necessary. This section briefly describes the relevant stakeholders and their interests and explains the cooperation structure that is envisaged to ensure adequate involvement and ownership.

Figure 3: Stakeholder Landscape of NAMA SUTRI



Table 1. Stakeholders for the implementation of NAMA SUTRI

| Goals and interests | |
|--|--|
| Veto Players | |
| Ministry of Transportation (MoT) | The MoT is the lead executing agency for the implementation of NAMA SUTRI. It is responsible for implementing climate change actions in the transport sector and in charge of urban transport regulation and policy. |
| The Indonesian Climate Change Trust Fund (ICCTF) | The ICCTF is an effective national mechanism designed to attract international climate funds in order to channel them into national climate mitigation and adaptation related programmes in line with the RAN-GRK and Indonesia's development goals. In doing this, the ICCTF management works closely with the lead agencies in the energy and land-use sectors to identify investment opportunities. The investment share of the NAMA Support Project will be channelled through the ICCTF. Therefore, the financing agreement / basket funding contract for the second phase will be set up between GIZ and the ICCTF. The ICCTF is led and managed by Bappenas to ensure that international and private sector support is harmonised and aligned with national development plans. |
| NAMA Facility | Responsible for providing tailor-made support for the implementation of highly ambitious and transformational NAMAs in developing countries according to the competitive calls and selection process of the most ambitious and promising NAMA Support Projects for funding. |

| Key Stakeholders | |
|--|---|
| National Development Planning Agency (Bappenas) | National focal point to the UNFCCC. Responsible for national mid-term development planning, budgeting for line ministries, coordination of climate change activities. Bappenas aims to strengthen line ministries in developing and implementing NAMAs. |
| Local governments (Provinces and Cities) Medan, Bogor, Yogyakarta, Solo, Palembang, Batam, Manado Local Planning and Transport authorities | Bappeda is responsible for elaborating strategic development plans (RPJMD) that serve as planning guidelines for local governments, for budget planning DISHUB and Dinas PU are responsible for developing and implementing local transport strategies and infrastructure. They have the mandate to provide urban transport services (public bus transport) and infrastructure (bus stops, local roads and pedestrian facilities). The governments of the pilot cities and corresponding provinces are local implementation partners with an interest in improving their urban transport situation. |
| Ministry of Finance (MoF) | Responsible for distributing/ allocating/managing the yearly public budget. One of the main actors involved with changing the funding mechanism and making additional funding available. |
| Primary stakeholders | |
| Ministry of Environment (MoE) | Responsible for GHG emissions management at national level, including the national MRV system. Reporting of NAMA SUTRI will be addressed to the MoE. The MoE plays an important role in mainstreaming the MRV concept into the monitoring framework for urban transport. |
| Ministry of Public Works (MoPW) | Responsible for providing major public infrastructure. Since the MoPW manages major infrastructure funding, the Specific Allocation Fund (DAK) could be further developed jointly in order to enable a different use of funds. The MoPW will be the partner for the TSU in defining design standards for urban roads. |
| DNPI | Responsible for coordinating the implementation of the climate change and strengthening the position of Indonesia in international forums in controlling climate change as mandated by Presidential Regulation of the Republic of Indonesia Number 46 Year 2008. |
| DAMRI (state-owned company) as the main public transport provider | Responsible for providing formal public transport in some of the pilot cities by mandate from the Ministry of Transportation. DAMRI is highly interested in improving the conditions for public transport to make more corridors profitable. |
| National Bank (local bank, e.g. Bank Mandiri) | Bank Mandiri is the national trustee of the ICCTF which distributes the provided funds in accordance with instructions. A subsidies loan scheme under NAMA SUTRI would be provided by Mandiri or another local bank. The loan programme would address local public transport providers who want to expand or renew their vehicle fleets. |
| Private sector (real estate developers, bus operation companies, local enterprises, etc.) | Companies and project developers can be potential co-funders for public transport infrastructure and pedestrian areas (e.g. as a CSR measure). Providers of urban transport services are interested in improving their business and potentially in expanding it. If profitable services can be provided, additional capital investment is likely. The loan programme of NAMA SUTRI will help to lower the barriers to additional investment. |
| BPLHD | Local authority responsible for environmental related activities as mandated by the Ministry of Environment, i.e. improve air quality, project safeguard, construction permit. |
| Informal Service Providers (i.e. Angkot) | Group or individual public transport owner providing public transport service, mainly operate in neighbourhood or local area. They have specific routes with no minimum service standards, i.e. timetable, IT system, etc. The informal service provider will be the main party affected by the public transport improvement programme. |
| Secondary stakeholders | |

| | |
|---|---|
| Indonesia Transport Society (MTI) | Knowledge hub, think tank and expert network. The MTI will be relevant for the establishment of a training network since it represents a broad field of transport institutions. The members of the MTI are interested in cooperating with NAMA SUTRI since the project can increase their influence and create jobs for consultancy. |
| Local, national and international media | Campaigns for awareness raising and sensitisation for projects under NAMA SUTRI. |
| Transportation user association | Important group for participation processes, target group for awareness raising |
| Local governments of other cities | Potential implementers to multiply good practices, users of experiences documented by the project. Beneficiary of the National Urban Transport Programme after the successful implementation of the NS. |
| Non-governmental organisations related to transportation and environment | Awareness-raising at local level, multipliers. NAMA SUTRI will cooperate with NGOs in order to raise awareness and transfer knowledge about national and local urban transport policy. |
| Consulting firms and research institutions | Contractors for feasibility studies, planning, design and implementation of SUT measures; NAMA SUTRI is of interest to consulting companies since capacity development will increase their business opportunities |
| University Forum on Transportation in Indonesia | Potential platform to promote design standards. The training network will work with universities and centres of excellence in the field of transport and environment. |
| Expert networks (e.g. on MRV and financing initiated by the GIZ TRANSfer project) | Sharing lessons learned and reflecting project outputs. Providing technical input on the MRV framework of NAMA SUTRI and developing a blueprint to be used in other countries. |
| Police | Responsible for vehicle registration, law enforcement related to transportation activity, i.e. traffic management, traffic violation |

Source: GIZ

2.3 Finance for the Urban Transport Sector in Indonesia

The heavy reliance on fossil fuels in the sector (which continue to be subsidised) puts pressure on the country's finances. Indonesia allocates 18.6 billion Euro in 2015⁶ for fuel subsidy, equivalent to 13.5% of total national budget. The amount increased from 16.7 billion Euro in 2014 and 14.2 billion Euro in 2013. In order to reduce the fiscal burden, the government puts some efforts by gradually shifting the fuel subsidy to the more productive sector, i.e. education, health and infrastructure including transportation. A reform of the transport sector is therefore becoming more and more important. Within the transport sector, most investments go to (physical) infrastructure such as roads, bridges, flyovers, which lies within the responsibility of the Ministry of Public Works at the central level or the Public Works Departments at the local level (province or regency). Public transport is under the jurisdiction of the Ministry of Transportation, or similarly, under the Transportation Department (*Dinas Perhubungan 'Dishub'*) of regencies or cities at the local level. The share of urban transport funding (except rail) is 0.45% of the overall budget available to the Ministry of Transportation (EUR 2.62 billion in 2014). The transportation budget of the Ministry of Public Works amounts to about EUR 5.4 billion in 2014, mainly used for major infrastructure development such as roads, railways, airports and ferry ports.

⁶ Data Pokok APBN 2015, Ministry of Finance.

Historically, during the colonial era, public transport in the form of tramlines and railway lines was fully financed by the government for both infrastructure and rolling stock. Apparently, when the bus era started only the infrastructure (road) was funded by the government, leaving the rolling stock provision to the private sector. As a result, the MoT is left with a very small budget for the development of the public transport sector. The small budget for the development of public transport systems is insufficient to prepare adequate urban (public) transport plans and to empower the parties involved, i.e. government officials as well as private operators. This notion has been in place for over 40 years, up to a point where the system is now being marginalised, losing passengers, and forcing some operators to go bankrupt. Nowadays, many local authorities have realized that without adequate investment, public transport cannot survive. As from 2004, the MoT has established a scheme to assist several cities to revitalise their public transport systems. The following table summarises the number of busses which are currently planned to be given to local governments.

Table 2. Planned investment by the urban transport unit of the Ministry of Transportation for the National Mid Term Plan (as proposed in June 2014)

| | 2015 | 2016 | 2017 | 2018 |
|----------------------------------|------------|------------|------------|------------|
| Number of (Semi-)BRT Busses | 50 | 100 | 150 | 200 |
| Number of other Busses | 75 | 125 | 180 | 230 |
| Number of busses in total | 125 | 225 | 330 | 430 |

Source: Draft Strategic Plan Ministry of Transportation, 2014

The national government has allocated an increasing amount of funding to support urban transport development in cities every year. Between 2011 and 2014, the Ministry of Transportation allocated about EUR 41 million to the implementation of urban transport measures listed in the RAN / RAD GRK for infrastructure and services in the agglomeration areas (12 cities, not including urban rail projects). The proposed budget for the Medium Term Planning 2015-2019 is about EUR 836.5 million for public transport and transport demand management measures in up to 40 cities (according to the Ministry of Transportation's Medium Term Economic Infrastructure Strategy: Bappenas & JICA, final Report, February 2014).

The annual investment needs of the seven pilot cities of the NAMA range between USD 80 and 400 million. The funding gap could be filled with other infrastructure funds in the future and/or additional budget allocations from the national government. In addition, significant private sector investment needs to be mobilised to achieve the necessary transformation of the urban transport situation. Even though the investment needs are significantly higher than the allocated funding⁷, it is important to use the available budget as effectively as possible. The central government's current practice of supporting public road transport is limited to providing buses as direct assets to selected cities. However, in many cases the vehicles do not match the system standards applied in the cities (e.g. access level, required capacity, street design): Many cities would like to improve their city bus systems with street-level access ('Bus Kota'), whereas the Ministry of Transportation is providing buses for the so-called 'Semi-BRT' (Bus Rapid Transit) or 'BRT-Lite' standard, which requires the construction of elevated bus stops.

⁷ Investment needs are estimated by JICA between USD 4.8 and 10 billion for urban transport in the next 5 years.

As a result, local governments have to construct special bus stops which create massive barriers for pedestrians. In fact, the Semi-BRT systems are often less convenient than the conventional bus service and require high subsidies from the local government to cover the costs of operation. In the future, funding from the national government should not be used for the procurement of public transport vehicles but rather to improve the infrastructure of public transport systems. In this way, private sector operators would be able to make direct investment in the vehicle fleet. Additional subsidies from the local governments to ensure high-quality public transport may still be required, but this can be financed through revenues from parking management or road use fees.

In 2014, EUR 393 million of the national budget was allocated for road infrastructure development through the so-called Decentralisation Fund managed by the Ministry of Public Works. In many cases urban roads are being developed with a focus on cars but without sidewalks and intersection design that accommodates different transport modes, even though the funding allows the construction of pedestrian infrastructure.

The above circumstances contribute to the prevailing high rate of individual car transport and do not incentivise a change towards less emission-intensive travel patterns.

2.4 Urban Transport policy in the context of climate change

During the 2009 G-20 Summit, Indonesia committed to a 26% reduction in emissions by 2020 from 'business as usual' baseline levels as voluntary mitigation actions, and to 41% with international support. This translates into 56 MtCO₂e in 2020 for the transport sector with international support, to which this NAMA will contribute. Presidential Regulation 61/2011 on the National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK) provides the basis for ministries and regional governments to implement direct and indirect emission reduction measures. Based on the above commitments, Indonesia has already made substantial efforts to mitigate GHG emissions.

Urban transport measures are key elements of the RAN GRK (public transport improvement, traffic management, parking management, non-motorised transport (NMT), congestion charging, urban railways, etc.). At the end of 2012, the Government of Indonesia registered its first NAMA with the UNFCCC, which is described in this document and now prepared for being implemented.

The significance of sustainable urban transport (SUT) is also addressed in the Indonesia Climate Change Sectoral Roadmap, 2010 (ICCSR). The ICCSR suggested that a national urban transport policy is required to encourage the development of comprehensive urban mobility and attract investment in infrastructure for non-motorised transport (NMT). It outlines a 20-year implementation plan for reducing greenhouse gas (GHG) emissions in the land transport sector, which includes an implementation plan for NMT as part of the urban transport improvement measures that started in 2010 and will finish in 2030.

The main urban transport measures listed in the National Mitigation Plan (RAN-GRK) indicate an emission reduction potential of approximately 4.7 MtCO₂e in 2020. These urban transport measures include bus or mass rapid transit improvement or expansion, more efficient public transport vehicles, fuel price reform, fuel switch to CNG, parking management, non-motorised transport, electronic road pricing, traffic impact control and intelligent transport systems. However, there is a lack of coordination and no common approach to move these 'projects' to 'programmes' that (a) are suitable for international support and (b) serve as a framework for measurement and reporting.

2.5 Integration into national and sector strategies

RAN-GRK consists of eight mitigation actions for the transport sector, building on the Strategic Plan 2011–2014 (Renstra) of the Ministry of Transportation. Most of the actions in land transportation focus on urban areas: parking management, development of public transport systems and non-motorised transport infrastructure. The new strategic plan for 2015-2020 is currently under preparation.

The provision of NMT and its supporting facilities is also included in several government regulations. These regulations include:

- Law #22 (2009) on traffic and road transportation
- Law #26 (2007) on spatial planning
- Minister of Transport Decree #48 (1997) on NMT and its use in road space.

2.6 International cooperation in the transport and climate change context in Indonesia

The design for NAMA SUTRI was developed by the MoT with support by the GIZ/ICI project 'TRANSfer – Towards Climate Friendly Transport Technologies and Measures' which is funded by the German Ministry for the Environment (BMUB). TRANSfer aims to enable decision makers to develop and implement transport NAMAs and facilitate international learning. The available resources to support the implementation of NAMAs, however, are limited and can only cover very few activities in each partner country of the project. In Indonesia, from 2011 until end of 2014, TRANSfer has contributed to design NAMA SUTRI, amongst others by enabling the local governments of three pilot cities (Manado, Medan, Batam) to identify policies and projects that are eligible as mitigation actions under NAMA SUTRI. With the beginning of the NAMA Facility project, the TRANSfer project will take an observer role in order to ensure that lessons learned from the Indonesian NAMA case will be shared with the international community, and so contribute to feeding back those experiences from implementation to the climate change debate and the international climate change negotiations (e.g. via side events, peer-to-peer learning, expert workshops, the transport NAMA database, the NAMA Partnership and the International Partnership on Mitigation and MRV).

The BMZ-funded 'Sustainable Urban Transport Improvement Project (SUTIP)' has been providing technical assistance to four pilot cities in Indonesia which were also selected as pilot cities of NAMA SUTRI. Sustainable urban transport plans have been prepared as a result of the cooperation between SUTIP and the cities of Solo, Yogyakarta, Bogor and Palembang. Several projects are already in an advanced stage and can be implemented in the short term. For the remaining duration of the project (until 09/2016), if BMZ so approves, the SUTIP project will focus on deriving lessons learned and developing transferable packages providing hands-on practical guidance for specific aspects of urban transportation (e.g. public transport reforms, non-motorised transport, parking management). These packages will be used at national level as an input for the establishment of the Technical Support Unit (TSU) that forms an important part of NAMA SUTRI. The SUTIP project will continue to provide technical assistance for ongoing projects in two cities (Solo and Bogor). The local subsidies of NAMA SUTRI can be used to support the implementation of selected measures, taking advantage of the long-standing and close cooperation for a fast-start implementation. In this way, both projects will benefit from each other. The contributions of both projects will be clearly distinguished.

The Asian Development Bank is carrying out two technical cooperation projects on urban transport which will create high synergies. One project is supporting public transport in

Medan while another project aims to develop a methodology to estimate the emission impact of non-motorised transport projects. The Asian Development Bank has also participated in the appraisal mission of the NAMA Support Project of the NAMA Facility to ensure strong donor coordination. The possibility of future financial contributions has been indicated, even though a commitment cannot be given at this stage.

Close coordination will continue with the BMZ-funded regional project 'Transport and Climate Change in the ASEAN Region' - TCC ASEAN. TCC is supporting Bappenas and the Ministry of Transportation in developing the Monitoring and Evaluation Framework for the Mitigation Action Plan (RAN/RAD GRK). Furthermore, the TCC is working with the MoT in the development of a green freight strategy to be adopted by the ASEAN Secretariat.

Close coordination on climate change policy and climate finance will take place with the projects 'Policy Advice on Environment and Climate Change' (PAKLIM, GIZ), funded by BMZ, and the 'Partnership for Supported NAMAs and Climate Finance: Support to the Indonesia Climate Change Trust Fund (ICCTF)' (GIZ), funded by BMUB. The ICCTF partnership will play an important role in preparing and implementing the financing instruments under NAMA SUTRI.

The BMUB funded project 'Vertically integrated NAMAs involving subnational actors in national mitigation strategies' (V-NAMAs, GIZ) supports the Gol in its efforts to mobilise sub-national actors in order to achieve national mitigation targets through cost-effective incentive packages and MRV systems. Further exchange and collaboration on efficient cooperation structures with cities is intended.

Further projects working in the context of transport and climate change are specified below. A regular exchange with the implementing organisations in Indonesia as well as in different international partnerships is foreseen.

The NAMA Support Project will build synergies with other GIZ projects on environment and climate and with projects of other donors (as listed above and below). The main synergies include sharing experiences and lessons learned (e.g. in events, publications, networks), increasing outreach and making use of ongoing capacity development activities (e.g. trainings, peer-to-peer learning, study tours).

- LECB Programme: Indonesia is one of 25 countries in this UNDP programme, which runs for five years (2011-2016) and is supported by various donors.
- Mitigation Action Implementation Network (MAIN): supports the design and implementation of Low Emissions Development Strategies (LEDS) and NAMAs through regional dialogues and practitioner networks. The counterparts of NAMA SUTRI have been active participants in the MAIN Asia dialogues already and will continue sharing lessons learned with the MAIN.
- The Mitigation Momentum project is a collaboration of ECN and Ecofys. The project aims to support the development of NAMAs in the field of renewable energy.
- NAMA programme for the construction sector in Asia. This programme aims to develop NAMAs and associated MRV approaches in the building sector in line with previous work by UNEP/Risø and the UNEP Sustainable Buildings and Climate Initiative (SBCI).

3 Barriers to a low carbon urban transport in Indonesia

The transport sector differs from other sectors in its high share of public investment in infrastructure for private vehicles in addition to various subsidies. The implementation of the NSP will help to overcome a series of structural barriers:

3.1 Barriers at national level

- Institutional barriers posed by the existence of separate ministries for infrastructure development and urban transport policy lead to the development of strategies which are not always aligned. Accordingly, budget allocations to urban transport systems are often isolated without regard for coherent infrastructure development. For example, the development of an urban rail network needs to be integrated with road development and bus systems. The current top-down approach of urban infrastructure development is an obstacle to integrated transport policy.

The NSP addresses these barriers by establishing a Steering Committee which involves all relevant stakeholders and builds political awareness of transport and climate change aspects. The Technical Steering Committee and the Technical Support Unit will strengthen inter-ministerial coordination. This will help to tackle the current challenges of urban transport policy, including beyond the scope of the project.

- Practise of national public transport funding:
The Specific allocation fund (DAK) generally provides the opportunity to finance non-motorised transport projects as well as further project types (e.g. public transport infrastructure). However, these sources have not been tapped for the implementation of sustainable transport projects due to lack of technical sector guidance from the national level and lack of demand actively communicated by local governments.

The current practice of the MoT to support urban transport strategies of local governments is limited to providing assets (e.g. buses, traffic lights) – which in many cases is not the most efficient way of allocating the funds. The inefficiency is caused by the following issues (*Background Study, JICA 2012*):

- Provided assets do not match existing demand (different types of bus systems).
- Due to legal barriers, the assets can only be given to provincial governments who do not have the mandate for bus transportation in cities.
- Lack of quality in project preparation and management.
- Weak institutional capacity for project delivery.

The NSP aims to overcome these barriers by improving the current mechanism to channel financial support and by developing technical standards for project planning and implementation. With this improved mechanism, the national government will ensure efficient spending by following transparent rules, ensuring ownership is claimed by local governments who submit proposals, and systematic monitoring of implementation and impacts.

- The overall amount of public funding is not sufficient to meet the investment needs of the sector. The share of urban transport funding (except rail) is 0.45% of the overall budget available to the Ministry of Transportation (EUR 2.62 billion in 2014). The transportation budget of the Ministry of Public Works amounts to about EUR 5.4 billion

in 2014. Funding is mainly used for major infrastructure development such as roads, railways, airports and ferry ports. Considering its increasing inclusion in the Climate Change Action Plan (RAN-GRK) and in sectoral strategies (Renstra), sustainable urban transport investment will become more important in the future. Developing and pilot-testing new funding mechanisms is therefore highly relevant to enable effective ways of public spending.

The NSP aims to develop a more effective funding mechanism and to demonstrate good practices of joint project funding between national and sub-national governments as well as the private sector.

- Public transport technology: The main instrument for road-based public transport support by the MoT is the provision of 'Semi-BRT' or 'BRT-lite' buses, medium sized vehicles with high-level entrance which require the construction of elevated bus stops. However, this technology does not provide measurable benefits compared to the existing city buses which already operate in medium-sized cities, but it does require relatively high upfront infrastructure investment for bus stops. In most cities, the Semi-BRT systems need to be subsidised even though they do not provide the required capacity and quality of public transport.

The funding mechanism to be developed under the NSP will be demand-oriented based on proposals by local governments. In contrast with current practice, the NAMA Support Project will create innovation potential and incentivise the development of small enterprises.

3.2 Barriers at local level

- City transport departments (operation) and regional planning authorities (planning) lack consistent coordination and technical expertise in sustainable transport measures. Lack of capacity leads to the fragmentation of planning processes and lack of continuity (including investment reliability) and responsiveness. Hence, there is no pipeline of high-quality project proposals to be implemented within a relatively short time. This absence of eligible projects is a bottleneck for potential funding partners (international, private, etc.).

During the NSP, technical assistance will be provided to improve stakeholder coordination and integrated planning. In the future, quality standards of the urban transport programme as well as the Technical Support Unit (under MoT) will ensure that different departments and other stakeholders are involved in the planning process in order to deliver high-quality project proposals that are eligible for funding.

- Local governments have limited fiscal capacity to finance transport infrastructure at the local level. Many cities do not meet loan/grant requirements. Involving the private sector is challenging due to asset management regulations, local governments' limited capacity to successfully structure and manage public-private partnerships (PPPs) and high transaction costs. Local governments are passive in seizing opportunities from external funding sources as they lack the necessary human resources and experience.

With the TSU and the training network, the NSP will support the establishment of a

permanent support structure that will provide technical assistance and guidance in developing funding and financing concepts for transport projects. The experiences from the NSP will be documented and distributed among local governments.

3.3 Private Sector barriers

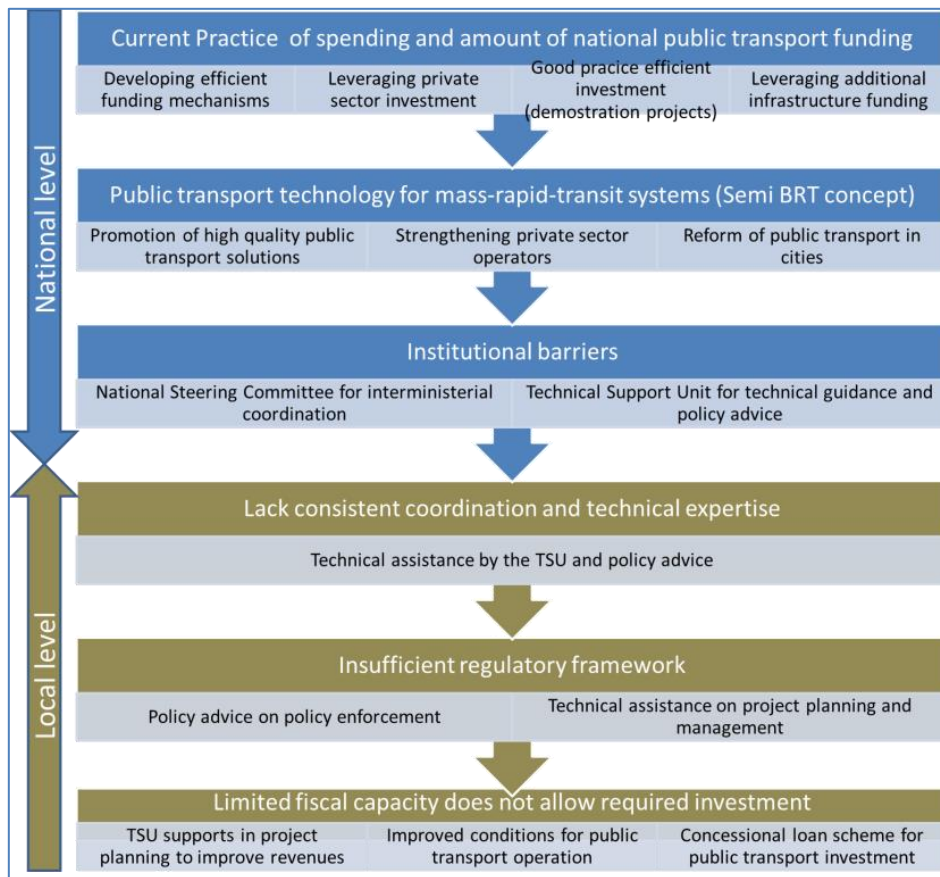
- Private sector investments require a clear regulatory framework that enables companies to create cost-recovering revenues over longer periods. Unattractive conditions for operating urban transport services prevent private companies from making investments. Off-street parking facilities are often not utilised due to limited or insufficient enforcement of parking policies. Operation of public transport corridors requires profitable basic infrastructure and regulation of minibus services.

The NSP via the establishment of the Technical Support Unit will provide guidance on the development and management of PPPs and the regulation of informal public transport. The documentation of projects will highlight the importance of regulations and policy enforcement (e.g. parking management) and demonstrate the benefits of stringent policy implementation (especially restrictions on private vehicle use). The exchange of experiences between the local authorities of the pilot cities (and beyond) will contribute to the replication of good practices in order to overcome current challenges (such as resistance of parking attendants, minibus operators and shops owners).

- Public transport providers lack the financial capacity to comply with terms and conditions of commercial banks (i.e. short pay back periods and high interest rates) which prevents investment into more energy-efficient vehicles or vehicle fleet expansion. High interest rates often limit purchases of new buses or vehicle replacements. In many cases, private bus companies do not meet the eligibility requirements for loans at the usual capital market interest rates of 14-16%. Dedicated private credit institutions, which charge very high interest rates (approx. 18%), are often used as a lender of last resort to borrow funds for fleet investment. In the majority of cases, most private companies can only afford investments in line with their own capacity to save.

One approach to overcoming this barrier under the NSP is the funding mechanism under NAMA SUTRI, which will provide concessional loans for public transport companies. To access these loans, borrowers are required to develop business models. Close cooperation and support by local governments are urgently required to enable profitable bus operation. Once the programme is set up and pilots are tested, it can be upscaled though additional funding from the national budget or international climate finance. Another approach is to improve the physical and regulatory conditions for bus services in the cities, which would lead to higher revenues and enable access to the existing capital market. By replacing old vehicles with new ones, bus operators will significantly reduce their ongoing costs of operation and maintenance.

Figure 4: Barriers for low-carbon urban transport in Indonesia



Source: GIZ

4 The NAMA: Objectives, measures and impacts

4.1 The NAMA in a nutshell

The Sustainable Urban Transport Programme Indonesia aims to create enabling conditions for planning, implementation and monitoring of sustainable transport policies and projects in Indonesia. For this purpose a **national programme** will be set up by the Ministry of Transportation. The programme will give technical assistance and policy guidance to local governments and provide financial incentives for funding of sustainable transport infrastructure and public transport investment.

The implementation starts with a **pilot phase of five years** in which the programme is going to be set up and pilot tested through financing and implementation of demonstration projects in **seven medium and large-sized pilot cities**. During the pilot phase, focus of the programme is the improvement of public bus transport and non-motorised transport modes as well as transport demand management, such as parking management and intelligent traffic management. After the pilot phase the national programme NAMA SUTRI will enter an **upscaling phase** with a broader scope in further areas of sustainable urban transport. The current timeframe of MRV covers the period from 2015-2030. However, if the programme runs successfully further extension is likely and also other public transport modes (e.g. light rail) and transport types (e.g. freight) can be included.

Lead executing agency is the Ministry of Transportation (MoT) Indonesia. As a result of a systematic NAMA screening process, the MoT has prioritised the urban transport subsector due to the need to overcome a series of structural barriers to improve the urban transport situation in many cities in Indonesia. The Indonesian Government is seeking international support for the implementation of this programme including technical assistance (policy advice for programme development, organisational development measures), capacity building for national and subnational implementation partners and financial support to create new funding mechanisms for urban transport projects.

For the implementation of the pilot phase, Indonesia receives international support from the NAMA Facility, a German-British funding programme that aims to support the implementation of transformational NAMAs. The investment share of the NAMA Facility will be channeled through the **Indonesian Climate Change Trust Fund (ICCTF)**. The financial agreement will be set up between GIZ as the delivery organisation of the NAMA Support Project (NSP) and the ICCTF. The ICCTF is led and managed by **Bappenas** to ensure that international and private sector support is harmonised and aligned with national development plans.

The envisaged mitigation actions to be implemented in cities aim to shift passengers from private motorised vehicles (private cars and motorcycles) to public transport and non-motorised transport. Furthermore, the programme will attract investment in more environmentally friendly busses (higher capacity, better fuel standards). Thus, NAMA SUTRI will lead to **emission reductions through shift and improve in (urban) passenger transport**.

NAMA SUTRI builds up on the **National Climate Change Action Plan (RAN GRK)** as well as **the transport sector's climate change roadmap (ICCSR)** and the National Development Mid-Term Planning (RPJMN). The climate change actions included in the transport sectors climate change road map are part of NAMA SUTRI with the objective to systematically support and upscale their implementation (e.g. Bus Rapid Transit Systems, non-motorised transport).

The National Urban Transport Programme has significant potential to initiate a **transformational change** due to the following reasons:

- The project will initiate further budget allocations by the central government for public transport infrastructure and non-motorised transport and lead to a more effective way

of spending those public funds at local level. The current funding mechanism with its limitations is considered to be an obstacle for further budget allocation. By developing more effective mechanisms for sustainable transport funding, the government can start bridging the gap between investment need and current budget allocation.

- The project will mobilise private sector investments by public transport providers and other operators of urban transport facilities and services, such as off-street parking facilities, ticketing systems and advertising companies. This will be achieved by creating enabling conditions in pilot cities (and beyond). Furthermore, the programme will create a concessional loan scheme for public transport operators which will attract private investment.
- The NAMA Support Project will be the first project of its kind to channel international climate financing through the ICCTF. In this way, NAMA SUTRI will serve as a role model and demonstrate successful operation of the ICCTF. This will attract further investments from bilateral and multilateral donors.
- Implementing NAMA SUTRI will create investment opportunities for other donors by developing a project pipeline. Currently, the lack of eligible projects that are well developed and politically supported is considered an obstacle to attracting international support.
- The project will induce the transition of urban transport policy in Indonesia towards a low-emission pathway by (1) developing policy guidance and a structure for technical support to strengthen local governments, (2) developing mechanisms for co-funding from public and private sources as well as international donors by creating a project pipeline, and (3) increasing the transparency and know-how about impacts of urban transport policy through improved monitoring and evaluation.
- The project will generate several co-benefits in the pilot cities by improving public transport services and walkability, which will result in reduced travel time for public transport users, improved local air quality, increased road safety and enhanced physical activity (since public transport users tend to walk longer distances than car/motorcycle users), among other social and economic benefits.

Table 3. NAMA summary table

| | |
|---|---|
| National Implementing Entity and involved stakeholders | <p><u>Institution:</u> Ministry of Transportation</p> <p><u>Name of contact persons:</u></p> <ul style="list-style-type: none"> • Mr. Nugroho Indrio, Senior Advisor for the Environment to the Minister, Email: nugrohoindrio@yahoo.co.id • Mr. Imam Hambali, Director of the Center for Partnership Studies and Transport Services, Email: hambali@yahoo.co.id <p><u>Involved national partners:</u> Bappenas, Ministry of Finance, Ministry of Environment, Ministry of Public Work, Local Governments, Indonesian Climate Change Trust Fund,</p> <p><u>Involved supporting organizations:</u> GIZ, NAMA Facility (BMUB, DECC)</p> |
| Type of action | Policy / Programme |
| Type of policy instruments | <ul style="list-style-type: none"> • Regulations • Economic instruments • Public spending/investments • Communication and information |
| Subsector | Urban land based passenger transport |
| Scope | <p><u>Geographical:</u> National and subnational elements</p> <p><u>Type of approach:</u> A-S-I</p> |

| | |
|---|--|
| | <p>Subsector: passenger</p> <p>Transport modes: bus, minibus, non motorised transport, car, motorcycle</p> |
| Main mitigation measures | <ol style="list-style-type: none"> 1. Public Transport system improvements (system reform, network, management, operation) 2. Investment in energy efficient vehicles (buses) 3. Investment in infrastructure (e.g. bus stops, pedestrian infrastructure, parking meters) 4. Integrated planning, parking management, informal bus-system / private vehicle regulation |
| Timeframe | <p>Phase 1 “Fast Start” (2015 and 2016): Support to initial showcase projects in pilot cities, pilot testing of capacity building scheme, preparation of funding mechanisms, refinement of MRV</p> <p>Phase 2 “Mainstreaming” (2016-2018): Systematic creation of a pipeline of good projects, operation of capacity building scheme, pilot testing of funding mechanism, first monitoring reports and GHG inventories</p> <p>Phase 3 “Upscaling” (2018 onwards): TSU identifies and supports projects, review and adjustment of capacity building scheme and funding mechanisms, up-scaling of funding, preparation for more cities, systematic monitoring and reporting</p> |
| Expected GHG mitigation and further benefits | <p>It is estimated that the annual mitigation impact (including direct and indirect impacts) may range between 3.4 - 13.3 Mt CO₂ per year in 2030 or 18.6 - 73 MtCO₂ emissions cumulative from 2020-2030. Initial estimations will be refined and continually updated during the implementation of the NAMA Support Project funded by the NAMA Facility.</p> |
| Type of NAMA | Supported with unilateral elements |
| Type of support requested | <p>NAMA Facility Funding: Technical support (EUR 5.5 million) and financial support (EUR 8.5 million)</p> <p>Further international support requested for full implementation.</p> |

4.2 Objectives of the NAMA

NAMA SUTRI aims to achieve the following overarching objective in its pilot phase: Cities in Indonesia contribute to climate change mitigation through sustainable transport policies and infrastructure projects supported by a national urban transport programme.

The success of the pilot phase will be measured with the following indicators:

- A new mechanism is leveraging public co-funding for the implementation of public transport and transport demand management projects based on a systematic approach and project quality standards to strengthen low-carbon transport development in cities in Indonesia.
- A national urban transport programme defines quality standards and supports local governments in developing public transport and transport demand management projects with different instruments of technical and financial assistance.
- Five out of the seven pilot cities have implemented sustainable urban transport measures that lead to emission reductions. The direct emission reductions delivered by the project will amount to up to 0.7-1.8 MtCO₂ per year in 2030 through reduced fuel consumption per inhabitant in five pilot cities.

4.3 Scope / coverage of the NAMA

The Sustainable Urban Transport Programme (NAMA SUTRI) addresses urban transport with specific focus on passenger transport.

The following measures and technologies of urban transport are foreseen:

- Public Transport system improvements (system reform, network, management, operation)
- Investment in energy efficient vehicles (buses)
- Investment in infrastructure (e.g. bus stops, pedestrian infrastructure, parking meters)
- Integrated planning, parking management, informal bus-system / private vehicle regulation

The pilot phase does not cover large infrastructure investments e.g. rail projects, bridges, or road construction for road network extension. It may cover redesigning road space in urban areas in favour of public transport and non-motorized transport. Furthermore, the pilot phase of NAMA SUTRI does not include freight transportation as well as the development of land and sea ports. The integration of different transport modes and types however will be considered in the design of the demonstration projects. This covers for example bus-corridors to the airport, facilities for the integration of different public transport modes, e.g. rail and bus-systems.

NAMA SUTRI will focus on the following cities during the pilot phase from 2015-2019:

- Medan
- Palembang
- Bogor
- Batam
- Solo
- Yogyakarta
- Manado



4.4 Mitigation and supportive measures under NAMA SUTRI

During the pilot phase of NAMA SUTRI, direct mitigation measures consist of the demonstration projects that will be implemented in the pilot cities. The national programme will initiate additional projects and investment during the upscaling phase of NAMA SUTRI. Setting up the national programme will not lead to direct emission reductions during the pilot phase but in the mid-term. The measures to support building up the national programme can be considered supportive measures - even though they are substantial activities of NAMA SUTRI, in particular to prepare the ground for the transformational change that the implementation of the programme will unlock in the upscaling phase of NAMA SUTRI.

Since the pilot phase of NAMA SUTRI is about setting up the national programme in order to systematically overcome barriers for sustainable transport development, which will – in a second step – initiate further direct mitigation measures in the form of additional projects, it can hardly be distinguished between core, direct mitigation measures and supportive

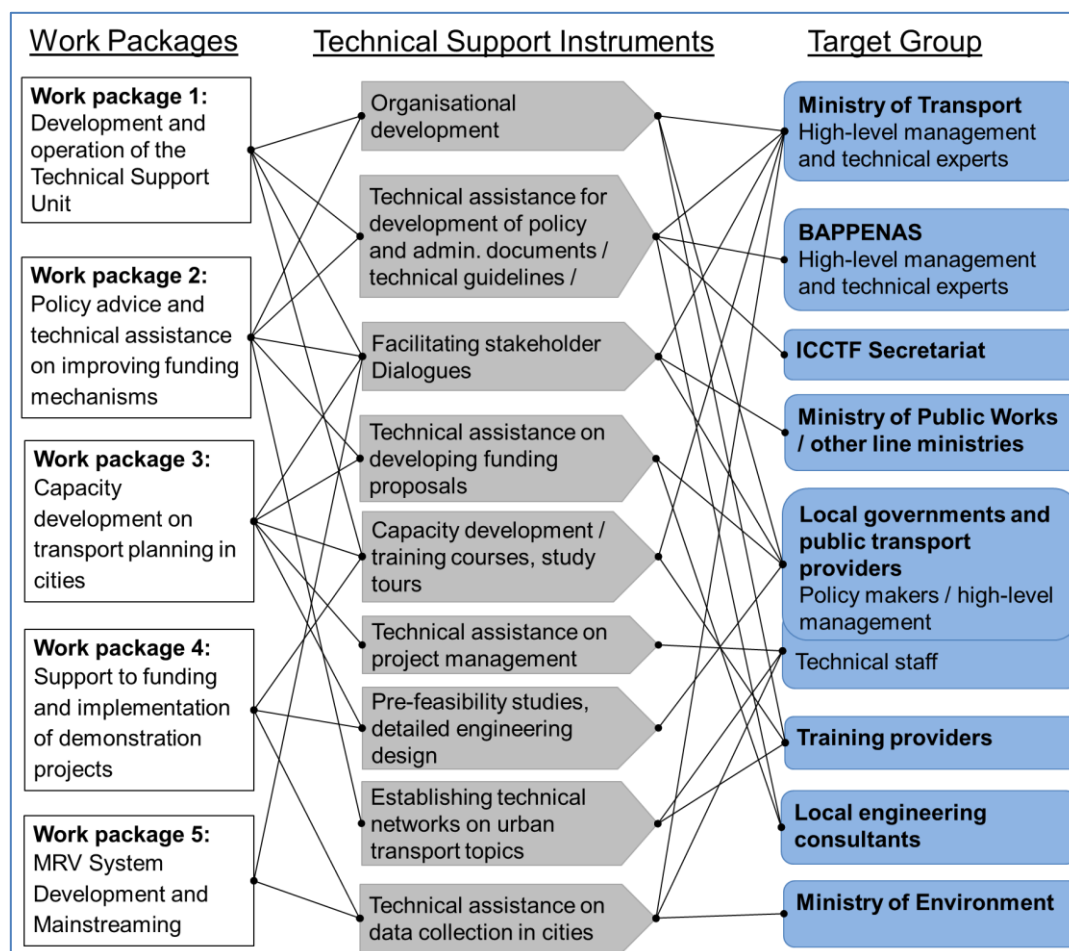
measures. For this reason, these two types of measures are treated jointly in a single section reflecting the holistic approach of the NAMA.

The comprehensive package of measures (direct mitigation measures and supportive measures) foreseen during the pilot phase of NAMA SUTRI consists of five main outputs:

- **Output 1 “Technical Support Unit”**: A Technical Support Unit is providing local governments with technical guidance and capacity development for the preparation and implementation of public transport projects and transport demand management.
- **Output 2 “Funding Mechanism”**: A funding mechanism to support public transport projects and transport demand management (TDM) in cities has been set up and pilot tested for funding measures in at least five of the seven pilot cities.
- **Output 3 “Project Pipeline”**: A pipeline of public transport and transport demand management projects exists and is consolidated with political partners and ready to be implemented during and beyond the lifetime of the NSP.
- **Output 4 “Implementation of Demonstration Projects”**: Demonstration projects evidencing improved public transport and transport demand management that serve as good practice for replication have been implemented in the pilot cities and disseminated.
- **Output 5 “MRV System”**: A consistent system for the monitoring, reporting and verification (MRV) of implementation (progress indicators), of emission reductions, of co-benefits of urban transport development projects and of support is in place and applied by national and local implementation partners.

The following instruments of technical cooperation will be applied during the pilot phase. The financial instruments used under SUTRI NAMA are outlined in more detail in section 6.

Figure 5: Instruments of Technical Cooperation



Source: GIZ

The pilot phase of NAMA SUTRI will be implemented as illustrated in the following Gantt chart. Please note that individual implementation plans for the pilot cities will be developed during the first months of implementation. Milestones are highlighted by dark blue shadowed und numbered cells in the timeframe. Core milestones are:

- Drafting and signing of an Implementation Agreement on the establishment of the programme including the TSU concept, office space, and personnel structure;
- Standard operating procedures for the Technical Support Unit;
- Definition and development of service packages and modes of delivery jointly with other international cooperation projects;
- Agreement with financing partners on standard operation procedures of the financing mechanism;
- Formulation of a financing agreement for the new mechanism of the urban transport programme;
- Development and implementation of a fundraising strategy;
- Establishment of a pool of consultants to support cities on long-term and short term assignments;
- Development of guidelines and standards to ensure a high quality of urban transport projects;

- Common MRV methodology that is agreed upon by the relevant stakeholders in the pilot cities and at national level;
- Reporting of GHG emission reductions, co-benefits, resources used and progress of implementation.

Table 4. Outcome, outputs and activities

| | Outcome, outputs and activities | 2015 | | | | 2016 | | | | 2017 | | | | 2018 | | | | 2019 | | | | |
|---|--|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|--|
| | | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | |
| Outcome | A national urban transport programme is leading the Indonesian urban transport sector onto a low-carbon development pathway by providing technical and financial support for sustainable urban transport policies and projects. | | | | | | | | | | | | | | | | | | | | | |
| Output 1: Technical Support Unit | A Technical Support Unit is providing local governments with technical guidance and capacity development for the preparation and implementation of public transport projects and transport demand management. | | | | | | | | | | | | | | | | | | | | | |
| Activity 1.1 | Drafting and signing of an Implementation Agreement on the establishment of the programme including the TSU concept, office space, and personnel structure; | | 1 | | | | | | | | | | | | | | | | | | | |
| Activity 1.2 | Organisational development measures for the Technical Support Unit (strategy, business plan, network and cooperation structure, roles and responsibilities, definition of work packages, standard operating procedures) | | | 2 | | | | | | | | | | | | | | | | | | |
| Activity 1.3 | Definition and development of service packages and modes of delivery jointly with other international cooperation projects (especially the GIZ project SUTIP) and initiatives on urban transport (development of guidance documents to assist local governments on specific transport projects / policies); | | | | | | 3 | | | | | | | | | | | | | | | |
| Activity 1.4 | Technical assistance on project development and management (e.g. development of concepts for parking zones and pricing models, tendering process for public transport operation services, process advice and stakeholder coordination for public transport reforms, including detailed | | | | | | | | | | | | | | | | | | | | | |

| | | |
|--|--|---|
| | engineering design, financing models, operation and maintenance plans); | |
| Activity 1.5 | Support and advisory service in budget planning at local and national level. Inter-ministerial coordination with the Ministry of Public Works, Ministry of Finance and Bappenas as well as dialogues with private sector representatives | |
| Output 2: Funding Mechanism | A funding mechanism to support public transport projects and transport demand management (TDM) in cities has been set up and pilot tested for funding measures in at least five of the seven pilot cities. | |
| Activity 2.1 | Assessment of existing and potential mechanisms to increase co-funding of sustainable transport measures substantially; | |
| Activity 2.2 | Agreement with financing partners on standard operation procedures, including rules, regulations and access criteria for the new funding mechanism of the urban transport programme; | 4 |
| Activity 2.3 | Formulation a financing agreement for the new mechanism of the urban transport programme which can be adapted by other potential donors; | 5 |
| Activity 2.4 | Pilot testing of the mechanism, analysing potential adjustment needs and executing necessary adjustments; | |
| Activity 2.5 | Development and implementation of a fundraising strategy | 6 |
| Output 3: Project Pipeline | A pipeline of public transport and transport demand management projects exists and is consolidated with political partners and ready to be implemented during and beyond the lifetime of the NSP. | |
| Activity 3.1 | Establishment of a pool of consultants to support cities on long-term and short term | 7 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | assignments; | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 3.2 | Strengthening capacities of local governments through measures of organisational development and trainings (e.g. participation processes, strategic planning, tendering, quality control and supervision of consultants); | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 3.3 | Technical assistance through the Technical Support Unit on policy design, project management and technical aspects | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 3.4 | Support of cities through the TSU in developing project proposals and presenting them to potential funders (project pipeline); | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 3.5 | Establishment of training networks to build capacity of local transport consulting companies (development of curricula, sub-contracting training institutions to provide seminars and training on-the job) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output 4: Implementation of Demonstration Projects | Demonstration projects evidencing improved public transport and transport demand management that serve as good practice for replication have been implemented in the pilot cities and disseminated. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 4.1 | Identification and fast-start implementation of proposed measures supported by local subsidies in the pilot cities | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 4.2 | Development of guidelines and standards to ensure a high quality of urban transport projects that serve as a reference in the selection of demonstration projects for co-funding; | | 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 4.3 | Development of demonstration projects to be supported under NAMA SUTRI; | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Activity 4.4 | Co-funding of high-quality projects which are able to demonstrate mitigation impact, leveraging potential and the achievement of co-benefits; | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|-----------------------------|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|----|--|
| Activity 4.5 | Support monitoring of the implementation and evaluation of impacts of each project as part of the M&E plan; | | | | | | | | | | | | | | | | | | | |
| Output 5: MRV System | A consistent system for the monitoring, reporting and verification (MRV) of emission reductions and co-benefits of urban transport development projects is in place and applied by national and local implementation partners. | | | | | | | | | | | | | | | | | | | |
| Activity 5.1 | Development of a common MRV methodology that is agreed upon by the relevant stakeholders in the pilot cities and at national level; | | | | 9 | | | | | | | | | | | | | | | |
| Activity 5.2 | Provision of technical advice for the standardisation of data collection and processing of urban transport data in the 5 cities as part of the operationalization of the MRV concept (MRV Roadmap Process); | | | | | | | | | | | | | | | | | | | |
| Activity 5.3 | Monitoring of the implementation of the national programme and the impacts of mitigation actions in the pilot cities; | | | | | | | | | | | | | | | | | | | |
| Activity 5.4 | Provision of support and technical advice for the reporting of GHG emission reductions, co-benefits , up-scaling potential and leverage effects in Indonesia and internationally. | | | | | | | | | | | | | | | | | | 10 | |
| Project Management | | | | | | | | | | | | | | | | | | | | |
| Activity PM1 | NAMA Facility Annual Report | | | | | | | | | | | | | | | | | | | |
| Activity PM2 | NAMA Facility Mid-term Report | | | | | | | | | | | | | | | | | | | |
| Activity PM3 | Internal Review, Learning and adjusting | | | | | | | | | | | | | | | | | | | |
| Activity PM4 | Development / Reviewing of a programme M&E system | | | | | | | | | | | | | | | | | | | |
| Activity PM5 | Development / adjustment of a knowledge management system | | | | | | | | | | | | | | | | | | | |

4.5 NAMA coordination & management (organisational measures)

The steering structure of NAMA SUTRI consists of:

- A National Steering Committee comprising representatives from the MoT (high level decision makers, Senior Advisor to the Minister), Bappenas (Deputy for Environment, Deputy of Transportation). The Steering Committee will give guidance to the project at political and strategic level.
- A Technical Steering Committee which comprises representatives of local governments, development partners, the Ministry of Finance and the Ministry of Environment in order to coordinate project implementation and give technical guidance.
- A Technical Support Unit (TSU) which functions as the project management unit of the NAMA Support Project led by the Vice Minister of Transportation comprising staff from MoT and GIZ. The TSU will develop technical documents and policy drafts on urban transport and prepare guidance documents for the co-funding of mitigation actions under NAMA SUTRI in close cooperation with the Technical Steering Committee.

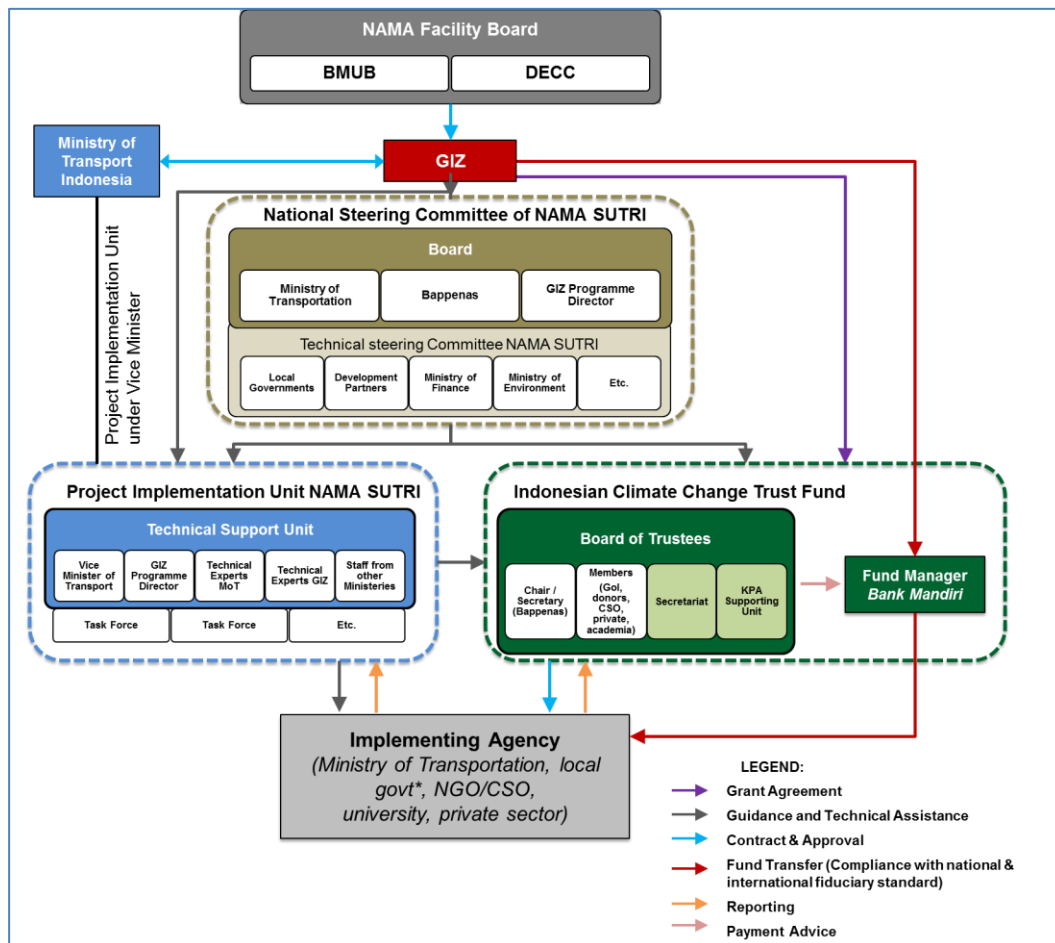
The Steering Committee has already been established for the preparation of this NAMA Support Project. The lead agency is the Ministry of Transportation in close coordination with Bappenas, including the department for environment (and climate change) as well as the transportation department. The ICCTF as an entity of Bappenas has supported the urban transport NAMA development from an early stage. The Steering Committee will take strategic decisions on the implementation and ensure close coordination with other line ministries such as the Ministry of Environment and Ministry of Public Works.

A training network will be developed in order to strengthen the capacity of local transport consulting companies that develop projects for local governments. It will consist of existing training institutions and departments of universities (e.g. Universitas Gajah Mada, Institut Teknologi Bandung) and NGOs who can transfer knowledge (e.g. Indonesia Transport Society), provide technical guidance and recommend good practice approaches.

The development and implementation of demonstration projects in pilot cities will be carried out by project implementation units of local transport and planning departments and other transport stakeholders. They will receive support from flexible expert teams who will contribute knowledge and experience to address a certain topic or situation that the local government faces. This will ensure close coordination with local and provincial governments.

The overall steering structure is illustrated in the figure below.

Figure 6: Steering Structure of NAMA SUTRI



Source: GIZ

The following organisations will be involved as implementing organisations in the project:

Ministry of Transportation (MoT): The MoT is responsible for transport sector policy and the implementation of climate change action in the transport sector in Indonesia. As a ministerial level institution, the MoT has the mandate for national policy formulation, policy implementation and technical policy, including the field of urban transportation. The MoT has long-standing experience in implementing bilateral financial cooperation projects (e.g. infrastructure development in railways) and technical cooperation with different countries.

In order to mainstream climate change mitigation in the transport sector, the MoT has established a Working Group on Transport and Climate Change which represents the different sub-sectors of land, sea, rail and water. As the main project partner, the MoT and GIZ will jointly build a Technical Support Unit which is to provide technical assistance, capacity development and policy guidance to local governments for the development and implementation of sustainable urban transport policies and projects.

GIZ will act as the delivery organisation to provide technical and financial support of the NAMA Support Project by the NAMA Facility, given the approval by the NAMA Facility. As delivery organisation GIZ is in charge to provide policy advice and technical assistance to the implementing organisations at national level. GIZ will assist in setting up and pilot testing the national programme in pilot cities. The financial assistance of the NAMA Support Project will be provided by GIZ through financial agreements with the Indonesian Climate Change Trust Fund (ICCTF).

In order to ensure inter-ministerial coordination, the MoT will chair the National Steering Committee of NAMA SUTRI, which was established in August 2013 in order to pave the way for the implementation of NAMA SUTRI. In this way the Steering Committee will contribute to strengthening the political endorsement, collaboration and coordination among organisations and institutions involved in the implementation of the NAMA as a multi-stakeholder approach. The Steering Committee will include representatives of the National Development Planning Ministry (Bappenas), the Ministry of Environment (KLH), the National Council for Climate Change (DNPI) and GIZ. The steering structure of the NAMA Support Project (NSP) will build on this existing cooperation structure.

The Indonesian Climate Change Trust Fund (ICCTF) is the national trust fund in charge of channelling international climate finance. The ICCTF aims to achieve Indonesia's goals of moving to a low-carbon economy and greater resilience to climate change, and to enable the Gol to increase the effectiveness and impact of its leadership and management in addressing climate change issues. It was established in 2009 as a self-managed channelling organisation. After building the ICCTF's organisational foundation and implementing the first six projects under the UNDP-assisted PREP-ICCTF scheme (2010-14), the ICCTF is prepared to take over the full management of functions. In compliance with Presidential Regulation Number 80 year 2011 (Perpres 80/2011), the ICCTF was accredited as National Trust Fund with Bank Mandiri appointed as National Trustee (Ministerial Decree accreditation received 04/03/2014). The ICCTF aims to achieve its full accreditation as a National Funding Entity in compliance with international fiduciary standards at the end of 2014.

The direct investment share of NAMA SUTRI is foreseen to be channeled partly through the ICCTF, which will be the fund manager and report to GIZ based on a grant agreement.

The National Development Planning Ministry (Bappenas) is actively supporting the implementation of NAMA SUTRI by giving its political endorsement and enabling inter-ministerial coordination. Bappenas has the mandate for overall development planning and coordination of climate change action and is therefore strategically important to mainstream sectoral programmes and initiatives. Due to its important coordination role, Bappenas is one of the main partners in the National Steering Committee. Bappenas will draw on the experiences gained in implementing NAMA SUTRI for NAMAs in other sectors and evaluate lessons learned for national NAMA development as well as for international climate change policy.

4.6 Expected GHG mitigation (ex ante)

In order to assess the potential mitigation impact, the MRV concept (see section 5.3 for further details) builds on scenarios that assess impacts of demonstration projects on city level in pilot cities (direct scenarios) as well as the impact of upscaling to further urban areas (indirect scenarios).

- The mitigation impact of improved transport systems in pilot cities is defined as the direct mitigation impact. Since the transformation of urban transport systems is a process which usually takes more than five years, the pilot phase will only demonstrate the impact of demonstration projects which have a limited scope after five years. However, these projects will be continued and serve as a model for reforming the urban transport systems in the pilot cities once feasibility (in terms of financing and operation) and positive impacts have been demonstrated.
- The mitigation impact of upscaling and replication of good practice beyond the pilot cities of NAMA SUTRI is defined as the indirect mitigation impact. The transformation of national urban transport policy is also a process which can only be initiated during the pilot phase of five years but will show its mitigation impact in the medium and long

term (10-20 years). The table below illustrates the expected mitigation impact of NAMA SUTRI along the timeline.

For the direct mitigation assessment, two different scenarios with a “high impact” and a “low impact” estimation have been developed. In the high impact scenario it is assumed that a shift and improve effect will occur, the low-impact scenario assumes only a shift of passenger kilometers. Detailed information on the assumptions can be found in section 5.3.2. As potential reduction in CO₂ emission of the 5 pilot cities, the combination of shift and improve effects of the NAMA SUTRI measures was analysed.

Estimated direct mitigation impact: Compared to the BAU scenario the CO₂ emissions from road passenger transport in 2030 are reduced by 0.9 MtCO₂ or 18% assuming low impact and by 1.8 Mt or 36% assuming high impact of the measures. Considering that the measures are introduced starting from 2015 and that the CO₂ reduction per year increases linearly until 2030, the cumulative CO₂ emission reduction accounts for 7.2 to 14.1 MtCO₂ (Table 11).

Table 5. Estimated range of direct CO₂ saving effects due to NAMA SUTRI in the 5 pilot cities

| | high impact | low impact | Unit |
|---|-------------|------------|-----------------------------------|
| Inhabitants in 2030 | 7,979,000 | 7,979,000 | [-] |
| Savings in CO₂ emissions in 2030 | 1.8 | 0.9 | MtCO ₂ /year |
| Savings in CO₂ per inhabitant in 2030 | 0.221 | 0.113 | tCO ₂ /inhabitant*year |
| Savings in CO₂ emissions 2015-2030 | 14.1 | 7.2 | MtCO ₂ |

Source: GIZ / Ifeu

As an outcome of the national programme the demonstration projects of NAMA SUTRI may be extended to further urban areas in Indonesia. At the current state, an estimation of the total CO₂ emission reductions in such areas can only give a very rough indication since the data availability is limited and the impact depends on several factors related to the national framework as well as the pace of progress. A range of the possible effects is given by a simplified upscaling approach which bases on the following calculation:

$$\text{CO}_2 \text{ reduction}_{\text{total}} (t) = \text{CO}_2 \text{ reduction}_{\text{pilot cities}} (t) / \text{inhabitants}_{\text{pilot cities}} * \text{inhabitants}_{\text{total}}$$

The estimated indirect mitigation impact of NAMA SUTRI amounts from 3.4 to 13.3 Mt per year in 2030.

Assuming a later implementation than in the pilot cities, the **cumulative emission reduction (direct + indirect)** from 2020 - 2030 is 18.6 - 72.9 Mt CO₂ (Table 12).

Table 6. Estimated range of total CO₂ saving effects due to NAMA SUTRI (direct and indirect) in total Indonesia

| | high impact + high Budget | low impact + lower budget | Unit |
|--|------------------------------|------------------------------|-------------------------|
| Inhabitants in 2030 | 60,000,000 | 30,000,000 | [-] |
| Savings in CO ₂ emissions in 2030 | 13.3 | 3.4 | MtCO ₂ /year |
| Savings in CO ₂ emissions 2020-2030 | 72.9 | 18.6 | MtCO ₂ |

Source: GIZ / Ifeu

4.7 Expected sustainable development benefits of the NAMA

The NAMA will generate several co-benefits in the pilot cities by improving public transport services and walkability, which will result in reduced travel time for public transport users, improved local air quality, increased road safety and enhanced physical activity (since public transport users tend to walk longer distances than car/motorcycle users), among other social and economic benefits. An estimation of the direct impact can only be performed once the demonstration projects are defined.

Evaluation data obtained from similar projects confirm that reforming informal public transport into clean and efficient formal public transport (e.g. BRT systems) creates measurable health benefits (e.g. reduced cases of chronic bronchitis), which leads to improved economic output due to reduced absenteeism. Road safety improvements can reduce injuries by 28% to 69% per year. Furthermore, increased physical activity of passengers shifting from private cars/motorcycles to public transport can be expected to reduce premature deaths from diseases related to physical inactivity.⁸ Sustainable urban transport systems contribute to economic development by improving access to regional markets, workplaces and business centres. A well-functioning transport system in cities improves the quality of life and business conditions due to reduced costs of transportation (better reliability, reduced time-loss).

In this way, the NAMA will contribute to the sustainable development goals of Indonesia as stated in the National Medium-Term Development Plan (RPJMN) 2010-2014, including: health improvements, poverty reduction, infrastructure development and protection of the environment.⁹ In order to estimate the contribution of the NAMA Support Project to these sustainable development benefits, an urban transport survey will be conducted in the pilot cities. The Monitoring and Evaluation Plan will define specific indicators for the monitoring of co-benefits.

⁸ Further references: Social, Environmental and Economic Impacts of BRT Systems (Embarq 2013).

⁹ The development plan is currently being updated for the period from 2015-2019.

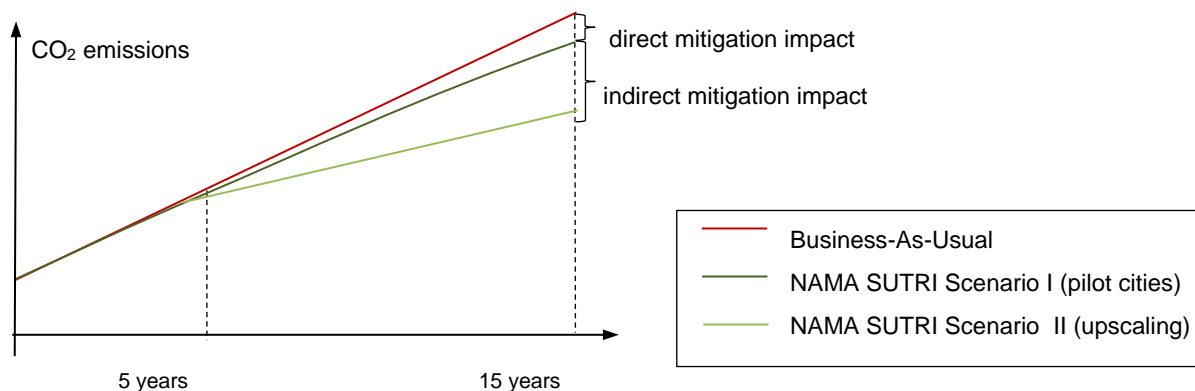
5 The MRV approach: Measurement, Reporting and Verification

The MRV approach reflects the transformational character of NAMA SUTRI. As described above the implementation will start with a pilot phase to establish a national programme to promote sustainable urban transport by a mix of technical and financial instruments and to implement demonstration projects in pilot cities which serve as a basis for upscaling. Hence, the major impact on GHG reduction and co-benefits will be achieved beyond the pilot phase.

In order to assess the potential impact, the MRV concept builds on scenarios that assess impacts of demonstration projects on city level in pilot cities (direct scenarios) as well as the impact of upscaling to further urban areas (indirect scenarios).

- **Direct scenarios:** The mitigation impact of improved transport systems in pilot cities is defined as the direct mitigation impact. Since the transformation of urban transport systems is a process which usually takes more than five years, the projects will only lead to the implementation of demonstration projects. However, these projects will serve as a model for reforming the urban transport systems in the pilot cities once feasibility (in terms of financing and operation) and positive impacts have been demonstrated.
- **Indirect scenarios:** The mitigation impact of upscaling and replication of good practice beyond the pilot cities of NAMA SUTRI is defined as the indirect mitigation impact. The transformation of national urban transport policy is also a process which can only be initiated during the pilot phase of five years but will show its mitigation impact in the medium and long term (10-20 years). The following graph illustrates the expected mitigation impact of NAMA SUTRI along the timeline.

Figure 7. Mitigation impact scenarios of NAMA SUTRI



Source: GIZ

The following section starts with a qualitative description of the impacts of NAMA SUTRI and a definition of the scope of MRV. As a next step, methodology and results of GHG impact assessment are explained. This sub-section also includes a description of uncertainties and further data and research needs. The following part builds up on these findings and describes the monitoring concept of NAMA SUTRI including GHG and non-GHG indicators and the process of monitoring. Finally, institutional arrangements for MRV are described followed by a reflection of challenges related to the implementation of the MRV approach.

5.1 Impacts of NAMA SUTRI

The main impacts of the pilot phase of NAMA SUTRI are illustrated in a causal chain (see figure below). The qualitative impacts can be summarised as follows.

In pilot cities:

- Demonstration projects provide additional transport options and initiate a shift from cars/motorbikes to public transport, walking and cycling. This will lead to reduced travel time for public transport users, improved local air quality, increased road safety and enhanced physical activity (since public transport users tend to walk longer distances than car/motorcycle users), among other social and economic benefits.
- A well-functioning transport system in cities improves the quality of life and business conditions due to reduced costs of transportation (better reliability, reduced time-loss).
- Public transport providers invest in more energy efficient busses. New vehicles lead to reduced air pollution and reduced costs for operation and maintenance. Public transport providers can offer additional services and provide more capacity.

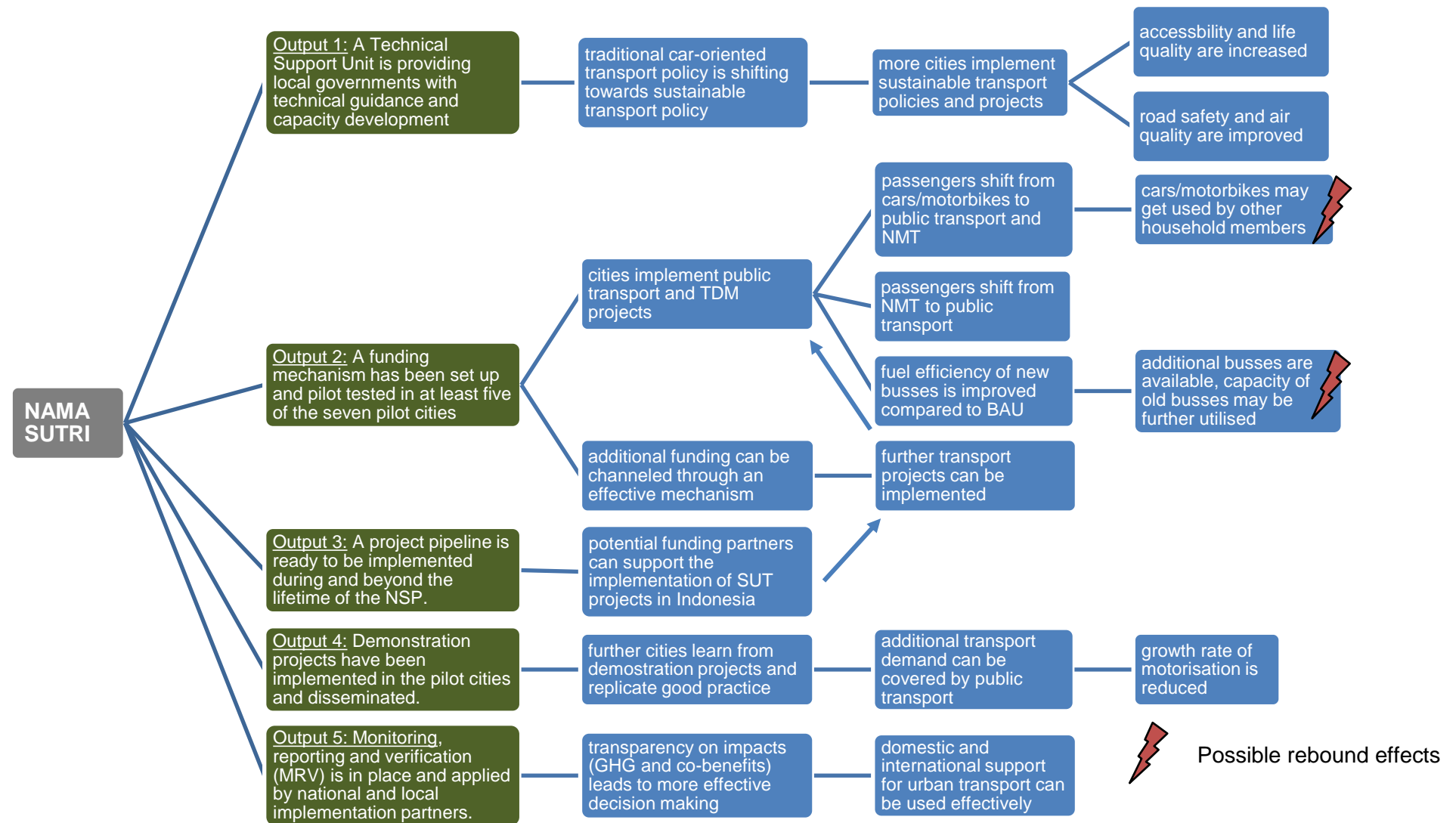
At national level:

- NAMA SUTRI will initiate further budget allocations by the central government for public transport infrastructure and non-motorised transport and lead to a more effective way of spending those public funds at local level.
- NAMA SUTRI will mobilise private sector investments by public transport providers and other operators of urban transport facilities and services, such as off-street parking facilities, ticketing systems and advertising companies.
- NAMA SUTRI will serve as a role model and demonstrate successful operation of the Indonesian Climate Change Trust Fund (ICCTF). This will attract further investments from bilateral and multilateral donors.
- investment opportunities for other donors by creating a project pipeline.
- transition of urban transport policy in Indonesia towards a low-emission pathway by (1) developing policy guidance and a structure for technical support to strengthen local governments, (2) developing mechanisms for co-funding from public and private sources as well as international donors by creating a project pipeline, and (3) increasing the transparency and know-how about impacts of urban transport policy.
- upscaling of good practice through the Technical Support Unit.

Further external effects that need to be considered in the context of impact assessment:

- national policies that attract the use of cars (e.g. Low-Cost Green Cars Policy from 2013);
- fuel subsidies which keep the fuel price far below the world's oil Price.

Figure 8. Outputs of NAMA SUTRI and their anticipated effects



5.2 Scope of the MRV approach

MRV of NAMA SUTRI includes:

- MRV of emission reduction (GHG impact).
- MRV of co-benefits (non-GHG impact),
- MRV of implementation (progress indicators),
- MRV of support.

The MRV approach covers those GHG impacts which are considered likely and major. The assessment of GHG impacts will be done on city level using different scenarios. Assumptions which have been taken for the ex-ante assessment will be updated and validated by different indicators included in the monitoring plan. The effect considered in the MRV concept will also reflect the unintended impacts (rebound-effects) since currently the order of magnitude cannot be clearly assessed yet. If those effects appear significant after a survey, the rebound effects will be subtracted from the overall mitigation impact.

The climate gas covered is only CO₂ emissions from fuel burning (tank to wheel) and no emissions from fuel supply (well to tank). This approach was assumed adequate for a simplified CO₂ emission estimation, since only conventional fuels (gasoline and diesel) are investigated, so that CO₂ emissions are dominated by the tank to wheel share.

Apart from GHG impacts the MRV concept covers monitoring of quality and progress of implementation as well as co-benefits. Contributions to sustainable development are the main drivers for policy makers at local level. Monitoring of co-benefits is therefore a substantial part of the MRV concept. In order to keep track on the actual implementation of the NAMA and to document the correlation of NAMA implementation and impacts achieved, the MRV concept includes several progress indicators at national level and at local level.

The monitoring period is defined for 15 years from 2015 (start of implementation) until 2030. While the implementation of the pilot phase of NAMA SUTRI which is described in this document takes place from 2015 to 2019, the major impact of the project will be measurable over a medium and long-time perspective. Since the NAMA aims to initiate a transformational change in Indonesia, a shorter time period for monitoring would be insufficient to capture the intended impacts of upscaling and replicating good-practices with support from a national urban transport programme.

The support received for the implementation of NAMA SUTRI will be monitored by the Indonesian Climate Change Trust Fund (ICCTF) which is channeling international funding. Further assistance through technical support and technology transfer will be monitored within the national government structure through registering international cooperation in the so-called "Blue Book".

5.3 GHG Impact Assessment (ex-ante)

The objective of the impact assessment is an estimation of the CO₂ emission reduction potentials, both direct and indirect, due to an implementation of different measures of the NAMA SUTRI project. In this context, the direct impact refers to the five pilot cities in which the measures are to be implemented while an indirect impact is expected from upscaling effects due to an expansion of the measures on further cities in Indonesia.

The GHG mitigation impact of NAMA SUTRI will be assessed on two levels:

- The direct mitigation impact will be captured on city level of the pilot cities that have implemented demonstration projects under NAMA SUTRI.
- The indirect mitigation impact will be calculated based on scenarios in which an upscaling and replication to further cities is assumed.

5.3.1 Scope of GHG Impact Assessment

The impact assessment considers climate gas emissions from transportation in urban areas. The focus is given on 5 pilot cities in which NAMA SUTRI is to be implemented, with an outlook on other urban areas with more than 100.000 inhabitants in Indonesia.

As “Priority 1” emission source according to the Global Protocol for Community-Scale GHG Emissions (GPC) motorized passenger road transport (passenger cars, motorcycles, bus and minibus) is considered. Rail passenger transport, which also belongs in this category, is not analyzed. Modes of Priority 2 (freight road transport) and 3 (passenger aircrafts, ships) are not analysed.

The climate gas emissions reported in this assessment cover only CO₂ emissions from fuel burning (tank to wheel) and no emissions from fuel supply (well to tank). This approach was assumed adequate for a simplified CO₂ emission estimation, since only conventional fuels (gasoline and diesel) are investigated, so that CO₂ emissions are dominated by the tank to wheel share. Other greenhouse gases than CO₂, e.g. methane and N₂O are not calculated.

The time line is described for the current situation in 2013. It is supposed that the measures of NAMA SUTRI can be implemented in a medium term and can be characterized by the year 2030. However, it must be noted that both CO₂ reduction impacts and maintenance expenses of the measures should be considered in the long term after 2030.

The impact of different NAMAs is analysed by a comparison of the CO₂ emissions in different scenarios for 2030, given in a Business as Usual (BAU) scenario and SHIFT and IMPROVE scenarios. Both, the emissions in the year 2030 and the cumulative emissions from the time of implementation until 2030 have been assessed.

5.3.2 Direct Mitigation Impact

5.3.2.1 Base year and BAU scenario

The key developments between the base year 2011 and 2030 (BAU) are an increase in population combined with an increased motorisation¹⁰ (see Table 7). Thus, in 2030, the highest vehicle numbers still occur for motorcycles (MCs). In most cities, high increase for the number of passenger cars (PCs) is assumed.

Table 7. Population and motorisation development from 2013 to 2030 (BAU) in the five pilot cities

¹⁰ The growth rates based on the „BAU restrain infrastructure” scenario in [SUTIP / GTZ, 2010], which assumes that motorization increases in urban areas, is limited by road infrastructure. We additionally assume, that the maximum motorization in BAU is limited to the average of all Pilot cities. Thus, unrealistic vehicle numbers in cities which already have higher motorization rates can be avoided.

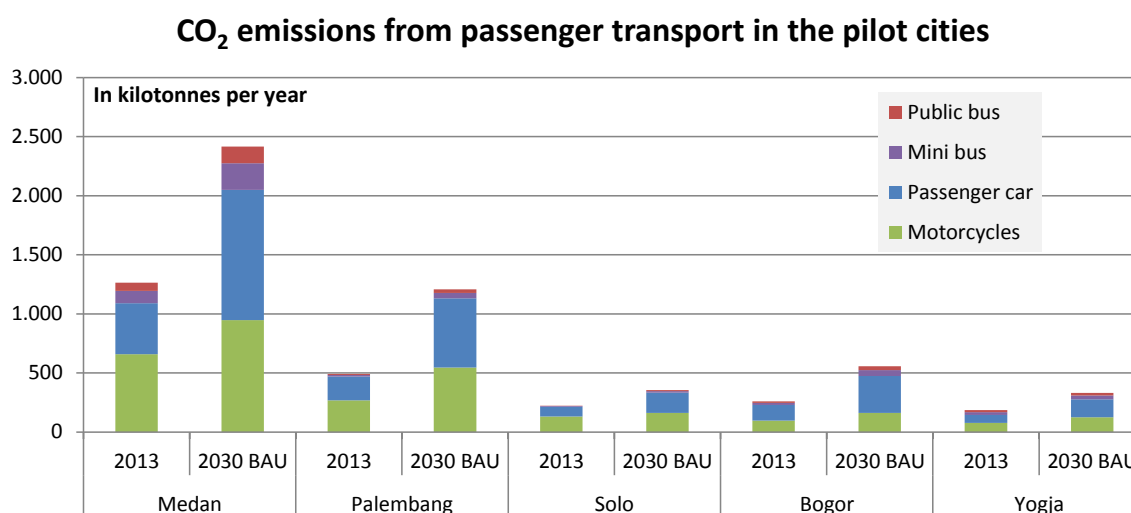
| | Year | Palembang | Solo | Medan | Bogor | Yogya | Total/ Average |
|------------------------|------|-----------|---------|-----------|-----------|---------|-------------------|
| Population | 2013 | 1,493,146 | 528,716 | 2,117,224 | 802,862 | 414,082 | 5,356,030 |
| | 2030 | 2,348,550 | 595,000 | 3,490,000 | 1,032,372 | 513,000 | 7,978,922 |
| PCs/ 1000 capita | 2013 | 70.0 | 81.0 | 106.0 | 85.0 | 83.0 | 88.6 |
| | 2030 | 144.2 | 166.9 | 182.5 | 175.1 | 171.0 | 182.5 |
| Busses/ 1000 capita | 2013 | 2.0 | 2.2 | 11.0 | 5.0 | 13.0 | 6.6 |
| | 2030 | 4.8 | 5.3 | 15.8 | 11.9 | 15.8 | 15.8 |
| MCs/ 1000 capita | 2013 | 362.0 | 503.0 | 625.0 | 244.0 | 379.5 | 422.7 |
| | 2030 | 519.8 | 606.9 | 606.9 | 350.3 | 544.9 | 606.9 |

Source: [GIZ, 2014a]; [SUTIP / GTZ, 2010]; own calculations and assumptions. Limit values marked in green.

In 2013 the CO₂ emissions of the cities range from 0.185 MtCO₂ in Yogya to 1.264 MtCO₂ in Medan. In all cities, individual transport with passenger cars and motorcycles causes the highest share of CO₂ emissions (Source: Calculations by Ifeu/GIZ

). Despite improved fuel efficiency (10% lower fuel consumption in l/km for all vehicle categories) the CO₂ emissions increase until 2030 roughly by factor 2 due to the growing vehicle population and transport demand.

Figure 9: Passenger transport CO₂ emissions of the pilot cities in 2011 and 2030 (BAU)



Source: Calculations by Ifeu/GIZ

5.3.2.2 SHIFT and IMPROVE scenarios

In the BAU scenario the CO₂ emissions of the pilot cities considerably increase until 2030 while individual passenger transport has the highest share in the emissions. The impact assessment of NAMA SUTRI measures therefore focuses on the potential to reduce CO₂ by

strengthening public bus transport. Two different scenarios with a “high impact” and a “low impact” estimation each are analysed. The following assumptions are made:

SHIFT

- Description: In BAU, an increasing demand in individual transport performance (Pass.km) compared to 2013 is assumed. By different measures (e.g. more bus lines, higher frequency) part of the increasing demand may be shifted to public buses or non-motorised transport (NMT). The structure of the bus fleet (bus size, vehicle load, fuel efficiency) is similar to BAU.
- SHIFT of additional Pass.km.: High impact: 20% from PC and mini bus and 10% from MC to public busses, 10% from MC to NMT. Low impact: 10% from PC and mini bus and 5% from MC to public busses, 5% from MC to NMT.

IMPROVE

- Description: In BAU, a modest increase in bus size and fuel efficiency is assumed. Due to higher individual motorisation, the seat utilisation is assumed to slightly decrease. Improvement measures for the bus fleet (e.g. new/efficient vehicles) may increase fuel efficiency, the bus size and seat utilisation.
- Additional fuel efficiency improvement: high impact: 10%; low impact: 0%.
- Share in Pass.km by bus size: 90 seats: 25% instead of 0% (BAU); 60 seats: 50% instead of 66% (BAU); 30 seats: 25% instead of 33% (BAU).
- Passengers/seat capacity: 60-80%¹¹ instead of 50% (BAU)

The most important changes in the scenarios are listed in Table 8 and Table 9. Depending on the city, public bus transport (mini bus excluded) in 2013 has a share of 4-19% in the total passenger transport of the respective city and in most cities decreases in the BAU scenario. In the SHIFT scenario with low impact (named SHIFT_LI in table below) bus transport has a share of 20-30% in total passenger transport, in a high impact variant (named SHIFT_HI in table below) the share is 35-50%¹² of the additional transport demand until 2030. The modal share of the current passenger kilometers is not subject to these projections and remains as in the base year.

Table 8. Share of public bus transport in transport performance (pass.km) in each city¹³

¹¹ Higher vehicle loads are assumed for large busses which may operate on more frequented routes.

¹² 50% was assumed a maximum share and represents an ambitious aim for public transport. For example, in Germany public transport in metropolitan areas is usually around 15%.

¹³ Base year 2013 compared to 2030, applying different scenarios.

| Scenario | Palembang | Solo | Medan | Bogor | Yogja |
|-------------|-----------|------|-------|-------|-------|
| Base (2013) | 5% | 4% | 13% | 11% | 19% |
| BAU/IMPROVE | 5% | 4% | 10% | 10% | 11% |
| SHIFT_HI | 49% | 35% | 46% | 50% | 42% |
| SHIFT_LI | 27% | 20% | 28% | 30% | 27% |

Source: own assumptions

In the IMPROVE scenario, next to specific fuel reductions, the average number of passengers per bus increases due to larger buses and higher vehicle loads, thus, managing similar transport performance (Pass.km) with lower vehicle kilometers. As described earlier, in BAU the average number of passengers per bus decreases compared to 2013 from 31.5 to 22.5 (Table 9.). In the IMPROVE scenario in average 34.2 passengers per bus are transported. The vehicle load of PCs, MCs and mini buses is constant in all scenarios.

Table 9. Average number of passengers transported per vehicle

| Scenario | Passenger Car | Mini bus | Public bus | Motorcycles |
|----------------|---------------|----------|------------|-------------|
| Base (2013) | 3.2 | 8.4 | 31.5 | 1.3 |
| BAU (2030) | 3.2 | 8.4 | 22.5 | 1.3 |
| SHIFT (2030) | 3.2 | 8.4 | 22.5 | 1.3 |
| IMPROVE (2030) | 3.2 | 8.4 | 34.2 | 1.3 |

Source: own assumptions

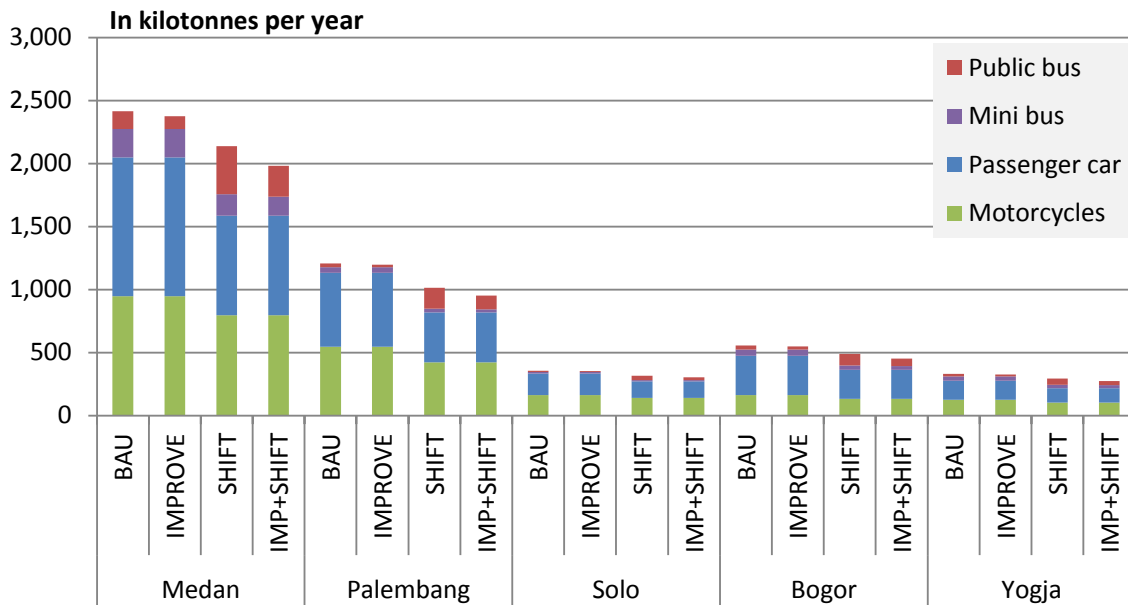
The effect of both measures, separate and in combination, is demonstrated in Figure 10 for low impact and Figure 11 for high impact assumptions (also see numbers in Table 10). With the underlying assumptions the highest reduction in CO₂ emissions can be achieved by a shift from individual to public transport. The improved vehicle load in public transport has a relevant effect if bus transport already has a high share. While the total CO₂ emissions by these measures still increase by more than factor 2 compared to the base year 2013, both measures together contribute to a relevant mitigation.

Table 10. Passenger transport CO₂ emissions for the pilot cities in all scenarios

| City | Scenario to 2030 | CO ₂ emissions in 1000 tonnes | | | | |
|-----------|------------------|--|----------|------------|--------------|-------|
| | | Passenger Car | Mini bus | Public bus | Motor-cycles | Total |
| Medan | 2013 | 432 | 105 | 70 | 658 | 1,264 |
| | BAU | 1,103 | 224 | 142 | 947 | 2,416 |
| | IMPROVE | 1,103 | 224 | 92 | 947 | 2,366 |
| | SHIFT | 477 | 118 | 621 | 644 | 1,860 |
| | IMP+SHIFT | 477 | 105 | 356 | 644 | 1,582 |
| Palembang | 2013 | 201 | 13 | 9 | 269 | 492 |
| | BAU | 587 | 45 | 29 | 546 | 1,207 |
| | IMPROVE | 587 | 45 | 19 | 546 | 1,196 |
| | SHIFT | 206 | 11 | 304 | 299 | 822 |
| | IMP+SHIFT | 206 | 10 | 175 | 299 | 691 |
| Solo | 2013 | 82 | 5 | 4 | 132 | 223 |
| | BAU | 172 | 13 | 8 | 162 | 355 |
| | IMPROVE | 172 | 13 | 5 | 162 | 352 |
| | SHIFT | 92 | 6 | 64 | 118 | 280 |
| | IMP+SHIFT | 92 | 5 | 37 | 118 | 252 |
| Bogor | 2013 | 131 | 18 | 12 | 97 | 259 |
| | BAU | 313 | 50 | 32 | 162 | 556 |
| | IMPROVE | 313 | 50 | 20 | 162 | 545 |
| | SHIFT | 148 | 19 | 155 | 103 | 425 |
| | IMP+SHIFT | 147 | 17 | 89 | 102 | 356 |
| Yogja | 2013 | 66 | 24 | 16 | 78 | 185 |
| | BAU | 152 | 33 | 21 | 125 | 331 |
| | IMPROVE | 152 | 33 | 13 | 125 | 323 |
| | SHIFT | 74 | 23 | 79 | 81 | 257 |
| | IMP+SHIFT | 74 | 20 | 45 | 81 | 221 |

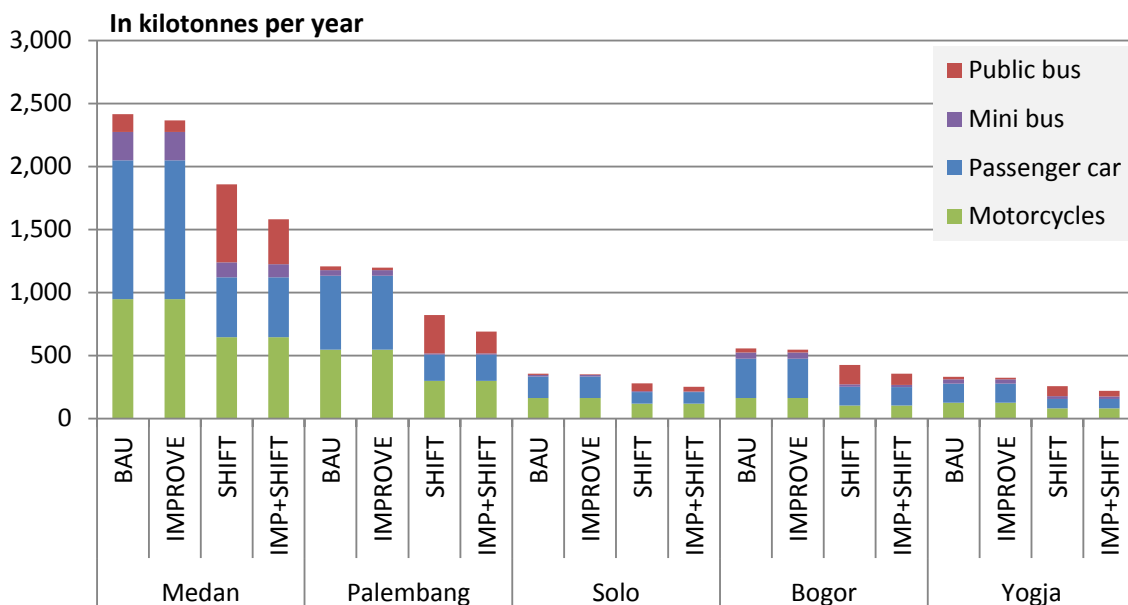
Source: Calculations by Ifeu/GIZ

Figure 10: Passenger transport CO₂ emissions and reduction potentials in 2030 – Low impact scenario



Source: Calculations by Ifeu/GIZ

Figure 11: Passenger transport CO₂ emissions and reduction potentials in 2030 – High impact scenario



Source: Calculations by Ifeu/GIZ

As reduction potential in CO₂ emission of the 5 pilot cities, the combination of shift and improve effects of NAMA SUTRI measures was analysed. Compared to the BAU scenario the CO₂ emissions from road passenger transport in 2030 are reduced by 0.9 MtCO₂ or 18% assuming low impact and by 1.8 MtCO₂ or 36% assuming high impact of the measures.

Considering that the measures are introduced starting from 2015 and that the CO₂ reduction per year increases linearly until 2030, the cumulative CO₂ emission reduction accounts for 7.2 to 14.1 MtCO₂ (Table 11).

Table 11. Estimated range of CO₂ saving effects due to NAMA SUTRI in the 5 pilot cities

| | high impact | low impact | Unit |
|---|-------------|------------|-----------------------------------|
| Inhabitants in 2030 | 7,979,000 | 7,979,000 | [-] |
| Savings in CO₂ emissions in 2030 | 1.8 | 0.9 | MtCO ₂ /year |
| Savings in CO₂ per inhabitant in 2030 | 0.221 | 0.113 | tCO ₂ /inhabitant*year |
| Savings in CO₂ emissions 2015-2030 | 14.1 | 7.2 | MtCO ₂ |

5.3.3 Indirect Mitigation Potential of NAMA SUTRI until 2030

As an outcome of the national programme the demonstration projects of NAMA SUTRI may be extended to further urban areas in Indonesia. At the current state, an estimation of the total CO₂ emission reductions in such areas can only give a very rough indication since the data availability is limited and the impact depends on several factors related to the national framework as well as the pace of progress. A range of the possible effects is given by a simplified upscaling approach which is based on the following calculation:

$$\text{CO}_2 \text{ reduction}_{\text{total}} \text{ (t)} = \text{CO}_2 \text{ reduction}_{\text{pilot cities}} \text{ (t)} / \text{inhabitants}_{\text{pilot cities}} * \text{inhabitants}_{\text{total}}$$

In the SHIFT+IMRPOVE scenario, the average CO₂ reduction compared to BAU ranges from 0.113 (low impact) to 0.221 (high impact) tonnes CO₂ per inhabitant and year (compare Table 11).

The total number of inhabitants in urban areas who can benefit from NAMA STURI is estimated by the financial budget for public road infrastructure funding and the costs for prioritized public urban road transport development (data and assumptions by [GIZ, 2014b]).

The costs for urban public road infrastructure development are assumed with 50 USD per year and inhabitant based on estimations of different pre-feasibility studies conducted by the Cities Development Initiative Asia (CDIA). The given costs correspond to different measures, e.g. investment in BRT infrastructure, technology for intelligent transport systems, interchange stations. It is assumed that the calculated CO₂ reduction effects from the SHIFT and IMPROVE scenarios can be reached by comparable measures and with comparable costs. The total budget is estimated to amount from 1.5 to 3 bn USD per year which is used as a range to estimate the number of inhabitants who can profit from NAMA SUTRI in 2030. Thus, NAMA SUTRI mitigation effects can be allocated to 30 to 60 million inhabitants in Indonesia. This corresponds to 30-60% of the population expected to live in Indonesian cities with 100,000 or more inhabitants in 2030 [GIZ, 2014a].

The estimated reduction effect of NAMA SUTRI measures amounts from 3.4 to 13.3 MtCO₂ in 2030. Assuming a later implementation than in the pilot cities, the cumulative emission reduction from 2020 - 2030 is 18.6 – 72.9 MtCO₂ (Table 12).

Table 12. Estimated range of CO₂ saving effects due to NAMA SUTRI in total Indonesia

| | high impact + high budget | low impact + lower budget | Unit |
|--|------------------------------|------------------------------|-------------------------|
| Inhabitants in 2030 | 60,000,000 | 30,000,000 | [-] |
| Savings in CO₂ emissions in 2030 | 13.3 | 3.4 | MtCO ₂ /year |
| Savings in CO₂ emissions 2020-2030 | 72.9 | 18.6 | MtCO ₂ |

Source: Calculations by Ifeu/GIZ

5.3.4 Uncertainties and needs for additional data and research

The CO₂ emission calculation can provide a first estimation of the impacts from NAMA SUTRI measures. In conformity with the MRV (measuring, reporting, verifying) approach for NAMAs, the impacts of NAMA SUTRI will have to be constantly monitored. Nevertheless, it is very important to provide a sound dataset to compare the developments in CO₂ emissions to the BASE and BAU scenario. To improve the results of these scenarios, additional research in the following fields is required:

Activity data:

The central parameter for the used scenarios is the transport performance of different vehicle categories, given as Pass.km. This parameter was calculated bottom-up by multiplication of vehicle numbers, average annual mileage (VKT), and vehicle load rates. This approach holds large uncertainties since information on this data is limited and thus has to be supported with own assumptions. Further research should try to focus on additional data on transport performance, e.g. by total passenger numbers from public bus transportation and trip surveys.

Also the level of detail in the input data might be improved to enable a differentiation by vehicle size, age and fuel type. This would allow using detailed data or giving better assumptions on average mileage, specific passenger load rates, specific fuel consumption and projections for the future vehicle park.

Specific fuel consumption:

As mentioned, specific fuel consumption can be described if detailed data for the vehicle park (size, age, fuel type) is available. Additionally, the characterisation of traffic situations (share of start-stop, free flow, etc.; average velocity) in urban areas in Indonesia in general or the selected pilot cities has a high effect on specific energy consumption. In the given report, only an “average” urban situation for Europe is analysed which is different in aspects to urban transport in Indonesia.

5.4 Monitoring Plan (ex-post)

The monitoring plan includes indicators to measure GHG impacts, non-GHG impacts (co-benefits), progress of implementation and MRV of support.

The mitigation impact will be assessed by comparing the business-as-usual case with the implementation case. GHG baseline is based on the motorisation trend of public and private vehicles in the pilot cities and trend scenarios of the average travel demand. The input data used for the ex-ante assessment needs to be validated and improved throughout the implementation of NAMA SUTRI. Since some indicators and assumptions taken in the baseline scenario are default values of the region, the monitoring plan includes the collection of data to validate these indicators in order to adjust the baseline over time (dynamic baseline).

It is planned to initiate a regular national urban transport survey that captures information on the mobility behavior of the urban population (e.g. in household survey), key indicators on urban transport supply (e.g. public transport service quality), vehicle fleet data and qualitative information to identify opportunities for transport system improvements.

5.4.1 Indicators on GHG impact

The GHG impact will be assessed at city level. In order to estimate the mitigation impact the monitoring approach will be based on the scenarios applied in the ex-ante assessment. Throughout the implementation of NAMA SUTRI, the data collected will be used to validate and update the assumptions made in the scenarios. This will give insights on emission trends and show the actual impact of the measures. However, these indicators will not allow the attribution of the impact of a specific measure to emission trends at city level. Additional qualitative information will help to identify how specific measures contribute to a certain change.

Table 13. Indicators on GHG Impact at national level

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

Source: GIZ

Table 14. Indicators on GHG Impact at local level

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

Source: GIZ

5.4.2 Indicators on non-GHG impacts (co-benefits)

The following city level / measure specific indicators will be used to quantify the impact of NAMA SUTRI on sustainable development objectives:

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

Sources: Public transport survey, household surveys, traffic counting, air quality measurement.

5.4.3 Indicators on progress in implementation

The MRV approach consists of short term, mid-term and long-term measurements:

- Short-term monitoring (yearly) focuses on output/progress indicators demonstrating that implementation is taking place according to the NAMA design (output indicators from NSP log-frame and Gantt chart).
- Mid-term monitoring (every 4 years) focuses on impacts achieved through the implementation of mitigation actions in pilot cities, and through the support programme at national level (outcome indicators from NSP log-frame).
- Long-term monitoring (every 8 years) focuses on impacts achieved at city level as well as of the transformational change at national level (outcome indicators at aggregated level from NSP log-frame).

5.4.4 MRV of support

The international support received for the implementation of NAMA SUTRI will be monitored by the Indonesian Climate Change Trust Fund (ICCTF) which is channeling international funding. Further assistance through technical support and technology transfer will be monitored within the national government structure through registering international cooperation in the so-called “Blue Book”.

5.4.5 MRV set-up and process

As highlighted earlier, MRV of NAMA SUTRI includes MRV of emission reductions, MRV of co-benefits, MRV of implementation (progress indicators) and MRV of support.

MRV of emission reductions and MRV of co-benefits will be monitored through urban transport data collection. Related indicators will demonstrate the impact of NAMA SUTRI and will be used to validate the assumptions made on emission reductions. Urban transport data collection efforts will be coordinated by the Ministry of Transport and carried out by local governments in cooperation with local universities. An urban transport survey will be carried out in the pilot cities at the beginning of the project to improve and validate the existing transport data. Based on these findings, the mitigation scenarios will be updated and adjusted. The survey will be a starting point for a regularly implemented urban transport survey to monitor information on the mobility behaviour of inhabitants as well as on the transport system and traffic situation. The survey will be updated four years later, before the end of the pilot phase, and continued afterwards by the Indonesian Government. A brief survey to evaluate the performance of the demonstration projects will be carried out one year after the implementation of each project in order to evaluate and adjust the planned measures.

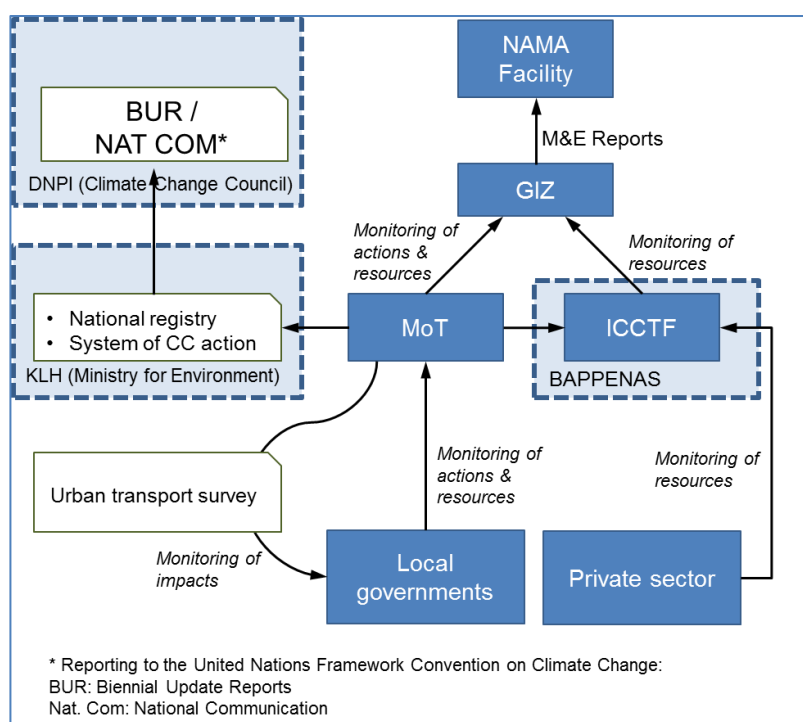
MRV of implementation progress will be carried out by the implementing organisations MoT, ICCTF, GIZ and the local governments who benefit from NAMA SUTRI. Progress indicators will be monitored in an annual report which will be submitted to the Ministry of Environment and to the donors of the NAMA Facility.

MRV of support received for the implementation of NAMA SUTRI will be monitored by the Indonesian Climate Change Trust Fund (ICCTF) which is channeling international funding. Further assistance through technical support and technology transfer will be monitored within the national government structure through registering international cooperation in the so-called “Blue Book”.

The main tasks and responsible institutions in summary:

1. The progress of project implementation will be monitored at national and local level. The monitoring approach covers the monitoring of implementation and funding. Annual updates will be provided by the MoT and local governments to compile information on the budget funds being spent and actions being implemented.
2. The ICCTF will be the body responsible for monitoring funding received from the NAMA Facility and other donors.
3. Reporting to the NAMA Facility will be done as requested in the NAMA Facility Evaluation Framework:
 - Preliminary M&E plan – six months after the NAMA Support Project is commissioned
 - Final M&E plan – 12 months after the NAMA Support Project is commissioned
 - Semi-annual project reports: reference date 30.06. (2015, 2016, 2017, 2018, 2019)
 - Annual project review, reference date 31 December (2016, 2017, 2018)
 - Final project review: during the last year of implementation (December 2019)

Figure 12: Institutional setup for MRV of NAMA SUTRI



Source: GIZ

The process of verification will be further defined in the near future by the National Planning Agency Bappenas who is coordinating climate change activities in Indonesia.

5.5 Specific considerations and challenges

The Ministry of Transportation is conducting urban transport data collection in selected cities as a basis for transport master planning. However, data collection is usually limited to traffic observations (e.g. traffic counting) and origin-destination surveys with a strong focus on motorized transport. The result is a lack of information on non-motorized transport.

Furthermore, local governments conduct surveys regularly, sometimes in cooperation with local universities. As of today, the matching of data collection methods and sharing of information is not always ensured.

One of the main challenges of implementing the MRV approach is to align the ongoing surveys and ensuring the mainstreaming of comparable data collection methods and data processing.

Another challenge related to GHG assessment is vehicle fleet data. National as well as province level data is outdated and inconsistent, e.g. in terms of vehicle categories. Furthermore, there is no mechanism to ensure that old vehicles which are not used anymore, are taken out of the database. The monitoring concept of NAMA SUTRI seeks to improve vehicle fleet statistics.

The specific energy consumption of different vehicles types and classes as well as in different traffic situations has not been analysed yet for Indonesia. In the context of NAMA SUTRI, the regional default values which have been used for the ex-ante assessment will be validated and adjusted to the local conditions based on samples in the pilot cities.

Besides improving the data quality for road transport in the current approach, other factors should be included for CO₂ balancing and reduction scenarios. This includes other transport modes, e.g. rail, and freight transport. Also alternative fuels (e.g. electricity or gaseous fuels) could be considered in further scenarios.

CO₂ emissions reported in the current scenarios consider only tank to wheel (TTW) emissions and no other greenhouse gases, especially N₂O (nitrous oxide) and CH₄ (methane). Further emission estimations should consider the most important components in form of CO₂ equivalents and consider upstream emissions (WTT), too.

6 Financing the NAMA

6.1 Financing mechanism and structure

The financing scheme is part of the national urban transport programme which will be set-up during the pilot phase of NAMA SUTRI. Since the preparation of NAMA SUTRI has already started more than two years prior to the publication of this document, a lot of national and subnational stakeholders have been involved in the preparation process and contributed to its design. In order to maintain the momentum and ensure the commitment of the local government partners, it is highly important to start with the implementation of physical measures in the short term. At the same time, creating an effective funding mechanism to overcome current barriers in financing urban transport requires a few months for administration procedures and preparing the financial agreements. For this reason, the pilot phase will consist of two different phases.

It is foreseen that the direct investment share of the NAMA Facility will be transferred to the ICCTF based on a grant agreement between the ICCTF and GIZ. Already established during phase 1, this agreement will include the option to add conditions on the use of funding dedicated to phase 2. Since Indonesia does not have a development bank, the ICCTF together with the national Bank Mandiri is supposed to provide financial services that support national development with regard to climate change actions. The ICCTF has been established as a national trust fund institution with a legal status to receive climate change funds from donor and disburse them as a grant to the lead executing agency (central government) and the implementing agencies (central government, local government, non-governmental organisations and private parties). In the future, the ICCTF aims to enable direct transfer of funds and directly access funds aligned with the Paris Declaration and the Green Climate Fund.

Phase 1 will provide investment grants for approximately 4-6 physical measures in pilot cities based on proposals by the local governments. The volume for co-funding from the NAMA Facility to be realised in phase 1 is about EUR 1 million. The projects eligible for co-funding have to fulfil the following conditions:

- advanced stage and technical quality of planning (at least conceptual planning),
- budget allocation by local (and provincial) governments for the implementation is approved,
- high potential for replication and upscaling.

The co-funding contribution from the NSP will increase the quality and impact of these projects, for example, by introducing a new technology (e.g. parking meters, traffic lights) or by implementing a demonstration project for replication (e.g. high-quality bus stop as a showcase for a full bus corridor).

The funds are supposed to be channelled via the ICCTF (Funding mechanism 1a, see table below). The ICCTF aims to obtain full accreditation as a National Funding Entity in compliance with international fiduciary standards at the end of 2014. In case of delays in administration procedures, a second option for fast-start implementation is feasible through local subsidies provided by GIZ (Funding mechanism 1b).

During this first phase, two funding windows for **phase 2** will be further developed with the relevant stakeholders Bappenas, ICCTF, Ministry of Finance, Ministry of Transportation, as well as the local bank and private sector companies. The funding volume from the NAMA Facility is EUR 7 million plus EUR 17 million from the Ministry of Transportation. Both windows, described below, are feasible and attractive for the partners, but further negotiations are necessary to define detailed modalities and access conditions.

- A concessional loan programme (Funding mechanism 2a) to mobilise private sector investment in energy-efficient public transport vehicles. The loan scheme will be

accessible to private investors through a financial intermediary (local bank) who will receive a subsidy from the ICCTF. The subsidy will be provided by the ICCTF to the local bank based on a grant agreement. The volume of the loan mechanism depends on negotiations with local banks. First negotiations with the national Bank Mandiri were promising and will be continued after project approval. In order to give a solid estimation, further analysis of the private sector demand need to be carried out in phase 1.

- Investment grants (Funding mechanism 2b) to local governments through a) direct procurement, b) a special account/budget line or c) an output-based modality scheme. The fund would provide grants to co-fund the implementation of measures which are defined by a 'white list'. Local governments can apply for co-funding and receive up to 40% of the total project investment costs if the conditions are fulfilled. The conditions to access co-funding will be defined in phase 1 and will include requirements for the planning process, technical standards, environmental standards and a feasibility study.

Both mechanisms are considered feasible by the Indonesian Government, but still require an in-depth stakeholder dialogue which has already been started. If the implementation partners decide to realise both mechanisms, the funding from the NAMA Facility can be divided between both windows.

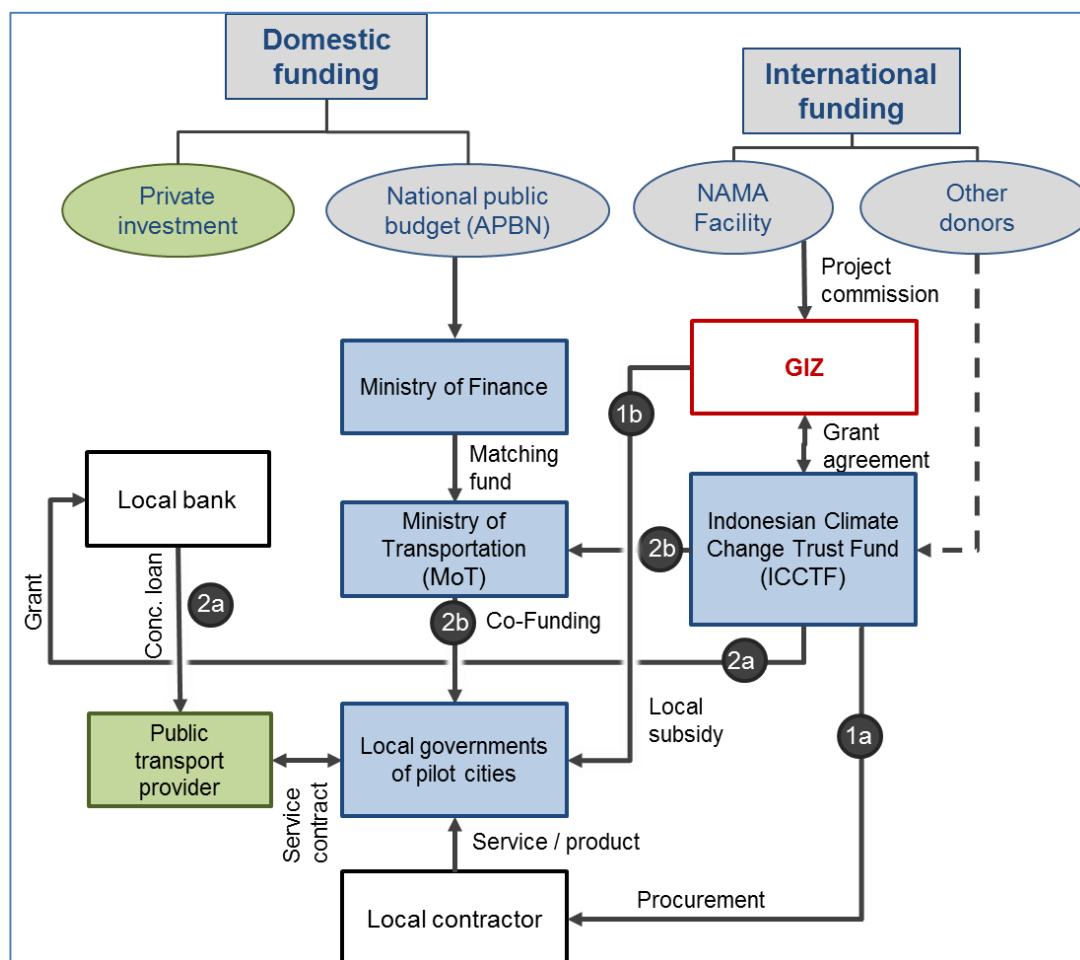
Table 15. Financing instruments for the implementation of mitigation measures

| | Type | Instrument | Beneficiary | Leverage potential |
|---|------------------------------|--|---|--------------------|
| Phase 1 – up to EUR 1 million from NAMA Facility Funding | | | | |
| 1a | Investment grants | Direct procurement through ICCTF | Local contractors (as proposed by local government) | 1:4 |
| Option 1b will be implemented if the ICCTF is not ready at the beginning of the project. | | | | |
| 1b | Investment grants | Local subsidies through GIZ | Local governments, NGOs, private companies | 1:4 |
| Phase 2 – up to EUR 7 million from NAMA Facility Funding, with approx. EUR 4 million for 2a) and EUR 3 million for 2b) | | | | |
| 2a | Loans for the private sector | Concessional loans provided by local banks | Private sector (bus operators, investors) | High |
| 2b | Investment grants | Direct subsidies / reimbursement / dedicated funding | Local governments | 1:8 to 1:10* |

* Including the matching fund from the Ministry of Transportation as described above

Source: GIZ

Figure 13: Funding mechanisms under NAMA SUTRI



Source: GIZ

6.2 Secured resources for NAMA implementation

The pilot phase of NAMA SUTRI will be implemented with support from the NAMA Facility provided through GIZ as the delivery organisation. The resources from the NSP funded by the NAMA Facility (not yet finally approved) foresee EUR 5.5 million for technical assistance and EUR 8.5 million for financial support.

Major financial and in-kind contributions will be provided by the Indonesian Government from the national state budget as well as from sub-national government budget or the pilot cities and the corresponding provinces. Since the selection of mitigation actions to be implemented during the pilot phase is not finalised yet and will continue throughout the pilot phase, the full costs of implementation cannot be determined yet.

The Indonesian national government has so far allocated a matching fund of the double amount of financial support received by international donors. This matching fund covers currently approximately EUR 17 million and will be used for the pilot phase of the public funding mechanism to implement demonstration projects in pilot cities.

Furthermore, the current budget allocation for the national mid-term planning also includes funding for measures to improve public transport, non-motorised transport, parking management, etc. The proposed budget for the National Medium-Term Planning in the seven pilot cities (MoT / Urban Transport Division, BSTP 2015-2019, APBN) amounts EUR 226.8

million. It has to be stated though, that this budget is already allocated for a certain purpose. It might be feasible however, to optimise the investment and increase the impact towards GHG mitigation and other sustainable development objectives.

The corresponding funding proposed by the sub-national level amounts up to EUR 73.5 Mio. Since at the time of the preparation of this document the budget planning of the new presidential period has not been finalised yet, the status of the budget cannot be confirmed yet.

In addition to these financial means, the Ministry of Transportation will support the implementation of NAMA SUTRI with several in-kind contributions, including:

- Seven or eight MoT experts working in the Technical Support Unit on a secondment basis, further MoT experts on a short-term basis, Support staff;
- Access to documents, studies, reports and minutes relevant to the project;
- Office space for seconded staff and GIZ team in the Department for Research and Development (R&D) as a separate office to represent NAMA SUTRI;
- up to EUR 200,000 for studies (budget of MoT Department PKKPJT);
- up to EUR 300,000 data collection (budget of MoT's research and development department).

The currently available budget from the Ministry of Transportation and the local transport authorities will be increased with funding from other infrastructure funds under the Ministry of public works.

6.3 Need for additional financial support

6.3.1 Direct mitigation measures

Currently, the selection and definition of mitigation measures to be implemented under NAMA SUTRI is not finalised. However, there is a high demand for financial support to increase the impact of NAMA SUTRI. Considering the high investment needs in the seven pilot cities, the current amount of funding is only a small seed which is elementary for the development of the new funding mechanism and to gain first experiences though pilot testing of the programme. In addition to the funding from the NAMA Facility and the funds by different levels of the Indonesian Government there is a huge variety of options to assist the Indonesian Government implanting further measures under NAMA SUTRI.

The following bullet points describe the type of mitigation measures for implementation during the pilot phase. As described earlier, a pipeline of eligible projects in the pilot cities will be developed throughout the pilot phase. This pipeline will give a clear understanding on specific projects seeking for financial support. Interested donors and the private sector are invited to share their perspectives and conditions on a possible cooperation. The type of projects as well as the dimension of co-funding is rather flexible at this stage to allow an adjustment to potential donor preferences.

Investment measures under NAMA SUTRI

Phase 1: Small infrastructure projects / technologies (up to EUR 250,000 co-funding per project)

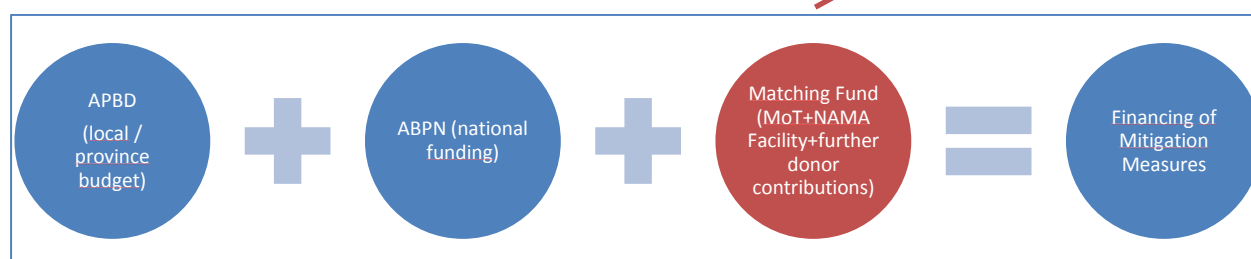
- Co-funding could be provided e.g. for traffic lights, parking meters, public transport stations, IT technology for traffic management. These measures will complement ongoing activities which are already prepared and budgeted. In this way, the NSP can highlight best practices in terms of more comprehensive approaches and enable quick wins in the pilot cities, e.g. on-board ticketing system for a 40 km bus network in Yogyakarta: EUR 530,000 (CDIA 2011: Pre-Feasibility Study Yogyakarta).

Phase 2: Concessional loans and investments grants

- Concessional loans (Funding mechanism 1a) will be provided to private sector companies for the procurement of energy-efficient buses which can be used to extend or rejuvenate the vehicle fleet of a bus operator, e.g. Public transport improvement project in Palembang (180 large buses: EUR 13.5 million; traffic lights: EUR 250,000 million (CDIA 2011: Pre-Feasibility Study Palembang).
- The direct investment (Funding mechanism 2b) can be used for infrastructure investment, e.g. BRT corridors, intersection design, on-street parking corridors. Full BRT corridor, e.g. EUR 34 million for infrastructure improvement on one corridor of 21km with 19 bus stops. Bus stops can be financed by the private sector with an investment volume of about EUR 3.5 million (reference from Conceptual Plan for TransJakarta, Jakarta, 2013)

Figure 14: Sources of financing the mitigation measures

Up to 40% of the total project investment costs



Source: GIZ

Further specific investment measures will be described in a study prepared by GIZ and the Institute for Transport Development Policy Indonesia to be published early 2015 at www.transport-namas.org.

6.3.2 Supportive measures

Further assistance would as well be most beneficial to increase the outreach of the pilot phase to further cities in Indonesia. Thus, additional support regarding the supportive measures of NAMA SUTRI would be most welcome, e.g. through:

- capacity development programmes to strengthen the capacity of transport planners and decision makers in cities (e.g. consultancies, trainings, development of online tutorials,)
- technology support to improve the performance and outreach of the technical support unit (website, publications, guidelines, funding for studies)
- MRV support (e.g. data collection, research, documentation)

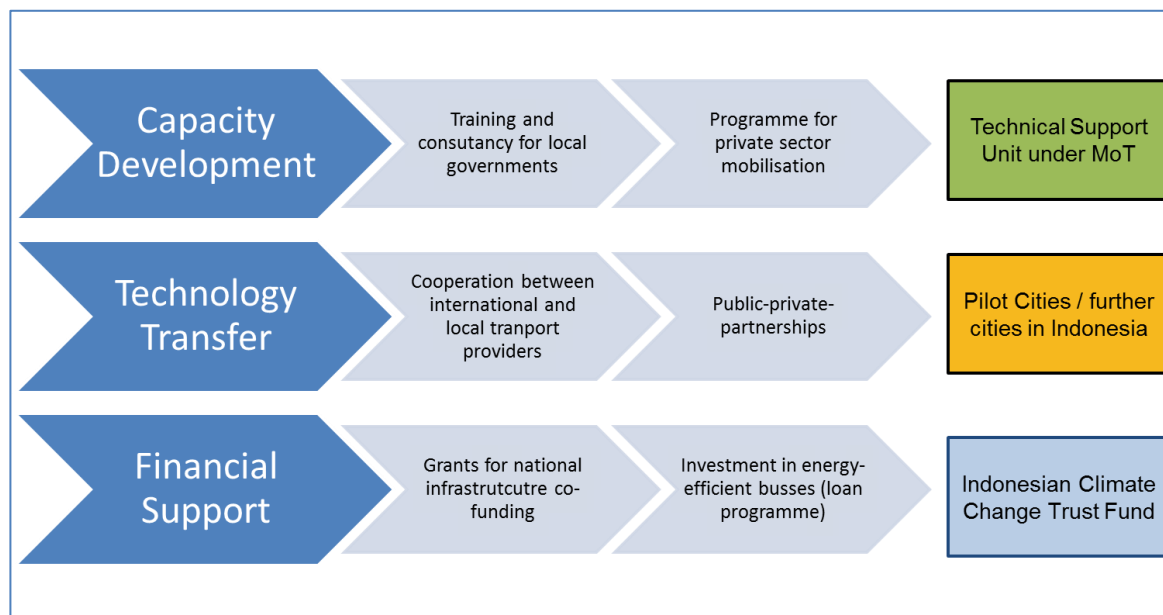
6.3.3 Opportunities for the private sector

Private sector investment plays an important role for financing public transport infrastructure and vehicles. Also parking infrastructure, bike-sharing systems or possibly car-sharing systems are facilities that are usually financed and managed by private sector companies. Private sector companies can be either direct operators receiving revenues from ticket fares or parking fees), advertising companies (e.g. for bus stops) or developers who intend to improve accessibility of their buildings (e.g. shopping centres) and will play an important role in the implementation of NAMA SUTRI.

6.3.4 Opportunities for the international donor community

AS outlined above, further international support could help to leverage the impact of NAMA SUTRI. This could be done through additional technical assistance which would increase the outreach of the programme or by financial assistance which would increase the direct mitigation impact and allow the implementation of further mitigation measures during and after the pilot phase. The following packages provide an overview of possible areas of support, but further ideas and contributions are feasible. Donors who are interested in supporting NAMA SUTRI are invited for an in-depth discussion of opportunities for cooperation.

Figure 15: NAMA Financing Packages



Source: GIZ

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