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Funding, financing and procurement guide

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Executive Summary

This guide outlines financial institutions and mechanisms that provide opportunities to access funding for innovative and sustainable transport initiatives, including for electric mobility. It further provides an overview of the costs of electric mobility solutions and highlights robust business models, financing mechanisms and incentives that can facilitate the transition to electric mobility. In order to ensure alignment of electric mobility solutions to national and local policy frameworks and priorities, the guide summarizes strategies, methods and processes to design integrated transport policies as well as provides insights into how to build cross-cutting institutional cooperation. Lastly, the guide highlights results of procurement round tables and details strategies that ensure the benefit of all interested parties in co-implementing innovations in mobility.



This report draws insights from the publication titled “Integration is key: The role of electric mobility for low carbon and sustainable cities”, jointly developed by the United Nations Human Settlements Programme (UN-Habitat) and the Urban Electric Mobility Initiative (UEMI).

Further information can be found [here](#).

CHAPTER 1 : FUNDING MECHANISMS FOR INTERNATIONAL CO-OPERATION

Green Climate Fund

The Green Climate Fund (GCF) is a global fund that supports the efforts of developing countries to respond to the challenge of climate change by supporting measures that limit or reduce greenhouse gas (GHG) emissions and adapt to climate change.

GCF has a multi-layered approach to mobilising climate finance, working directly with the public and private sectors. It is important to note that developing countries are in the driving seat of GCF's targeting and disbursement of climate finance. National Designated Authorities (NDAs) for each developing country act as the country's interface with the Fund and are closely involved in all GCF's funding processes.

GCF has four steps towards implementing projects (<https://www.greenclimate.fund/gcf101#>):

1. Empowering countries: Readiness Support
2. Getting Accredited: Accreditation Process
3. Funding Projects: Project Preparation and Project Funding
4. Implementing Projects: Project Implementation

Country ownership of GCF financing decisions enables developing countries to transform Nationally Determined Contribution (NDC) ambitions into climate action. GCF's activities align with developing countries' priorities through the principle of country ownership. In addition, the Fund has established a direct access modality so that national and sub-national organisations can receive funding directly rather than only via international intermediaries.

Partner organisations known as Accredited Entities implement GCF activities in developing countries. The project proposal has to be submitted by the National Designated Authority (NDA) in the country. Developing countries nominate National Designated Authorities (NDAs) or focal points to act as the point of communication with GCF. Every project the GCF Board agrees to fund must be endorsed, expressed via a no-objection letter, by the NDA or focal point. Accredited Entities develop funding proposals to be considered by the Fund and oversee, supervise, manage and monitor their respective GCF-approved projects and programmes. There are two GCF Accredited Entities based on access modalities: Direct Access Entities and International Access Entities.

In issuing some Requests for Proposals, GCF may accept proposals from entities it has not yet accredited. However, non-accredited entities will have to collaborate with Accredited Entities when formally submitting funding proposals to GCF. Accredited Entity receives financial assistance as a loan, grant, equity, or guarantee, depending on the kind of project.

Global Environment Facility

The Paris Agreement under the UN Framework Convention on Climate Change (UNFCCC) entered into force in November 2016, ushering in a new era of climate action that will put the world on track to eliminate carbon from the global economy by the second half of the century.

The GEF has several important roles to play under the Paris Agreement. The GEF is part of the Agreement's financial mechanism, which also established a process to ensure that all climate change actions are fully transparent and a mechanism to assist countries in meeting that goal. The GEF's climate change mitigation strategy, which the [GEF Trust Fund](#) finances, supports

developing countries making transformational shifts towards low-emission development pathways with three fundamental objectives:

- Promoting innovation and technology transfer for sustainable energy breakthroughs
- Demonstrating mitigation options with systemic impacts by strengthening interaction and integration between climate change mitigation and the other [GEF focal areas](#)
- Mainstreaming mitigation concerns into sustainable development strategies through the continuous support of enabling conditions in developing countries.

The GEF's climate change adaptation strategy, funded by the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF), aims to assist developing countries in transitioning to a climate-resilient development path while reducing exposure to immediate climate change risks. The GEF adaptation strategy hinges upon three main pillars:

- Reduce vulnerability and increase resilience through innovation and technology transfer for adaptation
- Mainstream adaptation and resilience for systemic impact
- Foster conditions that enable effective and integrated adaptation.

NAMA Facility

The NAMA Facility is a go-to platform for grant-based climate finance that emphasises providing financial support to developing countries and emerging economies that show leadership in tackling climate change. The NAMA Facility provides financial support for implementing national climate strategies and Nationally Determined Contributions (NDCs) in line with Paris Agreement goals via mitigation actions such as Nationally Appropriate Mitigation Actions (NAMAs) in relevant sectors, thereby realising sustainable transformational change towards a carbon-neutral pathway. The facility targets developing countries and emerging economies that show leadership in tackling climate change and want to implement transformational country-led Nationally Appropriate Mitigation Actions (NAMAs) within the global mitigation architecture.

The NAMA Facility is a joint initiative of:

- German Federal Ministry for Economic Affairs and Climate Action (BWMK)
- UK's Department for Business, Energy and Industrial Strategy (BEIS)
- Danish Ministry of Climate, Energy and Utilities (KEFM)
- Danish Ministry of Foreign Affairs (MFA)
- European Union
- Children's Investment Fund Foundation (CIFF)

International Climate Initiative

The International Climate Initiative (IKI) is vital to the German government's international climate finance commitment. Since 2022, IKI's implementation is overseen by the German Federal Government, bringing together the Federal Ministry for Economic Affairs and Climate Action (BMWK), the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and the Federal Foreign Office (AA), whose focus is to support international climate action and biodiversity.

Through the IKI, the ministries support approaches in developing and emerging countries to implement and develop ambitious Nationally Determined Contributions (NDCs) anchored in the Paris Agreement. The activities include measures to adapt to climate change and conserve and

rebuild natural carbon sinks, considering environmental, economic, and social concerns. The IKI also supports its partner countries in achieving the Convention on Biological Diversity (CBD) goals. The three ministries jointly agree on the basic IKI framework. The agreement includes the instruments that help ensure and verify the values and responsibilities of the IKI, the various funding calls and external communication.

The activities from [IKI projects](#) range, for example, from advising policymakers on capacity building and technology partnerships to risk hedging through innovative financial instruments. It also includes studies, project preparation advice for infrastructure development, and investment instruments for climate change mitigation or biodiversity conservation. To date, IKI has approved more than 800 climate and biodiversity projects in over 150 countries worldwide with a total funding volume of 5 billion euros (2008-2021).

Adaptation Fund

The Adaptation Fund is an international fund that finances projects and programmes aimed at helping developing countries to adapt to the harmful effects of climate change. It is set up under the Kyoto Protocol of the United Nations Framework Convention on Climate Change. Since 2010, the Adaptation Fund has committed more than US\$ 850 million for climate change adaptation and resilience projects and programmes, including more than 123 concrete, localised projects in the most vulnerable communities of developing countries around the world, with 28 million total beneficiaries. It also pioneered Direct Access, empowering governments to access funding and develop projects directly through accredited national implementing entities.

Bilateral and multilateral development funds and banks

In 2015, Multilateral development banks (MDBs), composed of the African Development Bank (AfDB), the Asian Development Bank (ADB), the Asian Infrastructure Investment Bank (AIIB), the Council of Europe Development Bank (CEB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the InterAmerican Development Bank Group (IDBG), the Islamic Development Bank (IsDB), KfW (Kreditanstalt für Wiederaufbau/Reconstruction Credit Institute), the New Development Bank (NDB) and the World Bank Group (WBG) and the International Development Finance Club (IDFC) agreed on a set of common principles for finance to mitigate climate change and an initial set of common principles for finance to support adaptation to climate change. In addition, they intended to take a common approach to track reporting on climate finance.

In 2021, the multilateral development banks committed \$50.666 billion to low-income and middle-income economies, thus surpassing the annual expectations of \$50 billion set in the joint MDB High-Level Statement of 2019. Of the \$50.666 billion of climate finance committed to low-income and middle-income economies, \$47.24 billion was from the MDBs' account and \$3.426 billion from external resources channelled through the banks. Mitigation finance committed to low- and middle-income economies totalled \$33.055 billion, or 65%, while adaptation finance totalled \$17.611 billion, or 35%. Sources of MDB climate finance are split between the multilateral development banks' accounts and the external resources channelled through and managed by them. External resources include trust-funded operations, such as those funded by bilateral agencies and dedicated climate finance funds, such as the Climate Investment Funds (CIF), Green Climate Fund (GCF) and climate-related funds under the Global Environment Facility (GEF), EU blending facilities and others. As bilateral reporting may already cover some external resources, those managed by the multilateral development banks are presented separately from their accounts¹.

CHAPTER 2 : COSTS, BUSINESS MODELS AND FINANCING OF ELECTRIC MOBILITY

Costs of electric mobility

Lifecycle costs for operating electric vehicles are close to, or in some cases lower than, internal combustion engine vehicles (Fulton, 2017). Figures 1 and 2 show the estimated cost per passenger kilometre for various electric modes and technologies in OECD-Europe and India. The importance of different factors (drivers and fuel cost) differs by region. For example, bus drivers' low labour cost and higher average load factors in India and other developing economies make public transport modes more cost-effective than in industrialised (OECD) countries. But in both cases, the costs of electric vehicles are close to competitive on a lifecycle basis, and this will only improve over time as battery costs continue to drop.

Figure 1 : Costs per passenger kilometre in Europe (Fulton et al., 2017)

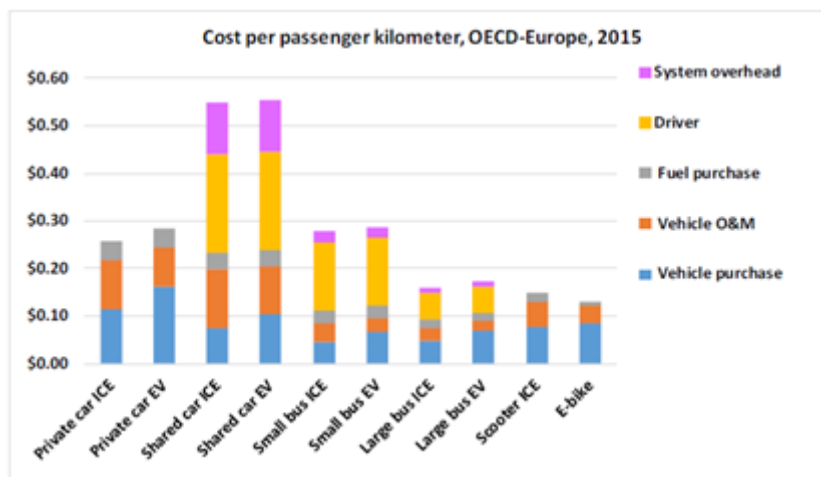
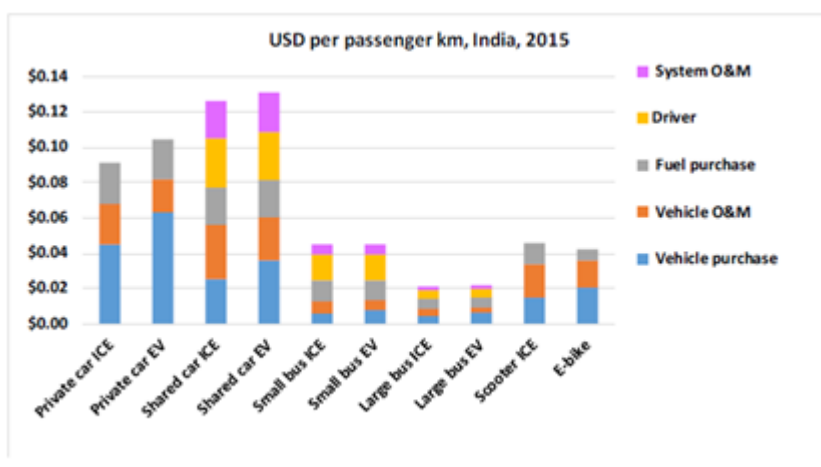


Figure 2: Costs per passenger kilometre in Asia (Fulton et al., 2017)



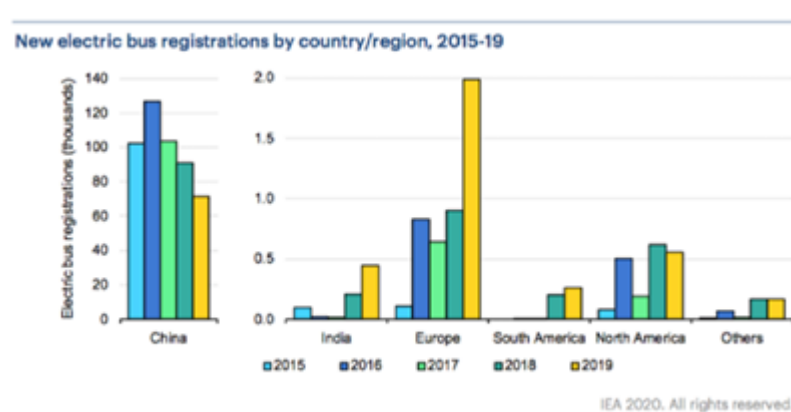
ELECTRIC BUSES

While electrified public transport modes such as metros, tramways or trolleybuses have existed in many cities for a long time, a recent trend is the expansion of electric bus fleets worldwide. The shift to electric buses is paramount, as urban buses have been predominantly powered by diesel engines, accounting for approximately 25% of the black carbon (BC) emitted in cities (Climate and Clean Air Coalition, 2020). The BC in diesel exhaust poses a significant health risk and has been listed as a known human carcinogen by the World Health Organisation (WHO). Electric buses are essential to reduce noise, air and GHG pollution in cities, while catering for a significant share of the mobility needs of urban dwellers.

At the end of 2018, there were 460,000 e-buses worldwide according to the International Energy Agency (IEA, 2020). China dominates the sector both in terms of manufacturing and vehicle registration, with figures two orders of magnitude higher than other countries and regions. Nonetheless, recently, electric bus fleets have been expanding in other parts of the world as well: registrations doubled in Europe and India between 2018 and 2019. In India, the policy scheme Fame II supported this uptake. In Europe, buses with e-mobility elements are expected to increase from a current 10-12% of the bus market to circa 40% in 2025 (World Bank, UITP, 2018). In addition, urban electric fleets have been growing in the United States, while in South America strong markets exist in Chile, Argentina, Brazil, Colombia and Ecuador. National and urban supporting policies are critical to foster the uptake of electric mobility.

Yet, the uptake of e-mobility faces two main cost hurdles: the higher upfront investment cost of vehicles and the classical 'chicken-and-egg' dilemma – put simply, difficulties in switching to electric vehicles in the absence of charging infrastructure and vice versa. Therefore, innovative financing and business models are required to address these issues and reduce the risk of switching to e-mobility for vehicles and charging infrastructure segments.

Figure 3: New electric bus registrations by country/region, 2015-2019 (IEA, 2020b)



Cities can lay the path towards ambitious or even full electrification of their bus fleets. This is already the case in the Chinese cities of Shenzhen and Dalian. In contrast, cities such as Los Angeles, Seattle, Copenhagen, Amsterdam, Guangzhou and Nanjing have started the procurement and operation of e-buses and set a target of a complete transition of their fleets by 2030 or earlier (C40, 2019). Santiago de Chile currently operates a fleet of circa 400 battery-electric buses - the largest e-bus fleet outside China – and targets full electrification by 2035. Rolling out this e-bus fleet reduced GHG emissions and substantial reduction operational costs compared to

conventional buses while showing higher satisfaction for transport users (ZEBRA, 2020). The reliability of e-bus operations is equal to or higher than that of diesel buses (ibid). Innovative partnerships and leasing models with electric utilities can help tackle the challenges of the initial investment. Public authorities are critical for creating financing and incentive frameworks for electric bus uptake in urban and suburban areas. Innovative financing and organisational schemes need to be identified to alleviate the barrier of higher upfront investment costs.

Example: E-Auto Rickshaws in Kochi, India



Figure 4: Electric Auto-Rickshaws in Kochi (TERI SAS 2022)

With support from the [Urban Pathways](#) project and further supported by GIZ's SMART SUT project, the Kochi Municipal Corporation in India has undertaken augmentation of an electric autorickshaw project which was launched on 15th November 2022. The pilot was launched with the distribution of 30 auto rickshaws from the planned 100 auto rickshaws to the members of the Ernakulam Jilla Auto Driver Cooperative Society (EJADCS). The e-auto initiative follows a unique financing model with a direct subsidy from the international partners (Urban Pathways and

GIZ) to a tune of INR 50,000 (USD 612) per autorickshaw which is almost 25% of the cost of each autorickshaw which is priced at about INR 200,000 (USD 2450). Rest of the cost is taken by EJADCS as a group loan through a Kerala government guarantee from State Bank of India (SBI). This financing model makes it affordable to own e-autos for the early adopters and helps them to earn enhanced incomes. In case of Kochi a detailed feasibility study helped greatly in scoping the financing arrangements and charging technology selection. In its initial phase it was also benefited by cooperation with EJADCS which was able to mobilise the bank loan for its own beneficiaries through a Kerala state guarantee which made the selection of beneficiaries easier for the KMC.

Further info can be found [here](#).

Innovative business models for electric mobility

Innovative business models are paramount to facilitating the transition to electric mobility, reaping the benefits of lower running costs while addressing higher upfront investment costs. Innovative models enable to reap of the advantages of e-mobility, such as lower running costs enabling savings. Solutions will vary according to local characteristics, and there is no one-size-fits-all. A baseline assessment is helpful in this regard, for instance, when following a Sustainable Urban Mobility Plan (SUMP) process. Solutions may involve transformation processes of manufacturers into mobility suppliers (e.g., battery rentals) or the involvement in the mobility of 'non-usual' players such as energy stakeholders (EVUE, 2012). Regarding vehicles, various options exist, ranging from classical purchase, over rental or leasing of vehicles and batteries, to shared options - the case of bus procurement being specific and separately analysed in the box below. Subsidies combined with commercial loans can help reduce the cost gap between conventional vehicles

and electric vehicles, with interest subsidies further decreasing capital costs (IIT Madras (CBEEV) & WRI India, 2019).

Rental and leasing options, instead of purchasing, have proven helpful in reducing upfront costs. These strategies may cover both vehicles as well as batteries alone. The latter case is especially interesting when coupled with a swapping system whereby batteries remain in the ownership of the mobility or energy company. The modality for the battery fees can also vary, for instance, with a pay-as-you-go model – currently used in the electricity sector, mainly for solar energy – or through a monthly or daily fee in a subscription model. Designing models lowering upfront costs and de-risking the transition is particularly vital for paratransit and informal feeder modes in the Global South. Such models are gaining traction in contexts like India or East Africa for electric two- and three-wheelers. Regarding re-energising infrastructure, two policy instruments may support its deployment. Alternatively, subsidies or preferential treatments can be awarded to private companies deploying charging or swapping points. On the other, public funding can act as a starting point for establishing charging facilities.

Innovative business models for e-mobility promotion can be addressed by public transport companies as well. Well-integrated, new electric mobility solutions may improve last-mile connectivity and ultimately increase public transport ridership. For instance, the public transport company Hochbahn Hamburg is involved in several initiatives providing first- and last-mile solutions. With the support of the [SOLUTIONSplus](#) program, Hochbahn will develop an e-scooter sharing system conceived (50 e-scooters co-funded by the project and the city), which will aim to test an incentive and pricing scheme that complements the public transport system and coverage rather than competing with it (SOLUTIONSplus, 2020). In addition, Hochbahn and the mobility company MOIA developed a ride pooling project, operational since 2019, structured around electric shuttles of six seats, which can be booked on demand on the Hochbahn 'switchh' platform.

Financial incentives for e-mobility

Cities can make use of a variety of tools to provide financial incentives, for instance, tax rebates or exemptions (e.g. exemption from road pricing charges or tolls), lower or zero parking fees for electric vehicles, lower electricity charges, subsidies for individual purchase of electric vehicles, grants and loans, scrappage schemes. In addition, financial support should be identified to facilitate innovative business models for vehicles and charging infrastructure, address the issue of high capital expenditure on electric vehicles, and reap the benefits of lower running costs.

Public procurement is a further significant instrument for municipalities to ease e-mobility uptake by directly purchasing electric vehicles for their fleet or requiring external contractors to introduce EVs (public transport, municipal fleets, waste collection vehicles). Bringing actors together for the joint procurement of EVs also enables information sharing, streamlining processes and possibly bringing prices down, as implemented in Stockholm (EVUE, 2012). With regards to electric buses, the International Union of Public Transport (UITP) guides tendering and renewal processes via reference documents such as the Bus Tender Structure Report (TSD version 3.1), a toolkit to support e-bus procurement in the specific case of India (UITP: International Association of Public Transport, 2019) or the Bus Fleet Renewal Checklist (UITP: International Association of Public Transport, 2019). Financing the shift towards cleaner vehicles can be done through national or local public funds or mixed funding models, including joint ventures and public-private partnerships (PPPs). A feebate system may also encourage this, introducing taxes for polluting vehicles whose revenues are then used to financially support EVs (IIT Madras (CBEEV) & WRI India, 2019).

Example: Financing electric bus adoption

Electric buses have a higher upfront investment cost than diesel buses. Depending on the region, the purchase price of an e-bus could be two to three times higher than the price of a diesel bus (IFC, 2020). However, the total cost of ownership (TCO), which includes maintenance and energy costs, levels the field significantly. E-buses also reach equal or even lower breakdown rates than internal combustion engine (ICE) buses (IEA, 2020b). The extent of operational gains will depend on local characteristics such as fuel and electricity prices. These particularities have led to new business models and financial mechanisms that involve new stakeholders in the ownership and operations of e-bus fleets for public transport. These models aim at making the uptake of electric buses more affordable, less risky and scalable. Business models and contractual relationships must be designed to reap the benefits of lower operational costs and facilitate the transition, for instance, through leasing mechanisms (vehicles or chargers). The key models being used to fund and finance the electrification of public transport in cities include:

Operator Procurement Model

The commonly selected procurement model is characterised by purchasing the e-buses and the corresponding charging infrastructure directly by the Public Transport Operator (PTO), which could be public or private. Thus, in this model, the ownership and the operations remain in the hands of the PTO. This is usually made possible with public funding support to overcome the barrier of upfront capital costs, such as purchase subsidies provided at the national or local level, targeting both vehicles (buses) or chargers. The purchase of electric buses could also be financed by debt, for instance, through concessional, market loans, or green bonds (GIZ, 2019); (WRI, 2019c). This model can be applied in both Net Cost Contracts (NCC), where the PTO collects and keeps its fare revenue, and Gross Cost Contracts (GCC), where the government receives the fare revenue and pays the PTO. Choosing the contract type depends on several parameters, including previous bus operation mode, funding availability, costs and earnings or technology (UITP, 2020). Many cities are moving towards GCCs with vehicle suppliers in the race for public transport electrification. GCCs create incentives for a high-quality public transport service since the government's payments to the PTO are based on a formula heavily weighted on a fee per kilometre of service provided (ITDP, 2020). Examples: Medellín (Colombia), 69 e-buses purchased by the public PTO with municipal resources; Montevideo (Uruguay), 30 buses purchased by the private PTOs with a subsidy covering the difference between diesel and electric buses.

Leasing Model

Leasing is a business model becoming more popular in fleet renewal processes as the investment risk is divided among various parties. In the case of leasing, the ownership of buses (or their components) or charging infrastructure is separated from the operation. A third-party company, for instance, utility companies, battery manufacturers or OEMs, purchases the e-buses, the batteries or the charging equipment and leases them to the PTOs. The PTOs will then have to pay a monthly fixed amount, depending on the lease contract terms (GIZ, 2019); (WRI, 2019c). Examples: Santiago (Chile) with the utility company leasing the buses; Bogotá (Colombia) with a third party leasing the buses and the utility company providing the charging infrastructure. Case of battery leasing: São Paulo (Brazil).

Pay-as-you-Save (PAYS)

PAYS is a business model developed by Clean Energy Works by which the PTO acquires the chassis of the buses, and the utility company purchases the corresponding batteries and charging equipment. The investment costs are recovered over time through a fixed tariff charged on the electricity bill agreed beforehand in terms of the contract service (GIZ, 2019). Example: no

example in the mobility sector yet, but the significant potential to be transferred from the energy sector, where it has been successfully operating.

It is worth noting that a comparison of several municipal electric bus fleets shows a high heterogeneity of solutions opted for in terms of financial support, responsibility for buses and chargers, types of contracts, and nature of charging infrastructure solutions (IEA, 2020b). Hence, there is again no one-size-fits-all strategy to be followed, and the presented models could complement each other. Assessing local specificities when designing an e-buses model is a prerequisite. Finally, financial mechanisms and incentives are not the only tools to promote the electrification of public transport. For instance, Santiago (Chile) implemented non-fiscal incentives in the form of longer contracts awarded (14 years for the operation of e-buses versus 10 for conventional buses). These alternatives should be accounted for.

Useful resources:

- IEA (2020b). E-bus case studies
- IFC (2020). E-Bus Economics: Fuzzy Math?
- ITDP (2020). A quick guide to bus sector modernisation
- WRI (2019a). Barriers to Adopting Electric Buses; WRI (2019b). How to Enable Electric Bus Adoption in Cities Worldwide
- WRI (2019c). Financing Electric and Hybrid-Electric Buses: 10 Questions City Decision-Makers should ask
- GIZ (2019). Financial Mechanisms for Electric Bus Adoption
- ICCT (2020c). Next stop for zero-emission buses: Latin America
- C40 (2019). How to shift your bus fleet to zero-emission by procuring only electric buses
- UITP (2020). Bus fleet renewal checklist: UITP (2020) Toolkit to support e-bus procurement under FAME II
- UITP (2020). Bus fleet renewal checklist: UITP (2020) Toolkit to support e-bus procurement under FAME II

CHAPTER 3 : E-MOBILITY AND NATIONAL FRAMEWORKS

Integrated Transport Policy Design Through National and Local Synergies

The national governments need to play a vital role in defining the strategy for electric mobility such that the core principle enshrined in the system are user-centric, adaptable, and embraces open standards and protocols. The developed policies and procedures need to have the flexibility to evolve as technology rapidly changes. The governments also need to be able to anticipate the future mobility situation based on the current patterns. This means that the national governments need to develop and put in place robust data collection frameworks.

Efforts should cover all transport modes and require the involvement of national and local levels of government. However, the uptake of low-carbon transport solutions has been lagging its potential due to numerous hurdles, among which the initial-cost barrier, a vital element for transport decarbonisation, is to design an integrated policy package. This multi-modal, multi-level sustainable transport package should seek alignment and complementarity between national and local policies. Integrating national and local policies is critical to streamlining decisions and ensuring consistency in measures targeting sustainable mobility.

The national transport policy needs to be guided by an overall vision and time frame. Having a time frame and a vision provides a direction for the subsequent sub-national policies and actions. The national policy also needs to identify the various legislative and regulatory framework changes required and ensure the implementation of such frameworks that reduce the complexity of sub-national governments implementing transformative actions.

With support from the [SOLUTIONSPlus](#) project, various countries are assisted with the development of a roadmap for National Urban Mobility Plans (NUMPs) to facilitate the uptake of electric mobility. The complexity of urban mobility systems requires a strong policy framework on the national level that supports integrated urban design, enables the shift to low-carbon mobility and fosters the take-up of innovative vehicle technologies and mobility services. The roadmaps developed under SOLUTIONSplus aim to provide advice to decision makers on the national level in the process of defining and implementing National Urban Mobility Plans (NUMPs). The countries targeted in this process include: the Philippines, Nepal, Uruguay, Ecuador and Tanzania. In Philippines the project aims to revisit the national urban mobility programme, aptly called the Philippine Urban Mobility Programme, or PUMP, to investigate how electric mobility is reflected in the programme and how electric mobility can enhance the plans set forth for the 5 thematic areas already defined in the PUMP. In Tanzania, the project is working with the Dar es Salaam Rapid Transit Agency (DART) in the demonstration of electric 3-wheelers (E-bajaj) and installation of charging infrastructure to support first and last mile connectivity to the BRT. Additionally, it is working on stakeholder integration of informal operators in electric mobility transition for Kigali, Nairobi, Kisumu and Dar es Salaam.

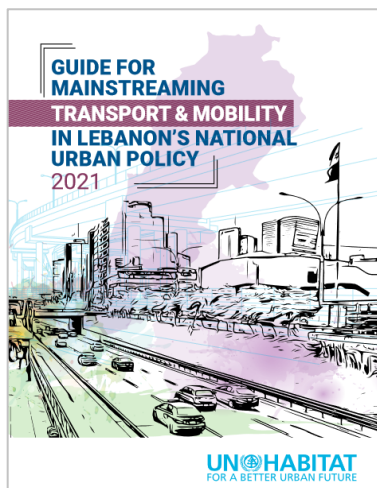
Countries like the USA, China, India, Norway and the Netherlands have developed standalone electric mobility policies and strategies. China has implemented policies to support the growth of its EV industry, including subsidies for EV buyers and requirements for automakers to produce EVs. India has a National Electric Mobility Mission Plan, which aims to put 6-7 million EVs on the road by 2020 (Government of India, 2020). Norway has implemented policies to support the adoption of EVs, including tax breaks for EV buyers and access to dedicated EV lanes on highways. USA is providing tax credits for EV buyers and funding for charging infrastructure while the Netherlands has committed from 2025, all new buses used in public transport will emit zero harmful exhaust gases (Netherlands Enterprise Agency (RVO.nl), 2019).

Other countries are working on integrated National Urban Policies that provide a framework for governments and other stakeholders to “get cities right”. As they affect urban development directly, it will be of utmost importance to have an “integrated lens” when developing them to achieve good urbanization and sustainable mobility. The national leadership during the development of NUPs is essential to enhance policy coordination across all levels of governments, civil society, and the private sector. NUPs are a key framework to deliver on the city-related Sustainable Development Goals (SDGs) and implement the New Urban Agenda. The NUA refers to Urban Mobility as a key measure to achieve sustainable and equitable cities. Cities have committed to develop policies and measures to improve road safety and integrate it into transport infrastructure planning and design. Cities also want to further promote access to safe, efficient, affordable and sustainable infrastructure for public transport, as well as non-motorized options such as walking and cycling, prioritizing them over private motorized transportation. Cities also have an increased interest in transitioning to electric mobility.

Action is needed at national and local level that will drive forward implementation of NUA, as seen in the graph below:



Figure 5: Action Framework for Urban Mobility in the New Urban Agenda – key insights of NUPs (source: UN-Habitat)



Further information on how to mainstream mobility into National Urban Policies can be found in the [Guidebook](#) developed by UN-Habitat for Lebanon in 2021.

Build cross-cutting institutional cooperation

Like other sustainable transport policies, the development and implementation of an e-mobility strategy requires an integrated approach with cooperation and consultation between the different levels of government and relevant authorities. This integrated planning requires intervention at two levels. First, coordinating across various governmental institutions is crucial at a horizontal level to ensure that targets and policies are aligned. Electric mobility impacts many sectors: transport, energy, industry, finance, environment, urban development, education, and research. At a vertical level, aligning strategies developed by national, regional, and local authorities is similarly critical to ensure consistency. National governments must bring forward enabling policies and regulatory frameworks and modulate fiscal instruments to facilitate a transition to e-mobility on the local level, for instance, through fuel, import, VAT and electricity duties and charges.

In public administration, adopting policies can serve as powerful tools for local implementation. For example, at a national level adopting a national level mobility policy such as the National Urban Mobility Plan (NUMP) can provide an overall direction. The objectives and goals of the NUMP can be adopted at a local level when cities develop a local Sustainable Urban Mobility Plan (SUMP). This ensures a concrete policy link between the national and local levels and can influence local actions.

Stakeholder Engagement, Public-private Partnerships, Transition Co-ownership

One major challenge for policymakers is identifying the various stakeholders involved. As e-mobility is an emerging technology in emerging economies, there are multiple players in the sector. Moreover, considering e-mobility as a sector with both automobile-related technologies and ICT technologies, identifying the stakeholders involved becomes complex.

A cohesive policy has to include the needs of all the stakeholders in the sector. Lessons from other countries and cities can be a valuable resource here. Once the stakeholders are identified and mapped, their operating environment and role in the e-mobility sector need to be studied.

Governments need to note that stakeholders are not just members of communities or non-governmental organisations. These entities affect and could be affected by an organisation's activities, products or services and associated performance about the issues to be addressed by the engagement (AccountAbility, 2015).

A pervasive range of stakeholders from the transport, energy, environment, urban development, industry and health sectors characterises e-mobility implementation. Therefore, successful implementation of e-mobility programmes requires participation in the design of e-mobility solutions must be encouraged and stimulated with a systemic approach among transport operators, grid operators and energy producers, utility companies, original equipment manufacturers (OEM), urban residents, businesses, shops, academia, mechanics, and other stakeholders who may be directly or indirectly involved in or impacted by a transition to e-mobility.

As situations vary depending on local contexts and transport modes, an ad-hoc mapping of relevant stakeholders is a prerequisite to any e-mobility policy. In addition, different sectors should understand e-mobility as a contributor to their policy objectives, such as air pollution climate strategies or local economic development. In more advanced e-mobility programs, governments are finding a role in supporting industry innovation, targeting both emissions policy and industrial policy to create jobs and develop the domestic industry.

The stakeholder identification is followed by assessing the value each stakeholder can bring to the decision-making process. This is done by mapping the stakeholders based on their levels of

engagement, the amount of time they will be involved in the activity and the extent of their communication. Upon mapping the stakeholders, it is also beneficial to categorise them as primary, secondary, and tertiary stakeholders, depending on their role in the project. Engaging with the stakeholders at regular intervals is essential regardless of their category.

Participatory planning makes public acceptance and support more likely and thus minimises risks for policymakers. The government needs to bring forward enabling regulatory frameworks and incentivise the private sector to engage in electric mobility. Citizens and stakeholders can not only contribute to the design of policies but also implement policies: they will be the ones (co-)owning electric mobility assets (i.e. vehicles and charging infrastructures) and using (shared) electric mobility services.

Governments need to work with manufacturers and other technology providers. The partnership will provide the governments with a clear understanding of the needs and synergies. For example, by working with manufacturers, governments can encourage the introduction of smaller and more efficient vehicles, while working with technology operators can support governments in how data is collected and utilised. At the same time, companies work with governments to improve their operating efficiency. The partnership can also help governments implement ICT infrastructure and other innovative business models that governments will be unable to provide due to a lack of resources.

Through the partnership, governments and the private sector can understand the final goals of each of the entities and choose the innovation options. For example, governments can use smart sensors to identify parking needs for vehicles and allocate the required parking facilities. By sharing data, operators have an overview of the real-time traffic data. In urban logistics, the data is critical to optimise delivery times. Optimising deliveries can also help companies reduce commuting time and thus translate to economic benefits.

Investing in building technical capacity and resources

A key ingredient for any step towards adopting innovative technologies is knowledge and awareness of the available options. Once such awareness is developed, it is easier for governments to move towards technological solutions as they can understand the benefits of such technologies.

A planned technical capacity development program is essential for involved government staff to increase awareness of the various technology options and the results they can produce. Of course, governments need not implement all these options, but knowing the available options can increase and allow them to identify key stakeholders and partners on their journey towards smart governance and smart logistics.

Resource availability is a crucial factor for governments to introduce innovative approaches. Many governments have introduced the concept of e-governance, leading to the digitalisation of various government services. The next step in evolution is moving from e-governance to smart governance. Moving to smart governance will mean investing in 5G technology and big data centres to collect and store the big data generated and analysed, implementing IoT sensors. Through partnerships and innovative business models, governments can create resources for new technology.

Examples of Multi-stakeholder e-mobility cooperation**AT THE NATIONAL LEVEL: THE GERMAN NATIONAL PLATFORM FOR ELECTRIC MOBILITY (NPE)**

The NPE was founded in 2010 by the German Federal Government as an advisory council tasked with monitoring the process of e-mobility development and developing recommendations to achieve the objectives of the National Development Plan for Electric Mobility. As dialogue between different sectors and stakeholders is critical for the success of e-mobility, the Platform gathers 150 representatives from industry, science, public institutions, trade unions and trade associations, looking at economic, social and environmental potentials of electric mobility. The NPE is supported by the Federal Government's Joint Agency for Electric Mobility (GGEMO). One of the working groups is specifically dedicated to urban planning and intermodality.

More information: <http://nationale-plattform-elektromobilitaet.de/en/>

AT THE CITY LEVEL: THE LIVE PLATFORM IN BARCELONA, SPAIN

The uptake of electric vehicles in Barcelona has been possible thanks to actions and incentives promoted at both governmental and local levels. Subsidies and funding opportunities facilitate the uptake of electric vehicles in Spain, such as the MOVELE Plan for cars, PIVE 8 Plan for efficient cars and the PIMA Air Plan for electric commercial vehicles and electric bikes. In Barcelona more specifically, benefits for e-vehicle drivers include free or discounted parking spaces at regulated areas, and free circulation on high occupancy vehicle lanes managed by the city. Another strategy adopted is the usage of social media to inform or promote the benefits of e-vehicles to the citizens. The platform LIVE (Logistics for the Implementation of the Electric Vehicle) coordinates policies and supports projects to promote e-mobility as well as new start-ups in the field of e-mobility. The platform is led by Barcelona City Council, the AMB (the public administration of the metropolitan area of Barcelona), and the Government of Catalonia, and is open to all private entities with an interest in e-mobility.

More examples: <http://www.uemi.net/toolkit.html>

CHAPTER 4 : PROCUREMENT ROUND TABLES AND WAY FORWARD

UN-Habitat is facilitating procurement round tables to allow for favourable negotiations between manufacturers, service providers and local implementing. The procurement exercise is based on the premise that the uptake of e-mobility in cities requires close cooperation between start-ups, industry, city administrations and research and academic institutions. Innovators are encouraged to show how they will work with various service providers and relevant stakeholders in their proposed demonstration actions. As part of the procurement process, UN-Habitat organised roundtables with local innovators from the target regions of Africa, Asia and Latin America to address any questions that they may have on the process and each party's expectations. Each roundtable was organised on a city basis to address the specific e-mobility needs in the specific context.

Reflections from the procurement round tables focused on:

- Working closely with the UN-Habitat's procurement department when coming up with the procurement call, guidelines and selection process since e-mobility is a nascent sector and may require specialized insights
- Engaging with various stakeholders to discuss how to engage with innovative local start-ups
- Conducting regular city-industry meets with local start-up communities to encourage knowledge exchange and partnerships
- Customising each city roundtable to the specific context taking into consideration language, internet connectivity and time zones
- Sharing procurement guidelines with local innovators so that they know how to work with cities, development agencies and industry
- Requesting clarification from innovators to ensure there is proper due diligence, especially concerning partners, team composition and technology selected
- Sharing and learning from each other on standards and industry best practices with other organisations seeking to work or incorporate local innovators in their programming

Working with Innovators to Promote Electric Mobility: UN-Habitat's Experience

UN-Habitat's experience of supporting a "mobility accelerator" at the University of Nairobi C4DLab in Kenya, led to the idea of challenging local innovator communities to come up with e-mobility solutions in collaboration with city authorities. A competitive selection process was run in 2021 by UN-Habitat, which resulted in 21 proposals tackling various electric vehicle types from different cities, including Hanoi (Vietnam), Pasig City (Philippines), Kathmandu (Nepal), Dar es Salaam (Tanzania), Kigali (Rwanda), Quito (Ecuador) and Montevideo (Uruguay).

This experience shows that cities can similarly adapt their standard procurement process to "procure" and "co-develop" innovative e-mobility solutions with the entrepreneurial community. Based on UN-Habitat's experience, cities can consider the following steps to collaborate with the start-up community:

- engage with national, local universities and technical institutions to establish "start-up/ mobility accelerators",
- carry out a market assessment of what is available. Cities can run a process or competition asking the start-up communities to present their innovative ideas and conduct a city-industry meet,
- frame more detailed specifications and invite competitive bids from the market for broadly defined solutions, for instance, a bike-sharing or a freight delivery system,
- launch a call for proposals and compare bids based on objective criteria such as passenger or freight kilometres offered by the e-mobility solution,
- frame contracts and make payments to the successful start-up based on performance criteria

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