Role of policymaking in mainstreaming electric mobility in Southeast Asia

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December 2020

1. Introduction

Southeast Asia is the sixth largest vehicle market in the world with an average of 3.4 million new motor vehicles sold annually in the last 5 years, comprising 4% of annual global vehicle sales (OICA, 2019). It is also the sixth largest producer of motor vehicles with 4.13 million units produced in 2019 (OICA, 2019). In 2017, it was projected that there will be 62 million passenger light duty vehicles in Southeast Asia by 2040, a two-thirds increase from baseline numbers (IEA, 2017).

The increase in motorized road transport emissions can produce more air pollutants such as fine particulate matter (PM$_{2.5}$), ozone and nitrogen dioxide that are harmful to health. It is estimated that, in 2015, transportation emissions are responsible for 20,000 premature deaths from PM$_{2.5}$ and ozone in Southeast Asia (Anenberg, 2019). Motor vehicles are also major contributors to greenhouse gas emissions. For Southeast Asia, “road vehicles account for 28% of total energy-related CO$_2$ emissions, and approximately 92% of the transport-related CO$_2$” (ASEAN, 2019).

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1 This policy brief is developed with the support from the UNEP Law Division and BMU-IKI supported project on integrating electric 2&3 wheelers in East Africa and Southeast Asia
2 Clean Air Asia is an international non-governmental organization leading the regional mission for better air quality, and healthier, more livable cities throughout Asia. We work with partners to reduce air pollution and greenhouse gas emissions across Asia by building capacity, advocating for effective and appropriate policies and practice, and informing stakeholders of air pollution and climate change impacts. We aim to reduce air pollution and greenhouse gas emissions in 1000+ cities in Asia through a range of innovative policies and programs covering air quality, transport and industrial emissions, and energy use. We work with energy, environment, health and transport ministries, cities, the private sector, development agencies, academia and civil society to provide leadership and technical knowledge in Air Quality and Climate Change, and Sustainable Transportation (Low Emissions Urban Development, Clean Fuels and Vehicles, Green Freight and Logistics). Since 2008, we have been a United Nations-recognized partnership comprised of more than 250 organizations in Asia and internationally, with six Country Networks (Indonesia, Malaysia, Nepal, the Philippines, Sri Lanka and Viet Nam). Our headquarters are in Manila, Philippines, and we have offices in Beijing, China, and New Delhi, India.
3 Refers to passenger cars and commercial vehicles only
4 In 2019, the top five countries with the highest new motor vehicle sales were China (25.7 million), United States of America (17.5 million), Japan (5.2 million), Germany (4 million) and India (3.8 million). The countries listed here are also the top five motor vehicle producing countries.
Mainstreaming electric mobility would bring multiple benefits to Southeast Asian countries, especially when linked with the use of renewable energy. It would reduce harmful air pollutants and greenhouse gas emissions from motor vehicles which negatively affect health, the environment, and climate; reduce dependence on imports of fossil fuels, thereby improving energy security; and provide green jobs. These benefits are important for this region where the health burden from premature mortality due to ambient air pollution (Health Effects Institute, 2019), vulnerability to climate change impacts (Eckstein, 2019), and unemployment rate in several countries are high. In the post-pandemic era, electric mobility can help build a better transportation system that “does no harm” to people, the environment, and climate and sustains the clean air and blue skies experienced in urban areas during the lockdown.

This policy brief aims to provide a quick overview of e-mobility policies in Southeast Asia and identifies key opportunities for policy development to mainstream e-mobility and support policymakers in the region.

2. Electric mobility in leading countries and in ASEAN

China, USA, and Europe are the countries or markets leading in electric vehicle deployment. They have implemented and continue to implement catalytic and supportive policies for electric mobility. The 2019 global highlights and trends in electric mobility (IEA, 2020) including in these three leading countries or markets are:

- **Electric vehicle stock**
  - **Electric cars.** At the end of 2019, there is a total of 7.2 million electric cars globally. Close to half of these electric cars (47%) are in China. Ninety per cent (90%) of electric car sales are in China, USA, and Europe. Electric cars comprise 2.6% of all cars sold in 2019. Electric vehicle market share in China reached 4.9% and in Europe reached 3.5%.
  - **Electric two- and three-wheelers (E2&3W).** There are 350 million E2&3W in the world and majority are in China. These vehicles comprise a quarter of all 2&3W in circulation.
  - **Light commercial electric vehicles and electric buses.** There are about 380,000 light commercial electric vehicles and 500,000 electric buses (most of the electric buses are in China).
  - **Electric trucks.** Six thousand (6,000) units of electric trucks were sold globally in 2019.

- **Subsidies and standards.** China’s subsidy program for electric vehicles has been extended until 2022 and its New Energy Vehicle mandate has been strengthened. Europe strengthened and extended its CO₂ emissions standards.

- **Charging infrastructure.** Of 7.3 million chargers, 6.5 million are LDV slow chargers set up at homes and workplaces. Policies in support of private charging include preferential rates, equipment purchase incentives and rebates. China leads in setting up fast chargers that the public can access and, of public charging facilities, 80% are in China.

Electric vehicle stock data for Southeast Asia is limited. The data for five (5) ASEAN countries in Table 1 shows that progress has been made since these countries set goals for electric mobility early in this decade, but the region is still far behind the leading EV markets.

Table 1. Electric Vehicle Stock in Five (5) ASEAN Countries
<table>
<thead>
<tr>
<th>Country</th>
<th>Electric Vehicle Stock</th>
<th>Reference Year</th>
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<tbody>
<tr>
<td></td>
<td>Cars and LDVs</td>
<td>Buses</td>
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<tr>
<td>Indonesia</td>
<td>-1,000 electric cars</td>
<td>-</td>
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<td>Philippines</td>
<td>64 electric cars</td>
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<td></td>
<td>89 electric utility vehicles</td>
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<tr>
<td></td>
<td>252 electric jeepneys</td>
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<tr>
<td>Singapore</td>
<td>380 PHEV cars and LDVs</td>
<td>4 BEV buses</td>
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<tr>
<td></td>
<td>701 BEV cars and LDVs</td>
<td>23 HEV buses</td>
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<tr>
<td></td>
<td>32,545 HEV cars and LDVs</td>
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<tr>
<td>Thailand</td>
<td>122,631 HEVs and PHEVs</td>
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<tr>
<td></td>
<td>1,454 BEVs</td>
<td>-</td>
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<tr>
<td>Viet Nam</td>
<td>1,086 electric cars</td>
<td>-</td>
</tr>
</tbody>
</table>


Notes: BEV = battery electric vehicle, HEV = hybrid electric vehicle, LDVs = light duty vehicles, PHEV = plug in hybrid electric vehicle

The electric vehicle industry in the ASEAN region is forecast to grow rapidly after 2025 with significant investments in new passenger electric vehicles and in new charging infrastructure, telematics, fleet management, among others (Hardcastle, 2019). There is high consumer readiness for electric mobility in Southeast Asia. In a survey of 1,800 people from Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam intending to purchase cars, 37% said they would consider purchasing electric cars.

There are some challenges to electric mobility in Asia and in this region; these are—high upfront purchase costs, lack of charging points for passenger cars, reliability of the technology for commercial customers (Grutter, 2019). Barriers to electric vehicle adoption identified by potential electric vehicle buyers from six (6) countries surveyed by Frost & Sullivan can be grouped into these major groups: range anxiety (running out of power), product quality (reliability of technology, safety), charging infrastructure, cost (higher purchase price), and the environment (type of electricity generated). To address these challenges to electric vehicle adoption, ASEAN governments “need to play a more crucial role in providing incentives, adopting standards, aligning taxation norms, and most importantly, facilitating the set-up of charging infrastructure” (Frost & Sullivan, 2018). Government policies are key to providing these solutions.

### 3. Electric mobility policies in Southeast Asia

Policies play an important role in mainstreaming electric mobility. The experience of countries and regions leading in electric mobility such as China, Europe, and the United States of America shows how policies have been instrumental in driving electric vehicle adoption. The policies that help develop
electric mobility include those that set electric vehicle uptake targets, vehicle and charging standards, fiscal incentives to bring electric vehicle cost at parity with that of an internal combustion engine (ICE) vehicle, electric vehicle procurement programs to spur demand, privileges that make electric vehicles more convenient to use (e.g., special parking allocation, waiver of road use bans), policies encouraging charging infrastructure installation, and fuel economy standards (IEA, 2019).

The United Nations Environment Programme (UNEP) and Clean Air Asia conducted research and analysis of electric mobility policies of ten (10) Southeast Asian countries – Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. The goal is to investigate challenges faced by Southeast Asian countries in the uptake of electric mobility in Southeast Asia and the role of policymaking to overcome these challenges.

The electric mobility laws and regulations covered by this review and analysis are: (a) electric vehicle roadmaps and targets, (b) Intended Nationally Determined Contributions (INDCs), (c) economic incentives, (d) non-fiscal instruments, (e) charging infrastructure deployment, (f) product quality standards, (g) registration or licensing, and (h) institutional arrangements. An overview of these policies is provided in Annex 1.

a. Electric vehicle roadmaps and targets

Electric vehicle roadmaps and targets are important ways of communicating to consumers and industry the government’s commitment to the electric mobility pathway. Targets either relate to the vehicle stock or relate to vehicle sales. More countries are targeting internal combustion engine (ICE) vehicles phaseout or 100% zero emission vehicle sales such as France, Germany, Japan, Netherlands, Norway, Spain, Canada, United Kingdom, and selected states in the USA (IEA, 2020).

In Southeast Asia, most countries (i.e., Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand) have set roadmaps and targets for electric mobility (Table 2). Electric vehicle production targets are set by the automotive manufacturing countries such as Indonesia, Thailand, Malaysia, and the Philippines with some looking to export electric motorcycles and other battery electric vehicles. Of the ASEAN countries, Indonesia and Singapore are the only countries to target a phaseout of ICE vehicles by 2040. Only Thailand presents a three-phased approach to attaining its 2030 electric vehicle production target.

The roadmaps focus on the development of a wide range of electric vehicles from cars, buses, government vehicles, two- and three-wheelers, and trucks. Electric public transportation is among the goals of the Philippines and Thailand, countries where public transportation ridership is high and where bus fleets need upgrades. For the Philippines, the Public Utility Vehicle (PUV) Modernization Program is a major program of the government which aims to improve the quality of public transportation including by upgrading the jeepney; operators can replace the old jeepney with a Euro 4/IV compliant vehicle or an electric or solar-powered alternative.

The targets of several ASEAN countries emphasize electric motorcycle development. The ASEAN is an important manufacturer and market for two- and three-wheelers, with 7 million motorcycles produced and 12 million motorcycles sold in 2019 (Federation of Asian Motorcycle Industries, 2019). The IEA forecasts that the future electric two- and three-wheelers will be found largely in China, India and the ASEAN (IEA, 2020).
Apart from helping reduce air pollution, short-lived climate pollutants and GHG emissions, electric mobility plans and roadmaps need to consider how to address congestion especially in the metropolitan areas of Southeast Asia (e.g., Jakarta, Bangkok, Manila). Prioritizing the upgrade of existing ageing diesel-run public bus fleets to electric buses in electric mobility plans and roadmaps would help reduce congestion in addition to other multiple benefits such as reducing the exposure of commuters to harmful air pollution.

Table 2. Electric vehicle targets of Southeast Asian countries

<table>
<thead>
<tr>
<th>Country</th>
<th>2020</th>
<th>2020-2022</th>
<th>2021-2025</th>
<th>2025</th>
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<tbody>
<tr>
<td>Brunei</td>
<td></td>
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<td>20% of cars produced and 20% of motorcycles</td>
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<tr>
<td>Indonesia</td>
<td></td>
<td>100,000 electric cars, 100,000 electric motorcycles and 2,000 electric buses on roads</td>
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<tr>
<td>Malaysia</td>
<td></td>
<td>60,000 – 110,000 units produced (16,000 government vehicles, 50,000 xEV private cars, and 53,000 electric motorcycle taxis)</td>
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<tr>
<td>Philippines</td>
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<td>100,000 – 250,000 units produced (100,000 to 250,000 Eco EV units and 1,000 to 3,000 Smart City Buses)</td>
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<tr>
<td>Singapore</td>
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<tr>
<td>Thailand</td>
<td></td>
<td>6.6 million EVs, 50% manufactured locally (72,250 PUV, 70,000 trucks, 12,250 buses, 2.7 million 2W, 300,000 3W, and 20,000 cars)</td>
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<table>
<thead>
<tr>
<th>Country</th>
<th>2026-2030</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
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</thead>
<tbody>
<tr>
<td>Brunei</td>
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<td>60% of annual vehicle sales</td>
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<tr>
<td>Indonesia</td>
<td></td>
<td>Phaseout ICE</td>
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<tr>
<td>Malaysia</td>
<td></td>
<td>Phaseout ICE</td>
<td></td>
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<tr>
<td>Philippines</td>
<td></td>
<td>Phaseout ICE</td>
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<tr>
<td>Singapore</td>
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<tr>
<td>Thailand</td>
<td></td>
<td>750,000 units produced in total in Thailand</td>
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</tbody>
</table>

Notes: 2W = two wheeler, 3W = three wheeler, EV = electric vehicle, ICE = internal combustion engine, PUV = public utility vehicle, xEV = all types of electric vehicles

i. Intended Nationally Determined Contributions (INDCs)

Only Brunei and Cambodia specifically mention hybrid and electric vehicle promotion among the measures to mitigate greenhouse gas emissions from the transport sector in their INDCs. Brunei will
develop a transport fuel economy regulation; Thailand states it will implement a CO₂-based vehicle tax scheme; and Viet Nam will implement a roadmap to phase out subsidies for fossil fuels. If implemented, all these measures will contribute to mainstreaming electric mobility in the ASEAN region.

The INDCs of these countries—Brunei, Cambodia, Lao PDR, Malaysia, Myanmar, Singapore, and Viet Nam—include renewable energy targets and support for cleaner forms of energy. As countries transition to electric mobility, it is important that the electricity used to power electric vehicles comes from clean sources. According to an ADB report, “EVs will result in significant GHG reductions if the grid factor is below 0.8 kilogram of carbon dioxide equivalent emission per kilowatt-hour (kgCO₂e/kWh). ... In countries with a grid factor of over 0.8 kgCO₂e/kWh, greening the grid should be the first priority.” The report explains that even countries with the very high grid factor (even above 1.05 kgCO₂e/kWh) would not have higher GHG well-to-wheel emissions by using EVs. “While the grid factor will greatly influence the GHG impact of EVs, countries with a grid dominated by fossil fuel sources can still profit from GHG reductions” (Grutter, 2019). Grid carbon factors of ASEAN countries are provided in Table 3.

Table 3. Electricity grid carbon emission factors

<table>
<thead>
<tr>
<th>Country</th>
<th>Grid Factor kgCO₂e/kWh</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>No information found</td>
<td>-</td>
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<tr>
<td>Cambodia</td>
<td>0.7</td>
<td>2015</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.81</td>
<td>2015</td>
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<tr>
<td>Lao PDR</td>
<td>0</td>
<td>2017</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.73</td>
<td>2015</td>
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<tr>
<td>Myanmar</td>
<td>0.37</td>
<td>2015</td>
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<tr>
<td>Philippines</td>
<td>0.68</td>
<td>2015</td>
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<tr>
<td>Singapore</td>
<td>0.42</td>
<td>2017</td>
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<tr>
<td>Thailand</td>
<td>0.55</td>
<td>2015</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.53</td>
<td>2015</td>
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</table>

Sources: Adapted from (Grutter, 2019), Singapore grid factor from (National Environment Agency, 2019)

b. Fiscal incentives

Attracting companies to manufacture and invest in electric vehicles, batteries, and charging infrastructure, and making electric vehicles (EV) affordable are needed to increase EV availability and sales in ASEAN. With these goals in mind, the ASEAN countries provide a range of fiscal incentives from import tariff exemption, tax exemption, subsidized electricity in public charging stations, reduced parking fees in public places, financing support for public charging station construction (Indonesia), reduced road tax, government procurement of EVs (Malaysia), leasing of factory space (Myanmar), subsidy for buyers or purchase incentive, corporate income tax deductions or exemption, discount from road user, vehicle registration, and inspection fees (Philippines), rebate under the Vehicle Emissions Scheme (Singapore), government procurement of electric vehicles (Thailand), among others. An
An overview of fiscal incentives for electric vehicle production and purchase in ASEAN countries is provided in Table 4.

Table 4. Fiscal incentives for electric vehicles in ASEAN countries

<table>
<thead>
<tr>
<th>Fiscal incentives</th>
<th>BRU</th>
<th>CAM</th>
<th>INO</th>
<th>LAO</th>
<th>MAL</th>
<th>MYR</th>
<th>PHI</th>
<th>SIN</th>
<th>THA</th>
<th>VIE</th>
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<tbody>
<tr>
<td>Reduced import duty and sales tax for BEV manufacturing companies and BEV component manufacturing companies</td>
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<td>Corporate income tax exemption or reduction for local assembly and manufacturing</td>
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<td>Income tax holiday for manufacturers of EV charging stations</td>
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<tr>
<td>Corporate income tax deductions or exemption under the Green Jobs Act</td>
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<tr>
<td>Rate of personal income tax for executives, specialists and researchers is capped at 17%</td>
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<tr>
<td>Subsidy provision for training and R&amp;D for local assembly and manufacturing of EEVs and parts</td>
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<tr>
<td>Zero excise taxes for local BEV production</td>
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<tr>
<td>Reduced import duties and excise taxes for local assembly and manufacturing of EEVs and parts</td>
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<tr>
<td>Zero rates of import duty on parts, components and accessories for the assembly of hybrid and electric vehicles, among others</td>
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<td>Reduced import tariff or machinery and raw materials</td>
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<tr>
<td>Waived foreign investment restrictions for electric vehicle and battery industries</td>
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<td>Financing support for construction of public electric charging stations</td>
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<td>Reduced import duty and tax for battery swap services and battery waste management</td>
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<td>Reduced import duty and tax for charging stations and buildings and houses that provide private charging installations</td>
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<td>Reduced taxes for public transportation that converts to electric vehicles</td>
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<td>Lease factory space for EV assembly plant</td>
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<td>Reduced import tariff for electric motorcycles</td>
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<td>Reduced excise tax for electric motorcycles</td>
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<tr>
<td>Lower excise taxes for energy efficient HEVs and PHEVs</td>
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<td>Battery electric vehicles exempt from excise taxes and reduced excise taxes for hybrid electric vehicles by 50%</td>
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<td>Luxury sales tax reduction based on vehicle fuel efficiency and emission level</td>
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<td>Subsidy for buyers of electric jeepsneys, motorcycles and tricycles</td>
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<td>Purchasers exemption from VAT when purchasing EVs and charging equipment</td>
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<td>Discount from payment of the motor vehicle user’s charge</td>
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<td>Discount from vehicle registration and inspection fees</td>
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<td>Rebate off Additional Registration Fees, up to $20,000</td>
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<tr>
<td>Government procurement of cleaner vehicles</td>
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<td>Reduced road tax of hybrids</td>
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<tr>
<td>Purchase subsidies for electric motorcycle taxis</td>
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Available: ● Under development

BRU = Brunei, CAM = Cambodia, INO = Indonesia, LAO = Lao PDR, MAL = Malaysia, MYR = Myanmar, PHI = Philippines, SIN = Singapore, THA = Thailand, VIE = Vietnam, BEV = battery electric vehicle, EEV = energy efficient vehicle
Brunei

In March 2019, Brunei announced regulations which would reduce the country’s fuel subsidies (Thomas, 2019). This measure would reduce the advantage of ICE vehicles over EVs and is an important fiscal incentive for EVs, in addition to potentially reducing fossil-fuel consumption and the GHG and air pollutant emissions that result from it.

Cambodia

In Cambodia, imported electric motorcycles are subject to special tariff rate of 10% which is lower than the rates for conventional motorcycles 150 cc to above 800 cc to which tariff is at 15 to 25% depending on engine size (Clean Air Asia, 2019).

Indonesia

In 2019, the Government of Indonesia issued regulations that would give incentives for low-emission vehicles. Government Regulation No. 73 of 2019 (GR-73) on the Luxury Sales Tax (LST) for Motor Vehicles shall be effective in 2021. In this regulation, the basis for LST rate on motor vehicles changed from vehicle type and cylinder filling capacity to fuel consumption and emission level. Vehicles that have higher fuel consumption and emission levels will be taxed higher. GR-73 provides an additional incentive for (a) motor vehicles included in the Low-Cost Green Car program, (b) four-wheeled motor vehicle using full and/or mild hybrid technology, (c) four-wheeled motor vehicle that uses flexy engine technology (Biofuel 100), and (d) four-wheeled motor vehicle that uses plug-in hybrid electric, electric battery, or fuel cell electric vehicle technology. These incentives are valid for ten (10) years from enactment of GR-73 (Deloitte, 2019). The importer or manufacturer of the motor vehicle is obligated to pay the tax which is charged on importation or on delivery of the manufacturer to another party (Yasol, 2017).

Indonesia also provides incentives to manufacturers. In Presidential Decree No. 55/2019, “Industries entitled to the incentives include electric vehicle and component manufacturers (to the extent they satisfy the local component requirements), industries that use components produced by local electric vehicle battery manufacturers, battery swap services, battery waste management, charging stations, buildings and houses that provide private charging installations, and public transportation that converts to electric vehicles. Fiscal incentives include reductions in import duties of machinery and raw materials, national and regional taxes on vehicles, taxes on luxury goods (such as imported electric cars). Other fiscal incentives include subsidized electricity in public charging stations and reduced parking fees in public places” (Tardif, 2019).

Lao PDR

Excise tax rates for motorbikes depend on engine displacement or capacity: (a) from 110 cc or less (10% tax), (b) from 111 cc – 150 cc (15% tax), (c) from 151 cc – 250 cc (20% tax), (d) from 251 cc or more (25% tax), (e) motorbike run by electricity (tax rate shall be reduced by 20% of each item) (Yasol, 2017).
**Malaysia**

Economic incentives in the National Automotive Plan 2014 included: incentives for local assembly and manufacturing of energy efficient vehicles (EEVs) (e.g., 100% tax break for 10 years for foreign direct investments (FDIs), 100% tax break for 10 years for corporate tax, subsidy provision for training and R&D, tax breaks (maximum 10%) for import duties, tax breaks (maximum 10%) for excise duties); incentives for locally assembled and/or manufactured EEVs (e.g., tax breaks (50%) for excise duties, subsidy provision from the Industrial Adjustment Fund); and incentives for promoting EEV-related parts including electric motors, HEV and EV batteries, battery management systems, inverters, ACs, and air compressors (e.g., 100% tax break for 10 years for corporate tax, 100% tax break for 10 years for FDIs) (ERIA, 2017). Malaysia’s Ministry of Transport offered a 50% reduction in road tax for battery EVs and plug-in hybrid EVs (Malay Mail, 2019). In the Green Technology Master Plan of Malaysia (2017-2030) of MESTECC, a possible incentive to be discussed with the Ministry of Finance is the government procurement of EVs and the provision of subsidy for the first 2,000 electric buses. (Ministry of Energy, Green Technology and Water (KeTTHA), 2017).

**Myanmar**

“The Industry Ministry and Green Power Myanmar signed an agreement in November to manufacture electric vehicles at the Thagara Industrial Zone in Bago Region’s Yedashae Township. The government will lease factory space for the assembly plant but will not invest. ... According to the agreement between the Industry Ministry and Green Power Myanmar, the latter will manufacture 300 long-haul electric buses for Myanmar and 7,000 electric vehicles for export to India, Singapore and Sri Lanka” (Consult Myanmar, 2019).

**Philippines**

The Department of Trade and Industry has recommended an electric vehicle incentive strategy of Php 83 billion ($1.6 billion) as fiscal support for the production and promotion of e-vehicles in the country. A large portion (Php 53 billion or $1.06 billion) of this fiscal support would be used as subsidy for buyers of e-jeepneys, motorcycles and tricycles; Php 30 billion ($0.6 billion) would be for manufacturers of electric public utility vehicles, buses, trucks, 2 and 3-wheelers’, passenger cars and battery. Manufacturers of EV charging stations would get income tax holiday as support. DTI proposes to add these incentives to the pending Senate Bill No. 1382 or the Electric Vehicles and Charging Stations Act (Magkilat, 2020). For the Public Utility Vehicle Modernization Program, the Department of Transportation has doubled the equity subsidy from Php 80,000 ($1,600) to Php 160,000 ($3,200) per unit to jeepney drivers who give up their old jeepney and purchase a modernized jeepney, according to Department Order No. 2020-006 (Department of Transportation, 2020).

The Tax Reform for Acceleration and Inclusion (TRAIN) Act (Republic Act No. 10963, 2018) exempts battery electric vehicles from excise taxes and reduces excise taxes for hybrid electric vehicles by 50% (Congress of the Philippines, 2018; Bureau of Internal Revenue, 2018). Other incentives for EVs are found also in these laws: Green Jobs Act (Republic Act No. 10771, 2016) and Special Economic Zone Act.
Republic Act No. 7916, 1995). The incentives under these laws include corporate income tax deductions or exemption and tax and tariff exemption. (Congress of the Philippines, 2016; Congress of the Philippines, 1995)

Senate Bill No. 1382 series of 2020 (An Act Providing the National Energy Policy and Regulatory Framework for the Use of Electric Vehicles and the Establishment of Electric Charging Stations) is pending approval. This is the latest Senate Bill which proposes to provide fiscal and non-fiscal incentives for EVs. Incentives for manufacturers include the inclusion of manufacture and assembly of EVs, charging stations, and parts and components, and establishment and operations of charging stations in the annual Investment Priorities Plan of the Board of Investments for 10 years. Incentives for importers include exemption for 9 years from excise taxes, duties, and value-added tax for the importation of completely built units of EVs and charging stations. Purchasers of EVs shall have these incentives for 9 years – exemption from VAT when purchasing EVs and charging equipment, and 30% discount from payment of the motor vehicle user’s charge as well as vehicle registration and inspection fees. Concessional financial packages would be made available by financial institutions to manufacturers, importers and users of EVs and EV charging stations (Gatchalian, 2020).

Singapore

The Budget 2020 provides fiscal incentives such as EV early adoption incentive (EEAI) from January 1, 2021 to December 31, 2023. “Owners who register fully electric cars will receive a rebate of 45% off the Additional Registration Fees (ARF), capped at $20,000. This EEAI will lower the upfront cost of an electric car by an average of 11% and narrow the upfront cost gap between electric and ICE cars. This scheme will apply to individual and fleet vehicle owners, such as taxi and car rental companies, and will cost Government an estimated $71 million over the next 3 years.” In addition, the road tax of petrol-electric hybrids will be reduced by an average of 29% (Land Transport Authority, 2020).

Thailand

Among the fiscal incentives provided or being planned by the Government of Thailand are: (a) vehicle purchase incentives, (b) lower annual registration taxes, (c) government and public transport purchase and use of EVs, and (d) incentives to manufacturers.

Vehicle purchase incentives/subsidies. The government in 2020 announced plans to provide subsidies for electric motorcycle taxis for 3 years (Y2020-2022). The subsidies are 15,000 THB ($480) for trading in an old motorcycle for a new EV motorcycle, 10,000 THB/unit ($320) subsidy for loan interest and 30,000 THB/unit ($965) subsidy for battery exchange. A pilot was planned for launch in June 2020 for 500 units. To encourage EV purchase, the government plans to launch a car and motorcycle trade-in scheme and has planned a budget of 750 million baht ($24 million) for the program (FAMI, 2020; Apisitniran, 2020).

Lower annual registration tax. Electric vans, trucks, motorcycles, taxicabs and tractors used in agriculture will be charged half of the annual registration tax to be paid by their fossil fuel counterparts. The annual registration tax for an electric passenger car with not more than seven seats will be the same tax as a fossil fuel passenger car for more than seven people (The Star, 2020).

Encouraging EV use by government offices and public transport. Examples include: “ordering the Bangkok Mass Transit Authority to begin using 200 BEVs by the end of 2017; compelling government..."
offices and nationalized industries to devote 20% of their budget for new vehicle purchases to the purchase of BEVs; instructing the Airports Authority of Thailand to plan for the use of PHEVs and BEVs for passenger transport; using BEVs for the transport of tourists in the major national historical parks; and instructing the Energy Policy and Planning Office to study the possibility of replacing the taxi fleet with EVs” (Yongpisanphob, 2017).

Incentives to manufacturers. The following are the incentives provided to manufacturers:

• In March 2017, manufacturers of parts for hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and battery electric vehicles (BEVs) of companies located in the Eastern Economic Corridor were given incentives such as corporate income tax exemption for 5 to 8 years and import duty exemptions for machinery and raw or essential materials used in manufacturing export products. In addition, the rate of personal income tax for executives, specialists and researchers is capped at 17% (FAMI, 2020; Apisitniran, 2020).

• Excise taxes were reduced from 8% to 0% for local BEV production from Y2020-2022 and is available to manufacturers granted by the Board of Investment (BOI) with investment privileges. The tax incentive is conditional – the manufacturers should start full EV production within 3 years from receiving the incentives. The EV industry is among the 12 economic growth industries under the S-curve policy and the tax incentive is government’s support to the industry (Fitch Solutions, 2019; Business Insider, 2019).

• To encourage the local manufacture of energy efficient HEVs and PHEVs and lower their cost, excise taxes were further lowered until 2025 based on the CO₂ emissions:

  Below 100 g/km CO₂ emission = from 8% to 4% excise tax
  101 to 150 g/km CO₂ emission = from 16% to 8% excise tax
  151 to 200 g/km CO₂ emission = from 21% to 10.5% excise tax
  Above 200 g/km CO₂ emission = from 26% to 13% excise tax

To encourage the local manufacture of BEVs, excise taxes were cut from 8% to 0% from 2020 to 2022 and to 2% from 2023 to 2025 (Maikaew, 2019).

• Corporate income tax holidays for eight years can be claimed by manufacturers of these 10 components: batteries, EV smart charging systems, DC/DC converters, traction motors, battery management services, inverters, portable electric vehicle chargers and electrical circuit breakers (Rastogi, 2018).

**Viet Nam**

Starting July 10, 2020, it was mandated that there will be no more import tariffs for auto parts and accessories which cannot be manufactured locally in Vietnam. The measure is meant to increase “the localization rate and enhance the competitiveness of Vietnam’s automobile industry.” (Decree No. 57/2020/ND-CP amending provisions of Decree No. 125/2017/ND-CP) (Ngoc, 2020).

Electric cars have significantly lower excise taxes since January 2018. The higher the capacity of the passenger vehicle the lower the tax. Passenger cars with 9 seats or fewer are taxed at 15%; with 10 to 15 seats are taxed at 10%; and with 16 to 23 seats are taxed at 5%. Hybrid vehicles or cars operated by gasoline and electricity or biofuel with gasoline accounting for at most 70% of the fuel used are imposed an excise tax rate of 70% of the tax rate for cars of the same kind. Passenger cars running on conventional fuels are taxed from 35% to 90% based on engine capacity with the lowest engine capacity
(<1.5L) imposed a 35% excise tax and the highest engine capacity (3-4L) imposed a 90% excise tax (Law 106/2016/QH13). Other than the excise tax, there is no national incentive plan for EV purchases (Le, 2019).

In 2018, the integration of the ASEAN market affected the local automotive market. To address this impact on local manufacturers, the government of Vietnam imposed stricter regulations for imported cars, benefitting local companies. The government also gave a local manufacturer (i.e., VinFast) a 50 percent reduction on corporate income tax for its first 15 years of operation (ASEAN Post, 2019). Import tax rates of 70% on EVs and hybrids, 18-20% on complete knock-down kits and special consumption tax rates of 15% still make manufacturing of EVs in Vietnam economically challenging (Vu, 2019).

Findings

Evident from the overview of fiscal incentives is the heavy focus on supply-side incentives or incentives for manufacturing of EVs, batteries and EV charging stations rather than demand-side or purchase incentives. The incentives are aimed at attracting investors that can bring their technology and manufacture the EVs, batteries and charging stations locally. In several cases, local content requirements in the manufactured EVs are pre-conditions to be eligible to tariff reduction. For instance, in terms of domestic components, two-wheel EVs must have at least 40% Indonesian parts to qualify for subsidy from 2023 onwards and at least 80% from 2026. Four-wheel vehicles must be at least 35% made in Indonesia by 2021 and 80% by 2030. Malaysia has cancelled in 2017 import tax exemptions for hybrid EVs introduced in 2011 for failing to attract foreign investment; incentives now favor locally assembled hybrid EVs and battery EVs.

Electric vehicles remain expensive for most countries in the region and not within the reach of the average household. EV prices have been found to be more expensive than in other markets like US, China, Europe and Australia. The limited number of models, taxes, and lack of subsidies are pointed to by experts as among the reasons for the high price of EVs. One way to drive down the price is through competition by having more EV models available. In Thailand, buyers had very limited choices in 2016; at that time, PHEVs were priced at $65,000. In 2019, there are more than ten (10) models of EVs available and the newest EV on sale was priced at about $39,000 (Parpart, 2019). In Viet Nam, a major challenge with the uptake of e-bikes is that the prices are not affordable. A VinFast e-bike sells for $1,719 but the average wage of people is only $171 per month (Jennings, 2019).

With battery costs becoming less expensive (achieving more than 85% cost decrease compared to 2010) and more models expected to be available globally, government fiscal incentives such as purchase incentives and preferential taxation for EVs and to encourage more EV models to become available on the market will help reduce EV prices. It would be important for the governments to assess the impact of the fiscal incentives on the EV prices and whether the incentives are sufficient to bring the price of EVs and the total cost of ownership at parity with ICE vehicles.

Estimates of purchase subsidies that would be required to bridge the price difference between xEVs\(^5\) and ICES for several ASEAN countries show it will require a significant investment (Suehiro, 2019). Other innovative and proven ways to fund the purchase incentives are needed to lessen the burden on the governments’ coffers. A good example is the Delhi Air Ambience Fund created in 2008 which “levies a

\(^5\) xEVs include all types of EV such as hybrid, plug in hybrid and battery electric
fee on the sale of diesel at a rate of ₹0.25 per liter. In FY2014–FY2015 cumulative fund collections reached $57.85 million, 12.86% of which is used to subsidize BEVs” (Kimura, 2018).

Fuel economy regulations, according to a recent modeling study, particularly the US Corporate Average Fuel Economy (CAFE) Standards, can increase EV adoption whether implemented alone or together with government incentives. “CAFE in conjunction with continued financial support for EVs was the most effective policy measure for EV market penetration. In this scenario, EV market shares reach more than 30% by 2030, with the increased shares of all-electric vehicles making up almost 80% of all EVs compared to all other scenarios” (Green Car Congress, 2017).

The interpretation by tax and customs offices of the fiscal incentives can sometimes make it difficult to avail of the incentives. An example is the interpretation of the 2016 Revised Law on Special Consumption Tax (SCT). Imported hybrid cars have not been granted the reduced tax. The reduced SCT can be availed of by “vehicles which operate on an internal combustion engine system combined with an electric propulsion system, with petrol consumption accounting for maximum 70 per cent of the total power. This vehicle type is subject to tariffs 30 per cent lower than those of conventional fuel-powered vehicles.” However, the Ministry of Finance stated that “hybrid vehicles are not powered by petrol in combination with electric power, because the electric power is completely recharged from the operations of the internal combustion engine system” (Pastoor D. , 2019; Long, 2018).

A case occurred in the Philippines where, in 2018, the Tariff Commission ruled that a completely built-up electric sedan was subject to a Most Favored Nation (MFN) rate of duty of 30% ad valorem excise tax (Personal Communication, 2018). It is important to note that the comprehensive tax reform law – Republic Act No. 10963 – which took effect on January 1, 2018 exempted purely electric vehicles from the excise tax on automobiles.

Financial incentives should be clearly formulated to leave little or no room for interpretation.

c. Non-fiscal incentives

Non-fiscal incentives found are limited only to a few countries in ASEAN. These non-fiscal incentives include exemptions from road use restrictions such as the odd-even license plate restrictions (Indonesia), allowing light mobility transport vehicles (electronic vehicles weighing not more than 100 kg) to use the cycling lanes to be established by local government units (Philippines), granting five-year work visa to investors, specialists and scientists, and a one-stop service center that issues permits for trading, export and import (Thailand).

In a Philippine Senate Bill still to be approved these non-fiscal incentives are proposed: 5% mandatory EV share in corporate (industrial and commercial companies), public transport operators, and government fleets; dedicated parking slots for EVs in buildings; open access installation of charging stations in dedicated parking slots and in gasoline stations; green public transport routes shall be created by local government units; EV users shall enjoy expeditious registration and renewal of registration; exemption of electric public utility vehicles (PUVs) from the mandatory unified vehicular volume reduction program or number coding scheme or other similar programs, and expeditious processing by the franchising regulatory board of franchise applications (and renewal) of PUV operators using EVs.
ASEAN countries could use non-fiscal incentives to attract EV buyers by offering more privileges and convenience for using electric vehicles.

d. Charging infrastructure

Singapore, Thailand and Viet Nam have the most ambitious plans for deploying charging infrastructure. Singapore set a goal of having 28,000 charging points by 2030, a significant increase from the 1,600 charging points currently available. Thailand’s Board of Investments, in 2019, approved a project to build 3,000 charging stations. Private sector is taking the lead in Viet Nam with VinFast joining PVOil in a plan to set up 50,000 charging stations in Viet Nam by 2020, however, very few charging stations have been installed so far.

In the Philippines, these are among the next steps recommended to develop charging infrastructure, which can also be considered by some of the ASEAN countries at the same stage of developing its charging infrastructure: (a) develop EV charging point master plan and regulations, (b) develop a charging infrastructure incentives program, (c) formulate charging power rates rules, (d) establish EV charging point installation standards, regulations and local permitting processes, and (e) establish standard charging protocols (Biona, 2019).

e. Product quality standards; registration and licensing

Indonesia, Malaysia, the Philippines, Thailand and Viet Nam continue to develop a more comprehensive set of registration or licensing requirements, as well as product quality standards. These countries follow international or locally adopted standards from International Electrotechnical Commission (IEC), International Organization for Standardization (ISO), and United Nations Vehicle Regulations. Harmonizing standards in the region especially for 2- and 3-wheelers will allow local manufacturers to access the greater ASEAN market (Gitano-Briggs, 2019). With harmonized standards within ASEAN, any certified vehicle test center or laboratory could perform conformity-testing, eliminating the need to repeat the same testing in numerous countries.

Viet Nam has adopted 30 product quality standards issued by the Ministry of Science and Technology, in line with the ISO/IEC standards, and nearly half of them are for electric 2-wheelers. The government has also issued a number of decrees and circulars on e-bike and e-motorbike technical standards, technical quality control, helmet wear regulation, and inspection fee for safety and environmental protection. Driver license registration, safety control, traffic monitoring system, road tax policy, import and export taxes remain to be resolved, as these vehicles are not officially regulated in the Law of Road Traffic. In 2015, the Ministry of Transport addressed an official dispatch No.4638/BGTVT-VT to the Prime Minister to report and propose the regulation of automobiles and suggested the Ministry of Public Security to oversee the registration of all EVs, as they currently do not come under any control.

In the Philippines, the Department of Trade and Industry-Bureau of Product Standards has adopted 45 EV-related standards. To note, all standards adopted remain voluntary until the appropriate government agency explicitly issues a Department Order or legal instrument requiring their adoption. There are registration and licensing requirements in place for all modes of vehicles, such as Administrative Order
AHS-2008-014 (Guidelines in the Registration of Low-Speed Vehicles) covering EVs and electric jeepneys, and Administrative Order 2006-01 (Guidelines in the Registration of Light Electric Vehicles) for electric 2- and 3-wheelers. These are, however, being updated as of late 2019 by the Land Transportation Office. The updating efforts is of urgent concern considering the rapid proliferation of two and three wheeled EVs in the market and the introduction of new modes of electric-based transport such as e-scooters.

In Indonesia, there are 8 product quality standards in place, 4 of them for electric 2-wheelers in line with ISO standards relating to energy consumption and battery safety requirements. With respect to electric buses, weak registration policy is creating a regulatory barrier to hinder such deployment. In a trial run of e-buses in Jakarta in June 2019 where the operator of Transjakarta, a bus rapid transit system, was unable to obtain vehicle registration certificates (known in Indonesia as STNK). The Ministry of Transport is in charge of conducting vehicle testing which is needed prior to obtaining the STNK, but it did not have testing facility to test batteries. The solution proposed by the ministry was for the bus manufacturer to obtain such certificate abroad where a vehicle type test certificate based on a test report would be issued.

Thailand has 14 product quality standards set out for all modes, which are in line with ISO/IEC standards, in terms of EV requirements and charging infrastructure. In Malaysia, there are 15 national standards in accordance with ISO/IEC standards, particularly for 2-wheelers. Malaysia has different regulations for electric bicycles, e-mopeds and e-motorcycles. Registration policy is mandatory for EVs with a top speed greater than 50kph, while recommending EV with speeds of 25-50kph to register at the concerned office. In terms of analyzing the availability of the standards and of the regulations, further investigation on each of the transport modes (electric 2-wheelers, electric 3-wheelers, electric buses, etc.) would be needed.

f. Electric bicycles

Several countries in the ASEAN region are still in the process of revising their road traffic and transport laws to regulate the use of electric bicycles or power assisted bicycles or battery assisted bicycles because their use on roads, registration, and other requirements are not in the purview of existing laws. Only Viet Nam and Singapore integrate electric bicycles in their regulations, allowing their use on public roads, governed by rules of conduct and regulations. It is important to provide the necessary regulatory and fiscal support for e-bicycles in order to support non-motorized transportation in cities and provide for healthier and more sustainable urban transport system.

g. Institutional arrangements

Many ASEAN countries recognize the need for close coordination among agencies in developing and implementing electric vehicle roadmaps and policies. Multi-agency coordination bodies are in place or are planned to be established. In Brunei, the National Council on Climate Change is comprised of these ministries – energy, development, transport, tourism – which are responsible for developing the climate change policy, regularly revising the same, and monitoring progress against the objectives.
In Indonesia, Presidential Decree No. 55/2019 establishes a Coordination Team for accelerating the development of the domestic battery electric vehicle industry which will be headed by the Minister for Maritime Affairs and Natural Resources, with the Minister for Economic Affairs as vice chair. Members of the Coordinating Team are: (i) Minister of Finance; (ii) Minister of Research, Technology and Higher Education; (iii) Minister of Industry; (iv) Minister of Trade; (v) Minister of Energy and Mineral Resources; (vi) Minister of Transportation; (vii) Minister of Environment and Forestry; (viii) Minister of Home Affairs; and (ix) the head of the Indonesian Police. A “National New Generation Vehicle Committee” comprised of representatives from the ministries of industry, energy and transport will be created by the Thailand’s Industry Ministry in 2020. The aim of the committee will be to drive the development of EV policies.

While there is no authority or body mandated for EV development and deployment in Viet Nam, there are the beginnings of a multi-sectoral movement. An EV Forum was organized in March 2019 with participants from key ministries (i.e., Ministry of Industry and Trade, National Traffic Safety Committee, Ministry of Transport, Ministry of Science and Technology), companies, researchers and experts from universities and institutes, and media.

The participation of representatives from the electric vehicle industry is important in setting of targets and developing of policies to mainstream electric mobility. Multi-stakeholder participation is taking place in several ASEAN countries and should be strongly encouraged.

An important aspect of coordination that needs to be strengthened is the national government and local government coordination with respect to implementation of electric vehicle policies. With local government units being delegated with more roles such as in planning public transport routes to be served by cleaner transportation modes, greater guidance needs to be provided by national government agencies to local governments in the implementation of electric vehicle policies to prevent delays in implementation.

4. Opportunities for policymaking to mainstream e-mobility in Southeast Asia

Based on an analysis of electric mobility policies of countries in Southeast Asia, there are several opportunities to mainstream electric mobility in Southeast Asia through policymaking:

a. In mainstreaming electric mobility, technology alone is not the solution. It is important for national and local governments to integrate or embed e-mobility in their national and/or local transport plans that prioritize the movement of people over vehicles. An overarching e-mobility policy framework that is linked to the use of renewable energy would help accelerate the energy transition in the transport and electricity generation sectors.

b. Policies to promote and integrate e-bicycles in the transport system are found in Southeast Asia only Singapore and Viet Nam. It is important to provide the necessary regulatory and fiscal support for e-bicycles in order to support non-motorized transportation in cities and provide for healthier and more sustainable urban transport system.

c. Prioritizing the upgrade of existing ageing diesel-run public bus fleets to electric buses would help reduce congestion and reduce the exposure of commuters to harmful air pollution.
d. As countries transition to electric mobility, it is important that the electricity used to power electric vehicles comes from clean sources.

e. Government fiscal incentives such as purchase incentives and preferential taxation for EVs and to encourage competition where more EV models become available in the market will help reduce EV prices. It would be important for the governments to assess the impact of the fiscal incentives on the EV prices and whether the incentives are sufficient to bring the price of EVs and the total cost of ownership at parity with ICE vehicles.

f. Innovative and proven ways to fund purchase incentives are needed to lessen the burden on the governments’ coffers. A good example is the Delhi Air Ambience Fund created in 2008 which “levies a fee on the sale of diesel at a rate of ₹0.25 per liter. In FY2014–FY2015 cumulative fund collections reached $57.85 million, 12.86% of which is used to subsidize BEVs” (Kimura, 2018).

g. Fuel economy regulations, according to a recent modeling study, like the US Corporate Average Fuel Economy (CAFE) Standards can increase EV adoption (Green Car Congress, 2017). ASEAN countries should consider the benefits of having fuel economy regulations.

h. Financial incentives should be clearly formulated to leave no room for misinterpretation.

i. ASEAN countries could attract more EV buyers using non-fiscal incentives.

j. Among the next steps to be considered in developing charging infrastructure are: (a) develop EV charging point master plan and regulations, (b) develop a charging infrastructure incentives program, (c) formulate charging power rates rules, (d) establish EV charging point installation standards, regulations and local permitting processes, and (e) establish standard charging protocols (Biona, 2019).

k. Ensure development of battery management, recycling, and reuse policies and strategies.

l. Harmonized standards in the region especially for 2- and 3-wheelers should be pursued as this will allow local manufacturers to access the greater ASEAN market. With harmonized standards within ASEAN, any certified vehicle test center or laboratory could perform conformity-testing, eliminating the need to repeat the same testing in numerous countries.

m. The participation of the electric vehicle industry is important in the setting of targets and development of policies to mainstream electric mobility.

n. Multi-stakeholder participation is taking place in several ASEAN countries and should continue to be strongly encouraged.

o. In addition to multi-sectoral agency coordination at the national level, an important aspect of coordination that needs to be strengthened is the national government and local government coordination with respect to implementation of electric vehicle policies.

p. Considering the importance of electric mobility to the economy and environment of Southeast Asian countries, cooperation among ASEAN countries would be beneficial. The ASEAN Land Transport Working Group could possibly consider creating a working group on e-mobility, in coordination with the energy working group, and with other relevant working groups within ASEAN to foster greater cooperation among its member states.

A transformation in the way people and goods are moved is needed in Southeast Asia. Electric mobility is among the most promising solutions to address air pollution, greenhouse gas emissions, and congestion from motor vehicles in the region. As the region aims to achieve its electric mobility goals, policies will continue to play an important role in mainstreaming electric mobility in Southeast Asia.
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