LOW EMISSION CAPACITY BUILDING PROGRAMME

REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

Nationally Appropriate Mitigation Action in Lebanon's Private Road Transport Sector (FEVs)

NAMA Proposal and Design Document

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UNDP Low Emission Capacity Building (LECB) Programme

The UNDP Low Emission Capacity-Building (LECB) Programme is a country-driven initiative that promotes essential cooperation between relevant institutions, engaging the public sector and industry in a concerted effort to design and implement approaches to low emission development that are consistent with national development priorities. National counterparts are supported to strengthen technical and institutional capacities to identify and formulate Nationally Appropriate Mitigation Actions (NAMAs) and Low Emission Development Strategies (LEDS) in the public and private sectors, and to strengthen the underlying greenhouse gas inventory management and Measurement, Reporting and Verification (MRV) systems.

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Abbreviations and Acronyms

AC	Air Conditioning
BAU	Business As Usual
BDL	Banque Du Liban
BUR	Biennial Update Reports
CAA	Clean Air Act
CE	Coordinating Entity
CCCU	Climate Change Coordination Unit
CDM	Clean Development Mechanism
CH_4	Methane
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
COM	Council of Ministers
COP	Conference of Parties
DIA	Development Impact Assessment
ELVs	Emission Limit Values
ESIA	Environmental and Social Impact Assessment
FEV	Fuel-Efficient Vehicle
FT	Financial Trustee
GBA	Greater Beirut Area
GHG	Greenhouse Gas
GOL	Government of Lebanon
GSU	Global Support Unit
HEV	Hybrid Electric Vehicle
HP	Horsepower
IE	Implementing Entity
(I)NDC	(Intended) Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
LECB	Low Emission Capacity-Building
LEDS	Low Emission Development Strategies
LIBNOR	Lebanese Standards Institution
LAU	Lebanese American University
LL	Lebanese Pound
LPA	Lebanese Petroleum Association
Mécanique	Mandatory Vehicle Inspection
MOE	Ministry of Environment
MOEW	Ministry of Energy and Water
MOF	Ministry of Finance
MOI	Ministry of Industry
MOIM	Ministry of Interior and Municipalities
MOPWT	Ministry of Public Works and Transport
MRV	Measurement, Reporting and Verification
MWG	Mitigation Working Group
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAMA	Nationally Appropriate Mitigation Action
NC	National Communication
NFF	NAMA Finance Facility
NGOs	Non-Governmental Organizations
NMVOC	Non-methane volatile organic compound
NSDS	National Sustainable Development Strategy
PPP	Public-Private Partnership
QA	Quality Assurance
QC	Quality Control
RP	Red Plates
SD	Sustainable Development
SDG	Sustainable Development Goals
SISSAF	Sector Strategies and Alternative Financing
SNC	Second National Communication
StREG	Support to Reform Environmental Governance

SODEL	Sustainable Oil and Gas Development in Lebanon
SUV	Sport Utility Vehicle
TNC	Third National Communication
TTVMA	Traffic, Trucks and Vehicles Management Authority
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollars
VAT	Value-added tax
WHO	World Health Organization
WP	White Plates

1 Introduction to the NAMA in the Lebanese Transport Sector

1.1 Challenges in Lebanon's Transport Sector

Lebanon, being a rather small country, has one of the highest population densities in the world with 560 people/km^2. The majority of people live in Greater Beirut Area (GBA) and other urban areas. The high population density and the relatively short distances would generally favor public mass transport systems. However, Lebanon is missing a sustainable and efficient transport system, including effective public transport options, although the Ministry of Public Works and Transport has plans for a public transport scheme for GBA, and a Land Transport Strategy is under preparation. The major part of public transport is provided by taxis and microbuses. As a result, the road transport sector (including the vast majority of daily commuters) is heavily reliant on private cars. This in turn produces road congestion and social and environmental impacts (including air pollution, and time spent in traffic jams). This fact is reinforced by the fact that the car fleet in Lebanon is very old and fuel intensive, with around 54% of the car fleet manufactured before 2001 (2014 data obtained from Traffic, Trucks, and Vehicles Management Authority, 2015). The current situation is manifested in congestion and commuting stress, reduced mobility for citizens, levels of air pollutants that exceed international standards and high energy consumption.

Currently policies that determine the maximum age of a vehicle, emission tests or norms that would help to reduce the number of inefficient and polluting vehicles and hence lead to a policy driven transformation of the private vehicle market either do not exist or are not complied with. In the absence of a reliable and high quality public transport system and with abundant car-purchase loan facilities and inexpensive used car models on the market, car ownership is expected to continue to grow in the future.

Already today, the transport sector in Lebanon is one of the major sectors in the economy contributing to greenhouse gas emissions (GHGs) (estimated at around 21% of total national emissions). These GHG emissions include only land transport, since rail transport is inexistent, and both domestic aviation (fleet composed of only 10 light aircrafts) and water-borne navigation are negligible (MoE, GEF, & UNDP, 2011).

1.2 Background and Opportunities of NAMAs in Lebanon

Lebanon is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), and as a Non-Annex I country has no official commitments under the Kyoto Protocol for reducing national GHG emissions. In accordance with the requirement for all countries which are signatories to the UNFCCC to put forward their Intended Nationally Determined Contributions (INDCs) as a key input to the 21st Conference of the Parties (COP) in Paris (COP21), Lebanon submitted its INDC to the UNFCCC in September 2015. The transport sector was explicitly mentioned in the INDC. The targets for the sector up to 2030 include the reduction of overall GHG emissions and a significant increase the share of FEVs in the country's vehicle fleet.

In the context of INDCs, the Nationally Appropriate Mitigation Action (NAMA) concept can be understood as a tool or implementation mechanism for countries to design and implement interventions and actions to achieve the goals and targets described under the INDC. The concept of NAMAs was first introduced in the Bali Action Plan as part of the Bali Road Map at the UNFCCC COP13 (2007) and was integrated in the Copenhagen Accord that came out of the UNFCCC COP15 in 2009. NAMAs are defined as a voluntary and non-binding set of policies or actions that should contribute to sustainable development and GHG emissions reductions. As NAMAs can leverage national and international support for actions towards transformational change, sustainable

development and GHG mitigation, many developing countries have engaged in the identification and the development of NAMAs.

The Lebanese Ministry of Environment (MOE) joined a global program coordinated and implemented by UNDP entitled the Low Emission Capacity Building (LECB) programme, a global initiative in which 25 developing countries participate. Under the LECB programme, national counterparts are supported to strengthen technical and institutional capacities to identify and formulate NAMAs and Low Emission Development Strategies (LEDS) in the public and private sectors, and to strengthen the underlying GHG inventory management and Measurement, Reporting and Verification (MRV) systems. Under the MOE, the Lebanese Climate Change Coordination Unit (CCCU), in consultation with relevant stakeholders, decided to use LECB support for the development of two NAMAs, one in the waste sector and one in the transport sector. This selection was the conclusion of a prioritization process.

Based on a comprehensive sector assessment (including an assessment of current shortcomings in terms of institutional, regulatory, informational, and technical aspects) and an intensive consultation process with key local stakeholders in the transport sector, it was decided that the NAMA should focus on private road transport.

While waiting for the implementation of concrete plans for the improvement of the public transport sector in Lebanon in the near future, which by itself would be the most important solution for Lebanon's traffic and air quality problems, it is foreseen that the transport NAMA focusing on the renewal of the car fleet could partially fill this gap and mitigate the impact of the road transport sector on the environment. The main environmental benefits from renewing the car fleet consist of improved ambient air quality (improved combustion efficiency in new cars and reduction in fossil fuel consumption) and the reduction in GHG emissions and traffic noise arising from the replacement of old cars in circulation by new, less polluting and more energy-efficient cars. The NAMA is also expected to produce environmental standards for the participation and operation of car scrappage facilities (storage, recycling and disposal) which would also mitigate the adverse environmental impacts of these facilities, which are not currently required to abide by sustainable operating practices.

1.3 Purpose and Objectives of the NAMA

The overall purpose of this NAMA is to enable a shift towards FEVs in Lebanon and hence increase fuel efficiency, reduce GHG emissions and to achieve a transformational shift towards higher sustainable development standards in the road transport sector.

In summary, the NAMA should achieve the following:

- Lead to scaled-up emission reductions;
- Result in co-benefits and align with Post-2015 SDGs;
- Lead to transformational change in the road transport sector;
- Enable private sector participation;
- Be financeable and bankable.

For achieving these objectives, the NAMA is designed and set up in a way that reflects the current situation and local circumstances and that is using a stepwise approach that should help first to build up the necessary enabling environment before on the ground interventions are implemented.

One of the main goals of the NAMA is to achieve significant reductions in GHG (and non-GHG) emissions and fuel consumption arising from the road transport sector in Lebanon and particularly from the ageing and highly polluting car fleet. The main intervention planned under the NAMA is a

car scrappage and replacement program where owners of old cars would voluntarily submit their cars for scrappage, and purchase a replacement FEV, after receiving a package of incentives. Both private owners (white plate cars) and taxi owners (red plate cars) are eligible to participate. A major preparatory component for achieving this is the establishment of an enabling environment (i.e. institutional and regulatory frameworks; awareness creation and capacity building) that provides clear incentives to private car owners for switching to FEVs.

These are the main building blocks of the NAMA.

A. Support the establishment and the operation of an institutional framework capable of managing and coordinating the NAMA and necessary activities for the scrappage program;

B. Prepare and help define the requirements for setting up the enabling environment for the scrappage program. This will include the framing of eligibility criteria for participation, setting emission limits for FEVs and developing and implementing an appropriate incentive scheme;

C. Increase awareness of the scrappage program among key stakeholders (including car dealers and car owners) and broad promotion of FEVs beyond the scrappage program;

D. Implementation of a car scrappage program for old and low efficiency vehicles and their replacement with FEVs to increase the fuel efficiency of the car fleet and reduce GHG emissions.

For ensuring successful implementation of those building blocks, the NAMA is designed in a stepwise approach, comprising two phases.

NAMA Phase 1 (2017-2020) focuses on the establishment of the enabling environment for a car scrappage and replacement program for increasing the share of FEVs in Lebanon. This will include the establishment of an institutional framework, assessing and defining appropriate incentive mechanisms for the scrappage program, building capacities among key stakeholders and increasing awareness about the benefits of the program and about fuel savings and efficiency in road transport. The main intervention leading to GHG emissions reductions under Phase 1 is a pilot scrappage program (starting in 2019 and running until 2020) with a limited scope and focusing on red plate cars (taxis) only. This is mainly to test case the incentive scheme procedures and use the experience for the expanded roll-out of the scrappage program under NAMA Phase 2.

NAMA Phase 2 (2021-2030) builds directly on the achievements of the NAMA Phase 1. The technical intervention of Phase 2 leading to significant GHG emission reductions consists of the scaling up of the car scrappage program to cover both red plate (taxis) and white plate (private cars) vehicles. The goal is that by the end of the scrappage program (2030), the passenger car fleet will be free of cars older than 15 years (100% replacement rate). As the final replacement rate will largely depend on the right incentive scheme and the willingness of car owners to participate in the program, alternative scenarios with 50% and 80% replacement rates were also developed to show the impacts in terms of GHG emissions reductions and total finance required under the NAMA. The NAMA preferred scenario (100% replacement) and the alternative scenarios (50% and 80% replacement) are presented in the Chapters 4 and 7. In addition to the replacement program, a broad nationwide promotion program for FEVs (including legal implementation of emissions standards and setting up incentive schemes), which extends beyond the scope of the car scrappage program, will be conducted under NAMA Phase 2.

A detailed description of all activities under the full scope of the NAMA is provided in Chapter 5 and a detailed overview in table format is provided in   Annex 1: NAMA Measures & Interventions and their Outputs, Activities and Inputs.

2   Background to the Road Transport Sector in Lebanon

2.1 Current Situation and Trends in the Sector

The road transport sector can be considered a priority sector given that it was chosen (together with the waste sector) as one of the first NAMAs to be implemented in Lebanon. The following sub-sections describe the current situation and trends of the road transport sector, including the contribution of the transport sector to overall national GHG emissions and non-GHG emissions and their ramifications for the health of Lebanon's citizens. In addition, a short overview of trends in the motorized individual transport and the public transport modes and attributes is provided.

2.1.1 Motorized Individual Transport in Lebanon

In the absence of reliable public transport solutions in Lebanon, road transport nowadays is heavily dependent on private passenger vehicles. This is also reflected in the fact that Lebanon is ranked 17th in the world in terms of passenger vehicles per person (434 per 1,000 persons) (Bloominvest Bank , 2015). According to the World Bank project "Urban Transport Development Project", at least 50% of the households own at least 1 car and 25% of the households own even two or more cars (Bloominvest Bank , 2015). The high proportion of people living in GBA in combination with the heavy reliance of urban residents on private cars leads to severe traffic congestion, which results in high economic losses for the country and negative impacts on air quality and GHG emissions. The fact that the car fleet in Lebanon is very old and fuel intensive, with around 54% of it manufactured before 2001 (Traffic, Trucks, and Vehicles Management Authority, 2015), makes the situation worse.

This high ratio of private cars can be attributed to several factors, including an inadequate public transport system, the availability of affordable vehicles and car purchase credit facilities, inadequate urban planning, and the perception of the car as a social status symbol (Chalak, Al-Naghi, Irani, & Abou-Zeid, 2015).

Car ownership in Lebanon can be generally differentiated into the following two categories:

- *White Plate cars (WP):*
  - Privately owned cars for personal/private use only
- *Red Plate cars (RP)*
  - Privately owned cars for commercial use (taxis/jitneys).

Table 1 below shows the distribution of white plate cars and red plate cars by age category as of 2014 (based on data provided by Association of Car Importers in Lebanon, 2015 (Assosciation of Car Importers in Lebanon, 2015)). Roughly half of the 2014 car fleet was manufactured before the year 2000 (51% of white plate cars and 54% of the red plate cars). The passenger car fleet distribution by vehicle size in 2010 was 12% small vehicles (vehicle weight less than 1 tonne; engine size less than 1.4 litres), 55% midsize vehicles (vehicle weight between 1 and 1.5 tonnes; engine size between 1.5 and 2.3 litres), and 33% large vehicles (vehicle weight greater than 1.5 tonnes; engine size greater than 2.4 litres) (MoE, GEF, & UNDP, 2014b). Thus, the vast majority of the current vehicle fleet is rather old and polluting (considering that vehicle efficiency decreases with vehicle age and considering the dominance of midsize and large vehicles, which consume more fuel than smaller cars).

Year of Manufacture	White Plate Cars	Red Plate Cars	Total
1950-1972	14,313	285	14,598
1973-1979	153,466	5,616	159,082
1980-1986	184,156	2,544	186,700
1987-1993	194,419	3,407	197,826
1994-1999	191,060	6,183	197,243
2000-2004	275,457	4,143	279,600
2005-2008	204,318	3,335	207,653
2009-2011	104,152	4,303	108,455
2012-2015	117,570	3,206	120,776
Total number of cars	**1,438,911**	**33,022**	**1,471,933**

Table 1: Number of white plate and red plate cars registered as of 2014

As for annual car registration numbers over the last few years, there has been a reduction in the annual number of cars registered over that period, as well as an increase in the market share and number of new cars compared with old cars, with about 55% of registered cars in 2013 being new cars (see Table 2). Consumer preferences have been shifting towards less costly fuel efficient cars, with Asian cars constituting a substantial share of the annual registrations in the last few years (Bloominvest Bank, 2014).

	2009		2010		2011		2012		2013	
New	34,752	*34.2%*	36,097	*38.0%*	34,522	*45.1%*	37,662	*51.1%*	38,366	*55.3%*
Used	67,000	*65.8%*	59,000	*62.0%*	42,000	*54.9%*	36,000	*48.9%*	31,000	*44.7%*
Total	101,752	*100%*	95,097	*100%*	76,522	*100%*	73,662	*100%*	69,366	*100%*

Table 2: New and used passenger car registrations, 2009-2013

This recent shift in consumer preferences could be a positive factor for increasing the acceptance of fuel efficient cars as replacement cars in the NAMA.

2.1.2   Public Transport

As mentioned in Chapter 1, Lebanon does not have a sustainable and efficient transport system including effective public transport options. Today, the public transport system in Lebanon consists of low-capacity public and private buses (for about 24 passengers), private minibuses, and shared-taxis or jitneys (known locally as "service"). The buses are perceived to be of poor quality, as many of these vehicles are old, fuel intensive and polluting. There are no fixed stops and bus shelters in the country, information/schedules are difficult to find, coverage is limited, and the bus travel times are much longer than the car travel time as buses have no dedicated lanes and therefore compete with private vehicles on very congested roads.

The modal share of trips within the Greater Beirut Area is estimated at: 10% by buses and minibuses, 19% by jitneys, and 71% by private cars (Kaysi, Harb, & Al-Dour, 2010). Jitneys serve a significant share of the public transport trips and their upgrade would contribute towards improving the image of the public transport sector in Lebanon. Rail transport in Lebanon largely ceased in the 1970s owing to the country's civil war. The last remaining routes were closed in the

1990s for economic reasons. Currently there is no rail transport network operated in Lebanon. Since there is no specific public transport improvement plan for which financing has been approved by the Government of Lebanon (GOL), it is assumed in this NAMA document that there will be no significant modal shift from car to public transport occurring over the NAMA time period (until 2030).

2.1.3   Contribution to Overall National GHG Emissions

The transport sector is a major contributor to GHG emissions in Lebanon, contributing about 21% of national GHG emissions (MoE, GEF, & UNDP, 2011). Carbon dioxide (CO_2) is the main GHG emitted in Lebanon, representing about 84% of total emissions, with the transport sector contributing to 25% of total CO_2 emissions.

Lebanon's Third National Communication (TNC) to the UNFCCC submitted in 2014 (MoE, GEF, & UNDP, 2014a) indicates that in 2005 total GHG emissions from the transport sector, including road transport, off-road transport, domestic aviation, and fishing boats and yachts, amounted to 3.79 million tonnes CO_{2-eq}, with 3.7 million tonnes CO_2, only 860 tonnes methane (CH_4), and 200 tonnes nitrous oxide. Road transport was by far the largest contributor to the transport sector GHG emissions with a contribution of almost 96%. In 2010 GHG emissions from the transport sector reached 5.6 million tonnes CO_{2-eq}, again with road transport contributing 96%.

Figure 1 shows the trend in GHG emissions from 1994 (the base year of the initial national communication) to 2011 for road transport in 1000 tonnes CO_{2-eq} (MoE, GEF, & UNDP, 2014a). The figure shows a significant increase in GHG emissions from the sector over the period. A key factor contributing to this increase has been the growth in the number of registered vehicles from around 0.5 million in 1994 to 1.5 million in 2011.
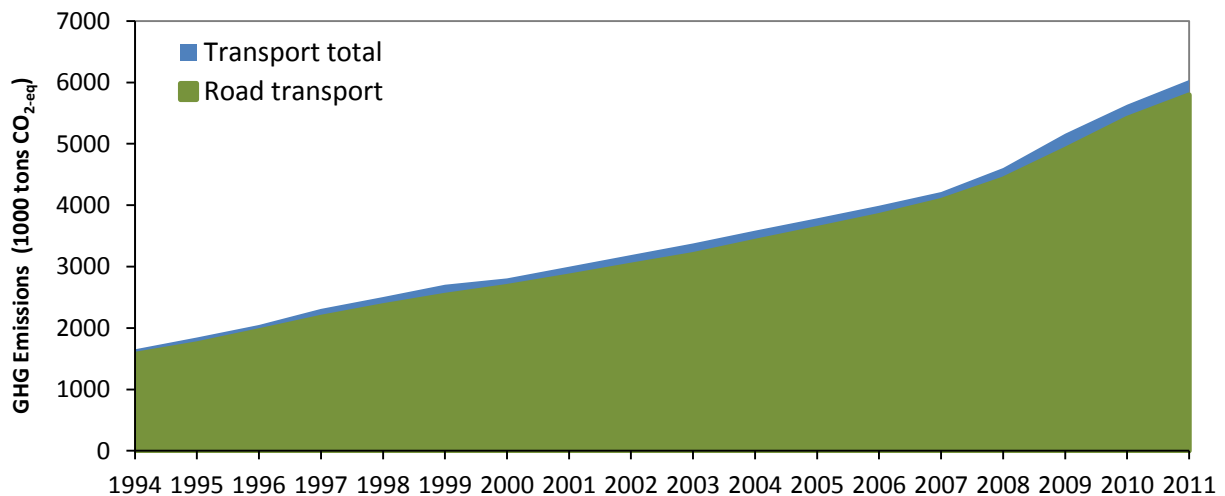
Figure 1: GHG emissions from 1994 to 2011 for road transport in 1000 tonnes CO_2-eq

Lebanon`s TNC further estimates that the GHG emissions from the passenger transport sector are expected to increase from 4.35 million tonnes of CO_{2-eq} in 2010 to 4.75 million tonnes of CO_{2-eq} in 2020 and to 5.51 million tonnes of $CO_{2-eq.}$ in 2040 under a Business-As-Usual (BAU) scenario (MoE, GEF, & UNDP, 2014b). This increase in GHG emissions is attributed to the anticipated growth in car ownership.

2.1.4   Contribution to Overall National non-GHG Emissions

Until the establishment of the Air Quality Monitoring network in 2013 (by MOE with the support of UNDP and UNEP), limited information was available on air quality in Lebanon, and available information mainly came from ad-hoc research studies.

In 2012, a temporally-resolved and spatially-distributed emissions inventory for the year 2010 was developed for Lebanon by Saint Joseph University to provide quantitative information for air pollution studies as well as for use as input to air quality models (Waked, A., Afif, C., & Seigneur, C., 2012). This inventory covered major anthropogenic and biogenic sources in the region with 5 km spatial resolution for Lebanon and 1 km spatial resolution for its capital city, Beirut, and its suburbs. The study showed that about 93% of CO emissions, 67% of non-methane volatile organic compound (NMVOC) emissions, and 52% of NO_x emissions originate from the on-road transport sector. The study also indicated that the results obtained for the year 2010 were 563,000 tonnes for CO, 75,000 tonnes for NO_x, and 115,000 tonnes for NMVOC.

Available studies have also shown that CO concentrations have not exceeded WHO guidelines to date, although NO_2 concentrations did exceed World Health Organization (WHO) guidelines in some cities where heavy traffic prevails (Waked A. S., 2013). The studies have highlighted the gap between WHO guidelines and limit values for some air pollutants set under the "Decision 52/1", which MOE is working to review in the near future.

An example could be given for NO_2, which has a longer history of being monitored in Beirut/Greater Beirut Area. These studies show that for the periods for which NO_2 data are available, although NO_2 did not exceed the annual limit allowed by Decision 52/1, in almost every year it has exceeded the WHO recommended value of 40 $\mu g.m^{-3}$.

Furthermore, modelling results showed that air emissions from traffic are mainly concentrated around main road axes and large cities.

The spatial distribution conducted as part of the assessment showed that GBA which already has moderate to poor air quality will suffer from an increase in air pollutants concentrations of up to 20% (based on the conservative approach followed in the assessment). It was also expected that other main cities such as Zahle, Baalbeck, Tripoli and Saida will also witness a significant degradation of their air quality and the health of their population, while rural areas will be affected but to a lesser extent.

2.1.5   Health Impact of the Road Transport Sector

Limited information is available on the health impact of the road transport sector in Lebanon, although the two studies that exist confirm the health impact of non-GHG pollution from the sector. These studies are:

- A World Bank report of 2004 that estimated that the impact of air pollution on human health in Lebanon is of the order of $170 million per year. It can be expected that these costs are considerably higher nowadays due to the increase of emissions (World Bank - Sarraf, 2004);
- A WHO study shows that Lebanon is one of the countries in the Eastern Mediterranean most affected by outdoor air pollution. The study also mentions that the health impact of air pollution might be even much larger than the estimates provided (World Health Organization, 2013).

Furthermore, the high dependence on cars in combination with the fact that the majority of cars operating on the roads are old, is a major concern in terms of car accidents and human health. An

increase in the proportion of new cars in the car fleet, with higher security standards (e.g. air bags), would reduce the severity of the impact of car accidents.

2.2 Relevant Stakeholders

This section describes the stakeholders currently involved in the transport sector in Lebanon. Many government institutions are involved in the planning and management of transport in Lebanon with overlapping mandates and responsibilities that have led to ambiguous lines of authority. This section summarizes the current role of key players in the public and private sectors, as well as identifying other stakeholders, including civil society. The institutional framework for the NAMA should be built on existing structures and should include stakeholders already experienced in the sector. That is why the stakeholders described below form the basis for the roles and responsibilities defined under the NAMA (see Chapter 8).

2.2.1 Public Sector

Table 3 provides an overview of relevant public sector agencies governing the transport sector in Lebanon that will influence the NAMA process.

Agency	Short description
Ministry of Environment (MOE)	The MOE was established in 1993. The Department of Air Quality at the Service of Environmental Technology sets technical standards related to emissions from the transport sector (in collaboration with other Ministries); the Department of Urban Environmental Protection sets environmental guidelines for car scrappage facilities (and other industrial facilities). The MOE is responsible for the protection of natural resources, preventing and minimizing pollution. Since the ratification of the UNFCCC, the Ministry has been involved in climate change related projects including submission of National Communications to the Secretariat of the UNFCCC. All NAMA activities in Lebanon are to be managed and administered by the MOE.
The Climate Change Coordination Unit (CCCU)	Lebanon ratified the UNFCCC in December 1994 and acceded to the Kyoto Protocol in November 2006. The CCCU was established within the MOE (as a group of climate change related projects) to implement various projects and activities aimed at spreading climate change awareness in the country, reducing national GHG emissions, developing measures to reduce adverse impacts on environmental, economic and social systems, building institutional capacity and mainstreaming climate change into different policies.
Ministry of Public Works and Transport (MOPWT)	The MOPWT is responsible for devising strategies for the transport sector and for setting, implementing, and monitoring policies related to land and maritime transport in Lebanon. A strong focus of the MOPWT is on planning improvements to public transport service provision. The Ministry is also responsible for the maintenance of public infrastructure, including roads, bridges, etc.
Ministry of Interior and Municipalities (MOIM) and the Traffic, Trucks, and Vehicles Management Authority (TTVMA)	The MOIM is responsible for the enforcement of traffic laws and regulations. The TTVMA was established in 2003 and is responsible for the application of traffic regulations and management services, vehicles maintenance and car parking. The TTVMA, operating under the MOIM, is responsible for the registration and deregistration of vehicles and the supervision of their technical inspection and supervises the technical inspection and maintains data on car registration numbers. The TTVMA currently operates four technical inspection facilities. An additional eight new facilities will be established and in operation by 2018.

Agency	Short description
Ministry of Finance (MOF)	The MOF is responsible for setting and controlling the Government budget, including setting transport-related tariffs and fees, such as taxes on the purchase of new cars (customs/excise, value-added tax (VAT), and registration), road use fees (paid after the technical inspection and therefore usually called "Mécanique fee"), and fuel taxes. The MOF may therefore be responsible for formulating decrees related to the economic incentives for fuel FEVs and supporting financing mechanisms for generating additional revenue for the NAMA.
Banque du Liban (BDL)	BDL has an important role in financing green projects (with interest rates as low as reaching 0%). BDL will be responsible for securing loans with very low interest rates for NAMA participants and will be hosting the NAMA Account.
Ministry of Energy and Water (MOEW)	The MOEW regulates, with the MOF, fuel prices in Lebanon on a weekly basis based on international oil prices. The MOEW is further involved with the MOE and the Lebanese Standards Institution (LIBNOR) in determining the quality of fuel and methodologies for testing the conformity of imported fuels. The MOEW would be an important Ministry in setting emissions limits for vehicles.

Table 3: Public Sector Stakeholders in the Road Transport Sector in Lebanon

It is important to note that all government agencies in Lebanon including the above cited Ministries involved in the NAMA process lack available resources in terms of staff and budgets.

In addition to the formal entities listed above, the Mitigation Working Group (MWG) needs to be mentioned as an additional relevant "stakeholder" in the current situation. Its overall structure is illustrated in Figure 2 below.
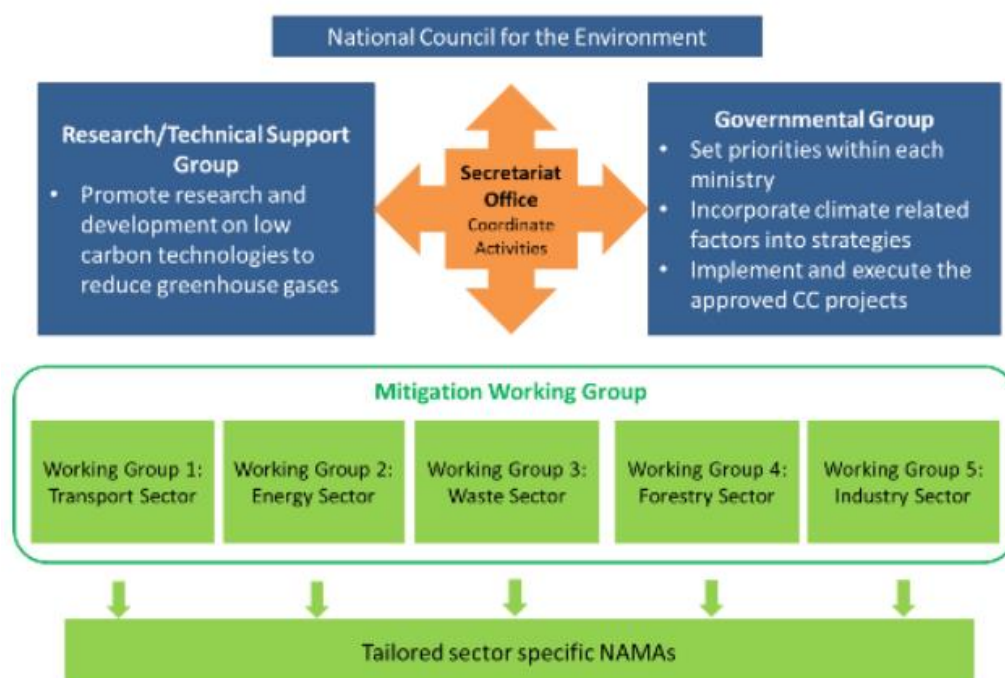
Figure 2: Structure of the Mitigation Working Group in Lebanon

The MWG was established with support from the LECB Project in Lebanon to provide guidance and supervision for all NAMA developments in Lebanon. The MWG is an non-official inter-ministerial body, which consists of representatives from numerous Ministries in order to address the different points of view regarding challenges and solutions related to GHG mitigation projects. It serves as the platform for NAMA development in the country, with the LECB Project acting as a type of secretariat.

2.2.2   The Private Sector

The private sector has been playing a main role in the road transport sector. The table below provides a summary of private sector stakeholders involved in the transport sector and specifically the road transport sector in Lebanon.

Stakeholder	Roles, Responsibilities, and Achievements
Private car owners	The owners of private cars (WPs and RPs) who own a car older than 15 years would be the focus of the NAMA and act as the central stakeholder group.
Commercial banks	Commercial banks provide car loans for individuals who purchase cars. They will offer low interest rates for the purchase of FEVs by program participants.
Microfinance/non-banking financial institutions	There are more than 20 microfinance institutions in Lebanon that offer lending services and business development support for low income individuals who might otherwise not be able to have access to loans from banks (http://www.executive-magazine.com/economics-policy/microfinance-lebanon-growth). These institutions may provide additional support beyond the already existing loans provided by commercial banks. This may be relevant for taxi drivers who have a higher risk profile for borrowing purposes because of their unstable incomes.
Car dealers	They influence the car sales and the market patterns to some extent through the promotions they offer and the prices they set. Also, currently car dealers can process car registration and deregistration on behalf of the individual who purchases a car or wishes to deregister a car.
The Association of Car Importers	The association represents car importers in Lebanon and maintains data on car registrations. As stated on the association's website (http://www.aialiban.org/Roles), its main functions are to help ensure the continued development of the automotive retail sector, to push for the adoption of policies and legislation aimed at better regulating the market, to defend consumers' rights, and to advocate for increased road safety and security.
Car scrappage facilities	There are currently around 200 scrappage facilities in Lebanon that differ in size and operating practices. The majority of these sites are not operating according to international environmental standards. The scrappage facilities will play a leading role in the implementation of the car scrappage program, which would require upgrading in terms of machines needed and environmentally sound operating practices (including recycling).
Insurance companies	Currently, mandatory insurance is included in car loans. While insurance companies may not be directly involved in the program, insurance will be mandatory for the replacement cars under the NAMA.

Table 4: Private sector stakeholders in the Road Transport Sector in Lebanon

2.2.3   Other Stakeholders

Although the public and private sectors have been the most important stakeholders in the transport sector and specifically the road transport sector, other stakeholders have also influenced

the sector by providing funding and/or international know-how. Table 5 lists those entities influencing the road transport sector, including civil society organizations and donors.

Stakeholder	Roles, Responsibilities, and Achievements
Non-Governmental Organizations (NGOs) and Civil Society	Even though there are a number of NGOs working for the improvement of the passenger transport sector in Lebanon, their focus has mainly been on improving public transport and is not directly related to private passenger cars. For taxis, however, there are the Order of Red Plates Drivers and the Taxi Drivers Union that represent taxi drivers and their interests. These organizations are considered relevant for investigating how the car scrappage program and its associated incentives may be perceived by taxi drivers and what elements would need to be incorporated according to experience with previous proposed initiatives.
EU Project (Donor) – **Support Programme for Infrastructure Sector Strategies and Alternative Financing (SISSAF)**	SISSAF is developing a Land Transport Strategy for Lebanon, which may be complementary to the current NAMA in supporting the transformation of the road transport sector in Lebanon onto a sustainable path. The project's overall objectives are: • to improve the efficiency and effectiveness of service delivery and financial sustainability in the Lebanese infrastructure sectors: energy, water and land transport; • to improve aid effectiveness provided to the Lebanese infrastructure sectors.
EU Project (Donor) – **Support to Reform-Environmental Governance (StREG) Programme**	The programme is supporting the MOE in the development of an **Air Quality Management Strategy** in accordance with Article 12-1 of the Draft Law of Protection of Air Quality. Preparation of the Strategy was initiated in August 2015. A draft Management Strategy was supposed to be available by the End of January 2016 and will remain a draft until enactment of the Law of Protection of Air Quality. It is expected that consultation meetings with concerned stakeholders will be conducted based on the draft Strategy with a view to validating the proposed long-term and short-term goals of the Strategy. The Strategy will allow the identification of priority actions for air quality management in Lebanon and the StREG programme will provide support to implement some of these actions in 2016. The Programme has also financed the enlargement of MOE's existing Air Quality Monitoring Network of five stations (which was established by UNDP and UNEP in 2013). This extension covers 10 additional Air Quality Monitoring stations.
The World Bank (Donor)	The World Bank has been supporting the GOL, including the MOPWT, in the urban transport sector and has prepared a Public Transport Strategy (TransBeirut) to improve mobility within the GBA. A Traffic Management Program has been successfully implemented with plans for operating it. The Public Transport strategy could be the basis for a Public Transport NAMA in the future.

Table 5: Overview of Other Stakeholders Influencing Lebanon's Road Transport Sector

2.2.4 Stakeholder Consultation and Engagement Process

This idea for a NAMA linked to the road transport sector was first identified by the CCCU at the MOE and was based on the Second National Communication (SNC) and the preliminary findings under the TNC. It was quickly determined that there are significant opportunities for GHG

reduction in the private vehicle fleet despite (and due to) the lack of efficient public transport. The focus of the NAMA was supposed to be on market transformation of the existing car fleet in Lebanon through fuel efficient vehicles and a car scrappage program.

The design of the transport NAMA was developed as a result of an extensive stakeholder consultation process with several stakeholder meetings and workshops. Important design parameters (including eligibility for program participation, program incentives, potential financing mechanisms, etc.) were discussed and decided on with the CCCU through a number of project meetings. Other meetings were held with both public sector and private sector stakeholders to obtain their feedback about the proposed NAMA and to better understand their procedures and functions especially those that are relevant to the NAMA.

A table showing the stakeholders taking part in the consultation process as well as the main discussion points is provided in Annex 2: Stakeholder Consultations during the Design Phase.

3 Policy Analysis

This chapter describes the relevant national policies and regulations that have an impact on the NAMA or that have been considered in designing the NAMA's scope. For a NAMA to be "nationally appropriate" and appropriate for the sector, it is essential that the NAMA is aligned with existing and planned national policies, plans and strategies and with regulations that have an impact on the road transport sector and the transport sector as a whole.

3.1 Relevant National and Sector Strategies and Policies

This section describes relevant national and sector strategies and policies, including the National Sustainable Development Strategy (NSDS), the TNC, the INDC, and the National Land Transport Policy and Strategy.

3.1.1 National Sustainable Development Strategy (Draft)

In Lebanon, there is currently no approved national level strategy for climate change, green growth or sustainable development. However, the MOE is currently developing a National Sustainable Development Strategy (NSDS). The MOE entered into a NSDS consultation process with government agencies in December 2015 followed by consultation with private sector entities. The final NSDS document is expected to be enacted by a Council of Ministers (COM) decision in the first quarter of 2016 (potential date: March 2016).

The draft NSDS (MOE/StREG; GFA, 2015) has a strong emphasis on transport policies that foster low carbon forms of transport and a modal shift from passenger to public transportation. Among the measures considered, the strategy focuses on improving the efficiency of Lebanon's vehicle fleet through clean and alternative fuel technologies, as well as shifting freight from road to rail. In the available version of this draft, no set of specific targets or goals has yet been detailed.

> **NAMA Relevance:**
>
> The NSDS is a comprehensive document. It highlights potential measures to enhance all modes of transportation in Lebanon including land, maritime and aviation. Specifically, this NAMA is in line with the NSDS through the improvement of the vehicle fleet, achieving fuel efficiency and fostering transformational change to higher sustainable development standards within the transport sector in Lebanon.

3.1.2 National Land Transport Policy and Strategy

In 2001, the Directorate General for Land and Marine Transport at the MOPWT submitted a draft transport policy to the GOL that aims to promote the economic, financial, environmental and social sustainability of the land transport sector in Lebanon. However, as of the writing of this NAMA document, information was not available regarding how GOL plans to finalize the policy and strategy, and so far the draft policy has been neither enacted nor approved.

Presently, the EU funded SISSAF Project is developing, for MOPWT, a Land Transport Policy for the Lebanese Land Transport Sector, including road transport (SISSAF, 2016). This Policy is in a draft form and the detailed implementation plan still needs to receive official endorsement by the GOL. The Policy has three main objectives including:

(1) Providing improved and safer land transportation services to Lebanese citizens;

(2) Promoting the development of the economy; and

(3) Introducing institutional reform and fostering human resources development with short- (the next five years), medium- (the next 10 years) and long-term (the next 15 years) concepts.

However, the first draft of the Land Transport Policy does not set specific or quantifiable short- and long-term goals and targets to achieve a sustainable land transport sector in the country.

NAMA Relevance:

The NAMA will have several co-benefits that are aligned with the three main objectives of the Sector Policy document. The new FEVs will improve the mobility of Lebanese citizens who dispose of their old cars and will improve their road safety levels as well due to the lower risk of vehicle breakdown and the higher safety standards of the cars. The NAMA will also contribute to the development of the economy as it enables the creation of new jobs and the improvement of the businesses of several of the stakeholders involved (taxi drivers, car dealers, scrappage facilities, etc.). And the coordination and implementation of the various NAMA activities will require capacity building, human resources development, and staffing of the related NAMA units.

3.1.3 Public Transport Plans

Improvement in public transport provision can play a major role in reducing GHG emissions and improving the mobility of Lebanese citizens (e.g. through reduced congestion). Even though public transport is not the focus of this NAMA (assumed to have constant market share of ridership over the NAMA period), the increase in car ownership over the years will be related to improvements in public transport provision if and when they occur.

This section highlights the main policies and plans related to public transport in Lebanon.

As for public transport related legislation, in 2002 and to promote the sustainability of the mass transport system in Lebanon, the Directorate General for Land and Maritime Transport in the MOPWT developed and submitted to the GOL a draft transport policy that aimed to promote the economic, financial, environmental and social sustainability of the land transport sector. No action was taken by the GOL and the draft policy was never enacted nor approved. In 2013, the SISSAF Project, under the MOPWT, developed a National Integrated Strategy for Public Transport in Lebanon and a pilot project for GBA. The project includes the purchase of 250 buses circulating on 20 routes, the erection of 911 new bus stops (310 in Municipal Beirut), and the establishment of an innovative ticketing system. The objective of the pilot project is to provide a high quality accessible bus service to test market demand for riding buses. At a later stage, more improvements are planned including the design of dedicated/priority bus lanes on main roads to ensure schedule adherence, etc. However, funding for this pilot project is still pending.

Moreover, and to improve public transport in Lebanon (red plate vehicles), the Council of Ministers (COM) approved Decree 8942 (21/9/2012) on the "Draft Law which aims to incentivize the public transport sector (public transport vehicles and buses)" through various exemptions and government support for low interest loans. However, this decree awaits parliamentary approval.

3.1.4 National Environmental and Climate Policy Context

Improving Ambient Air Quality

To improve ambient air quality at the national level, the MOE issued Decision 52/1 in 1996 which set National Ambient Air Quality Standards (NAAQS). In 2001, the MOE amended Decision 52/1-1996 and issued Decision 8/1-2001 which defined Emission Limit Values (ELVs) for stack emissions

and effluent discharge from classified new and existing establishments, including industrial establishments.

In 2005, the MOE prepared a draft law on the Protection of Air Quality, the Clean Air Act (CAA), that was ratified by the COM in 2012 (Decision No. 34), but is yet to be approved by the Lebanese Parliament. The CAA includes an assessment of the state of air pollutants and intends to define limits for ambient air quality and air pollutants as well as emission limits of stationary and mobile sources (the Air Quality Standards are currently being updated in Lebanon). The CAA envisages establishment of a network for monitoring air quality and a national emission inventory. The table below shows the legal documents which relate to emissions from mobile sources and that are to be covered under the CAA once enacted by Parliament. Defining emission limit values for mobile sources (including vehicles) will be in line with measures proposed under this NAMA.

Legal Text	Related Articles in CAA	Title
MOE Decision	Article 10-1	Defining emission limit values for mobile sources for criteria pollutants
MOE Decision	Article 10-2	Defining methodologies and techniques for the measurement of emissions from mobile sources
Decree	Article 11-1	Defining harmful substances in fuel through fuel composition and physical properties
MOE Decision	Article 11-2	Setting methodologies for testing the conformity of imported fuels

Table 6: Draft Legal Texts in the CAA in relation to the Land Transport Sector

Reducing Air Pollution from the Transport Sector

There are a number of transport laws and regulations that are in place or have been drafted but not yet enacted, and that are of relevance to this NAMA. They are described briefly below.

In 2001, the GOL approved and implemented Law 341 (dated 06/08/2001) on "Reducing air pollution from the transport sector and encouraging the use of less polluting fuel". It was amended by Law 380 (14/12/2001) and Law 453 (16/8/2002). Specifically, the law banned (1) the import of minivans and buses (<15 passengers + driver) operating on diesel oil, (2) the import of old and new diesel engines for private passenger cars and minivans, (3) the use of diesel in private vehicles, and (4) the use of leaded gasoline in all vehicles. It also made catalytic converters a mandatory requirement in all vehicle categories and reinstated the mandatory vehicle inspection (*Mécanique*) for gasoline engines (annual inspection) and diesel engines (every six months). The inspection includes examination of brakes, lights, and tailpipe emissions using Lebanese pass-or-fail values for CO, CO_2, and HC. However, according to statistics obtained from the Association of Car Importers in Lebanon, in 2013 41.5% of registered vehicles had not paid their annual inspection fees.

Even though Law 341/2001 made catalytic converters mandatory in all vehicle categories, this has not been fully implemented in practice.

In 2002, the COM enacted Decree 8442 (dated 13/08/2002) which defined standards for gasoline and diesel oil used in vehicles including their sulfur content; 0.05% by weight in gasoline 92, 95 and 98 Octane and 0.035% by weight in diesel oil. However, to date there is no legislation related to the regulation of passenger vehicle emissions.

In the years that followed the promulgation and enforcement of Law 341/2001, private interest groups and legislators identified a number of deficiencies. This prompted the GOL to explore avenues for improving and expanding the provisions of Law 341/2001, by reviewing similar laws and the experiences of other countries. A draft amendment was prepared in 2010, which still

awaits parliamentary approval. It includes a number of provisions such as (1) providing incentives (tax cuts and tariff exemptions) for vehicle owners to switch to hybrid electric, fuel cell/hydrogen, and natural gas vehicles, (2) banning the import of diesel vans unless they comply with EU Emission Standards (EURO), (3) permissible exhaust limit values that have to be determined, (4) banning the operation of diesel buses in cities, (5) an obligation to use local fuel for buses, pick-ups, freight cars and heavy machinery, (6) the inspection of diesel quality in gas stations, (7) checks on fuel quality by traffic police, and (8) standards for fuel quality based on EU standards (MOE/UNDP/ECODIT, 2011).

In 2012, the GOL issued Law 243 (dated 25/10/2012), the "New Traffic Law", which reinstated the installation of catalytic converters in all gasoline vehicles (Article 89; Item 3) and exempted new vehicles from inspection for the first three years after registration (Article 159). Moreover, vehicles older than eight years cannot be imported (Customs Decision).

> **NAMA Relevance:**
>
> This NAMA will support the provision of incentives for FEVs and hybrid electric cars as well as define emission limit values for new cars, thus supporting some of the provisions stipulated in the 2010 amendment of Law 341/2001.

3.1.5   International Climate Policy Context

Third National Communication (TNC)

Lebanon signed and ratified the UNFCCC in 1994 and the Kyoto Protocol in 2006. Being a developing country, and classified as Non-Annex I country under the Kyoto Protocol, Lebanon has no official binding requirement to decrease national GHG emissions.

However, in accordance with the reporting requirements under the UNFCC, Lebanon submits National Communications (NC) to the COP on the implementation of the Convention. NCs include information related to national GHG emissions and removals, mitigation options analysis, vulnerability to climate change, adaptation options, gaps and constraints in implementing the provisions of the Convention, and any other relevant information the country wishes to communicate. Lebanon's first and second NCs were submitted in 1999 and 2011, respectively. In the draft version of the TNC report, entitled "Mitigation Actions and Analysis for the Transport Sector in Lebanon" (MoE, GEF, & UNDP, 2014b), three mitigation actions are studied in terms of their GHG reduction potential: increasing the share of FEVs in the car fleet, increasing the share of FEVs and hybrid electric vehicles (HEVs) in the car fleet, and increasing public transport usage.

> **NAMA Relevance:**
>
> The NAMA's main goal of reducing GHG emissions and energy consumption is directly in line with the main goal of the mitigation actions proposed in Lebanon's TNC. Moreover, and to achieve the above goal, both the NAMA and the TNC consider a similar mitigation scenario focusing on the increase in market share of FEVs. The UNFCCC report additionally includes a scenario where public transport market-share increases, which is conservatively assumed unlikely in the NAMA document over the period of the NAMA.

Intended Nationally Determined Contribution (INDC)

Countries taking part in the international climate negotiations under the UNFCCC, including Lebanon, have agreed to publish what actions they intend to take under a global climate agreement signed at the Paris Climate Summit in December 2015 (COP21).

Even though the INDC is not a policy instrument, it presents a long-term strategy for GHG mitigation and sustainable development. The INDC is considered relevant for the NAMA, as NAMAs can be understood as implementation mechanisms for parts of a country's INDC. Therefore, the NAMA targets should also be aligned with a country's INDC and also with future National Determined Contributions (NDCs), as a NAMA and its interventions can be an important instrument for implementing concrete actions and for achieving the targets of a country under the INDC/NDC.

The INDC of Lebanon, submitted to the UNFCCC in September 2015, summarizes Lebanon's intended targets related to voluntary GHG emission reductions (Republic of Lebanon, 2015). It presents two general reduction scenarios compared with the BAU scenario until 2030. Mitigation and adaptation actions considered in the development of the INDC targets were selected using a bottom-up approach, employing existing sectoral plans and strategies as a basis. This approach allowed the inclusion of the most appropriate mitigation and adaptation actions for each sector and ensured full support from sectoral stakeholders, who see their own planning reflected in the targets set by the INDC.

The relevant targets for the transport sector (based on the TNC currently under preparation) are summarized in the table below.

The Unconditional Target	As an unconditional target, keeping the share of annual passenger-kilometers driven using public transport at 36% up to 2030.
The Unconditional Mitigation Scenario includes the impacts of mitigation actions which Lebanon is able to implement without additional international support.	- 2% reductions in greenhouse gas emissions are achieved compared with the sectorial emissions in the business-as-usual scenario up to 2030
The Conditional Target	As a conditional target, a share of 20% FEVs is to be achieved by 2030.
The Conditional Mitigation Scenario covers the mitigation actions under the unconditional scenario, as well as further mitigation actions which can be implemented upon the provision of additional international support.	- 8% reductions in greenhouse gas emissions are achieved compared with the sectoral emissions in the business-as-usual scenario up to 2030

Table 7: Lebanon's INDC Targets for 2030 in the Transport Sector compared with Business As Usual

Lebanon's INDC presented two reduction scenarios for the transport sector compared with the BAU scenario to 2030, as summarized in Table 7.

Figure 3 shows the GHG trends in the transport sector (2011-2030). Compared with the sectoral emissions in the BAU scenario, 2% reductions of GHG emissions are targeted for 2030 under the unconditional scenario and 8% GHG emission reductions are targeted under the conditional scenario (including international funding). The NAMA in the road transport sector will contribute towards achieving the conditional target, with international funding, by increasing the share of FEVs in the car fleet and reducing GHG emissions.

These two scenarios are illustrated in Figure 3 as compared with the BAU scenario.
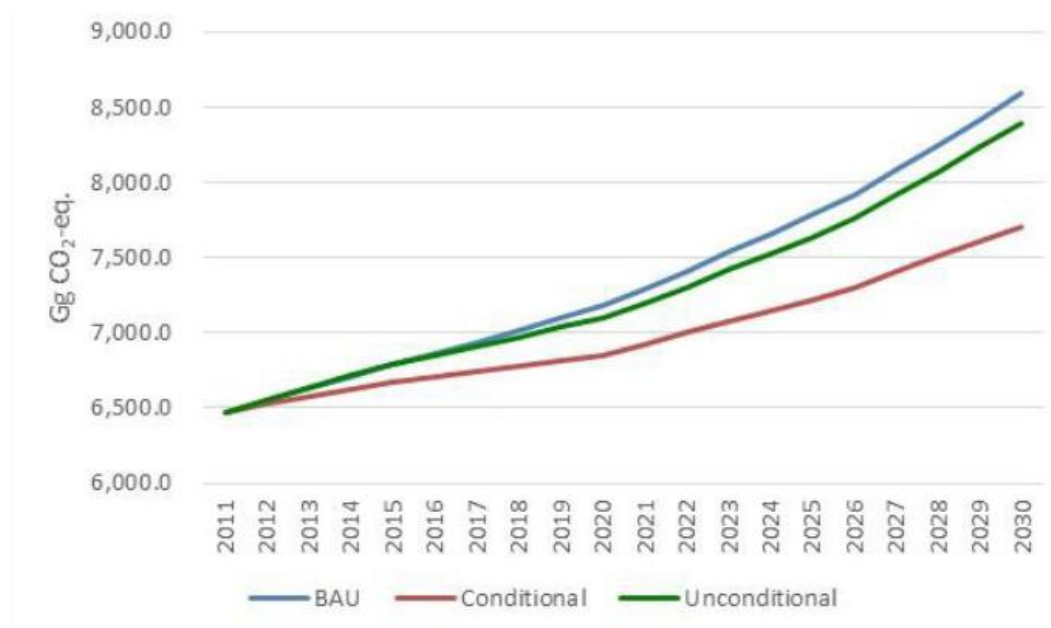
Figure 3: Overall GHG Emissions Trajectories under the INDC: Conditional and Unconditional Mitigation Scenarios

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NAMA Relevance:

The INDC covers several Intergovernmental Panel on Climate Change (IPCC) sectors including the transport sector. The direct relationship between the INDC and the NAMA is that both envisage an increase in the share of FEVs and a reduction in GHG emissions (see Chapter 4 for the emission reduction scenarios).

Additionally, the INDC mentioned a number of infrastructure projects, including improving the bus system, in the GBA, introduction of a bus rapid transit system and revitalization of the railway system which will reduce GHG emissions from the transport sector in general.

3.2 Alignment with National and Sector Strategies and Policies

For being able to include long-term thinking into planning processes within the road transport sector and for arriving at mid-term goals and short-term actions, a long-term vision can help ensure policy coherence and unify different actors to strive for a common goal in the transport sector. As the NAMA intends to bring a positive long-term transformation to the transport sector, leading to GHG emissions reductions and higher sustainable development standards, a central component of the NAMA is to support the establishment of a regulatory framework, including developing and implementing incentive schemes for the road transport sector.

For achieving the outcomes of the NAMA, it is critical to align the NAMA closely with both national and sectoral level policies, plans and targets (both qualitative and quantitative). As mentioned earlier, no endorsed or approved national or sectoral climate change policy exists in Lebanon. However, the NSDS is currently under development and there is a draft law on the Protection of Air Quality which awaits parliamentary approval. Nationally, there are no goals or targets set for the road transport sector in Lebanon.

Alignment at the National Level

At the national level, with reference to the draft law on the Protection of Air Quality (known also as the Clean Air Act - CAA), the NAMA directly supports the goals outlined in the CAA by contributing to the reduction of air pollution through the improved fuel efficiency caused by replacement of old and inefficient cars with new FEVs. Furthermore, the NAMA will establish a MRV system that will monitor the GHG and non-GHG emission reductions achieved in the transport sector under the NAMA. The MRV system will be developed to be aligned with national/international emission reporting requirements. This will directly support the goal of establishing a national emission inventory.

Alignment at the Sectoral Level

The latest policies and legislation on Lebanon's transport sector have a strong focus on the use of less polluting fuels and on the ban of diesel oil through Law 341 (dated 06/08/2001) and its subsequent amendments (Law 380 (14/12/2001) and Law 453 (16/8/2002)). By replacing old and inefficient cars with new and more efficient cars and hence reducing the amount of fossil fuels used per kilometer, the NAMA will directly lead to a reduction of air pollution and of greenhouse gas emissions.

The draft amendment of Law 341/2001, which still awaits parliamentary approval, sets new priorities, such as incentives for hybrid electric vehicles, fuel cell/hydrogen, and Compressed Natural Gas (CNG), references to international norms such as the EURO norm, and incentives for owners of red plate vehicles to replace their vehicles. The incentives for cleaner technologies and exhaust limit values are well aligned with the NAMA. Even though the NAMA does not directly promote hybrid electric cars, fuel cell/hydrogen or natural gas vehicles, it serves the overall objective of renewing and increasing the efficiency of the private sector car fleet in Lebanon. And eventhough the legal basis for the NAMA does not yet exist, the NAMA is well aligned with the latest legal developments.

The most relevant legislation to the NAMA is Decree 8941 (21/9/2012) (draft law forwarded to the Parliament), which aims to incentivize the public transport sector including red plates (e.g. taxis targeted under the NAMA) through various exemptions and government support for low interest loans. Once enacted, the law will be followed by several implementation decrees which will provide (1) a specified cash-for-replacement amount for red plate car owners who submit their cars for scrappage, (2) exemptions from customs and excise duty, and from the registration fee and the first Mécanique fee for the new replacement car, and (3) government support for low interest rates on the car loan for the replacement car.

To encourage old car owners to give up their cars for scrappage and buy new cars, and in discussion with the Ministry of Finance, the present NAMA also proposes waivers for red plate car owners from the customs and excise duty, the registration fee, and the first Mécanique fee. These waivers for taxi owners are consistent with what has been proposed in Decree 8941 (21/9/2012). However, the proposed NAMA includes additional exemptions including a cash-for-scrappage benefit, which is not included in the draft law. The NAMA also sets eligibility conditions on the year of manufacture of the old car submitted for scrappage, requiring that being older than 15 years at the time of application to the program. No specific eligibility conditions are mentioned in the draft law. Finally, the NAMA sets a specific threshold on the emissions standard of the replacement cars (FEVs) to achieve the goal of significant GHG emission reductions.

Therefore, the regulatory framework for granting exemptions for the replacement of red plate vehicles exists in Lebanon and the NAMA can build up on it by either modifying the existing draft law to incorporate the eligibility conditions mentioned above for old and new, replacement cars and the cash-for-scrappage subsidy, or by supporting the drafting of another law that would be independent of Decree 8941.

For white plate car owners, given the large number of cars that need to be replaced, it will not be economically viable for the GOL to waive customs and excise fee. Therefore, for white plate cars, the only exemptions proposed under the NAMA are of the registration and first Mécanique fees. VAT is not waived for either white or red plate cars on the grounds that cars like any other consumer good should be subject to this tax.

Finally, the focus of the transport NAMA on GHG emissions reductions is also in line with the vision of the draft land transport sector policy document prepared by SISSAF, which includes various concepts that promote sustainability. While the focus of the NAMA is on the private transport sector, the policy document places greater emphasis on improvements in public transport service provision.

Since this is the first NAMA for the transport sector being developed for Lebanon, there is currently no specific regulatory framework in place that can be used by the NAMA. It is part of the scope of the NAMA to establish such an institutional and regulatory framework. The national NAMA funding would be approved by a law or a decree (see Section 5.3). The COM in collaboration with the MOE and other ministries will draft reporting and implementation mechanisms for the NAMA.

Table 8 summarizes NAMA alignment with existing national policies, plans or strategies.

National Policies	NAMA Alignment
National Sustainable Development Strategy (Draft)	- Improvement of the vehicle fleet, achieving greater fuel efficiency and fostering transformational change to higher sustainable development standards within the road transport sector in Lebanon.
National Land Transport Policy and Strategy	- The NAMA will have several co-benefits that are aligned with the three main objectives of the sector policy document. - The new FEVs will improve the mobility of Lebanese citizens who dispose of their old cars, and will improve road safety levels as well due to lower risk of vehicle breakdown and higher safety standards of the cars. - The NAMA will also contribute to the development of the economy as it will create new jobs and improve the businesses of several stakeholders (taxi drivers, car dealers, scrappage facilities, etc.). - The coordination and implementation of the various NAMA activities will require capacity building, human resources development and the staffing of related NAMA units.
Draft Law on the Protection of Air Quality	- The NAMA will also implement measures to reduce, and measure and report air pollution from the transport sector.
Draft amendment of Law 341/2001 (awaiting parliamentary approval)	- The NAMA will support the provision of incentives for FEVs and hybrid electric cars as well as define emission limit values for new cars, thus supporting some of the provisions stipulated in the 2010 amendment of Law 341/2001. - Incentives for owners of red plate vehicles to renew their vehicles. - Reference to international norms such as the EURO norm
Third National Communication (TNC)	- The NAMA's main goal of reducing GHG emissions and energy consumption is directly in line with the main goal of the mitigation actions proposed in the TNC of Lebanon. - Both the NAMA and the TNC envisage a similar mitigation scenario focusing on an increased market share for FEVs.
INDC	- The direct relationship between the INDC and the NAMA to increase the share of FEVs and reduce GHG emissions

Table 8: Summary of the NAMA alignment with existing national policies

4   Baseline Information and NAMA Targets

As the NAMA is structured in a phased approach with specific technical interventions starting in Phase 1 and additional interventions starting in Phase 2, the GHG baseline and the mitigation targets for the two phases are described separately. Phase 1 will mainly consist of the preparatory work of building the basis and enabling environment for the main intervention, namely the roll-out of the car scrappage program under NAMA Phase 2. This car scrappage program will produce most of the GHG emissions reduction under the NAMA. However, there will be a pilot car scrappage program with only a reduced number of cars participating already under Phase 1. This pilot program is also classified as an intervention resulting in GHG emissions reductions.

4.1   Baseline Boundary and Assumptions

4.1.1   Sector/Sub-sector Boundary

The NAMA targets Lebanon's transport sector, and within this sector the privately operated cars (white plates), as well as taxis/jitneys (red plates). The basic idea is the replacement of old and fuel intensive cars. The NAMA targets old cars that are operational and were manufactured at least 15 years ago (on a rolling basis; eligibility criteria may be revised as part of Phase 1 of the NAMA). That the program operates on a rolling basis (meaning that the car that should be replaced/scrapped must be at least 15 years old at the year of replacement) is required as, otherwise, there would not be any improvements achieved by the scrappage program due to the constantly ageing fleet. The owners of the old cars targeted by the NAMA are expected to belong to lower to medium income groups. Buses and freight vehicles are excluded from this NAMA.

In NAMA Phase 1, the pilot scrappage program will be implemented. The program targets solely red plate vehicles meeting the above mentioned criteria. NAMA Phase 2 broadens the scrappage program, to comprise both red plate and white plate vehicles.

4.1.2   Geographical Boundary

This NAMA will be implemented on a national scale. However, one third of the Lebanese population lives in the GBA that geographically occupies only 2% of Lebanon (Faour & Mhawej, 2014). Given the uneven distribution of the population, most of the emissions reductions are expected to take place in the GBA.

Neither phase of the NAMA restricts the geographical extent of the scrappage program within Lebanon. The program will be implemented nationwide.

4.1.3   General Assumptions for the Baseline Scenario

The baseline scenario is used as a reference for comparison with the scenario under the NAMA. For the NAMA in the road transport sector, the baseline scenario or BAU scenario describes the situation in the absence of the NAMA or the expected interventions. For quantifying the GHG emissions baseline, certain trends and assumptions are being used to develop the BAU scenario for the full NAMA period (2017-2030).

The baseline scenario in the absence of the NAMA refers to the continuation of current practices in the private car transport sector over the period of the NAMA lifetime, where no NAMA/scrappage program is implemented and old, fuel intensive vehicles are used until the end of their lifetime.

Baseline assumptions for GHG Emission Reductions

A GHG emission baseline is calculated taking into account the evolution of the fleet of private vehicles (WP) and taxis (RP) in terms of their stock change and specific CO_2 emissions per km. The underlying data, methodology and assumptions are provided in Section 4.2.

The baseline emission path represents a BAU scenario. In particular, it assumes that the transport mode, i.e. the high share of private transport in Lebanon's transport sector, remains unchanged over the NAMA period. This assumption is based on the two following considerations. First, to date there is no effective policy for the short- to mid-term future related to fostering mass public transport (rail, metro, etc.) and medium/high capacity transport vehicles. Second, no regulations are expected to be introduced over the NAMA period to discourage car ownership given the large flows of revenue to the government from new and used car imports and sales.

Regarding direct GHG emission reductions, the only GHG considered in this NAMA is CO_2, although some emissions of CH_4 and N_2O can be expected from gasoline internal combustion engines. However, their emissions in CO_2 equivalent are much lower than the emissions from CO_2 (typically by more than one order of magnitude on an absolute value basis (IPCC, 2001)).

Regarding indirect GHG emission reductions, the assessment is limited to the direct reductions from the scrappage program, but cannot reflect potential indirect effects due to fuel tax modifications or any other measure on a national level aimed at behavioral changes. The determination of a baseline that would encompass the entire transport sector (including freight, motorcycles, public transport, etc.) is beyond the scope of this NAMA. However, the recently published part of Lebanon's TNC to the UNFCCC provides a good basis for mapping the transport sector as a whole (MoE, 2015).

Other assumptions for the baseline scenario

The baseline scenario is applicable for both phases of the NAMA. RP vehicles, which are targeted in Phase 1 and Phase 2, are expected to serve similar numbers of passengers throughout the NAMA period, as no shift in the selection of the transport mode is expected to happen. Also for WP vehicles, which are targeted under NAMA Phase 2, no major change in the selection of the transport mode is expected.

In the baseline scenario, private individuals owning old cars in Lebanon, who generally belong to lower income brackets, may not be encouraged to renew their cars in the absence of financial incentives such as subsidies, soft loans, or tax waivers offered by the government. As a result, currently more than 50% of the car fleet is more than 15 years old.

It is expected that in the absence of the NAMA, most car scrappage facilities in Lebanon would still not be licensed by the Ministry of Industry and would - as under current regulations - not be required to follow environmental standards (on storage of materials, recycling, etc.) to operate.

Car dealers would continue to follow market trends and consumer preferences, among other factors, in models of cars they import. Due to the lack of government financial incentives offered to those who purchase FEVs, car dealers would not predominantly focus on importing FEVs. It is further assumed that commercial banks would continue to offer car loans to credit-worthy individuals who purchase new cars at competitive interest rates, which could however be further reduced if the BDL waived their reserve requirements. Individuals with unstable or no incomes or with no assets that can be used as collateral would continue to have difficulties in gaining access to loans from commercial banks.

In the absence of a transport NAMA, the prospects for financing transport projects aimed at improving private car transport in Lebanon would be weak. There is currently neither domestic financing nor international financing earmarked for improving this sector, and this situation is not expected to change much under the baseline scenario.

4.2 GHG Baseline Emissions

The GHG baseline emissions describe the current situation for the different vehicle categories targeted under the NAMA. The general approach for determining the GHG emissions under the baseline scenario are the same for both NAMA Phases. Therefore, the approach described below is applied for both the pilot scrappage program (NAMA Phase 1) and the extended scrappage program (NAMA Phase 2).

4.2.1 Baseline Data

Vehicle stock in the base year (2014). The Association of Car Importers in Lebanon provided the data about the year of manufacture of all passenger cars registered as of 2014 (see Table 1). The data set included information about the engine output in horsepower (HP) units, which could be used to classify the vehicle population into three sizes:

-   **Small vehicles**: weight < 1 tonne, engine size ≤ 1.4 litres, engine output < 15 HP
-   **Midsize vehicles**: weight 1-1.5 tonnes, engine size 1.4-2.3 litres, engine output 15-24 HP
-   **Large vehicles**: weight > 1.5 tonnes, engine size > 2.3 litres, engine output > 24 HP

The resulting size distribution of the 2014 population of WP and RP vehicles is presented in Table 9 (Asssociation of Car Importers in Lebanon, 2015). As can be seen, the distribution is further differentiated between two age categories. Vehicles manufactured in the year 1999 or earlier fall into the category *PRE 2000*, while the category *POST 1999* refers to cars manufactured between 2000 and 2014. The year 2000 was selected as the base year, as the NAMA was developed in the course of 2015 and cars older than 15 years are the target group of the scrappage program.

Class	White plates				Red plates			
	PRE 2000		POST 1999		PRE 2000		POST 1999	
Small	95,294	12.9%	138,328	19.7%	1,823	10.1%	5,380	35.9%
Midsize	427,123	57.9%	311,761	44.4%	13,415	74.4%	8,301	55.4%
Large	214,997	29.2%	251,408	35.8%	2,797	15.5%	1,306	8.7%
Total	737,414	100%	701,497	100%	18,035	100%	14,987	100%

Table 9: Passenger car population distribution by size class and age category, 2014

Passenger car activity. As a robust car activity proxy, the annual mileage was chosen. This parameter is easy to monitor and it averages daily variations caused by – for instance – user preferences or downtimes. The corresponding data for each vehicle size class and category was obtained from a domestic market survey among WP and RP car drivers in Lebanon (Ecodit, 2015). The outcome of the survey is presented in Table 10. The weighted average for each age category was obtained using the corresponding size class shares as weighting factors (shown in Table 9). For the RP vehicles, only the *PRE 2000* age category has been surveyed, hence both age categories use the same mileage data for the three size classes.

Class	White plates		Red plates	
	PRE 2000	POST 1999	PRE 2000	POST 1999
Small	10,500	15,000	55,700	55,700
Midsize	10,300	11,200	44,800	44,800
Large	10,000	10,200	52,100	52,100
Weighted average	10,238	11,591	47,034	49,349

Table 10: Annual mileage per vehicle

Emission factors in the base year 2014. The emission factors were compiled based on data from 10 car manufacturers for recent brand new cars (adapted from Arab Forum for Environment and Development (AFED), 2012; Chapter 12, pp. 91-92 of the Handbook). These data are shown under the heading "New" in Table 11 and includes cars in the vehicle stock that are no more than three years old relative to the year 2014. The data shown are an average across the manufacturers for each class. Then, for the small and midsize class, it was assumed that the specific emissions of the older vehicles are on average 15% and 30% higher for the *POST 1999* and the *PRE 2000* categories, respectively. For the large class, these factors were estimated to be somewhat lower, namely 10% and 20% for the *POST 1999* and the *PRE 2000* categories, respectively. With 248 g CO_2/km, the emission factor of the large class is relatively high already in the *NEW* category, due to the trend towards Sport Utility Vehicles (SUVs) in this category. These are generally heavier and less efficient than other cars of the same size class. For instance, removing SUVs through effective legislation will probably decrease the emissions from the large class by some 20% based on rough estimates of average fuel efficiency of SUVs compared with other large cars. SUVs were largely imported to Lebanon after the year 2000 (Assosciation of Car Importers in Lebanon, 2015). Hence, the difference of the emission factor between the *NEW* and the older categories is estimated to be lower for the large class than for the small and midsize class.

Using again the size class shares from the population distribution in Table 9, one obtains the weighted average emission factor for the age category under consideration.

Class/Category	New (original data)	Post 1999	Pre 2000
Small	128	147	166
Midsize	177	204	230
Large	248	273	298
	Weighted average (by size class share)		
White plates	193	217	242
Red plates	166	189	234

Table 11: Vehicles' CO$_2$ emission factors (g CO$_2$/km)

Based on the data provided so far, the baseline emissions can be determined ex-ante for a preliminary assessment of the emissions reduction potential of this NAMA. Once the program has started, the baseline will be adjusted ex-post using real data (the actual cars scrapped and replaced) as part of the MRV.

4.2.2 Applied Methodology and Assumptions

Even though there exists a Clean Development Mechanism (CDM) Methodology (AMS III.S - Introduction of low-emission vehicles/technologies to commercial vehicle fleets) specifically for transport projects (UNFCCC, 2015), a different approach to estimating GHG emission reductions was sought and applied. This was mainly because the CDM methodology requires the use of data that are not available right now and that would be difficult to obtain during the implementation of the interventions under the NAMA.

The general approach consists of two steps. First, the evolution of the number of vehicles, i.e. the "stock change", is calculated for each plate color and vehicle age category. This is required to forecast the growth rate of the total fleet as well as the amount of vehicles that are "naturally" scrapped every year. Natural scrappage occurs, for instance, when accidents or mechanical failures lead to the total loss of a vehicle. Secondly, assuming that the average annual mileage given in Table 10 remains constant during the NAMA period, the emissions are calculated by multiplying the number of vehicles [#] by the annual mileage [km/yr] and the specific emission

factor [g CO_2/km]. Emission factors, however, do not remain constant but change from year to year according to certain dynamics that are, together with the assumptions for the stock change, further described below.

Stock change

Growth of total fleet. The total number of cars as of the base year 2014 is extrapolated into the future by applying the annual growth rates as presented in Table 12. The following considerations have led to these estimates:

• Recent growth trends were derived from data received from the TTVMA for the period 2010-2014.

• The extrapolation is based on tentative forecasts of economic activity in Lebanon, in the knowledge that car purchases are closely linked to the economic cycle. It is estimated that economic activity will remain weak for the next three years (decreasing growth rates between 2015 and 2017) (World Bank, 2015) (Trading Economics, 2015) before picking up in 2018. While these developments affect the projected growth rate of the white plate fleet, the number of red plates is under governmental control. Currently, there are no signals indicating that the GOL would increase the number of red plate licenses before the end of the pilot scrappage program in 2020.

• It is assumed, that the number of residents of Lebanon is increasing modestly and that all owners of foreign plates entering Lebanese territory will register their vehicles as required by law.

Period	White plates		Red plates
2014 – 2020	2014: 3% 2015 – 2016: 2.5% 2017: 2% 2018 – 2020: 3%		0%
2021 – 2030	2021 – 2022: 3% 2023: 2% 2024 – 2030: 1.5%		1%

Table 12: Estimated annual growth rates of car stock

In the absence of the scrappage program, the distribution of the passenger car population by size (i.e. the shares of small, midsize, and large vehicles) is assumed to remain the same as in the base year, i.e. as in the *POST 1999* category (see Table 9). This assumption follows from the absence of regulations that would impose a disincentive for large and non-fuel efficient cars or of an incentive for the purchase of FEVs. However, the specific emission factors of the vehicles that enter the fleet due to stock growth, which are allocated to the category *NEW*, is lower than those of the *POST 1999* category owing to their more advanced technological state (see Table 11).

Natural scrappage: While the total stock of vehicles is expected to slowly increase over the years due to the purchase of *NEW* vehicles, the stock of *PRE 2000* and *POST 1999* vehicles that existed in the base year 2014 will keep decreasing due to natural scrapping. All vehicles that are naturally scrapped are replaced by new vehicles of category *NEW*. In practice, the annual natural scrapping rate follows from the number of cars that are scrapped in Lebanon's scrapping facilities, $N_{scrapped}$, divided by the total number of vehicles in the fleet, N. By keeping record of each scrapped vehicle's year of manufacture at scrappage, A, it is possible to determine the share of natural scrapping occurring in the *PRE 2000* and in the *POST 1999* stock. Natural scrapping in the stock of *NEW* vehicles does not change their stock size, since *NEW* vehicles are assumed to be replaced again by *NEW* vehicles.

For the ex-ante baseline emission calculations, the annual natural scrapping rate is estimated to be 2% of the total stock throughout the baseline (for both WP and RP vehicles). This estimate assumes that natural scrapping takes place solely in the *PRE 2000* and the *POST 1999* stock. It is further assumed that the bulk of this scrappage (95%) occurs in the *PRE 2000* vehicle stock.

Emission factor dynamics

The average emission factors for each category (*PRE 2000*, *POST 1999*, *NEW*) given in Table 11 are valid for the base year 2014. Starting from these base values, two dynamic effects and certain impacts arising from the country specific operating conditions are considered.

Wear and tear. Generally, vehicles become less efficient with every year of operation. The reason is wear and tear of mechanical parts and materials such as joints, seals, etc. To account for this ageing effect, it is assumed that the emission factor of a vehicle increases by 1% per year. For the vehicles of the *PRE 2000* and *POST 1999* categories, i.e. for the total vehicle stock in the base year 2014, this means that the longer it takes until they are removed through natural scrapping, the higher their annual contribution to the fleet's CO_2 emissions. For example, a *POST 1999* white plate vehicle that is still being operated in the year 2030 will by then have reached an emission factor of 259 g CO_2/km, as compared with the 221 g CO_2/km it had in 2014 (see Table 11). Vehicles of the *NEW* category, once they become part of the fleet, are affected by wear and tear in the same manner.

Technology improvement. Newly imported/manufactured vehicles can be assumed to come with technology advancements year after year. In other words, the more modern a *NEW* vehicle is at the time it joins the fleet, the lower the starting level of its emission factor. To account for such technology improvement, it is assumed that emission factors of *NEW* vehicles will have decreased by 1.85% per year over the time between the base year 2014 and the year in which the vehicles become part of the fleet.[1] For example, a *NEW* white plate vehicle replacing a naturally scrapped vehicle in the year 2025 joins the fleet at an emission factor level of 157 g CO_2/km, as compared with the base year level of 193 g CO_2/km (see Table 11). Then again, starting from that 2025 level, the emission factor of this replacement vehicle will increase with every year of continued operation due to wear and tear.

Country specific operating conditions. Car manufacturers tend to underestimate the specific CO_2 emissions of their models under real operating conditions. Hence, it is proposed to correct the emission factors for certain impacts related to country specific operating conditions. The relevance of those impacts was checked via the already mentioned market survey of passenger car drivers in Lebanon (Ecodit, 2015). Based on this insight, correction factors are proposed as described below and listed in Table 13. Note that these factors are not based on dedicated emission factor studies, but are rather in-house estimates subject to future adjustments.

-   The first impact is related to Lebanon's congested traffic situation. On average, white plate drivers indicated that 30% of their daily mileage takes place in traffic jams. With an average of 40%, that share is even higher for the surveyed red plate drivers. Such high shares of mileage in stop-and-go mode are assumed to impair the emission factors of all vehicles by +5%.

-   The second impact is related to topography. Around 70% of Lebanon's surface area is mountainous. WP and RP vehicle drivers indicated that on average, respectively, 29% and 30% of their mileage takes place on mountainous roads. It is conjectured that the manufacturers have not taken into account a high share of mountainous topography and that the increased emission intensity when driving uphill is not balanced by intensity reductions on

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[1] The annual technology improvement rate of 1.85% is adopted from the eligibility criterion for replacement vehicles during the scrappage program, which is further described later in the text (Section 4.3.1, Paragraph *Emission factor dynamics*, on page 49).

the way down – for reasons related to engine performance and driving characteristics. Consequently, a correction of the emission factor of +5% is applied for all vehicles.

- The third impact is the passenger load or vehicle occupancy. It is conjectured that for RP vehicles the passenger load is higher than assumed by manufacturers. In fact, the survey revealed an average occupancy for RP vehicles of 4.4 persons per trip, including the taxi driver. A correction of the emission factor of +3% is proposed for RP cars.

- The fourth impact arises from air conditioning (AC) and comes into play only during the hot season and mainly at altitudes below 500 m. While during the five months of summer, the impact on the emission factor for drivers who use the AC frequently may be substantial (> 15%), it is more moderate when averaged over 12 months and when considering that between 17% and 33% of the white and red plate drivers do not switch on the AC even if their vehicle is equipped with it (Ecodit, 2015). It is further assumed that the proposed AC correction factor of +3% only applies to *POST 1999* and *NEW* vehicles, but not to the *PRE 2000* category given that 46% of the surveyed RP cars and 70% of the WP cars are not equipped with AC.

- The fifth and last impact is related to substandard vehicle maintenance. Based on the survey findings, drivers in Lebanon usually do not adopt good car maintenance practices, which is assumed to negatively impact the fleet's emission performance. Consequently, an empirical correction factor of +3% is proposed for all vehicles.

Impact	White plates		Red plates	
	PRE 2000	**POST 1999/NEW**	**PRE 2000**	**POST 1999/NEW**
Traffic jams	1.05	1.05	1.05	1.05
Mountainous topography	1.05	1.05	1.05	1.05
Passenger load	1.00	1.00	1.03	1.03
AC, averaged over the seasons	1.00	1.03	1.00	1.03
Substandard vehicle maintenance	1.03	1.03	1.03	1.03
Lumped correction factor (*f*)	**1.14**	**1.17**	**1.17**	**1.20**

Table 13: Correction factors applied to the vehicles' emission factor arising from country specific operating conditions

Mathematical implementation of the approach

The considerations and assumptions outlined above lead to the following mathematical model for the calculation of the baseline emissions of all vehicles under this NAMA. The total baseline emissions *BE* in the year *y* are the sum of the contributions from both plate colors, *p*, and all three age categories, *c*:

$$BE_y = \sum_p \sum_c BE_{p,c,y} \qquad (1)$$

Where:

BE_y =   Baseline emissions of the total fleet in the year *y* – (t CO_2/yr)

$BE_{p,c,y}$ =   Baseline emissions of the vehicles of plate colour p and age category c in the year y, where plate colour p = white plate (WP) and red plate (RP), and where age category c = Pre 2000 (PRE), Post 1999 ($POST$), and NEW due to growth and natural scrapping (NEW) – (t CO_2/yr)

As mentioned earlier, the first step of the general approach to be applied is the evaluation of the stock change. The number of vehicles BN of plate color p in the year y ($y>0$) of the baseline is calculated for the three age categories according to:

$$BN_{p,PRE,y} = BN_{p,PRE,y-1} - \sum_c BN_{p,c,y-1} \times (1 + g_{p,y}) \times \left(\frac{\mu_{PRE}}{1-s} - \mu_{PRE}\right) \tag{2}$$

$$BN_{p,POST,y} = BN_{p,POST,y-1} - \sum_c BN_{p,c,y-1} \times (1 + g_{p,y}) \times \left(\frac{\mu_{POST}}{1-s} - \mu_{POST}\right) \tag{3}$$

$$BN_{p,NEW,y} = BN_{p,NEW,y-1} + \sum_c BN_{p,c,y-1} \times (1 + g_{p,y}) \times \left(\frac{1}{1-s} - 1\right) + \sum_c BN_{p,c,y-1} \times g_{p,y} \tag{4}$$

Where:

$BN_{p,c,y}$ =   Baseline number of vehicles of plate colour p and age category c in year y

$g_{p,y}$ =   Growth rate of the fleet of plate colour p in the year y (see Table 12)

s =   Natural scrapping rate during the baseline, i.e. s = 0.02 during the baseline

$\mu_{PRE/POST}$ =   Share of natural scrapping occurring in the PRE and $POST$ category, i.e. μ_{PRE} = 0.95 and μ_{POST} = 0.05 during the baseline

The second term of the right-hand-side of Equations 2-4 represents the number of vehicles that are naturally scrapped in a given year y, which is discounted from the *PRE 2000* and *POST 1999* stock (Eq. 2 and 3), and at the same time is added to the *NEW* stock (Eq. 4). Also added to the *NEW* stock are vehicles that join the fleet due to its growth, represented by the third term on the right-hand-side of Eq. 4. For the base year 2014, where y = 0, the right-hand-side of Eq. 4 is simply zero, while for Eq. 2 and 3 it can be looked up in Table 9, where the total number of white and red plate vehicles that existed in the year 2014 is listed.

Recalling that the emission factors of the *PRE* and *POST* vehicles are not affected by technology improvements, their baseline emissions, i.e. their contribution to the sum in Eq. 1, are obtained directly from the following product (representing the second step of the general approach):

$$BE_{p,c,y} = BN_{p,c,y} \times \frac{EF_{p,c,y} \times f_{p,c}}{10^6} \times D_{p,c} \tag{5}$$

Where the emission factor in year y, y = 0, …, 16 (corresponding to the years 2014, …, 2030) is given by:

$$EF_{p,c,y} = EF_{p,c,0} \times (1 + WT)^y \tag{6}$$

And where:

$BE_{p,c,y}$ =   Baseline emissions of the vehicles of plate colour p and age category c in the year y – (t CO_2/yr)

$BN_{p,c,y}$ = Baseline number of vehicles of plate colour p and age category c in year y

$EF_{p,c,y}$ = Emission factor of vehicles of plate colour p and age category c in year y; the starting value $EF_{p,c,0}$ can be looked up in Table 11 under "weighted average" – (g CO_2/km)

$f_{p,c}$ = Lumped correction factor for vehicles of plate colour p and age category c (see Table 13)

$D_{p,c}$ = Annual mileage of vehicles of plate colour p and age category c (see "weighted average" in Table 10) – (km/yr)

WT = Yearly increase of the emission factor due to wear and tear, i.e. $WT = 0.01$

Since the starting level of the emission factor of the *NEW* vehicles is affected by technology improvement, i.e. it depends on the year a given vehicle joins the fleet, and the emission factor grows thereafter due to wear and tear, their baseline emissions need to be calculated by summing the contributions from each year's stock change, *ΔBN*, according to:

$$BE_{p,NEW,y} = \sum_{i=0}^{y} \Delta BN_{p,NEW,i} \times \frac{EF_{p,NEW,0} \times (1+TI)^i \times (1+WT)^{y-i} \times f_{p,NEW}}{10^6} \times D_{p,NEW} \qquad (7)$$

Where:

$BE_{p,NEW,y}$ = Baseline emissions of *NEW* vehicles of plate colour p in the year y – (t CO_2/yr)

$\Delta BN_{p,NEW,i}$ = Baseline stock change in the stock of *NEW* vehicles of plate colour p in the year i, $i = 0, …, y$

$EF_{p,NEW,0}$ = Emission factor of *NEW* vehicles of plate colour p and in year 0, i.e. in the year 2014; can be looked up in Table 11 under "weighted average" – (g CO_2/km)

TI = Yearly decrease of the starting level of the emission factor due to technology improvements, i.e. $TI = 0.0185$

WT = Yearly increase of the emission factor due to wear and tear, i.e. $WT = 0.01$

$f_{p,NEW}$ = Lumped correction factor for *NEW* vehicles of plate colour p (see Table 13)

$D_{p,NEW}$ = Annual mileage of *NEW* vehicles of plate colour p (see weighted average in Table 10, the mileage of *POST 1999* is assumed to apply for the *NEW* category, too) – (km/yr)

The stock change $\Delta BN_{p,NEW,y}$ for each year y is given by the sum of the second and third term on the right-hand-side of Eq. 4, i.e. by the number of vehicles joining the fleet due to growth and due to natural scrapping (replacement vehicles).

4.2.3 Resulting Baseline Emissions

The combined effect of growth and natural scrappage on the evolution of the number of cars in the three categories *PRE 2000*, *POST 1999*, and *NEW* over the entire study period (from base year to end of NAMA period) is illustrated in Figure 4 and Figure 5 for the white and red plate fleet, respectively. It should be noted, that the years in Figure 4 and Figure 5 shown on the horizontal axis refer to "end of year". The effect of the proposed growth rates in Table 12 can be seen from the Total Fleet data series. Note the steeper decline of the *PRE 2000* stock where the bulk of the natural scrapping is assumed to take place. Accordingly, in the absence of policy measures in the baseline scenario, the *POST 1999* stock that existed in the base year 2014 is still largely operational by the year 2030. A considerable number of *PRE 2000* vehicles are still operating in

the year 2030, namely around 28% and 43% of the base stock of white plates and red plates, respectively.
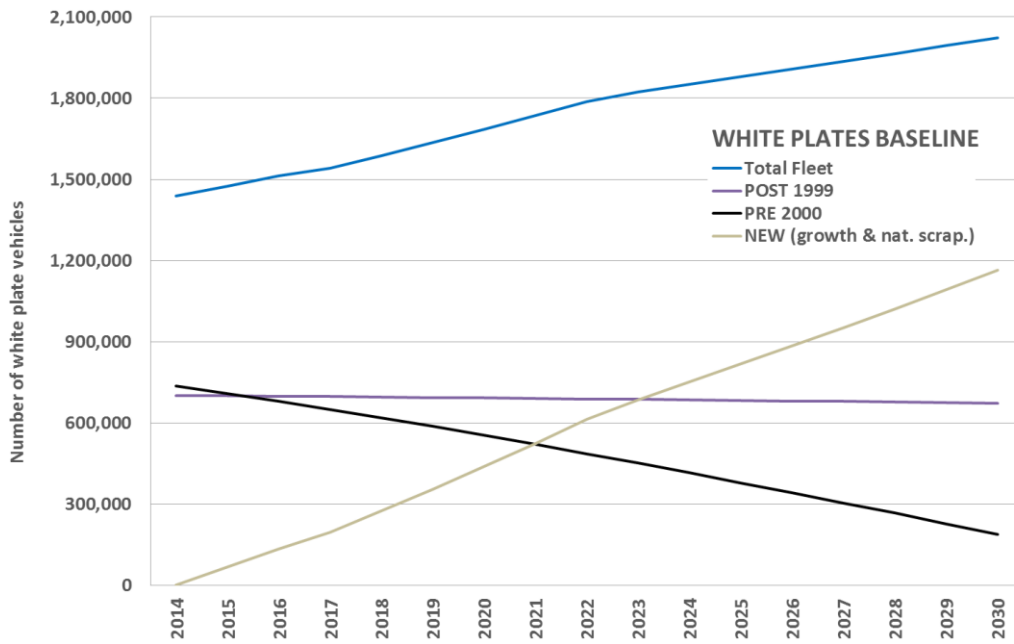
Figure 4: Baseline stock evolution in the white plate fleet
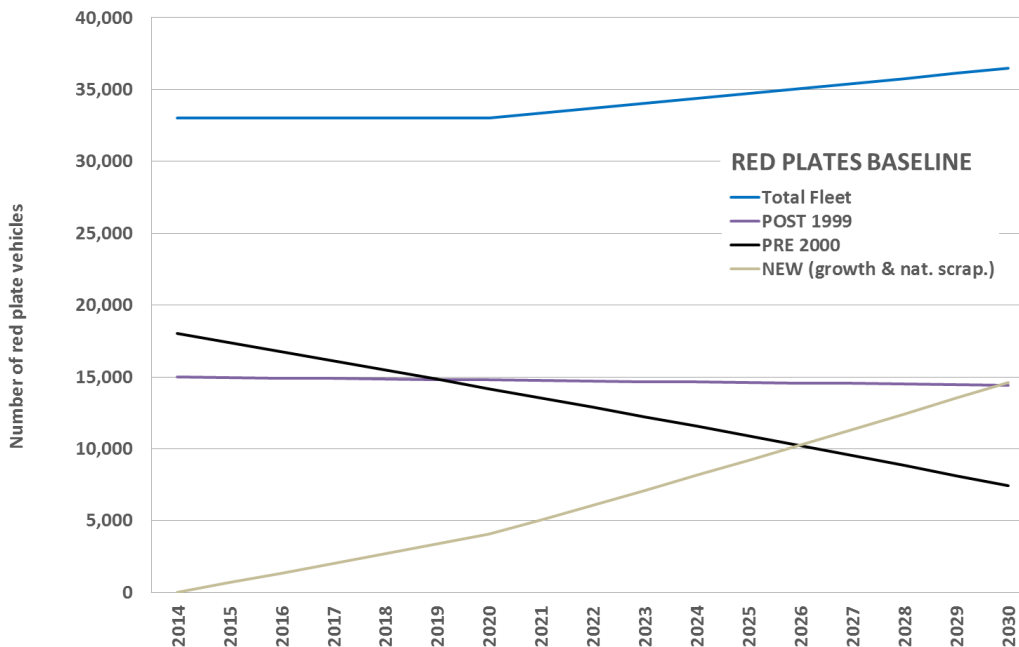
Figure 5: Baseline stock evolution in the red plate fleet

The resulting baseline emissions for the total fleet of red and white plate vehicles are shown in Figure 6 and summarized in Table 14. In the absence of policy measures, the total emissions will

grow by about 11% during Phase 1 of the NAMA (2017-2020) and another 17% during Phase 2 (2021-2030). Overall, the emissions will grow by 37% between the base year 2014 and 2030.
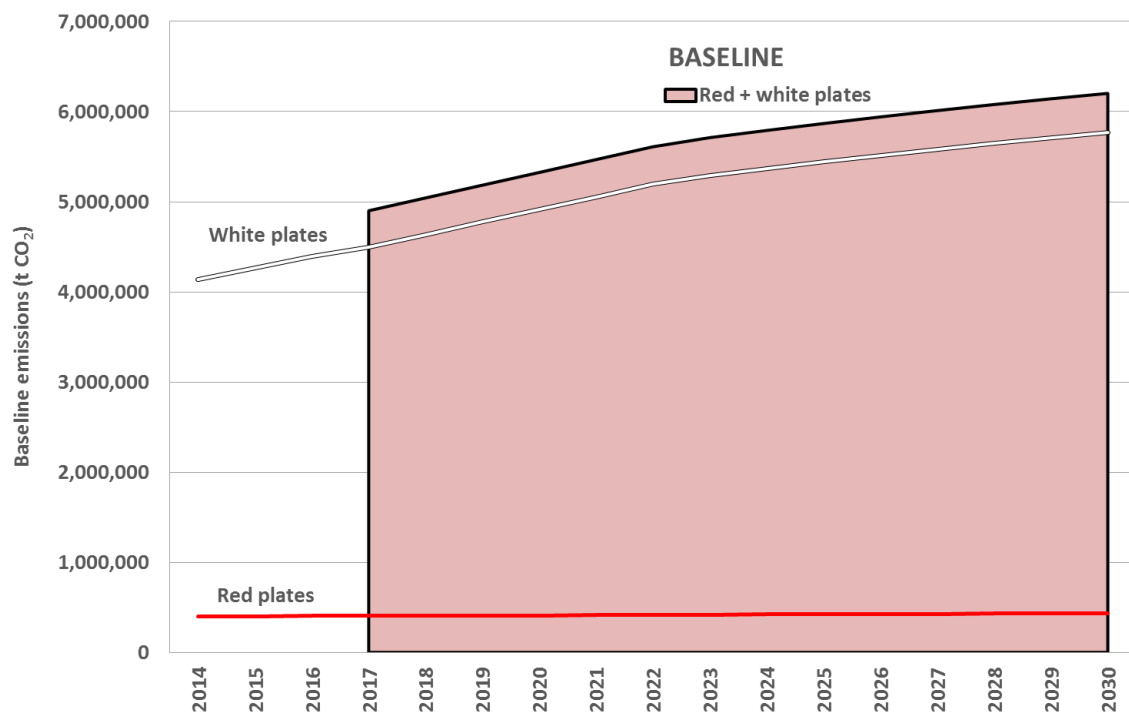
Figure 6: Baseline emissions between the start (2017) and end of the NAMA period (2030)

	Phase 1	Phase 2	Total over NAMA period
	2017-2020	2021-2030	2017-2030
White plates	18,822,386	54,583,713	73,406,099
Red plates	1,630,993	4,244,136	5,875,129
Total	20,453,379	58,827,849	79,281,228

Table 14: Baseline emissions for Lebanon's entire vehicle fleet (t CO_2)

4.3 GHG mitigation targets

As with the baseline emissions, the methodology and the general assumptions for the calculation of the GHG emission reductions are the same for both NAMA Phases.

4.3.1 Methodology and Assumptions

The approach for calculating the GHG emission reductions for the NAMA follows the following steps:

1. Definition of the baseline emissions *BE*: the baseline scenario according to the approach described in the previous section;

2. Determination of the project emissions *PE*: the project emissions in this case are the emissions which are generated under the NAMA;

3. Calculation of the GHG emission reductions *ER* according to the following equation:

$$ER_y = BE_y - PE_y$$

(8)

Where:

ER_y =   Emission reductions of the total fleet in the year *y* – (t CO_2/yr)

BE_y =   Baseline emissions of the total fleet in the year *y* – (t CO_2/yr)

PE_y =   Project emissions of the total fleet in the year *y* – (t CO_2/yr)

The calculation of the project emissions follows the same methodology as described in Section 4.2.2 with the difference that the scrappage program introduces a new stock of fuel efficient vehicles, *FEV*. This will affect the stock evolution of the now four different categories and emission factor dynamics in the following manner.

Stock change. As already noted, the preferred goal of the NAMA activity is that by the end of the program the passenger car fleet contains no vehicle older than 15 years (100% replacement). Accordingly, up to the year 2030, the combination of natural and incentivized scrapping has to lead to the replacement of about 33,000 red plate and 1.4 million white plate vehicles, i.e. the complete stock of *PRE 2000* and *POST 1999* vehicles (see Table 9). In the case of the RP vehicles, 15% of the total number of FEVs that will have to be introduced by the year 2030 will join the fleet equally split over the two years of the pilot scrappage program at the end of the NAMA Phase 1 (2019-2020, 7.5% every year). The remaining 85% will join the fleet again equally split over the 10 years of Phase 2 (2021-2030, 8.5% every year). In the case of the WP vehicles, 100% of the FEVs will join in Phase 2, i.e. 10% every year. For both plate colors it is assumed that the FEVs replace the vehicles of the *PRE 2000* stock first, and once there are no more *PRE 2000* vehicles left, the *POST 1999* vehicles start to be replaced. It is further assumed that as soon as the incentivized scrapping takes off, the natural scrapping rate in the *PRE 2000* and *POST 1999* stock decreases from 2% to 0.5%, whereas 80% of this scrapping takes place in the *POST 1999* stock. The overall growth of the fleet is the same as in the baseline scenario (see Table 12). The stock change due to growth and natural scrapping is added to the *NEW* stock as in the baseline scenario.

Emission factor dynamics. It is assumed that only small vehicles are eligible as replacement cars in the scrappage program. Accordingly, the *FEV* category has a 2014 emission factor level of 128 g CO_2/km (compare with Table 11). This is in line with the goal of the EU countries to limit the specific emissions of new passenger cars to 130 g CO_2/km by the year 2015. As time goes by, the GOL will have to lower this eligibility criterion in order to keep up with the technological advances inherent in new passenger car models. In fact, the EU intends to lower its emission limit further down to 95 g CO_2/km by the end of 2021. It is acknowledged that this goal might be too ambitious in the Lebanese context – even though it would apply only to FEVs bought in connection with the NAMA. Instead, it is posited that the limit of 95 g CO_2/km will be reached by the end of the NAMA period. Gradually reducing the eligibility criterion from 128 g CO_2/km in the year 2014 to 95 g CO_2/km in the year 2030 corresponds to an annual decrease of 1.85%.[2] The other emission factor dynamics (wear and tear, impacts from country specific operating conditions) are the same as described in Section 4.2.2 for the baseline calculations.

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[2] This is the rate that was already used in the baseline to account for technology improvements in the NEW vehicle stock (see Section 4.2.2 and Eq. 7)

Analogous to the baseline emissions, the project emissions, *PE*, are calculated as follows:

$$PE_y = \sum_p \sum_c PE_{p,c,y} \tag{9}$$

Where:

PE_y = Project emissions of the total fleet in the year *y* – (t CO_2/yr)

$PE_{p,c,y}$ = Project emissions of the vehicles of plate colour *p* and category *c* in the year *y*, where plate colour *p* = white plate (*WP*) and red plate (*RP*), and where category *c* = Pre 2000 (*PRE*), Post 1999 (*POST*), new vehicles due to growth and natural scrapping (*NEW*), and new FEVs due to incentivized scrapping (*FEV*) – (t CO_2/yr)

Concerning the categories *PRE*, *POST*, and *NEW*, the general structure of the equations used to calculate the stock size and emissions are the same for the project and baseline scenario (Eq. 2-7). The only differences are:

- the nomenclature ("*P...*" instead of "*B...*");

- the value of the natural scrappage rate *s* (*s* = 0.005 during the scrappage program and *s* = 0.02 prior to the program start);

- the values of the share of natural scrapping occurring in the *PRE* and *POST* category, $\mu_{PRE/POST}$ ($\mu_{PRE/POST}$ = 0.8/0.2 during the scrappage program and $\mu_{PRE/POST}$ = 0.95/0.05 prior to the program start);

- and an additional stock change term in Eq. 2 and 3 (namely the yearly number of vehicles that participate in the scrappage program, which are deducted first from the *PRE* and then from the *POST* stock).

For the sake of brevity, only the equations for the new *FEV* stock are described in the following. The number of *FEV* vehicles in the year *y* is given by:

$$PN_{p,FEV,y} = PN_{p,FEV,y-1} + \Delta PN_{p,FEV,y} \tag{10}$$

Where:

$PN_{p,FEV,y}$ = Number of FEVs of plate colour *p* in year *y* of the project

$\Delta PN_{p,FEV,y}$ = Stock change in the stock of *FEV* vehicles of plate colour *p* in the year *y* of the project, i.e. the yearly number of FEVs that join the fleet to replace vehicles participating in the scrappage program

The calculation of project emissions for the *FEV* stock is analogous to that for the *NEW* stock:

$$PE_{p,FEV,y} = \sum_{i=0}^{y} \Delta PN_{p,FEV,i} \times \frac{EF_{p,FEV,0} \times (1+TI)^i \times (1+WT)^{y-i} \times f_{p,FEV}}{10^6} \times D_{p,FEV} \tag{11}$$

Where:

$PE_{p,FEV,y}$ = Project emissions of the FEVs of plate colour *p* in the year *y* – (t CO_2/yr)

$\Delta PN_{p,FEV,y}$	=	Stock change in the stock of *FEV* vehicles of plate colour *p* in the year *i* of the project, *i = 0, …, y*
$EF_{p,FEV,0}$	=	Emission factor of *FEV* vehicles of plate colour *p* in year 0, i.e. in the base year 2014, i.e. $EF_{p,FEV,0}$ = 128 – (g CO_2/km)
TI	=	Annual decrease of the starting level of the emission factor due to technology improvements, i.e. *TI* = 0.0185
WT	=	Yearly increase of the emission factor due to wear and tear, i.e. *WT* = 0.01
$f_{p,FEV}$	=	Lumped correction factor for *FEV* vehicles of plate colour *p* (see Table 13, the factor of *POST 1999/NEW* applies)
$D_{p,FEV}$	=	Annual mileage of *FEV* vehicles of plate colour *p* (see weighted average in Table 10, the mileage of *POST 1999* applies) - (km/yr)

4.3.2 Resulting GHG Mitigation Targets

Applying the model outlined above under the condition that first the *PRE 2000* and then the *POST 1999* stock has to go to zero by the year 2030 as the result of both natural and incentivized scrapping, one finds the annual number of WP and RP vehicles that need to participate in the scrappage program, which is summarized in Table 15

	NAMA Phase 1	NAMA Phase 2	Total over NAMA period
	2017-2020	**2021-2030**	**2017-2030**
White plates	0	119,082 per year	1,190,820
Red plates	2,171 per year in 2019 and 2020	2,461 per year	28,952

Table 15: Annual and total number of vehicles expected to participate in the scrappage program (100% replacement)

For the alternative scenarios, where only 80% and 50% of the total 2014 stock are replaced, the number of vehicles participating in the scrappage pilot program in Phase 1 remains the same. During Phase 2, however, the annual replacement in the 80% scenario reduces to 89,537 white plates (895,370 in total) and to 1,787 red plates (22,212 in total, including the pilot program). In the 50% scenario, the annual replacement during Phase 2 reduces further down to 43,187 WPs (431,870 in total) and to 738 RPs (11,722 in total, including the pilot program).

The resulting evolution of the stock size for all four categories *PRE 2000*, *POST 1999*, *NEW*, and *FEV* over the entire study period (from base year to end of NAMA period) is shown in Figure 7 and Figure 8 for the WP and RP fleet, respectively. For the sake of readability, the Figures show only the preferred case of 100% replacement. Further, it should again be noted, that the years in Figure 7-Figure 10 shown on the horizontal axis refer to "end of year", so that e.g. the start of the scrappage program in January 2021 coincides with the 2020-tick mark in Figure 7. It can be seen that until the year 2018 for the RPs and until the year 2020 for the WPs, the figures are identical to Figure 4 and Figure 5. Thereafter, the *PRE 2000* stock shows a much faster decline owing to the onset of the scrappage program under the NAMA. Once the *PRE 2000* stock has reached zero, the *POST 1999* stock declines faster and reaches zero by the end of the year 2030 as required. The *NEW* stock increases gradually accommodating the growth of the fleet and the replacement vehicles for those that are naturally scrapped, while the *FEV* stock increases after the start of the program at the yearly rate provided in Table 15. By the end of the NAMA period in the year 2030, the majority of the fleet consists of FEVs, leading to the desired GHG emission reductions.
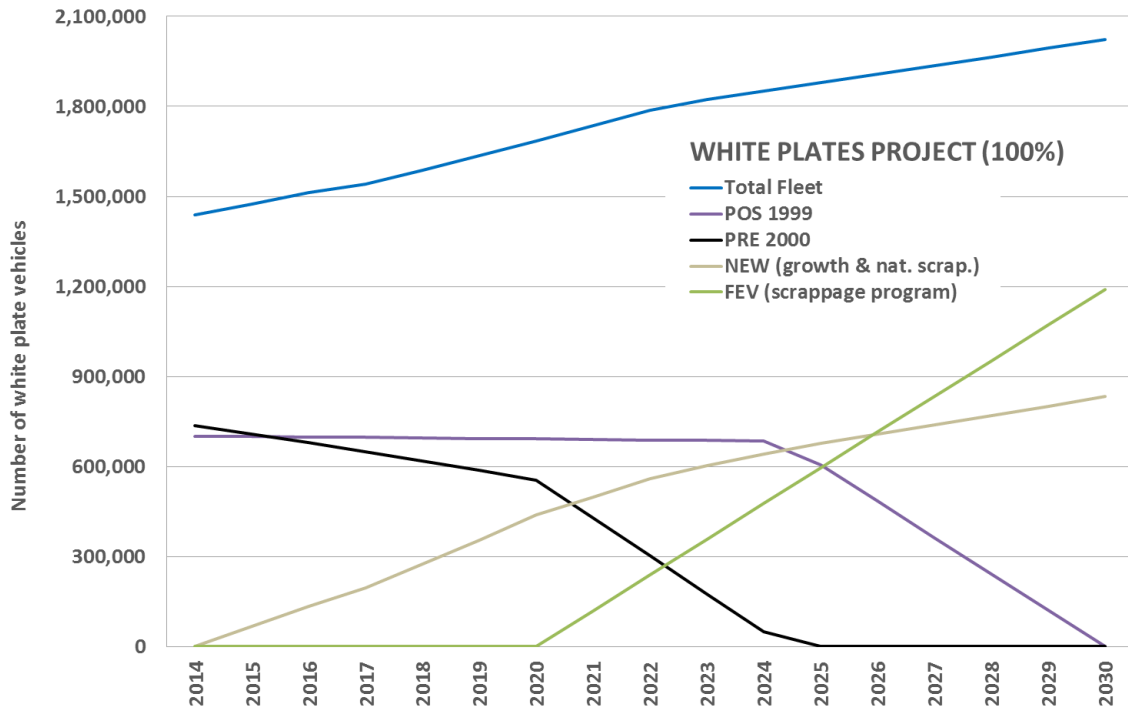
Figure 7: Project stock evolution in the white plate fleet
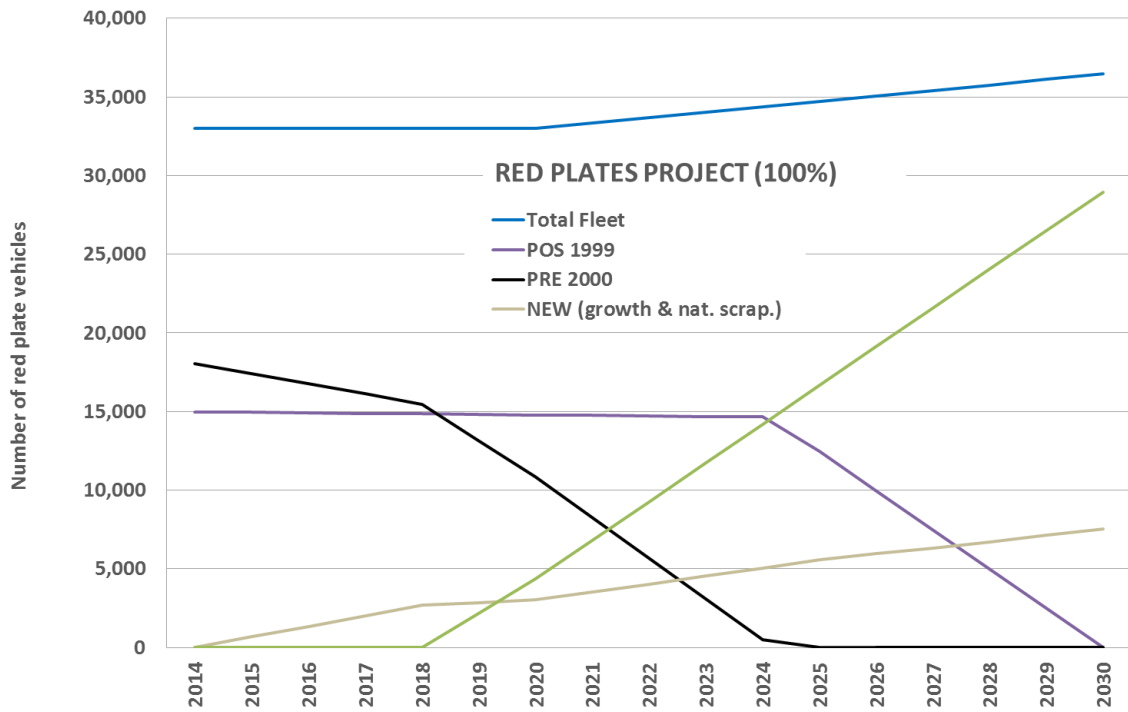
Figure 8: Project stock evolution in the red plate fleet

The resulting GHG emissions under the NAMA in the 100% scenario for the total fleet of WP and RP vehicles are shown in Figure 9 and Figure 10, respectively. Also shown are the baseline GHG emissions of the corresponding fleet to depict the expected GHG emission reductions under this NAMA. A summary of the absolute and relative GHG emission reductions is provided in Table 16 for all three replacement scenarios.
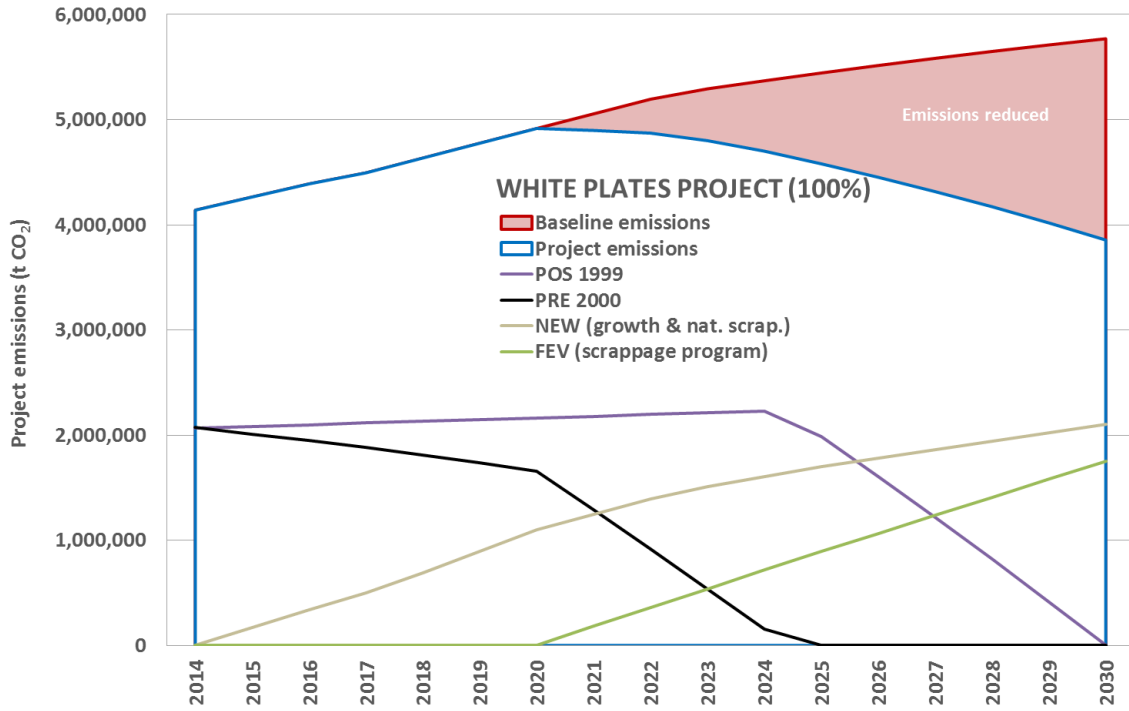
Figure 9: Expected GHG emission reductions under the NAMA resulting from replacement of white plate vehicles
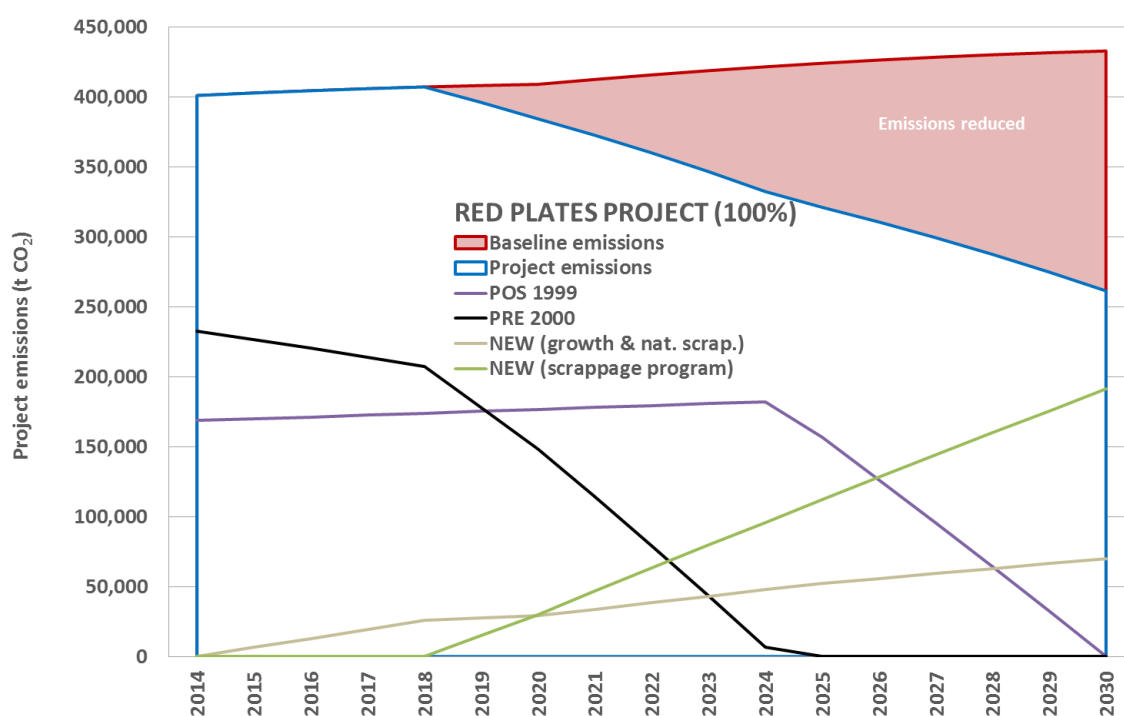
Figure 10: Expected GHG Emission reductions under the NAMA resulting from replacement of red plate vehicles

	Phase 1 reductions (t CO_2)	Phase 2 reductions (t CO_2)	Total reductions (t CO_2)	Baseline emissions (t CO_2)	Relative reductions
	2017-2020	2021-2030	2017-2030	2017-2030	2017-2030
Scenario 100%					
White plates	0	9,919,093	**9,919,093**	73,406,099	**13.5%**
Red plates	36,764	1,075,994	**1,112,758**	5,875,129	**18.9%**
Total	**36,764**	**10,995,088**	**11,031,852**	79,281,228	**13.9%**
Scenario 80%					
White plates	0	6,986,528	**6,986,528**	73,406,099	**9.5%**
Red plates	36,764	830,996	**867,760**	5,875,129	**14.8%**
Total	**36,764**	**7,817,524**	**7,854,288**	79,281,228	**9.9%**
Scenario 50%					
White plates	0	2,553,277	**2,553,277**	73,406,099	**3.5%**
Red plates	36,764	410,594	**447,358**	5,875,129	**7.6%**
Total	**36,764**	**2,963,871**	**3,000,635**	79,281,228	**3.8%**

Table 16: Absolute and relative GHG emission reductions achieved by the NAMA

4.4 Sustainable Development Baseline and Co-Benefits

For Lebanon, the NAMA in the road transport sector provides additional sustainability co-benefits for the public and private sectors. Sustainable development (SD) aspects, such as sustainable economic growth, reduced negative environmental impacts, improved air quality and standard of living, improved energy security and increased awareness about the impacts of climate change and ways to bring transformational change, are key development goals. In addition to its relevance to sustainable development and the co-benefits for the GOL, for most donors and private sector stakeholders, the potential of the NAMA interventions and measures to deliver tangible co-benefits forms the basis of decisions to provide support and finance for such activities.

The prevailing practice in the private road transport sector in Lebanon typically consists of high consumption of fossil fuel by old and inefficient cars leading to high GHG emissions and other pollutants. This in turn has negative environmental, social and economic impacts especially in densely populated areas with high traffic volumes.

Due to the lack of information and limited existing studies about the environmental and social aspects of the transport sector in Lebanon, it is recommended that an Environmental and Social Impact Assessment (ESIA) be conducted prior to the start of the NAMA (see Chapter 5 for further details). This ESIA should assess the potential positive and negative environmental and social impacts expected from the NAMA. A detailed baseline determination with quantifiable targets for SD co-benefits should be based on the results of the ESIA.

For the time being, the approach for describing the success of this NAMA in terms of achieving co-benefits that will help to foster sustainable development in Lebanon's road transport sector, will be assessed by the contribution of the NAMA to the relevant globally agreed SDGs.[3]

If the NAMA were fully applied through all the activities described in Chapter 5, it would contribute to a number of SDGs. The table below describes the expected co-benefits of the NAMA (first column) and how these co-benefits would relate to specific SDGs (second column). As the SDGs contain a number of targets, only those targets that are directly relevant to the NAMA in the road transport sector are listed.

Co-benefits of the NAMA	Relevance to Sustainable Development Goals (SDGs)
- Reduction of hazardous pollution from emissions resulting from private road transport - By replacement of old cars with newer cars, increase the safety standards of cars with the potential to reduce the severity and number of injuries and deaths associated with road traffic	SDG 3: Good Health and Well-Being 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents 3.9: Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination
- Increase the fuel efficiency per kilometer of private cars in Lebanon - Promote and increase awareness of energy efficiency in the transport sector	SDG 7: Affordable and Clean Energy 7.3: Double the global rate of improvement in energy efficiency
- Provide incentives for local private sector engagement (including private car owners, taxi owners and operators, car dealers, car scrappage facilities) that lead to growth of	SDG 8: Decent Work and Economic Growth 8.3: Promote development-oriented policies

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[3] On the SDGs, see https://sustainabledevelopment.un.org/?menu=1300.

local enterprises, job creation and access to financial services - Provide innovative ideas and a potential shift towards fuel efficient vehicles across the private sector involved in car purchase and registration - Provide capacity building and support for local financial institutions to support sustainable development and fuel efficiency activities under the NAMA	that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services 8.10: Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all
- Provide capacity building and awareness creation to key local stakeholders on fuel efficiency in private road transport and climate change, and hence reduce air pollution and improve air quality associated with road transport in cities and urban areas in Lebanon - By replacing of old cars by newer cars (FEVs), reduce the frequency of car breakdowns leading to accidents, traffic jams and congestion	SDG 11: Sustainable Cities and Communities 11.6: Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
- Provide capacity building and awareness creation to key local stakeholders and the public on fuel efficiency and more sustainable and efficient use of fossil fuels and natural resources - Improve the information base and knowledge about fuel consumption and the emissions level in road transport and hence generate more transparency, which in turn would lead to improved capacity to move towards more sustainable consumption patterns of fuel used in road transport - Improve the regulatory framework and establish incentives that support more sustainable consumption of natural resources (including fossil fuels) in the road transport sector in Lebanon	SDG 12: Responsible Consumption and Production 12.2: Achieve the sustainable management and efficient use of natural resources 12.8: Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature 12.a: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production
- Support the enactment of laws that specify emission limits and/or environmental standards for private passenger vehicles, first as part of the scrappage program and possibly subsequently at a national level beyond the scope of NAMA - Provide capacity building and training on climate change mitigation and its impacts to key institutions and stakeholders in the road transport sector - Create and promote awareness broadly of the relation between fuel efficiency in road	SDG 13: Climate Action 13.2: Integrate climate change measures into national policies, strategies and planning 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

transport and climate change mitigation	
- Support the improvement and/or establishment of an incentive scheme for domestic resource mobilization in the road transport sector and the mobilization of additional financial sources - Provide capacity building and support to domestic institutions on incentive scheme development and an increase in fuel tax - Provide incentives for local private sector engagement that lead to the growth of local enterprises, job creation and access to financial services (including through PPPs) - Promote the introduction and dissemination of FEVs in Lebanon on favorable terms (through establishing an incentive scheme based on domestic resources supplemented by international financial sources)	SDG 17: Partnerships for the Goals 17.1: Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection 17.3: Mobilize additional financial resources for developing countries from multiple sources 17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutually agreed 17.17: Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

Table 17: Co-benefits of the NAMA and their relation to the SDGs

Where measurement is not directly possible due to lack of existing data for assessing the detailed baseline situation for each co-benefit, it is recommended that a survey be conducted prior to the start or directly after the start of the NAMA. This is e.g. to assess the level of awareness and knowledge of key stakeholders about fuel efficiency in the road transport sector. An ex-post Development Impact Assessment (DIA) of the NAMA interventions and measures should be conducted to reveal the degree of success in achieving the defined co-benefits. The procedures and parameters for the measurement and reporting of the co-benefits are described in the Section 9.2.3.

The table below describes the different co-benefits of the NAMA and the assumed baseline situation of each co-benefit. The currently available information base in the road transport sector in Lebanon is insufficient to develop a reliable and quantifiable baseline scenario regarding SD co-benefits. The ESIA to be conducted prior to the NAMA is highly recommended to help quantify the baseline situation for the different co-benefits

Co-benefit of the NAMA	Baseline situation
- Reduction of hazardous pollution from emissions resulting from private road transport	- The fuel intensive cars with higher emissions would continue to operate leading to a higher level of pollution and emissions
- Usage of FEVs leading to increase of the safety standards of cars with the potential to reduce the severity and number of injuries and deaths in road traffic accidents and the frequency of car technical break-downs leading to accidents, traffic jams and congestion.	- Cars with lower safety standards and higher technical break-down potential would continue to be operated
- Increase the fuel efficiency of private cars in Lebanon	- The old cars would continue to operate or be replaced at some point with cars that are

	more fuel intensive than the FEVs introduced under the NAMA
- Promote and increase the awareness of energy efficiency in the transport sector and improve the information base and knowledge about fuel consumption and emissions levels in road transport	- Only limited or no awareness about fuel efficiency in road transport. No significant efforts or awareness campaigns are made to increase the awareness of GHG intensity, fuel consumption, and the air quality impacts of road transport in general and non-FEV technologies in particular
- Support the improvement and/or establishment of an incentive scheme for domestic resource mobilization in the road transport sector and the mobilization of additional financial sources from abroad	- No specific incentive scheme to mobilize domestic resources and additional finance for a scrappage program for private road transport is developed
- Provide incentives for local private sector engagement (including private car owners, taxi owners and operators, car dealers, car scrappage facilities) that lead to growth of local enterprises, job creation and access to financial services (including through PPPs)	- An incentive scheme for a replacement program does not exist and no FEVs are purchased as a result of the scrappage program - The baseline situation corresponds to the current business activity level of taxi drivers, current number of employees in the private sector and relevant public institutions/entities (MOE, TTVMA, etc.), as well as current FEV car sales and the number of cars scrapped per month at designated car scrappage facilities
- Provide capacity building support for local institutions and local stakeholders (including the private sector) on fuel efficiency, climate change and sustainable development in the road transport sector	- No capacity building and awareness creation activities have been conducted as part of the NAMA
- Improve the regulatory framework and support the enactment of laws that specify emissions limits and/or environmental standards for private passenger vehicles, first as part of the scrappage program and possibly subsequently at a national level beyond the scope of NAMA	- Currently, there are no emissions limits imposed on new car imports to Lebanon and no environmental tax on fuel used for transport

Table 18: Baseline situation of NAMA co-benefits

4.5 Transformational Change

Besides its contribution to long-term, low-carbon development and sustainable development in the targeted sector and country, the NAMA should also offer proof of how it supports transformational change. This includes the provision of innovation to the sector, the support and encouragement of positive changes to the sector's enabling environment (including strengthening institutional capacities, helping to overcome systemic or regulatory barriers), ensuring a high level of local ownership by showing that the NAMA is supported by relevant authorities, and showing that the NAMA is aligned with the trends and strategies of the country and the sector. Furthermore, the NAMA should consider the private sector and how the private sector will contribute and engage

with the NAMA. Finally, the NAMA should consider the replicability and scale-up potential of the activities planned and implemented under the NAMA.

The road transport sector in Lebanon needs a long-term strategy and coordinated efforts to improve the enabling environment and to ensure public and private sector investments for the necessary technical improvement. This NAMA in the transport sector of Lebanon has been developed with the clear intention of fostering long-term transformational change in the private road transport sector. The whole process of assessing the potential of a NAMA in the sector and the design of the NAMA's scope in close interaction with local stakeholders, the involvement of public and private sector entities, the chosen interventions and measures, the close alignment of the NAMA with existing country and sector strategies, and the technologies applied and the capacity building measures have the overall objective of bringing significant positive changes in the direction of low-carbon development and of contributing to a more sustainable development pathway in Lebanon's transport sector. The NAMA has the potential to be one element of Lebanon's INDC goals of Lebanon and to contribute to their achievement by realizing the emissions reduction targets for the transport sector.

The contribution to sustainable development goals within the transport sector are a central objective of the NAMA. By the introduction and implementation of a car scrappage program for old and fuel- and emission-intensive cars and by the introduction of FEVs, the support for the establishment of an enabling environment for this replacement program (establishment of the institutional framework, assessing and defining eligibility criteria), the development of an incentive scheme for the private sector to participate in the program, and the provision of capacity building measures and awareness creation for local stakeholders, a strong contribution to the sustainable development goals will be delivered. The NAMA will help to change the prevailing practice of high fuel consumption and high emission levels of cars in the private road transport sector, supporting a systematic change and learning process and hence contributing to long-term sustainable development in the sector.

In the following sections, the specific contributions of the NAMA to transforming the private road transport sector in Lebanon are described.

Fostering innovation

Innovative approaches are a key concept of this NAMA. This is the first car scrappage program to be implemented in Lebanon. With the implementation of emission standards on imported FEVs, the NAMA will be innovative by introducing newly established emission limits, leading to the import and higher penetration of FEVs in Lebanon. The car replacement program will directly support the transfer of innovative technologies, leading to an increase of FEVs in Lebanon. The NAMA supports the creation of systems for the measurement and reporting of indicators of mobility and of transport emissions. Such indicators are currently non-existent, rendering the calculation of GHG project impacts inaccurate. The MRV system developed as part of the NAMA will empower public authorities, planners and researchers with better and richer data, leading to a higher level of transparency and allowing for more accurate assessments of the GHG emission reduction impacts of the car scrappage program and of other fuel efficiency emission reduction projects in the road transport sector in the future.

Private sector involvement

Public private partnerships (PPPs) are still limited in Lebanon and specifically in the road transport sector. In the absence of the NAMA, the car fleet is expected to continue to be ageing and polluting since the market segment targeted by the NAMA is of relatively lower socio-economic status than present owners of new cars and may not be able to afford to buy newer cars if the incentives stipulated by the NAMA are not in place. It is likely that specific functions in the NAMA will be operated based on PPP models.

The private sector plays a leading role in the structure and approach of the NAMA. Besides the private cars that are targeted for the scrappage program (in addition to the commercial taxis), other key players in the NAMA set-up are from the private sector. These include car dealers, privately or partially privately owned scrappage facilities, commercial banks and non-banking financial institutions for providing loans or loan guarantees, and car insurance companies. Additionally, and depending on the incentive scheme developed for the private sector, it can be expected that the private sector may take a role for the Monitoring, Reporting and Verification of the GHG mitigation results and other project impacts (at least for parts of it). Overall, the NAMA would significantly strengthen the role and capacities of the private sector in supporting low-carbon transport technologies (e.g. of banks in providing soft loans for FEV purchases, car dealers in increasing the proportion of their FEV imports, scrappage facilities in upgrading their operating practices towards a more sustainable model, etc.).

Impact beyond the scope of the project

With the establishment of the institutional framework and the provision of capacity building, knowledge transfer, and support for obtaining a better information base, the NAMA will provide benefits across the institutions and local stakeholders (e.g. car owners, car dealers, etc.), which go beyond the sector and the scope of the NAMA. The transport NAMA will set the framework for market transformation of the car fleet in Lebanon to become over time a "green", low-emission and fuel-efficient fleet. The marketing campaign which accompanies NAMA implementation will further strengthen this important aspect regarding market transformation. Building on a sustainable financing mechanism from domestic sources and the incentive scheme that will be developed within the NAMA period, the car scrappage program will continue to operate beyond the initial, internationally financed phase. With the alignment of the NAMA with national and sectorial policies and strategies, and taking the local ownership and the awareness creation and promotion activities, the NAMA has built-in elements that aim to impact the transport sector beyond the actual scope of the NAMA. Moreover, the NAMA will strengthen institutional capacities (project governance, MRV systems, financing, etc.) and the capacities of local stakeholders (including the private sector) which would have positive impacts, including in transparency, in the future well beyond the NAMA period.

Replicability and Scaling-up

The transport NAMA is developed to be applicable to all of Lebanon. The measures and interventions may also be applied to other sub-sectors within the transport sector, such as renewing the bus fleet in Lebanon and in particular privately owned buses and minibuses that are old and polluting.

The NAMA will achieve emissions reductions from the scrappage of old cars and their replacement with FEVs, leading to an emission reduction per car and per kilometer driven. Also a switch to cleaner fuel-specifications could be promoted. The NAMA will be developed in two phases. The first phase will focus on a pilot scrappage program with a limited scope, targeting red plate vehicles only. The second phase will lead to a scaling-up of the scrappage program with both white and red plate cars being eligible. The large-scale implementation of the NAMA is to be financed through domestic sources (such as fuel tax increase) in such a way that the process becomes financially sustainable on a rolling basis.

As the first phase of the NAMA includes measures to establish the enabling environment for a scrappage program and since the awareness creation and capacity building measures are expected to increase awareness, a further scaling-up of the number of cars and an expansion beyond the NAMA lifetime can be expected.

The measures and interventions planned under this NAMA have high scalability potential for other regions and countries. It would be important though to consider the specific situation in such countries in terms of aligning the activities with existing policies/strategies, the regulatory framework, the institutional framework and the stakeholders involved.

5   Measures & Interventions under the NAMA

This chapter describes the key elements of the NAMA, namely the interventions or physical actions that lead to direct GHG emission reductions and the measures (supporting activities) that will help prepare and support the implementation of the physical/technical interventions.

All actions under the NAMA are defined in a log-frame with Outcomes, Outputs and Activities. The Outcomes are the main achievements of the NAMA. To reach the Outcomes in a stepwise approach, the full NAMA is broken down into a number of Activities. Each Output consists of a certain set of Activities. The successful conduct of all these Activities leads to an Output. These Outputs are necessary to achieve the final Outcomes. This structure allows the monitoring of the progress and success of the NAMA.

The following figure shows the general approach of Activities, Outputs and Outcomes.
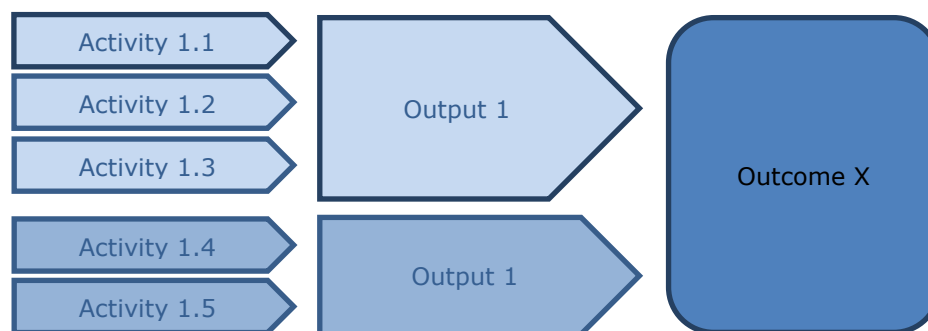
Figure 11: General principle of Activities, Outputs and Outcomes

In the following sections within this chapter the full scope of the NAMA with proposed measures and interventions and the breakdown of Outcomes, Outputs and Activities is described.

Although some preparatory steps to describe the details and assess the feasibility of this NAMA have been completed already, further preparatory steps to be taken prior to the start of the MA need to be set out in detail. To establish these needs, it is recommended that a set of studies be conducted prior to the start of the NAMA. These studies will provide the required information base to help define the details required for implementing the technical interventions and for setting the incentives in the most appropriate way. The studies recommended for this step are described in Section 5.1.

Section 5.2 will then give an overview of the key elements of the NAMA (interventions and measures). A more detailed description of Activities and Outputs leading to the achievement of the NAMA Outcomes is provided in Section 5.3.

5.1   Preparatory steps (prior to the start of the NAMA)

After the preparation of initial surveys and documents, which have been completed already, some further preparatory works have been identified and that are recommended for being conducted prior to the start of the NAMA. These studies have purposely not been considered as part of the NAMA scope. This is because the results of the studies are considered as important basic information for comprehensive planning of the technical intervention, as well as for assessing funding for the planned measures and interventions. The conduction of these studies will further reduce the risks for the successful NAMA implementation and operation and hence improve the

probability for accessing funding for the different elements of the NAMA. Therefore, these studies are considered outside the NAMA boundary.

Undertaking the following studies is recommended before the start of the NAMA.

0.1 Study on the appropriate level of the replacement fee

0.2 Environmental and Social Impact Assessment (ESIA) of the scrappage program

These two studies are briefly described below.

0.1 Study on the appropriate level of the replacement fee

The initial survey undertaken as part of this NAMA preparation was conducted obviously before the final NAMA design. As part of the survey, the people interviewed indicated the level of the replacement fee (subsidy) they would consider necessary to trigger the replacement of their old car. **It is important that this question be put to a larger sample and under empirically and statistically sound conditions**. As the appropriate incentives scheme for car owners and their willingness to pay are key elements in determining the success of the program, it is important to have the most reliable and most up to date information prior to the start of the NAMA. If the subsidy/incentive were to be set too low, only a few car owners would join the program. An overly high subsidy would increase the cost of the program unnecessarily, and the replacement fee would be challenged by the donors. The replacement fee has then to be selected on the basis of robust data. Further, a soundly selected replacement fee will reduce the risk of the failure of the program.

0.2 Environmental and Social Impact Assessment (ESIA) of the scrappage program

The ESIA for the technical interventions planned under the NAMA will focus on the intervention, i.e. the scrappage program. The ESIA will include the analysis and monitoring of the intended and unintended environmental and social impacts, both positive and negative, of the planned intervention under the NAMA. The specific contents of the ESIA should be defined by the GOL. Typical aspects that the ESIA will assess include environmental impacts (i.e. air pollution, noise), impacts on biodiversity and ecosystems and social impacts (i.e. public health, safety), impacts on stakeholders and gender related impacts. The ESIA should cover the impacts during the planning phase and the operational phase of the scrappage program.

As already described in Section 4.4, this ESIA will also be used to define and quantify the baseline values for assessing and evaluating the co-benefits (sustainability and transformational change) of the NAMA.

5.2 Interventions, Measures and Phased Approach

The NAMA has been designed in a phased approach to allow for a gradual improvement of the current situation and to develop the enabling environment for involving the private sector and for ensuring a mid- to long-term positive transformation of the road transport sector leading to GHG emission reductions and sustainable development. The actual NAMA proposal comprises two phases, with the first phase (2017-2020) focusing on the creation of an enabling environment for this NAMA through the establishment of the institutional and regulatory framework, awareness raising and marketing measures, and the operation of a pilot scrappage program. The second phase (2021-2030) focuses on the fully fledged implementation of the scrappage program, which will be accompanied by broad promotion of FEVs beyond the actual scrappage program under the NAMA. This phased approach is deemed to allow for a transition from international partner finance, which will support Phase 1, to domestic finance, which will be used in Phase 2.

The intervention under this NAMA is the:

Scrappage Program Implementation

To ensure that the intervention can be implemented and operated, a number of measures are considered that will help prepare for and support this intervention. These measures need to address the institutional side (establishing an institutional framework), improve awareness about the program itself, assess and shape the political and legal framework for determining an appropriate incentive scheme for the intervention, and enable capacity building for key stakeholders engaged in the activities under the NAMA.

The following chart shows the proposed Outcomes and Outputs of the NAMA. The items numbered with capital letters A to D, are the Outcomes, the subsequent items A.1 to D.2 are the Outputs, all of them leading to the Outcomes. All Outputs scheduled for Phase 1 of the NAMA are coloured in blue and all scheduled for NAMA Phase 2 are coloured in orange.

A. Institutional framework for the scrappage program is established	B. Scrappage program is prepared and incentive scheme defined	C. Promotion and awareness building	D. Scrappage program implementation
A.1 A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating	B.1 Eligibility criteria are assessed and defined & emission standards assessed and given legal force	C.1 Awareness creation for the scrappage program	D.1 Pilot scrappage program is implemented
A.2 NAMA Finance Facility is established and operating	B.2 Incentive scheme for the scrappage program is legally established and operating	C.2 Broad promotion of FEVs beyond the scrappage program	D.2 Extended scrappage program is implemented
	B.3 The upgrading of participating scrappage sites is ensured		Phase 1 / Phase 2

Figure 12: Outputs and their associated Activities leading to Outcomes

The full list of the proposed Outcomes, Outputs and detailed Activities per Output can found in Annex 1: NAMA Measures & Interventions and their Outputs, Activities and Inputs.

As the measures support the implementation of the interventions, to better understand the interrelation of measures and interventions, the following Figure 13 shows all measures and interventions and how the measures support the interventions in both phases of the NAMA.
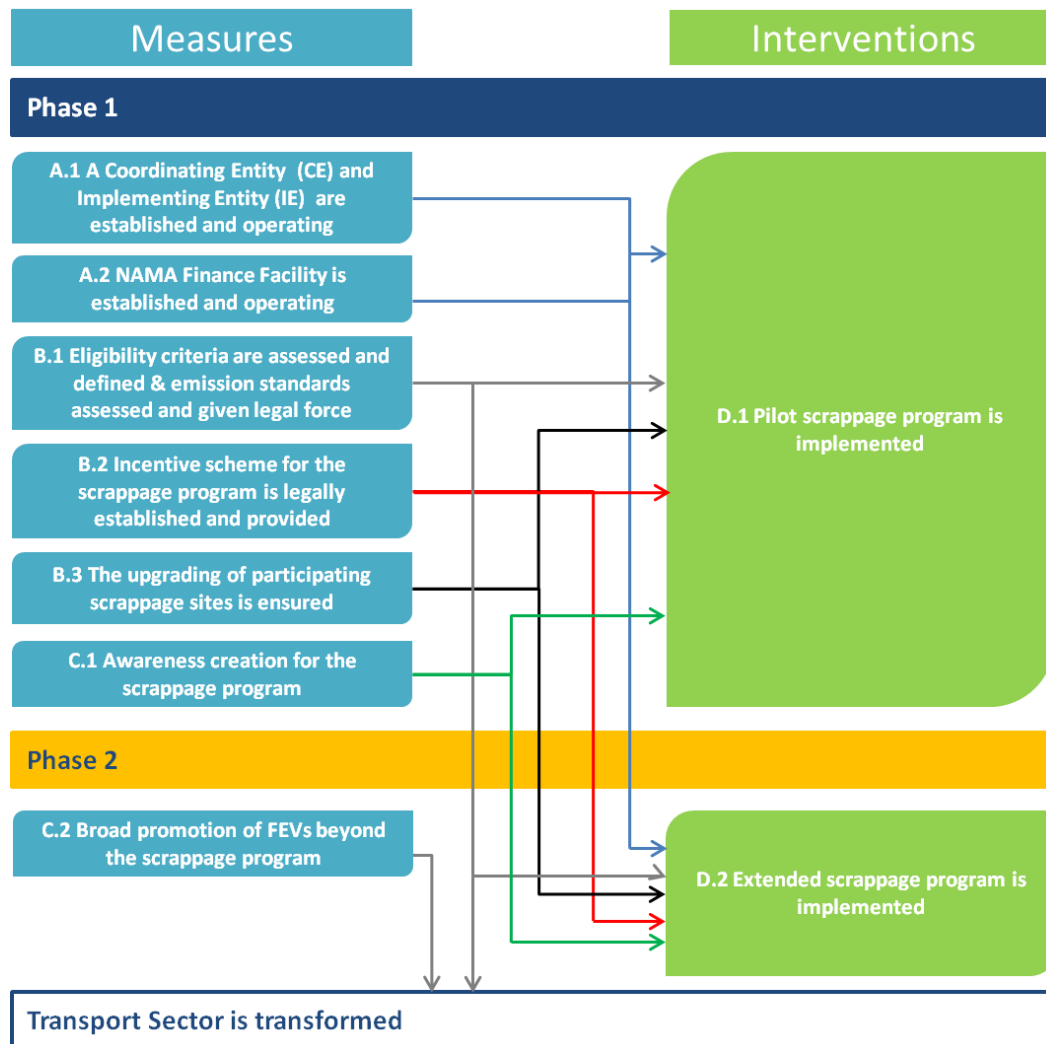
Figure 13: Measures leading to interventions

Measures to create the institutional framework (A.1 and A.2) are a key element of the enabling environment for the NAMA and for preparing the intervention. Measures to create a regulatory framework (B.1, B.2 and B.3) are also essential to the preparation of the intervention, but are tailored more specifically to its implementation. B.1 (eligibility criteria defined and emission standards implemented) is relevant to defining the conditions under which car owners can join the scrappage program. B.2 (incentive scheme is legally implemented and provided) gives regulatory backing to the issuing of the subsidies. B.3 (upgrade of participating scrappage sites is ensured) ensures that the scrappage sites meet minimum environmental and safety standards, which is very important to ensure sustainability of the scrappage program.

The awareness creation in preparation for the intervention, which is tackled in measure C.1 (Awareness creation for the scrappage program) is required to achieve the targeted share of car replacements.

Based on the successful implementation of the interventions D.1 (pilot scrappage program is implemented) and D.2 (extended scrappage program is implemented), measure C.2 (Broad promotion of FEVs beyond the scrappage program) will lead to the transformation of the entire sector via the implementation of emissions limits for all newly imported cars.

5.3 The Proposed NAMA Scope in Detail

Generally, car scrappage programs are broadly classified into two types: cash-for-scrappage and cash-for-replacement programs. In a cash-for-scrappage program, a participant submits his/her old car for scrappage, gets a monetary amount in return, and is not obliged to replace his/her old car with a new one. In a cash-for-replacement program, the participant is also required to buy a replacement car (with certain requirements imposed, such as on the fuel efficiency and/or the age of the new car) and may have access to additional financial incentives such as tax waivers or soft loans. The replacement fee is therefore a subsidy for the purchase of the new car, payable once the old car is scrapped.

It is suggested that the Lebanese program under the NAMA should be a cash-for-replacement program in order to have better control over the fuel efficiency of the replacement cars (FEVs) that program participants would purchase. Further, emission reductions can only be achieved if in exchange for the replacement fee, a more fuel efficient car will be replacing the scrapped car. Even though in principle a program participant may not want to buy a replacement car, the fraction of such participants is expected to be insignificant since the present public transport quality is low and is not a strong substitute for the car. If program participants are driving their old cars regularly, it can be assumed that they depend on the car for mobility.

Based on the Outcomes and Outputs presented above, the detailed Activities planned under the NAMA are described. We will outline how these Activities will lead to the Outputs and Outcomes of the NAMA and hence lead to GHG emission reductions, sustainable co-benefits and support for a transformation in the Lebanon's road transport sector. For a detailed overview of the NAMA Outcomes, Outputs and Activities in table format, please see   Annex 1: NAMA Measures & Interventions and their Outputs, Activities and Inputs.

5.3.1 Outcome, Outputs and Activities under NAMA Phase 1

NAMA Phase 1 (2017-2020) focuses on the establishment of an institutional framework, the preparatory work for the intervention, promotion and awareness raising, and lastly the implementation of the pilot scrappage program. The key technical intervention under Phase 1 is leading to GHG emission reductions is the implementation of the pilot scrappage program.

Outcome A. Institutional framework for the scrappage program is established

Output A.1 (Measure) - A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating

To be functional, the NAMA requires a good management and governance structure. At present, there is no single entity in Lebanon that can manage the proposed transport NAMA as the required functions are split across multiple public authorities. The main management and governance should be split between the two distinct roles of a Coordinating Entity (CE) and an Implementing Entity (IE).

The Activities planned to ensure the achievement of Output A.1 include:

- Activities A.1.1 and A.1.3 involve the formation of a CE and an IE, and ensure that these are staffed, have an office and are operating;

- Activities A.1.2 and A.1.4 ensure that the staff of the CE and the IE are trained in relevant issues like MRV and the facilitation of the sharing of know-how related to the NAMA within government institutions and the private sector.

For more information on the proposed institutional framework for the NAMA with roles and responsibilities, please see the descriptions in Chapter 8.

Output A.2 (Measure): NAMA Finance Facility (NFF) is established and operating

The NAMA will lead to a variety of financial flows. Donor money, probably from different sources, needs to be managed and disbursed, and the relevant national funding needs to be raised and managed. A "soft loan program", "tax exemptions", the "cash for replacement fee" and "capacity building grants" need to be managed.

The NAMA grant can be enacted into law (by Parliament) or as a decree (by the Council of Ministers). To manage this grant and to manage the other financial instruments of the NAMA, a NAMA Finance Facility (NFF) will be set up. The financial instruments under this NFF will be managed by a Financial Trustee overseen by a Board of Directors. In particular, this NFF will establish and operate the NAMA Loan Facility, the Grant Subsidy Scheme, and Capacity Development Grants in cooperation with participating international and national organizations.

The Activities planned to ensure the achievement of Output A.2 include the following:

- Activity A.2.1 to identify, establish, and operate the Financial Trustee to manage the financial instruments under the NFF, e.g. the NAMA Loan Facility and the Grant Subsidy Scheme. The activity is to identify the candidates to act as the Financial Trustee; to prepare an evaluation and selection process for deciding on the Financial Trustee; execute any procurement process which may be required to secure agreement with the Trustee; and to establish a mandate, operational by-laws and evaluation mechanisms for the NFF.

- Activity A.2.2 to establish and operate the NAMA Loan Facility and Grant Subsidy Scheme under the Financial Trustee. The core of this Activity is to determine the source(s) of capital for the financial instruments (grants, guarantees) needed for the Financial Trustee to offer grants and loans to the private sector. The Financial Trustee will need to structure the investment agreement(s) and establish by-laws with each agency/institution that is providing international or national support to the NAMA. In addition, the Trustee will design eligibility criteria and perform due diligence of the private sector businesses (Private Parties) seeking to secure grants. The Financial Trustee will also need to devise a risk mitigation strategy and evaluation mechanism for all types of financial instruments.

Outcome B. Scrappage program is prepared and incentive scheme defined

Output B.1 (Measure): Eligibility criteria are assessed and defined and emission standards assessed and given legal force

The most important first step in launching the scrappage program is the definition of eligibility criteria for participation in the program. Eligibility criteria may be defined along various dimensions, including age, operational condition of the car, RP versus WP cars, engine size or horsepower, etc. Further to these criteria, the emission limits for eligible replacement cars need to be defined and these limits need to be given legal force.

The Activities planned to ensure the achievement of Output B.1 include the following.

- B.1.1 Eligibility criteria of old cars to join the scrappage program are defined;

- B.1.2 Appropriate emission limits for the newly imported cars under the scrappage program are defined;

- B.1.3 The emission limit is legalized by enacting a law for FEVs joining the scrappage program.

Below is a description of each eligibility criterion and the assumptions adopted in this report for GHG reduction calculations, keeping in mind that these criteria may be revised during the capacity-building phase of the program.

Car year of manufacture. Individuals eligible to participate in the program should have an old non-FEV car for the program to have an impact on the baseline GHG emissions. Based on international experience with car scrappage programs, the age of the car being scrapped varies from 9-10 years (as in several European countries) to 20 years or more (as in Egypt). In the context of the present NAMA for Lebanon, and for the purpose of GHG reduction calculations in this NAMA document, a 15+ year old car is considered to be eligible for participation in the program on a rolling basis. This takes into account the fact that the largest number of cars in Lebanon are of that age and hence the impact of the proposed NAMA is potentially high. Hence, for cars to be scrapped in 2019, cars that are manufactured in 2004 or before are eligible to be scrapped as part of this program, and so on. The scrappage program will probably operate on a first come and first served basis.

Operational condition of the car. Another eligibility requirement is that the car should be in an acceptable operating condition at the time of scrappage. Otherwise, the car would probably soon go out of service even without the program, and the reductions in emissions due to scrappage and replacement would have occurred anyway and would be wrongly attributed to the program. Since it may be administratively complicated to do a proper vehicle inspection for every car submitted for scrappage, the car may be considered to be in an acceptable operating condition, if it had passed the required annual vehicle inspection test (Mécanique) within the last 12 months before application to the program.

Red vs. white plate cars. Both RP and WP plate cars will be eligible to participate in the program but their participation will be phased, with Phase 1 scrappage (the pilot program) targeting only RP cars and Phase 2 scrappage extending to WP cars as well.

Engine size or horsepower. Cars with larger engine size and/or higher horsepower arguably produce more emissions per kilometer than equivalent smaller cars and should accordingly be prioritized for scrappage to maximize the reduction in GHG emissions. Such prioritization may be however too complex to administer and is not considered in the analysis presented in this NAMA document.

Emission limit. One precondition for the operation of the scrappage program is the definition of an emission limit for the newly imported FEVs, which will be one more eligibility criterion for joining the scrappage program. These emission limits should only focus on newly imported cars (keeping in mind an eventual national target for all imported cars in Phase 2). This is necessary to achieve a significant reduction in GHG emissions from the replacement of old, polluting cars. The exact value of this emission limit will need to be set based on a number of factors, including the quality of fuel imported to Lebanon, recent trends in new car imports, and consumers' preferences among FEVs. The emission limits for imported cars are not yet defined. It could be based on emission limits in other countries (e.g. many in Europe), while taking into account the quality of fuel (considered low quality) in Lebanon. The suggested emission limits for participation in the scrappage program need to be enacted by law and can form the basis for the future roll-out of emission limits for all imported cars. After the definition of the emission limits, a law to confirm the selected values has to be prepared.

Output - B.2 (Measure): Incentive scheme for the scrappage program is legally established and operating.

The interventions in Phase 1 and Phase 2 will require the provision of incentives to car owners through the following measures: cash-for-replacement, soft loans for the car owners to purchase the new FEVs, and tax exemptions. The implementation of these incentive schemes will require prior legal action. Based on the study concerning the replacement fee, and the legal situation described below, the following Activities leading to the incorporation of the scrappage program into the laws and decrees need to be undertaken.

The Activities planned to ensure the achievement of Output B.2 include the following.

- B.2.1 Legal basis for replacement fees is established and financing of fees is provided;

- B.2.2 Legal basis for soft loans is established and financing of loans is provided;

- B.2.3 Legal basis for tax exemptions is established and exemptions are provided;

- B.2.4 Framework for advertisements on taxis is established and fee is provided;

- B.2.5 Legal and political support for assessing the legal basis for fuel tax increase is provided;

- B.2.6 Implementation of legal basis for fuel tax increase.

The financial incentives to the participants in the scrappage program need to be legally implemented. Further, the increase in the fuel tax, from which the costs of the implementation of the scrappage program in Phase 2 will be covered (see Chapter 7), needs to be prepared from a legal point of view. A framework for advertising the scrappage program needs also to be established. The incentives offered for the scrappage of RP and WP cars and the eligibility to receive these incentives by WP car owners are related to the legal structure described in Section 3.1.5.

Taxi drivers will be able to generate additional income by putting advertisements about the scrappage program on their car. This will be an important step for marketing the scrappage program.

To raise domestic finance, a variety of mechanisms have been considered. In discussion with the MOE and the MOF, a fuel tax seems to be the most promising mechanism. The increase in fuel tax does not require any decree or a law but can be implemented by a decision, which can be simply issued by the MOE and the MOF. An increase in the annual inspection fee may also be possible, but will gather less revenue for the GOL and is for the moment not under consideration.

Output - B.3 (Measure): The upgrading of participating scrappage sites is ensured

The environmental sustainability of the scrappage program will depend not only on GHG emission reductions from replacing cars but also on the environmental impacts of the car scrappage facilities that will be involved in the program. Based on site visits to two large scrappage facilities and interviews with their owners, it was inferred that the majority of scrappage facilities in Lebanon do not necessarily follow sustainable operating practices and almost none is licensed by the Ministry of Industry (MOI). The minimum environmental standards will need to be defined to cover standards related to the licensing of the scrappage facilities by the MOI (so that the MOE can include environmental conditions, the equipment and storage areas available at the scrappage site, and recycling practices (for oil and spare parts, etc.) as part of the permitting procedure). The scrappage facilities selected for the program will have to satisfy these standards. Generally, there is a tripling of the number of scrapped cars expected. Existing scrappage facilities have already shown interest in getting nominated for the scrappage program, as they expect it to generate additional business. Output B.3 encompasses the definition of minimum environmental standards for the designated car scrappage facilities.

The Activities planned to ensure the achievement of Output B.3 include the following.

- B.3.1 Environmental minimum standards for the designated scrappage sites are defined;

- B.3.2 Eligible scrappage sites are identified and nominated.

The assessment and selection of scrappage facilities which are eligible for the scrappage program will be one of the first tasks of the CE and the IE.

Outcome C. Promotion and awareness building

Output - C.1 (Measure): Awareness creation for the scrappage program.

To make the scrappage program work, the stakeholders representing the distribution channels for newly imported FEVs have to be made aware of the program. Resources to inform and to build awareness among car dealers of the scrappage program will be developed. Afterwards, car dealers will be informed and trained on the scrappage program, so that they can advertise the scrappage program by making use of the information and material provided themselves, using their existing means of advertising efficiently. In addition to that, the scrappage program will be marketed through a countrywide campaign. Marketing resources to promote the scrappage program will be developed, and the marketing campaign will be launched and reach out to car owners in the entire country.

The Activities planned to ensure the achievement of Output C.1 include the following.

- C.1.1 Educational and awareness-building resources for car dealers are developed and car dealers are enabled to support the program;

- C.1.2 Marketing resources to promote the scrappage program are developed and marketing campaign is launched.

Outcome D. Scrappage program implementation

Output - D.1 (Intervention): Pilot scrappage program is implemented.

Under Phase 1 of this NAMA, a pilot program will be implemented first. This pilot program will tackle the old and low efficiency *red plate* cars. The pilot scrappage program will start as soon as the institutional and regulatory frameworks exist. These steps shall be completed by the end of 2018 and hence the pilot scrappage program will run from 2019 till 2020.

The Activity planned to ensure the achievement of Output D.1 is the following.

- D.1.1 Low-efficiency red plate cars are scrapped and FEVs are purchased under the pilot scrappage program.

The cash for the replacement fee is the monetary amount given to a program participant for scrapping his/her car. Since the program involves the replacement of the old car with a new one, this monetary amount is tied to the purchase of a new car and hence would represent the down-payment on the new car. The value of this monetary amount should in general be commensurate with the average market value of the car being replaced, but will also depend on the other financial incentives offered and on the budget available for the program. Low cash-for-scrappage amounts may not be appealing to potential program participants and may result in low program participation while high amounts may lead to rapid depletion of the program budget without a significant impact. A value in the range of USD 2,000-4,000 is envisaged for the car scrappage program in Lebanon.

Market surveys were conducted with potential program participants (those owning WP or RP cars with year of manufacture before 2000) in the course of preparing the design of this NAMA, in which the value of these incentives was varied and the willingness of the potential participants to participate in the car scrappage program was measured. It was shown that under the most favorable scenario presented (cash-for-replacement value of USD3000-USD4000; 0-3% interest rate over five years; exemptions from custom duties (for red plates), registration, and the first Mé*canique* fee; and monthly revenue from advertisements (for red plates) of about USD100-USD150), 80% of RP car owners and 56% of WP car owners indicated that they would participate in the car scrappage program (Ecodit, 2015).

For the determination of an appropriate level for the replacement fee, a survey on the "willingness to pay" for new FEV cars should be undertaken before the start of the NAMA (see Section 5.1). If it turns out during the pilot scrappage program, that the level of the replacement fee should be adjusted, this could be done at the beginning of Phase 2.

The number of cars replaced during Phase 1 is summarized in the table below.

Phase 1 - replaced cars	
Red plates replaced 2019-2020	Red plates replaced annually
4,360	2,180

Table 19: Numbers of cars replaced in Phase 1

5.3.2 Outcome, Outputs and Activities under NAMA Phase 2

The NAMA Phase 2 (2021-2030) builds directly on the achievements of the NAMA Phase 1. The technical intervention in Phase 2 is the implementation and operation of the extended scrappage program. The extended scrappage program will lead to significant GHG emission reductions under Phase 2. In addition, the broad promotion of FEVs and the introduction of emission limits for newly imported cars will help to transform the road transport sector.

Outcome C. Promotion and awareness building

Output - C.2 (Measure): Broad promotion of FEVs beyond the scrappage program.

This Output builds on the experience gathered during the implementation and operation of the scrappage program. It is suggested that the measures like emissions limits, which have been applied in the scrappage program under the NAMA, are extended to other newly imported cars into Lebanon. As an example, an average national emission target or a "bonus-malus" system for all imported cars (where cars that emit more than a defined limit of CO_2/km would pay an environmental tax commensurate with their emissions) could be implemented. No concrete emission limit for this Activity has yet been discussed. Nevertheless, it is clear that such a limit will be similar to the ones applied in countries with experience with such systems, as many European countries have. Such a measure will set Lebanon on a transformational path towards a sustainable private transport sector that not only is concerned with the pollution generated from old cars but also penalizes new cars that are high consumers of fuel and/or are considered more polluting.

The Activities planned to ensure the achievement of Output C.2 include the following.

- C.2.1 Appropriate emission limits for newly imported cars are defined on a national level;

- C.2.2 Emission limits for newly imported cars are legally established;

- C.2.3 Support is provided to design financial incentives for the purchase of FEVs on a national level.

National financial incentives beyond the scrappage program may build on the experience of Phase 1 and are assumed to be established in Phase 2. Such mechanisms may include a vehicle tax which incentivizes FEVs and discourages the purchase of more polluting cars and/or an increase of import taxes for vehicles which have higher emissions than a certain pre-defined limit, which would have the effect of encouraging the purchase of FEVs.

Outcome D. Scrappage program implementation

<u>Output - D.2 (Intervention): Extended scrappage program is implemented</u>

After the successful implementation of the pilot scrappage program in Phase 1, slight adjustments on emission limits, replacement fees and other incentives may need to be made, based on the lessons learned from the pilot scrappage program. The full scale scrappage program will be implemented starting in 2021 and continuing till 2030.

The actual roll-out of the scrappage program will come under this Output, whereby RP and WP cars will be replaced and the replaced cars will be scrapped.

The Activities planned to ensure the achievement of Output D.2 include the following.

- D.2.1 Low-efficiency red plate cars are scrapped and FEVs are purchased under the extended scrappage program.

- D.2.2 Low-efficiency white plate cars are scrapped and FEVs are purchased under the extended scrappage program.

As detailed in Section 7.2.5, with the funding and revenue sources available to the GOL, the NAMA Phase 2 is financially viable for the total replacement by 2030 of 100% of vehicles over 15 years old. The projection of the number of vehicles takes into account the increase in the stock of old vehicles over time, and also the natural scrappage rate for such vehicles (see Section 4.2).

As the replacement rate of 100% is an ambitious goal, replacement rates of 80% and 50% of Lebanon's car fleet up to 2030 are presented in the emission reduction calculation and the financial modeling as well. These correspond to the following replacement rates.

Phase 2 - replaced cars	Red plates replaced 2021–2030	Red plates replaced annually	White plates replaced 2021-2030	White plates replaced annually
100% replacement	29,070	2,471	1,198,930	119,893
80% replacement	22,330	1,797	903,550	90,355
50% replacement	11,850	749	440,370	44,037

Table 20: Number of cars replaced during Phase 2 of the NAMA

6 Capacity Building

As outlined in the previous chapter, the NAMA's scope includes a number of Activities that prepare for and support the successful implementation of the NAMA interventions. There exist a number of barriers in the road transport sector in Lebanon to implementing the car scrappage program that currently hinder concrete interventions from being implemented. The NAMA includes a variety of capacity building components that are embedded throughout the full scope of the NAMA. The NAMA includes a number of stakeholders and different groups of stakeholders (i.e. government agencies, car owners, car dealers, commercial banks) that will be involved in the different stages of the NAMA. The capacity building components planned under the NAMA will help to ensure that the stakeholders are well trained and prepared for the Activities and that an adequate information base exists for stakeholders to engage in the planned Activities. The capacity building for the NAMA can be differentiated into the following general components:

- Capacity building for local stakeholders conducted by international consultants (including training and workshops);

- Capacity building for local stakeholders conducted by local consultants (including training and workshops);

- Technical and legal support to improve the information base and know-how;

- Facilitating coordination and exchange among stakeholder groups through working group meetings;

- Awareness creation and marketing activities.

As capacity building is an important and integral part of the NAMA log-frame whereby Activities and Outputs lead to the Outcomes of the NAMA, this chapter describes the different capacity building components and how these components are embedded in the overall scope pf the NAMA.

In Phase 1 capacity building focuses on providing strategic, policy, institutional and regulatory support to produce improved regulations in the road transport sector, establish the institutional framework for the NAMA, assess and define an appropriate incentive scheme for car owners and car dealers to participate in the car replacement program and to provide awareness creation activities to key stakeholders involved in the road transport sector. Capacity building in Phase 2 of the NAMA focuses on the broad national promotion of FEVs and in providing knowledge transfer to the key stakeholders participating in the expanded roll-out of the scrappage program under the NAMA Phase 2.

The following sections will describe those activities that involve capacity building components and how these activities will help to achieve the Outputs and Outcomes of the NAMA. For a detailed overview of Outcomes, Outputs and Activities, please refer to Chapter 5 and Annex 1: NAMA Measures & Interventions and their Outputs, Activities and Inputs. For each phase and each Output and Outcome, the relevant capacity building components are described below. A summary of all capacity building components is provided for each phase at the end of the sub-section (Phase 1 and Phase 2).

6.1 Capacity Building under NAMA Phase 1

The majority of capacity building is considered under Phase 1 of the NAMA. Due to very specific gaps in the road transport sector in Lebanon at present, these capacity building activities in Phase 1 are designed to help establish the foundation and create the enabling environment for implementing the car scrappage program. In Phase 1, capacity building consists of providing policy, institutional and regulatory support to enable regulations to be improved in the transport sector related to emission limits on newly imported cars, set the eligibility criteria for program

participation, establish and operate the NAMA CE and the IE, provide training to key stakeholders involved in the NAMA (CE, IE and NFF staff; operators of car scrappage facilities; car dealers), establish initial MRV systems, and raise public awareness about the program and its benefits.

In the following the individual capacity components related to the Outcomes and Outputs are described.

Capacity Building for Outcome A: "Institutional framework for the scrappage program is established"

A.1.2 The CE is trained on relevant issues related to their role and responsibility under the NAMA

The focus is to help establish and operate the CE of the NAMA. The CE is supposed to coordinate and mediate between the Government and the private sector and facilitate knowledge transfer between different stakeholders. Currently this coordination and exchange of information and know-how between different actors is missing or inadequate. The capacity building component will include training the staff of the CE about areas that the CE is responsible for and that are most relevant for the operation and management of the NAMA.

A.1.4 The IE is trained on relevant issues related to their role and responsibility under the NAMA

This capacity building component focuses on providing support to help establish and operate the IE of the NAMA. An IE does not exist yet and it is currently anticipated that TTVMA, a unit within the MOIM, will take on the role of the IE. This capacity building component is considered as an important precondition to installing an IE that will be capable of fulfilling the tasks required under the NAMA. The capacity building provided will consist mainly of training staff of the IE about those areas that the IE is responsible for.

A.2.1 An agreement with the Financial Trustee (FT) is established

The capacity building will help identify the appropriate institution for the role of the NFF for the NAMA, support establishment of the facility, train staff and support in fulfilling the required tasks under the NAMA. The focus will be on financial incentives, management of finance flows, MRV of finance aspects of the NAMA and the allocation of finance to the NAMA Activities. The capacity building components will include local and international advisory (including support to the staff in carrying out tasks) and two (2) training programs for the staff of the NFF.

Outcome A under Phase 1 requires the following capacity building components.

NAMA Output	NAMA Activity	Capacity Development components
A.1 A Coordinating Entity (CE) and Implementing Entity (IE) are established and operating	A.1.2 The CE is trained on relevant issues related to their roles and responsibilities under the NAMA	✓ One International Technical Adviser ✓ One Local Technical Adviser ✓ Facilitation of internal working group meetings (2) ✓ Two training programmes for CE staff
	A.1.4 The IE is trained on relevant issues related to their role and responsibility under the NAMA	✓ One International Technical Adviser ✓ One Local Technical Adviser ✓ Facilitation of internal working group meetings (2) ✓ Two training programmes for IE staff
A.2 NAMA Finance Facility is established and	A.2.1 An Agreement with the Financial Trustee (FT)	✓ One International Financial Adviser ✓ One Local Financial Adviser

operating	is established	✓ Two training programmes for Finance Facility staff

Table 21: Capacity Building under NAMA Phase 1 (Outcome A)

Capacity Building for Outcome B: "Scrappage program is prepared and incentive scheme defined"

B.1.1 Eligibility criteria for old cars to join the scrappage program are defined

The capacity building under this Activity consists of country specific assessments about the car fleet and knowledge transfer from other countries' experiences with car scrappage programs to set suitable eligibility criteria for program participation in Lebanon. Setting the eligibility criteria is a critical component of the scrappage program as it determines the size of the market for car scrappage. It is thus to be considered in the context of the breakdown of the car fleet in Lebanon by age and other important criteria, which data are to be obtained from relevant authorities/entities (TTVMA, car dealers) and transferred to the CE/MOE for setting the eligibility criteria.

B.1.2 Appropriate meaningful emission limits for the newly imported cars under the scrappage program are defined

Currently, there is no emission limit set on cars imported into Lebanon. The only condition imposed is that imported cars may not be older than eight years. However, the draft law on the Protection of Air Quality (the CAA) that was ratified by the COM in 2012 (Decision No. 34) but is yet to be approved by the GOL defines emission limits for stationary and mobile sources. The capacity building component under Activity B.1.2 consists of providing further support to the MOE in setting an emission limit specifically for replaced cars in the scrappage program. This will involve further information assessment about the current car fleet in Lebanon as well as knowledge transfer from other countries' experiences with car scrappage programs that have set emission limits on replaced cars. It will also involve a market study to assess popular models of FEVs currently imported to Lebanon (in coordination with the Association of Car Importers) as well as the preferences of potential program participants (e.g. the preference of taxi drivers for particular brands/models of FEVs) to help define a realistic emission limit, while considering also the quality of fuel in Lebanon.

B.1.3 The emission limit is legalized by enacting a law for FEVs joining the scrappage program

After completing the capacity-building component B.1.2, the capacity building activity B.1.3 will provide additional capacity building support to the key institutions (mainly the MOE) that are in charge of developing the law on emission limits for the FEVs under the scrappage program. The clear target is to establish the legal emission limit.

B.2.1 The legal basis for replacement fees is established and financing of fees is provided

As an important component of the incentive scheme and as the central financing mechanism of the car replacement program, the replacement fee for the purchase of FEVs under the replacement program would need to be given a legal basis. Capacity building for this Activity includes the institutional support provided to the MOF, the NFF and the CE (through the necessary financial analysis) to set the level of the replacement fee and draft the necessary law. This replacement fee would be complementary to any financial disincentives/taxation scheme imposed on non-FEV purchases.

B.2.2 The legal basis for soft loans is established and financing of loans is provided

As part of the incentive scheme, financial incentives favoring the purchase of FEVs under the replacement program would need to be legally established. One of these incentives is soft loans provided to car owners. Capacity building for this activity includes the institutional support provided to the MOF and the NFF (through the necessary financial analysis) to set the appropriate levels of these incentives and develop and provide the legal basis for the soft loans.

B.2.3 The legal basis for tax exemptions is established and the exemptions are provided

As part of the incentive scheme, financial incentives favoring the purchase of FEVs under the replacement program would need to be legally established. One of these incentives is tax exemptions provided to car owners. Capacity building for this Activity includes the institutional support provided to the MOF, the NFF and the CE (through the necessary financial analysis) to set the appropriate levels of these incentives and develop the legal basis for development of tax exemptions. These tax exemptions would be complementary to any financial disincentives/taxation scheme imposed on non-FEV purchases.

B.2.4 The framework for advertisements on taxis is established and financing of the fee is provided

This capacity building component provides support in developing the framework concept for advertisements on taxis. This will involve the initial assessment of the effectiveness of potential advertisements, where the advertisements are placed and how the incentive scheme for the taxi owners and the fee structure for advertisements should be designed and established. Furthermore, this will include the interaction with companies potentially willing to advertise.

B.2.5 Legal and political support for assessing the legal basis for the fuel tax increase is provided

This capacity building component involves providing support for the relevant ministries (the MOE and the MOF) in determining an appropriate level of increase in fuel tax. This requires input from financial experts to determine the level of the increase in tax that would ensure a reasonable domestic revenue stream for the NAMA. Capacity building also involves drafting a proposal by the MOF and MOE requesting and justifying this increase in fuel tax, to be finally approved by the Ministry of Energy and Water (without requiring a law), as well as creating a mechanism at the MOF to earmark the revenues generated from the tax increase for supporting the transport NAMA. A mechanism currently exists whereby an account can be opened at the BDL by the MOF for another Ministry for special purposes. Such a mechanism may be utilized for opening a transport NAMA account where international and national NAMA funds (including the revenues from the increase in fuel tax) would be deposited.

B.2.6 Implementation of legal basis for fuel tax increase

Based on the information and knowledge obtained and capacities built under Activity B.2.5, the capacity building for B.2.6 will focus on providing local legal advisory support to the Ministries in charge of establishing the legal basis for a fuel tax increase.

B.3.1 Environmental minimum standards for the designated scrappage sites are defined

This capacity building Activity includes setting standards by the MOE, in consultation with technical advisers. The focus will be on setting the minimum environmental standards for the operation of these facilities. Knowledge transfer from international car scrappage facilities that abide by environmental standards is necessary since such practices are rare/limited in Lebanon. Capacity building will therefore include the involvement of international experts through site visits to Lebanon and/or workshops (or vice versa, through visits of Lebanese stakeholders to international car scrappage facilities).

B.3.2 Eligible scrappage sites are identified and nominated

A list of scrappage sites that are upgraded to satisfy the minimum environmental standards defined under Activity B.3.1 and which are selected to scrap eligible cars under the NAMA will be available. Staff members working at these sites will receive training to ensure that they operate according to the defined standards, e.g. by observing sustainable scrappage practices elsewhere.

Outcome B under Phase 1 requires the following capacity building components.

NAMA Output	NAMA Activity	Capacity Development components
B.1 Eligibility criteria are assessed and defined & emission standards assessed and given legal force	B.1.1 Eligibility criteria of old cars to join the scrappage program are defined	✓ One International Technical Adviser ✓ One Local Technical Adviser ✓ One Assessment Study (including survey) ✓ Facilitation of internal working group meetings (3)
	B.1.2 Appropriate meaningful emission limits for the newly imported cars under the scrappage program are defined	✓ One International Technical Adviser ✓ Two Local Advisers (Technical/Legal) ✓ One Market Study ✓ Facilitation of internal working group meetings (3)
	B.1.3 Emission limit is legalized by enacting a law for FEV joining the scrappage program	✓ One International Legal Adviser ✓ One Local Legal Adviser ✓ Facilitation of internal working group meetings (2)
B.2 Incentive scheme for the scrappage program is legally established and operating	B.2.1 Legal basis for replacement fees is established and financing of fees is provided	✓ One International Adviser (Financial) ✓ Two Local Advisers (Financial/Legal) ✓ One Market Survey ✓ Facilitation of internal working group meetings (2)
	B.2.2 Legal basis for soft loans is established and financing of loans is provided	✓ One International Adviser (Financial) ✓ Two Local Advisers (Financial/Legal) ✓ Facilitation of internal working group meetings (2)
	B.2.3 Legal basis for tax exemptions is established and the exemptions are provided	✓ One International Adviser (Financial) ✓ Two Local Advisers (Financial/Legal) ✓ Facilitation of internal working group meetings (2)
	B.2.4 Framework for advertisements on taxis is established and financing of the fee is provided	✓ One International Adviser (Technical) ✓ One Local Adviser (Technical) ✓ One Market Survey ✓ Facilitation of internal working group meetings (2)
	B.2.5 Legal and political support for assessing the legal basis for the fuel tax	✓ One International Adviser (Financial/Legal) ✓ Two Local Advisers (Financial/Legal)

	increase is provided	✓ One Assessment Study ✓ Facilitation of internal working group meetings (3)
	B.2.6 Implementation of legal basis for fuel tax increase	✓ One Local Adviser (Legal) ✓ Facilitation of internal working group meetings (3)
B.3 The upgrading of participating scrappage sites is ensured	B.3.1 Environmental minimum standards for the designated scrappage sites are defined	✓ One International Adviser (Technical) ✓ One Local Adviser (Technical) ✓ Facilitation of internal working group meetings (3)
	B.3.2 Eligible scrappage sites are identified and nominated	✓ One Local Adviser (Technical) ✓ Facilitation of internal working group meetings (1) ✓ Two (2) training programs

Table 22: Capacity Building under NAMA Phase 1 (Outcome B)

Capacity Building for Outcome C: "Promotion and awareness building"

C.1.1 Educational and awareness-building resources for car dealers are developed and car dealers will be equipped to support the program

This capacity building component consists of developing educational resources for car dealers so that they are fully informed about all the aspects of the program. This will allow them to convey the right information to program participants looking for replacement of cars (e.g. the type of cars that are eligible for replacement based on the emission rate, age or efficiency of the car) and to coordinate with the IE on different parts of the scrappage process (i.e. de-registration and registration on behalf of the program applicant if desired, conveying information about the replacement car emission limit to the TTVMA, etc.). The training of car dealers can be coordinated in collaboration with the Association of Car Importers in Lebanon.

C.1.2 Marketing resources to promote the scrappage program are developed and a marketing campaign launched

This capacity building Activity aims at disseminating information about the car scrappage program and increasing the awareness of Lebanese citizens about the benefits of FEVs at both financial and environmental levels. Even though recent trends in car registration figures in Lebanon indicate a shift in consumer preferences towards smaller cars, many still prefer larger size cars that are less fuel efficient. Moreover, market surveys conducted as part of the pre-assessment for the NAMA revealed that some of the lack of interest in participating in the program results from a lack of interest in fuel efficiency or in FEVs in general, or from a preference for larger size cars. Marketing and awareness campaigns will help mitigate concerns about the program and further highlight the benefits of FEVs. Furthermore, the promotion efforts will also include informing car dealers and car owners about the incentive scheme designed and developed for the scrappage program. This may help convince car owners and car dealers of the benefits of the NAMA and to participate in the scrappage program.

Support will be provided to develop the content and structure for appropriate campaigning (e.g. posters, brochures/flyers, radio, TV). The IE should be in charge of coordinating advertising efforts to promote the car scrappage program.

The Outcome C under Phase 1 requires the following capacity building components.

NAMA Output	NAMA Activity	Capacity Development components
C.1 Awareness creation for the scrappage program	C.1.1 Educational and awareness-building resources for car dealers are developed and car dealers will be equipped to support the program	✓ One International Technical Adviser ✓ One Local Technical Adviser ✓ Support for development of awareness creation material ✓ Three (3) training programmes for car dealers
	C.1.2 Marketing resources to promote the scrappage program are developed and a marketing campaign launched	✓ One International Technical Adviser ✓ One Local Technical Adviser ✓ Facilitation of internal working group meetings (2) ✓ Support for Marketing Strategy & Material

Table 23: Capacity Building under NAMA Phase 1 (Outcome C)

6.2 Capacity Building under NAMA Phase 2

In Phase 2, the capacity building Activities will enable the scaling up of the emission limit (or an equivalent environmental tax) to a national level, the support of the expanded car scrappage and replacement program, an extensive marketing and awareness campaign related to the program, and an extended MRV operations and management scheme.

In the following the individual capacity building components related to the outcomes and outputs are described.

Capacity Building for Outcome C: "Promotion and awareness building"

C.2.1 Appropriate emission limits for newly imported cars are defined on a national level

Capacity building for this activity is similar to that described for Activity C.1.2 but its implications extend to all imported cars and is not limited to the FEVs participating in the replacement program under the NAMA. Capacity building may also involve knowledge transfer and technical support for the MOE and MOF in determining a suitable environmental taxation scheme (Bonus-Malus system) through a review of international experiences. This capacity building component is an essential step towards transformational change in the road transport sector beyond the scope of the NAMA.

C.2.2 Emission limits for newly imported cars are legally established

Capacity building for this activity builds on Activity B.1.3 where the emission limits for FEVs taking part in the scrappage program under the NAMA were targeted and on Activity C.2.1 where appropriate emission limits were assessed and defined. The Activity C.2.2 has the objective of supporting the legal establishment of emission limits for all imported cars and is not limited to the FEVs participating in the replacement program under the NAMA. This capacity building component is an essential step towards transformational change in the road transport sector beyond the scope of the NAMA.

C.2.3 Support is provided to design financial incentives for the purchase of FEVs on a national level

This Activity builds on the incentive scheme developed for the car replacement program under the NAMA (Output B.2), but expands its scope to define potential incentives for the purchase of FEVs on a national level (beyond the scope of the NAMA).

The Outcome C under Phase 2 requires the following capacity building components.

NAMA Output	NAMA Activity	Capacity Development components
C.2 Broad promotion of FEVs beyond the scrappage program	C.2.1 Appropriate emission limits for newly imported cars are defined on a national level	✓ Two International Advisers (Technical/Legal) ✓ Two Local Advisers (Technical/Legal) ✓ Facilitation of internal working group meetings (2) ✓ One training program
	C.2.2 Emission limits for newly imported cars are legally established	✓ One International Adviser (Legal) ✓ One Local Adviser (Legal) ✓ Facilitation of internal working group meetings (3)
	C.2.3 Support is provided to design financial incentives for the purchase of FEVs on a national level	✓ One International Adviser (Technical/Financial) ✓ Two Local Advisers (Technical/Financial) ✓ Facilitation of internal working group meetings (3) ✓ One training program

Table 24: Capacity Building under NAMA Phase 2 (Outcome C)

7   NAMA Financial Requirements and Mechanisms

This chapter describes the financial requirements and sources for the NAMA based on the measures and interventions discussed in Chapter 5 and Capacity Building discussed in Chapter 6, as well as the phased NAMA approach discussed in Chapter 8. Effective financial mechanisms are needed in order to ensure the long-term success and sustainability of the transport sector in Lebanon. The financial participation of both national and international stakeholders will therefore be detailed as well as the specific financial instruments used to achieve the NAMA objectives.

7.1   Assessment of Financial Needs for the NAMA

The phased approach for the transport sector relies on two distinct phases with different approaches to financing their various measures, interventions and capacity building. The purpose of this phased NAMA approach is, first, under Phase 1 (2017-2020), to build institutions to manage the NAMA, implement the first intervention (the pilot scrappage program) and take measures laying the foundation for Phase 2. The pilot scrappage program will also serve to fine tune the incentives provided to car owners. Then, under Phase 2 (2021-2030), scrappage will be extended to allow for WP vehicle participation and achieve the second intervention.

When determining the specific costs of NAMA Activities, both in terms of investment and operation, a cash flow model is used on the basis of the Activities, Outputs and Outcomes framework detailed in Chapter 5. The perspective of the national Government (and the population in affected areas) is taken, as a means of addressing the question of the precise national costs and international support required. Where appropriate, the viewpoint of the private sector entities implementing the interventions is also considered.

In Table 25, an overview of the NAMA cost assessment for the total replacement of 100% red and white plate vehicles over 15 years old by 2030 is presented (see Section 7.1.2). While the primary inputs into the assessment as well as the distinction between and specificities of domestic and international finance are described in the following sections, the table below is an overall picture of expected NAMA costs. For Outcomes A through D, the total cost per output is presented over the NAMA timeframe (2017-2030) in 2016 U.S. Dollars (USD). For the targeted replacement rate of 100% by 2030, the total cost of the NAMA, including those costs incurred by the National Government of Lebanon, the domestic private sector and International Support Partners, amounts to USD 17,975 million. It can be noted that the largest investment will be borne by private sector car owners, who will be purchasing the new FEVs (Outcome D), as is detailed in Section 7.2.3.

		Total	Domestic	International
Outcome A	**Institutional framework for the scrappage program is established**			
Output A.1	A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating	5,212,000	5,060,000	152,000
Output A.2	NAMA Finance Facility is established and operating	135,000	65,000	70,000
TOTAL - Cash Flow: Outcome A		**5,347,000**	**5,125,000**	**222,000**
Outcome B	**Scrappage program is prepared and incentive scheme defined**			
Output B.1	Eligibility criteria are assessed and defined & emission standards assessed and given legal force	429,000	90,000	339,000
Output B.2	Incentive scheme for the scrappage program is legally established and operating	3,660,223,000	3,646,709,000	13,514,000
Output B.3	The upgrading of participating scrappage sites is ensured	115,000	-	115,000
TOTAL - Cash Flow: Outcome B		**3,660,767,000**	**3,646,799,000**	**13,968,000**
Outcome C	**Promotion and awareness building**			
Output C.1	Awareness creation for the scrappage program	428,000	-	428,000
Output C.2	Broad promotion of FEVs beyond the scrappage program	636,000	90,000	546,000
TOTAL - Cash Flow: Outcome C		**1,064,000**	**90,000**	**974,000**
Outcome D	**Scrappage program implementation**			
Output D.1	Pilot scrappage program is implemented	39,843,000	39,843,000	-
Output D.2	Extended scrappage program is implemented	14,267,949,000	14,267,949,000	-
TOTAL - Cash Flow: Outcome D		**14,307,792,000**	**14,307,792,000**	**-**
TOTAL - Cash Flow		**17,974,970,000**	**17,959,806,000**	**15,164,000**

Table 25: Summary cost assessment based on NAMA Outcomes and Outputs (USD)

A more detailed table with all costs per Activity under the NAMA is presented in Annex 3: Detailed NAMA Cost Assessment. The different cost components and the distinction between domestic and international financing will be discussed in the following sections.

7.1.1 Capacity Building

Cost estimates for Capacity Building entities, and consultancy in this NAMA are developed based on current domestic and international labor costs, and specific costs for various office, workshop, meeting, advertising and materials costs. In most cases, an initial setup fee – consisting of investment capital or capacity building – is necessary, followed by recurring (or operating) expenses. The latter typically begins once the initial setup is complete. All estimated costs do not account for cost of taxes and inflation, and are subject to change due to exchange rates.

As was detailed in Chapter 5, the individual measures and interventions will be delivered by a series of key Activities, either of the capacity building, technological or financial type. Capacity development of stakeholders as well as developing financial and regulatory processes is a vital component in ensuring NAMA Outcomes can be achieved. Table 26 presents expected capacity building costs, totalling USD 2.14 million over the full timeframe of 2017-2030. A particular emphasis is placed on legal and policy advice for the establishment and enactment of emission limits, financial incentives and the additional fuel tax. These activities account for over half of all capacity development (USD 1.25 million) and serve to lay the foundational mechanisms necessary to the NAMA. Funding will also be particularly targeted towards developing the marketing and promotional resources (USD 428,000) required to build awareness for the scrappage program in

Phase 1. These materials will then serve the car dealers or other stakeholders running the marketing campaigns, which are to be launched in parallel to the pilot replacement program.

Secondary capacity building activities include defining the parameters of the scrappage program (e.g. old car eligibility criteria, environmental minimum standards for scrappage sites) as well as training the management entities, the CE, IE and the NFF (see Sections 7.2.4 and 8.1).

Capacity Building Activities	Phase 1	Phase 2	NAMA Total
Support for Entity Development (CE, IE, Finance Facility)	USD 222,000	USD 0	**USD 222,000**
Mechanisms for Establishing & Implementing Policies, Laws, Regulations and MRV	USD 701,000	USD 546,000	**USD 1,247,000**
Stakeholder Education, Marketing and Awareness Building	USD 428,000	USD 0	**USD 428,000**
Definition of Scrappage Program Standards, Requirements and Eligibility Criteria	USD 239,000	USD 0	**USD 239,000**
Total	**USD 1,590,000**	**USD 546,000**	**USD 2,136,000**

Table 26: Capacity building for the transport sector NAMA in Phase 1 and Phase 2

7.1.2 Vehicle Replacement

The most significant expenses for this NAMA, however, result from the actual car replacements themselves (the interventions). On one hand, the national Government and the International Partners will support the financial incentives provided to the vehicle owners for each vehicle replaced, and on the other hand the vehicle owners will purchase the new (subsidized) FEVs. Sufficient incentives are therefore necessary for car owners to participate in the car replacement program and to guarantee private sector involvement in the NAMA. As such, four main incentive mechanisms will support car owners in replacing their old vehicles with FEVs.

1. Replacement fees will be provided as an approximately USD 3,000 grant to the WP or RP vehicle owners upon purchase of a new FEV. This cash subsidy – identical in amount for both RPs and WPs – will act as the down payment on the new vehicle and will therefore serve to lower the loan requirements for new vehicle purchases. The amount of the expected replacement fee has been determined through survey results and corresponds to the level at which participants indicated a disposition to scrap their vehicle for a new FEV. It is recommended that the willingness of vehicle owners to participate in the scrappage program based on this level of incentive will be further evaluated through additional surveys conducted prior to the start of the NAMA (see Section 5.1 – Preparatory steps).

2. Tax exemption: To further subsidize the cost of a new FEV to the owner and lower the loan requirements, tax exemptions will be delivered to support the car owners. For new WP vehicles, this exemption will include the registration fee and the first annual vehicle inspection fee (Mécanique fee), amounting to USD 1,125 (on a USD 15,000 purchase price).[4] New RP vehicles will also be exempt from customs fees in addition to registration and the first Mécanique, amounting to a USD 3,278 tax exemption (also on a USD 15,000 purchase price).[5] This higher incentive for RP vehicle owners is provided in order to further reduce the burden on taxi drivers as their vehicles represent their sole source of livelihood.

3. Soft loans: Soft loans will be granted to eligible participants in the pilot scrappage program for new vehicle purchases. The low interest credit, only available to RP vehicle owners during the Phase 1 pilot program,[6] will serve as further encouragement for taxi drivers. These loans will be provided by commercial banks – incentivized to participate in the program by the increased business – and backed through the Finance Facility by loan credit guarantees (see Sections 7.2.2 and 7.2.4). After the pilot phase, vehicle owners will revert to standard loan terms in Lebanon.

   The cost breakdown for the replacement fee, tax exemption and loan for a USD 15,000 vehicle purchase is presented in Table 27. A basis for granting soft loans in the transport sector does not currently exist in Lebanon, although analogies can be found in energy efficiency projects. As a result, while setting up a soft loan facility is possible, risks associated with creditworthiness will need to be addressed, particularly for RP owners as their income is not considered fixed.

4. Advertisements on taxis. Enabling private sector businesses to hire advertising space on RP vehicles will provide a revenue source for taxi drivers and reduce the payback period on new vehicle purchases (see Section 7.2.3). A framework currently exists in Lebanon for this incentive; however limited participation has been noted. This framework will therefore be refined and marketed to increase its reach and ensure RP vehicle owners benefit from this revenue source.

	RP (Phase 1)	RP (Phase 2)	WP (Phase 2)
Vehicle Purchase Price	**USD 15,000**	**USD 15,000**	**USD 15,000**
(-) *Replacement Fee*	*USD 3,000*	*USD 3,000*	*USD 3,000*
(-) *Tax Exemption*	*USD 3,278*	*USD 3,278*	*USD 1,125*
(+) *Interest Cost of Loan*	*USD 452*	*USD 731*	*USD 911*
Net Cost of Vehicle to Owner (incl. Subsidies)	**USD 9,174**	**USD 9,453**	**USD 11,786**

Table 27: Total cost of a new FEV to vehicle owner with cost breakdown of financial incentives provided

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[4] On a USD 15,000 vehicle purchase price, registration amounts to USD 787 (calculated according to the cost breakdown provided by the Association of Car Importers and the Traffic, Trucks and Vehicle Management Agency in Lebanon). Furthermore, the first annual inspection fee would amount to USD 338.

[5] On a USD 15,000 vehicle purchase price, customs duties amount to USD 2,153 (see Table 29).

[6] As vehicles replaced in Phase 2 exceed one million units, the cost of extending the loan credit guarantee to this phase is prohibitive.

In the table above, main assumptions include 2.5% soft loan interest rate in Phase 1 (including interest on principal, cost of guarantee and bank fees), a 4% standard loan interest rate thereafter, and USD 15,000 vehicle purchase price includes freight, insurance, customs, VAT and vehicle registration.

In parallel to vehicle owners purchasing new FEVs based on these economics, old vehicles will be scrapped at eligible scrappage sites. While no specific monetary incentive is provided to scrappage site operators to ensure the facilities meet the defined environmental minimum standards, they will nevertheless be inherently incentivized to undergo this upgrading process in order to receive business from the NAMA-driven car scrappage. It is therefore anticipated that these operators will naturally seek to upgrade their facilities by making the required investments in their facilities, thereby ensuring a sufficient supply of scrappage sites to cope with the demand created by the NAMA.

The BAU scenario used for the financial assessment is the one described in Section 4.3. Here, the number of anticipated vehicles over 15 years old by 2030 is used as the reference for comparing vehicle replacement quantities in the NAMA. This baseline is a function of the ageing of the private vehicle fleet in Lebanon as well as the natural scrappage rate of old vehicles. Thus, in 2030, the projected number of old vehicles is 28,952 for RPs and 1,190,820 for WPs (see Section 4.3.2). This NAMA aims for the full replacement (100% of vehicle numbers) of both RP and WP vehicles older than 15 years by 2030 in order to deliver transformational change in the transport sector in Lebanon (for annual vehicle replacement figures see Table 15). As the actual replacement rate will depend on several factors, including willingness to pay, provision of an appropriate incentive scheme, etc. and in order to reflect alternative and less costly NAMA scenarios, the final section of this chapter will highlight cases with lower car replacement rates of 80% and 50% (see Section 7.2.5).

7.2 National and International Finance: Sources and Distribution Mechanisms

The transport sector NAMA is a co-financed effort between international and national financial sources. The purpose of this design is to construct a robust, reliable and transparent financial framework that addresses the needs of the different phases while ultimately enabling the transformational change expected from the NAMA. The financial system presented here accounts for all costs of supporting the execution of the individual tasks and provides tools to secure the needed funds and distribute them as appropriate.

In Table 28, the allocation per phase of the two broad financing streams for the NAMA is indicated. Generally speaking, the cost of the first NAMA intervention (Phase 1: "Pilot scrappage program is implemented") is met through available international sources, whereas for the second NAMA intervention (Phase 2: "Extended scrappage program is implemented"), the cost is met through available domestic sources. Indeed, the disbursement of the primary financial incentive (i.e. replacement fees)[7] is supported solely by International Support Partners in Phase 1, and by the national Government in Phase 2.

Phase 1 will, at first (2017-2018), build up transport sector capabilities from a combination of international support for capacity building and the national Government budget for the establishment of management entities and regulatory mechanisms. Then, with the launch of the pilot program (2019), the provision of replacement fees by International Partners as well as private sector involvement will kick in with the first FEV purchases. During this time and until

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[7] While tax exemptions play a significant role in incentivizing private sector involvement in the replacement program, they are not in fact considered a cost to the National Government. Indeed, vehicle purchases through the scrappage program are additional to what would occur in the baseline scenario. Furthermore, the cost to International Partners of the credit guarantees for purchases of red plate vehicles in Phase 1 are already accounted for in the soft loan interest rate.

2020, International Partners will also provide backing to the Finance Facility. Furthermore, revenue-generating mechanisms (such as an additional fuel tax, see Section 7.2.1) will also be launched in 2019, providing an income stream to support disbursements from the national Government budget and public sector grants in Phase 2 to ensure the sustainable management of the NAMA intervention in the road transport sector.

Funding Source	Phase 1 (2017-2020)	Phase 2 (2021-2030)
Domestic	National Government Budget Private Sector	National Government Budget National Government Support (Grant Subsidy Scheme) Private Sector
International	International Support Partners (Capacity Building Grants) International Support Partners (Grant Subsidy Scheme) International Support (Loan/Credit Guarantee)	International Support Partners (Capacity Building Grants)

Table 28: Overview of funding sources for the NAMA by phase

7.2.1   National Government Support

The national Government of Lebanon and all relevant Ministries and authorities represent the purveyors of national support within the context of this NAMA. In Phases 1 and 2, different approaches will be implemented from a domestic finance point of view due to the difference in objectives described earlier in this document.

In Phase 1 (2017-2020) national Government sources will cover the establishment of the CE and IE (and their initial operating costs), as well as the NFF. In addition, allocations will also be required for the establishment of the legal bases for the financial incentives (replacement fees, tax exemptions, soft loans) and additional fuel tax. Then, in Phase 2 (2021-2030), further to continued support for the operating costs of the management entities as well as financing the replacement fees for both RP and WP vehicles, the national Budget will also fund the legal implementation of emission limits.

To support the broader ambitions of Phase 2, involving the continuation and expansion of the replacement program beyond the pilot programme, tax and fee mechanisms will be implemented or reallocated to generate the revenue to guarantee the sustainable management of Lebanon's transport sector (see Table 29). Collected and disbursed by the national Government, these mechanisms will in fact be available starting with the first vehicle replacements in 2019; however, as vehicle replacements will be funded by the international support partners in Phase 1, the mechanisms will primarily be deployed from 2021. The instruments under consideration would be built into the public sector budget and then made available to fund both public and private sector activities.

Instrument	Description
Additional Fuel Excise	A supplementary fuel tax will be levied on fuel consumption of all cars as a negative incentive towards less efficient vehicles and will be collected per unit of fuel purchased. Different options were discussed for the tax structure with the MOF and this particular mechanism is the most probable means of applying a negative incentive nationwide, as others would require parliamentary approval. Lebanon currently has in place a fuel excise of around USD 0.17/l[8], upon which an additional excise of USD 0.025/l will be collected. The process for developing the basis for implementing this tax is already underway in Lebanon. This instrument would be implemented in Phase 1, with collection taking place already at the beginning of the pilot program in 2019. For the purpose of this NAMA, the net effect of the additional fuel excise is considered, where losses to the base fuel tax from more fuel efficient vehicles are taken into account.
Scrappage Site Fees	Scrappage sites currently pay car owners who scrap their vehicles. This fee is based on the salvage value of the car (including the market value of the metal to be recovered and then sold by the site operator). For this NAMA, an average scrappage facility fee of USD 275 (per vehicle) is expected and this fee will be diverted from car owners to the national Government as a revenue source to support the disbursement of cash replacement fees. This mechanism will be implemented through the pilot and broader scrappage program, i.e. starting 2019. This would support additional vehicle replacements compared to what would be possible with fuel tax revenue only.
VAT and Customs Fees	It is proposed that VAT collected on all vehicles replaced within the scope of this NAMA (RPs and WPs) as well customs fees collected on white plates be reallocated to fund further vehicle replacements.[9] In order to be implemented, such a proposal would require Parliamentary ratification and would be implemented in the form of an open allocation to the MOE for the amount equivalent to the revenue collected. This significant additional revenue source would enable the NAMA to achieve the transformational change sought. On a USD 15,000 vehicle purchase price, VAT amounts to USD 1,292, while custom duties are USD 2,153.[10]

Table 29: Tax and fee mechanisms implemented or reallocated to generate income to finance NAMA Activities

Table 30 provides a summary of the incremental costs incurred by the National Government for the implementation of NAMA Activities from 2017 till 2030[11] (costs incurred by the private sector or citizens for the actual purchase of vehicles are not included and are described in the following

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[8] Fuel excise value corresponds to the weighted average of the tax imposed on octane 95 and octane 98 fuel consumption in 2015 (Jan-Nov) (MOF, 2015; Lebanese Customs, 2016)

[9] Red plate vehicles are exempt from customs fees in this NAMA (see Section 7.1.2).

[10] Calculated according to the cost breakdown provided by the Association of Car Importers and the Traffic, Trucks and Vehicle Management Agency in Lebanon.

[11] Note that for Activities started in Phase 1 but extending into Phase 2 (i.e. operation of CE and IE), all costs will be accounted for fully within Phase 1 (see timeline of NAMA Activities in Section 8.4).

section). The Activity groups highlighted only reflect components of the NAMA supported by the National Government. A total of USD 5.73 million will be allocated from the National Budget by 2030 and injected into the public and private sectors to support the implementation of NAMA Activities. With the help of revenue generation from taxation and fees collected, the Grant Subsidy Scheme will fund USD 3,646 million in replacement fees by 2030. Overall, the National Contribution to the NAMA, from a public sector viewpoint, amounts to USD 3,652 million.

The cost of abatement for the National Government contribution in Phase 2, which entirely supports the NAMA's second intervention, is then 332 USD/tCO$_2$ (based on GHG emission reductions detailed in Section 4.3.2).

For the table below, please note, that costs are representative of vehicle replacements targeting 100% of red plates and white plates by 2030.

	Type	Phase 1	Phase 2	Total
National Government Budget	Support for Entity Establishment & Operating Costs (CE, IE, Finance Facility)	USD 5,125,000	USD 0	USD 5,125,000
	Mechanisms for Establishing & Implementing Policies, Laws, Regulations, and MRV	USD 511,000	USD 90,000	USD 601,000
	National Government Budget Total	**USD 5,636,000**	**USD 90,000**	**USD 5,726,000**
Grant Subsidy Scheme	Disbursement of Incentives (Replacement Fees)	USD 0	USD 3,646,288,000	USD 3,646,288,000
	Grants Subsidy Scheme Total	**USD 0**	**USD 3,646,288,000**	**USD 3,646,288,000**
Total		**USD 5,636,000**	**USD 3,646,378,000**	**USD 3,652,014,000**

Table 30: Overview of national Government costs for the transport sector NAMA (in USD)

7.2.2 International Finance

International finance encompasses financial flows originating outside of Lebanon and consisting of support from International Partners.

Support from International Partners is vital to the implementation of the NAMA and will be the sole source of Capacity Building funds in both Phase 1 and Phase 2. Whether from an institution or a program, these grants will facilitate training programs, provide technical and legal advice, and enable assessment studies and market surveys to be carried out and public awareness and

education campaigns to be launched (see Chapter 6 for further details). A NFF specially set up for this purpose will have the responsibility of managing and disbursing these funds (see Sections 7.2.4 and 8.1).

Early-stage support from International Support Partners is particularly essential for this NAMA in order to implement and test the bases for the scrappage program prior to its rollout being extended after the pilot phase to the whole private transport sector. In addition to knowledge transfer through capacity development, the International Support Partners will be the driving force behind early technology transfer to Lebanon in the form of fuel-efficient RP vehicles. The replacement fees provided by the International Support Partners for the purchase of these vehicles between 2019 and 2020 will be allocated via the Grant Subsidy Scheme (see Section 7.2.4).

An additional and significant pillar of International Support Partner involvement will be through its role as purveyor of credit guarantees on loans to RP vehicle owners seeking to participate in the pilot scrappage program. As determined previously (see Section 7.2), the cost to the International Partners of the credit guarantees is already accounted for in the interest rate on the loans. Although not a net cost to the International Partners, the amount of the credit guarantee in Phase 1 is important to consider. Based on the financial incentives described in Section 7.1.2 and the number of vehicles replaced in Phase 1, Table 31 derives the costs for the entire pilot replacement program. In order to de-risk all loans provided by commercial banks to RP vehicle owners in Phase 1, a credit guarantee in the amount of USD 37.88 million over the two years would be required from the International Support Partners.

	Phase 1 (Pilot)
Total Number of Vehicles Replaced	4,343
Total Cost of Replacement Vehicles (USD 15,000 per vehicle)	USD 65,145,000
Total Tax Exemptions Provided (USD 3,278 per vehicle)	USD 14,236,000
Total Soft Loans Required	**USD 50,909,000**
Total Replacement Fees Provided for Down Payment (USD 3,000 per vehicle)	USD 13,029,000
Total Credit Guarantee Required	**USD 37,880,000**

Table 31: Calculation of credit guarantee requirements for Phase 1 Loan Facility

Table 32 summarizes the costs incurred by International Support Partners throughout the NAMA. The Activity groups highlighted reflect only those components of the NAMA supported by these partners and are categorized according to their type. The bulk of support from International Partners is deployed in Phase 1, as the majority of Capacity Building funds (USD 1.59 million or 74%) are granted in this phase and replacement fees for RP vehicles in the pilot are being issued (USD 13.03 million). The cost of abatement for the overall international contribution in Phase 1, which entirely supports the NAMA's first intervention, is then 398 USD/tCO$_2$ (based on emissions reductions detailed in Section 4.3.2)

When adding the support for Phase 2 Capacity Building Activities, the overall contribution from International Partners for the NAMA amounts to USD 15.16 million between 2017 and 2030.

For Table 32 please consider that costs are representative of vehicle replacements targeting 100% of RP and WP cars by 2030 and that loan credit guarantees are provided only in Phase 1 of the NAMA under the pilot program.

	Type	Phase 1	Phase 2	Total
Capacity Building Grants	**Support for entity development (CE, IE, Finance Facility)**	USD 222,000	USD 0	USD 222,000
	Mechanisms for Establishing & Implementing Policies, Laws, Regulations and MRV	USD 701,000	USD 546,000	USD 1,247,000
	Stakeholder Education, Marketing and Awareness Building	USD 428,000	USD 0	USD 428,000
	Definition of Scrappage Program Standards, Requirements and Eligibility Criteria	USD 239,000	USD 0	USD 239,000
	Capacity building Grants Total	**USD 1,590,000**	**USD 546,000**	**USD 2,136,000**
Grant Subsidy Scheme	**Disbursement of Pilot Phase Incentives (Replacement Fees)**	USD 13,028,000	USD 0	USD 13,028,000
	Grant Subsidy Scheme Total	**USD13,028,000**	**USD 0**	**USD13,028,000**
Loan/Credit Guarantee	**New Vehicle Purchases**	*Included in the loan interest rate*[12]	USD 0	*Included in the loan interest rate*
	Loan/Credit Guarantee Total	***Included in the loan interest rate***	**USD 0**	***Included in the loan interest rate***
Total		**USD14,618,000**	**USD 546,000**	**USD15,164,000**

Table 32: Overview of costs to International Support Partners in the private transport sector

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[12] Note that the credit guarantee is expected to be of the magnitude of USD 38 million. However, the cost of this guarantee is factored into the annual interest rate of the loan and is not a net cost to International Partners.

7.2.3 The Private Sector

The national private sector, consisting of private vehicle owners for the purpose of this NAMA, forms the backbone of this program. Indeed, by purchasing new cars, private vehicle owners (both red and white plates) enable the implementation of the NAMA's intervention, leading to emission reductions and transformational change in the sector. As a result, the potential for adoption of this program by private vehicle owners – namely RP car owners as their vehicle is their source of livelihood – is a key parameter to consider in this financial evaluation.

Based on the incentive scheme described in Section 7.1.2 (Table 27) and an average fuel price of 1.05 USD/l in Lebanon over the past three years[13] (MOF, 2014), the payback period for purchases of new fuel-efficient RPs is calculated in Table 33 for both Phase 1 and Phase 2. RP vehicle owners see their investment in a new FEV pay off in 3.6 - 3.7 years (depending on the phase) under the NAMA and this timeframe decreases by approximately 15% with income from advertisements placed on their vehicles. Furthermore, the use of soft loans with attractive interest rates throughout the pilot program helps bring down the payback period of the initial test phase to levels comparable with Phase 2 – 3.1 years. This effect is intentionally designed into this NAMA to create an attractive business opportunity for taxi drivers and minimize the risks incurred in changing vehicles as they represent taxi drivers' source of income.

Type	Phase 1	Phase 2
Annual Fuel Cost Savings[14]	USD 2,485	USD 2,636
Net Cost of Vehicle to Owner (including Subsidies)	USD 9,174	USD 9,453
Payback Period (No Ad Revenue) (y)	**3.7**	**3.6**
Annual revenue from advertisements on red plates[15]	USD 1,500	USD 1,500
Net Cost of Vehicle to Owner (including Subsidies) with Revenue from ads	USD 7,674	USD 7,953
Payback Period (With Ad Revenue) (y)	**3.1**	**3.0**

Table 33: Financial viability of the scrappage program for red plate vehicle owners throughout the NAMA

Overall, accounting for the replacement of 100% of RP and WP vehicles over 15 years old by 2030, private vehicle owners bear the highest investment burden in the NAMA. Indeed, replacing 4,343 vehicles in Phase 1 and 1,215,429 vehicles in Phase 2 will cost USD 14,308 million as detailed in Table 34.[16] It should be noted, however, that although this cost is significant within the terms of the NAMA, large parts of the cost would in fact occur even without the NAMA. Indeed, vehicle owners would need to replace their old vehicles at some point in time. From the NAMA perspective, the costs presented below should therefore be considered within this context.

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[13] While this figure represents a historical average, its accuracy in predicting the future is uncertain given the fluctuations in international oil prices and particularly recent price falls. If a more recent fuel price of 0.70 USD/l is considered, the payback without ad revenue rises to 5.5 years for both phases, whereas with ad revenue this value becomes 4.6 years.

[14] Annual savings resulting from FEV usage are derived from the reduced fuel consumption. This difference in fuel volumes, compared with fuel consumption with a non-efficient vehicle, is obtained directly from the emission reduction calculations and using a gasoline emission factor of 2,393 g CO_2/l.

[15] Costs of advertisements are determined by the authors based on surveys conducted in Lebanon.

[16] For a conservative estimate, no revenue from ads is considered in this amount in the case of red plate vehicles.

Type	Phase 1	Phase 2	Total
National Private Sector (Vehicle Purchases)	USD 39,843,000	USD 14,267,949,000	**USD 14,307,792,000**

Table 34: Overview of private sector (vehicle owners – or citizens) costs for the transport sector NAMA

7.2.4 Financial Distribution Mechanisms

For NAMA implementation purposes, the management structure is primarily centered on the CE and the IE. The CE will be the responsible party for facilitating the involvement of key stakeholders and the coordination of NAMA Activities, while the IE will manage the scrappage program itself, including all related MRV (see Chapters 8 and 9). These entities will be established in Phase 1 and will subsequently operate for the duration of the NAMA. It is anticipated that the CE be hosted within the MOE, whereas the IE shall fall under the guidance of the TTVMA within the MOIM.

Despite their central roles in the NAMA management system, the CE and IE are not legally entitled to manage funds and thus the allocation and distribution of finance will be the responsibility of the GOL. Under its guise, the NFF will be established to financially support the interventions leading to GHG mitigation. While the FT of this NFF is yet to be determined, it will oversee the Grant Subsidy Scheme, the Phase 1 Loan Facility and the Capacity Development Grants. This means that the FT will physically allocate and direct the transfer of funds (to government institutions, consultants, contractors, private vehicle owners, and/or banking institutions), based on direction from the CE. Capacity Building grants are granted by one or more International Support Partners, whereas the Grant Subsidy Scheme is funded both by International Partners and national funds. In terms of the Loan Facility, it will be primarily supported by International Support Partners in order to provide the needed credit guarantees in Phase 1. The purpose of each is as follows.

- **Capacity Development Grants** are designed to contribute, in Phase 1 and Phase 2, to the costs of providing Institutional and Sectoral Capacity Development;

- The **Grant Subsidy Scheme** would provide a fixed grant of capital – in the form of the vehicle replacement fee - to private vehicle owners taking part in the scrappage program. In Phase 1, this scheme will be funded by International Partners, whereas in Phase 2 these costs will be incurred by the national Government.

- The **Loan Facility** scheme will provide credit guarantees to support RP vehicle owners in securing the soft loans needed to purchase new FEVs in Phase 1.

In addition to the CE, the IE, the NFF, the National Government, private sector vehicle owners and the International Support Partners, the remaining stakeholders in the transport sector NAMA are represented in a proposed flow chart in Figure 14. This overview presents the disbursement of grants via the NFF (solid red lines) for Phase 1 and Phase 2 Activities as well as the financial flows and income streams for the national Government budget (solid blue lines). Private sector financial flows within the replacement program are also represented with their intended purpose. In this representation, entities relevant to the NAMA but outside its scope (such as commercial banks for the provision of soft loans) are not included.
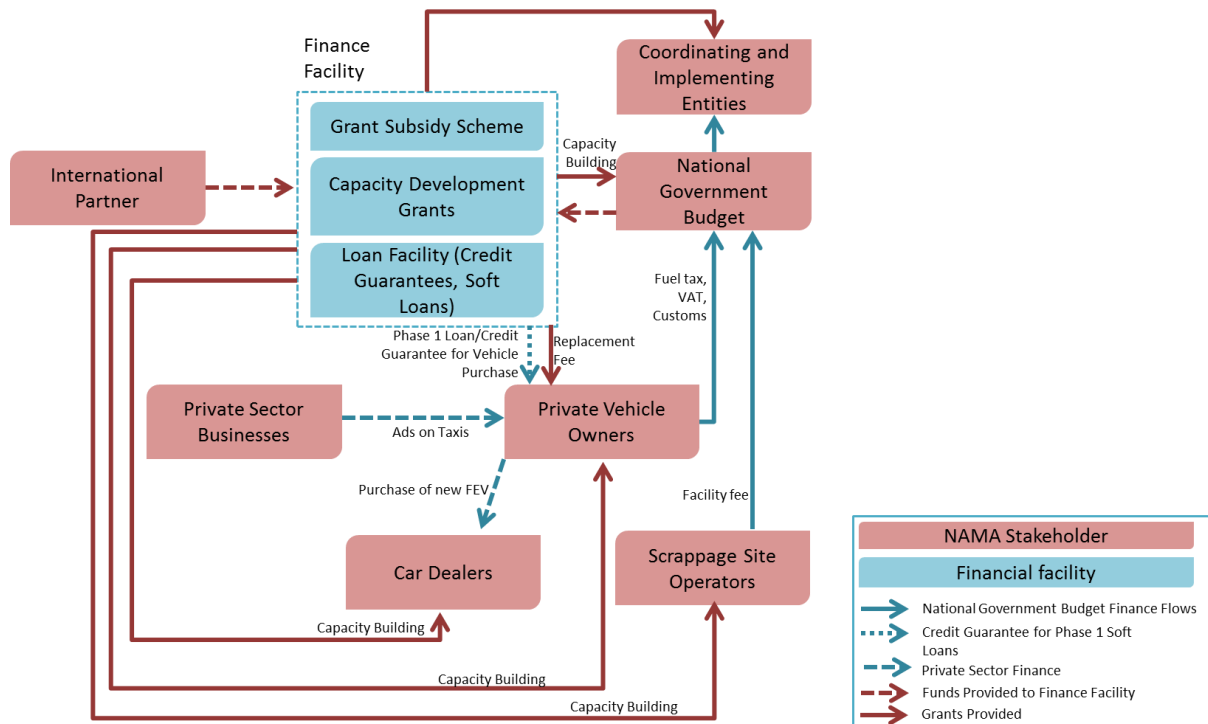
Figure 14: Financial flows for the transport sector NAMA

7.2.5 Financing Needs

From the National Government perspective, the assessment described in the sections above represents a maximum estimate of the costs of the NAMA. This is done in order to provide a realistic picture of the financing necessary to launch the NAMA and achieve a 100% replacement of old RP and WP vehicles by 2030. Based on the co-financing model presented in the beginning of Section 7.2, a detailed representation of the full NAMA costs can be found in Annex 3: Detailed NAMA Cost Assessment. Table 35, below, presents a summary of this assessment in the form of a breakdown of incremental funds needed from international sources and the National Government to implement the NAMA intervention. In addition, private sector involvement for the purchase of new FEVs is also indicated.

In Phase 1, the implementation of the first intervention of this NAMA ("Pilot scrappage program is implemented") will require funding of USD 60.01 million, including both international and national contributions (including the cost to the car owners). In this phase, USD1.59 million is required from International Partners starting in 2017 for capacity development of the transport sector in Lebanon, while the remaining international contribution (USD 13.03 million) is required starting in 2019 with the launch of the pilot program. The National Government portion of financing for Phase 1 is 9.4% of total costs, whereas International Partner Support represent 24.3%. The remaining 66.3% is to be provided by private sector vehicle owners.

In Phase 2, the implementation of the second intervention ("Extended scrappage program is implemented") will drive the majority of costs. Private sector involvement in the form of vehicle purchases will amount to USD 14.27 billion (80%), while support from the National Government will add up to USD 3.65 billion (20%). The financial requirements for the second phase therefore amount to USD 17.91 billion, bringing the total finance needed for the transport sector NAMA to USD 17.97 billion for replacing 100% of old vehicles. Overall, as was seen in previous sections, the private sector vehicle owners bear the highest costs under this NAMA.

In the table below it should be noted that national private sector contributions represent the net cost of vehicle purchases to vehicle owners (based on the costs presented in Table 34). For Activities starting in Phase 1, but extending into Phase 2 (i.e. the operations of the CE and the IE), all costs are accounted for fully within Phase 1.

Type	Phase 1 (2017-2020)	Phase 2 (2021-2030)	Total (2017-2030)
National Government Budget	USD 5,636,000	USD 90,000	**USD 5,726,000**
National Government Support (Grant Subsidy Scheme)	USD 0	USD 3,646,288,000	**USD 3,646,288,000**
National Private Sector (Vehicle Purchases)	USD 39,843,000	USD 14,267,949,000	**USD 14,307,792,000**
International Support Partners (Capacity Building Grants)	USD 1,590,000	USD 546,000	**USD 2,136,000**
International Support Partners (Grant Subsidy Scheme)	USD 13,028,000	USD 0	**USD 13,028,000**
Total	**USD 60,097,000**	**USD 17,914,873,000**	**USD 17,974,970,000**
National Government Portion	9.4%	20.4%	
Private Sector Portion (citizens)	66.3%	79.6%	
International Partner Portion	24.3%	~0.0%	
Additional: International Support Partners – Loan/Credit Guarantees	USD 37,880,000	USD 0	**USD 37,880,000**

Table 35: Cost breakdown by financing source for the transport sector NAMA

The high cost to the national Government (from the national budget and the Grant Subsidy Scheme) of achieving this transformational change of 100% vehicle replacement is financially viable given the tax and fee mechanisms described in Section 7.2.1. In Table 36, indicative income from these sources over the timeframe of the NAMA is presented and total revenue is contrasted

with the financing needs of the national Government. In each phase, and over the timeframe of the NAMA, these sources would be sufficient to ensure vehicle replacements funded by the National Government.

For the table below it should be noted that a value of 0.025 USD/l for additional fuel excise starting in 2018 was used, baseline and NAMA fuel consumption are derived directly from the GHG emission calculations using a gasoline emission factor of 2,393 g CO_2/l, a USD 275 scrappage facility fee per vehicle was applied, and VAT amounts of USD 1,292 and customs duties of USD 2,153 assumed for a vehicle purchase price of USD 15,000.

Type	Phase 1 (2017-2020)	Phase 2 (2021-2030)	Total (2017-2030)
National Government Financial Needs	USD 5,636,000	USD 3,646,378,000	USD 3,652,014,000
Net Revenue from Additional Fuel Tax	USD 106,875,000	USD -272,963,000	USD -166,088,000
Scrappage Facility Fee	USD 1,194,000	USD 334,243,000	USD 335,437,000
VAT & Customs	USD 5,611,000	USD 4,134,170,000	USD 4,139,781,000
Indicative Total Revenue	USD 113,680,000	USD 4,195,450,000	USD 4,309,130,000

Table 36: National Government revenue generation from fuel tax and fees re-allocated to the NAMA

For comparative purposes, the cost assessment performed for the transformational replacement target of 100% is contrasted in the table below with two alternative replacement goals.

Type	2017-2030 100% replacement	2017-2030 80% replacement	2017-2030 50% replacement
National Government Budget	USD 5,726,000	USD 5,726,000	USD 5,726,000
National Government Support (Grant Subsidy Scheme)	USD 3,646,288,000	USD 2,739,716,000	USD 1,317,752,000
National Private Sector - citizens (Vehicle Purchases)	USD 14,307,792,000	USD 10,761,827,000	USD 5,199,733,000
International Support Partners (Capacity building Grants)	USD 2,136,000	USD 2,136,000	USD 2,136,000
International Support Partners (Grant Subsidy Scheme)	USD 13,028,000	USD 13,030,000	USD 13,024,000
Total	USD 17,974,970,000	USD 13,522,435,000	USD 6,538,371,000
Indicative Total Revenue (to Fund National Government Financing Needs)	USD 4,309,130,000	USD 3,456,069,000	USD 2,107,321,000

Table 37: Comparative cost assessments and financial needs for 100%, 80% and 50% vehicle replacement scenarios

An identical approach to the one presented throughout the previous sections is used, with the aim of providing less ambitious and less costly alternatives to implementing the transport sector NAMA. In both the 80% and 50% replacement scenarios below, the investment burden remains on the private sector. However, the magnitude of that burden is decreased. Similarly, less support is required from the National Government, while revenue generation maintains viability from the public sector perspective in all three cases.

The critical barrier to the viability of the NAMA is the ability of the National Government to secure the funding needed in the preparatory period of Phase 1 (2017-2018), prior to revenue generation. Without this involvement, the co-financing is at risk, which would jeopardize the chances of securing support from International Partners. Ensuring the availability of the financial incentives is a noteworthy risk, and one that rests on the National Government's ability to develop and implement the required legal basis. While the possibility of reallocating VAT and customs fees collected to fund vehicle replacement fees has been deemed feasible in principle,[17] the actual implementation of this mechanism would still need to overcome the associated technical and regulatory hurdles.

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[17] Based on consultations with MOF.

8   NAMA Implementation Structure

In order to understand the mechanisms and plans for the implementation of the NAMA, an implementation pathway has been developed that adequately takes into account the current situation in the road transport sector in Lebanon and the practical needs and requirements for management, governance and the establishment of the interventions and measures under the NAMA.

NAMAs are important instruments for translating GHG mitigation targets into concrete actions. The concrete actions (interventions and measures) outlined in this NAMA must not only be aligned to national and sectoral policies and strategies, but they must also be implemented and coordinated by an organization(s) with sufficient legal and regulatory authority to ensure that the Activities are fully integrated, coordinated and carried out. As in all modern governments, authority and responsibilities are functionally and structurally delegated to various ministries and organizations based on the Constitution and the government's executive orders and decrees, and Parliamentary legislation. Identifying the most appropriate governance and management structure is a critical task at the very beginning of the NAMA planning process.

In the following chapter the key institutions and stakeholders, their responsibilities and interrelations as well as the NAMA implementation structure (phased approach and implementation schedule) will be presented. A detailed overview, explaining the steps to implement the NAMA from the perspective of a participant, is provided in Annex 4: Detailed Steps to be followed in the Scrappage Program.

8.1 Key Institutions and Implementing Partners

The recommended institutional structure of the NAMA should ensure the strong involvement of national stakeholders to create country ownership and political commitment. It should further utilize existing and experienced entities and organizational systems which are already in place and allow for the prompt and smooth implementation of the NAMA and to ensure that the institutional structure is appropriate for receipt of international private and/or public donor funding.

The management structure and the key institutions envisaged for this NAMA are based on the existing stakeholders involved in the road transport sector in Lebanon (see Section 2.2 for further description of the stakeholders currently involved). For the purposes of this NAMA, management and governance are split between two distinct organizations: The Coordinating Entity (CE) and the Implementing Entity (IE). The respective responsibilities for each of these two organizations are outlined below.

The key Ministries involved in the NAMA are the Ministry of Environment (MOE), which will host the CE, the Ministry of Interior and Municipalities (MOIM) whose Traffic, Trucks and Vehicles Management Authority (TTVMA) will be the IE of the NAMA, and the Ministry of Finance (MOF) responsible for coordinating and overseeing the overall allocation of financing within the NAMA and hosting the NFF. Another key stakeholder on the national level will be the central bank, Banque du Liban (BDL), which will be involved in the financing of the NAMA through the provision of loans to the private sector.

8.1.1 The Coordinating Entity

The CE is expected to be organized within the MOE. An office with a functional staff, a working group and a secretariat for the coordination of activities under the NAMA are anticipated. The working group should consist of representatives from relevant Departments of key Ministries (e.g.

MOE, MOIM and MOF), the TTVMA and qualified NGOs and civil society groups. The secretariat of the CE could be the Climate Change Coordination Unit (CCCU) or another unit from MOE.

The Coordinating Entity will have the mandate to:

- develop, implement and oversee NAMA strategy and planning;
- coordinate all international support;
- coordinate and facilitate government finance mechanisms;
- facilitate actions encouraging private sector involvement;
- coordinate capacity development activities;
- facilitate actions encouraging policy and regulation changes;
- oversee and coordinate the implementation of MRV processes; and
- Link NAMA MRV with nationally/internationally required MRV (as set out in NCs, BURs and NDCs).

8.1.2 Implementing Entity

The IE will be the TTVMA, which is a unit within the MOIM. The TTVMA currently handles all matters related to registration and deregistration of vehicles, and as such it is a natural candidate for being in charge of the management of the implementation of the car scrappage program. The general functions of the IE in the NAMA will be to:

- provide technical inputs in the decision making process (e.g. for developing the incentive scheme);
- apply and ensure consideration of policies and regulatory changes;
- ensure support for and control the physical implementation of the technical interventions under the NAMA (the car scrappage and replacement program);
- manage the procurement process for the interventions;
- facilitate knowledge transfer between the different institutions involved (Government, the private sector, other stakeholders);
- coordinate and mediate between the GOL and the private sector;
- support the capacity building activities for the private sector (e.g. car dealers); and
- support the MRV of the NAMA as the link between the operators and the CE.

The specific tasks of the IE for the car scrappage program will be to check program applicants' eligibility for participation, deregister old cars submitted for scrappage, monitor the car scrappage process at car scrappage facilities, coordinate with the CE regarding the issuance of cash-for-replacement amounts, register new replacement cars, record the relevant MRV parameters, and coordinate advertising efforts.

8.1.3 The Financial Trustee of the Finance Facility

The Financial Trustee (FT) is to execute and manage the NFF, which includes the Grant Subsidy Scheme and the NAMA Loan Facility. The Financial Trustee has a critical role in financial oversight of the capital used n NAMA activities. This means that the FT physically allocates and directs the transfer of funds (to government institutions, consultants, contractors, operators of facilities and/or banking institutions), based on direction from the NAMA CE. A reliable FT must be selected at the start of the NAMA. The FT should be incentivized through: (1) a primary mandate to ensure sustainable development and operations under an international standard of practice, and (2) being allocated funds to support the functions of the FT. The FT will have a mandate originating from the GOL and the International Support Partners, seen as acting on their behalf, and will be evaluated at least annually and notified of shortcomings by the CE. The FT may be an International Support

Partner, or a banking institution. There are a number of organizations who have the capability and the capacities to act as the FT in the context of this NAMA.

The FT will need to structure the investment agreement(s) and operational by-laws with each agency/institution that is providing international or national support to the NAMA. In addition, the FT will design eligibility criteria and perform due diligence of private sector stakeholders who seek to secure grants and/or loans under the NAMA. The FT will also need to devise a risk mitigation strategy, plus a monitoring and evaluation mechanism, for all types of finance instruments and the use of funds to be integrated into the NAMA MRV.

8.1.4 Stakeholders' Roles and Responsibilities

The following table provides an overview of the intended institutions/stakeholders and operational bodies involved and their roles and responsibilities in the road transport NAMA in Lebanon. It should be noted that Chapter 7 contains a more specific overview of stakeholders involved in the financing of the NAMA and Chapter 9 contains an overview of stakeholders involved in the MRV process and how the reporting of information is to be conducted among those stakeholders. Therefore, the following table provides a more general overview of the institutions involved.

Stakeholder/ Institution	Role(s)	Responsibilities	Level
MOE	- Host the CE	- Host the CE including the hired personnel - Report to the GOL and the UNFCCC	National (Public)
MOF	- Host the NFF - Manage all incoming and outgoing financing for the NAMA	- Support and coordinate the operating budget of the CE and the IE	National (Public)
MOIM	- Host the IE through the TTVMA	- Enforcement of traffic laws and regulations - Registration and deregistration of vehicles (through the) - Mandatory annual inspection (through the Mécanique)	National (Public)
CE	- Coordinate the NAMA and stakeholder involvement, including international and private sector	- Coordinate all international support - Coordinate capacity building activities - Coordinate tender processes - Coordinate and facilitate government finance mechanisms -Receive aggregated monitoring data - Create final monitoring reports - Undertake internal QA/QC procedures	National (Public)
IE	- Coordinate NAMA implementation	- Oversee the implementation of NAMA interventions and implementation of policies and regulatory changes - Coordinate and mediate between GOL and implementing entities (including the private sector) - Initiate knowledge transfer and MRV coordination - Facilitate actions to encourage private sector involvement, including launching and managing the implementation process - Data gathering and aggregation from operational level for MRV - Internal QA/QC procedures - Provide capacity building to specific stakeholder groups	National (Public/ Private)
NFF	- Financial Trustee (FT) for the financing of the NAMA	- Collect revenue generated in the NAMA from scrappage fees and fuel tax - Supervise the financial incentive scheme allocation - Co-finance capacity building efforts - Support private companies in implementing NAMA interventions - Provide security for international donors for	National (Public/ Private)

		finance provided for the NAMA	
Car dealers	- Sales of replacement car	- Proactively inform purchasers of private passenger cars about the scrappage program and about eligible vehicles - Gather data on the emission limits of the replacement cars	National (Private)
Car scrappage facilities	- Scrap old cars	- Upgrade facilities to comply with required environmental standards in order to participate in the program - Scrap the old vehicles	National (Private)
Owners & Purchasers of vehicles	- Purchase of FEVs	- Purchase FEVs as part of the scrappage program	National (Private)
Commercial Banks	- Provision of soft loans	- Provision of low interest rate loans for the purchase of fuel efficient cars by program participants	National (Private)
Banque du Liban (BDL)	- Provide loans and guarantees	BDL operates a soft loan facility by waiving the reserve requirements for commercial banks. BDL will also be hosting an account for the MOF/MOE containing the NAMA grant (or other sources of finance) for disbursement of the cash-for-scrappage payments to participating car owners.	National (Public)
MOEW	- Support legal implementation of incentive scheme (including tax on fuel)	- Together with MOF, the MOEW will determine and legalize the additional tax on fuel to finance the scrappage program domestically.	National (Public)
International Donors	- Support the funding of Phase 1 and 2, capacity building and implementation activities (measures)	- Co-finance activities under the NAMA	International (Public)

Table 38: Roles and responsibilities of institutions involved and stakeholders

The list of stakeholders in the table above shows the relevance of the NAMA for the private sector in Lebanon. It is one of the central elements and objectives of the NAMA to support the increased participation of the private sector and to help decentralize the private transport sector in Lebanon. Private sector involvement in this NAMA encompasses car dealers (to sell the FEVs and advertise the incentives under the NAMA), car scrappage sites (to ensure the appropriate scrappage of the old cars), commercial banks (for providing loans), and the private car owners (to purchase and utilize the FEVs). Furthermore, private sector investments are a key component of the overall financing mechanism of the NAMA.

8.2 NAMA Operational & Management System

The operation and management system of the NAMA requires an institutional structure, which meets the following requirements.

- It is embedded in national and sectoral policies and strategies.

- It ensures effective communication and reporting as required by international agencies (e.g. the UNFCCC Secretariat)

- It provides the interface with international bilateral and multilateral NAMA funding entities (e.g. the Green Climate Fund).

- It ensures proper management of financial flows between the NAMA funding entities and the recipients of the finance.

- It ensures the achievement of NAMA targets in terms of fuel efficiency, GHG mitigation, and sustainable co-benefits.

- It allows transparent monitoring of GHG emission reductions and sustainable development indicators.

The operational and management structure of the NAMA in the road transport sector must recognize the unique political, strategic, financing, execution and MRV aspects of the proposed NAMA as outlined below.

Political Aspects

The key institutions would play a role in providing policy direction and oversight. They would look into overall NAMA supervision in Lebanon by receiving inputs and providing feedback to the relevant Ministries.

Strategic Function

The key institutions will ensure successful implementation of NAMA projects by coordinating all financing, execution, and MRV functions as well as being the point of contact for international reporting to the UNFCCC Secretariat.

Financing Function

The key institutions will play a major role regarding NAMA implementation in the areas of budgetary allocation and the disbursement of funds from the public purse for NAMA related projects. Private sector institutions and financial institutions are however relevant for mobilizing private funds for NAMA investments. Development Partners are an important source of international public funds.

Execution Function

The execution function will be undertaken by entities that will be responsible for implementing action plans regarding specific NAMA Activities on the ground.

MRV Function

The responsibilities of MRV functional entities among others, will involve:

- establishing standards, guidelines and procedures for the monitoring & reporting of GHG and non-GHG indicators;

- establishing systems and procedures for the verification of reported indicators; and

- establishing guidelines to ensure the quality control and quality assurance of collected data.

The diagram below summarizes the stakeholders involved, differentiating between the national and international institutions involved and the private sector stakeholders. The diagram further depicts the hierarchy for decision making under the NAMA.

With the MOE as CE and the public entity TTVMA functioning as the IE, the key management institutions for the NAMA are to be national public institutions. The private sector stakeholders play an important part in the implementation, operation and financing of the technical interventions (the car scrappage and replacement programmes). This will include the roll-out of the pilot scrappage program in NAMA Phase 1 and the implementation and operation of the expanded car scrappage program under NAMA Phase 2.

The IE is to manage and coordinate the operational part of the NAMA, including the interactions between the NAMA institutions and the private sector (including car owners). The IE will directly engage with the private sector stakeholders (e.g. car dealers, operators of scrappage sites). The CE will provide guidance to the IE and the NFF. Furthermore, the CE will be in charge of fulfilling the external/international reporting requirements (to the UNFCCC Secretariat or international donors).
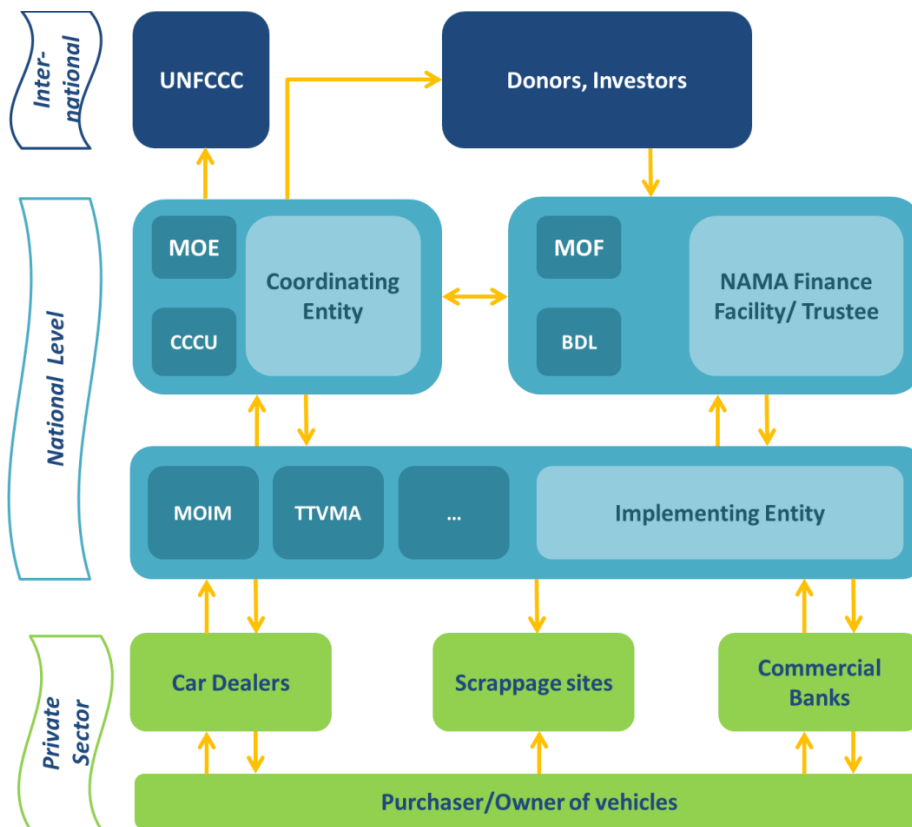
Figure 15: Interrelations between stakeholders

Other implementing partners include car dealers, commercial banks and car scrappage facilities. Car dealers provide the new replacement cars with certain emission limits and they transfer the emissions data to the TTVMA for the MRV database. They may also take over functions on behalf of the owners of the vehicles (such as registering the new replacement car). Commercial banks offer car loans at low interest rates and receive the cash-for-replacement subsidy from the MOE/BDL as a down payment on the new replacement car. Car scrappage facilities that are selected to scrap cars in this program will be responsible for scrapping old cars in accordance with minimum environmental standards.

8.3 Phased Implementation Plan

The NAMA's scope is planned to be phased to ensure that a stepwise approach is followed and that the enabling environment is improved and established before the car scrappage and replacement program is implemented. The figure below provides a graphic overview of the two different phases of the NAMA with the specific interventions and measures and the related Outcomes, Outputs and Activities for each phase.

(1) NAMA Phase 1 (2017-2020) will focus on the establishment of an institutional framework, the establishment of the regulatory framework, the assessment and definition of an incentive scheme, the definition of eligibility criteria for participating in the car replacement program, preparatory tasks like market studies and surveys for information gathering, awareness creation and marketing efforts and the preparation and conduct of a pilot car scrappage and replacement program for RP cars (taxis). Phase 1 will establish the enabling environment for the successful implementation of the car scrappage and replacement program.

(2) NAMA Phase 2 (2021-2030) will build on the achievements of NAMA Phase 1 but significantly increases the scale of the NAMA interventions and provide further support for transformational change in the entire road transport sector in Lebanon. The key element under Phase 2 is the extended and large-scale roll-out of the car scrappage program including both RP and WP cars. In addition, the broad promotion of FEVs in Lebanon, which will go beyond the scope of the NAMA, will be conducted.
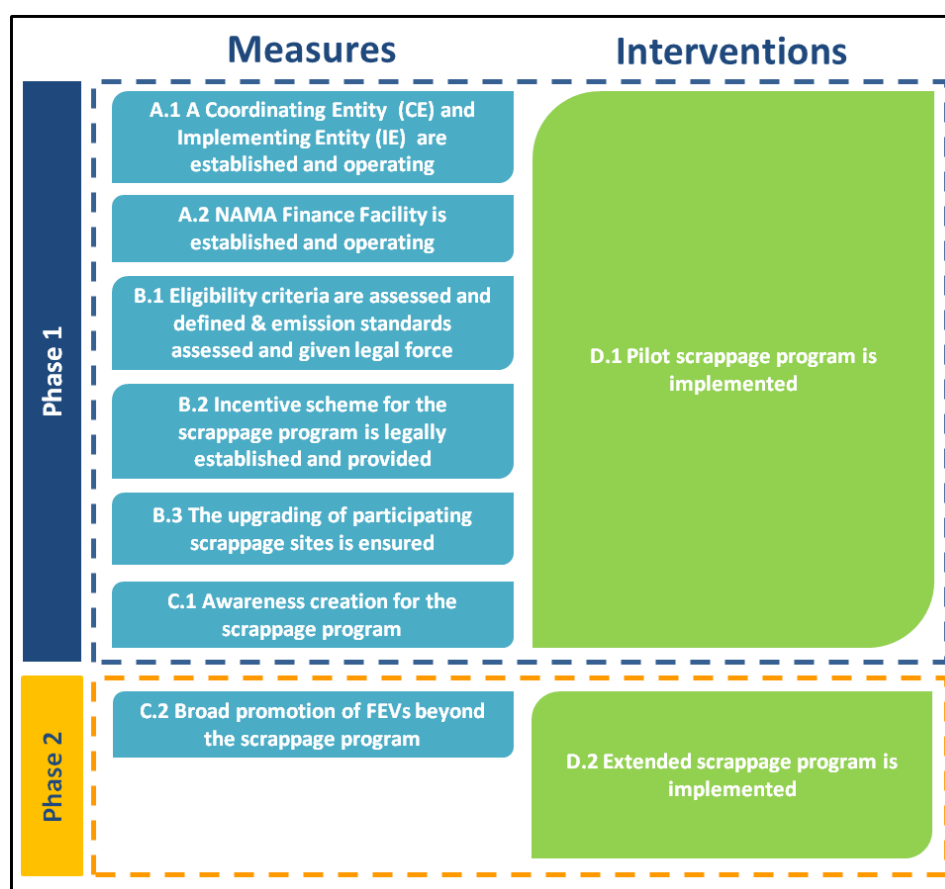
Figure 16: Phased NAMA Approach

NAMA Phase 1, as currently proposed, is the NAMA preparation phase, during which the NAMA enabling environment is established and NAMA finance is sought. Phase 2 is the continuation of the NAMA, involving a further scale-up, a higher level of national funds, the private sector taking a more central role and the GOL achieving greater independence from international donors.

For a more detailed overview of the phased approach of the NAMA and a comprehensive description of the different phases, the outcomes, outputs and activities under each phase, please refer to Chapter 5 - Measures and Interventions.

8.4 Implementation Schedule

The following implementation schedule outlines the envisioned time schedule for the different Activities, Outputs and Outcomes of the NAMA. It shows the planned chronology of the Activities that will lead to the Outputs and Outcomes.

The main purpose of the implementation schedule is to provide information about the duration that is required to achieve the Outputs and the Outcomes. Where the Activities once begun will continue throughout the lifetime of the NAMA, the continuation over time is depicted in the same row but with a grey color.

For the Output C.2 "Broad promotion of FEVs beyond the scrappage program", it should be noted that the actual timeline will largely depend on the GOL and the willingness to establish national standards for emission limits and financial incentives for FEVs beyond the car replacement program under the NAMA. The timelines given for Output C.2 in the implementation schedule should be considered as indicative.

Figure 17: NAMA Implementation schedule

9   Measuring, Reporting & Verification

The aim of this section is to present the principles and general approach of the MRV system for the transport NAMA including data requirements and monitoring procedures for the four dimensions of GHG mitigation, sustainable development benefits, the implementation and transformation process, as well as the finance management/the progress of the NAMA.

The MRV system for the transport NAMA in Lebanon is as much as possible based on existing structures (i.e. available information, reporting structures, and the involvement of existing local stakeholders) and are built in a way that the majority of required MRV parameters are based on the information that would be available from the operation of the technical interventions anyway.

The principal objective of the Measuring, Reporting and Verification (MRV) system is to communicate progress and provide credibility for the interventions and measures under the NAMA. This should be done in a manner that is transparent and preferably internationally comparable with the efforts of other parties to the UNFCCC, such as in determining an appropriate baseline approach, identifying the methodology for the estimation of the emission reductions, etc. The MRV system should establish the environmental integrity of mitigation actions and ensure that no double-counting occurs.

The objective of MRV systems is to measure and ensure the effectiveness of the proposed interventions and measures, e.g. in meeting the required standards and expectations (also in providing proof of this for the stakeholders), to provide a credible and transparent approach for quantifying and reporting GHG emission reductions, sustainable development benefits and the support being provided. As the NAMA is an output based, supported program, the results of implementing the NAMA need to be considered in order to secure support and to ensure the that success of the interventions and measures is sustainable.

A MRV system for a NAMA should be comprehensive and reliable, but at the same time only as complex as necessary and as simple as possible. The MRV should not overburden the stakeholders involved and have negative implications for the success of the NAMA. This should be considered when designing and setting up an MRV system.

To build a sound monitoring system, the following criteria should be taken into account.

- Transparency: All processes should be documented; data flows should be verifiable.

- Cost-efficiency: Data gathering should be undertaken in a cost effective way by electronic and automatic recording procedures. Data should be gathered in a database.

- Sound institutional framework: Roles and responsibilities should be defined and a sound institutional structure applied.

- Comparability: Data collected and the results calculated from these data should be in line with approved methodologies, e.g. from the Clean Development Mechanism (CDM).

- Completeness: The data collected should be complete. Parameters neglected need to be explained.

- Data recording and data quality need to adhere to accuracy levels in line with industry practices or the approved methodologies from existing mechanisms like the CDM.

The successful achievement of each Activity or Output should be described and reported through MRV parameters. The parameters can either be qualitative (e.g. whether a measure was undertaken or not), or quantitative (e.g. amount of cars replaced). For each parameter, the frequency of reporting, the measurement method and the type of measurement need to be defined. Aside from the definition of the parameters, the process of data gathering and the

responsibilities for the MRV, including reporting of data and the verification processes, will be described.

9.1 Stakeholders' Tasks and Responsibilities

The MRV requirements and the related tasks and responsibilities of the different stakeholders involved in the MRV are described from top to bottom in this section. However, the responsibilities for the individual measurement parameters are listed in Table 44 in the Section 9.3.

Coordinating Entity (MOE/CCCU)

This CE is not a new organizational body but will rather be embedded in the CCCU (MOE). The CE will be responsible for the oversight of the NAMA's progress. This involves the preparation of reports on the success of the NAMA, which can then be shared with the International Partners. For some parameters, namely the key milestones in the NAMA, such as the ratification of relevant laws, emission limits, etc., the CE will measure and report the progress made.

Further, the CE will have an overview of the support which is granted for this NAMA and will interact with the NFF on the disbursement of these funds.

Under the NAMA the CE will need to report to international donors providing support to the NAMA and to the UNFCCC Secretariat about the progress of NAMA implementation (including GHG emission reductions). This transport NAMA will directly contribute to emission reductions in the transport sector, an important sector in Lebanon´s INDC, and it is therefore important that it be measured and reported on.

Implementing Entity

The IE assumes the central role in overseeing the physical implementation and operation and thus in measuring the performance of the NAMA with regard to the interventions. The IE is in direct contact with the car dealers, scrappage facilities and the BDL, and gathers the site specific data from them. The data collected will be stored in a central database, which will be operated and hosted by the IE. Already active players in the transport sector like the TTVMA will be given an active role in the IE and will support the operations with their experience.

The IE will receive the data sets from the operational entities in the NAMA (i.e. car dealers, scrappage facilities, etc.), aggregate the monitored data and process it, so that the aggregated data can be reported to the CE. Furthermore, the IE will monitor expenditures on implementation and operations and report them to the MOF, and supervise and coordinate the implementation of the interventions.

Central MRV database:

The IE will operate a central database in which all NAMA related information will be stored. This database needs to be capable of receiving continuous data readings from the operators of the relevant plants and facilities. Data on, for example, the achievement of milestones, the progress of the NAMA, the funding collected and disbursed, will be collected in this database, too. Automatic data verification procedures will be implemented in this database to allow for immediate reaction if data are erroneous or plants cease operation.

Besides the CE and IE, the MOF will have an oversight role with regard to the financial flows of the NAMA.

NAMA Finance Facility (NFF)

The NFF, which will act as the Finance Trustee for the NAMA and is responsible for the disbursement of funds and the management of national finance flows, will monitor these financial streams and inform itself about the use of the allocated funds. This information will be received directly from the stakeholders involved in the implementation (scrappage sites, car dealers) and also be reported to the IE.

Banque du Liban (BDL)

The BDL will be responsible for the management and distribution of the soft loans, and hence needs to make a record of the finance disbursed. Therefore, the BDL will clearly need to measure and report the related parameters. The measured data will be reported to the NFF which is to aggregate the data and will report it to the IE and the CE.

Car dealers

As the car dealers will have direct access to the emission thresholds of the newly imported and sold cars under the scrappage program, they will be obliged to measure these data and report it to the IE. They also shall be responsible for the monitoring and reporting of the emission limits of the cars.

9.2 Measurement

9.2.1 Parameters to be Measured

To provide an overview of the relevant parameters in this transport NAMA, Table 39 has been compiled. Parameters are numbered from M1 to M18 and abbreviated names have been allocated. Each of the parameters will further provide information on the achievement of the different goals of the NAMA, i.e. relevant for

1. emissions reduction (ER);

2. sustainable development (SD);

3. transformational change; and

4. the progress of the NAMA implementation.

Details of each parameter, including descriptions and the interval of reporting, are listed in the Annex 5: MRV Parameters.

Transport NAMA MRV Parameters			
	MRV parameter description	Name of parameter	Unit
Outcome A. Institutional framework for the scrappage program is established			
Output A.1 - A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating			M
M1	The Coordinating and Implementing Entity are defined, the operation of Coordinating Entity and Implementing Entity are financed	CE IE operational	-
Output A.2 - NAMA Finance Facility is established and operating			M
M2	The NAMA Finance Facility is defined, the operation of is financed	CE IE operational	-
M3	Monetary values of financial incentives on a national level disbursed	Incentives_national	USD
Outcome B. Scrappage program is prepared and incentive scheme defined			
Output B.1 - Eligibility criteria are assessed and defined & emission standards assessed and given legal force			M
M4	Emissions limit for newly imported cars legally enacted	limit_program_enacted	-
Output B.2 - Incentive scheme for the scrappage program is legally established and operating			M
M5	Amount replacement fees disbursed as part of the scrappage program	replacement fee	USD
M6	Value of soft loans issued for the purchase of FEVs as part of the scrappage program	soft loans	USD
M7	Monetary value of tax exemptions for newly imported FEVs as part of the scrappage program	exemptions	USD
M8	Number of taxis placing ads on their vehicle	ads	-
Output B.3 - The upgrading of participating scrappage sites is ensured			M
M9	List of eligible scrapage sites complying with the environmental standards is defined	Sites_list	-
Outcome C. Promotion and awareness building			
Output C.1 - Awareness creation for the scrappage program			M
M10	Money spent on trainings and marketing of the scrappage program	advertisement	USD
Output C2 - Broad promotion of FEVs beyond the scrappage program			M
M11	Environmental standard for all newly cars is legally implemented	limit_national_enacted	-
Outcome D. Scrappage program implementation*			
M12	Year of manufacture at scrappage	A_p	years
M13	Numbers of cars scrapped of plate colour p in year y	N_scrapped,p,y	-
M14	Numbers of cars imported and registered of plate colour p in year y	N_registered,p,y	-
M15	Number of FEVs joining the scrappage program of plate colour p in year y	N_FEV,p,y	-
M16	Emission factor of newly registered vehicles of plate colour p in year y	EF_FEV,p,y	gCO_2/km
M17	Annual mileage of NEW vehicles participating in the scrappage program of plate colour p in year y	D_NEW,p,y	km/yr
M18	Amount of additional fuel tax collected	fuel tax	USD
* the same monitoring parameters apply for both phases of the scrappage program			

Table 39: Full list of MRV parameters

The following sections discuss the selected monitoring parameters and what they indicate about the achievement of each of the four goals of the NAMA (emission reductions, NAMA progress, sustainable development, transformational change).

9.2.2 Emission Reductions

Emission reductions are achieved by the replacement of old and inefficient cars with new FEVs. One of the key objectives of the car scrappage program is the reduction in GHG emissions through the replacement of a fleet of old, polluting vehicles (older than 15 years) with new, small FEVs that have lower emission rates. These emission rates are assumed to be below a threshold which is legally authorized for participation in the scrappage program (recommended 128 g CO_2/km).

Parameters for the scrappage program (Outputs D.1 and D.2)

The parameters selected generally follow the approach described in Section 4.2. For both interventions, the pilot scrappage program (Output D.1) in Phase 1 and the extended scrappage program (Output D.2) in Phase 2, the monitored parameters are the same. It is, though, important to mention that each of the listed parameters needs to be recorded individually for RP and WP cars in each year of operation of the NAMA.

To arrive at the ER calculation, the change in the stock of cars in Lebanon will be calculated based on the total number of newly imported and registered cars in Lebanon, the number of cars participating in the scrappage program and the number of scrapped cars per year. Factors which change during the period of the scrappage program, such as the growth rate of the fleet ($g\_(p,y)$), the natural scrapping rate (s), and the share of natural scrapping occurring ($\mu\_(PRE/POST)$), will be calculated based the data monitored at the scrappage facilities, i.e. the age of the cars at scrappage and the numbers of cars scrapped.

MRV parameters for emission reductions in Phase 1 and Phase 2			
	MRV parameter description	Name of parameter	Unit
M12	Year of manufacture at scrappage	A_p	years
M13	Numbers of cars scrapped of plate colour p in year y	N_scrapped,p,y	-
M14	Numbers of cars imported and registered of plate colour p in year y	N_registered,p,y	-
M15	Number of FEVs joining the scrappage program of plate colour p in year y	N_FEV,p,y	-
M16	Emission factor of newly registered vehicles of plate colour p in year y	EF_FEV,p,y	gCO₂/km
M17	Annual mileage of NEW vehicles participating in the scrappage program of plate colour p in year y	D_NEW,p,y	km/yr

Table 40: Monitoring parameters used for the calculation of the emission reductions in Phases 1 and of the NAMA

9.2.3 Sustainable Development

To assess the specific impacts of the NAMA for sustainable development and environmental and social co-benefits, and to quantify these impacts, it is recommended that an Environmental and Social Impact Assessment (ESIA) be undertaken prior to the start of the NAMA (for further description see Section 5.1 Preparatory steps (prior to the start of the NAMA).

An ex-ante assessment of SD co-benefits focuses on the NAMA's contribution to the UN Post 2015 Sustainable Development Goals (SDGs). With the scope and activities as currently defined, the NAMA in the transport sector of Lebanon would directly contribute to the following SDGs:

- SDG 3: Good Health and Well-Being;

- SDG 7: Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for all;

- SDG 8: Decent Work and Economic Growth;

- SDG 11: Sustainable Cities and Communities;

- SDG 12: Responsible Consumption and Production;

- SDG 13: Climate Action;

- SDG 17: Partnerships for the Goals.

The main co-benefits of the NAMA under these SDGs are:

- Stopping the use of old and inefficient cars;

- Reduction of air pollution;

- Reduction of fuel consumption and hence reduction of GHG emissions;

- Reduction of casualties from accidents;

- Mobilization of additional financial sources; and

- Promoting environmentally sound technologies.

The NAMA will incorporate significant capacity building efforts to institute changes in policy and regulation, practices in the road transport sector and individual behavior (awareness creation).

Measuring and reporting on the meeting NAMA objectives and attaining SD co-benefits will be done via a process of national level reporting and verification through a national scheme, which is a part of the MRV system, as described in Sections 9.3 and 9.4.

Most of the SD co-benefits can be measured using the parameters listed and described in Section 9.2.1 (Table 39). As not all environmental impacts of transport sector practices are currently measured, reporting on the achievement of the SDGs will be partly based on the avoidance of these current practices. This holds especially true for the SDGs No. 3 (Good Health and Well-Being) and No. 8 (Decent Work and Economic Growth). SDG No. 11 (Sustainable Cities and Communities) will be measured indirectly by the reduction in air pollution caused by car traffic.

SDG No. 13 (Climate Action) can be measured directly, as the achieved emission reductions will be captured through the relevant MRV parameters. SDG No. 7 (Ensure Access to Affordable, Sustainable and Reliable Modern Energy Services for All) will be measured indirectly via the reduced fuel consumption and SDG No. 17 (Strengthen and Enhance the Means of Implementation and Global Partnership for Sustainable Development) will be measured indirectly via the amount of new FEVs subsidized by the scrappage program. Details of the selected monitoring parameters are shown in the table below.

Transport NAMA MRV Parameters: Sustainable Development				
Goal Aim	**Goal Target**	**Contribution of the Transport NAMA**	**Para-meter No.**	**Name of parameter**
3: Good Health and Well-Being	3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents 3.9: Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	Reduction of hazardous pollution of emissions resulting from private road transport by replacement of	M15 M16	Number of FEVs joining the scrappage program of plate color p in year y Emission factor of

Transport NAMA MRV Parameters: Sustainable Development				
Goal Aim	Goal Target	Contribution of the Transport NAMA	Para-meter No.	Name of parameter
		old cars by newer cars; increase the safety standards of cars with the potential to reduce the severity and number of injuries and deaths in road traffic		newly registered vehicles of plate color p in year y
7. Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All	7.3 By 2030, double the global rate of improvement in energy efficiency	Promotion of fuel efficient cars	M15 M5	Number of FEVs joining the scrappage program of plate color p in year y Value of replacement fees disbursed as part of the scrappage program
8. Promote Inclusive and Sustainable Economic Growth, Employment and Decent Work for All	8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services. 8.10: Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all	(1) Access to financial services for taxi drivers to replace their vehicles. (2) Increase of business at designated scrappage sites. (3) Car dealers and car insurance companies profit from additional car sales (4) Job creation within Coordination and IE and potentially within the private sector participants of the NAMA	M15 M6	Number of FEVs joining the scrappage program of plate color p in year y, focusing on the RP vehicles Value of soft loans issued for the purchase of FEVs as part of the scrappage program
11. Make Cities Inclusive, Safe, Resilient and Sustainable	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	(1) Improvement of air quality due to more environmental friendly cars (2) Reduction of vehicle breakdown due to renewed car fleet	M15 M11	Number of FEVs joining the scrappage program of plate color p in year y Environmental standard for all newly imported cars is legally implemented
12. Ensure Sustainable Consumption and Production Patterns	12.2 By 2030, achieve the sustainable management and efficient use of natural resources 12.11 Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance	(1) Increase of fuel efficiency due to the promotion of FEVs (2) Enactment of a Ministerial Decision on additional fuel tax as an income source	M15 M 18	Number of FEVs joining the scrappage program of plate color p in year y Amount of additional fuel tax collected

Transport NAMA MRV Parameters: Sustainable Development				
Goal Aim	Goal Target	Contribution of the Transport NAMA	Para-meter No.	Name of parameter
	with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities 12.8: Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature 12.a: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	for the NAMA	M10 M11	Money spent on training on and marketing of the scrappage program Environmental standard for all newly imported cars is legally implemented
13. Take Urgent Action to Combat Climate Change and its Impacts	13.2 Integrate climate change measures into national policies, strategies and planning. 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	(1) Enactment of emissions limits and/or environmental standards for private passenger vehicles (2) Raising awareness on fuel efficiency of vehicles	M4 M11	Emissions limit for newly imported cars legally enacted Environmental standard for all newly imported cars is legally implemented
17. Strengthen and Enhance the Means of Implementation and Global Partnership for Sustainable Development	17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection 17.3 Mobilize additional financial resources for developing countries from multiple sources 17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation 17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutually agreed	(1) Revenue collection through fuel tax (2) Mobilization of additional financial sources through the NAMA	M 18 M5 M7 M15 M15	Amount of additional fuel tax collected Amount of replacement fees disbursed as part of the scrappage program Monetary values of financial incentives disbursed on a national level Number of FEVs joining the scrappage program of plate color p in year y

Transport NAMA MRV Parameters: Sustainable Development				
Goal Aim	**Goal Target**	**Contribution of the Transport NAMA**	**Para-meter No.**	**Name of parameter**
	17.17: Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships			Number of FEVs joining the scrappage program of plate color p in year y, focusing on the RP vehicles

Table 41: Transport NAMA MRV Parameters reporting on Sustainable Development

9.2.4 Support/NAMA Progress

From the perspective of the International Partners (i.e. Donors), and from the Government's side, it is important to receive information about whether the domestically and internationally allocated funds and the support received are being properly used, and whether progress in the NAMA is being achieved. This can in most of the cases not be measured directly. The successful completion of certain Activities like capacity building, the establishment of new entities like the CE and IE, or the implementation of new laws and regulations will provide indications of the progress of the NAMA.

Progress on the NAMA progress can be observed based on defined parameters. The completion of a milestone is shown by the successful implementation of the related Activity. As an example, once the CE is operational, the milestone of CE establishment is achieved, which also provides the information that the related international support was used as intended. Monitoring parameters to record NAMA progress are provided in the table below.

Transport NAMA MRV Parameters relevant for the NAMA progress					
Para-meter No.	**MRV parameter description**	**Unit**	**Frequency of reporting**	**Means of measurement**	**Statement on the parameter**
M1	The CE and IE are established, the operation of CE and IE is financed	-	once upon completion	Qualitative	The CE and IE are cornerstones of the NAMA, and hence their establishment is important for reporting on the NAMA's progress
M2	The NAMA Finance Facility is established, the operation of it is financed	-	once upon completion	Qualitative	The NAMA Finance Facility is an important entity within NAMA operation and needs to be established
M3	Monetary values of financial incentives disbursed on a national level	USD	monthly	Counting	The financial incentives disbursed indicate the number of participants and hence the progress of the NAMA
M4	Emissions limit for newly imported cars is legally enacted	-	once upon completion	Qualitative	Only with legally enacted emission limits, can the NAMA be implemented
M5	Amount of replacement fees disbursed as part of the scrappage program	USD	monthly	Counting	The amount of replacement fees disbursed is a direct indication of the finance issued and hence the operation of the NAMA
M6	Value of soft loans issued for the purchase of FEVs as part of the scrappage program	USD	monthly	Counting	The amount of soft loans disbursed is an indication of private sector financial involvement
M7	Monetary value of tax exemptions for newly imported FEVs as part of the scrappage program	USD	monthly	Counting	Tax exemptions provided will show how many new cars have been imported and therefore also how the NAMA is progressing
M8	Number of taxi drivers placing ads on their vehicles	-	annually	Counting	Taxi drivers placing ads will contribute to advertising the NAMA

M9	List of eligible scrappage sites complying with the environmental standards is compiled	-	once upon completion	Qualitative	Without eligible scrappage sites the NAMA cannot be implemented and is hence a precondition
M10	Money spent on training on and marketing of the scrappage program	USD	monthly	Counting	Money spent on awareness/ marketing is important, to increase the number of participants in the scrappage program
M11	Environmental standards for all newly imported cars are legally implemented	-	once upon completion	Qualitative	The environmental standards for newly imported cars will show the success of the broad promotion of FEVs
M18	Amount of additional fuel tax collected	USD	monthly	Counting	Fuel tax will allow national expenditures to be reimbursed and will be responsible for continued implementation

Table 42: Transport NAMA MRV Parameters indicating progress on the NAMA

9.2.5 Transformative Change

The NAMA will be transformative in nature for the entire sector in which it takes place. This transport NAMA focuses on the transformation of the private passenger transport sector and more specifically on the promotion of FEVs. The NAMA is transformative in nature as it focuses on encouraging change in the direction of towards fuel efficiency and innovation in the transport sector. The NAMA further supports processes needed to transform current practices in the transport sector into more sustainable practices, by providing capacity building on emission standards, introducing environmental standards for scrappage sites, supporting legislation that supports environmental standards and their implementation, increased awareness raising and making use of financial (dis)incentives such as fuel tax. Furthermore, the NAMA and its MRV system will increase the knowledge and data quality within the transport sector and hence lead to improved transparency. This can help in the more effective application of policy instruments that foster Lebanon's sustainable development goals of Lebanon.

Parameters relevant to transformative change need to especially look beyond the NAMA. Hence for this transport NAMA, the legal implementation of Activities extending beyond the term of surviving the NAMA are of relevance. These are especially legal decisions, like the inclusion of emission limits in laws, and the continuation of practices beyond the NAMA, in which the successful implementation of NAMA measures play a major role. The relevant parameters describing this are listed in the following table.

Transport NAMA MRV Parameters relevant for Transformational Change					
Param eter No.	MRV parameter description	Name of parameter	Unit	Frequency of reporting	Statement of the parameter
M14	Numbers of cars imported and registered of plate colour p in year y	N_registered,p, y	-	Continuously	The number of cars replaced will renew Lebanon's car fleet, which will last beyond the NAMA
M15	Number of FEVs joining the scrappage program of plate colour p in year y	N_FEV,p,y	-	Continuously	The number of cars replaced will renew Lebanon's car fleet, which will last beyond the NAMA
M4	Emissions limit for newly imported cars is legally enacted	limit_program_ enacted	-	once upon completion	Emission limits implemented during the scrappage program will build the basis for future general emission limits and for transformational change
M11	Environmental standard for all imported cars is legally implemented	limit_national_ enacted	-	once upon completion	The implementation of a general emission limit for implemented cars will be the key monitoring parameter reporting on transformative change beyond

					the NAMA
M18	Amount of additional fuel tax collected	fuel tax	USD	Monthly	The increased fuel tax will help to finance the scrappage program and is necessary to help transform the sector. Revenue from the fuel tax collected will last beyond the NAMA and can be used to further transform the sector

Table 43: Transport NAMA parameters indicating transformational change

9.3 Reporting

Gathering of monitoring data will not itself provide sufficient information on the success of a NAMA. The data gathered have to be accumulated, processed and reported to the entity heading or coordinating the NAMA Activities. In principle, all monitored data need to be reported, unless they provide information which is relevant only within the originating entity. All monitoring parameters listed in the previous sections need to be reported. Otherwise, the data gathering is useless for the NAMA level.

The car dealers will record relevant data in accordance with the defined monitoring parameters. The IE will be the central authority receiving data from the car dealers. It will process and aggregate these data and report to the CE and the MOE on a monthly basis. Furthermore, the CE will record the completion of Outcomes and Outputs in the form of measures and interventions achieved. The MOF will report about the expenditures and revenues from the fuel tax to the MOE. Finally, the MOE will report on the progress of the NAMA to the Donors and UNFCCC Secretariat using reports filed by the CE file reports.

What needs to be reported?

All data which are relevant to assessing the progress of the NAMA need to be reported. This can either be qualitative data, such as whether certain milestones have been achieved, or quantitative technical data such as the emission reductions achieved. Further, financial data also need to be monitored.

When shall data be reported?

In this NAMA, no electronic or automated reporting can take place, as the single event of the replacement of one car is the key factor which needs to be tracked and will be reported periodically. Other events like the completion of certain milestones can be monitored whenever they happen, and reported periodically. The format of reporting can vary from automatically generated electronic records from a database via protocols and forms, to fully fledged reports issued for the attention of the donors.

Who shall report?

Responsibilities and reporting lines need to be defined at the beginning of the NAMA. A suggestion for these can be found in Figure 18: Reporting structure in the Transport NAMA.

How shall the reporting take place?

It is recommended that the data which accrue from the operation of the interventions of the NAMA be recorded electronically and stored in a database. Other data, which are reported by the provision of reports or through the reporting of milestones achieved, should also be entered in the database to ensure proper data management and to facilitate the reporting.

The reporting responsibility levels, the direction of the reporting and its periodicity are shown in the following figure.

Symbol	When	How
(yellow arrow)	Continuous reporting	Electronic data transfer
(blue arrow)	Bi-weekly reporting	Electronic forms
(red arrow)	Monthly reporting	Electronic forms
(purple arrow)	Bi-annual reporting	Internal reports
(brown arrow)	Reporting according to requirements	Reports
(black triangle)	according to requirements	External (third party auditor)
(red triangle)	Bi-annual verification	Internal, annually by a third party auditor
(blue triangle)	Monthly verification	Internal, when filling forms
(yellow triangle)	Continuous verification	Automized in database by parameters set

Figure 18: Reporting structure in the Transport NAMA

In terms of reporting frequency, it is suggested, that the IE will be in bi-weekly contact with the car dealers/scrappage facilities and the BDL, who will record and report the measured parameters continuously. The IE also reports to the CE in bi-weekly interval. The CE will report to the CCCU on a bi-annual basis. The NFF will also report monthly to the CE. The achievement of measures like capacity building, etc. should be reported on a bi-weekly basis by the IE to the CE. Reporting to the UNFCCC Secretariat or the International Partners will be done by the MOE (CCCU) according to the specific reporting requirements.

The car dealers and scrappage facilities will report consolidated data (e.g. weekly or monthly reports) either directly into the NAMA database, or in case this is not possible, via the IE. The IE will summarize these data for the reports to the CE at ministerial level. The CCCU will issue reports like the BURs and NCs to the UNFCCC and provide reports to the International Partners that

support this NAMA. The data gathered on emission reductions will help the MOE to improve the quality of the BURs and NCs.

The specific roles of the stakeholders including the parameters they need to measure and report on are summarized in Table 44. In general, measurement of overall NAMA coordination and its progress is done by the CE, whereas the IE will be responsible for the measurement and reporting of all physical interventions and the actual implementation of the NAMA Activities. This will include direct coordination with the car dealers, scrappage facilities and car owners. In addition, the measurement and reporting relating to financial parameters is overseen by the NFF. A close interaction and coordination among the stakeholders involved in the MRV is essential for the successful operation of the NAMA MRV system.

| Transport NAMA MRV Parameters | | Responsibilities for Reporting | | | |
Para-meter No.	Name of parameter	Name of parameter	Unit	Frequency of reporting	Means of measure-ment
Responsibility for data recording: BDL					
M6	Value of soft loans issued for the purchase of FEVs as part of the scrappage program	soft loans	USD	monthly	counting
Responsibility for data recording: Coordinating Entity					
M9	List of eligible scrapage sites complying with the environmental standards is defined	Sites_list	-	once upon completion	qualitative
M11	Environmental standard for all newly cars is legally implemented	limit_national_enacted	-	once upon completion	qualitative
Responsibility for data recording: Implementing Entity					
M13	Number of cars scrapped of plate colour p in year y	N_scrapped,p,y	-	continuously	counting
M14	Numbers of cars imported and registered of plate colour p in year y	N_registered,p,y	-	continuously	counting
M15	Number of FEVs joining the scrappage program of plate colour p in year y	N_FEV,p,y	-	continuously	counting
M16	Emission factor of newly registered vehicles of plate colour p in year y	EF_FEV,p,y	gCO_2/km	continuously	manufactu-rer specifications
M17	Annual mileage of NEW vehicles participating in the scrappage program of plate colour p in year y	D_NEW,p,y	km/yr	annually	reported
M8	Number of taxis placing ads on their vehicle	Ads	-	annually	counting
Responsibility for data recording: MOF					
M5	Amount of replacement fees disbursed as part of the scrappage program	replacement fee	USD	monthly	counting
M7	Monetary value of tax exemptions for newly imported FEVs as part of the scrappage program	exemptions	USD	monthly	counting
M10	Money spent on training in and marketing of the scrappage program	Advertisement	USD	monthly	counting
M18	Amount of additional fuel tax collected	fuel tax	USD	monthly	counting
Responsibility for data recording: Scrappage Facilities					
M12	Year of manufacture at scrappage	A_p	years	continuously	recorded

Table 44: Proposed responsibilities with regard to reporting

9.4 Verification & Evaluation

Verification of the reported parameters is necessary to ensure the correctness of the data reported on the NAMA and the level of emission reductions. The goal of verification is to ensure that the NAMA is operating as planned and that the MRV system is being implemented as planned.

Verification also ensures that emission reductions and SD benefits are real and measurable. Verification can be done internally, or via an independent third party auditor.

In this NAMA it is suggested internal quality assurance (QA) and quality control (QC) measures be undertaken by the external and independent third party auditors who will verify the measured and reported data and information. Third party auditors should be accredited entities. They can be entities accredited under the CDM or under another accreditation system agreed upon by the GOL and the International Partners supporting the NAMA. Verification also ensures that emission reductions and SD benefits are real and that the NAMA is reaching its overall targets.

The final verification procedures will be based on requirements set by the CE, the IE and the International Partners supporting the NAMA.

QA/QC procedures will be implemented at the operational level of the NAMA, whereas third party audits will address the managerial level of the NAMA, the MRV database and reporting at the level of the IE and the CE. Furthermore, external auditing should check the functioning of QA/QC procedures and may undertake spot-checks on the measured and reported data.

9.4.1 QA/QC Procedures (Internal)

QA/QC procedures are necessary to mitigate risks, to ensure accuracy and correct measurement and reporting, and to reduce risks of error during verification. In this proposed NAMA, the QA/QC procedures will be applied at each level of the MRV system under the governance of the CE. Checks will be undertaken at the levels of the car dealers and scrappage sites, the IE and the NFF.

QA/QC undertaken on level of car dealers and scrappage facilities

The IE will periodically cross-check the data gathered from the car dealers and scrappage facilities in the database and spot-check the physical records of the car dealers on a monthly basis.

QA/QC undertaken by the IE

Internal checks on the technical interventions, looking at the performance of equipment and procedures, on the measured and reported data, etc., should be undertaken on a regular basis. Furthermore, the central MRV database operated by the IE should be assessed regularly. Automatic plausibility checks will help ensure correct data inputs and data processing within the database. A frequency of quarterly checks will ensure that loopholes, mistakes and missing data can be avoided.

The IE reports shortcomings it has discovered to the CE. If necessary, the CE can then intervene.

QA/QC undertaken by the CE

The CE shall ensure the overall performance of the NAMA and should oversee the reporting procedures of the IE and the NFF. The CE reports shortcomings it has discovered to the MOE, which will assist the CE in fixing the issues identified.

9.4.2 Verification Procedures (External)

Third party verification is necessary to ensure the credibility of the reported results to the International Partners and other international players. External verification may take place in coordination with the reporting requirements agreed upon with the International Partners and the reporting requirements of Lebanon to the UNFCCC Secretariat (in the BURs, NCs, NDC). The latter are relevant, as reports about domestic emission reductions and achievements in sustainable development and transformational change, are part of these communications. This reporting to the UNFCCC Secretariat is mandatory at least on a biennial basis and hence it would make sense to also schedule third party verification of the NAMA biennially. This verification should be scheduled

well in advance of the international reporting requirements, so that any necessary corrections can be addressed prior to the development of such report. A decision on this, though, is up to the MOE/CCCU.

Each verification will consist of:

- a desk review of documents such as verification reports and underlying documents/data;

- a site visit/interview of key stakeholders;

- drafting of the verification report;

- provision of feedback on the report by the CE; and

- the finalization of the verification report.

10   Risk Management

This section describes potential risks to achieving the Outcomes of the NAMA and how the NAMA set-up was designed to mitigate these risks. The risks described do not include risks due to force majeure or risks that would have an impact any other large project in the country (i.e. political unrest, refugees, war). The risks described are rather related to regulatory, institutional, financial or operational aspects of the NAMA.

The risks will be qualitatively assessed according to the expected seriousness of the risk (low, medium, high) and to achieving the Outcomes of the NAMA. Besides outlining proposed and planned Activities and processes within the NAMA that were considered capable of mitigating the risk, potential opportunities for tracking and mitigating the risks may be described, if appropriate.

The main risks described for the road transport NAMA in Lebanon are summarized in the table below. There have been several risks identified, which are listed in the table from A to I. Besides being named, each risk's potential impact on the NAMA, including possible negative impact, is briefly described. The three columns in the table describe 1) the specific measure & Outcome of the NAMA that would be impacted by the risk; 2) the proposed and planned Activities and risk mitigation measures; and 3) proposed and planned means to assess and track the risk during the NAMA lifetime. The level of seriousness (low, medium or high) is qualitatively assessed based on considerations like its potential impact on the NAMA Outcome, required pre-conditions for mitigating the risks and already planned and proposed risk mitigation measures considered under the NAMA design.

Identified Risks and Risk Mitigation Options

Risk A: [High] Delay of political and regulatory decisions (e.g. for emission limits, incentive scheme)
Since the setting-up of an appropriate incentive scheme for car owners (for providing replacement subsidies) is essential for the successful implementation of the car scrappage and replacement program, any delay or non-approval of the incentives for political reasons, would delay the start of the scrappage program and could risk the whole intervention under the NAMA.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome D "Scrappage program implementation"	The main Ministries responsible for the road transport sector and for the NAMA planning, finance and implementation have been regularly consulted and were directly involved and informed during the design and planning of the NAMA (see Section 2.2). The NAMA's scope is designed in a way to best reflect and mitigate this risk, by establishing the institutional framework that is necessary for the coordination of the NAMA and by providing targeted institutional, legal and technical support to the key institutions and Ministries responsible (Output B1 and B2).	1. The stepwise approach and the progress of the NAMA with all Activities and their completion will be measured and reported under the MRV scheme on a continuous basis. This will allow to intervene at any given point in time, in case delays are being detected.

Risk B: [Medium] Selected eligibility criteria for old cars would be insufficient
This risk is relevant for both the red plate and the white plate vehicles. The selection of appropriate eligibility criteria (EC) will ensure that the resources spent on the scrappage program will result in maximum fuel savings, emission reductions and co-benefits, and thus the effectiveness of the NAMA. In addition, the EC should ensure that the participation rate in the scrappage program in terms of how many cars are replaced, meets expectations.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome B " Scrappage program is prepared and incentive scheme defined" and Outcome D "Scrappage program implementation"	The Activity B.1.1. includes a detailed assessment of appropriate eligibility criteria. This assessment will be one of the first Activities in Phase 1 of the NAMA. This assessment will be done for red plate and white plate vehicles separately to ensure appropriate eligibility criteria for the different target groups of the scrappage program. The pilot programme under Phase 1 will also assess the appropriateness of the eligibility criteria in practice and under real conditions. This experience can be used for the extended roll-out of the scrappage program under Phase 2.	1. The definition of eligibility criteria will be conducted in close consultation with the relevant stakeholders experienced in the sector. 2. The completion of Activity B.1.1 will be measured and reported under the MRV scheme. 3. The eligibility criteria will be reassessed during the pilot scrappage program (2019-2020) when they will be applied under real conditions.

Risk C: [Low] Car dealers, as important stakeholders and potential multipliers, would not be aware of the scrappage program
In case the car dealers would not be interested in participating in the NAMA for whatever reasons, a very important link between the NAMA institutions and the car owners (as key participants) would be missing or not function.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome C "Promotion and awareness building"	The car dealers have been identified as a key multiplier for the scrappage program and as a link to the car owners for the replacement of cars. Therefore, Activity C.1.1 is focusing on awareness creation for the car dealers and takes the needs and experience from car dealers into consideration when developing capacity building modules on awareness creation. This Activity will start in Phase 1, well in advance of the start of the pilot scrappage program and the extended scrappage program under Phase 2.	1. The progress of capacity building and awareness creation will be measured under the MRV 2. The NAMA under Phase 1 will include several stakeholder interactions in which car dealers are included in the discussions, to make use of their experience when designing the incentive scheme for the car owners but also to assess the general attitude of the car dealers towards the scrappage program under the NAMA.

Risk D: [Medium] Low or no willingness of car owners to participate in the scrappage programme.
Without the participation of the car owners in the scrappage program, the NAMA will not be successful. As this aspect is carefully addressed in the first Phase of the NAMA, through different measures, the risk is assumed to be medium.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome B " Scrappage program is prepared and incentive scheme defined" and Outcome D "Scrappage program implementation"	It is recommended that comprehensive survey of car owners covering their willingness to participate in the car scrappage and replacement program and their willingness to pay for FEVs. Under the NAMA, right from the start there are different Activities that will help mitigate the risk described. Besides the assessment and development of appropriate eligibility criteria for the scrappage program (Activity B.1.1), there will be education and awareness creation activities for car dealers and car owners to increase awareness of the benefits for car owners from participating in the program (Output C.1). The most relevant measures for ensuring willingness to participate is the assessment and development of appropriate incentive schemes (including financial incentives) for car owners. These incentive schemes will be carefully assessed and developed in Phase 1 of the NAMA (Output B.2). Furthermore, regulatory measures under Output B.1 (Emission Standards) and Output B.2 (Increase in Fuel Tax) will provide additional incentives for car owners to switch to FEVs.	1. Surveys will be conducted to assess the willingness of car owners to participate, and to assess awareness of the benefits of the scrappage program under the NAMA 2. The NAMA MRV system will measure the progress of the Activities described on a continuous basis to ensure that the car dealers are trained, and the incentive scheme is being developed and ready to be provided. 3. During the pilot scrappage program an assessment of the participation rate and the appropriateness of the incentive scheme will be conducted. This information can then be used to further increase the willingness to participate in the extended car scrappage program in the NAMA Phase 2.

Risk E: [Medium] Incentive scheme for car owners not appropriate or insufficient
In case the incentive scheme (including financial incentives) for car owners to participate in the scrappage program is not appropriate, the willingness to participate would not be there and the scrappage program would fail and so would the NAMA, as the scrappage program is the key Outcome of the NAMA leading to GHG emission reductions and sustainable co-benefits.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome B " Scrappage program is prepared and incentive scheme defined" and Outcome D "Scrappage program implementation"	As this has been identified as a bottleneck for the success of the NAMA, different Activities are being planned under the NAMA to assess, identify and develop the most appropriate incentives for car owners. This will be a core focus of the NAMA under Phase 1. The approach to developing an incentive scheme includes the involvement of the car owners (through surveys), both red plate and white plate, and the development of a bundle of incentives that will be applied jointly together. The financial incentives will include replacement fees, soft loans, tax exemptions and income from advertisements (only for red plate vehicles). The different stakeholders will be closely involved in the process of defining the incentives for the car owners. For the soft loans, for example, the local banks as well as potential international loan or guarantee providers, will be involved in the process. In addition, in the pilot programme under Phase 1 the full incentive scheme will be applied under real conditions. In case adjustments are required, this can be done prior to the extended roll-out of the scrappage program under Phase 2.	1. The MRV system will track the progress if identifying and developing the incentives described under the incentive scheme. 2. The involvement of relevant stakeholders (e.g. local and commercial banks for assessing the soft loan conditions) will be tracked to ensure that the incentives are most appropriate for being successful. 3. During the pilot scrappage program an assessment of the participation rate and the appropriateness of the incentive scheme will be conducted.

Risk F: [Low] Negative environmental impacts due to extended scrappage of old cars

The NAMA has the objective of supporting positive development and leading to sustainable co-benefits. Any negative impacts on the environment need to be avoided. When the extended scrappage of old cars occurs under the NAMA, it must be ensured that the environment is not negatively impacted by the scrappage program and by improper disposal of waste.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome B " Scrappage program is prepared and incentive scheme defined" and Outcome D "Scrappage program implementation"	The NAMA comprehensively takes this risk into consideration and provides risk mitigation measures by including a separate Output (B.3) under the Outcome B that addresses specifically safety conditions and the improvement of environmental standards on the scrappage sites participating in the NAMA. This will include financial support, technical support and capacity building measures for the scrappage site operators. Currently only a minority of scrappage sites operate under any comparable guidance or support.	1. The MRV will track which scrappage sites are identified for participation in the NAMA and whether they have been trained according to minimum environmental (to be defined) and safety standards. 2. Whether the participating scrappage sites are complying with the environmental standards defined under the NAMA will be measured and verified.

Risk G: [Medium] Institutional framework and management structure not in place or insufficient

There is a risk that the CE and the IE, which are intended to play a central and critical role for the coordination and management of the NAMA, will not have the capacities and staff to fulfil the tasks required. In addition, there is a risk that the coordination of different Ministries and stakeholders could be difficult as a result of limited capacities and capabilities.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome A "Institutional framework for the scrappage program is established" "	Due to the awareness of this risk, the NAMA has included a separate Outcome (A) with two specific Outputs that will help to support the identification, establishment, staffing, training and operation of the CE and the IE. The bulk of that support will be provided within the first two years of the NAMA to ensure that the coordination and management systems are functional and operational by the time the pilot scrappage program starts (2019).	1. The whole process of setting up the CE and the IE will be tracked under the MRV system of the NAMA, including the capacity building provided, staff hired and salaries paid.

Risk H: [Medium] Fees and funds obtained from the scrappage program not fully attributed to the NAMA

There is a risk that the money obtained from the financial mechanisms implemented (i.e. customs, fuel tax) will not be fully applied to finance the incentives provided under the NAMA to extend the car scrappage program.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome D "Scrappage program implementation"	With the planned setting up of and support for the NFF under the MOF, a specifically assigned institution to manage the funds under the NAMA is being established, supported (through capacity building) and operated. Furthermore, the MRV system developed for NAMA includes the measurement, reporting and verification of all financial flows within the NAMA.	1. The process of establishing, supporting and operating the NFF as well as all financial flows in the NAMA will be tracked under the MRV system of the NAMA.

Risk I: [Medium] Increase of fuel tax not politically implementable
The increase of fuel tax is one of the key financing sources for the national finance provided to the NAMA. In case an increase of the fuel tax in the expected amount would not be possible for whatever reason, a significant financing source for domestic support of the NAMA would be at risk.

Measure & Outcome Impacted	Proposed and Planned Risk Mitigation Measures	Proposed and Planned Means to Track the Risk
Outcome B " Scrappage program is prepared and incentive scheme defined" and Outcome D "Scrappage program implementation"	In Lebanon a fuel tax already exists, somewhat reducing the risk, as the fuel tax does not need to be introduced as a completely new concept. People are already used to the tax. For ensuring that the slight increase of the fuel tax is legally sound and implementable, the NAMA under Output B.2 and Activity B.2.5 and B.2.6 will provide political and legal backing to the decision makers in favour of implementation of the legal basis for an increase of the fuel tax. These activities will already start in the early phase of the NAMA (under Phase 1).	1. The process of establishing the legal basis for the increase in fuel tax will be tracked under the MRV system of the NAMA. 2. The status of the implementation will be reported to the CE on a regular basis.

Table 45 Potential risks and risk mitigation measures

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Annex 1: NAMA Measures & Interventions and their Outputs, Activities and Inputs

NAMA Measures & Interventions and their Outputs, Activities, and Inputs			Measure/ Intervention (M/I)	Inputs
Outcome A. Institutional framework for the scrappage program is established				
Output A.1 - A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating			M	
Activities	A.1.1	The CE is defined, staffed and is operating		Finance
	A.1.2	The CE is trained on relevant issues related to their role and responsibility under the NAMA		Capacity-building
	A.1.3	The IE is defined, staffed and is operating		Finance
	A.1.4	The IE is trained on relevant issues related to their role and responsibility under the NAMA		Capacity-building
Output A.2 - NAMA Finance Facility is established and operating			M	
Activities	A.2.1	An agreement with the Financial Trustee (FT) is established		Capacity-building
	A.2.2	The Grant Subsidy Scheme is established and operational under the FT		Finance
Outcome B. Scrappage program is prepared and incentive scheme defined				
Output B.1 - Eligibility criteria are assessed and defined & emission standards assessed and given legal force			M	
Activities	B.1.1	Eligibility criteria of old cars to join the scrappage program are defined		Capacity-building
	B.1.2	Appropriate meaningful emission limits for the newly imported cars under the scrappage program are defined		Capacity-building
	B.1.3	The emission limit is legalized by enacting a law for FEVs joining the scrappage program		Capacity-building, Finance
Output B.2 - Incentive scheme for the scrappage program is legally established and operating			M	

Activities	B.2.1	The legal basis for replacement fees is established and financing of fees is provided		Capacity-building, Finance
	B.2.2	The legal basis for soft loans is established and financing of loans is provided		Capacity-building, Finance
	B.2.3	The legal basis for tax exemptions is established and the exemptions are provided		Capacity-building, Finance
	B.2.4	The framework for advertisements on taxis is established and financing of the fee is provided		Capacity-building
	B.2.5	Legal and political support for assessing the legal basis for the fuel tax increase is provided		Capacity-building
	B.2.6	Implementation of legal basis for fuel tax increase		Capacity-building, Finance
Output B.3 - The upgrading of participating scrappage sites is ensured			M	
Activities	B.3.1	Environmental minimum standards for the designated scrappage sites are defined		Capacity-building
	B.3.2	Eligible scrappage sites are identified and nominated		Capacity-building
Outcome C. Promotion and awareness building				
Output C.1 - Awareness creation for the scrappage program			M	
Activities	C.1.1	Educational and awareness-building resources for car dealers will be developed and car dealers will be equipped to support the program		Capacity-building
	C.1.2	Marketing resources to promote the scrappage program will be developed and a marketing campaign launched		Capacity-building
Output C.2 - Broad promotion of FEVs beyond the scrappage program			M	
Activities	C.2.1	Appropriate emission limits for newly imported cars are defined on a national level		Capacity-building
	C.2.2	Emission limits for newly imported cars are legally established		Capacity-building, Finance
	C.2.3	Support is provided to design financial incentives for the purchase of FEVs on a national level		Capacity-building
Outcome D. Scrappage program implementation				

Output D.1 - Pilot scrappage program is implemented			I	
Activities	D.1.1	Low-efficiency red plate cars are scrapped and FEVs are purchased under the pilot program		Finance, Technology
Output D.2 - Extended scrappage program is implemented			I	
Activities	D.2.1	Low-efficiency red plate cars are scrapped and FEVs are purchased under the extended scrappage program		Finance, Technology
	D.2.2	Low-efficiency white plate cars are scrapped and FEVs are purchased under the extended scrappage program		Finance, Technology

Annex 2: Stakeholder Consultations during the Design Phase

List of relevant stakeholder consultations	
Stakeholder	Brief summary of consultation and outcomes
Association of Automobile Importers	Several meetings were held with *Mr. Selim Saad*, Advisor of the Association of Automobile Importers in Lebanon. Mr. Saad provided the following information and data: - Description of the taxation scheme and tax rates on cars imported into Lebanon - This information was subsequently used in the design of the scenarios (car prices, incentives, taxes) in the surveys that were conducted. - Fleet age and composition for cars registered in 2013 (both red plate and white plate) - These data (or more updated and detailed data from 2014) can be used in the calculation of emissions from the vehicular fleet in Lebanon. - The text of Decree 8941 (enacted in 2012) which aims to incentivize the purchase of public transport vehicles and freight vehicles abiding by certain specifications - The development of the transport NAMA will be framed in line with this decree for red plate vehicles. - A summary of a study on the health and environmental problems related to vehicles that run on diesel after referring a draft law to Parliament related to importing vehicles that run on green diesel and natural gas per Decree 8942 dated 28/3/2012 Mr. Saad was also of the opinion that the future of cars in Lebanon lies not with hybrid cars (due to price and road network/traffic conditions) but with gasoline fuel efficient vehicles and/or down-sized engines[18], and that the best option for reducing congestion is to operate a national mass public transport system. He believes that the current registration fee structure does not encourage people to renew their cars (it could for instance be reduced and the difference made up with a higher custom fee), and that a mechanism should be set in place to ensure that all cars get inspected and that *Mécanique* fees are paid. After the Inception Workshop (see below), another meeting took place with *Mr. Selim Saad*. The main purpose of the meeting was to inquire about the potential role of car dealers in the scrappage program and the steps that the association could take to simplify the scrappage and replacement process for program participants. The main conclusions and suggestions were: - Car dealers cannot provide the car loan guarantee for program participants (even though some of them currently do so). - In principle, car dealers can carry out the following operations on behalf of the program participants: designating the old car as out of circulation (*ankad*), registration of the new car, applying for a bank loan, and receiving the cash-for-scrappage sum and discounting it from the new car price. - Car dealers cannot store the old cars in their yards or deal with theirscrappage. - Mr. Saad suggested starting the scrappage process for old cars at Beirut Port for better government control (by the Customs office). Mr. Saad then made arrangements for the to visit Diametal scrappage facility and meet with its owner, Mr. George Salame (see below).
Ministry of Public Works and Transport (MOPWT)	One meeting was held with *Mr. Abdul Hafiz Kayssi* (Director General of MOPWT) and *Ms. Elham El Khabbaz* (Engineer at MOPWT). They gave an overview of an MOPWT plan for a pilot project involving the operation of an improved bus service in Greater Beirut Area (whose finances have not been secured yet) as well as future plans related to light and heavy rail. They were of the opinion that public transport is the main solution to reduce reliance on private vehicles in Lebanon (with a target goal of 75% of the population relying on public transport in the future instead of the current 25%); they did not show great support for giving incentives given to white

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[18] Cars with high HP but small displacement (e.g., 2000cc Turbo).

	plate vehicle owners. They also thought that hybrid cars are not suitable for Lebanon due to their high purchase price and to Lebanon's topography.
Traffic, Trucks and Vehicles Management Authority (TTVMA)	A meeting was held with *Ms. Hoda Salloum* (Director General) and *Mr. Ayman Abdul Ghafour* from the Traffic, Trucks and Vehicles Management Authority[19] (TTVMA). Information was provided about the structure of the *mécanique* fee and the registration fee and the role of the Ministry of Finance in setting those fees. The TTVMA does not have a role in influencing these fees or in providing incentives/disincentives on car purchase. A mention was made of an attempt to revamp the taxi fleet in North Lebanon in 2005, and TTVMA suggested that we meet with *Mr. Bassam Tleis* (Order of Red Plates Drivers) and with MP *Mohammad Kabbani* to discuss the transport NAMA. The TTVMA may be able to provide data about the number of current vehicles registered in Lebanon, broken down by various attributes (e.g. red vs. white plate, year of manufacture, engine size, etc.). Such data were requested by the MOE, and the data that have been received includes the number of vehicles registered for each of the years from 2010 to 2014 (for white and red plate vehicles separately) broken down by year of manufacture and horsepower.

As a follow up to the Inception Workshop (see below) and to support the MRV of the Transport NAMA, another meeting was held with TTVMA. They explained what and how data are uploaded to their database in connection with the annual vehicle inspection, the *Mécanique*. The odometer reading and the combustion efficiency of cars are not recorded, and the inspection history of a car is not linked to the TTVMA database. It was by the NAMA consulting team suggested recording the odometer reading during vehicle inspection, which will be useful for the NAMA's MRV system. They indicated that this is feasible, and informed the team that an additional eight inspection facilities are planned for the near future. Information was also obtained about the process and documents needed to designate a car as out of circulation (*ankad*). |
Banque du Liban	One meeting was held with *Dr. Youssef El-Khalil*, Head of Financial Operations Department at Banque du Liban (BDL), who explained that the role of BDL in the vehicle scrappage program would be to waive commercial banks that offer soft car loans (on the replacement cars) from the reserve requirements, thus decreasing the effective interest rate on car loans to about 0-3%. A cost-benefit analysis and a well-formulated NAMA package will need to be presented to BDL, based on which a circular would be issued to banks to seek their interest in offering soft loans on car purchases. It was suggested that the team meet also with the Ministry of the Interior and Municipalities, car dealers, commercial banks and insurance companies.
Order of Red Plates Drivers	A meeting was held with *Mr. Bassam Tleis*, Head of the Order of Red Plates Drivers. Mr. Tleis described a law in the 1990s that incentivized taxi drivers to replace their cars. He believes that taxi drivers' main issue would be the difficulty in paying the loan for the new car, and that soft loans should be provided with low interest rates and long repayment periods. He also believed that the scrappage program and incentives should target only red plate car owners and not white plate car owners, as the former are more in need of new cars to sustain their business. Mr. Tleis mentioned that any eligibility guidelines/conditions that this study recommends for the replacement car be communicated to him for subsequent discussion with Parliament's Committee for Infrastructure and Transport.
Scrappage Facility EVANDY	EVANDY, a scrappage facility was visited. It is located in Sad El Bauchrieh on Mount Lebanon, where we met with its owner *Mr. Ahmed El Set*, who explained and demonstrated the steps involved in scrappage. According to Mr. El Set, there are about 200 scrappage facilities in Lebanon,[20] which in his opinion would be sufficient to scrap all cars in Lebanon whose year of manufacture is before 2000, in a period of five years or less. On average, EVANDY receives 15-20 cars for scrappage per week. However, the facility can scrap 20-30 cars/day. Car owners who deliver their cars to the scrappage facility receive between $150 and $400 (depending on prevailing markets prices for metals). Currently, oil, tires, batteries and plastics are sold locally, while copper, iron and aluminum are sold abroad, and furniture and glass are disposed of in municipal bins. Mr. El Set believes that if a vehicle scrappage program is implemented in Lebanon, the inspection of old cars should take place at a facility different from the scrappage facility mainly because of space limitations. He also believes that more rigorous procedures should be implemented at all scrappage facilities to ensure proper drainage of oil, proper recycling of batteries, etc.
Ministry of Finance (MOF)	As a follow up also to the inception workshop, two meetings were held with MOF. The first meeting was with *Mr. Talal Salman* (adviser to the minister) in the presence of the CCCU. The main purpose of the meeting was to discuss strategies for sustaining the financing of the NAMA over multiple years, given that the NAMA

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[19] هيئة إدارة السير والمركبات والآليات

[20] The team cannot verify this estimate which seems exaggerated.

	grant (in the range of US$15 million) may be insufficient to achieve significant market transformation. The first option was to levy an additional tax on gasoline, part of which could be used for financing the scrappage program. This option was already being considered by the MOF and was therefore potentially feasible but hinged on the price of gasoline being low. The second option was to increase the *mécanique* fee by a small amount that would go towards financing the scrappage program; further information was to be sought regarding the mechanism for increasing the *mécanique* fee[21]. The third option, considered by the MOF to be politically not feasible, was to increase the tax on the purchase price or registration of midsize and large cars. When discussing ways to overcome the difficulty that taxi drivers face in getting access to car loans from banks due to the fact that they don't have a fixed income, Mr. Salman suggested that the team meet with the Investment Development Authority of Lebanon (IDAL) or the International Finance Corporation (IFC) to discuss the potential for providing guarantees for taxi drivers so that banks can give them car loans at low interest rates. The second meeting was with *Mr. Fadi Rahal* (Head of the Accounting Department at MOF, TVA building) to inquire about the mechanism for implementing the exemptions proposed in the scrappage program, the transfer of the cash-for-scrappage amount from the MOF to program participants, and the mechanism for increasing the *mécanique* fee as mentioned above. Exemptions on the purchase of new replacement cars in the scrappage program would be enacted by law and several implementation decrees. The transfer of the cash-for-scrappage amount from the MOF to program participants would require a dedicated MOE account set up by the MOF at Banque du Liban (BDL) for managing the NAMA grant and other sources of financing. The cash-for-scrappage amounts would then be directly transferred from BDL to the car loan bank accounts of the program participants, to be used as down payments on the new replacement cars. The mechanism for increasing the *mécanique* fee would be through the budget law in Parliament. The suggested increase and its use would be stated in the law.
Scrappage Facility Diametal	A site-visit to the scrappage facility Diametal was conducted. It is located in Mkalles. Its owner, *Mr. George Salame*, explained and demonstrated the scrappage process and commented on the proposed scrappage procedure under the NAMA. Diametal has a steel shredder (reportedly the only one in Lebanon) and is licensed by the Ministry of Industry as a scrappage facility. The current demand for car scrappage is very low given the relatively low scrappage value compared with that offered a few years ago. Mr. Salame explained that a government proposal similar to the current scrappage program was made five years ago whereby old cars would be cut in half at Beirut Port, but the main concern back then was the additional transport cost that would be incurred to transfer these cars to the scrappage facilities. He was also of the opinion that the scrappage process would be much faster and cheaper if conducted at the scrappage facilities directly (without being processed first at the port), with an office for Customs inspectors set up at the scrappage facilities for control of the process. In a subsequent communication, Mr. Salame provided a set of minimum requirements that he believes should be put in place to ensure a sustainable operation at Lebanon's scrappage facilities
International Finance Corporation (IFC)	The CCCU met with *Mr. Thomas Jacobs*, Senior Country Officer at IFC, to discuss the proposed NAMA in the transport sector including the market transformation of the existing car fleet in Lebanon through the car scrappage program and whether the IFC would support such an initiative, in terms of guaranteeing loans to low-income households (i.e. taxi drivers) willing to buy a new car under the scrappage program. Mr. Jacobs mentioned that although the IFC does not have technical expertise in this field, it would help guarantee car loans given that commercial banks are willing to do so. He also suggested contacting microfinance institutions such as Al Majmoua.
VITAS	As a follow up to the IFC meeting and through Mr. Jacobs, the CCCU met with Mr. Ziad Halaby, General Manager at VITAS, a leading non-banking financial institution registered with Banque du Liban in 2007, to discuss whether VITAS would support the car-for-scrappage program, by providing car loans to taxi drivers. Mr. Halaby said that VITAS would grant car loans to Taxi drivers. However, he stressed that interest rates on such loans would be high (around 13%) given that VITAS (i) would bear the risk of default and (ii) would finance its operations by borrowing from commercial banks, namely FransaBank, Credit Libanais, and Jamal Trust Bank. If required, VITAS could partner with other banks, such as Audi Bank and BLOM Bank. Mr. Halaby also proposed that the Ministry of Tourism be involved in the car-for-scrappage program, given the role of taxis in this sector.

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[21] Based on vehicle age and Horse Power (i.e. For a vehicle manufactured between 2012 and 2013 and a HP between 1-10, the *mécanique* fee is LL325,000-2013 - MOF Data)

Transport NAMA Inception Workshop

An inception workshop was held for the transport NAMA on 9 June 2015 at the Ministry of Environment (MOE). The purpose of this workshop was to present an overview of the NAMA process and the preliminary scenarios, the market survey results, preliminary GHG calculations and similar experiences in Europe. This workshop was designed and conducted in coordination with G+H International, the backstopping consultant, represented by First Climate (FC).

Stakeholders

The CCCU invited several stakeholders from different public and private organizations as well as non-governmental organizations (NGOs) implementing transport related activities in Lebanon. A total of 27 individuals attended the workshop. They included the MOE/UNDP Team (CCCU), the International Backstopping Team (FC), the Presidency of the Council of Ministers, the Ministry of Finance, the Ministry of Public Works and Transport, Banque du Liban, the Traffic, Trucks and Vehicles Management Authority under the Ministry of Interior and Municipalities, the Lebanese Petroleum Administration, the Association of Car Importers, the SISSAF-EU Project, an auto dealer (IMPEX), a commercial bank (BLOM Bank), a scrappage facility (EVANDY), two NGOs (Train/Train and CIH) and the ECODIT Team.

List of Participants

Karim El Jisr, ECODIT
Rola Eido, BLOM Bank
George Xanthakos, SISSAF – EU Project
Simon El-Hachem, SISSAF – EU Project
Hisham Malaeb, Strategic Planning Unit –Directorate General of Land and Marine Transport - Ministry of Public Works and Transport
Ahmad Osman, StREG – Project at the Ministry of Environment
Jad Stephan, LAU
Vahakn Kabakian, UNDP/Ministry of Environment
Mary Awad, UNDP/Ministry of Environment
Sara Rayes, UNDP/Ministry of Environment
Ahmad Elset, Evandy
Elias Maalouf, Train/Train NGO
Souraya Srage, Banque du Liban
Edwin Saliba, Ministry of Finance
Jihan Seoud, UNDP jihan.seoud@undp.org
Rola Sheikh, UNDP/Lebanese Petroleum Administration
Ayman Abdel Ghafour, Traffic Management Organization
Capricia Chabarekh, ECODIT
Sélim Saad, Association des Importeurs d'Automobiles
Barla Vieli, First Climate
Maya Abou Zeid, ECODIT
Lea Kai Aboujaoudé, UNDP/Ministry of Environment l.kai@moe.gov.lb
Izzat Alameddine, UNDP/Presidency of the Council of Ministers/Office of the Prime Minister
Naji Tannous, ECODIT
Christine Abillama, Civic Influence Hub
Charbel Mansour, LAU
Khaled Ghraizi, IMPEX

Discussions

In addition to presenting the Transport NAMA, including the scenarios studied, the surveys conducted and their results, discussions tackled the questions of whether hybrid electric cars should be included in the NAMA, the definition of market transformation, the financing of the NAMA, the conditions to be imposed on the new replacement cars, and the scrappage mechanism for the old cars. The CCCU prepared a summary report of the inception workshop and shared it with the different stakeholders.

Outcomes

Following the discussions held during the workshop, the bellow was decided:

New cars will be considered eligible as replacement cars if they satisfy a certain emissions rate, to be determined at a later stage based on data to be collected on emissions rates of Fuel Efficient Vehicles (FEVs) currently in the Lebanese market and further consultations.

Hybrid Electric Vehicles (HEVs) can be included in the program as replacement cars as long as they satisfy the emissions rate referred to above. However, no procedure will be developed specifically for HEVs.

Given the limited size of the prospective NAMA grant (estimated to be in the range of USD 15 million), the team will study several allocation scenarios for optimizing the grant for white and red plate cars, based on year of manufacture and/or size. As part of NAMA funding, expenses will also include the creation of a NAMA unit, marketing for the project, administration, etc.

Given the limited NAMA grant, the team brainstormed on various options to sustain its financing so that car scrappage can be staged over several years (that may start before and extend beyond the first NAMA grant). These options include: increasing the gasoline tax, increasing the *Mécanique* fee for all cars, and imposing additional taxes related to the purchase of midsize and/or large gasoline cars. These options were discussed further with the MOF.

Transport NAMA Validation Workshop

Nationally Appropriate Mitigation Actions in the Transport Sector - _Validation Workshop_

24 November 2015

Workshop Objective

The objective of the workshop was to present the draft final NAMA Design Document (DD) and validate the overall proposal and solicit feedback from relevant stakeholders, in support of the Final DD.

Participants

Entity	*Participant*
Climate Change Coordination Unit (UNDP-CCCU)	Mr. Vahakn Kabakian Ms. Sarah El Rayes
Ministry of Public Works and Transport (MOPWT)	Mr. Hisham Malaeb (Strategic Planning Unit)
Ministry of Finance (MOF)	Mr. Edwin Saliba Mr. Farah (absent)
Presidency of the Council of Ministers (PCM)	Mr. Izzat Alameddine
Lebanese Petroleum Administration (LPA)	Ms. Rola Sheikh
Ministry of Energy and Water (MOEW)	Mr. Michel-Ange Medlej (Adviser)
Association of Automobile Importers in Lebanon	Mr. Selim Saad (Adviser)
Support Programme for Infrastructure Sector Strategies and Alternative Financing (SISSAF)	Mr. George Xanthakos – SISSAF Transport Expert Mr. Simon El Hashem – SISSAF Energy Expert
DIAMETAL (owner)	Mr. Wajdi I. Diab
ECODIT (local consultant)	Mr. Karim El Jisr (Team Leader) Ms. Maya Abou Zeid (Transport Expert) Mr. Naji Tannous (Energy/GHG Expert) Ms. Capricia Chabarekh (Coordinator)
First Climate (international consultant)	Mr. Nikolaus Wohlgemuth Mr. Jonathan Schwieger

Summary Notes

- Mr. Hisham Malaeb (MOPWT) inquired if some of the international funding could be diverted and invested in the public bus transport (e.g. to replace old buses and vans). Mr. Kabakian (CCCU) explained that MOE had previously tried to propose a NAMA for the public transport sector but was not able to secure MOPWT's support. Recently, CCCU and CDR met to discuss the feasibility of a separate NAMA for public transport.
- Mr. Selim Saad (Adviser to the Association of Automobile Importers) emphasized that national emission standards should be applied to all vehicles (and not only to FEVs as replacement vehicles in the scrappage program). New and more stringent emission standards would accelerate the natural process of car replacement and fleet renewal, over time. He also explained that Decree 8941 dated 21/9/2012 (draft law) which aims to incentivize the public transport sector will require that all trucks and buses abide by the last Euro-2 norm. Furthermore, RP vehicles might be considered part of the public transport sector.
- Mr. Edwin Saliba (UNDP Officer at the MOF) inquired if the expected GHG reduction from both White Plate (WP) and Red Plate (RP) scrappage programs can be combined. Mr. Naji Tannous (ECODIT) explained that this would require applying a weighting factor since the baseline for the two pools are different. In the end, RP replacement would contribute very little to total GHG reduction no matter which scenario was adopted.
- Mr. Izzat Alameddine (UNDP Officer at the PCM) emphasized that the official number of RP licences (about 33,000) does not reflect the total number of RPs which is estimated at over 50,000 because thousands of RPs operate illegally in the country (duplicate number plates). The TTVMA cannot hold records of unlicensed plates, hence the need to fully regulate the sector (to be mentioned in the NAMA). At the other end of the spectrum, he also mentioned that there are many legal RP that are not in service because their owners do not drive them but have them so they can collect certain social benefits (National Fund for Social Security).
- Mr. Georges Xanthakos (SISSAF) clarified that the SISSAF program started in 2013 (not 2010). During the course of the presentation, the NAMA team highlighted that the Land Transport Strategy prepared by SISSAF did not include targets. However, Mr. Xanthakos stated that the Final Strategy will include targets and may also include emission limits determined by the MOE.
- There is a need to consider if the fuel tax is socially accepted. The increase in fuel tax is a highly political issue and should perhaps be avoided.
- Mr. Saad mentioned that no new RPs have been sold by the GOL in the last five years. Therefore, the NAMA team should reconsider the growth rate of the RP fleet since there is effectively a freeze on the issuance of RPs.
- Mr. Saad inquired if the type of the terrain (flat or mountainous) and car occupancy were considered during the calculation of emission rates. The NAMA team clarified that these factors are already considered in the emission estimation model.
- Based on the new Traffic Law, the PCM is working to establish a new entity, the Road Safety Authority, to coordinate all transport related issues. This would facilitate NAMA implementation.
- Mr. Saad emphasized that the current structure of car registration fees is absurd and discourages car replacement and renewal. Specifically, the car registration fee today is between USD 1,500 and USD 2,000 which is "lost" if the owner decides to sell the car. He suggested that registration fees should be decreased or a fixed registration fee be applied. To make up for lost revenues, the GOL can increase the customs/excise tax.
- With regard to the Program Participation Steps and the eligibility criteria, Mr. Saad suggested that the old car should have passed the M*écanique* inspection within the last three months (and not 12 months as determined by the team) since old cars can deteriorate rapidly. It was also suggested that the process be streamlined so that it reduces the burden on the program participant and the time required for the different steps. It was agreed that the Team will further discuss the procedure with Mr. Saad with the aim of streamlining/shortening the process further and determining which steps that can be carried out by the car dealer on behalf of the program participant.

SWOT Analysis (open discussion and brainstorming)

At the end of the presentations, the workshop facilitator asked the participants to brainstorm on the strengths and weaknesses of the draft NAMA DD. Those were:

Strengths	*Weaknesses*
• Excellent tool (NAMA DD) to renew the car fleet in Lebanon and to re-structure the car transport sector • Excellent tool to abide by international norms and standards • Access to international technical	• High overall cost of the NAMA • High domestic cost borne by the GOL and the private sector • Time consuming procedure; should be a one-stop shop • Issue of social equity; households

support and funding • Many co-benefits that go beyond GHG reduction • Tangible objective to reduce GHG emissions and improve air quality • The proposed MRV is a step towards enhancing the image of the public institutions • Reduce energy consumption through a newer and more efficient car fleet • Incentives to import new FEVs/new technology	without a car (representing 25% of the population) will not benefit from the NAMA • There are hidden costs to the GOL (i.e. reduction in fuel consumption because of FEVs) • Marginal abatement costs are high (USD/t CO_2 reduced)
Opportunities	***Threats***
• There is an opportunity to improve linkages and communication between relevant (transport) entities • Great opportunity for private sector participation • Pioneering changes in other sectors based on the successful implementation of the NAMA • Opportunity to improve health and safety in the country and reduce hospital bills • Potential to reduce road congestion	• Risk of buses being left out • Spillover effect from private to public transport might be hindered • Expected delays and barriers to proposed NAMA legal framework

Other considerations during guided discussion:

1. The TTVMA will substitute the existing plates (red and white) with "intelligent plates" (as stipulated in the New Traffic Law). This may help remove some of the illegal cars.
2. LIBNOR is currently working on new standards for fuel abiding by Euro V (which will be issued through a COM decree) which should be considered under the NAMA. The current Euro III prevents car dealers from importing certain car models.
3. SODEL (under LPA) is working on a cost-benefit analysis for alternative fuels in the transport sector. It will be finalized in the next 6-8 months and the project results can be shared.
4. There should be more collaboration between SISSAF and the NAMA team to align the SISSAF strategy with the NAMA. The current SISSAF project ends in September 2016 but may be extended.
5. The NAMA team will meet with the Association of Automobile Importers to streamline the scrappage participation program/procedure.
6. All government institutions should have a unified database for the transport sector (number of vehicles, fuel consumption, age of the vehicle fleet, etc.)
7. Ultimately, cars older than 20 years should not be allowed to circulate by law, and the exact cut-off year should be linked to public transport.
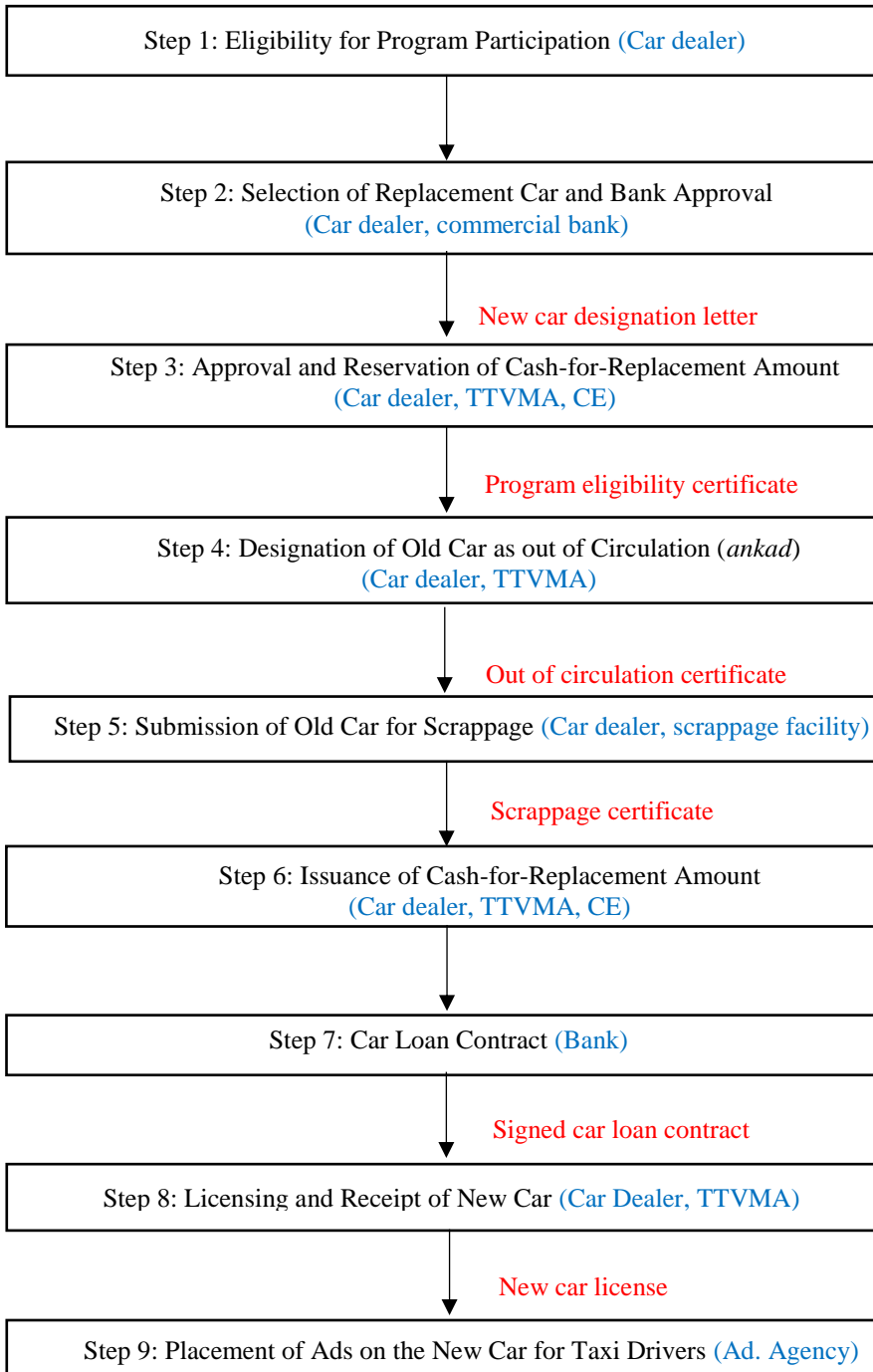
Working with MOPWT, consider a new Transport NAMA focusing exclusively on the public bus transport sector.

Annex 3: Detailed NAMA Cost Assessment (in USD)

			Total	Domestic	International
Outcome A		**Institutional framework for the scrappage program is established**			
Output A.1		**A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating**			
Activities	A.1.1	The CE is defined, staffed and is operating	2,530,000	2,530,000	-
	A.1.2	The CE is trained on relevant issues related to their role and responsibility under the NAMA	76,000	-	76,000
	A.1.3	The IE is defined, staffed and is operating	2,530,000	2,530,000	-
	A.1.4	The IE is trained on relevant issues related to their role and responsibility under the NAMA	76,000	-	76,000
Output A.2		**NAMA Finance Facility is established and operating**			
Activities	A.2.1	An agreement with the Financial Trustee (FT) is established	70,000	-	70,000
	A.2.2	The Grant Subsidy Scheme is established and operational under the FT	65,000	65,000	-
TOTAL - Cash Flow: Outcome A			**5,347,000**	**5,125,000**	**222,000**

			Total	Domestic	International
Outcome B		**Scrappage program is prepared and incentive scheme defined**			
Output B.1		**Eligibility criteria are assessed and defined & emission standards assessed and given legal force**			
Activities	B.1.1	Eligibility criteria of old cars to join the scrappage program are defined	124,000	-	124,000
	B.1.2	Appropriate meaningful emission limits for the newly imported cars under the scrappage program are defined	144,000	-	144,000
	B.1.3	The emission limit is legalized by enacting a law for FEVs joining the scrappage program	161,000	90,000	71,000
Output B.2		**Incentive scheme for the scrappage program is legally established and operating**			
Activities	B.2.1	The legal basis for replacement fees is established and financing of fees is provided	3,659,523,000	3,646,379,000	13,144,000
	B.2.2	The legal basis for soft loans is established and financing of loans is provided	191,000	120,000	71,000
	B.2.3	The legal basis for tax exemptions is established and the exemptions are provided	191,000	120,000	71,000
	B.2.4	The framework for advertisements on taxis is established and financing of the fee is provided	76,000	-	76,000
	B.2.5	Legal and political support for assessing the legal basis for the fuel tax increase is provided	119,000	-	119,000
	B.2.6	Implementation of legal basis for fuel tax increase	123,000	90,000	33,000
Output B.3		**The upgrading of participating scrappage sites is ensured**			
Activities	B.3.1	Environmental minimum standards for the designated scrappage sites are defined	74,000	-	74,000
	B.3.2	Eligible scrappage sites are identified and nominated	41,000	-	41,000
TOTAL - Cash Flow: Outcome B			**3,660,767,000**	**3,646,799,000**	**13,968,000**

			Total	Domestic	International
Outcome C		**Promotion and awareness building**			
Output C.1		**Awareness creation for the scrappage program**			
Activities	C.1.1	Educational and awareness-building resources for car dealers will be developed and car dealers will be equipped to support the program	200,000	-	200,000
	C.1.2	Marketing resources to promote the scrappage program will be developed and a marketing campaign launched	228,000	-	228,000
Output C.2		**Broad promotion of FEVs beyond the scrappage program**			
Activities	C.2.1	Appropriate emission limits for newly imported cars are defined on a national level	393,000	-	393,000
	C.2.2	Emission limits for newly imported cars are legally established	164,000	90,000	74,000
	C.2.3	Support is provided to design financial incentives for the purchase of FEVs on a national level	79,000	-	79,000
TOTAL - Cash Flow: Outcome C			**1,064,000**	**90,000**	**974,000**

			Total	Domestic	International
Outcome D		**Scrappage program implementation**			
Output D.1		**Pilot scrappage program is implemented**			
Activities	D.1.1	Low-efficiency red plate cars are scrapped and FEVs are purchased under the pilot program	39,843,000	39,843,000	-
Output D.2		**Extended scrappage program is implemented**			
Activities	D.2.1	Low-efficiency red plate cars are scrapped and FEVs are purchased under the extended scrappage program	232,627,000	232,627,000	-
	D.2.2	Low-efficiency white plate cars are scrapped and FEVs are purchased under the extended scrappage program	14,035,322,000	14,035,322,000	-
TOTAL - Cash Flow: Outcome D			**14,307,792,000**	**14,307,792,000**	**-**

		Total	Domestic	International
TOTAL - Cash Flow: ALL NAMA (excluding preparatory phase)		**17,974,970,000**	**17,959,806,000**	**15,164,000**

Annex 4: Detailed Steps to be followed in the Scrappage Program

A preliminary plan for the transport NAMA car scrappage program is presented below in terms of the steps that a potential program participant needs to follow, the coordinating entity that is responsible for the implementation of a particular process, and the output of each step. These steps are also summarized in the figure below, with the coordinating entity shown in blue text inside brackets, and important documents generated after each step shown in red text. Several steps are carried out by the car dealer on behalf of the program participant to streamline the process for program participants (time delays or inconvenience). Moreover, during actual implementation, certain data/document transfer operations may be done electronically where possible to speed up the process.

Step 1: Eligibility for Program Participation (Car dealer)

Step 2: Selection of Replacement Car and Bank Approval
(Car dealer, commercial bank)

New car designation letter

Step 3: Approval and Reservation of Cash-for-Replacement Amount
(Car dealer, TTVMA, CE)

Program eligibility certificate

Step 4: Designation of Old Car as out of Circulation (*ankad*)
(Car dealer, TTVMA)

Out of circulation certificate

Step 5: Submission of Old Car for Scrappage (Car dealer, scrappage facility)

Scrappage certificate

Step 6: Issuance of Cash-for-Replacement Amount
(Car dealer, TTVMA, CE)

Step 7: Car Loan Contract (Bank)

Signed car loan contract

Step 8: Licensing and Receipt of New Car (Car Dealer, TTVMA)

New car license

Step 9: Placement of Ads on the New Car for Taxi Drivers (Ad. Agency)

Preliminary implementation plan of the transport NAMA (CE denotes NAMA Coordinating Entity)

Step 1: Eligibility for Program Participation

Eligibility for program participation will be determined as part of the capacity building activities in Phase 1. At a minimum, it may be based on the year of manufacture of the car (e.g. being 15 years or older at the time of program application) and on the condition that the car is still operational. For simplicity, the latter condition can be assumed to be satisfied if the old car has passed the Mécanique inspection within the last 12 months prior to application to the program and if all Mécanique fees have been duly paid.

Responsible entity: Car dealer

Process: The individual submits to the car dealer (from which the individual plans to purchase a replacement car) a copy of his/her ID, the documents related to the last Mécanique inspection and payment, and the registration license of the old car.

Output: The car dealer checks eligibility for program participation, and if the individual is deemed eligible, he/she proceeds to the next step.

Step 2: Selection of Replacement Car and Bank Approval

The individual visits car dealers to get information about the types of cars available that are eligible to be replacement cars in the program (based on their emission rate being lower than a limit set by the program, and potentially also based on maximum car purchase price in order to avoid cases where the customs or other exemptions are very large) and the car loan conditions including insurance. The individual then chooses a new car and the car dealer sends the necessary documents to the respective bank for approval of the car loan.

Responsible entity: Car dealer, commercial bank

Process: The individual submits the standard documents needed for the purchase of a new car. The car dealer sends these documents to the bank to check if the individual is approved for a car loan.

Output: If the bank approves the individual's application for a car loan, the car dealer issues a "new car designation letter" containing the following data items about the new car: chassis number, engine number, make and model, engine size, horsepower, year of manufacture, price, emission rate (in gCO_2/km) and name of bank where the car loan is to be paid. This letter in effect reserves the chosen car for the individual. A new bank account specific to the car loan is also opened for the individual.

Step 3: Approval and Reservation of Cash-for-Replacement for Program Participant

The car dealer submits to the TTVMA the necessary documents to get official approval from the TTVMA for the individual's program participation. The TTVMA then coordinates with the Coordinating Unit at the Ministry of Environment to reserve the cash-for-replacement amount for the participant for a certain period of time (e.g. up to 6 months).

Responsible entity: Car dealer, TTVMA, and NAMA Coordinating Entity

Process:

The car dealer submits on behalf of the individual the following documents to the TTVMA.

Documents related to the old car: a copy of the individual's ID, the documents related to the last *Mécanique* inspection and payment, and the registration license of the old car

Documents related to the new replacement car: new car designation letter

Then the TTVMA checks program eligibility and verifies also that the new replacement car satisfies the emissions limit (and if applicable the maximum car-purchase price) set by the program. It then sends a list of approved program participants' names to the Coordinating Entity.

Output: The TTVMA issues a "program participation certificate" for the individual, which officially establishes that the individual is eligible to participate (on which is also listed the relevant information about the new replacement car). The cash-for-replacement amount is reserved by the Coordinating Entity for program participants for a certain period of time.

Step 4: Designation of Old Car as out of Circulation (*Ankad*)

After the program participant is informed by the car dealer that the new replacement car is in stock and available for purchase, the program participant needs to designate the old car as out of circulation, i.e. to de-register it (known as *ankad* locally) in the databases of the TTVMA. This step is taken only after ensuring that the new car is in stock in order to avoid significant delays between the submission of the old car for scrappage and the receipt of the new car. This step can be carried out either by the car dealer on behalf of the program participant or directly by the program participant. Step 4 can be carried out simultaneously with Step 3 if the new replacement car is in stock at the time the official approval for program participation is sought from the TTVMA.

Responsible entity: Car dealer, TTVMA

Process: The individual or the car dealer submits to the TTVMA the new car designation letter and the old car license plate number and registration license as well as a copy of the individual's ID.

Output: The TTVMA issues an out of circulation (*ankad*) certificate for the individual in relation to his/her old car.

Step 5: Submission of Old Car for Scrappage

Having received the *ankad* certificate for the old car, the individual then submits the old car for scrappage at a designated car scrappage facility. The car dealer may also carry out this step on behalf of the individual for a certain fee that covers the cost of transporting the old car to the scrappage facility.

Responsible entity: Car dealer, scrappage facility

Process: The individual (or the car dealer) submits the program eligibility certificate, the new car designation letter, the *ankad* certificate, a copy of the individual's ID, and the old car itself for scrappage to a designated scrappage facility.

Output: The individual receives a "scrappage certificate" for the old car from the designated scrappage facility and the old car is scrapped. The scrappage of the old car is verified by TTVMA employees (or other public institution employees such as from the Customs Office) with temporarily set up offices at the scrappage facilities. The scrappage value of the old car is paid by the scrappage facilities to the Ministry of Finance.

Step 6: Issuance of Cash-for-Replacement Amount

After the old car is scrapped, the individual can have access to the cash-for-replacement amount to be used as a down payment on the new car.

Responsible entity: Car dealer, TTVMA and NAMA Coordinating Entity

Process: The individual or the car dealer submits to the TTVMA the program eligibility certificate, the new car designation letter, the *ankad* certificate, the scrappage certificate, a copy of the individual's ID, and car loan bank account information.

Output: The TTVMA coordinates with the NAMA Coordinating Entity the transfer of cash-for-replacement amounts from the NAMA account in BDL to the bank where the car loan is to be paid. The cash-for-

replacement amount is to be used as a down payment on the new car loan. The individual/car dealer is notified by the TTVMA or the commercial bank that the down payment has been deposited in the individual's bank account.

Step 7: Car Loan Contract

After the down payment is transferred to the individual's bank account, the individual visits the bank to sign the car loan contract specifying the terms of the loan (regarding timely payments, insurance, what happens in case the instalments are not paid, etc.).

Responsible entity: Bank

Process: The individual visits the bank to sign the loan contract, where it is verified that the down payment has been made and a car loan contract is prepared. The car dealer is also notified by the bank that the car loan contract has been signed and that the car is used as collateral.

Output: The car loan contract is signed. The individual also pays mandatory insurance for the car at the bank.

Step 8: Licensing and Receipt of New Car

After the down payment is paid and the car loan contract is signed, the individual can get the new car and have it licensed by the car dealer from the TTVMA.

Responsible entity: Car dealer, TTVMA

Process: The individual visits the car dealer and submits the necessary documents (*ankad* certificate, scrappage certificate, copy of ID, etc. - if not already obtained previously by the car dealer).

Output: The individual receives the new car from the car dealer that is licensed by the TTVMA.

Step 9: Placement of Ads on the Car (for taxi drivers only)

Taxi drivers who participate in the program may choose to place ads on their cars to generate additional revenue.

Responsible entity: Advertising agencies

Process: Taxi drivers take their new cars to an advertising agency for placement of ads.

Output: Ads are placed on the taxi.

During the above steps, and where applicable, the TTVMA records important MRV parameters (such as number of old cars de-registered, number of new cars registered, emissions data related to the new replacement cars, etc.) that will then be transferred to the NAMA Coordinating Entity for analysis.

Annex 5: MRV Parameters

						Contribution to				
Transport NAMA MRV Parameters	MRV parameter description	Name of parameter	Unit	Frequency of reporting	Means of measurement	ER	SD	NAMA progress	Transformational change	Responsible for data gathering
Outcome A. Institutional framework for the scrappage program is established										
Output A.1 - A Coordinating Entity (CE) and an Implementing Entity (IE) are established and operating			M							
M1	The Coordinating and Implementing Entity are defined, the operation of Coordinating Entity and Implementing Entity are financed	CE IE operational	-	once upon completion	qualitative		x	x		Coordinating entity
Output A.2 - NAMA Finance Facility is established and operating			M							
M2	The NAMA Finance Facility is defined, the operation of is financed	CE IE operational	-	once upon completion	qualitative		x	x		Coordinating entity
M3	Monetary values of financial incentives on a national level disbursed	Incentives_national	USD	monthly	counting			x	x	Coordinating entity
Outcome B. Scrappage program is prepared and incentive scheme defined										
Output B.1 - Eligibility criteria are assessed and defined & emission standards assessed and given legal force			M							
M4	Emissions limit for newly imported cars legally enacted	limit_program_enacted	-	once upon completion	qualitative			x	x	Coordinating entity
Output B.2 - Incentive scheme for the scrappage program is legally established and operating			M							
M5	Amount replacement fees disbursed as part of the scrappage program	replacement fee	USD	monthly	counting		x	x	x	Ministry of Finance
M6	Value of soft loans issued for the purchase of FEVs as part of the scrappage program	soft loans	USD	monthly	counting		x	x	x	Banque du Liban
M7	Monetary value of tax exemptions for newly imported FEVs as part of the scrappage program	exemptions	USD	monthly	counting			x	x	Ministry of Finance
M8	Number of taxis placing ads on their vehicle	ads	-	annually	counting			x	x	Implementing entity
Output B.3 - The upgrading of participating scrappage sites is ensured			M							
M9	List of eligible scrapage sites complying with the environmental standards is defined	Sites_list	-	once upon completion	qualitative		x	x		Coordinating entity
Outcome C. Promotion and awareness building										
Output C.1 - Awareness creation for the scrappage program			M							
M10	Money spent on trainings and marketing of the scrappage program	advertisement	USD	monthly	counting		x	x	x	Ministry of Finance
Output C2 - Broad promotion of FEVs beyond the scrappage program			M							
M11	Environmental standard for all newly cars is legally implemented	limit_national_enacted	-	once upon completion	qualitative			x	x	Coordinating entity
Outcome D. Scrappage program implementation*										
M12	Year of manufacture at scrappage	A_p	years	continuously	recorded	x				Scrappage facilities
M13	Numbers of cars scrapped of plate colour p in year y	N_scrapped,p,y	-	continuously	counting	x				Implementing entity
M14	Numbers of cars imported and registered of plate colour p in year y	N_registered,p,y	-	continuously	counting	x				Implementing entity
M15	Number of FEVs joining the scrappage program of plate colour p in year y	N_FEV,p,y	-	continuously	counting	x	x	x		Implementing entity
M16	Emission factor of newly registered vehicles of plate colour p in year y	EF_FEV,p,y	gCO2/km	continuously	manufacturer specifications	x	x			Implementing entity
M17	Annual mileage of NEW vehicles participating in the scrappage program of plate colour p in year y	D_NEW,p,y	km/yr	annually	reported	x				Implementing entity
M18	Amount of additional fuel tax collected	fuel tax	USD	monthly	counting	x		x	x	Ministry of Finance
* the same monitoring parameters apply for both phases of the scrappage program										