AFTER ACTION REPORT:

ASEAN – U.S. ELECTRIC VEHICLE WORKSHOP ON TECHNICAL STANDARDS

January 18-19, 2023

US-Indo Pacific Standards and Technology Cooperation Program (STCP)
Contract No.: 1131PL19CCP31207

Produced by the **American National Standards Institute (ANSI)**
under sponsorship of the **United States Trade and Development Agency (USTDA)**

February 2023

PUBLIC

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EXECUTIVE SUMMARY

On January 18-19, 2023, the American National Standards Institute (ANSI), through the United States Trade and Development Agency (USTDA) funded U.S.-Indo-Pacific Standards and Technology Cooperation Program (STCP), coordinated with the ASEAN Secretariat and the U.S. Department of Transportation to present the ASEAN – U.S. Electric Vehicle Workshop on Technical Standards. The virtual workshop took place online via Zoom. Highlights from the workshop are as follows:

- With the support of the co-organizer, the ASEAN Secretariat, many relevant government officials from the ASEAN countries and the U.S. attended, spoke at, or moderated sessions at the workshop, including three officials from the Ministry of Transportation of Indonesia, and experts from the U.S. Department of Commerce and National Highway Traffic Safety Administration (NHTSA).
- The sessions' speakers included experts from multiple countries across the region, including Indonesia, Malaysia, and the Philippines.
- Representatives from U.S. industries and standard development organizations introduced global and U.S. standards and best practices in the region, including representatives from SAE International, UL Solutions, National Electrical Manufacturers Association (NEMA), ANSI EV Standards Panel, Argonne National Laboratory, National Highway Traffic Safety Administration (NHTSA), and the American Automotive Policy Council (AAPC).
- The workshop reached a total of 300 unique participants from the U.S. and ASEAN countries, and included participants from both the public and private sectors. The participants' base locations include Brunei, Cambodia, Indonesia, Japan, South Korea, Laos, Malaysia, Myanmar (Burma), Papua New Guinea, the Philippines, Singapore, Thailand, and Vietnam, with most of the participants from the Philippines (65), Indonesia (58), and Thailand (34).
- **92%** of respondents felt that the workshop will have a positive impact on regulatory development necessary to foster electric vehicle (EV) technology advancement and innovation.
- **89%** thought that the workshop will help spur the adoption of international standards and best practices in the ASEAN region.
- **89%** of those who responded felt that the workshop would lead to more interoperable and smarter EV charging infrastructure.

This After Action Report (AAR) includes the following elements: (i) Executive Summary, (ii) Final Agenda, (iii) Detailed Workshop Summary, including technical analysis and links to workshop video recordings, photos and presentations, and (iv) Participant and Stakeholder Feedback.

FINAL AGENDA

Workshop Day 1 – January 19 ICT (January 18 EST)

TIME (ICT/GMT+7)	TOPICS
8:30 am	**Workshop Opening Remarks** • Mr. Heri Prabowo, Head of Safety Management Directorate of Road Transport Means, Ministry of Transportation of Indonesia • Mr. Kevin Toohers, Country Manager, Indo-Pacific, U.S. Trade and Development Agency (USTDA)
8:40 am	**Session 1: Standards for Common and Smart Charging Infrastructure** • Standards and interoperability and cost-effective connectivity among EVs and charging facilities • Smart grid-enabled charging infrastructure empowered by digital solutions (e.g. cloud and big data) • Charging facilities and standards for higher power and heavy-duty systems **Moderator:** Mr. William Gouse, Global Ground Vehicle Standards, SAE International **Speakers:** • Mr. Joe Bablo, Principal Engineering Manager – Energy Storage and E-mobility, UL Solutions • Mr. Steve Griffith, Executive Director, Transportation Systems Division, National Electrical Manufacturers Association (NEMA) • Mr. Theodore Bohn, Principal Electrical Engineer, Argonne National Laboratory
9:50 am	**Session 2: U.S. and ASEAN EV Standardization Priorities and International Cooperation** • Introduction of the ANSI *Standardization Roadmap for EV* and the ongoing drafting progress for the latest version • Critical standards for EVs at scale and priorities under the codes and standards pillar of the U.S. Department of Energy (DOE) • Mass deployment of EVs and associated infrastructure in the U.S. with international cooperation and engagement • National EV standards development status, strategies, and other related priorities in ASEAN countries **Moderator:** Ms. Estiara Ellizar, Transport Planner, Transport Policy Agency, Ministry of Transportation of Indonesia **Speakers:** • Mr. James McCabe, Senior Director, Standards Facilitation, American National Standards Institute (ANSI) • Mr. Theodore Bohn, Principal Electrical Engineer, Argonne National Laboratory

	• Mr. Bram Hertasning, Deputy Director for Urban Transport Policy, Center of Traffic & Urban Transport Policy at Transportation Policy Agency, Ministry of Transportation of Indonesia
10:55 am	**Day 1 Wrap-up Remarks** • Mr. Kevin Toohers, Country Manager, Indo-Pacific, U.S. Trade and Development Agency (USTDA)

Workshop Day 2 – January 20 ICT (January 19 EST)

TIME (ICT/GMT+7)	TOPICS
8:30 am	**Day 2 Opening Remarks** • Mr. Kevin Toohers, Country Manager, Indo-Pacific, U.S. Trade and Development Agency (USTDA)
8:35 am	**Session 3: EV Safety Standards and Development Trends in Global and Regional Contexts** • Regulatory support and standardization for electric vehicles and bikes/scooters in the ASEAN countries • Overview of international technical standards for EV inspection and safety methods, and the work of the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) • Outlook for the future development trends and new technological innovation in the EV industry **Moderator:** Mr. Andy Parris, Senior International Trade Specialist, International Trade Administration, U.S. Department of Commerce **Speakers:** • Ms. Stefanie Goodwin, Transportation Specialist, International Harmonization & Policy Division, National Highway Traffic Safety Administration (NHTSA) • Mr. Dermot Heron, Consultant, American Automotive Policy Council (AAPC) • Ts. Mohd Sharulnizam Bin Sarip, Chief Technology Officer, Malaysia Automotive Robotics and IoT Institute (MARii)
9:45 am	**Session 4: Developing Standards to Support the Full Life Cycle of EV Batteries** • International standards and system requirements in the production, storage, packaging, transportation, recycling, and waste management of EV batteries • Private sector's views on the need for EV standards and private sector's role in recycling EV batteries **Moderator:** Mr. Alloysius Joko Purwanto, Energy Economist, Economic Research Institute for ASEAN and East Asia (ERIA)

	Speakers: • Ms. LaTanya Schwalb, Principal Engineer, Energy & Industrial Automation, UL Solutions • Mr. Edmund Araga, President, Asian Federation of Electric Vehicle Association (AFEVA)
10:55 am	**Closing Remarks and Follow-up Actions** • Mr. Beny Irzanto, Senior Officer at Transport Division, ASEAN Secretariat • Mr. Kevin Toohers, Country Manager, Indo-Pacific, U.S. Trade and Development Agency (USTDA)

DETAILED WORKSHOP SUMMARY

Background

The ASEAN-U.S. Electric Vehicle Workshop on Technical Standards was designed to engage technical experts from ASEAN and the United States to share the latest developments in critical technologies and insights around standards and policies that support scaling of the EV industry, facilitate discussion among key policy-makers and industry experts on the benefits of international standards and conformance to support the development of cutting-edge and sustainable EV ecosystems, encourage alignment with international standards and best practices, and foster cooperation between ASEAN stakeholders and industry partners and technology providers. Co-organized with the ASEAN Secretariat, this workshop is also included under the U.S.-ASEAN Electric Vehicle Initiative as part of the ASEAN-U.S. Transport Cooperation Work Plan 2022 – 2025.

In support of climate targets and reducing carbon emissions, both the U.S. and ASEAN member states have looked to scaling up production and use of EVs. In 2021, the Biden Administration set a goal for half of all new vehicles sold in the U.S. in 2030 to be zero-emissions vehicles, in order to cut U.S. greenhouse gas emissions in half. The Administration also released an EV Charging Action Plan to support the development and deployment of a national network of 500,000 EV chargers. According to the International Renewable Energy Agency, 20 percent of all vehicles in the Southeast Asia region will be electric by 2025, and there is even more potential for growth as countries in the region build up the domestic capacity to participate in the global supply chain. Some ASEAN countries, such as Indonesia and Thailand, have already outlined the framework and goals to promote the adoption of EVs. There is also a collective push toward regional standardization of charging infrastructure to enable cross-border travel and reduce the fragmentation of charging networks across different countries.

A crucial component of scaling EV technologies is robust infrastructure, codes, and standards based on international best practices. Standards for EV safety, battery design and storage, vehicle grid integration, high-power scalable/interoperable wireless charging, and vehicle-oriented systems will all be necessary to underpin the continued growth of this technology space within ASEAN member states and globally.

Summary of Workshop Topics

The target audience for this workshop included government officials and industry representatives from the U.S. and ASEAN member states, especially with strong support from Indonesia and Malaysia. The experts from the public and private sectors exchanged their insights on the current regulatory and

standards landscape of EVs and its associated sub-sectors on a global scale, as well as specific situations in the U.S., Indonesia, Malaysia, and the Philippines. The speakers also had interactive discussions and Q&As with the audience on the safety of electric vehicles and bikes/scooters, the work of the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) and the ANSI EV Standards Panel, smart charging infrastructure design and deployment, EV battery recycling and waste management, among many others.

The two-day workshop, consisting of 2.5-hour sessions each day, covered various topics as described below:

Key Highlights

- With the support of the co-organizer, the ASEAN Secretariat, many government officials from Indonesia attended the workshop and spoke at or moderated various sessions to introduce the local efforts and policy objectives to support the EV development, including three officials from the Ministry of Transportation of Indonesia: Mr. Heri Prabowo, Head of Safety Management Directorate of Road Transport Means, Ms. Estiara Ellizar, Transport Planner at the Transport Policy Agency, and Mr. Bram Hertasning, Deputy Director for Urban Transport Policy, Center of Traffic & Urban Transport Policy at Transportation Policy Agency.
- Experts from Malaysia and the Philippines also provided their insights on their respective government strategies and supportive policy frameworks to realize the sustainable development goals in the upcoming decades, and their will to collaborate with the U.S. and other countries to develop their EV industries as one of the supporting actions.
- U.S. experts from the government, standards development organizations (SDOs), and private companies introduced relevant international standards and best practices that they have been using to improve the whole value chain of regular EVs and heavy-duty systems, and their potential to be adopted and localized in the ASEAN region. As standards development generally follows technology breakthroughs, the standardization community is striving to catch up and provide internationally harmonized solutions in EVs and relevant industries. In addition, public-private partnerships in facility testing, industry growth, and regulatory development are also addressed by many speakers as key pathways to success.

Session 1

Standards for Common and Smart Charging Infrastructure

With the moderator from SAE International and three speakers from UL Solutions, the National Electrical Manufacturers Association (NEMA), and the Argonne National Laboratory (ANL), this session focused on the standards and interoperability of smart charging facilities for regular EVs and heavy-duty systems. This session was designed for the ASEAN stakeholders to understand and learn from the best practices in the U.S..

UL Solutions began with an overview of the existing international standards and their implications for the common charging infrastructure, and introduced the established standards for electrical safety in North America and European countries (IEC standards), including AC/DC output devices and charge couplers, as well as the bi-directional chargers that are still under development. The trending technologies to meet increased electrification demands for electric delivery vans, trucks, ferries, and other heavy-duty systems include 1) megawatt charging for new systems, which has different ratings, couplers, and communication

protocol; 2) non-grid tied charging systems for remotely located solar and wind systems; and 3) automatic connection devices for pantograph or connector-based systems for vehicles. UL is currently involved in the development of these standards globally. While the demands for faster charging speeds of larger vehicles are increasing, more accessible, safer, and more reliable charging infrastructures are urgently needed in new building construction. Flame propagation and lack of first responder awareness for inflammable batteries in established buildings and storage facilities also cause public safety concerns.

NEMA elaborated on the Bipartisan Infrastructure Law (BIL) and its impacts on the industry, the key concept of "EV Ready" and "EV Capable", and introduced a few relevant standards. The BIL created a new joint office that collaborates between the U.S. Department of Energy (DOE) and the Department of Transportation (DOT). It is a critical component that provides support and expertise to a multitude of programs that are deploying a network of electric vehicle chargers, and zero-emission fueling infrastructure. They are providing more than $5 billion over the next five years to all 50 U.S. states to create a network of EV charging stations designated along "Alternative Fuel Corridors". The funds are available under the National Electric Vehicle Infrastructure (NEVI) Formula program. The BIL also played a part in the launch of the *ANSI Roadmap of Standards and Codes for Electric Vehicles at Scale* (see more in Session 2).

As further explained by NEMA, EV charging infrastructure is not only hardware, but rather a combination of hardware, software, cables, cable management, and analytics that are integrated into a network that delivers energy safely, reliably, and efficiently to a vehicle. It can include additional elements like lighting, controls, and other communication devices, enabling the use of the charging equipment, and enhancing the safety of the overall environment. Interoperability allows for communication and coordination between the vehicle, the charging station, and the grid to maximize the benefit and convenience for vehicle owners, not putting overdue stress on the grid. EV charging infrastructure should be interoperable, networked and connected to the cloud, and compliant with appropriate safety standards and building codes. They should also follow the three cybersecurity principles (boot security, secure over-the-air updates, and secure customer information) to secure physical safety and sensitive data, such as personally identifiable information or payment information.

A key component in the development of guidance for EV infrastructure is EV Ready and EV Capable, and getting those into both commercial and residential building energy codes. NEMA has been very involved with the International Energy Conservation Code (IECC) to get EV Ready requirements into its 2024 Code. NEMA also introduced the NEMA EVSE 1 – EV Charging Network Interoperability Standard, NEMA TS 10-Connected Vehicle Infrastructure-Roadside Equipment, and the National Electrical Code Article 625: Electric Vehicle Power Transfer.

ANL laid out the landscape of key EV charging communication and interoperability standards and technical committee documents. ANL also introduced a gradient of EV charging couplers for different power levels of vehicles, from small AC systems in the 20kW range, medium systems in the 50kW to 100kW range for AC/the 50kW to 350kW to 500 kW range for DC, and then the 600kW to 1.5MW to 4.5MW. While some countries and entities are currently developing their own standards and communication protocols for the electric truck-bus charging couplers, it is important to harmonize the safety levels and equipment that are built for each country, and make sure they can comply with the country's regional safety standards. The example of ABB Oppcharge was used to explain pantograph installation in the building, which also reflects the standards that are covered in J3105. Another example is an interoperability field testing event in Portland, Oregon, where 30 vehicles were tested in 30 charging stations with round-robin rotation every 30 minutes. It is a fast and cost-efficient way for developers to know whether their systems work with every charger made by different manufacturers, since they no longer need to ship their vehicles to each

charging manufacturer. The dispensing measurement systems and certification are other key issues mentioned in Mr. Bohn's presentation. In this regard, the International Organization of Legal Metrology (OIML) was established to encourage each country to treat its measurement systems and security in the same way. Its mission is to enable economies to put in place effective legal metrology infrastructures that are mutually compatible and internationally recognized.

The speakers also answered questions from the audience regarding charging protocols, information gathering and cloud storage, e-bus charging, battery swap, trends in the passenger car market, concerns in the import tariffs environment, available technical capacity building and trainings, EV infrastructure insurance and indicative economic life, and standard warranty for charging stations.

Session 2

U.S. and ASEAN EV Standardization Priorities and International Cooperation

This session's moderator and speakers are from the American National Standards Institute (ANSI), ANL, and the Ministry of Transportation (MOT) of Indonesia. They highlighted the latest efforts that the U.S. and Indonesian governments and industry have for the development of EV standardization and regulations, and explored potential collaboration across the region.

ANSI introduced the ANSI EV Standards Panel (EVSP) and the *Roadmap of Standards and Codes for EV at Scale* (EVs@Scale) that they are currently developing. The efforts of the EVSP originally started in 2011, and two versions of the standards roadmap were released in the 2012 to 2014 timeframe. The current version is under development to identify and address challenges and barriers to the integration of EVs@Scale charging with the grid created by the uncoordinated development of codes and standards, and the rapid advances in vehicle and charging technologies. The EVSP is working to identify issues as well as standards, codes, and regulations that exist or that are in development to address those issues, and also identify potential gaps where no published standard, code, regulation, or conformance program exists. With three working groups (WG1 – Vehicle Systems, WG2 – Charging Infrastructure, and WG3 – Grid Integration), the EVSP has already identified some gaps in the respective fields and is working on further analysis and recommendations by the consortium. Version 3 of the roadmap is expected to be published for public review in March and finalized in June 2023.

ANL is one of the six labs in the U.S. Department of Energy (DOE)'s EVs@Scale consortium. Following on the previous introduction by ANSI, ANL further elaborated on the objectives and the five work pillars of the consortium, in which the top two standards areas are MW charging (SAE J3271 MCS) and system-level grid interconnection (IEEE P2030.13). In the MW charging, ANL explained the layout from source to load (grid-to-battery), with examples of site planning in Ontario, California, ANL smart charging plaza, ANL AC coupled MW DC charging facilities, multi-port MD/HD electric bus and truck charging, and the electric island charging plaza in Portland. ANL also introduced the SAE megawatt charging standards (SAE J3271/IEC TS63379), its design and functions, as well as the timeline and key milestones of relevant international standardization efforts, which include ISO, IEC, and SAE standards. The relevant use cases include modular chargers (ABB Terra360 configurable ISP modules), CAT 793 large mining truck demo, Beta Technologies' Power Cube, etc.

Representing the ASEAN perspective, the Ministry of Transportation of Indonesia shared the national EV policies and regulations in Indonesia, including the legal basis, current situation, ministry response for policy updates and international engagement, as well as relevant recommendations. The commitment of President Joko Widodo to fight global warming while mitigating the use of fossil energy and replacing it

with other alternatives began with the issue of Presidential Regulation No. 55 in 2019 and Presidential Instruction No. 7 in 2022. The Ministry of Industry of Indonesia has made an EV implementation roadmap, in which the target is for 20% of all vehicles in Indonesia to be categorized as green cars by 2025. The public transportation TransJakarta targets 10,000 buses, among which 83% will be EVs by 2030. To address EV safety concerns, the Ministry has updated some regulations regarding vehicle testing and formulated the main points of national EV policy, including building a sustainable ecosystem, fulfilling the availability of charging stations, ensuring safety procedures, and establishing a risk mitigation policy for accidents. MOT also emphasized the need for sustainable cooperation between public and private sectors, inter-government policy integration, and building a broadly reliable EV ecosystem that includes infrastructure, industry, investment, financing, marketing, and regulations.

The speakers also answered questions from the audience, such as the facilities for electric boats, the Indonesian government's procurement for e-bus and subsidies for EV purchase, and the total number of EVs and charging stations in Indonesia.

Session 3

EV Safety Standards and Development Trends in Global and Regional Contexts

This session highlights three speakers from the National Highway Traffic Safety Administration (NHTSA), the American Automotive Policy Council (AAPC), and the Malaysia Automotive Robotics and IoT Institute (MARii), with the moderator from the International Trade Administration of the U.S. Department of Commerce. It laid out an overview of international technical standards for EV inspection and safety methods, the work of the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29), and analyzed the future trends on new technological innovation in the EV industry.

To give a big-picture overview of international EV standardization, AAPC presented the work of WP.29, which is identified as the best option for the global harmonization of vehicle requirements for safety environment. It meets three times a year with specialists and multiple informal working groups. The two important agreements for the WP.29 are the 1958 and 1998 Agreements. The 1958 Agreement has a clearly defined certification process, bolted the type of approval, and the ongoing conformity of production which is contained within each regulations. It also has obligations and responsibilities when countries sign up to ensure there are no conflicts when bringing in new regulations in their markets. The 1998 Agreement focuses purely on the Global Technical Regulations (GTRs) content without the administrative requirements as the 1958 Agreement. There is considerable overlap between the two agreements, but the 1998 Agreement includes key large members not included before, namely the USA, China, and India. It is widely recognized that all EV requirements are set under the 1998 Agreement. The input from the ASEAN region could also play a very significant role in global requirements. GTRs may have levels of stringency for each region, and there can be a section within the GTR that actually applies to the ASEAN region.

NHTSA focused particularly on the UN GTR No. 20 on Electric Vehicle Safety and the Federal Motor Vehicle Safety Standard (FMVSS) No. 305 Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection. The objective of GTR No. 20 is to develop in-use and post-crash performance space requirements, which address potential safety risks from high voltage systems and electrical components. It has members that are from government bodies, industry standard organizations, and manufacturers. The co-sponsors of GTR No. 20 are the U.S., Japan, the EU, and China. Presently the GTR is in phase two, and the current items under discussion include single-cell thermal runaway and propagation, emissions

from the Rechargeable Electric Energy Storage System (REESS) vibration, and water exposure. The six general principles for developing the FMVSS are also the same principles that are used to evaluate GTR No. 20 for adoption. NHTSA currently has several research initiatives and activities to advance the safety of EV systems, with a three-pronged approach that spans prevention, mitigation, and response to EV fires. NHTSA has also announced in its regulatory agenda a rule proposing battery safety requirements into the FMVSS to further align the standard with GTR No. 20.

MARii introduced its role in Malaysian national policy development, the Low Carbon Mobility Blueprint (LCMB), and the EV standard landscape in Malaysia. MARii is responsible for constructing the National Automotive Policy (NAP) as a government agency and think tank. The latest amendment in 2020 focuses on three new elements, namely next-generation vehicles, mobility as a service, and Industrial Revolution 4.0. MARii also assists the Ministry of Environment via the Malaysia Green Tech Cooperation to develop the LCMB, which emphasizes the strategy and the way to work on reduction in total primary and energy supply consumption, fuel expenditure, and also greenhouse emission reduction accumulation. Currently, there are 15,307 units of EVs, 354 units of e-motorcycles, 88 units of electric buses, and 900 units of EV chargers in Malaysia. The government's goal is to achieve 15% of EV penetration by 2030 and 38% by 2040.

MARii is also mandated by the National Committee to develop the latest EV standards. It established a new technical committee specifically focusing on electrically-propelled vehicles, and made reference to the ISO/TC 22/SC 37 and the WP.29 agreement. UN regulations (UNRs) and GTRs have been made as main references in Malaysia's standard development. MARii listed the existing standards for passenger cars, e-motorcycles, e-bicycles, EV batteries and chargers, and the relevant National Occupational Skills Standards (NOSS). Moving forward, Malaysia's strategy is to discourage the utilization of internal combustion engines (ICE), promote carbon neutrality, especially EV adoption, and introduce the Corporate Average Fuel Economy (CAFE). Malaysia will work closely with the U.S. to further promote EV incentives to encourage further development.

Session 4

Developing Standards to Support the Full Life Cycle of EV Batteries

This session is moderated by the Economic Research Institute for ASEAN and East Asia (ERIA), with speakers from UL Solutions and the Asian Federation of Electric Vehicle Association (AFEVA) / Electric Vehicle Association of the Philippines to share expertise on the standards in the life cycle management, especially the repurposing of used EV batteries.

UL Solutions introduced the relevant UL, ISO, and IEC standards for lithium-ion cell safety, EV safety, and the repurposing of secondary cells and batteries. The cell safety standards include UL 2580, IEC 62619, IEC 62620, and also IEC 62660-1/2/3 standards, which not only cover the safety requirements for the cells, but also cover the reliability and abuse testing, and performance testing for them as well. The UL standards for EV battery safety cover a wide range of electrical products from industrial trucks, light EV (LEV) applications, personal e-mobility devices (such as three or two-wheelers that are very popular in ASEAN countries), unmanned aircraft, automatic mobile platforms (AMPs), etc. There are also many series of ISO and IEC standards covering the safety requirements for battery packs and overall EV systems. For battery repurposing, it offers a pathway to reuse the batteries that still have a lot of life and energy left in them. The UL 1974 standard, unlike the other standards mentioned previously, is not a product certification standard. It is a certification for the repurposing facility itself. Evaluation of the repurposing

facility requires a review of the processes used by the facility to repurpose the battery and some of the items that can be reviewed at the facility. They include but are not limited to quality control when handling, sorting, grading, and storing battery packs or modules or cells that are intended for repurposing. The other related standards currently under development are IEC 63330 and IEC 63338. The UL Standards typically cover both the U.S. and Canada, and are generally accepted globally.

AFEVA is composed of member countries from Malaysia, the Philippines, Thailand, and Singapore. It established the policy guidelines for electric two to three-wheelers for Southeast Asia. Each member country has its own goals to increase BEV's share in the market and phase out ICE vehicles in the upcoming years. Currently, the Philippines is developing the *Comprehensive Roadmap of EV Industry (CREVI)*, spearheaded by Director Patrick Aquino from the Ministry of Energy (EUMB). Note: Mr. Aquino also participated as a speaker in the previous STCP event, the U.S.-Philippines Cold Chain Standards and Innovation Workshop. The lines of action for EV battery recycling and waste management mentioned in CREVI include capacity building, policy development, and government incentives. EV adoption is expected to accelerate starting in 2025 when support programs are put in place. AFEVA has been working with governments and many other stakeholders to coordinate and support the technology cooperation efforts.

Relevant Links

Links to a flyer, the final agenda, and other materials from the workshop are available on the U.S.-Indo-Pacific STCP website:

https://www.standardsportal.org/usa_en/toolbox/US%E2%80%93Indo-Pacific-STCP.aspx

PARTICIPANT AND STAKEHOLDER FEEDBACK

122 individuals, or approximately 41% of all workshop participants, filled out an AAR questionnaire, which was hosted online via Google Forms. Links to the questionnaire were shown in the closing slide displayed on both days of the event, included in the Zoom Chat for all participants, and distributed via email to participants following the workshop, with two reminders sent. Highlights from the questionnaires include:

- **85%** of respondents indicated that they felt the workshop met their objectives.
- **92%** of respondents felt that the workshop will have a positive impact on regulatory development necessary to foster EV technology advancement and innovation.
- **84%** felt that the workshop will lead to increased application of new and innovative technologies in the EV supply chain.
- **89%** thought that the workshop will help spur the adoption of international standards and best practices in the ASEAN region.
- **89%** of those who responded felt that the workshop would lead to more interoperable and smarter EV charging infrastructure.
- **88%** indicated that the workshop is likely to encourage standards development for battery disposal and recycling.

Additional details from survey responses include:

An ASEAN-based relocation company indicated that they would start internal logistics trial operations based on what they learned at the workshop.

A Malaysian technology research center indicated that they would expand collaboration with the U.S. on the Corporate Average Fuel Economy (CAFE) development.

A Filipino government agency highlighted that the information they gained from the event serves as great references for their EVCS and EV policies and their possible amendments/updates.

A Filipino university discussed using the information gained to help build training programs and other capacity building programs in the Philippines.