

This document will discuss the project outcomes, methodology used, scopes of the project, and GESI mainstreaming plan for the project

Building a Regulatory and Financial Basis for Transjakarta's First Phase E-bus Deployment

Task 1.1. Inception Report

June 30, 2022

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Abbreviations

AC	Alternating current
APM	<i>Agen Pemegang Merk</i> (Authorized OEM Distributor)
BAU	Business-As-Usual
BDMI	bus, driver, maintenance, insurance
BEIS	The Department for Business, Energy & Industrial Strategy of the United Kingdom
BEV	Battery Electric Vehicle
BPPBJ	<i>Badan Pelayanan Pengadaan Barang dan Jasa</i> (Jakarta Goods and Services Procurement Service Agency)
BRT	Bus Rapid Transit
C40-CFF	The C40 Cities Finance Facility
CAPEX	Capital expenditure
CBR	Cost-Benefit Ratio
CO ₂ eq	Carbon dioxide equivalent
DC	Direct current
DKI	<i>Daerah Khusus Ibukota</i> (Special Capital Region of Jakarta)
DPRD	Regional People's Representative Council
EV	Electric Vehicle
FBC	Final Business Case/ Full Business Case
FCDO	Foreign, Commonwealth, and Development Office
FGD	Focus Group Discussion
GAUN	<i>Gerakan Aksesibilitas Umum Nasional</i> / The National Public Accessibility Movement
GESI	Gender equality and social inclusion
GHG	Green-house Gases
GIA	Gender Impact Assessment
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoI	Government of Indonesia
GoJ	Government of Jakarta
ICCT	International Council on Clean Transportation
ICE	Internal combustion engine
ITDP	Institute for Transportation and Development Policy
JBFT	Jakarta Barriers Free Tourism
JTA	Jakarta Transport Agency
kg	kilogram
km	kilometre
kW	kilowatt
kWh	kilowatt per hour
LEZ	Low Emission Zone
LFP	Lithium Iron Phosphate
LKPP	<i>Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah</i> (<i>The Government of Procurement Goods/ Services</i>)
MDB	Multilateral Development Bank
MtCO ₂ eq	Million Tonnes of carbon dioxide equivalent

NMC	Lithium Nickel Manganese Cobalt Oxide
NO _x	Nitrogen oxides
NPV	Nett present value
OBC	Outline Business Case
OEM	Original equipment manufacturer
PIU	Project Implementation Unit
PLN	<i>PT Perusahaan Listrik Negara/ State Utility Company</i>
pm	Particulate Matter
PPP	Public Private Partnership
PSO	Public Service Obligation
RFA	Regulatory Framework Assessment
ROI	Return of Investment
RUEN	National Energy Plan (<i>Rencana Umum Energi Nasional</i>)
SLA	Service Level Agreement
SMI	PT Sarana Multi Infrastruktur
SO ₂	Sulphur dioxide
SoC	State of Charge
SOC	Strategic Outline Case
SPV	Special Purpose Vehicle
TAG	Transport Appraisal Guidance
TCO	Total cost ownership
UKEF	United Kingdom Export Finance
UNEP-CTCN	United Nation Environment Programme – Climate Technology Centre and Network
USD	United States Dollar

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1. Introduction

The Government of Indonesia has already established an ambitious target to tackle the dangerous impact on climate transitions. The government aims to reduce 58% of Green-house Gases in 2050 compared to Business-As-Usual, equivalent to 2,726 MtCO₂eq. Implementing battery electric vehicles has become one of the measures to mitigate the problem. On the provincial level, the Government of Jakarta signed a C40 Fossil-Fuel-Free Street Declaration, as a commitment to achieve net-zero emissions in 2030 through implementing 100 electric buses in the pilot projects, achieving 50% electric bus share in 2025, and establishing two Low Emission Zones (LEZ) within the city border.

Previously, the electrification still lacks of a comprehensive large-scale road map to cater the Transjakarta's needs to electrify its 10,000 fleets in 2030—thanks to UK PACT support to fund the large-scale electrification roadmap study of Transjakarta through electrification of Mikrotrans, the microbus system of Transjakarta, which account for nearly one-third of total fleets Transjakarta needs to be electrified in 2030.

	2022	2023	2024 - 2025	2026 - 2028	2028 - 2030
	Pilot	Phase I	Phase II	Phase III	Phase IV
Policy	Roadmap & institutional policy, demand creation policy		Environmental policy, infrastructure provision policy	Supply support policy	Land bank policy
E-Bus to be procured	50	507	974	928	850
Charging infrastructure	Existing Terminals (layover location)	Depots and existing terminals	Existing and new depots, existing and new terminals, parking bays	Existing and new depots, existing and new terminals, public charging stations & parking bays	Existing and new depots, existing and new terminals, public charging stations & parking bays
Charging strategy	Overnight + terminal charging	Overnight + terminal charging	Overnight + terminal charging	Overnight + terminal + staging charging (optional)	Overnight + terminal + staging charging (optional)
Battery and charging technology	LFP	LFP, NMC	LFP, NMC	LFP, NMC, or newer technologies	LFP, NMC, or newer technologies
	50 - 75 kWh	50 - 100 kWh, efficiency ~ 3 km/kWh	50 - 100 kWh, efficiency > 3.5 km/kWh	50 - 100 kWh, efficiency > 4 km/kWh	50 - 100 kWh, efficiency > 4 km/kWh
	DC 22 - 50 kW charger	DC 22 - 50 kW charger	DC 22 - 50 kW charger	DC 22 - 100 kW charger	DC 22 - 100 kW charger
Routes selection	New routes + based on pilot selection	Based on routes ranking	Based on routes ranking	Based on routes ranking	Based on routes ranking

Figure 1. The Mikrotrans electrification roadmap, produced on the first phase of the project

Other than that, a comprehensive action plan has already been established on the previous study, comprising electric microbus operational plan & market research, TCO & cost-benefit analysis calculation, risk mitigation and resilience framework plan, grid analysis, and renewable energy integration. One report is also reserved to discuss GESI aspects on electrification. The project team has already delivered business models & policy recommendations, as well as conducting a series of

capacity-building with key parties involved in electrification, such as Transjakarta, OEM, bus operators, and other cities in Indonesia.

The Phase-I of this study found that shifting from conventional to electric microbuses using the power supported by solar PV systems offers benefits that go beyond the financial aspects, such as reducing 70% of GHG emissions. The analysis of electricity demand in Jakarta discovered that a large-scale electrification of Transjakarta—comprising of all BRT, non-BRT, and microbus services—will increase electricity demand by only 1.39% in 2030, and the use of renewable energy source, such as solar power can meet 5% to 55% (annual basis) of the charging needs of electric microbuses.

The cost-benefit calculation of microbus electrification results in a very healthy CBR. The current un-air-conditioned microbus resulted in a 1.87 Benefit-Cost Ratio. Electrifying microbus between 2023 and 2031 will avoid the IDR 2.6 billion of subsidised gasoline and generate USD 12.46 million from savings in foreign exchange spending.

However, without first addressing the absence of a legal framework and the dual constraints of greater up-front costs and technological complexity that have so far hampered investment prospects, Transjakarta's eloquent electrification targets could be out of the way.

As a continuation from the previous phase of the project, the project extension will establish enabling circumstances for real-world implementation of e-bus fleets, building on the electrification roadmap ITDP presently created with UK PACT assistance, and establishing a robust legislative framework for bus electrification as well as a final business case (FBC) to boost access to funding will be part of this study. Furthermore, further technical assistance on implementation methods and capacity development will be provided to ensure that stakeholders continue to work toward their electrification goals.

2. Project Outcomes & Methodology

The Phase-II project aims to provide technical assistance in the development of regulatory and financial basis for Transjakarta's first phase e-bus deployment. There are three outcomes expected to be delivered from this project:

1. Transjakarta, the Government of Jakarta, and the national government commit the resources and secure the financing necessary to implement the action plan and timetable to achieve 100% Transjakarta fleet electrification by 2030 and increased mobility and accessibility for women, low-income, and marginalised communities.
2. The Government of Jakarta adopts new or amended policies and regulations utilising the project's regulatory framework that legally enable the achievement of the 10,000 e-bus deployment target.
3. National and subnational policy-makers have improved capacity in conducting regulatory, financial, and technical assessments of e-bus deployment with the integration of GESI perspectives (e.g. through conducting gender impact assessments).

In order to achieve those three outcomes, several outputs are set to be developed.

1. Firstly, ITDP will gather information to update the project rationale, strategic suitability, and strategic gaps of the project. The team will reaffirm communication protocols, channels, and liaison procedures to familiarise new experts with the city and project administrations. Transjakarta and Jakarta Transportation Agency will be involved as the key beneficiaries in developing and affirming detailed Project Work Plan and Project Risk Mitigation Framework.
2. Secondly, a regulatory framework for Transjakarta large-scale e-bus deployment will be comprehensively assessed regarding public transport electrification by Transjakarta to support GoJ's program in GHG emission reduction, including identifying GoJ's program and policies and performing Gender Impact Assessment (GIA). Participatory workshops will be conducted involving women, low-income, and marginalised community representatives to ensure that GESI is integrated into the regulatory framework. The stakeholder mapping and responsibility matrix produced on the First-Phase of the project will be updated, particularly at the regional level for the first phase of procurement. Review and gap analysis on the current Draft Revision on Local Regulation 2/2005 is needed to develop the regulatory framework recommendation.
3. Thirdly, ITDP will perform market analysis, including several consultations with bus operators, OEMs, charging infrastructures providers, financing institutions, and retrofitting companies to gather inputs on the procurement, financial, technical, and other aspects associated with determining Transjakarta long-term implementation and developing Final Business Case for the first-phase of the large-scale electrification. The BRT, non-BRT, and microbus electrification plan developed in the previous studies will be integrated into new phasing groups, considering the financial, economic, and technical gaps analysis.

4. The fourth output is Final Business Case (FBC) for Transjakarta's first phase of large-scale e-bus deployment. ITDP will develop the FBC document consisting of technical plan, gender impact assessment, cost-benefit analysis, financial feasibility analysis, business models, and contractual framework of Transjakarta first phase electrification. ITDP will deeply analyse the adoption of fund channelling to Transjakarta and bus operators to accelerate the adoption of electric rolling stocks under the Transjakarta services, that would start being implemented in 2023.
5. Lastly, ITDP will document the regulatory framework, business case development, and e-bus technical plan, and update the national e-bus planning toolkit development in the previous phase of the project. To disseminate the updated toolkit, ITDP will conduct a capacity building session collaborating with the Ministry of Transportation.

Desktop research will be mainly conducted to accomplish the outputs of this study. Other than that, the project team will perform eventual stakeholder meetings & consultations with several parties or institutions, which detailed in the Table 1 below:

Table 1. External stakeholders that will be engaged

Stakeholders	Purposes
Electric bus OEMs & APMs, operators, financing institutions, and retrofitting companies	Market analysis to gather information on the procurement, financial, technical, legal, and other aspects, and to increase project attractiveness for developing the FBC document
Women-led advocacy groups and equity organisations	Ensure GESI aspects are being mainstreamed on this study through capturing inputs for Gender Impact Assessment (GIA) of the regulatory framework assessment and first-phase of implementation
Decision makers at provincial level	Present the mid-output and final recommendations of regulatory framework

Other than desktop research and stakeholder consultations, the project team will conduct on-board surveys to collect information for technical analysis purposes, such as actual route data, actual travel time, actual daily distance, potential charging facility location area data; and for cost benefit analysis, e.g. accessible basic facilities to estimate the value of accessibility improvement, ridership, traffic survey, et cetera.

3. Scope of Project

As previously mentioned, the Phase-II of the project will consist of five outputs. Some outputs become the prerequisites for the other, as illustrated on the flowchart below:

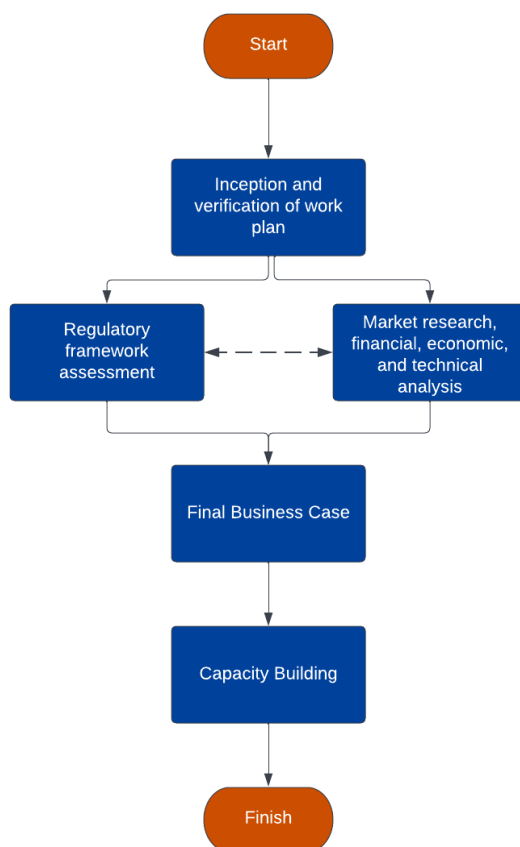


Figure 2. Workflow of UK PACT EUM 124 Phase-II

Before working on the technical outputs, such as Output 2, Output 3, and Output 4, the ITDP team needs to affirm the work plan and risk mitigation framework with beneficiaries and experts that are included in the activities in Output 1. After having a more affirmed work plan, the project team will work on doing regulatory framework assessment for the large-scale electrification of Transjakarta, parallel with doing market research and developing a detailed financial, economic, and technical analysis to determine implementation phases based on Transjakarta's electric BRT, non-BRT, and microbus roadmap. This will result in the recommendation of implementation phasing of Transjakarta electrification, including The Phase 1. The project team will discuss further with Transjakarta to determine the Phase 1 of the electrification.

After obtaining the Phase 1 of Transjakarta electrification, the project team will work on developing the Final Business Case document for that implementation phase, consisting of detailed technical plans, gender impact assessment, cost-benefit analysis, financial feasibility analysis, business

models, and contractual framework. The FBC document will be presented to the decision makers at the provincial level.

The process of developing the regulatory framework assessment, business case, and e-bus technical planning incorporated into the updated e-bus planning toolkit developed in the first phase of this project. The project closes with a capacity building event with other cities in Indonesia, collaborating with The Ministry of Transportation.

A detailed description of each output will be provided in the following sections.

3.1. Output 1: Inception Report

At this stage, ITDP will begin updating project rationale and gathering related information to work further for other outputs. ITDP presented the project objective, activities, and timeline to external stakeholders and beneficiaries. Jakarta Transport Agency and Transjakarta will be involved from the beginning of this project to enable the team to gather information, and to inform and synchronise the project work plan and project risk mitigation. This output is crucial as up-to-date data and information from stakeholders needed to develop following outputs is gathered. Learning from the first phase can help mitigate bottlenecks that may occur in the second phase.

There are three activities within the Output 1 of this project:

1. Task 1.1 Update the project rationale, strategic fit, and strategic gaps by gathering information from all available sources.
2. Task 1.2 Reaffirm communication protocols, channels, and liaison procedures; and familiarise new experts with the city and project administrations.
3. Task 1.3 Develop, discuss and affirm detailed Project Work Plan and Project Risk Mitigation Framework with key beneficiaries (Jakarta Transport Agency and Transjakarta).

3.1.1. Project rationale, strategic fit, and strategic gaps

Through C40 Fossil-Fuel-Free Street declaration, The Government of Jakarta committed its resources to launch 100 pilot e-bus and electrify 50% of its fleets by 2025. The plan for electrifying 10,000 of their fleets was stated on Transjakarta's Long-term Company Plan. However, Transjakarta and Jakarta Transport Agency still do not have a clear, comprehensive roadmap for electrifying their 10,000 fleets on a large-scale basis. A roadmap for Transjakarta to reach its 10,000 electric bus target by 2030 is being developed in the first phase of the project, laying out a strategic pathway for the e-bus deployment, including identification of policy support, priority routes for e-bus implementation, high-level assessment for battery and fleet technology, and grid requirement. However, tactical implementation plans are crucial as a next step to realising the roadmap.

While another on-going electrification project is focused on assisting with the implementation of the e-bus pilot, which will only operate one type of bus, post-pilot implementation faces various hurdles, from a financial, technological, and regulatory standpoint, these include the requirement to run many types of electric buses using various charging methodologies, as well as the establishment of off-depot charging facilities. Transjakarta has therefore requested assistance in developing implementation plans for the next post-pilot implementation phase as a follow-up activity. The ITDP team has regularly engage with Transjakarta for identifying what Transjakarta actually needs for the electrification. Through this project, the Transjakarta team ensure that all aspects of the assistance need by Transjakarta is covered by all technical assistance's projects, as shown at Figure 3.

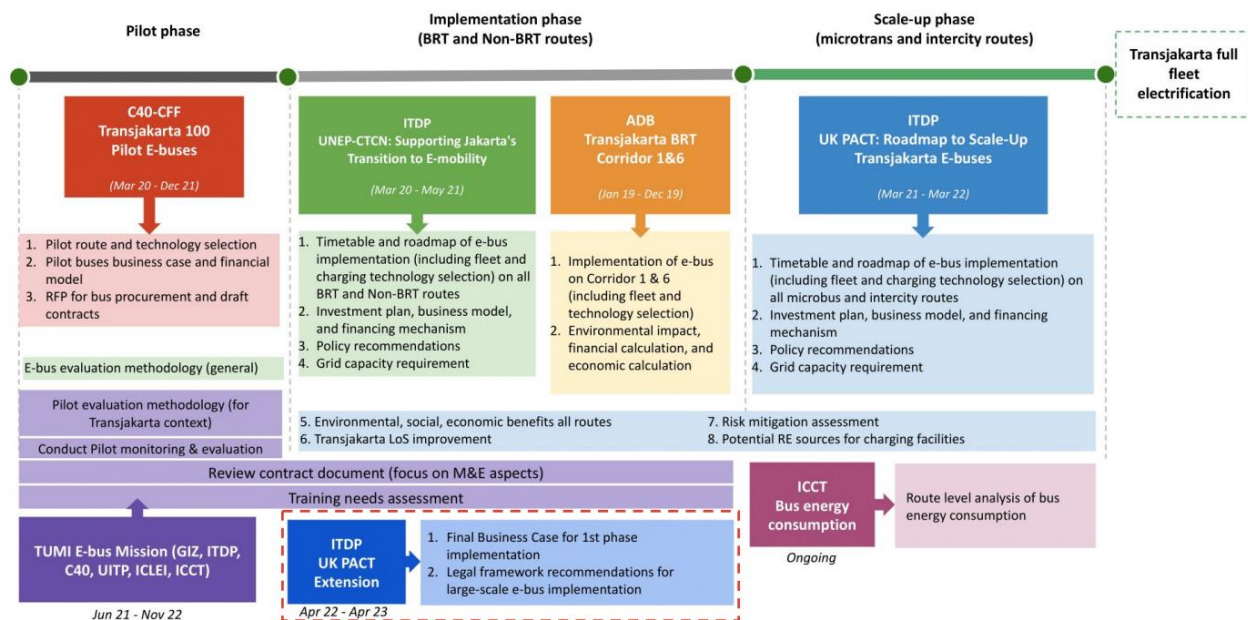


Figure 3. Transjakarta E-Bus Timeline Project & Continuation

Furthermore, while the present business model requires bus operators to purchase e-buses and charging stations, a lack of financial support from banks, MDBs, or other financial institutions remains the principal impediment to them adhering to Transjakarta's e-bus transformation plan. To reduce the uncertainty of implementing novel technology, reduce financial risks, and increase the project's bankability to attract investors, a full financial and technical review is required.

In addition to the need for more innovative business models, government financial support at this early stage is critical to enable scale up due to the higher expenditure required by e-bus conversions. Despite the fact that the Jakarta government has already given cash to support public transportation operations in the city, a clear estimation of the additional funding support required for e-bus adoption that will benefit all customers is required. On the other hand, Transjakarta has initially

explore the new initiatives or business models to obtaining funds for procuring e-bus, e.g. through global bonds, implementing Bus-as-a-Service scenario, etc. The project team will further assist detailed study for Transjakarta before they go further on implementing those new initiatives.

Transjakarta has developed an updated plan of the electrification, as shown at Figure 4 below. While the total numbers of e-bus fleets to be operated in 2030 remains same (10,047), Transjakarta will focus on procuring the rest of 12-metre low-entry bus in 2022, supported by overnight charging. In the following year, Transjakarta will deploy high-floor BRT buses and medium low-entry buses; while electrification of microbus will start in 2024 respectively. Retrofitting the diesel bus will be started in 2025 onwards.

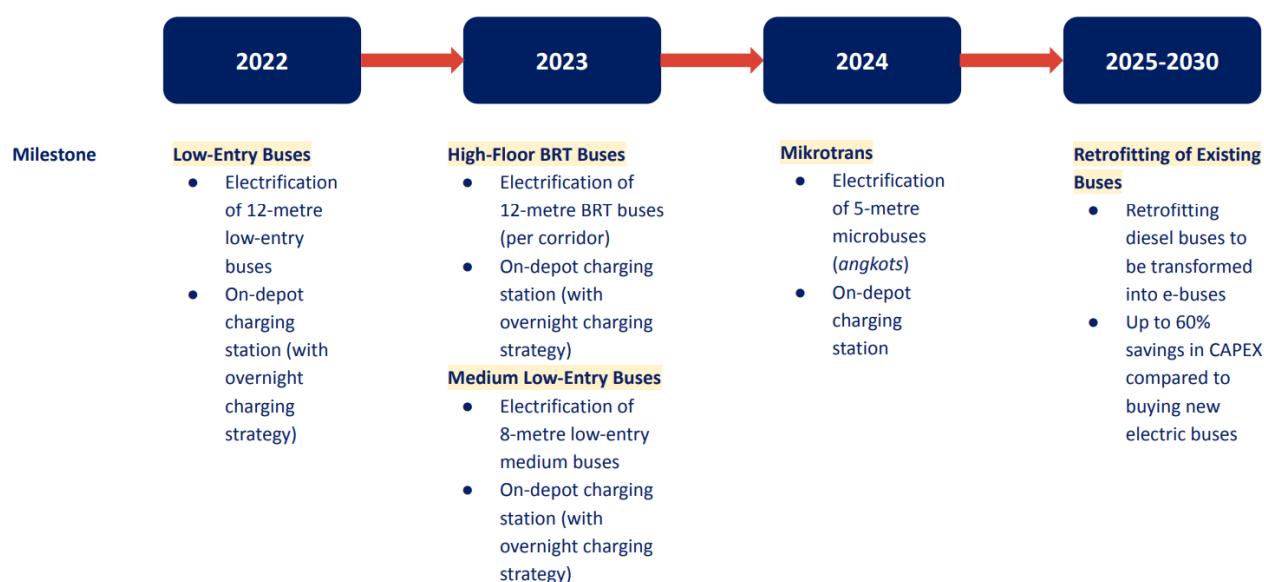


Figure 4. Transjakarta Electrification Plan, 2022 - 2030

3.1.2. Communication protocols, channels, and liaison procedures

The ITDP team has already established communication protocols, channel, and liaison procedures from the Phase-I of the project, so that the protocol and procedures only need to be evaluated and reaffirmed. ITDP led a bi-weekly coordination meeting with the internal project team for technical coordination, progress reporting, and action approval. For internal coordination with the UK PACT team (ICF), the project team attended a monthly-coordination meeting to deliver main progress and raise strategic issues regarding the project. The service provider of the project is illustrated as follow:

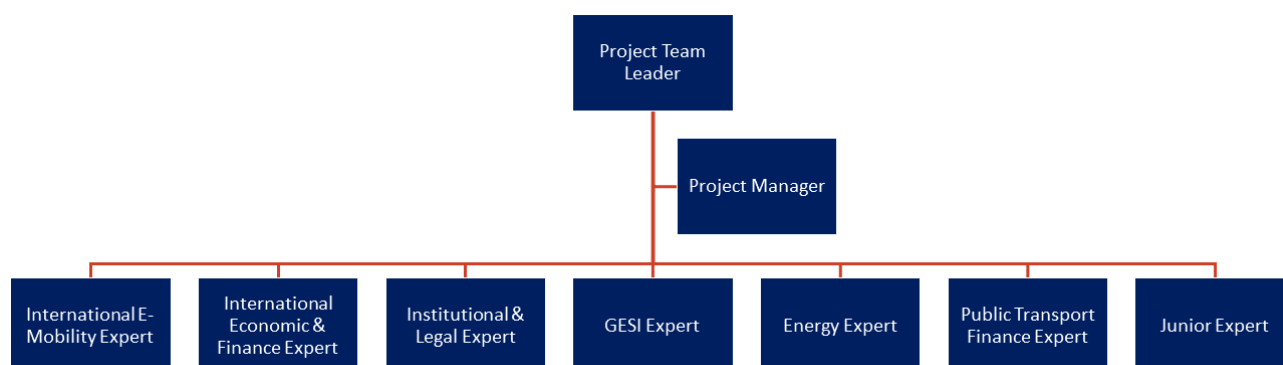


Figure 5. Project organogram

From the previous phase of the project, the project team also conducted a bi-weekly coordination meeting with the key beneficiary, which is Transjakarta, to discuss the progress & findings of the project, to fit the strategies and requests from Transjakarta, and as a medium for data-sharing coordination. Regular coordination with the Government of Jakarta, including Jakarta Transport Agency, conducted through E-Mobility Project Implementation Unit monthly meetings.

Several communication channels used for different purposes under the Phase-I of the project, such as Microsoft Teams for file-sharing, Google Mail for formal communication, and Zoom for formal virtual meetings.

As the project extension still focuses on Transjakarta electrification, the region-owned enterprise still becomes the main beneficiaries of the project. Jakarta Transport Agency, the government agency counterparts whom Transjakarta responsible for, will also be the main beneficiaries of the project. To help achieve the project objectives and to deliver benefits to other stakeholders, the project team will still be doing regular coordination meetings with key beneficiaries, such as Transjakarta and Jakarta Transport Agency. In April 2022, the project team conducted a kick-off meeting with the project beneficiaries within the provincial level.

Unfortunately, the E-Mobility PIU has been shut down since December 2021 as the decree only applies until the end of 2021. The ITDP team will push the government to-reactivate the E-Mobility PIU and re-establish the monthly meeting as a coordination medium between each stakeholder at the provincial level. Furthermore, to keep the project on track, the project team will do similar regular internal coordination meetings schemes both with internal or external parties. The project team will use the same platforms for communications.

The project team will ensure the communication protocols and channels keep capturing the voice of women and other vulnerable groups by creating an inclusive communication channel and coordination framework. As a continuation from the previous phase of the project, the project team will regularly encourage gender-balanced meetings and discussions, notably with external stakeholders, and develop an inclusive participatory planning process and medium. The

communication process, channels, and liaison procedures with the governments and non-governmental counterparts is summarised in Table 2 below.

Table 2. Liaison procedures and communication channels

Stakeholders	Status	Liaison Procedures	Communication Channels
UK PACT/ ICF team	Internal parties	Monthly regular meeting	Google Mail and Ms. Teams
Consultants/ experts	Internal parties	Bi-weekly coordination meeting	Google Mail, Ms. Teams, Zoom
Transjakarta	External beneficiaries	Bi-weekly coordination meeting	Google Mail, Zoom
Jakarta Transport Agency & Government of Jakarta	External beneficiaries	E-Mobility PIU monthly meeting	Google Mail, Zoom

3.2. Output 2: Regulatory Framework

Output 2 will focus on the regulatory framework of the Transjakarta e-bus deployment to support GHG emission reduction in Jakarta. The assessment will start by identifying the GoI's and GoJ's programs and policies in GHG emission, particularly on public transportation electrification. Gender impact assessment will be performed by reviewing the GESI aspect of the regulatory framework and conducting participatory workshops to validate the findings. The findings of the assessment will be used as a reference in updating the stakeholder mapping at the policymaking sector. Draft Revision of Local Regulation 2/2005 which will be the umbrella policy for all GHG emission and air pollutant reduction initiatives in Jakarta also needs to be reviewed. Stakeholder consultations with the policymakers will be conducted to disseminate the assessment result and regulation review.

As the project will not previously develop the Outline Business Case (OBC) for the first-phase of electrification to assess the project's feasibility, this output will be performed to assess the feasibility of Transjakarta electrification from the regulatory side. Moreover, this output is very important in establishing a robust legal basis to secure resources needed—including regional budget—needed for achieving the electrification goal, maintaining the sustainability of the electrification program, reaffirming the role of each stakeholder in Transjakarta's first large-scale e-bus deployment, and ensuring no one is left behind through conducting participatory workshops with equity organisations and women-led advocacy groups for Gender Impact Assessment of the policies and programs that are in place.

The detailed activities for this output will be structured as follow:

1. **Task 2.1** Conduct regulatory framework assessment (RFA) regarding public transport electrification by Transjakarta to support the Government of Jakarta's programs in GHG emission and air pollution reduction, including GESI mainstreaming in the frameworks and build capacity of beneficiaries on topic.
2. **Task 2.2** Conduct gender impact assessment (GIA) of the regulatory framework.
3. **Task 2.3** Conduct participatory workshop to assess and validate the regulatory framework with equity organisations and women-led advocacy group representatives.
4. **Task 2.4** Update stakeholder mapping at the policymaking sector, based on the regulatory framework assessment.
5. **Task 2.5** Review the Draft Revision of Local Regulation 2/2005 on Air Pollutant Control, which will be the umbrella policy for all GHG emission and air pollutant reduction initiatives in Jakarta.
6. **Task 2.6** Conduct stakeholder consultation with the policymakers for mid-output and present the final recommendations of the regulatory framework.

The output will be developed between June and November 2022, as illustrated at Table 3 below. There are two main considerations for the RFA finalisation timeline:

- First, the Government of Jakarta will finish the academic draft of Local Regulation 2/2005 by August - September 2022.
- Second, corresponding with Task 2.6, the term of the current government will finish on October 16, 2022. However, the mid-output findings and final recommendations might be presented to different stakeholders, and it needs to be mitigated to ensure both the former and existing stakeholders have the same level-of-knowledge.

Table 3. Timeline for developing activities for Output 2

Activity		Months										
		May '22	June '22	Jul '22	Aug '22	Sept '22	Oct '22	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23
Output #2	Regulatory framework for Transjakarta large-scale e-bus deployment to support Government of Jakarta's programs in GHG emission reduction											
Task 2.1	Conduct regulatory framework assessment regarding public transport electrification by Transjakarta to support the Government of Jakarta's programs in GHG emission and air pollution reduction, including GESI mainstreaming in the frameworks and build capacity of beneficiaries on topic											
Task 2.2	Conduct gender impact assessment of the regulatory framework											
Task 2.3	Conduct participatory workshops with equity organizations and women-led advocacy group representatives											
Task 2.4	Update stakeholder mapping at the policymaking sector, based on the regulatory framework assessment											
Task 2.5	Review the Draft Revision of Local Regulation 2/2005 on Air Pollutant Control, which will be the umbrella policy for all GHG emission and air pollutant reduction initiatives in Jakarta											
Task 2.6	Conduct stakeholder consultation with the policymakers mid-output and present the final recommendations of regulatory framework											

3.2.1. Regulatory framework assessment (RFA) of Transjakarta's electrification

At the national level, Presidential Regulation No. 22/2017 on the National Energy Plan (*Rencana Umum Energi Nasional/ "RUEN"*) and Presidential Regulation No. 55/2019 on the Acceleration of the Battery Electric Vehicle (BEV) Program for Road Transportation form the foundation for the country's transition to electric vehicles. The acceleration of the BEV program, according to PR 55/2019, involves industry development, guidelines for possible incentives, charging infrastructure and regulation of electricity tariffs, environmental protection and the formation of a National BEV Acceleration Coordination Team. This Presidential Regulation serves as a legal foundation and a high-level framework for national ministries under the National BEV Coordination Team to develop more precise policies and regulations to advance BEV in Indonesia.

Jakarta has begun to integrate electric vehicles into its public transport system, Transjakarta. Jakarta has existing regulatory basis for e-bus deployment, namely: Jakarta Governor Instruction No. 66/2019 on Air Quality control which instructs to accelerate public transport fleet renewal and implement a more stringent emission standard for public transport fleet; Governor's Regulation No 90/2021 on Local Low Carbon Development Plan which instructs to deploy electric buses on the BRT system, adopt BEV in government fleet and develop charging infrastructure; Jakarta Regional Secretary Instruction No 01/2021 on Regional Strategic Activities Acceleration Action Plan which include a mandate for Transjakarta to implement electric buses; C40 Fossil Fuel Free Streets Declaration in 2019, where Jakarta pledged to implement 100 e-bus by 2020 and 50% of Transjakarta fleet electric by 2025 and implement Low Emission Zones. Transjakarta has a Long

Term Corporate Plan 2020-2030 which states its target to operate more than 10,000 electric buses, or 83% of its total fleet by 2030.

The Government of Jakarta has regulations that provide incentives for BEVs and disincentives for ICE buses. As stated in Jakarta Governor Regulation No. 03/2020, incentives such as tax exemption have been applied to BEVs, such as ownership transfer tax exemption for BEVs until December 2024 and 0% transfer tax for two-wheelers and four-wheelers. Non-financial incentives, such as Low Emission Zone laws and odd-even driving restrictions, have been implemented in addition to fiscal incentives. Furthermore, the GoJ intends to draft a new regulation concerning Electronic Road Pricing (ERP). The draft has been issued to the Jakarta Regional People's Representative Council (DPRD DKI), and is targeted to be inaugurated in October 2022. The DPRD DKI postponed the discussion of revising the local regulation in respect of parking.

The Government of Jakarta has taken some initiatives to encourage e-mobility, particularly in public transportation, but there is more work to be done. Several policy recommendations have been structured on the previous project for faster accelerating EV adoption in public transport in Jakarta, such as providing a clear roadmap for EV rollout, regulation review about public transport fleets' age limitation, business models, financing support, technical aspects, phasing out ICEVs roadmap, and ensuring e-mobility implementation by recommending an interdepartmental empowered group for electrification at the provincial level. As the continuation from the Phase-I of the project, this extension will focus on developing a more specific, robust, and more implementable regulatory framework to support a large-scale electrification of Transjakarta.

The RFA has a close relation with financial and technical aspects of the electrification. The project team has gathered inputs from Transjakarta regarding the preliminary financial and technical aspects needed for the electrification, including numbers of regulations that need to be revised—or even created. While the detailed financial and technical aspects will be developed further in the following output, the RFA will be developed earlier and then readjusted after the regulatory changes or revisions needed are identified to enable large-scale electrification from the financial and technical aspects. Further, an analysis on the regulatory basis for fund channelling the bus operators will be performed too.

The goal of the RFA in this study is to evaluate the most suitable intervention for existing regulations or new proposed regulations that could enable the most suitable financing models for large-scale electrification which has minimum obstacles, require the fastest time possible to be created or revised, and has maximum impact to accelerate the electrification.

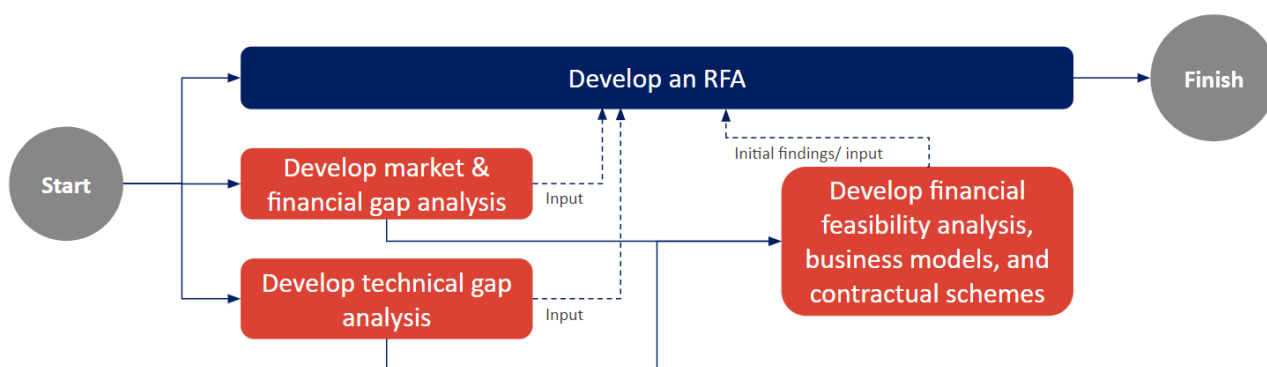


Figure 6. Workflow of developing RFA on this study

The RFA will be established in order to ensure that the required regulations are in place before the deployment of large-scale electrification of Transjakarta commences. This approach will examine the current legislation governing large-scale electrification in Transjakarta, as well as international regulations and best practices. It will look into the technical and environmental issues that apply at the provincial level towards Transjakarta electrification. The RFA will primarily be carried out via desktop research, while stakeholder consultations need to verify and gather inputs from the respective party that will deploy the regulation into places.

3.2.2. Gender impact assessment of the regulatory framework

The Government of Indonesia (GoI) has demonstrated its commitment to gender equality and social inclusion at both the international and national level. The Presidential Regulation No. 18/2020 on the National Mid-Term Development Plan 2020–2024 highlights six forms of mainstreaming, including gender equality and sustainable progress, as a driver for development toward a prosperous and equitable society. Gender and disability are also highlighted as cross-cutting concerns that must be addressed in all development sectors in the National Mid-Term Development Plan 2020–2024.

The GoI issued the Service Level Agreement (SLA) for Transjakarta Services, and it has been incorporating gender issues into the regulations, such as tariff affordability for vulnerable groups, equal treatment/ service for passengers with special needs, priority seating for the elderly, children, people with disabilities, and pregnant women, and in-fleet wheelchair space.

However, ITDP and the project team have documented hurdles that vulnerable groups should face for travelling independently with Transjakarta services. These hurdles could be mitigated at two levels: macro level, where the interventions should be made throughout the policy and programme level; and micro level, where GESI mainstreaming occurs for more tangible technical aspects, such as electric bus fleet, infrastructure, and facilities. Of course, the implementation at micro level happens when the robust programmes and policies are already in place. While the first-phase of the project focuses on assessing the hurdle overseen at electric bus fleets, infrastructure, and facilities,

the project team will develop a more comprehensive macro level analysis to incorporate Gender Impact Assessment into the regulatory framework regarding electrification.

3.2.3. Participatory workshop with equity-organisations and women-led advocacy groups

The previous project has regularly captured input from the vulnerable groups regarding the accessibility of Transjakarta services through a series of Focus of Group Discussion (FGD), field survey, and interview. Involving women and vulnerable groups at every level of Transjakarta electrification, from decision-making to execution, will assist in preserving sustainability and establishing a gender-responsive Transjakarta system. Because of that, the project team will engage women and vulnerable groups representatives, such as GAUN, JBFT, and UN Women into the next participatory planning process, to evaluate and corroborate the result on Gender Impact Assessment developed in the previous task.



Figure 7. Electric bus on-board survey conducted with vulnerable groups in Phase-I of the project

3.2.4. Stakeholder at the policymaking sector

This section will discuss a list of all stakeholders who may have an impact on vehicle electrification activities, especially the deployment of electric buses in Jakarta. Transjakarta, as the main beneficiary, has an influence on Transjakarta's electric bus deployment strategy, both directly and indirectly. The Government of Jakarta, in particular the Jakarta Transport Agency, as the public counterpart that controls Transjakarta's public transport service provision in their jurisdiction, are the key stakeholders in this project. Other stakeholders at the local level consist of private bus operators under the management of Transjakarta who own and operate the fleets, PLN (State Utility Company) Greater Jakarta Distribution Unit as the electricity provider, other local agencies that issue policies related to the e-bus deployment and charging infrastructure provision, Transjakarta passengers, and Jakarta road users.

Moreover, large-scale electrification requires Transjakarta to secure a large amount of PSO from the regional budget, considering the status quo of funding sources to daily-operating the BRT system. The Government of Jakarta needs to ensure the Jakarta Regional People's Representative Council (DPRD DKI) allocates enough capital to achieve the electrification target.

At the national level, several ministries are involved in BEV acceleration programs that will benefit from the policy recommendations in this project. An initial stakeholders mapping can be seen in Figure 8 and Table 4.

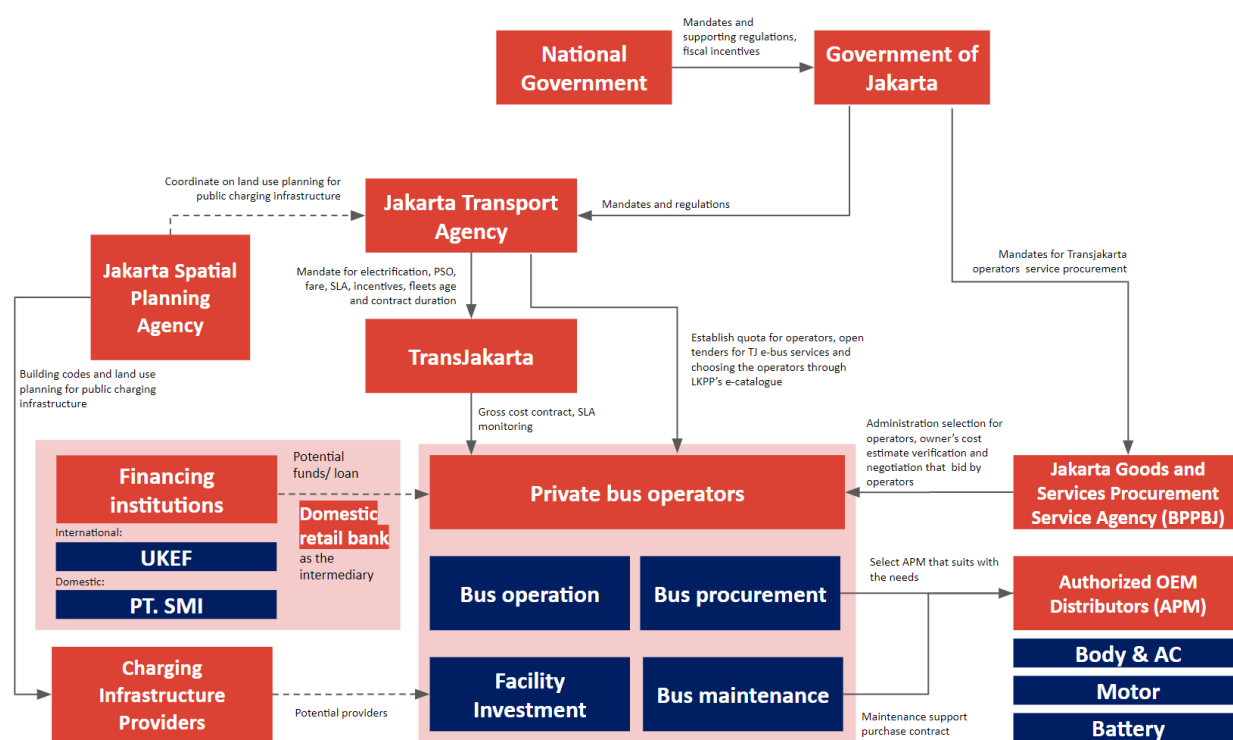


Figure 8. Stakeholder mapping for Transjakarta fleet electrification

Table 4. Stakeholder mapping for Transjakarta fleet electrification

No	Institutions	Level	Responsibility/Role	Importance	Influence
1	Transjakarta	Local	Implements the fleet electrification plan; contracts and manages bus operators	High	High
2	Bus Operators	Local	Procure, maintain, and operate bus fleets in accordance with the Transjakarta contract; provide charging infrastructure.	High	Low
3	Jakarta Transport	Local	Regulator of Transjakarta services;	High	High

	Agency		provides PSO; determines SLA, fares, fleet age and contract duration; formulates local-level non fiscal incentives.		
4	DPRD DKI	Local	Arrange the allocation of annual regional budget, including PSO for electric bus	Medium	High
5	PLN (State Utility Company) Greater Jakarta Distribution Unit	Local	Provides grid and ensure grid stability, determines electricity tariff for public transport charging facilities; provides grid installation incentives; initiates charging infrastructure provision	High	Medium
6	Citizens and Transjakarta users, including marginalised and vulnerable groups	Local	Transjakarta service users; other road users also might be impacted indirectly (general road safety issues, etc.); provides inputs from the user side experience	Medium	Medium
7	Local government institutions, in particular the Jakarta Economic Affairs and Finance Bureau, Jakarta Spatial Planning Agency and Jakarta Goods/Services Procurement Service Agency	Local	Formulates detailed local policies relevant to e-bus deployment (e.g. incentives, amend building codes and land use planning for charging infrastructure locations, service fees); conduct selection of bus operators	Medium	Medium
8	National government institutions, in particular those mandated to form the BEV acceleration task force in the Presidential Decree	National	Formulates national policies to support national BEV adoption	Medium	High

Moreover, the project team will also assess the current employment configuration of Transjakarta and decision makers at the Government of Jakarta, disaggregated by gender, both at the decision-maker and non-decision maker level. As of now, all the decision makers of Transjakarta (director level) are all men. Further identification of stakeholder related to GESI mainstreaming in each technical agency, such as Working Group of GESI Mainstreaming (*Kelompok Kerja Pengarusutamaan Gender/ "Pokja PUG"*) on addressing the inclusivity aspects on public transport and electrification will also be conducted.

3.2.5. Review of the Draft Revision of Local Regulation 2/2005 on Air Pollutant Control

Local Regulation 2/2005 on Air Pollution Control aims to improve and protect public health by ensuring the safety and preservation of environmental functions, realising the community's attitude toward environmental care, controlling resource use, and controlling air pollutant sources in order to achieve healthy air. Air quality protection is based on ambient air quality standards, ambient air quality status, emission quality standards, exhaust emission thresholds, noise level standards, noise thresholds, and the Air Pollutant Standard Index, which is reviewed every 5 years and takes into account national standards. Every activity that has the potential to generate air pollution is required to adhere to the established guidelines. Sanctions are given for any disobedience of regulations and might take the form of permission revocation or the payment of fines.

The regulation also governs various measures for controlling air quality in the transportation sector. In order to reduce pollution caused by vehicles, every vehicle must pass a vehicle emission test, which will be considered in its tax payment, and it must also pass a noise test. Furthermore, it is reported that a vehicles-free day is held at least once a month in specific places as part of a series of air quality restoration efforts.

However, current Local Regulation No. 25/2005 needs to be updated to enable vehicle electrification programs—particularly large-scale electrification of Transjakarta—as from the Transjakarta's own estimation, the total of USD 2,450,557,000 needs to be secured for purchasing & retrofitting e-bus, as well as establishing on-depot and terminal charging stations, until 2030.

3.2.6. Stakeholder consultation with the policymakers

The last activities needed to establish a regulatory framework are stakeholder consultations with the policymakers, such as Jakarta Transport Agency, Jakarta Spatial Planning Agency, Jakarta Regional Development Agency, Jakarta Economic Affairs and Finance Bureau, and Ministry of Transportation. The stakeholder consultations will be held twice. The first consultation aims to verify and gather inputs at developing the mid-outputs of the RFA. The last meeting will present the final results and recommendations.

3.3. Output 3: Financial, Economic, and Technical Analysis of Transjakarta Electrification Phasing

Output 3 will outline the financial, economic, and technical gap analysis of Transjakarta electrification. The analysis will be started by conducting market analysis—including preliminary market consultations—to gather information from the respective stakeholders regarding on the procurement, financial, technical, legal, and other aspects before performing financial, economic and technical gap analysis, and to increase project attractiveness. The market analysis could also

gather any other information needed before developing the Final Business Case document (Output 4).

The following activities after the market consultations are detailed financial and economic gap analysis for each e-bus implementation groups, based on the BRT, non-BRT, and microbus long term electrification plan that has been developed in the previous studies. With also incorporating inputs from Transjakarta, the project team will re-assess the long-term electrification plan and phases of Transjakarta electrification and choosing the first phase of electrification to further develop the FBC document.

3.3.1. Market analysis

The project team will conduct desktop study to gather relevant information available on market analysis. The desktop research will be performed to analyse the electric bus market ecosystem (worldwide and domestic level), analysing Transjakarta electric bus procurement process to identify the role, interest, and influence of each industry players involved in the procurement process, identify list of information from the preliminary plan of technical aspects that is needed to be gathered from market consultations, and identify findings from previous studies on market analysis. Table 5 summarised the list of previous studies that also developed market research regarding electrification in Indonesia.

Table 5. Previous studies on electrification in Indonesia

	Title of Studies	Funders	Institutions	Purpose of Market Research	Method	Scopes of Market Research (Types of Industries)	Year
1	Indonesia Mass Transit Project	World Bank	ITDP & ICCT	TCO calculation, explore models and technologies' availability	Desktop research & interviews	OEMs, charging infrastructure providers	2021 – 2022 (ongoing)
2	Supporting Jakarta's transition to E-Mobility	UNEP-CTCN	ITDP	Preparing Transjakarta's pilot project, TCO calculation and comparison, service tariff calculation	Desktop research & interviews	OEMs	2020 - 2021
3	Building Capacity and Action Plan to Scale Up Transjakarta E-bus	UK BEIS (now FCDO), under the UK PACT programme	ITDP	Explore vehicles availability in the market and its performance suitability	Desktop research	OEMs, EV manufacturers, charging infrastructure providers	2021 – 2022
4	CFF Zero Emission Buses for Jakarta	C40 CFF	GIZ	TCO calculation, explore models availability, design the appropriate e-bus operations	Desktop research, interviews and data	OEMs, EV manufacturers, charging infrastructure providers	N/A – Sept 2020

				system	analysis		
5	Innovating for clean air: E-Mobility in Indonesia	UK BEIS	Catapult	Gap analysis and identify sectors in Indonesian E-Mobility Ecosystem	Desktop research & interviews	OEMs	Jan – Mar 2021

The findings from the previous studies on market analysis become the baseline information for identifying the need of market consultations based on the list of companies or industry players that have been engaged, the depth of information gathered from the respective industry players, and the year the market consultations conducted.

Previous market research of e-buses provided several information on both technical and non-technical aspects of e-bus procurement. Based on the Indonesia Mass Transit Project market study, the average price for single 12 m e-bus is USD 269,487 and for the medium 9m e-bus is USD 172,042. Unfortunately, no pricing information for the micro electric bus (6 m e-bus) has been provided.

Indonesia has several local e-bus charging suppliers. There are two types of chargers that are generally available in the market, plug-in and pantograph chargers. Based on the Indonesia Mass Transit Project market study, each of them has various power output, ranging from 150 kW to 450 kW, and the price starts from USD 52,886 to USD 344,892. In the Building Capacity and Action Plan to Scale Up Transjakarta E-bus market study, plug-in charger's power output can be either AC or DC. It is important to understand the charger characteristic since a battery can only be charge by DC powers. Standardization of charging is required to enable recharging of e-buses from different manufacturers. In addition to the local market research, e-bus charging market research was also conducted in overseas market. As the important part of e-bus, Indonesia Mass Transit Project market study found that battery account for 40% of the total e-bus price and will have a significant impact on TCO of e-buses and business models. By 2020, the average e-bus battery pricing on the market was USD 100 per kWh. It predicted to be cheaper in the future and will come down by about 80 percent from its original price.

Transjakarta has tested e-buses from PT. Bakrie Autoparts and PT. Mobil Anak Bangsa on roads through CFF Zero Emission Buses for Jakarta. It was found that a single 12m bus consumes 1.465 kWh/km of electricity while a medium 9-m bus consumes 0.804 kWh/km. TCO was calculated for various scenarios of usage and found that the TCO for an electric bus is still higher than equivalent diesel buses. TCO for E-buses with big battery size is 29% (on average) higher and 11% (on average) higher for the e-bus with medium battery size. For the non-BRT routes, it ranges from 13-36% higher for the low entry or single buses and 53% higher for the medium buses.

The Indonesian electric bus industry ecosystem still faced several growing challenges. It needs more supports to grow up, both from the regulatory and financial perspective. Currently, there are several overlapping regulations that govern the e-mobility ecosystem that are issued by multiple government agencies or ministries, but still have minimal real-world outcome. It can also be seen

that the e-buses' sales rate is still relatively low, even though interest in e-bus is very high. Despite the numerous regulations that regulate the e-mobility ecosystem, e-bus operators are still facing financial difficulties. The operators do not have adequate financial to qualify for getting loans from banks or financing institutions. At the same time, banks are also hesitant to fund due to immaturity of e-mobility industry and its value depreciation, as well as the lack of insurance and guaranteeing of the buses. Regulation is also required to control the technical aspect, notably in battery waste management and recycling.

These challenges were also happened throughout Transjakarta procurement process. The existing regulations regarding the contract scheme between Transjakarta and operators are inflexible. It may dissuade potential parties that are initially interested to invest in e-buses. To ensure the long-term sustainability of the project for the potential investors, a flexible contract scheme with longer durations must be formulated.

Furthermore, before performing market consultations, the procurement process of Transjakarta e-bus is also needed to be identified to know the types of industry players that have direct involvement or interest at the procurement. The Government of Jakarta giving mandates for road-based mobility service and electrification to Jakarta Transport Authority and mandates for Transjakarta operators service procurement to Jakarta Goods and Services Procurement Service Agency (*Badan Pelayanan Pengadaan Barang dan Jasa*, "BPPBJ"). Transjakarta presents to the Jakarta Transport Authority the need for operator service procurement and requests that tenders for operator procurement be opened through the e-catalogue portal. Based on the need of mobility, The Jakarta Transport Authority proposes operator service procurement at the e-catalogue portal managed by BPPBJ. Operator quotas need to be defined before private bus operators begin bidding the service.

To bid on Transjakarta services, private bus operators must get support letters from bank for fleet purchases, as well as APM (authorised OEM bus distributors) and provide a performance bond. BPPBJ manages the selection process, which includes administrative selection, owner's cost estimate verification—together with Transjakarta and Jakarta Transport Authority, and negotiation with operators. After the operators have been selected, they need to run a gross-cost contract with Transjakarta within a certain contract period, under the BDMI (bus, driver, maintenance, and insurance) system.

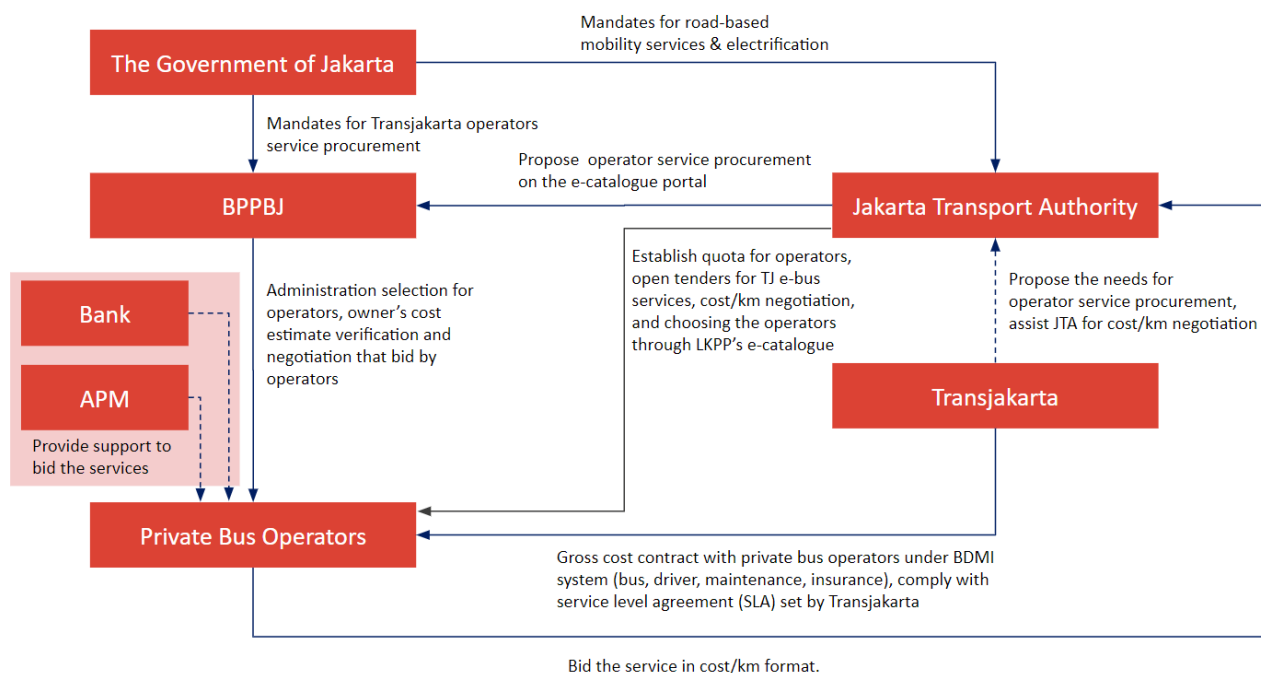


Figure 9. Transjakarta e-bus procurement process & stakeholder involved

The workflow of the procurement process illustrated at Figure 6.

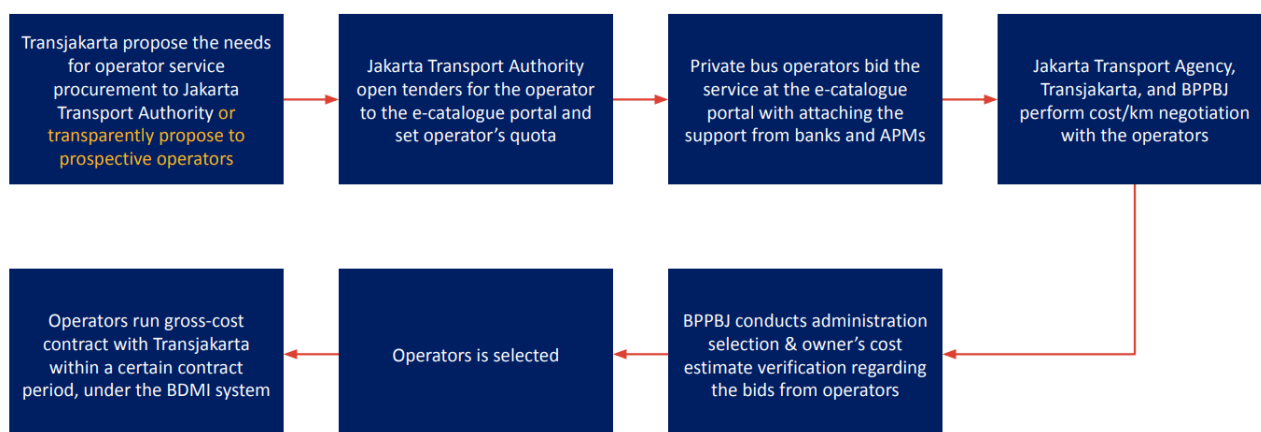


Figure 10. Transjakarta e-bus procurement workflow

As from the initial identification on the stakeholder analysis and the procurement process, the project team has identified that **bus operators, OEMs or local authorised distributors (APM), bank/ financing institutions, and charging/ power/ renewable energy companies** as the key industry players that need to be consulted as they have large involvement on today's e-bus fleets procurement. Other than that, **retrofitting companies** should also be explored, as from the

discussion with Transjakarta, they are keen to retrofit their electric bus in a large-scale since 2025.

3.3.2. Financial, economic, and technical gap analysis for each e-bus implementation groups

A comprehensive roadmap and timetable of implementation phases on Transjakarta BRT, non-BRT, and microbus electrification plan has been developed in the previous studies, including the Phase-I of UK PACT EUM 124, as illustrated respectively on Figure 11 and Figure 12. Moreover, an integrated roadmap for BRT-non-BRT and microbus electrification need to be re-evaluated by conducting a detailed financial, economic, and technical gap analysis for each e-bus implementation groups. In addition to the previous developed roadmap that fully focus on procuring the new e-bus, the financial, economic, and technical gap analysis will take into account the analysis on the retrofitting scenario and mixed operation scenario between conventional and electric bus.

	2021 - 2024		2024 - 2027		2027 - 2030
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Infrastructure	<ul style="list-style-type: none"> Transjakarta provides one staging facility 5 charging points at terminal provided by Transjakarta Overnight charging provided by operators 	<ul style="list-style-type: none"> 9 fast charging points at terminal provided by Transjakarta Overnight charging provided by operators 	<ul style="list-style-type: none"> 10 fast charging points at terminal provided by Transjakarta 2 staging facilities ready to be used Overnight charging provided by operators 	<ul style="list-style-type: none"> 11 fast charging points at terminal provided by Transjakarta 3 staging facilities ready to be used Overnight charging provided by operators 	<ul style="list-style-type: none"> 12 fast charging points at terminal provided by Transjakarta 4 staging facilities ready to be used Overnight charging provided by operators
Charging Strategy	Overnight + Staging Facilities + Terminal Charging	Overnight + Terminal Charging	Overnight + Terminal Charging + Staging Facilities	Overnight + Terminal Charging + Staging Facilities	Overnight + Terminal Charging + Staging Facilities
Number of e-bus to be produced	234	493	416	257	325
Fleets and Charging Technology	<ul style="list-style-type: none"> Single bus Depot: Plug in 150 kW Terminal: Pantograph 450kW Staging: Plug in 180 kW 	<ul style="list-style-type: none"> Single bus Medium bus Depot: Plug in 150 kW Terminal: Pantograph 450kW Staging: Plug in 180 kW 	<ul style="list-style-type: none"> Single bus Medium bus Depot: Plug in 150 kW Terminal: Pantograph 450kW Staging: Plug in 180 kW 	<ul style="list-style-type: none"> Single bus Medium bus Articulated bus Depot: Plug in 150 kW Terminal: Pantograph 450kW Staging: Plug in 180 kW 	<ul style="list-style-type: none"> Single bus Medium bus Articulated bus Depot: Plug in 150 kW Terminal: Pantograph 450kW Staging: Plug in 180 kW
Investment	<ul style="list-style-type: none"> CAPEX: USD 117,744,467 OPEX: USD 72,942,592 TOTAL: USD 190,687,059 	<ul style="list-style-type: none"> CAPEX: USD 208,076,022 OPEX: USD 117,155,160 TOTAL: USD 325,231,182 	<ul style="list-style-type: none"> CAPEX: USD 247,227,487 OPEX: USD 123,644,007 TOTAL: USD 370,871,494 	<ul style="list-style-type: none"> CAPEX: USD 208,076,022 OPEX: USD 117,155,160 TOTAL: USD 325,231,182 	<ul style="list-style-type: none"> CAPEX: USD 139,924,597 OPEX: USD 78,866,001 TOTAL: USD 218,790,598
GHG Reduction (from business-as-usual)	<ul style="list-style-type: none"> CO₂eq: (17,475) ton PM_{2.5}: (30.7) kg SO₂: (19.3) kg NO_x: (691.9) kg 	<ul style="list-style-type: none"> CO₂eq: (43,350) ton PM_{2.5}: (72) kg SO₂: (45) kg NO_x: (1,664) kg 	<ul style="list-style-type: none"> CO₂eq: (68,861) ton PM_{2.5}: (99) kg SO₂: (61) kg NO_x: (2,431) kg 	<ul style="list-style-type: none"> CO₂eq: (85,112) ton PM_{2.5}: (122) kg SO₂: (75) kg NO_x: (2869) kg 	<ul style="list-style-type: none"> CO₂eq: (100,89) ton PM_{2.5}: (137) kg SO₂: (84) kg NO_x: (3,251) kg

Figure 11. Transjakarta BRT and non-BRT electrification roadmap, developed in a previous study by ITDP (funded by UNEP-CTCN)

	2022	2023	2024 - 2025	2026 - 2028	2028 - 2030
	Pilot	Phase I	Phase II	Phase III	Phase IV
Policy	Roadmap & institutional policy, demand creation policy		Environmental policy, infrastructure provision policy	Supply support policy	Land bank policy
E-Bus to be procured	50	507	974	928	850
Charging infrastructure	Existing Terminals (layover location)	Depots and existing terminals	Existing and new depots, existing and new terminals, parking bays	Existing and new depots, existing and new terminals, public charging stations & parking bays	Existing and new depots, existing and new terminals, public charging stations & parking bays
Charging strategy	Overnight + terminal charging	Overnight + terminal charging	Overnight + terminal charging	Overnight + terminal + staging charging (optional)	Overnight + terminal + staging charging (optional)
Battery and charging technology	LFP	LFP, NMC	LFP, NMC	LFP, NMC, or newer technologies	LFP, NMC, or newer technologies
	50 - 75 kWh	50 - 100 kWh, efficiency ~ 3 km/kWh	50 - 100 kWh, efficiency > 3.5 km/kWh	50 - 100 kWh, efficiency > 4 km/kWh	50 - 100 kWh, efficiency > 4 km/kWh
	DC 22 - 50 kW charger	DC 22 - 50 kW charger	DC 22 - 50 kW charger	DC 22 - 100 kW charger	DC 22 - 100 kW charger
Routes selection	New routes + based on pilot selection	Based on routes ranking	Based on routes ranking	Based on routes ranking	Based on routes ranking

Figure 12. Transjakarta Mikrotrans electrification roadmap, developed in a previous study by ITDP (UK PACT EUM 124 Phase-I)

3.3.3. Transjakarta long-term implementation phases of electrification

After re-evaluating the of roadmap, the long-term implementation phases that are favourable and implementable in term of financial, economic, and technical aspects could be secured. The most critical aspect on this long-term implementation phases of electrification is to get the first phase of the electrification. The project team will discuss and reaffirm the first phase of the electrification proposed to Transjakarta. The Final Business Case document will be developed only for the first phase of long-term implementation, not all the phase.

3.4. Output 4: Final Business Case

Business case, according to The APMG Public-Private Partnership (PPP) Certification Guide-Preparation, is a “planning and development tool for projects and an aid to effective decision-making”. The UK’s HM Treasury defined the purpose of a business case as “a management tool developed over time as a living document as the project develops which keeps together and summarises the results of all the necessary research and analysis needed to support decision-making in a transparent way.” The role of business case is very crucial to deliver information needed to investors and creditors or lenders. Business case documents need to include the following aspects:

- Commercial feasibility;
- Technical feasibility;
- Financial feasibility & bankability;
- Market interest; and
- The identification of funding sources.

Generally, there are three types of supporting business case for enabling a certain project: Strategic Outline Case (SOC), Outline Business Case (OBC), and Final/ Full Business Case (FBC). The Final Business Case is the third stage in the formulation of a business case for a major project program. It determines the most economically beneficial offer after procurement, validates affordability, and puts in place the precise arrangements for effective delivery.

However, there are no exact guideline to develop a Final Business Case document or for the appraisal of public investment, particularly for public transportation-related procurements or projects like Transport Appraisal Guidance (TAG) or The Green Book (UK's HM Treasury and Government Finance Function).

The final business case document intended for this project will go deeper rather than other “FBC” document developed for different studies—the document will serve more as “business proposal” that will be used by Transjakarta to engage with potential investors or parties for supporting their electrification target.

As a consequence of the absence of a tying guidance at the national and regional level for developing an FBC for the public transportation sector and the unique purpose of the FBC on this project, output 4 will outline the Final Business Case document for the first phase of long-term electrification, consisting of:

- Technical plans;
- Gender impact assessment;
- Cost-benefit analysis;
- Financial feasibility analysis; and
- Business models and contractual framework.

3.4.1. Technical plans

A detailed technical plans will be developed for the first phase of large-scale electrification of Transjakarta obtained from the previous activities in Output 3. This is one of the most crucial aspects to develop properly, as it will affect the rest of analysis that will be developed in the FBC document (Gender Impact Assessment, Cost-Benefit Analysis, Financial Feasibility Analysis, and Business

Models & Contractual Framework). The technical plan will consist of route-level prioritisation, updated fleets technology, battery size, charging strategy, detailed charging facility planning, mixed operational plans between the electric and diesel buses, and retrofitting scenario.

The actual, detailed technical plans could not be acquired from desktop research or secondary data only. The project team will conduct an on-board survey to gather additional information needed to develop an excellent technical plan, such as actual route data, actual travel time, actual daily distance, and potential charging facility location area data. The on-board survey will be focused on the routes for the first phase of electrification.

3.4.2. Gender impact assessment

Gender Impact Assessment (GIA) will be performed to assess the impact of the first-phase of the electrification to vulnerable groups—not only women in general, but also children, elderly, and people with disabilities. This could be a flagship example to incorporate the importance of Gender Impact Assessment in the FBC document on the electrification for other cities to duplicate.

The gender impact assessment for infrastructure or public facilities will be conducted in the several steps, such as:

1. Portrait the existing conditions on the facilities—in this case is all facilities related to Transjakarta electrification on the routes proposed as the first-phase, such as the fleets model, the pedestrian and cycling facilities along the routes or corridors, accessibility at the terminus, etc.;
2. Analyse zero-alternative scenario;
3. Analyse the implication of the zero-alternative scenario;
4. Analyse prioritisation of improvements needed;
5. Cross-sector analysis; and
6. Developing gender action plan.

The project team will also conduct an on-board and off-board survey to portrait the existing conditions on the facilities.

Furthermore, to gather comprehensive inputs and information from the marginalised and vulnerable groups, the project team will conduct a participatory workshop with equity organisations and women-led advocacy groups. The project team will present the findings from the previous studies on Transjakarta's accessibility, including the findings from the existing conditions on the facilities, the prioritisation of improvements needed, the proposed gender action plan.

3.4.3. Cost-benefit analysis

Cost-benefit analysis is one of the most deciding part on the Final Business Case document as it will show the benefit of the project proposed—both qualitative and quantitative—as well as the actual cost that will be required to implement the project.

In the case of electrification, the analysis of the environmental impact of should be performed before developing the quantitative cost-benefit analysis. The cost components are mainly driven by the investment and operational cost required to operate the electric bus, as well as the monetisable value of additional green-house gases produced to the increasing demand of electrification; while the benefit mainly gained from the green-house gases and air-pollution reduced, fuel subsidies reduction, and saving in foreign exchange outgo.

The cost-benefit analysis should result in a healthy cost-benefit ratio (CBR) which is greater than 1.0. CBR is less than 1.0 means that the costs of the project exceed the benefits, hence the project should not be considered.

Other than that, the non-monetisable components, such as accessibility improvement and social inclusion compared to diesel buses scenario will also be assessed through this task. Because of that, it is necessary to collect on-ground data to conduct the cost benefit analysis, e.g. accessible basic facilities to estimate value of accessibility improvement, ridership, traffic survey, etc.

3.4.4. Financial feasibility analysis

The financial feasibility analysis will be conducted to know whether the project is fiscally viable or not. The feasibility from the financial aspect will be decided through quantitative economics parameters, such as cost-benefit analysis that will be developed in the prior activities, the Return-of-Investment (ROI), NPV, etc., identify the bankability of proposed project, and identify any other financial risks possible.

Other than from the fare-box revenue, the status quo of funding sources for operating the Transjakarta services was mainly came from the public service obligations (PSO) or subsidies that sources from the regional budget, hence the calculation of PSO needed to operate the e-bus—compared to diesel bus scenario—will be needed.

3.4.5. Business models and contractual framework

As of now, Transjakarta still applies a gross-cost contract scheme to the bus operators to run the daily-operation of e-bus. The e-bus operators will do a separate contracting with the charging infrastructure providers. The gross-cost contract scheme & the reluctance of banks to lend their money for e-bus because the technology has not mature yet required the bus operators to have

major amount of equity. Previous studies concluded that Transjakarta could not linger with the existing business models and contractual framework hence they should apply innovative business models; or else the financial capacity of Transjakarta and private bus operators should be strengthened. This section will overview the business models and contractual framework of current business models and contractual framework, analyse the gaps, and assess incorporating potential financing support from other institutions, including PT SMI (PT Sarana Multi Infrastruktur), a state-owned company for infrastructure financing. The project team will also develop the scopes of business plan for running the electric buses that would be sustain until 2030 or further.

Furthermore, section will also deep-dive into analyse the feasibility of establishing the SPV (Special Purpose Vehicle) that will act as a lease entity for electric buses, batteries, and charging infrastructures; identify the fund channelling between investors to bus operators; and developing the new contract structure.

After developing the FBC document comprises of a detailed technical plan, gender impact assessment, cost-benefit analysis, financial feasibility analysis, and business models and contractual framework for the first-phase of Transjakarta's electrification, the project team will compile and develop executive summary the FBC and present the final recommendations to the decision makers in Transjakarta and the Government of Jakarta, such as Head of Jakarta Transport Agency, Head of Jakarta Regional Planning Agency, etc.

3.5. Output 5: National-level Capacity Building

3.5.1. Updated e-bus planning toolkit

The previous phase of the project developed an e-bus planning toolkit. The document is intended for the government at the national and sub-national level, as well as public transport operators, as a knowledge-tank for them to implement Battery Electric Buses (BEB) for road-based public transportation. The toolkit is also covering the factors to consider for electrifying the public transport fleets and what should be done first before electrification. The findings from the first phase of UK PACT EUM 124 study is also disseminated through the document.

However, the document needs to be updated to document the regulatory framework assessment (RFA), the development of business case, and e-bus technical planning process, including the gender-impact assessment (GIA) process conducted in the phase two of this project.

3.5.2. National-level capacity building, collaborating with Ministry of Transportation

To bring this project to an end, the project team will collaborate with the Ministry of Transportation to orchestrate a national-level capacity building to disseminate the updated e-bus planning toolkit developed in the previous activities as well as other lessons learned in the project extensions regarding how regulatory framework being and the FBC document for implementing e-bus is developed.

In the previous series of capacity building event held by in the Phase-I of the project, the project team had a Focus Group Discussion with five cities in Indonesia to know their current perspectives about electrification, the obstacles they faced to operate electric public transportation fleets, and their suggestions or inputs on from the external parties, including the Ministry of Transportation, about the support they need for the electrification.

	Barriers and Main Issues on Electrification				Support Needed from External Parties				
	Conclusion: E-bus funding, including expensive fleet cost, battery, and its infrastructure				Conclusion: Technical Assistance and Capacity building or training; Financial and Procurement Support; Legal Basis for Electrification				
Medan	Knowledge transfer to drivers	Dissemination to e-bus industry players	Determining e-bus routes and the integration to current PT system	Promoting the transition from ICE bus to e-bus to citizen	Financial support	Technical Assistance	Capacity building for deepening the knowledge about e-bus implementation		
Bandung	Expensive pricing for the new EV fleets	Complicated requirements to get charging station installation permit	The collaboration with state utility company is less attractive from business perspective		Capacity building about bus type, brands, and determining depot's location	Fleet provision	Knowledge transfer regarding the impact of road slope and congestion on battery life	Policies that support local electrification	
Semarang	Land acquisition issue	Vehicle parking near the bus stop	Roads that are narrower and have varying contours	The bus stop needs to be revitalised	Support from the GOI for procurement and operational costs	Fleet procurement support from GOI	Financial support for operational and fleets' rejuvenation	Electricity price subsidy for public transport fleets	Comprehensive training/ technical assistance
Surabaya	After-service fleet utilisation	Flooding			Financial support to fill local gov's budget gaps	Fleet provision			
Denpasar	Charging speed from the state utility company is too slow and take longer time				Regulations about vehicle repower (retrofitting with electric engines) as a cheaper alternative than procuring new EV fleets	Faster charging process (solar PV, etc.)			

Figure 13. Barriers and main issues on electrification, as well as support needed from external parties, gathered from 5 Indonesian cities during workshops on the first phase of the project

The inputs and gap analysis from the five cities consulted previously could become additional considerations for the project team to deliver more unerring materials for capacity building.

The capacity building event with The Ministry of Transportation is expected to happen in late March 2022.

4. GESI Mainstreaming Strategy and GESI Action Plan

As the continuation from the previous phase of the project, the project extension will keep mainstreaming GESI aspects, to ensure no one left behind when the public transport electrification is in place. The GESI aspects will be mainstreamed through identifying possible GESI activities from the proposed task. The project team submitted **38 GESI-related activities** under the GESI action plan ([see Annex 1](#)). Several highlights from the GESI-related activities are:

- The ITDP team will strive for gender-balanced project team composition.
- The project team will mainstream the GESI aspects on the reporting of each task by adding at least one section, subsection, or issue related to GESI and inclusivity on each report.
- The project team will encourage women and people with disabilities' participation in the CSE (civil society engagement) agenda, such as participatory workshop. Women and people with disabilities' participations will also be encouraged for the discussion with other beneficiaries, such as Transjakarta, Jakarta Transport Agency, etc.
- The project team will fulfil the needs of vulnerable groups—especially people with disabilities—for communication, if applicable.
- The project team will publish a campaign for encourage e-bus women drivers' safety aspects on the work place.

5. Project Timeline

The project has been kicked-off in April 22nd, 2022, with external beneficiaries at the provincial level, such as Jakarta Transport Agency, Transjakarta, Jakarta Economic Affairs & Finance Bureau, Jakarta Environmental Agencies, etc. One month after that, in May 31st, the project kicked-off with the internal team, presaging that the team could started working on this project.

As the original proposal promised the project to start in March 2022 and it just started one month after, all deliverables for this project will be postponed one month. It is targeted that the project finished at March 2023, lasting for about **11 – 12 months** since the project kicked-off. Figure 14 shows the timeline of each output and task within the project.

Activity		Months											
		May '22	June '22	Jul '22	Aug '22	Sept '22	Oct '22	Nov '22	Dec '22	Jan '23	Feb'23	Mar '23	
Output #1	Inception and verification of work plan												
Task 1.1	Update the project rationale, strategic fit, and strategic gaps by gathering information from all available sources												
Task 1.2	Reaffirm communication protocols, channels, and liaison procedures; and familiarize new experts with the city and project administrations												
Task 1.3	Develop, discuss and affirm detailed Project Work Plan and Project Risk Mitigation Framework with key beneficiaries (Jakarta Transport Agency and Transjakarta)												
Output #2	Regulatory framework for Transjakarta large-scale e-bus deployment to support Government of Jakarta's programs in GHG emission reduction												
Task 2.1	Conduct regulatory framework assessment regarding public transport electrification by Transjakarta to support the Government of Jakarta's programs in GHG emission and air pollution reduction, including GESI mainstreaming in the frameworks and build capacity of beneficiaries on topic												
Task 2.2	Conduct gender impact assessment of the regulatory framework												
Task 2.3	Conduct participatory workshops with equity organizations and women-led advocacy group representatives												
Task 2.4	Update stakeholder mapping at the policymaking sector, based on the regulatory framework assessment												
Task 2.5	Review the Draft Revision of Local Regulation 2/2005 on Air Pollutant Control, which will be the umbrella policy for all GHG emission and air pollutant reduction initiatives in Jakarta												
Task 2.6	Conduct stakeholder consultation with the policymakers mid-output and present the final recommendations of regulatory framework												
Output #3	Detailed financial, economic, and technical analysis to determine implementation phases based on Transjakarta's Electric BRT and Non-BRT Deployment Roadmap												
Task 3.1	Conduct market analysis, including by conducting consultations with bus operators, OEMs, charging infrastructure providers, financing institutions, to gather inputs on the procurement, financial, technical, legal, and other aspects, and to increase project attractiveness												
Task 3.2	Conduct detailed financial and economic analysis for each e-bus implementation groups, based on the developed BRT-Non BRT electrification roadmap until 2030												
Task 3.3	Determine long-term implementation phases based on detailed financial and economic analysis and technical gap analysis												
Output #4	Final Business Case for Transjakarta's first phase of large-scale e-bus deployment												
Task 4.1	Develop technical plans of the first phase implementation, including route-level prioritization, updated fleet technology, battery size, and charging strategy, mixed operational plans between electric and diesel buses, and charging facility planning												
Task 4.2	Conduct gender impact assessment of project implementation												
Task 4.3	Conduct participatory workshop to assess and validate the regulatory framework with equity organizations and women-led advocacy group representatives												
Task 4.4	Conduct cost-benefit analysis of the first phase of the project, as well as qualitative assessment of non-monetizable components, e.g. accessibility improvement and social inclusion, compared to diesel buses scenario												
Task 4.5	Conduct financial feasibility analysis, including calculation of year-wise PSO needs compared to diesel buses scenario and build capacity of beneficiaries on topic												
Task 4.6	Develop business model and contractual framework for the implementation phase, including assessment to incorporate potential financing support from PT SMI and other financial institutions/investors												
Task 4.7	Compile and develop executive summary the FBC and present the final recommendations to the decision makers in Transjakarta and the Jakarta Government												
Output #5	National-level capacity building on e-bus regulatory framework, business case development, and technical planning with GESI mainstreaming												
Task 5.1	Document the regulatory framework, business case development, and e-bus technical planning process, including the gender-impact assessment (GIA) process conducted in this project and update the national e-bus planning toolkit developed in EUM124												
Task 5.2	Conduct a capacity building session in collaboration with the MoT to disseminate the updated toolkit as well as other lessons learned in the project extensions regarding e-bus regulatory framework development and the FBC												

Figure 14. Timeline for each output and activities of the project

Moreover, as the continuation from the first phase of the project, the submission for each task or activities will happen for every three-months. Figure 15 summary the quarterly submission tentative-target respective to the task. Most of tasks will be finished in the 4th quarter of 2022.

Q2 2022	Q4 2022		Q1 2023
Output 1: Inception Report	Task 2.1: Regulatory framework assessment report	Task 3.2: Detailed financial and economic analysis	Task 4.5: Financial feasibility analysis of FBC
	Task 2.2: Gender impact assessment report	Task 3.3: Long-term implementation phase	Task 4.6: Business models and contractual framework for FBC
Q3 2022	Task 2.3: Participatory workshop	Task 4.1: Technical plans of FBC	Task 4.7: Final FBC document
Task 3.1: Market analysis	Task 2.4: Stakeholder mapping	Task 4.2: Gender impact assessment of FBC	Task 5.1: Updated e-bus planning toolkit
	Task 2.5: Review of Draft Revision Local Regulation 2/2005	Task 4.3: Participatory workshop	Task 5.2: National-level capacity building
	Task 2.6: Stakeholder consultation with policymakers	Task 4.4: Cost-benefit analysis of FBC	

Figure 15. Submission target for each task

6. Risk Mitigation Framework

Six risks that will influence the result and accomplishment of the project have been identified as stated on the project proposal. The risks are grouped into five categories: delivery, operational, fiduciary, reputational, safeguarding, and external contents, whereas the risks identified in this project covers the delivery, operational, and external contents' aspects. Three risks are categorised into "major" impact, such as:

1. The end of the provincial government term in October 2022 (external content);
2. The shifting of the government's budget priorities for pandemic recovery (external content); and
3. The dynamic regulatory changes in the national and subnational level (delivery).

The remaining three risks are categorised into "moderate" impact, such as:

1. Workshop participants' health concern due to COVID-19 (delivery);
2. Limited participation from the market players in the consultation sessions (delivery); and
3. Limited mobility of team members due to pandemic restrictions (operational).

The project team has prepared a mitigation strategy to tackle the issues, as described in Figure 16. The project team will continuously update the list of the risks identified throughout the project, necessary actions that should be taken, and residual risk once the mitigation have been taken.

ID	Risk category	Risk description	Probability	Impact	Risk	Actions that have been taken since last delivery plan
1	Delivery	The ongoing COVID-19 crisis may prevent identified workshop participants from attending due to health and safety concerns, especially if they are from a vulnerable group.	Possible	Minor	Moderate	Develop a virtual stakeholder engagement plan. In the past year, ITDP has conducted a number of online workshops with vulnerable groups and will utilize the experience in this project extension.
2	External Context	The current government term will end in November 2022, and incoming officials may have differing political priorities that are not aligned with this project.	Possible	Major	Major	Ensure that the legal framework is incorporated into regional regulation, so that they are not easily changed if there is a change in government. In addition, initiate engagement and conversations with the new government as early as possible.
3	External Context	The pandemic has shifted budget priorities to focus on alleviating the economic recession, therefore impacting resources available for public transport service, including Transjakarta, in the coming years. Hence, the PSO recommendation to support e-bus deployment implementation is at risk.	Possible	Major	Major	Create business models which emphasize the role of the private sector and improve project feasibility. A legal framework will also be developed to enable novel business models.
4	Delivery	Limited participation from the market players in the consultation sessions.	Unlikely	Moderate	Moderate	Encourage Transjakarta to be the facilitator of the market consultation sessions. By having the potential client directly serve as the session host, will hopefully encourage more active engagement from other market players.
5	Delivery	Dynamic regulatory changes (national and local level) as well as fast paced technology development might render the analysis less relevant in several years	Possible	Major	Major	A number of scenarios will be assessed in the financial and economical analysis
6	Operational	Limited mobility of team members due to pandemic restrictions	Possible	Minor	Moderate	Given the current trend of declining cases in Indonesia and improving vaccination rate, it is expected that mobility restriction policies will be more relaxed in the coming years. However, should the restrictions still happen, online meetings are prioritized by default.

Figure 16. The risk register of the project and the mitigation strategies

Annex 1 – GESI Action Plan

Project Work Package/Output/Task	GESI Proposed Activities	Indicators
Output #1: Inception and Verification of Technical Assistance and Work Plan		
Task 1.1. Update the project rationale, strategic fit, and strategic gaps by gathering information from all available sources	Explore Transjakarta and Government of Jakarta (Jakarta Transport Agency) efforts on GESI mainstreaming within their development programs, including on public transportation and electrification	One subsection addressing the current Transjakarta and Government of Jakarta efforts on GESI mainstreaming, including on PT and electrification
	Update employment data of Transjakarta by gender, including on decision-making positions, and identify the Province's Gender Working Group	One subsection addressing the current employment configuration Transjakarta, disaggregated by gender
Task 1.2. Reaffirm communication protocols, channels, and liaison procedures; and familiarize new experts with the city and project administrations	To ensure that communication protocols and channels capture the voice of women and other vulnerable groups throughout all stages of projects	Number of communication protocol in place, types of communication channels used in the project
	To ensure gender-responsive and inclusive liaison procedures are in place	All communications with external stakeholders, including invitations and discussions, to encourage women, PWD, children rep., and elderly rep. participations
Task 1.3. Develop, discuss and affirm detailed Project Work Plan and Project Risk Mitigation Framework with key beneficiaries (Jakarta Transport Agency and Transjakarta)	Ensure gender-balanced project team, both sexes have equal opportunities in decision making processes. The project lead is woman and 50% of the team members are women.	Proportion of male and female team members are equal (50:50)
	Employ a dedicated GESI expert within project team to monitor GESI implementation internally and externally	one GESI expert employed in the team
Output #2. Regulatory framework for Transjakarta large-scale e-bus deployment to support Government of Jakarta's programs in GHG emission reduction		
Task 2.1. Conduct regulatory framework assessment regarding public transport electrification by Transjakarta to support the Government of Jakarta's programs in GHG emission and air pollution reduction, including GESI mainstreaming in the frameworks and build capacity of beneficiaries on topic	Identify list of issues in GESI perspectives for Transjakarta electrification in accordance with GHG emission and air pollution reduction	Number of sub-section included at the report
Task 2.2. Conduct gender impact assessment of the regulatory framework	Integrate GESI perspectives in initial e-bus regulatory framework	Number of sub-section included initial e-bus regulatory framework
Task 2.3. Conduct participatory workshop to assess and validate the regulatory framework with equity organizations (disability/other vulnerable groups) and women-led advocacy group representatives	Conduct participatory workshop that invited at least 1 people with disabilities groups' representatives and 1 women-led advocacy group	Number of PwD groups' representatives and women led advocacy group invited on the workshop
	Encourage marginalised and vulnerable groups (women, PwDs, elderlies, and children) participations on the workshop	Proportion of participants, disaggregated by gender, age, and disability (when applicable)
	Propose campaign for Transjakarta women e-bus drivers while advocating safety in the workplace	At least one online campaign for advocating women drivers' safety on electrification conducted or published
Task 2.4. Update stakeholder mapping at the policymaking sector, based on the regulatory framework assessment	Ensure the inclusion of stakeholders related to GESI mainstreaming in regulatory framework assessment result	Number of stakeholders related to GESI mainstreaming
Task 2.5. Review the Draft Revision of Local Regulation 2/2005 on Air Pollutant Control, which will be the umbrella policy for all GHG emission and air pollutant reduction initiatives in Jakarta	Identify and embed issues in GESI perspectives for Transjakarta electrification in accordance with GHG emission and air pollution reduction from Draft Revision of Local Regulation 2/2005	Number of issues identified & included at the report
		Number of proposed principles addressing GESI issues at the Draft Revision of Local Regulation 2/2005
Task 2.6. Conduct stakeholder consultation with the policymakers (mid-output and present the final recommendations of regulatory framework)	Present points related to GESI perspectives from the previous task	Number of stakeholder consultation that includes GESI topics
	Encourage women and PWD to actively participate in the consultation	Number of participants disaggregated by gender and disability (when applicable)
Output #3 Detailed financial, economic, and technical analysis to determine implementation phases based on Transjakarta's Electric BRT and Non-BRT Deployment Roadmap		
Task 3.1. Conduct market analysis, including by conducting consultations with bus operators, OEMs, charging infrastructure providers, financing institutions, to gather inputs on the procurement, financial, technical, legal, and other aspects, and to increase project attractiveness	Explore the inclusivity aspects and women participation on the existing condition of procurement process	At least one section specifically address inclusivity aspects for the procurement process
	Explore GESI and inclusivity issues on electrification from market consultation	At least one section specifically address GESI and inclusivity issues on market analysis report
Task 3.2. Conduct detailed financial and economic analysis for each e-bus implementation groups, based on the developed BRT-Non BRT electrification roadmap until 2030	Integrate GESI perspectives in developing the detailed financial and economic analysis	One section is provided to integrate GESI perspectives in developing the detailed financial and economic analysis
Task 3.3. Determine long-term implementation phases based on detailed financial and economic analysis and technical gap analysis	Integrate GESI perspectives in the long-term implementation phase	One section or subsection addresses the GESI aspects at the report
	Conduct preliminary analysis on GESI aspects at the developed long-term implementation phases and the proposed first-phase of electrification	

Project Work Package/Output/Task	GESI Proposed Activities	Indicators
Output #4 Final Business Case for Transjakarta's first phase of large-scale e-bus deployment		
Task 4.1. Develop technical plans of the first phase implementation, including route-level prioritization, updated fleet technology (selection), battery size, and charging strategy, mixed operational plans between electric and diesel buses, charging facility planning, retrofitting	Conduct preliminary analysis on GESI mainstreaming at technical plans of the first-phase implementation	One section or subsection is provided to identify GESI aspects on the report
Task 4.2. Conduct gender impact assessment of project implementation	Analyse route-level prioritization result in accordance with the Gender Impact Assessment	One section or subsection is provided to identify GESI aspects and passengers data
	Conduct on-board survey to collect passengers data disaggregated by gender and disability on route deployed on the first-phase of implementation	
	Analyse updated fleet technology in accordance with Gender Impact Assessment	One section or subsection is provided to identify GESI aspects from updated fleet technology
	Analyse the impact of mixed operational plan to vulnerable groups	One section or subsection is provided to identify GESI aspects from the mixed operational plan
Task 4.3. Conduct participatory workshops with equity organizations and women-led advocacy group representatives	Conduct participatory workshop that invited at least 1 people with disabilities groups' representatives and 1 women-led advocacy group	Number of PwD groups' representatives and women led advocacy group invited on the workshop
	Encourage marginalised and vulnerable groups (women, PwDs, elderly, and children) participations on the workshop	Proportion of participants, disaggregated by gender, age, and disability (when applicable)
Task 4.4. Conduct cost-benefit analysis of the first phase of the project, as well as qualitative assessment of non-monetizable components, e.g. accessibility improvement and social inclusion, compared to diesel buses scenario	Desktop research on qualitative, non-monetizable components from GESI aspects, compared to diesel buses scenario on the selected route for the first phase of implementation	One section is provided for social & inclusivity benefit and cost
	Conduct on-board survey to collect passengers data disaggregated by gender and disability on route deployed on the first-phase of implementation	Passengers data disaggregated by gender and disability is provided in the social & inclusivity benefit and cost section
Task 4.5. Conduct financial feasibility analysis, including calculation of year-wise PSO needs compared to diesel buses scenario and build capacity of beneficiaries on topic	Integrate GESI perspectives in developing the financial feasibility analysis	One section is provided to integrate GESI perspectives in developing the financial feasibility analysis
	Integrate the calculation of year-wise PSO in accordance with priority groups which get free tariff that currently being deployed by Transjakarta	The year-wise PSO calculation result has integrate the free tariff for priority groups
Task 4.6. Develop business model and contractual framework for the implementation phase, including assessment to incorporate potential financing support from PT SMI and other financial institutions/investors	Ensure GESI mainstreaming within the proposed business model and contractual framework	Number of section or sub-section that discuss GESI mainstreaming in business model and contractual framework
Task 4.7. Compile and develop executive summary the FBC and present the final recommendations to the decision makers in Transjakarta and the Jakarta Government	Ensure the executive summary of the FBC accommodates the GIA and non-monetizable cost-benefit from social & inclusivity aspects	One section or subsection is reserved for GIA & non-monetizable cost-benefit
Output #5 National-level capacity building on e-bus regulatory framework, business case development, and technical planning with GESI mainstreaming		
Task 5.1. Document the regulatory framework, business case development, and e-bus technical planning process, including the gender-impact assessment (GIA) process conducted in this project and update the national e-bus planning toolkit developed in EUM124	Document the gender-impact assessment process conducted in the project and incorporate the findings in the national e-bus planning toolkit	One section on the updated e-bus planning toolkit is reserved for GIA process
Task 5.2. Conduct a capacity building session in collaboration with the MoT to disseminate the updated toolkit as well as other lessons learned in the project extensions regarding e-bus regulatory framework development and the FBC.	Conduct a capacity building event with a well-balanced gender representations with related participants, including rep. from the Province's agency for women empowerment and local public transport operators	At least 30% of workshop participants are representatives of vulnerable groups, including women and people with disability
	Ensure the participation of women as the speakers of the capacity building session	At least 1 women participate as main speakers
	Ensure the language interpretation is provided on the capacity building session, including sign language	At least 2 language interpretations are provided
	Ensure GIA process is included in the capacity building materials	One section of capacity building session is reserved for GIA process

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