



This document will explain the initial plan on conducting this project.

Road Map and Timetable of Two-Wheeler Electrification in Greater Jakarta

Inception Report

31/03/2021

Table of Contents

List of Figures	4
List of Tables.....	4
1. Introduction.....	5
2. Proposed Approach and Methodology	5
3. Detailed Activities and Milestones	7
3.1. Output 1: Inception and Verification of Technical Assistance and Work Plan	7
3.1.1. Gather relevant information from all available sources	8
3.1.2. Identify the stakeholder, establish the service providers project team and familiarize it with the city and project administration.....	8
3.1.3. Establish the liaison procedures, communications protocols and channels	9
3.1.4. Discuss and affirm the project work plan with Jakarta and UKPACT	9
3.1.5. Develop closure and data collection report.....	10
3.2. Output 2: Report of Broader Motorcycle Landscape in Greater Jakarta	10
3.2.1. Research the role of motorcycle in Indonesia's mobility scenario	11
3.2.2. Analyse the social, environmental, and economic issues related to the existing usage of motorcycle, including in terms of gender, equity, and social inclusion (GESI)	12
3.2.3. Identify the opportunities with motorcycle electrification, considering GESI issues	13
3.2.4. Identify the barriers for motorcycle electrification from the perspective of drivers and ride-hailing operators	13
3.2.5. Highlight the importance of electrifying the motorcycle ride hailing fleets.....	14
3.3. Output 3: Action Plan for Electrification of Motorcycle Ride Hailing	14
3.3.1. Document existing condition of ride hailing services, the perspective of ride-hailing operators, drivers, and consumers.....	15
3.3.2. Outline best practice from other cities around the world's experience and identify gaps in Indonesia.....	16
3.3.3. Develop a roadmap and timetable to fully electrify the ride hailing companies in Jakarta	16
3.3.4. Conduct environmental, social, and economic benefit analysis, e.g. by modelling the impact to the city's GHG reduction plan.....	17
3.3.5. Develop a tool for ride hailing fleet operators to calculate the Total Cost of Ownership (TCO) and environmental benefit of e-motorcycle fleet	17

3.3.6.	Conduct capacity building for government officials, ride-hailing operators, and drivers	18
3.4.	Output 4: Policy Recommendation to Support Electric Motorcycle Adoption	18
3.4.1.	Document and assess the current e-mobility and energy related policies	20
3.4.2.	Identify the related stakeholder and responsibilities in the regional and national level	20
3.4.3.	Conduct stakeholder consultation event to verify the policy analysis findings.....	20
3.4.4.	Develop national-level policy recommendations to achieve the electrification timetable	21
3.4.5.	Develop local-level e-motorcycle supporting policy recommendations for Jakarta .	21
3.4.6.	Develop electricity grid supply plan with PLN (State Power Company) to accommodate the e-motorcycle roll out plan	21
3.4.7.	Disseminate the policy recommendation document to Government of Indonesia and the Government of Jakarta	22
3.5.	Output 5: Complete Street Design Guideline Accommodating E-Motorcycle Uptake	22
3.5.1.	Understand the perspective and concerns of road users, especially pedestrians, cyclists, and motorcyclists on future mass e-motorcycle usage on the road	23
3.5.2.	Develop complete street design guideline, accommodating electric motorcycle uptake.....	23
4.	Timeline	23
5.	Communication Plan	24
6.	Expected Constraints and Risks	25

List of Figures

Figure 1 Modal Split of Greater Jakarta (source: BPS, 2019).....	12
Figure 2 GHG Emission Contribution of Each Transport Mode in Jakarta (source: KPBB, 2019)	13
Figure 3 Total Cost Ownership Comparison of Several E-motorcycle Types in India.....	18

List of Tables

Table 1 Initial Stakeholder Mapping	8
Table 2 Timeline of the Project	24
Table 3 Expected Risks and Initial Mitigation Plan	25

1. Introduction

Given the number of motorcycles in Jakarta--13.3 million units as of 2016--the mode is a major contributor to air pollution and greenhouse gas (GHG) emissions in the city. The unprecedented growth of motorcycle ride hailing fleets, which account for around 20-30% of the motorcycles based on ITDP's traffic counting data on several main road segments in Jakarta, are a major contributor to the continually increasing motorcycle numbers. It is clear that a shift to cleaner fuel options is urgently needed for private motorcycles and ride-hailing fleets. These ride-hailing motorcycles emit more total emissions than personal vehicles, since they have significantly longer daily vehicle kilometres travelled.

Unfortunately, Indonesia currently lags behind in electric vehicle (EV) adoption. E-motorcycle uptake is only 0.14%, a long way from the government's target to electrify 2.1 million motorcycles by 2025. The slow uptake is due to the absence of capacity and coordination between stakeholders, lack of incentives and directives from the government, lack of a national and local roadmap and mechanisms on large-scale electrification, and slow charging infrastructure development. Currently, instead of developing clear policies, roadmaps, and targets, the government relies solely on market forces to accelerate two-wheeler electrification. Meanwhile, the market employs a wait-and-see attitude due to the lack of commitment shown by the national government in accelerating e-mobility, lack of charging facility, high EV prices compared to conventional vehicles, and the absence of an after-sales market.

There are indeed a number of domestic and international e-motorcycle manufacturers whose products already in the Indonesian market. However, due to small market uptake, which causes higher prices compared to diesel motorcycles, and limited charging infrastructure available, the adoption of e-motorcycle is stalling. The electrification of ride-hailing motorcycles, which offers an economy of scale and initial demand for the e-motorcycles, would support the ecosystem of e-mobility in Indonesia.

2. Proposed Approach and Methodology

The project will develop a comprehensive road map and timetable for electrifying ride-hailing motorcycles in collaboration with ride-hailing companies, the Jakarta Transport Agency, and the Ministry of Transport. The project will provide the guidance for and build the capacity of the beneficiaries to deliver and further leverage the action plans beyond the timeframe of this project. This will enable substantial decreases in GHG emissions and air pollution, while providing tangible benefits for low-income and marginalized communities.

Success would help generate an ecosystem of e-mobility throughout the region due to:

- The ride-hailing fleets account for a significant portion of motorcycles in Greater Jakarta. Therefore, the ride-hailing operators as the aggregators of the service provided by the ride-

hailing drivers have the economy of scale to implement electrification effectively and build the initial ecosystem of e-mobility.

- Appropriately developed ecosystem will bring the total cost of ownership (TCO) down and charging infrastructure less complicated compared to other modes. Therefore, the mass adoption of e-motorcycle will be easier to accomplish.
- Jakarta serving as a regional influencer, with successes inspiring scale up throughout Indonesia and Southeast Asia.

To achieve the outcomes, several outputs are set to be developed. Each of these will require inputs including resources for personnel, travel, and event expenses; internal and external experts; existing relationships with key stakeholders; and technical expertise.

1. Firstly, ITDP will conduct inception and verification of the technical assistance and work plan. In this stage of the project, all related stakeholders will be consulted and regular coordination meetings will be arranged to promote buy-in for the future recommendations.
2. Secondly, a planning document suite, including best practices from other cities and identifying gaps in Indonesia, underpinning policies (fiscal and non-fiscal), the responsibilities of stakeholders, charging infrastructure support, and a timetable for full electrification will be developed. A grid supply plan will also be developed and communicated to PLN. To ensure GESI strategies are included in the planning documents and implementation, a participatory workshop series will be conducted with women, marginalized communities' representatives, and ride hailing motorcycle drivers, who are often low- and low-middle income.
3. Thirdly, policy recommendations will be developed to address barriers and policy gaps. Although there is a presidential decree to kickstart an national BEV acceleration program, no comprehensive plans or policies yet exist. The policy recommendation document, including a recommendation on the establishment of a local e-mobility task force, will be disseminated to national and local policymakers.
4. Finally, capacity building on the technology, benefits, and mechanisms for implementation will be conducted for ride-hailing companies, city officials, and other beneficiaries including the motorcycle drivers. ITDP will encourage knowledge sharing from cities that have deployed electric motorcycles in the form of webinars, study tours, and other capacity building events. Lessons learned will be documented as a toolkit on electric motorcycle adoption and disseminated to other cities in Indonesia through workshops for stakeholders.

The project's five-year impact will be to help achieve the national government's stated targets for vehicle electrification. In addition, there will be significant air pollution and GHG reduction and this

will also trigger the national government to shift to a more sustainable energy source for the grid for example using solar PV, wind, hydro, and geothermal energy.

3. Detailed Activities and Milestones

The conduction of this project will be divided into five different stages. The five outputs of the project are as following:

1. Inception and Verification of Technical Assistance and Work Plan
2. Report of Broader Motorcycle Landscape in Greater Jakarta
3. Action Plan for Electrification of Motorcycle Ride Hailing
4. Policy Recommendation to Support Electric Motorcycle Adoption
5. Complete Street Design Guideline Accommodating E-Motorcycle Uptake

3.1. Output 1: Inception and Verification of Technical Assistance and Work Plan

ITDP will use the inception phase to engage with all of the related stakeholders: Ride hailing operator, Transport Agency, Jakarta city government, PLN, and community groups. Stakeholder involvement from the beginning will allow for smooth knowledge transfer and ability to gain engagement for the project.

This output is important because harnessing stakeholder involvement during the design stages will promote support and buy-in. It ensures the scheme delivered is acceptable to the stakeholders who need it most and should not stop at delivery. Targeted engagement can help address social exclusion and make the community aware that the developments will bring new access to opportunities and positive effects for their daily life.

There are five activities to be conducted on the Output 1 of this project as the following:

- Task 1.1: Gather relevant information from all available sources.
- Task 1.2: Identify the stakeholder, establish the service providers project team and familiarize it with the city and project administration.
- Task 1.3: Establish the liaison procedures, communications protocols and channels.
- Task 1.4: Discuss and affirm the project work plan with Jakarta and UK PACT.
- Task 1.5: Develop closure and data collection report.

3.1.1. Gather relevant information from all available sources

In this task, the team's existing knowledge and preliminary discussions of the project will be incorporated to produce an inception report. The team's key expert will also be consulted to complete the document.

3.1.2. Identify the stakeholder, establish the service providers project team and familiarize it with the city and project administration

Within a week of contract award notification, a virtual kick-off meeting between UK PACT and ITDP will be organised to discuss and agree on key operating modalities of the service delivery and communication protocols.

ITDP will engage with stakeholders from the early stages and present the objective of the project, activities and the project timeline. ITDP will also become conversant with project personnel, city administration and other relevant stakeholders, to gather existing information and documentation for the project implementation.

The initial stakeholder mapping for this project is as follows:

Table 1 Initial Stakeholder Mapping

No	Institution	Level	Responsibility/Role
1	Ride hailing company	Local	Implementor of the fleet electrification plan; manages ride hailing drivers; provides non-depot charging infrastructure
2	Ride hailing drivers	Local	Procure, maintain, operate ride-hailing motorcycle fleet
3	Charging infrastructure providers	Local	Provide charging infrastructure for e-motorcycles
4	Dinas Perhubungan DKI Jakarta (Jakarta Transport Agency)	Local	Regulator (e.g. formulates mandate for motorcycle electrification roadmap); formulates local-level non-fiscal incentives (e.g. LEZ)
5	BPTJ (Greater Jakarta Transport Authority)	Regional	Formulates regional transport plans

6	PLN (State Utility Company)	Local/ National	Provides grid and ensure grid stability; determines electricity tariff for charging facilities; provides grid installation incentives
7	Citizens, including marginalized and vulnerable road user advocacy groups	Local/ National	Ride hailing service users; other road users also might be impacted indirectly (general road safety issues, etc)
8	Local government institutions, in particular Jakarta Economic Affairs and Finance Bureau and Jakarta Spatial Planning Agency	Local	Formulates local-level policies (e.g. fiscal incentives, revise building codes to accommodate charging infrastructure)
9	National government institutions, in particular those mandated to form the BEV acceleration task force in the Presidential Decree No. 55/2019	National	Formulates national policies to support national BEV adoption

3.1.3. Establish the liaison procedures, communications protocols and channels

To ensure seamless collaboration between project team members, a dedicated Ms. Teams' Channel has been established. The project implementation team will also conduct a coordination meeting once every two weeks to prevent any miscommunication and ensure each task is completed on a timely manner.

During the project preparation, a coordination meeting will be done with the ride hailing operators, Transport Agency, Jakarta Government, and other related stakeholders in order to identify what relevant information is still needed to complete the project. The coordination meeting will discuss coordination cadence, gather additional inputs on the project tasks to ensure alignment with the beneficiaries' needs, and communication as well as data sharing protocols.

3.1.4. Discuss and affirm the project work plan with Jakarta and UKPACT

To establish support and buy-in from stakeholders, a close communication should be maintained at every stage of the project. Therefore, the detailed work plan of this project will be discussed with beneficiaries, such as ride hailing operators and Government of Jakarta, to incorporate their inputs. Changes to the detailed work plan would then be coordinated with the representative of UK PACT team to ensure it is aligned with their purpose.

3.1.5. Develop closure and data collection report

At the end of the project, all data and reports related to this project will be compiled. This will then be summarised in a closure and data collection report.

3.2. Output 2: Report of Broader Motorcycle Landscape in Greater Jakarta

The project will produce a report on the current motorcycle landscape in Greater Jakarta and issues arising from public reliance on conventional motorcycles including GESI issues will be identified. The analysis will also underpin the benefits and challenges of phasing out conventional motorcycles and highlight the importance of transitioning ride-hailing fleets to electric as one of the first measures to encourage wider adoption of electric motorcycles.

The output's components will include:

- **Data collection:** A desk study to gather relevant statistical data and structured interviews with the ride hailing operators will be conducted to gather insights from fleet operator's perspectives. Field surveys will also be conducted to complete missing data or update obsolete information. Wherever applicable, the data collected will be disaggregated by gender and income level. By working closely with Jakarta Transport Agency, the agency's capacity in collecting relevant data for developing mobility plans will also be improved.
- **Participatory workshops:** To ensure GESI issues are addressed in the report, a participatory workshop series will be conducted with women and marginalized communities' representatives to capture their perspective as ride-hailing and private motorcycle drivers, pedestrians, and other vulnerable road users affected by the large number of motorcycles on the road.
- **Document development:** A baseline report on the motorcycle landscape will be developed based on analysis of collected data and the stakeholder consultation workshop findings.

The findings and report will be presented to ride-hailing operators, Greater Jakarta Transport Agency (BPTJ) and Jakarta Transport Agency.

This output is critical to the project's success because a baseline analysis on the current usage of motorcycle, the issues related to the society's dependency to the mode, and the benefits and challenges of phasing out ICE motorcycles to electric is needed to raise initial awareness on motorcycle electrification and underpin the need for supporting policies among transport policymakers.

ITDP will carry out the below tasks to achieve the project output:

- **Task 2.1:** Research the role of motorcycle in Indonesia's mobility scenario, including how motorcycle are currently used within the private transport for families, deliveries (the rise of on-demand deliveries, food, groceries, etc), and ride hailing for passengers.
- **Task 2.2:** Analyse the social, environmental, and economic issues related to the existing usage of motorcycle, including in terms of gender, equity, and social inclusion (GESI).

- Task 2.3: Identify the opportunities with motorcycle electrification, considering gender, equity, and social inclusion (GESI) issues.
- Task 2.4: Identify the barriers for motorcycle electrification from the perspective of drivers and ride-hailing operators.
- Task 2.5: Highlight the importance of electrifying the motorcycle ride hailing fleets.

The output will take the form of a series of documents that will be produced as milestones:

1. Report document of current two-wheeler landscape, and benefits and challenges for electrification.

The Jakarta Transport Agency and the Ministry of Transport through BPTJ will use this report to understand the urgency to promote the shift to electric motorcycles and the challenges currently faced by the users (drivers and motorcycle ride hailing operators) to shift. These challenges faced by the users are crucial for the policymakers to comprehend, to be able to collaboratively work on developing action plans and roadmaps for the next output of this project.

2. Documentation of benchmarking analysis from other countries such as, but not limited to, China and India on the electrification of motorcycles.

Benchmarking from other countries can be adopted to accelerate the implementation of e-mobility in Indonesia. Lesson learned from other countries could become a shortcut to avoid the unnecessary mistakes made by them and implement the activities or interventions that could accelerate the deployment of e-motorcycles.

3. GESI workshop report and GESI document

To have analysis on GESI for all of the activities done will make sure that GESI issues will be addressed on this e-motorcycle implementation. Therefore, no one will be left behind including ride-hailing motorcycle's drivers which most of them are from low-income communities.

3.2.1. Research the role of motorcycle in Indonesia's mobility scenario

In this activity, motorcycle usage data in Indonesia and Greater Jakarta in particular will be reviewed. This includes how motorcycles are used as private transport for families, deliveries (the rise of on-demand deliveries, food, groceries, etc.) and ride hailing. Motorcycle usage data will also be compared to other modes of non-motorized transport, public transport, and other private modes.

Currently motorcycles dominate the modal split in Greater Jakarta as shown by [Figure 1](#) below, which might be caused by its affordability and flexibility. Based on traffic count in 2019 by ITDP, it was found that up to 30% of the motorcycle on the road are ride hailing motorcycles. Therefore,

there is an opportunity to accelerate the electrification of all motorcycles in Greater Jakarta by starting from ride hailing fleets. This should then provide enough market to scale up the development of other needed components of electrification such as charging infrastructures.

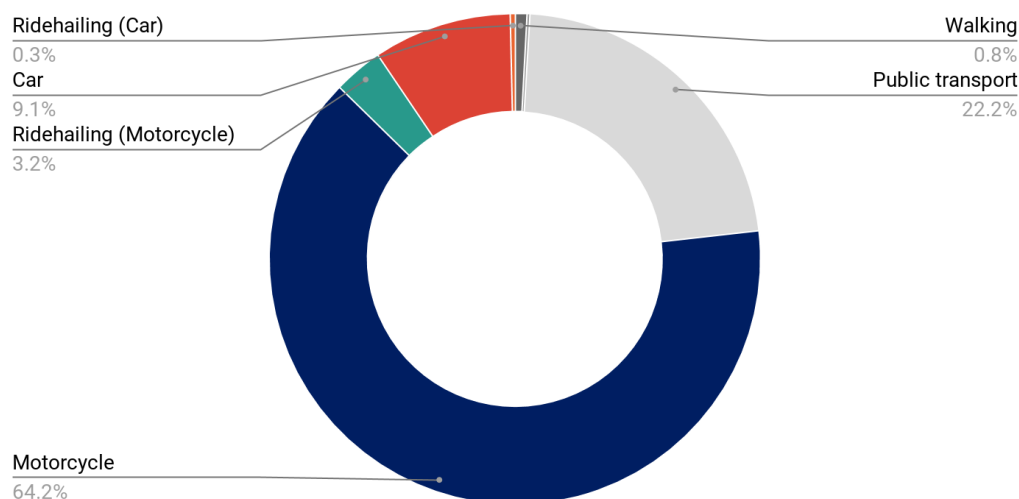


Figure 1 Modal Split of Greater Jakarta (source: BPS, 2019)

3.2.2. Analyse the social, environmental, and economic issues related to the existing usage of motorcycle, including in terms of gender, equity, and social inclusion (GESI)

In this activity, social, environmental, and economic issues related to the existing usage of motorcycle will be analysed. An issues matrix will then be produced to give a more comprehensive understanding of motorcycle usage impact to our society. To ensure GESI issues in motorcycle usage and transition towards electric motorcycle are captured, a participatory workshop and/or structured interview sessions will be conducted. A workshop report will also be composed to summarise the activity.

One example of environmental issue related to motorcycle usage is on GHG emission. As there are a huge number of motorcycles on the road as explained in the previous part of this report, motorcycles contributed a lot as well on the number of GHG emission in Jakarta as shown on [Figure 2](#). A similar situation is also expected in other cities in Greater Jakarta Area.

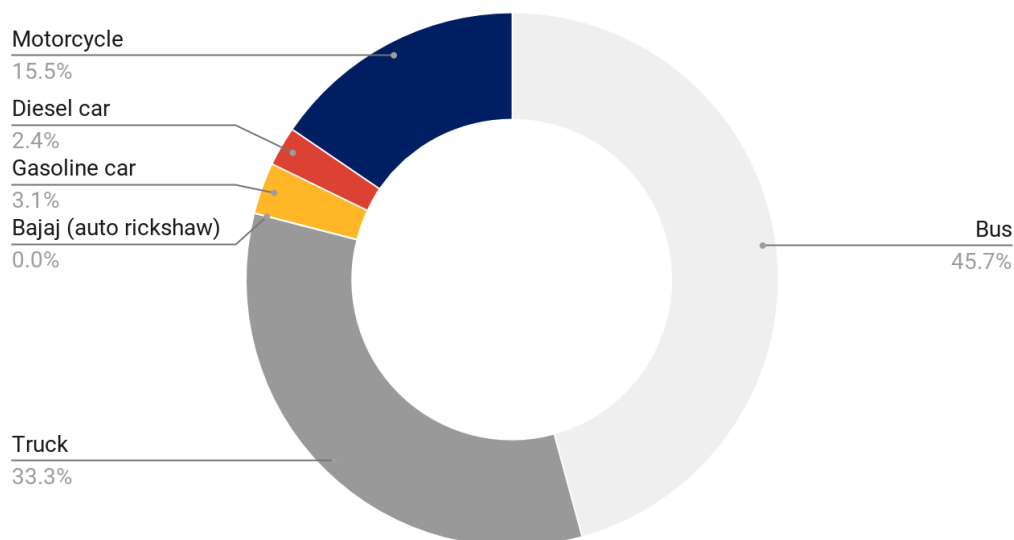


Figure 2 GHG Emission Contribution of Each Transport Mode in Jakarta (source: KPBB, 2019)

3.2.3. Identify the opportunities with motorcycle electrification, considering GESI issues

After studying the current motorcycle usage and impact in Greater Jakarta, the electrification of motorcycle will be assessed in the next two activities. In this activity, all opportunities related with motorcycle electrification will be identified, in particular on ride hailing services, while also considering GESI issues. Benchmarking analysis from other countries might also be needed to get insights on less identifiable opportunities in electrifying two wheelers. Tools such as SWOT analysis will be used to make a more comprehensive analysis.

There are no limitations will be put on which opportunities would be assessed. Such opportunities could be assessed from many perspectives. The most obvious one might be the environmental opportunity, where electric motorcycle produce no GHG emission on the road. Other more obscure opportunities, such as gender equality opportunity, should also be assessed, as long as it is in line with the project outcomes.

3.2.4. Identify the barriers for motorcycle electrification from the perspective of drivers and ride-hailing operators

Not only opportunities, barriers for motorcycle electrification will also be assessed. The first and foremost barrier that should be assessed is the obstacle faced by drivers and ride hailing operators on transitioning towards electric vehicles. It is important to have a comprehensive understanding of this matters, as at current scenario, drivers acquire the motorcycle themselves. But this does not mean that only their perspectives are important.

Variations in type of barrier will also be assessed. Not only from financial perspective, other barriers such as safety, social, and charging capacity barrier could be assessed as well.

Benchmarking analysis from other countries might also be needed to get insights on less identifiable barriers in electrifying two wheelers.

3.2.5. Highlight the importance of electrifying the motorcycle ride hailing fleets

In this activity, the potential impact of ride hailing electrification that has been done on the previous activities will be compiled altogether. Highlights would be put on the positive impact that electrification could bring, mainly on environmental, fiscal, and energy aspects. This would then serve as the basis to promote support and buy-in from related parties on why the action plan and timetable should be done in timely manner.

3.3. Output 3: Action Plan for Electrification of Motorcycle Ride Hailing

The project will produce a roadmap and timetable document for electrifying ride-hailing motorcycles. The document includes recommendations on e-motorcycle scenarios, policy barriers and recommendations, charging infrastructure, financial and business model, and grid supply plan developed with the State Power Company (PLN).

The output's components will include:

- Data collection and plan alignment: ITDP in collaboration with stakeholders will conduct primary and secondary data collection and surveys and disaggregate by gender, age, and income where applicable. Working in collaboration with the stakeholders will raise their capacity and buy-in for the project.
- Stakeholder consultation through participatory workshop: ITDP will conduct consultation through participatory workshops with stakeholders to verify the initial findings. In addition, GESI issues are addressed in the planning documents and implementation and a participatory workshop series will be conducted with women and marginalized communities' representatives.
- Align the proposed recommendations with stakeholders' current plans and policies.
- Document development: ITDP team will conduct regular coordination meetings with the Transport agency and ride hailing operators to co-develop the action plan and timetable document.
- TCO and environmental benefit calculation tool development: A calculation tool will be developed with stakeholders to project the benefits of electrification and calculate TCO.

The findings and report will be presented to the Ministry of Transportation, Jakarta Transport Agency, and BPTJ as inputs to the roadmap and timetable of e-motorcycles in Indonesia.

The output is important as it will be used for ride-hailing operators to set phases, create timetables, and prepare the mechanisms and investments needed to electrify their fleets. The city government will use the output to prepare the regulation and supporting policies needed. The national government and other cities could also adopt this roadmap and utilize the calculation

tool. The roadmap will also help ensure alignment between supporting infrastructure provision and fleet deployment.

ITDP will carry out the below tasks to achieve the project output:

- Task 3.1: Document existing condition of ride hailing services, the perspective of ride-hailing operators, drivers, and consumers.
- Task 3.2: Outline best practice from other cities around the world's experience and identify gaps in Indonesia.
- Task 3.3: Develop a roadmap and timetable to fully electrify the ride hailing companies in Jakarta.
- Task 3.4: Conduct environmental, social, and economic benefit analysis, e.g. modelling the impact to the city's GHG reduction plan.
- Task 3.5: Develop a tool for ride hailing fleet operators to calculate Total Cost Ownership (TCO) and environmental benefit of e-motorcycle fleet.
- Task 3.6: Conduct capacity building for government officials, ride-hailing operators and drivers.

The output will take the form of a series of documents that will be produced as milestones:

1. Report on current motorcycle ride hailing service and operation data including passenger's perception on its services and issues raised by drivers.
2. Report on best practices from other cities around the world, e.g. cities in India, China, and the US, regarding their effort on motorcycle electrification.
3. Roadmap and timetable document of ride-hailing motorcycle electrification in Jakarta
4. Report on environmental, social, and economic benefit analysis.
5. Capacity building toolkit and workshop report.

3.3.1. Document existing condition of ride hailing services, the perspective of ride-hailing operators, drivers, and consumers

This activity will start from assessing the existing perspective of ride hailing operators, drivers, and consumers on the current motorcycle ride hailing service. Then it will also continue to assess the perspective of those same groups mentioned on the electrification of ride hailing vehicles. Surveys and/or interviews with related parties might be needed to capture all kind of perspectives, be it a concern or an interest, from those mentioned group of people.

This activity is needed as an action plan will be made on this third output. Understanding the perspective of all related parties might be the key to create a feasible action plan, as these groups of people would be impacted directly when the electrification of two wheelers has been taken

place. If all those concerns and interests were successfully accommodated on the action plan, then support and buy-in from ride hailing operators, drivers, and consumers could be obtained more easily and increasing the chance that at least one of the outcomes of the project could be achieved in the future.

3.3.2. Outline best practice from other cities around the world's experience and identify gaps in Indonesia

Indonesia is not the first country that have an electrification plan. Many countries in the world, developed and developing countries, have been successful on their attempt to mass adopt electric vehicles. Best practice from other countries could be learned to avoid unnecessary step that they have taken before. This way, an efficient action plan would be produced by the end of the project.

In this activity, best practice of motorcycle electrification initiatives from other global cities will be assessed. A good mix of sample cities from developed and developing countries would be preferred to ensure the steps to be adopted in Indonesia is suitable. Indonesia's existing condition would also be analysed to identify any gaps that might prevent the best practice to be implemented here.

3.3.3. Develop a roadmap and timetable to fully electrify the ride hailing companies in Jakarta

To be able to develop a comprehensive roadmap and timetable to fully electrify the ride hailing company, there are four sub-activities to be done on this part of the project. The first sub-activity is developing the timetable itself, which consider e-motorcycle adoption targets in ride-hailing fleets and charging facilities deployment targets in Jakarta. The second sub-activity is developing the roadmap, which includes technology standardization, charging technology recommendation, national and local policy recommendations, subsidies, related traffic strategies and tax incentives where needed. The third sub-activity is developing the investment plan for e-motorcycle deployment ride hailing company, including estimations of the amount of investment needed by ride-hailing companies to support fleet electrification, based on the business model recommendation. The last sub-activity is developing recommendations for business model and financing options, which includes assessments of possible business models in ride-hailing fleet electrification and reviewing the current policies on financing options.

This activity is very much needed to be able to produce an action plan of two wheelers electrification as the output of this activity would be the electrification timetable. In a comprehensive action plan, there should always be an information regarding when those actions should be taken place, and therefore this activity will fill that gap. The timetable to be put in the action plan should also be realistic, therefore a full analysis on investment plan, business models, and financing options should also be considered in constructing the timetable.

3.3.4. Conduct environmental, social, and economic benefit analysis, e.g. by modelling the impact to the city's GHG reduction plan

To further complement the action plan, impact analysis of the electrification plan should also be done. This will further promote support and buy-in from related parties as they would understand what benefits they would get from doing the action plan. Apart from that, any negative impacts of two wheelers electrification could also be captured. Thus, suitable mitigation measures could be planned where necessary.

Electric transport implementation should be in line with the reformation of the usage of sustainable energy. Currently, the national government mainly focuses on the economic benefits of electric mobility, but environmental considerations, such as well-to-wheel GHG reductions, must also be incorporated in the government's policy planning horizon.

In this activity, an analysis of two wheelers electrification impacts would be made. Mainly it will cover the environmental, social, and economic benefit analysis. One example of analysis that could be done is by modelling the impact of ride-hailing electrification to the city's GHG reduction plan. In this task, an assessment of environmental and social benefits of carbon emission and local air pollution reduction in accordance with the electrification plan will be conducted. Emission cost quantification such as the Social Cost of Carbon (SCC) or other similar methods will be used in the analysis.

Potential negative impacts of motorcycle electrification should also be discussed in this part of the project. A mitigation measures to prevent or reduce the negative impact should also be planned where necessary.

3.3.5. Develop a tool for ride hailing fleet operators to calculate the Total Cost of Ownership (TCO) and environmental benefit of e-motorcycle fleet

One indicator that could be used to assess the effectiveness of financial aspect of electrification program, including but not limited to financing options and fiscal incentives given, is TCO. This indicator could give a better picture on whether the cost of owning an electric two wheelers still more expensive than conventional two wheelers. This could also serve as the basis of whether there is a need of a further incentives to be given towards electric vehicles.

The cost components throughout the life cycle of e-motorcycles which will be included in the tool include procurement cost, energy cost, maintenance cost, and battery replacement cost. An example of a TCO calculation for e-motorcycles in India result can be seen in [Figure 3](#) below: (Ricardo Consulting, accessed on March 1, 2021).

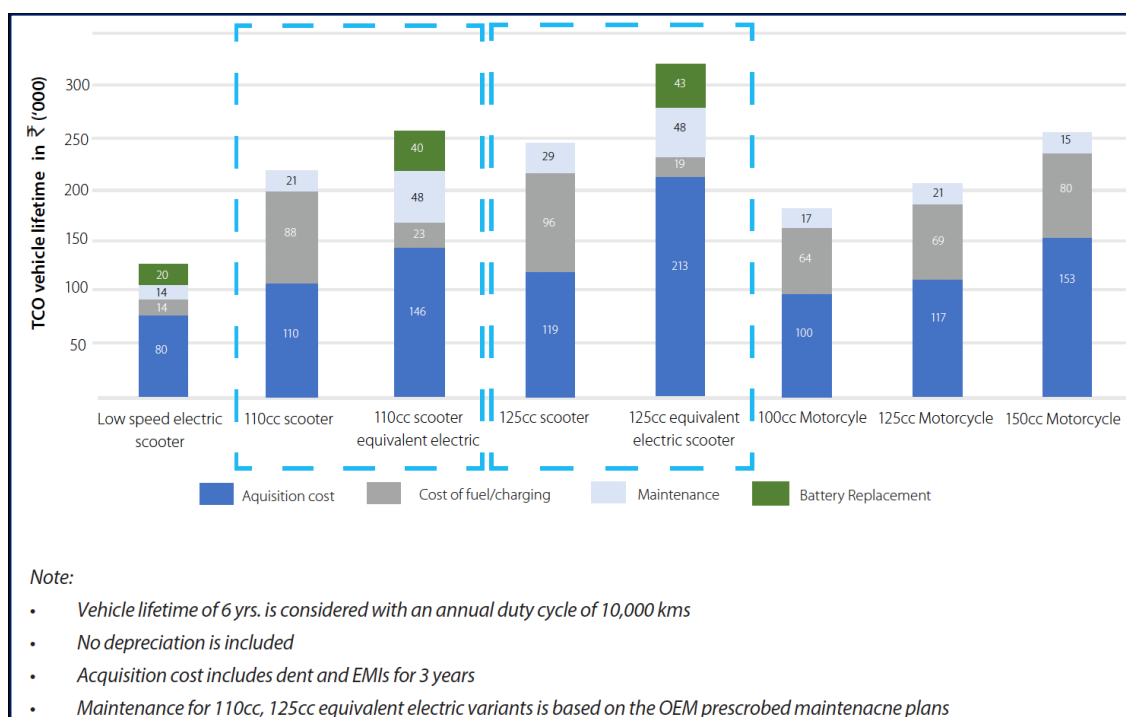


Figure 3 Total Cost Ownership Comparison of Several E-motorcycle Types in India

As the name suggest, TCO calculation involves every price aspect of owning a vehicle, which includes the capital needed to acquire the vehicle itself and the operation cost needed to use the vehicle. Further classification on the operational expenditure might be needed along the way to make a better recommendation on which kind of incentives would be useful in reducing the TCO of electric vehicles. Furthermore, a tool to calculate the environmental benefit of motorcycle electrification at the city level will also be produced and made available to the beneficiaries.

3.3.6. Conduct capacity building for government officials, ride-hailing operators, and drivers

In this activity, a capacity building toolkit will be developed for government officials, ride hailing operators, and drivers. The toolkit document will consist of steps to calculate TCO and environmental benefit, and steps to mainstreaming GESI issues in motorcycle electrification.

This activity is needed to complement the previous activity, which is the tool development. By doing this activity, government officials, ride hailing operators, and drivers would be able to use the tools provided from the previous activity.

3.4. Output 4: Policy Recommendation to Support Electric Motorcycle Adoption

The output will include two main components:

- Conducting a review on the current national and local transport, energy, and environmental planning documents and other relevant policies. This will include fiscal and non-fiscal incentives, mandates of commercial fleet electrification and charging infrastructure provision, and environmental policies which directly and indirectly affect electrification. The

review will also identify gaps and overlaps in the current policy landscape which may hamper electrification.

- Producing a draft policy or a policy recommendation document to remove barriers and support e-motorcycle deployment by ride hailing operators, including a recommendation on the establishment of a local e-mobility task force and its working mechanisms.

This will be accomplished through:

- Desk research: ITDP will conduct a policy analysis to identify policy gaps and overlaps through a desk study. A benchmarking of bus fleet electrification policies from leading cities in commercial fleets electrification around the globe will also be conducted.
- Stakeholder consultation: A stakeholder consultation event, in the form of an online workshop or one-on-one discussion sessions, will be conducted to verify the results of the desk study and benchmark analysis, identify further regulatory and implementation challenges met by the stakeholders, and identify options of policies to support the fleet electrification.
- Document development: The resulting policy review and benchmarking study from the desk research, as well as the identified implementation challenges and policy options will become the inputs for the policy recommendation document. A set of policy recommendations for policymakers will be presented.

Although there is a presidential decree to kickstart an electric vehicle acceleration program, no clear plans for motorcycle ride-hailing electrification exist despite its prominence in the sector. This output is crucial because without clear policy support, mandates for charging infrastructures, and fiscal and non-fiscal incentives, the deployment of e-motorcycle ride-hailing fleets will be hampered.

ITDP will carry out the below tasks to achieve the project output:

- Task 4.1: Document and assess the current e-mobility and energy related policies.
- Task 4.2: Identify the related stakeholder and responsibilities in the regional and national level.
- Task 4.3: Conduct stakeholder consultation event to verify the policy analysis findings.
- Task 4.4: Develop national-level policy recommendations to achieve the electrification timetable.
- Task 4.5: Develop local-level e-motorcycle supporting policy recommendations for Jakarta.
- Task 4.6: Develop electricity grid supply plan with PLN (State Power Company) to accommodate the e-motorcycle roll out plan.
- Task 4.7: Disseminate the policy recommendation document to Government of Indonesia and the Government of Jakarta.

The output will take the form of a series of documents that will be produced as milestones:

1. Policy gaps and recommendations report

The document will benefit mainly the policymakers, both on city- and national-level, as a reference document to develop a policy package in support of motorcycle ride-hailing fleet electrification, which are currently still missing. Identification of regulation overlaps, which are often a challenge for local governments to produce derivative regulations and hold back private sectors (in this case: ride hailing operators, charging infrastructure providers, and utility companies) to take actions, will also benefit the regulators to pinpoint the issues and streamline the existing regulations.

2. Local e-mobility task force recommendations document

A recommendation will be made on local e-mobility task force establishment, based on lessons learned on the project coordination.

3.4.1. Document and assess the current e-mobility and energy related policies

Current regulations on e-mobility on national and local level will be assessed. This will include policies on incentive, energy, and environmental planning documents and other relevant policies, in particular on ride hailing vehicles. Benchmark on policies of electric motorcycles from other countries will also be done and will be assessed whether it is applicable in Indonesia or not.

This activity is needed to assess the gap of current regulation on electric motorcycle in Indonesia. By benchmarking policies on successful countries in term of electrification, and assessing the current regulatory condition of Indonesia, a more concise and precise policy recommendations could be made to bridge that gap.

3.4.2. Identify the related stakeholder and responsibilities in the regional and national level

After the gap has been identified on the previous activity, an identification of each stakeholders will be made. At this stage, a desk study to find out the responsibility of each stakeholder from local, regional, and national level will be conducted. Lesson learnt from previous similar projects could also be consulted. A more comprehensive stakeholder mapping will be produced at this stage of the project.

This activity is needed before a more thorough stakeholder consultation is done. Stakeholders such as governments would lose interest if we took much of their times asking about their responsibility. Therefore, this kind of desk study provides cheaper and faster alternatives and makes an efficient use of their time to discuss more on technical aspect of the policy.

3.4.3. Conduct stakeholder consultation event to verify the policy analysis findings

As gaps have been identified on the first activity, and responsible stakeholders for each gap have also been identified on the second activity, in this activity discussion will be made with each respective stakeholder. Any findings will be informed to the stakeholder and discussion on the

solution will take place as well. Any information such as current plan on bridging the gap from stakeholder sides will be assessed comprehensively.

By doing this activity, updates on current policy development of motorcycle electrification on each stakeholder could be compiled. An efficient and effective policy recommendation could also be developed after doing this activity. This activity also presents the opportunity to involve stakeholders in designing policy recommendation, which will be distributed back to each stakeholder.

3.4.4. Develop national-level policy recommendations to achieve the electrification timetable

In this activity, policy recommendations on national level to achieve the electrification roadmap and timetable that has been developed in the previous output will be produced. This includes but not limited to fiscal and non-fiscal policy incentives, which also address GESI strategies.

In general, national government will have major influence on the electric vehicle penetration. Therefore, policy recommendations to fill the gap that exists in electrifying motorcycle, such as assessments of the policy needed to reaching cost parity with ICE motorcycles, would be important to achieve the roadmap and timetable that has been developed throughout this project.

3.4.5. Develop local-level e-motorcycle supporting policy recommendations for Jakarta

Similar with the previous activity, in this activity policy recommendations on local level will be produced to achieve the electrification roadmap and timetable that has been developed in the previous output. At the local level, the analysis will be more focused on non-fiscal policies which can be implemented in a short or a medium term by the local government. Based on lessons learned on the project coordination, recommendations on local electric mobility task force establishment will also be included in the recommendation documents for Jakarta.

3.4.6. Develop electricity grid supply plan with PLN (State Power Company) to accommodate the e-motorcycle roll out plan

This project will also assess the capability of State Power Company in accommodating the electric motorcycle roll out plan that has been develop in the roadmap and timetable. Current grid capacity analysis and the projected grid requirements will be done. The deficit of grid capacities in accommodating electric motorcycle uptake in the future will be communicated with the related stakeholder. A recommendation on providing renewable energy sources for charging infrastructures will also be assessed.

This activity is needed as this might be an issue on electrifying ride hailing two wheelers in Jakarta. By analysing this in advance, a mitigation plan could be carried out by the responsible stakeholder. Recommendations provided in this project, in particular on renewable energy sources, could also be adopted to accommodate the uptake of electric motorcycle.

3.4.7. Disseminate the policy recommendation document to Government of Indonesia and the Government of Jakarta

To ensure the policy recommendation produced in this output could be implemented and fill the gap on electrification of motorcycles in Greater Jakarta and Indonesia, there will be a dissemination activity to related stakeholders. The policy recommendation documents produced in this project will be sent to all respective stakeholders after approval by UK PACT.

3.5. Output 5: Complete Street Design Guideline Accommodating E-Motorcycle Uptake

Development of complete street design in response to e-motorcycles adoption focusing on road safety and accessibility for marginalized communities. This may include:

- Where e-motorcycles fit in the transportation ecosystem
- Differentiating e-bikes and e-motorcycles, through weight, power, and speed limitations, etc.
- Parking regulations for e-motorcycles and motorcycles in general
- Charging regulations
- How to address congestion with two-wheelers

The large-scale uptake of e-motorcycles will pose new challenges to road users since several segments of e-motorcycles may fall into a grey area between bicycles and motorcycles. A guide on street design is important to provide a clear classification of the e-motorcycles in the road user ecosystem and to ensure accessibility for all road users.

ITDP will carry out the below tasks to achieve the project output:

- Task 5.1: Understand the perspective and concerns of road users, especially pedestrians, cyclists, and motorcyclists on future mass e-motorcycle usage on the road.
- Task 5.2: Develop complete street design guideline, accommodating electric motorcycle uptake.

The output will take the form of a document that will be produced as a milestone:

1. Complete street design guideline document, which includes safety and GESI issues currently faced by road users, categorization of e-bikes and e-motorcycles through dimension, weight, speed limits, and other characteristics, street section templates, parking regulation for e-motorcycle, charging regulations, and policy recommendation to address congestion given the uptake of e-motorcycle.

The main beneficiaries, i.e. the Jakarta Transport Agency, Jakarta Public Works Agency, and BPTJ, can use the document as a guideline to redesign inclusive streets in the Greater

Jakarta Area which can also appropriately accommodate e-motorcycle as a new road user segment. Other cities and the national government could also adopt the recommendations by considering their local contexts.

3.5.1. Understand the perspective and concerns of road users, especially pedestrians, cyclists, and motorcyclists on future mass e-motorcycle usage on the road

This is the issue identification part of the outputs. ITDP with stakeholders will identify road safety issues related to future mass electric motorcycles usage on the road through desk research and a participatory workshop. Active participation from women, people with disabilities, the elderly, and other marginalized communities as road users shall be ensured and the data gathered will be disaggregated by sex, disability, age groups, and income level whenever applicable.

3.5.2. Develop complete street design guideline, accommodating electric motorcycle uptake

A complete street design guidebook addressing the identified issues will be produced. Regular discussion with the local governments, in particular Transport Agency and Public Works Agency of Jakarta, will be conducted to ensure the applicability of the recommendations. The guideline will be disseminated to the Government of Jakarta, BPTJ as the transport authority of the Greater Jakarta Area, and other city governments.

4. Timeline

This project will be conducted for 12 months starting from February 2021. The expected completion date of each output is as the following:

1. Output 1: Inception and Verification of Technical Assistance and Work Plan to be delivered by **31 March 2021**
2. Output 2: Report of Broader Two-Wheeler Landscape in Greater Jakarta to be delivered by **27 April 2021**
3. Output 3: Action Plan for Electrification of Ride Hailing Motorcycle to be delivered by **22 November 2021**
4. Output 4: Electric Two-Wheeler Supporting Policy and E-Mobility Policy to be delivered by **31 January 2022**
5. Output 5: Complete Street Design Guideline Accommodating E-Motorcycle Uptake to be delivered by **14 February 2022**

For the full timeline including work schedule for each tasks of the output could be seen on the following table:

Table 2 Timeline of the Project

Output	Deliverables	Month											
		Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
Output #1: Inception and Verification of Technical Assistance and Work Plan	Project inception report												
	Minutes of meeting (Kick-off meeting)												
	Liaison procedure and communication protocols												
	Detailed work plan												
	Output 1 deliverables submission												
Output #2: Report of Broader Motorcycle Landscape in Greater Jakarta	Baseline motorcycle landscape in Greater Jakarta												
	Motorcycle-related issues in Greater Jakarta												
	Opportunities and barriers of motorcycle electrification, focusing on ride-hailing services												
	Potential impacts of ride-hailing electrification												
	Output 2 deliverables submission												
Output #3: Action Plan for Electrification of Motorcycle Ride Hailing	Current perspectives on ride hailing electrification												
	Documentation of electric motorcycle best practices from other global cities in India, China, and the US												
	Timetable and roadmap for ride-hailing fleet electrification												
	Environmental, social, and economic benefit analysis												
	TCO and environmental benefit tool												
	Capacity building toolkit and workshop												
	Output 3 deliverables submission												
Output #4: Policy Recommendation to Support Electric Motorcycle Adoption	E-motorcycle policy gaps												
	Regional and national stakeholder mapping												
	Stakeholder consultation event												
	National-level policy recommendations												
	Local-level policy recommendations												
	Grid capacity requirement for e-motorcycle deployment in Greater Jakarta												
	Dissemination activities												
	Output 4 deliverables submission												
Output #5: Complete street design guideline accommodating e-motorcycle uptake	Road safety concerns of electric motorcycles												
	Complete street design guideline for Indonesian cities												
	Output 5 deliverables submission												

5. Communication Plan

There are mainly two types of communication plans in this project, which are the coordination channel with team members and the coordination channel with beneficiaries. These two coordination channels are necessary to ensure seamless collaboration in doing this project. Here is the communication plan for both team members and beneficiaries:

- Internal communication plan:

- A collaboration platform will be set up in Ms. Teams that can be accessed by all team members. This will enable data sharing between team members to ensure seamless collaboration throughout the project.
- Bi-weekly coordination meeting will be conducted between ITDP team members and UK PACT Indonesia program manager to coordinate work plan and ensure the project is conducted in a timely manner. This meeting will be led by ITDP.
- Quarterly meeting will be conducted between ITDP and UK PACT Indonesia program manager to report the quarterly progress of this project.
- External communication plan:
 - Regular meetings with beneficiaries will be conducted between ITDP team members and beneficiaries, which will include Jakarta Transport Agency, Grab, and Gojek, to communicate any findings and incorporate any inputs from each beneficiary on a regular basis. The meetings will be conducted monthly or per achieved outputs.
 - Collaboration platforms will be set up in Ms. Teams separately between ITDP and each external party (Jakarta Transport Agency, Grab, and Gojek). This will enable data sharing between ITDP and related stakeholders to ensure seamless collaboration throughout the project.

6. Expected Constraints and Risks

In conducting this project, here are some of the expected constraints and risks that might happen including the mitigation plan:

Table 3 Expected Risks and Initial Mitigation Plan

Risk Description	Risk Category	Probability	Impact	Risk Rating	Plan to mitigate/ manage risks
Risk #1: The ride-hailing operators is not willing to share data due to confidentiality concerns	Delivery	Possible	Moderate	Major	ITDP and the Transport Agency will conduct field surveys and participatory workshops to gather primary data
Risk #2: Ride-hailing drivers or the driver association is difficult to be approached to get inputs and insights from them	Delivery	Possible	Moderate	Major	Approach an institution/contact person who already has a close relationship with the drivers' current concerns from the third party. Start the engagement by approaching the association leader through having several informal discussions on the benefits of switching to e-motorcycle. After that, ensure

Risk Description	Risk Category	Probability	Impact	Risk Rating	Plan to mitigate/ manage risks
					their understanding of this project's purpose and benefits.
Risk #3: The ICE vehicle industry players are expected to lobby the government to not support the project in order to protect their businesses	External context	Unlikely	Moderate	Moderate	As a mitigation measure, the project will also explore recommendations on ICE vehicle disincentives which could be issued by the government, such as parking limitation, road access restriction, etc.
Risk #4: Focus of the city government is currently not on the e-mobility but fighting the covid-19 issues	External context	Possible	Minor	Moderate	Explain the city government that this project will have many medium to long term benefits to the overall air quality and urban mobility

UK PACT

www.ukpact.co.uk

For any enquiries, please get in touch via email at communications@ukpact.co.uk