

NEWSLETTER

E-Mobility Investment Platform
for Asia and the Pacific

March 2024

E-mobility support and investment platform updates

The e-mobility platform for Asia and the Pacific organised a three-day long workshop between 14th and 16th November 2023 in Seoul, Republic of Korea. The workshop was a major success and participated by representatives from Developing Member Countries (DMCs) of the Asian Development Bank (ADB) staff, International Development Partners, and industry experts. Effective discussions and knowledge exchange took place through panel sessions, technical presentations, round-table discussions, and site visit.

On day one, the technical considerations of electric buses, electric two- and three-wheelers, charging infrastructure and electric vessels were presented. Amongst different technologies, deploying electric buses and charging infrastructure was identified as a high priority in Asia. The discussions with the private sector highlighted the need for more public-private engagement to prepare a country's regulatory environment. Domestic supply-chain readiness is also highlighted as a critical factor for private-sector investment. The DMCs would need support to develop a stronger agenda for engaging effectively with the private sector. The public sector representatives identified private sector investment opportunities, particularly around vehicle and battery manufacturing, charging infrastructure and battery end-of-life processing.

On day two, the Korea Transport Institute (KOTI) and the Seoul City Government

showcased Korea's e-mobility transition, including the policy drivers, enabling factors and key projects to date. The delegates visited a battery swapping station, bus charging and hydrogen refuelling bus depot and destination charging facility in Seoul. The site visits presented the technical and operational details and implementational challenges of those facilities.

On day three, the delegates reconvened and discussed how different enabling environments can be created to accelerate EVs. It was followed by two round-table discussions about the challenges and opportunities of EV deployment in the region. The countries that are more advanced in EV adoption acknowledged the need for Just Transition policies and greater private sector participation and investments. Countries with lower levels of e-mobility deployment need support in developing the appropriate policy and regulatory framework for guided development. A collective regional approach to developing policy, strategy and regulatory framework could be suitable for the Pacific Island Countries.



Message from ADB

We are pleased to deliver the 2nd newsletter of the E-Mobility Support and Investment Platform for Asia and the Pacific. The workshop arranged in Seoul in November 2023 was a successful initiative for engaging diverse e-mobility stakeholders in the region. We wish to continue the fruitful discussions and knowledge exchange through the platform in 2024, moving toward decarbonization of transport.

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Advanced EV Technologies

Asia and the Pacific E-mobility platform team



The electric vehicle adoption is quite technology-dependent, and the fast advancement of technologies is taking us closer to the electrification of our transport sector. Over the last decade, we have seen technologies being researched, piloted, and made commercially available to the public. What is coming to our doorway next? The cost differentials between Internal Combustion Engine (ICE) technology and Electric Vehicle (EV) technology are gradually narrowing. This is partly due to our technological innovation and the improved efficiencies. Let's explore three emerging technologies that will change our charging infrastructure landscape for EVs. Some are already commercially available to users, and some are still in the piloting stage.

Vehicle-to-Grid (V2G)

EVs traditionally draw power from the grid to charge their batteries. However, V2G (vehicle-to-grid) technology allows for a two-way flow of power where users can send excess energy back to the grid. This requires a special charger that enables the two-way flow of power. V2G technology allows vehicles to act as energy storage systems during times of low electricity demand and send back power to the national grid during peak periods. Furthermore, if EVs are charged during the day using renewable sources like solar power, the excess energy can be sent back to the grid at night, thereby optimizing the supply in a sustainable way. The technology also allows users to sell back excess energy to the national grid, making it a commercially viable option. In addition, there are benefits in the form of energy resiliency. In China, research is underway for commercial use of V2G technology (Zhang Lin, Nikkei Asia). In Thailand, Delta Electronics, a public company, has introduced [bi-directional chargers](#).

Battery Swapping

This technology enables the replacement of depleted or partially charged batteries with fully charged ones. It is particularly suitable for two and three-wheelers, where battery swapping is easier compared to cars and other heavy vehicles. This means users no longer wait for long hours to charge up their vehicles. However, standardization of battery size and standards with the vehicles is necessary. The technology has revolutionized the commercial business model for EVs because owners no longer need to own the battery, but instead rent them. Detaching batteries from the vehicles also reduces the purchase cost of the vehicle. Battery swapping stations offer a commercial value proposition to investors. Several cities in Asia have introduced this technology. [Selex Motors](#), with funding support from ADB, in Vietnam has introduced 56 battery swapping stations across three major cities.

Inductive Charging

What if we could charge our electric vehicles using wireless technology, similar to how mobile phones can be charged these days? Inductive charging technology makes this possible, eliminating the need for a wired connection to charge EV batteries. To charge, a transmitter is required on the ground or buried, as well as a receiver on the vehicle. This technology is particularly suitable for taxi services, as vehicles can be charged during idle time at taxi ranks, which is less disruptive compared to wired chargers. Several countries have conducted pilot projects and feasibility studies on this technology. Volvo is currently testing wireless EV charging technologies in Sweden (Kris Holt, Joint TechCrunch+, 2022). In 2018, the [UK government](#) provided an innovation grant to deploy wireless charging infrastructure for commercial use.

Platform webinar updates

The Asia and the Pacific e-mobility platform delivered three interesting webinars between November and December 2023.

The key outcomes of those webinars were:

8th November 2023 - Gender and inclusivity in Electric Vehicle adoption
Speaker: Heather Allen

Inclusive EV policies with targeted investments empower women entrepreneurs for a stronger impact in the sector.

[Click to view recording](#)

29th November 2023
Green financing for Electric Vehicles
Speaker: Ozlem Kildir

Establishing a green project pipeline aligned with eligibility criteria is crucial for bond frameworks.

[Click to view recording](#)

6th December 2023
Electric Vehicle roadmap development
Speaker: Stuart Clapham

Roadmaps are vital for navigating E-Mobility challenges, serving as living documents in the transition to electric vehicles.

[Click to view recording](#)

Asia EV Outlook: Philippines

Sudhir Gota and Alvin Mejia, Asia Transport Outlook (ATO)

The [Asian Transport Outlook \(ATO\)](#) project - supported by the Asian Development Bank and the Asian Infrastructure Investment Bank - together with the [Urban Electric Mobility Initiative \(UEMI\)](#) and the EU-supported [SOLUTIONSplus](#) project, are producing e-mobility profiles that focus on taking stock of the main developments relating to e-mobility transition in Asian economies. This edition of the newsletter presents the profiles for Philippines.

The Philippines is focused on achieving sustained economic growth and social development, anticipating an annual urban population increase of 1.3 million and a GDP per capita growth of 4.4% until 2050. This growth is expected to drive a 3.0% annual increase in passenger transport and a 3.6% growth in freight transport.

In 2018, the Land Transportation Office recorded a significant rise in new battery electric vehicles, particularly motorcycles,

reaching 4,362 registrations, double the previous year. Despite limited charging infrastructure, the Electric Vehicle Association of the Philippines forecasts an 8%-12% annual growth until 2024, generating \$33.6 million from approximately 200 thousand units sold.

The Electric Vehicle Industry Development Act (EVIDA), effective since April 2022, regulates various aspects of electric vehicles, encouraging the sector's development. The

government provides fiscal incentives such as exemptions for fully built EV imports, eight years of duty exemption for charging station imports, and discounts on EV purchases, motor vehicle charges, registration, and inspection fees.

Non-fiscal incentives include priority registration, exemption from certain vehicle reduction programs, and expedited processing for EV-related activities. These initiatives aim to bolster the electric vehicle industry in the Philippines and contribute to sustainable economic and environmental objectives.



Detailed report can be found [here](#)

ELECTRIC VEHICLES

ELECTRIC VEHICLES

News in short...

ADB, BANPU Partner for E-Tuktuks and Battery Production.

ADB and BANPU signed a 2.4 billion baht loan for 1,500 e-tuktuks and charging stations in Bangkok. The funds also support a 1.3 GWh expansion of a lithium-ion EV battery facility in the People's Republic of China. A \$10.7 million concessional loan from ADB administered Clean Technology Fund is part of the package. ADB will also provide technical assistance, funded by the ASEAN Catalytic Green Finance Facility, to assess the potential for micro-scale transit services in other Southeast Asia cities. Read more here: [ADB, BANPU Sign Deal to Support Electric Tuktuks in Thailand and Battery Production in PRC](#)

E-Bus Purchase, Enhancing Sustainable Transport in Thailand

ADB and Energy Absolute have signed a 3.9 billion Thai baht (about US\$110 million) loan to fund Energy Absolute Public Company Limited's purchase of up to 1,200 electric buses for Bangkok. This initiative, supported by a financing package from ADB, JICA, and EXIM Thailand, aims to replace internal combustion engine buses, contributing to cleaner public transport in Thailand. ADB Director General for Private Sector Operations Suzanne Gaboury highlighted the project's potential impact on reducing pollution and greenhouse gas emissions, emphasizing its significance as a large-scale financing initiative for e-buses in Thailand. Read more in [ADB Brief: E-Bus Purchase, Enhancing Sustainable Transport in Thailand](#)

ADB Commits Record Climate Finance of Almost \$10 Billion in 2023

In 2023, ADB set a record in climate finance commitment, allocating \$9.8 billion to aid its developing member countries in Asia and the Pacific in reducing greenhouse gas emissions and adapting to climate change. ADB exceeded its 2019–2024 target of US\$9 billion for cumulative adaptation financing by providing over US\$10.4 billion from 2019 to 2023. Notable projects include a US\$1 billion loan for the Philippines' large-scale electric bus system in Davao City. Read more in ADB Brief: [ADB Commits Record Climate Finance of Almost \\$10 Billion in 2023](#)



UNEP Report: Electric 2 and 3 Wheelers in Emerging Markets

Further details of the report can be found [here](#).

grows even more significant as the markets for these vehicles continue expanding. UNEP classifies over 800 electric two and three-wheeler models across three regions, providing insights into technical specifications, charging technologies, and usage patterns. Notably, Asia emerges as the leader in manufacturing, with China playing a pivotal role and other countries like Vietnam and Indonesia rapidly increasing their production capacities.

In Asia, the transition to electric has been quite progressive with an estimated 7% of the 490 million two and three-wheelers being electric. Government support and innovative battery-swapping mechanisms contribute to Asia's dominance in this market. Despite regional variations, the report underscores the economic benefits of electric two and three-wheelers, highlighting potential fuel cost savings and urging the need for significant capital investment alongside supportive policy and regulatory frameworks for a safe, just,

and environmentally sustainable transition. For in-depth insight, read the report here - [Electric Two and Three Wheelers - Global Emerging Market Review](#).



A recent report by the UNEP Global Electric Mobility Programme, funded by the Global Environment Facility (GEF) estimates that 570 million two and three-wheelers currently dominate the roads of Africa, Asia, and Latin America. The majority still rely on internal combustion engines (ICE) and petroleum fuels, collectively consuming 15% to 20% of non-OECD countries' liquid petroleum fuels for transport annually.

The potential for positive environmental impact is substantial, with the transition to electric vehicles having the capacity to reduce between 500 and 600 million metric tons of CO2 equivalent each year. This potential

Webinar Series: Scaling up E-Mobility

E-mobility Support and Investment Platform for Asia & Pacific

The first of six e-mobility webinars from Series 2 arrives this January to provide a deeper understanding of the e-mobility landscape in Asia and the Pacific. Join our speakers from 15:00-15:45* (Philippines Standard Time)

*Unless otherwise stated

17th Jan

[Click to view recording.](#)

E-mobility Trends and Policy Measures: A Peek into Asia and the Pacific
Alvin Mejia, Director, Analysis & Impact at Urban Electric Mobility Initiative; Team Member, Asian Transport Outlook
Explore key trends and insights on e-mobility policy measures that are taking hold in developing countries in Asia.



31st Jan

[Click to view recording.](#)

Implementing Micro Mobility Effectively
Tom Fleming, Associate at Integrated Transport Planning
Learn how to plan, design and implement shared micro mobility schemes effectively in cities and successfully integrate them into the wider urban transport system.



14th Feb

[Click to view recording.](#)

Accelerating Adoption of E-Mobility in Malaysia
Nur Zuriyana Zaki, Senior Analyst at Malaysia Green Technology and Climate Change Corporation
Delve into the transformative initiatives being implemented to develop an EV charging network in Malaysia.



28th Feb

[Click to view recording.](#)

Battery Passport Pilot Scheme
Inga Petersen, Executive Director at Global Battery Alliance
An introduction to the world's first battery passport pilot scheme and key considerations for developing transparent and responsible battery value chains.



13th Mar

[Click to register.](#)

Developing Inter-Urban EV Charging Network in Bangladesh
Koen Van Baekel, Director & Advisor on Infrastructure, Transit & Cities at Rebel Group
Explore the latest advancements shaping EV infrastructure on key routes connecting major cities in Bangladesh.



27th Mar

[Click to register.](#)

Accessing Green Finance
Devindranauth Bissoon, Senior Infrastructure Specialist at Green Climate Fund
Explore Green Climate Fund's e-mobility financing and collaboration opportunities with ADB and DMC's.



Promotion of **Electric Buses** Nepal

Ram Chandra Poudel, Director, The Department of Transport Management

Expanding the adoption of electric vehicles is a national policy in Nepal. Recently, there have been instances that suggest activities targeted toward the deployment of electric buses are gradually taking off. For example, Sundar Yatayat, a private transport company, operates four public electric buses in Kathmandu. Furthermore, ADB supported the procurement of five electric buses to service passengers traveling in Lumbini and Sajha Yatayat, a public transport cooperative, procuring 40 electric buses in its first phase of procurement is expected to be operational by 2022.

Nepal developed provincial technical standard guidelines for small EVs. Equally large EVs, particularly e-buses, are given priority for investments. A number of strategic plans have been prepared by the Government in collaboration with

international development partners and private investments. For example, the 2023 plan for E-Bus Rapid Transit, a PPP investment initiative that the Nepal Investment Board is working towards to introduce 75 electric buses.

Other investments include, for example, the Government of Nepal providing three billion Nepalese Rupees (US\$ 27.27 million) to procure electric buses for the public transport operator Sajha Yatayat Cooperative. The operator has 71 large and four standard buses in their fleet that serve around 26,000 passengers a day in the Kathmandu Valley. The operator receives 40 Battery Electric Buses (BEBs) through this investment. The plan is to replace the entire fleet with electric buses by 2025. Similarly, the Lumbini Development Trust a government entity working for the overall development of the Lumbini area has procured 19 electric vehicles (5 buses and 14

vans) under a grant from ADB.

The following measures are being undertaken in Nepal to accelerate electric bus adoption,

- Formulation of **Standards** for Electric Vehicles to be Imported into Nepal and for **Conversion** of fossil fuelled vehicles into EVs.
- Formulation of **Test Standards** for Electric Vehicles Imported into or assembled/manufactured in Nepal.
- Cooperation between government entities and the private sector for the establishment of a **network of Charging Stations** suitable for multiple types of electric vehicles across the country.
- Formulation/revision of **Battery Recycling/Management Policy** for safe and productive management of different types of batteries used in electric vehicles.
- Promotion of battery **recycling plants**.
- Partnership between federal government, provincial governments, local governments and private sector for promotion of electric vehicles in **public transport under a potential (GCC Gross Cost Contracting (GCC) model**.



The key challenges in electrification of public transport in Nepal



ORGANISATION

The public transport in Nepal is mainly composed of informal bus providers, dominated by the private sector with individual service owners. E-bus adoption can be challenging in such an informal



ECONOMY OF SCALE

sector.

Significant capital investments are required for the acquisition of electric buses and batteries. Subsequently, the fare level is low to make electric buses more profitable.



INFRASTRUCTURE

An adequate supply of charging infrastructure is needed to mitigate the operating challenges due to difficult terrain, poor road infrastructure and traffic congestion.

FEEDBACK Provide feedback on the newsletter to the **Platform Team**