ASEAN-US Workshop: Integrated Approaches to Scaling Up Electric Mobility Summary Report

This report was written by USAID Southeast Asia Smart Power Program and produced by the Global Climate Action Partnership.

Background

As the Association of Southeast Asian Nations (ASEAN) seeks to meet nationally determined contributions, the transportation sector represents one of the biggest emitters of greenhouse gas (GHG) emissions. Most ASEAN countries are pursuing electrification of cars, buses, trains, two- and three-wheelers, and other modes of transportation. The transition to electric vehicles (EVs) has many benefits: it can reduce both GHG emissions and local air pollution, increase energy security for countries that are reliant on liquid fuel imports, and create manufacturing and export opportunities. Despite high EV potential, there are still several barriers to EV adoption across the region—most ASEAN member states lack EV charging infrastructure, are dependent on fossil fuels for electricity generation, lack incentives and policies for private sector growth, and do not have clear regulatory and safety standards. Cooperation among ASEAN member states and between government ministries is essential to accelerating EV adoption in the region.

Under this context, from September 19–22, the U.S. Agency for International Development (USAID) Southeast Asia Smart Power Program (SPP), U.S. Department of State's Global Climate Action Partnership (implemented by the U.S. National Renewable Energy Lab [NREL]), and the U.S. Department of Transportation partnered with the ASEAN Land Transport Working Group (LTWG) and the ASEAN Centre for Energy to host the ASEAN-U.S. Workshop: Integrated Approaches to Scaling Up Electric Mobility. The 3.5-day workshop convened 162 participants from ministries of energy, transport, and environment, as well as power sector regulators and utilities from eight ASEAN countries. The workshop featured leading experts from governments, global nongovernmental organizations, and leading private sector players from across ASEAN to speak on e-mobility in the region, including the United Nations Environment Program, United Nations Development Program, and Asian Development Bank, among others.

Goals and Objectives of the Workshop

EVs are a proven technology that is scaling globally in line with countries' decarbonization goals. Because EV adoption is in the early stages in many ASEAN countries, this workshop aimed to support government technical experts, regulators, policymakers, and private sector stakeholders to make data-informed policy decisions that will support a holistic and sustainable transition to EVs. In line with this goal, participants undertook activities to:

- Exchange knowledge on the opportunities and challenges of EV implementation

Left to right: *Beny Irzanto (ASEAN Secretariat), Grayson Heffner (USAID SPP), Linda McElroy (USAID Regional Development Mission for Asia), David Stonehill (USAID Regional Development Mission for Asia), and John Bruce Wells (USAID SPP) greet each other at the beginning of the workshop.*

- Gain an up-to-date understanding of the status of EV policies, targets, and implementation efforts across ASEAN
- Increase knowledge to gather and apply local data (e.g., emission factor, travel patterns) through best-in-class tools for decision-making
- Learn about the need for strong multi-stakeholder coordination to account for the impact of the EV transition on the transport and energy sectors while also ensuring e-mobility promotes sustainable economic growth
- Gain actionable insights into how to increase cross-ministerial cooperation in developing and implementing EV policies
- Hear from private sector actors within ASEAN and increase awareness of leading practices and case studies to create an enabling environment for the private sector.

Executive Summary

After 3.5 days of collaboration and exchange, participants expressed interest in an ASEAN-wide e-mobility road map and identified key components of such a road map (**Figure 1**). Some common themes to include in the road map were the need to define emissions reduction targets and address air pollution, enable better EV and EV battery supply chains (including production and assembly), build a regional workforce for the EV ecosystem, and develop physical and regulatory infrastructure (e.g., standards) to harmonize EV adoption.

This workshop provided a unique and important forum for stakeholders across the energy and transportation sectors to come together to discuss the opportunities, challenges, and solutions for an equitable transition to low-carbon energy and transportation solutions in ASEAN.

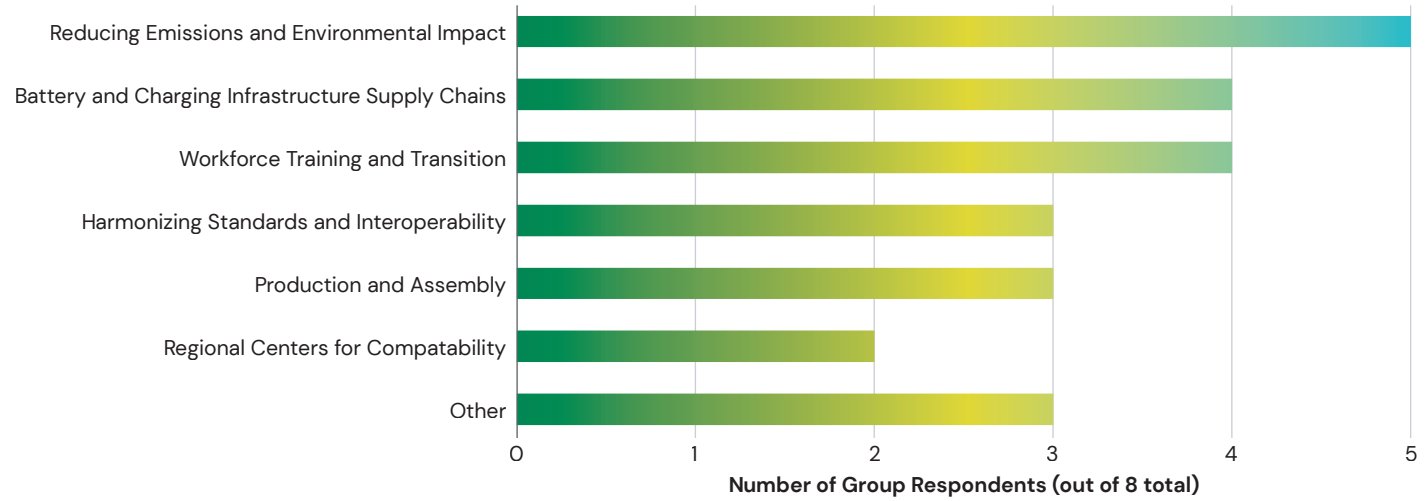

Figure 1. *Regional EV road-mapping imperatives identified by participant. In small breakout groups, participants identified their top three e-mobility topics that are imperative to include in a regional EV road map. There were eight total breakout groups, and this figure summarizes whether the group ranked an issue in its top three priorities.*

For next steps, participants identified the following priorities:

- Regional collaboration on EV supply chain, especially battery manufacturing, recycling, reuse, and other end-of-life management approaches
- Continued dialogue at the regional level between government bodies and the private sector on topics including vehicle manufacture, interoperable and universal EV charging station (EVCS) development, and clean grid expansion, given each ASEAN country is at a different stage of EV implementation
- Need for further engagement on cybersecurity issues related to the grid, EVCS, and EVs
- Conducting life cycle and sustainability assessments for EVs to understand waste, water, and GHG emission impact, given the variable grid emission factors in each country
- Interest in more training on EV/grid integration, managed charging, and vehicle-to-grid methodologies and good practices
- Incorporating equity and social inclusion into EV planning and policymaking.

Opening Session

The workshop began with inspiring remarks from Mr. Yusuf Nugroho, Head of the Vehicle Testing and Certification Center within the Directorate-General of Land Transport at Indonesia's Ministry of Transportation, who set the scene for the workshop by recounting the previous workshops held under the US-ASEAN Transportation Dialogue Partnership and highlighting the goals for the present workshop. Dr. Prasert Sinsukprasert, Director General of the Department of Alternative Energy Development and Efficiency at Thailand's Ministry of Energy, then provided a host country welcome.

Finally, Ms. Linda McElroy, Deputy Mission Director at the USAID Regional Development Mission for Asia, expressed the U.S. Government's appreciation and support for this strong partnership between the United States and ASEAN, especially regarding the cooperation across air, maritime, land transport, and other sustainable transport efforts, including EVs.

The opening technical sessions began with e-mobility updates from the global, U.S., and ASEAN perspectives. Yeonju Jeong, who leads Asia-Pacific activities in the Sustainable Mobility unit at the United Nations Environment Program, shared global trends in the transport sector—highlighting that the number of vehicles globally is expected to double by 2050, and transport-related GHG emissions will grow from one-third to one-half of all energy-related emissions, underscoring the importance of the e-mobility transition in tandem with decarbonizing the electricity sector.

Caley Johnson of NREL provided examples of leading practices and lessons learned in the United States. The United States has been able to increase EV sales through the use of financial and non-fiscal incentives, including grants for commercial and residential EVCS installation, high-occupancy vehicle lane access, and priority parking spaces. A notable good practice is that the United States used proper temporal and spatial planning to overcome grid constraints.

Bram Hertasning of Indonesia's Center for Traffic and Urban Transport Policy and Rizky Aditya Putra of the ASEAN Centre for Energy highlighted how ASEAN's policy landscape varies in EV targets, bans on internal combustion engine vehicles, EV subsidies, and EVCS. ASEAN member states also have different energy security goals and fuel affordability issues, which affects the pace of each country's EV transition. The regional cooperation effort toward the development of the EV ecosystem was highlighted, noting the recent ASEAN's Leaders Declaration on Developing Regional EV Ecosystems and the launching of the ASEAN Strategy for Carbon Neutrality.

Finally, during the country reports, each ASEAN member state in attendance highlighted significant developments in their EV policies and programs (**Table 1**), as well as the overarching status of EV and EVCS deployment in their countries (**Figure 2**).

Table 1. *Notable Developments Highlighted During the Country Reports Segment*

Country	Notable Developments
Cambodia	Reduced import duties for EVs. Revision of road traffic law to allow EV registrations. Developing a national transport policy and EV and EV charging infrastructure road map, including more EV and EV battery safety standards.
Indonesia	Set policy to accelerate use of EVs through an entire EV ecosystem. Developing public charging infrastructure. Converting government fleets to EVs. Setting up regulations for EVCS, electricity tariffs, and safety standards.
Lao PDR	Set EV goal of 30% by 2030. Has import tax exemptions for EVs and EVCS. Working on further technical and safety standards, EV pilot projects, and EVCS installations.
Malaysia	Set up a national automotive policy for 38% EV sales by 2040 and 80% by 2050. Developed incentives and standards. Has comprehensive plan to achieve 10,000 EVCS by 2025 and aims to have one charger per eight EVs.
Philippines	Developed a comprehensive road map for the EV industry that outlines rules and regulations for EVCS, steps for a domestic EV manufacturing industry, research and development, and human resource development. Released the EV Incentive Strategy to encourage EV manufacturing.
Singapore	Creating targets for 100% clean energy vehicles by 2040, 60,000 chargers by 2030, no new internal combustion engine cars or taxi registrations starting in 2030, and electrifying the public bus fleet by 2030.
Thailand	Established an EV road map to promote EV production, develop infrastructure, and promote usage. Set a target of 30% EV production by 2030 and 12,000 chargers by 2030.
Vietnam	Offers subsidies and lower taxes and fees for new EV purchases. Released goals in July 2022 that will make urban mass transit run on electricity and have all vehicles be zero-emissions by 2050.

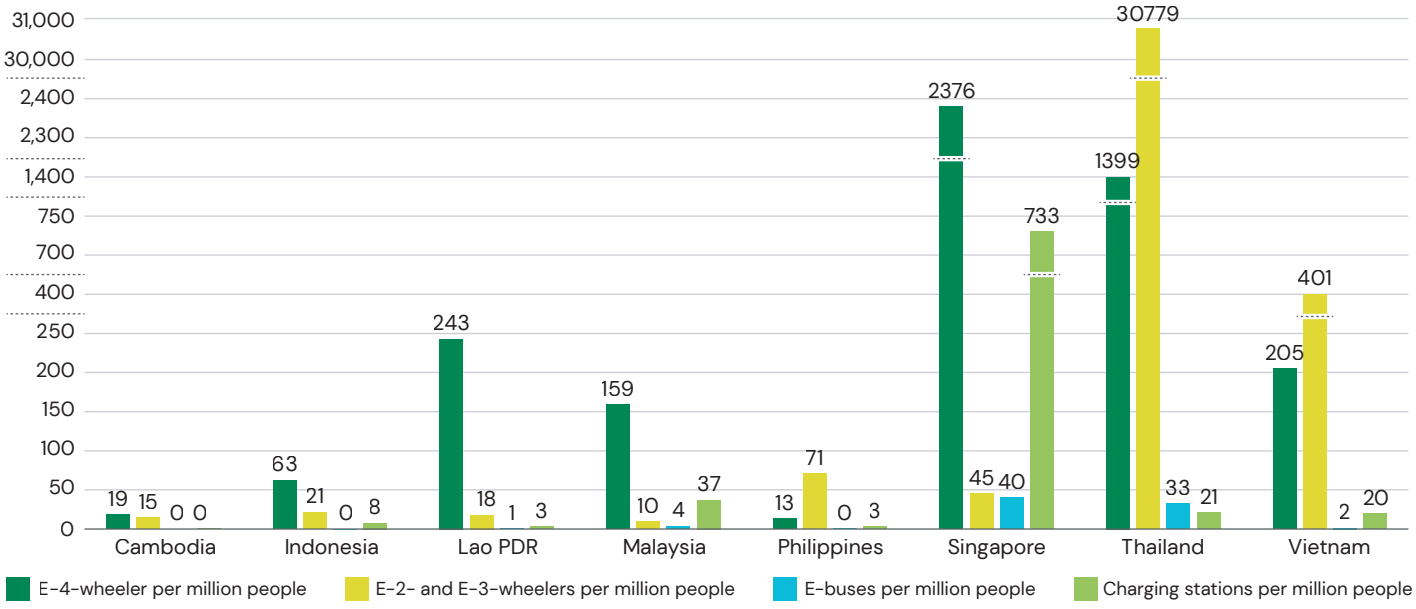

Figure 2. *Number of EVs and EV chargers deployed in the represented member countries. Source: Data compiled from country report presentations*

Strategies for Scaling Up Electric Mobility

Several governments—including those of Singapore, Philippines, Vietnam, and the United States—have taken steps to improve cross-sector coordination and governance of e-mobility solutions. The **United States** and Singapore have government entities—the Joint Office of Energy and Transportation and the National Electric Vehicle Centre, respectively—that coordinate across government agencies for the expansion of EVs and build out of EVCS. The **Philippines** passed the Electric Vehicle Industry Development Act in 2022 that details clear roles and responsibilities across government departments for manufacturing EVs, increasing EV adoption, conducting research and development, and increasing human resource development. The Philippines government also convenes a technical working group that brings together all departments involved in the EV buildout to ensure harmonized policies and streamlined standards and regulations. **Vietnam** has been working with the USAID Vietnam Low Emissions Energy Program II to define ministry roles and responsibilities and build cross-ministerial coordination to develop and implement policies throughout the EV value chain.

Power utilities and the private sector are also key stakeholders for EV scale-up. For example, the Provincial Electricity Authority (PEA), a Thai distribution utility, offers charging services through PEA-run charging stations and its own mobile app. SCG International is a private sector logistics company that is electrifying various segments of its business, from e-taxis to cement trucks. It is undertaking efforts to decarbonize across its operations by incorporating EVs, microgrids, and energy efficiency.

At the end of Day 1, the participants split up into small group breakout sessions to brainstorm and reflect on e-mobility scale-up strategies. The breakout groups were asked about priorities, challenges, and solutions for EV deployment, and their answers are summarized in **Figures 3 and 4 and Box 1**.

EV Infrastructure and Environmental Impacts

To understand the technical impacts of electric mobility—including changes to power systems, technical standards, and environmental impacts—it is necessary to cooperate across ministries, utilities, regulators, and the private sector, who each hold the key tools and expertise to mitigate any disruptions during the EV transition. Grid impacts, for one, is a key issue facing utilities who are tasked with facilitating the e-mobility transition by operating the grid to supply electricity to EVCS. Certain tools, like NREL's EVI-Pro Tool, can forecast where EV chargers should be located, plan how they will impact the distribution grid, and manage expansion

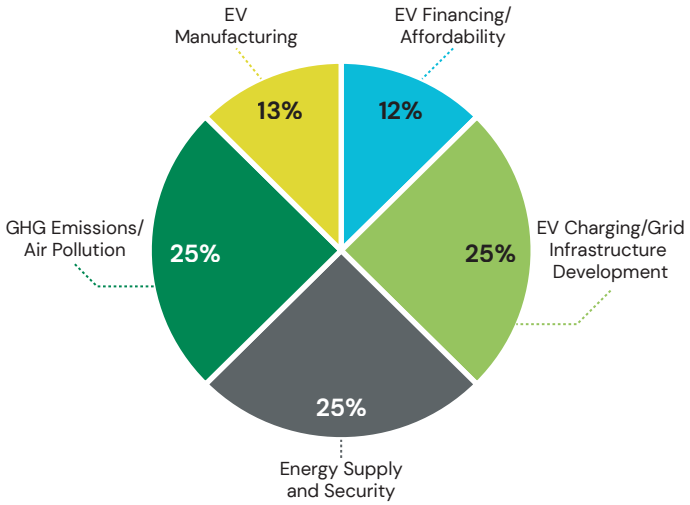

Figure 3. *What are your top priorities for EV deployment?*

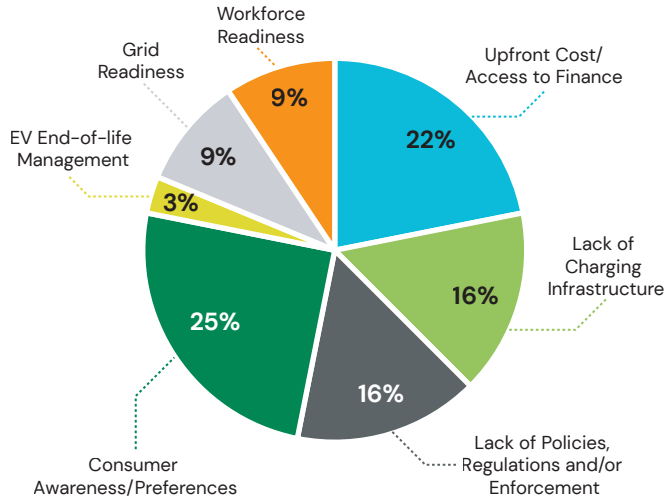

Figure 4. *What are challenges or gaps that need to be addressed to achieve these priorities?*

Box 1. Participant-Proposed Solutions to Overcoming Challenges:

- Developing harmonized standards
- Engaging in public-private partnerships to support financing for EV and EVCS
- Inter-ministerial coordination
- Cross-sectoral planning
- Grid impacts analysis
- Providing tax support, loans, and incentives
- Capacity building within government
- Enhancing public awareness
- Developing a road map, including life cycle and feasibility assessments plus social inclusion.

of EVCS through innovative utility programs. **Figure 5** shows EVI-Pro's user interface tailored for Bogotá, Colombia.

In addition to expressing a need to understand and mitigate any adverse impacts of EVs on the grid, participants gained a deeper understanding of the process to develop technical standards and their importance for safe development and deployment of EVs and EVCS from UL and PEA. Finally, participants increased awareness of important environmental considerations, tools, and practical approaches, including analyzing local air quality benefits, by using NREL's Global InMap Air Quality tool, which is a cross-sectoral decision-making tool that can be used for policymaking. Experts from Deloitte and NREL also advised on leading practices for conducting a life cycle GHG assessment and identifying opportunities for more-inclusive e-mobility policies and programs capable of bridging the gender gap in the transport sector.

In the afternoon of Day 2, participants reconvened in breakout groups to discuss cross-ministerial collaboration on EVs. Groups were asked how they can create strategies for government officials to work across ministries and with synergy to increase EV adoption. **Boxes 2–4** summarize common themes participants highlighted on how to ensure greater cross-sectoral coordination.

Role of the Private Sector

The private sector is a crucial part of the EV transition as frontline providers of EV options to consumers and respondents to government policies on EVs and EVCS. A strong enabling environment and relationship with the government can create better private sector participation in a country's EV market. ASEAN already has several innovative companies who are working across EV segments (electric two-wheelers, electric three-wheelers, battery EVs, and e-buses) and sectors (private transportation, ride hailing, and logistics). A panel featuring the Electric Vehicle Association of Thailand, Vietnamese electric two-wheeler startup Selex,

Left to right: *Madura Watanagase (USAID SPP), Vikram Ravi (NREL), and Chokanan Kawkanlaya (PEA) listen to a member of their breakout group during the discussion session.*

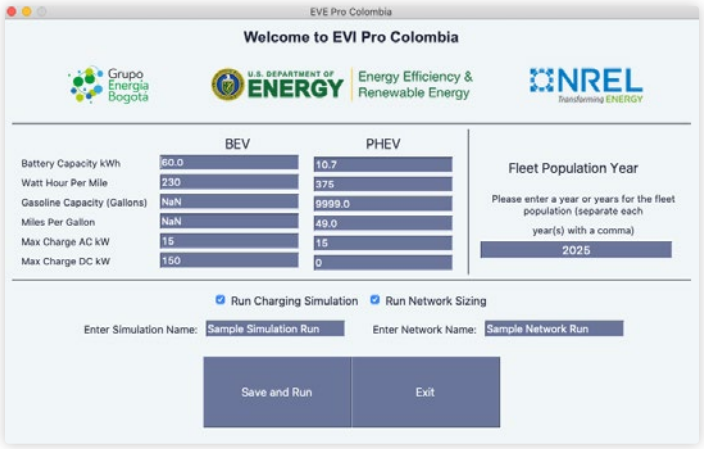

Figure 5. *NREL's EVI-Pro interface tool modeled EV adoption scenarios for Bogotá, Colombia. The application of EVI-Pro in Bogotá was the first customization of the tool for an international context using local data.*

Box 2. Achieving an Integrated E-Mobility Planning Approach:

- Designate a focal point agency to oversee EV adoption, national policy, and energy planning
- Assign clear roles and responsibilities, plus reporting requirements for agencies
- Establish technical working groups for key topics (e.g., tariffs, regulations, standards)
- Engage in public-private partnerships to pilot projects
- Increase government EV fleet conversations to stimulate EV demand
- Conduct EV charging readiness programs to increase consumer confidence in EVs
- Benchmark against best practices from other countries
- Increase public awareness through educational campaigns.

Lao PDR-based ride-hailing startup LOCA, regional ride-hailing platform Grab, and Thai e-bus manufacturer Energy Absolute/NEX Point showcased the breadth of expansion of the e-mobility sector across ASEAN. These business leaders all echoed the significant progress and rapid expansion of the e-mobility market across the region, which is further driving private sector interest and investment in EVs. As seen in other more-advanced EV markets, the private sector is the main driver of innovation in technology and business models; however, many technologies and businesses are still in the proof-of-concept phase. Much more targeted policy and financial support will be required to reach the level of EV deployment needed to achieve the ambitious targets for EV

Box 3. Cross-Ministerial Collaboration Strategies:

- Include private sector in subcommittees for planning
- Require monthly reporting for technical working group(s)
- Establish communication channels between relevant officials to share knowledge between stakeholders
- Archive and document initiatives prior to government transition
- Lead training programs with stakeholders from across the EV ecosystem (e.g., EVCS installers, vehicle repair technicians, etc.)
- Coordinate power sector planning with EV forecasting
- Increase cross-border power trade
- Create supportive policy frameworks for EV infrastructure development
- Transfer technology with ASEAN neighbors.

Box 4. Additional Integration Priority Topics To Consider:

- Developing further policy and planning on the transport and climate change nexus
- Planning across the entire EV value chain
- Understanding local travel patterns, specifically related to gender-disaggregated data
- Engaging with the private sector
- Prioritizing EV retention
- Proactively planning for end-of-life and circular economy for EV batteries
- Increasing knowledge on cybersecurity issues
- Conducting life cycle assessments
- Considering EV-grid integration and managed charging
- Integrating diversity, equity, and inclusion aspects of the e-mobility transition
- Integrating regional economies.

deployment and economy-wide decarbonization set forth by many member states. The private sector representatives noted unique challenges, such as bottlenecks in raising finances and difficulty getting insurance given the early stage of the market, which is accompanied by uncertainty and hesitancy from consumers, financiers, and insurers alike.

To encourage private sector activity on EVs, leading governments have created an enabling environment through policies including EV sales targets, bans on internal combustion engine vehicles, safety standards, vehicle efficiency standards, consumer subsidies, non-financial consumer incentives, and EV manufacturing and import incentives. Some governments have also produced or promoted certain universal EV charging business models—such as charging pricing regulations and improved permitting processes. Doing so helps overcome barriers for EVCS permitting, financing, and installation.

One of the highlights of the workshop was a site visit to a PEA charging station and Energy Absolute/NEX Point's e-bus manufacturing facility in Chonburi, Thailand. Participants enjoyed riding the e-buses to and between site locations.

Wrap Up

The final keynote session from James Leather, Chief of the Transportation Sector Group at the Asian Development Bank, underlined how access to financing, policy development and implementation, power sector decarbonization, and more regional cooperation is essential to achieving national EV goals. He also mentioned that one of the key policy gaps in the region is the lack of planning around the phase-out of internal combustion engine vehicle stocks. The U.S. Trade and Development Agency (USTDA) also presented preliminary findings from its ASEAN EV Charging Infrastructure Market

Box 5. Private Sector Panel and Exhibition Participants

Figure 6. *An electric tuk tuk from Muvmi, a battery EV from Tesla, and two electric two-wheelers from MotoEV on display at the workshop's exhibition.*

Figure 7. *Participants smiling after a tour of Energy Absolute and NEX Point's e-bus manufacturing factory in Chonburi.*

> "The site visit to Nex Bus manufacturing station was very informative. With all the new learnings, I will continue working on supporting the electric mobility transition in Thailand."
>
> **Anuwat Apiwattananon, Chief of LV Standardization, PEA, Thailand**

Analysis study, for which the USTDA has surveyed and collaborated with transportation stakeholders in each ASEAN country to benchmark current and future plans for GHG emissions, grid capacity, power generation, EV charging, and EV deployment. The USTDA presented their overarching policy recommendations, which included conducting region-level research, conducting a study with recommendations on regional standards, developing a regional carbon credit platform, and establishing a joint research platform.

The topic of developing a regional EV road map for ASEAN was further discussed in a panel led by USAID SPP's Chief of Party, John Bruce Wells, with panelists from ASEAN Secretariat, the ASEAN Centre for Energy, NREL, and Thailand's Department of Alternative Energy Development and Efficiency. Takeaways from the panel discussion included the need for deeper regional collaboration, developing policy and implementation plans to meet set EV targets, understanding roles and responsibilities of key stakeholders, and planning the EV transition through the lens of the end user. Equity considerations often lag in EV discussions, as focus is often on the technical, policy, and finance aspects. However, developing policies to create equitable transport systems can lead to great economic development in the region. The panel discussion also noted the importance of coordination among various agencies in the United States to synergize the support to ASEAN in developing EV ecosystem, noting that there have been several cooperation projects between ASEAN and the United States in the areas of transport, energy, and automotive standards. Therefore, synergy among these ASEAN-U.S. projects would provide better coordination in producing the outputs, such as an ASEAN road map on EVs, and avoid overlap of similar initiatives.

In the final breakout session of the workshop, participants talked about lessons learned based on the discussions of the last few days and priorities for a future ASEAN regional road map for e-mobility. Participants underscored a range of policy, business, and other strategic efforts to further e-mobility planning and implementation from vehicle manufacture, charging infrastructure development, grid decarbonization and access, and battery end-of-life management, as summarized in **Figure 8**.

> "The knowledge is in the region and the solutions are in the region."
>
> **James Leather, Transportation Sector Chief, Asian Development Bank**

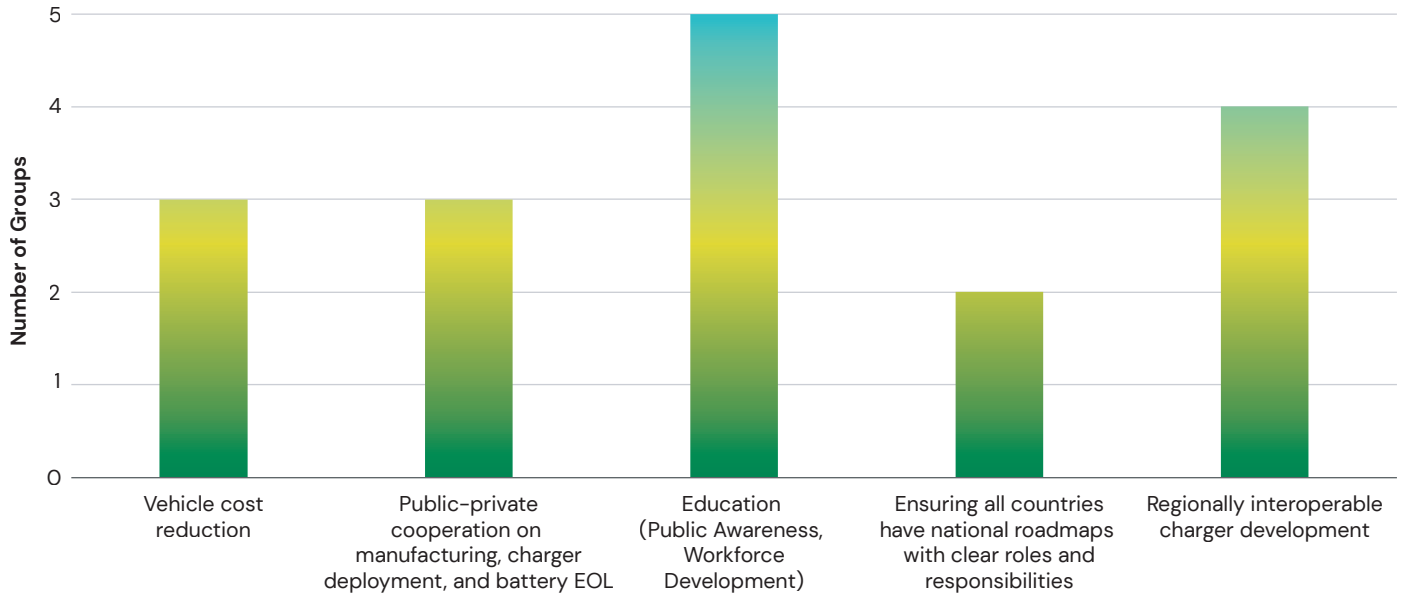

Figure 8. *There were eight total breakout groups, and this figure summarizes if the group identified a certain issue as a top initiative/activity to contribute to regional road-mapping and cooperation identified by each breakout group.*

Box 6. Lessons for a Regional ASEAN Road Map:

Because each country is at a different stage of EV policy development and deployment, and each country has different motivations for pursuing e-mobility, the answers to the question of "What should a regional EV road map include?" varied widely. Participants from countries that have developed EV road maps noted that it is imperative to **align road-mapping with policy objectives**, targets, and an **implementation action plan** so that the road map can provide actionable steps to achieving those targets. They also underscored the importance of **harmonizing standards at both the national and regional levels** to support interoperability of EVs and EVCs across ASEAN. Countries in earlier stages of EV adoption and those that do not currently have a regional road map noted that a regional road map would be very helpful for providing best practices from across ASEAN so countries can all learn from one another. Some additional points discussed include:

- Environmental considerations of EVs, such as waste management and life cycle GHG emissions, are important to include.
- Utilities and energy ministries have a large role to play in an EV road map so EV charging and power sector issues, like grid stabilization, are assessed.
- The private sector is critical to include, and governments should solicit feedback from manufacturers and associations throughout the process.
- A designated focal point should oversee collaboration between ministries and stakeholders.
- Regional stakeholder mapping and analysis should be conducted to prepare comprehensive implementation strategies for the regional road map and involve each target group more efficiently.
- Regional task force or working group for EV road-mapping should be considered to facilitate integrations of key policy instruments across sectors and stakeholders (e.g., alignment of EV targets with energy efficiency targets or plans).

> "Malaysia has ambitious target of 15% share of EV by 2030. The workshop provided opportunity to understand various aspects of E-mobility ecosystem necessary for successful transition. We look forward to more yearly peer exchange with other nations."

Mohammad Nor Othman, Senior Assistant Director, Malaysia Energy Commission

Left to right: *Narongsak Kittisarn (Ministry of Transport, Thailand), Athita Vivatpinyo (USAID SPP), Natnaree Sutheesophon (Ministry of Transport, Thailand), Tran Viet Nguyen (EVN), Floresinda Baldo-Digal (Energy Regulatory Commission, Philippines), Phat Pumchawsaun (ASEAN Center for Energy), Nguyen Nguyen (Selex), Mohamad Nor Othman (Energy Commission, Malaysia), and Vijay Saini (ICLEI) collaborated over the course of the workshop in their breakout group.*

Key Takeaways and a Way Forward

For **next steps**, participants identified the following as key topics to be incorporated into future planning and policymaking on EVs at the local, national, and regional levels. Through the U.S.-ASEAN Transportation Dialogue Partnership, U.S.-ASEAN EV Initiative, and USAID SPP, the USG looks forward to collaborating with ASEAN on these high-priority topics.

- **Regional collaboration, including stakeholder mapping and analysis, on EV supply chains**, especially battery materials and manufacturing and end-of-life management.
- **Continued dialogue at the regional level between government bodies and the private sector** across the EV value chain (including vehicle manufacturers, interoperable EVCS developers, utilities responsible for clean grid expansion, etc.), given each ASEAN country is at a different stage in EV implementation.
- **Conducting life cycle and sustainability assessments for EVs** to understand waste, air pollution, and GHG emission impacts, given the variable grid emission factors in each country.

This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of Deloitte Consulting LLP and do not necessarily reflect the views of USAID or the United States Government.

This work was supported by the Global Climate Action Partnership, funded by the U.S. Department of State. The contents do not necessarily reflect the views of the U.S. Department of State or the United States Government.