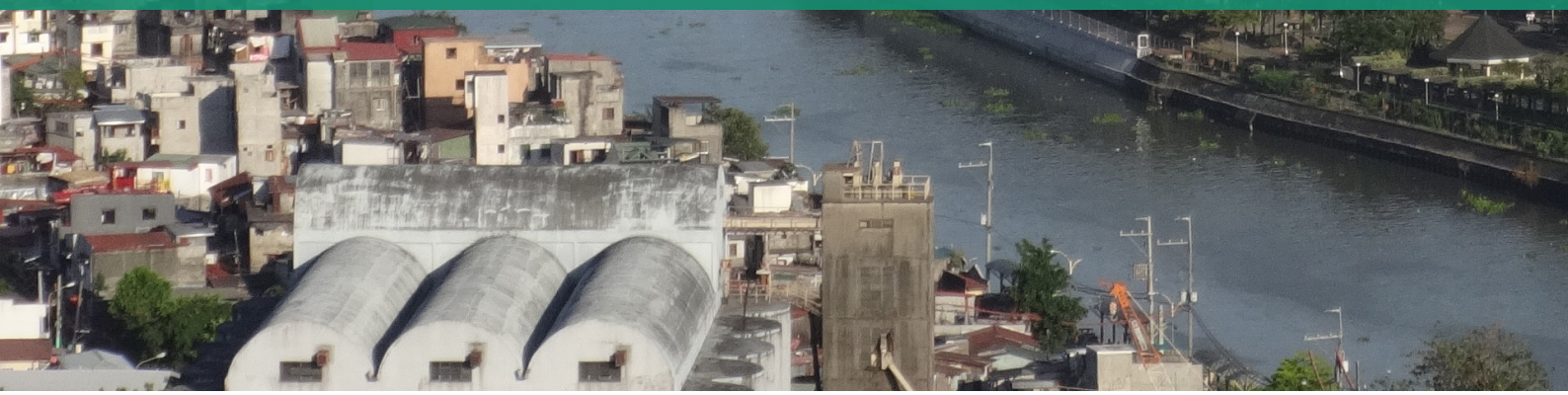
Pasig, the Philippines

SOLUTIONSPLUS I LIVING LABS UPDATE



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PROJECT PARTNERS

ABOUT

This is a summary of the paper, submitted to the journal 'Sustainable Earth Review' developed under SOLUTIONSplus project. Currently the paper is under peer review.

TITLE

Capacity and market potential for local production and distribution of electric two-wheelers in Southeast Asia, focused on Thailand, Indonesia, and Vietnam

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LAYOUT

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PICTURES

All the pictures are provided by the ITDP

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PASIG, THE PHILIPPINES

The SolutionsPlus project aimed to accelerate the transition to sustainable urban mobility through innovative and integrated e-mobility solutions. To this end, the consortium partners created Living Labs at city level to test different types of innovative and integrated e-mobility solutions. Living Labs reach beyond the implementation of technological innovations and also include elements of information, inspiration and initiation to achieve a stronger and sustainable impact of the project activities.

INFORM

Boost capabilities of local and national authorities, public transport operators and entrepreneurs about innovative urban e-mobility solutions across various transport modes by **informing them about tools** to plan, assess, implement and operate e-mobility solutions.

INSPIRE

Foster the take-up of e-mobility innovations by businesses, start-ups, local and national governments and transport operators by **inspiring** officials, operators, industry and businesses through peer-to-peer exchange on innovative e-mobility products and services.

INITIATE

Strengthen policy and business **collaboration** by **initiating** partnerships between local and national governments and local and European entrepreneurs and supporting the development of new e-mobility models business implementation plans.

IMPLEMENT

Create reference models for e-mobility innovation by **implementing** demonstration actions to test innovative e-mobility technologies and services, foster their **replication** and ensure their long-term **sustainability**.

IMPACT

Contribute to global **sustainability and climate goals** by boosting the **impact** of this project through the integration of the innovative concepts into policy, funding, operation, research and business practice.

Pasig is one of the 17 cities in Metro Manila. It is home to 6% of Metro Manila's population, totalling 803 thousand inhabitants according to the 2020 National Census. It has a calculated urban population density of 16,574 inhabitants per square kilometres. Pasig houses the Ortigas Centre financial district as well as dense residential areas spanning from informal settlements along the Pasig River to high-income developments.

Similarly to the entire Metro Manila, the use of ICE vehicles is prevalent and growing. Consequently, the city is characterised by high traffic levels. Much of that traffic is generated by motorcycles which account for 60% of the vehicles. From 2015-2020, motorcycle fleets grew at an average of 19% annually. Pasig is serviced by the Manila Metro Rail Transit Line 3 (MRT-3) and Light Rail Transit Line 2 (LRT-2), with proposed mass transport projects in the pipeline. However, challenges in providing integrated,

high-quality urban public transport persist due to factors such as complex governance structures, a lack of planning integration, missing integration of informal modes, and lax regulations and enforcement.

Recent government initiatives such as the Public Utility Vehicle Modernisation Programme aim to transform the public transport sector. In the past, cities were only mandated to regulate and manage their local tricycle sectors. Pasig has implemented a tricycle replacement programme that has resulted in the elimination of old 2-stroke vehicles in the city. More current, Pasig is looking at supporting the transition to electric tricycles under the new Electric Vehicle Industry Development Act. In terms of freight transport, the Philippines, like many developing countries, has a mix of registered cargo vehicles and private individuals engaged in urban freight delivery for e-commerce companies.

DEMONSTRATION ACTION IN KIGALI

The Pasig demonstration focused on activities that aim to maximise the usage of the city-owned electric vehicle fleet. The SOL+ demo created locally designed multi-purpose electric quadricycles, combining the agility of smaller vehicles with the carrying capacity of larger ones used for urban deliveries in Pasig. Vehicles feature a management and control system for real-time monitoring, analytics, charging decisions, security, GPS, and performance adjustment. The system is aimed to send vital information to a Fleet Maintenance Decision Support System, integrating machine learning for performance analysis. The Pasig pilot explored a "shared e-vehicle use" concept, involving PHLPost, the Pasig City Government, and other private entities, to maximise vehicle fleet usage.

INFORM

Knowledge products related to demonstration activities and e-mobility in general, including light electric vehicles, mixed-use vehicle, charging infrastructure, and vehicle integration, have been incorporated into the SOLUTIONSplus online toolbox and shared with the city. This has supported Pasig City in comprehending the technical, policy, and planning aspects of the e-mobility system. Moreover, Pasig has been capacitated on how to measure and assess the impact of their e-mobility programs and interventions. Through the impact assessment tool, Pasig City is equipped with the knowledge on what are the key monitoring indicators to measure, what data will be needed, and how to measure it through the diverse methodologies introduced in the toolbox.

INSPIRE

In 2021 and 2022, Pasig stakeholders actively participated in both Asian-regional and Pasig-specific training sessions on e-mobility. In May 2021, SOLUTIONSplus organized an online training focused on 'How e-mobility and integrated urban mobility planning can contribute to the SDGs in Asian cities.' The subsequent Asia Regional training (online) in October 2021 covered introductory knowledge about the electric mobility sector, prerequisites for planning the electric mobility ecosystem, and specialized topics on electric vehicle management, selecting and setting up charging infrastructure, and cross-cutting themes. Concurrently, the Pasig-specific training (online) in the same month delved into these topics while addressing the local context.

In December 2022, Pasig City hosted a 3-day training session on the role of Philippine cities in electric vehicle adoption and the planning of charging infrastructure. The event facilitated valuable knowledge exchange among the Pasig City Government and representatives from six other Philippine city governments, who shared insights into their respective e-mobility initiatives and experiences. Participants from various city offices—including transport, planning, environment, and council offices—engaged in discussions on addressing capacity and policy gaps to promote the widespread adoption of e-mobility in their respective cities. Another round of local (on-site) trainings were held in November 2023, wherein key staff were trained on the utilisation and proper maintenance of the vehicles, as well as on the IT sharing system. In December 2023, representatives of Pasig participated in a knowledge sharing event on e-mobility

for Philippine local governments. The event was organised by Clean Air Asia together with the Department of Energy and the cities of Pasig, Manila, and Quezon. Pasig shared information on their e-mobility initiatives, including the SOLUTIONSplus activities.

Local city partners profited from peer-to-peer activities and exchanges with partners from Africa and Latin America, which included dedicated sessions focusing on the development and maintenance of e-bike sharing systems.

In 2024, Pasig has actively joined both as presenters and participants in various events with focus areas on low-emission zones, measurement-reporting-verification (MRV) systems, and e-mobility transition dialogue in the Philippines. In a roundtable discussion in February 2024 with other cities and national government agencies in the Philippines, Pasig shared its experience, challenges, and lessons learned in deploying and managing electric vehicles in their fleet including the SOLUTIONSplus pilot demonstration. In the exchange, Pasig highlighted the challenges in sustaining the efforts beyond the pilot phase, finding funding opportunities for scale-up, as well as having supportive policies for their transition to sustainable electrification. Meanwhile, Pasig was selected to participate in a regional exchange between Asian cities in a training on low-emission zones in Bangkok in April 2024. Pasig presented how their e-mobility programs such as the SOLUTIONSplus pilot has helped the Pasig Transport office strengthen their commitment to adopting sustainable mobility solutions and how it can make the case for developing a low emission zone in the city. The training also provided technical guidance to Pasig on how to design and build low emission zones within their jurisdiction, building on their existing green programs. More recently, in May 2024, Pasig also learned about the importance of MRV systems as part of the sustainability efforts in measuring the impacts of these e-mobility programs. This training, organized by Clean Air Asia, aimed at understanding the current capacities, gaps, and opportunities of city governments in collecting data and measuring the GHG impacts of their various policy interventions.

INITIATE

The Pasig City demonstration received technical support and innovative technologies from Europe during the first round of matchmaking activities. Two units of the e-quadricycle prototype utilized second-life batteries from Betteries, a German start-up selected from the EU-Innovators call. As part of the matchmaking activities, PEM Motion provided expert technical advice to the local innovator in Pasig City, ToJo Motors, focusing on the Structural Assessment of Flexible Electric Vehicle (FLEV) Chassis. ToJo Motors has also established a partnership with Valeo, particularly in the context of the powertrains developed by the company.

Figure 1. E-Quad Showcase Event in Pasig City (December 2022)

On December 2022, the prototypes of the e-quadricycle were launched in Pasig City. These e-quads are expected to offer insights into the use of multi-purpose electric vehicles as replacement for the current ICE vehicles in the City Government's fleet. This effort aligns with the objective of delivering sustainable urban mobility solutions to the City, especially given the requirement, under the Electric Vehicle Industry Development Act (EVIDA) of 2022, for local government units in the Philippines to increase the share of electric vehicles in their fleets.

The official launch of the completed e-quads was held on November 20, 2023. The IT sharing system is now being tested by the drivers of the Pasig city-owned electric vehicle fleet which includes the e-quadricycles and their existing e-tricycles. On-the-ground observations and feedback will be gathered after the trial run of the IT sharing system.

IMPLEMENT

The e-quadricycle has a carrying capacity of 450 kilograms, or accommodates four passengers. It features a versatile chassis for multiple purposes, primarily serving Pasig City Government offices. The e-quadricycle prototype was launched in December 2022, and the completed and enhanced version in November 2023. Both events were attended by key decision-makers in the city, including the Mayor, Vice-Mayor, and representatives of the City Council.

Figure 2. Launching of E-quad and IT booking System in Pasig City (November 2023)

The vehicles are earmarked for two principal uses: transport of health workers (passenger) and small medicines (goods) to different health centers and shared use amongst the various offices of Pasig. The demonstration action provides additional incentives for the integrated development of charging facilities, marking the next step in the evolution of Pasig's mobility solutions.

Besides vehicle development, a dedicated sharing system app has been created with the assistance of LOCA, a ride-hailing app based in Laos. This app enables Pasig City offices to reserve and schedule vehicles for their operations. The app is being tested with various city offices, using Pasig City's current vehicle fleet, including existing e-tricycles, in addition to the initially delivered SOLUTIONSplus e-quadricycles. Feedback from the trial run will be utilized to modify and customize the app according to Pasig City government's operational needs.

IMPACT

In the Philippines, the National Urban Mobility Programme, locally called the Philippine Urban Mobility Programme, or PUMP, concept document has been developed to operationalize the National Transport Policy. SOLUTIONSplus developed a paper to enhance the PUMP, further looking into unlocking urban mobility opportunities through electrification and taking into account the lessons learned from the pilot demonstration.
The ex-post assessment of the demonstration activity suggests that the e-quadcycle will be the financially preferable option (total cost of ownership) for public administrations, compared to the currently deployed ICE vehicles. Replacing ICE vehicles with the SOLUTIONsplus vehicle will also avoid emissions of CO2, NOx, PM2.5 and CO.

REPLICABILITY

With the help of an extension attachment at the back of the e-quadricycle, the e-quad's use-case potential as a transport vehicle for bicycles and e-scooters is currently being explored and tested. In partnership with Tipaklong (2024), a start-up company with a shared mobility system, a pilot is being tested to evaluate the performance and suitability of the e-quad to help balance bicycles and e-scooters within the campus of the University of the Philippines Los Baños (UPLB) , one of the largest university campuses in the country. The shared mobility system that features the SOL+ equad (as a redistribution vehicle) was launched last June 1, 2024.

Figure 3. SOLplus Equad at the UPLB Green Mobility Initiative Launch

Figure 4 SOLplus Equad serves as a redistribution vehicle for the shared mobility scheme at the UPLB Campus

Scaling up of the e-quads using these vehicles in the pilot cities is being explored under the GEF-supported Philippines E-mobility ASAP (Acceleration and Scale up of the Adoption of E-mobility in the Philippines) project. As these vehicles are modular, they can be adapted to a range of use cases and local circumstances, and thus have great potential for replication.

Finally, the shared vehicle concept and booking app developed and tested under SOLUTIONSplus are in line with the requirements of the national 2022 Electric Vehicle Industry Development Act to increase the share of electric vehicles in public fleets, and can be replicated in other departments and municipalities.

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