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Decarbonizing Transport Sector: Prospects of ASEAN-India Collaboration

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Abstract: *Transition to cleaner modes of transport is paramount to address the challenges of global warming and climate change. India and ASEAN countries are committed to augmenting Eclectic Vehicles (EV) manufacturing and their adoption. However, owing to issues pertaining to access to critical minerals and localization of the supply chain, bridging the supply-demand gaps of EVs has remained challenging. Analysis the existing EV market scenario in ASEAN and India this commentary highlights the need & scope of collaborations among ASEAN countries and India to leapfrog in the "Electric vehicles" sector.*

Introduction

The ongoing climate change has posed existential crisis to mankind. Recognising the severity of challenge, global leaders have recently agreed to reduce greenhouse emissions. Major economies have announced timeline to achieve net zero emission target. India and ASEAN member states are no exception in this regard. Most ASEAN nations as well as India have aligned their policies to

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be net-zero nations between 2050 and 2070. Central to these targets is the imperative for decarbonisation of the transport sector, which requires aggressive development and deployment of Electric vehicles (EVs) across the region. While the demand for EVs in India and ASEAN is increasing, the supply of EVs has remained limited. Auto manufacturers are struggling to scale-up the production as per market demand. It has been estimated that the EV market in ASEAN countries alone is expected to grow at CAGR 32.73% from USD 858.76 million to USD 3,537.65 million by 2028[1]

India aspires to establish itself as a prominent EV manufacturing hub. To achieve this goal, it has launched initiatives such as Production Linked Incentives (PLI) for Advanced Chemistry Cell (ACC) batteries and auto components, amounting to USD 537 million. These measures are designed to stimulate local manufacturing and drive growth in the electric vehicle industry. However, issues like the absence of a resilient supply chain for parts and material used in production of EV along with limited R&D efforts for developing battery technologies continues to be a matter of serious concern. International cooperation and collaboration thus become critical for the development of EV sector. This commentary analysis the existing EV market scenario in ASEAN and India and highlights the need & scope for collaborations among ASEAN countries and India to leapfrog in the "Electric vehicles" sector.

EV Policy Scenario in ASEAN Nations

ASEAN countries have outlined ambitious targets for the adoption and production of electric vehicles (EVs) and other clean energy models. Brunei plans to have 10% of the fleet stock and 60% of new vehicle sales represented by EVs by the year 2035. Indonesia aims to produce 20% of its vehicles as EVs or hybrids by 2025, with stock targets set at 2 million electric passenger vehicles and 13 million electric motorcycles by 2030. Malaysia is taking a comprehensive approach, intending to electrify 100% of all private transport vehicle stock and 40% of all public transport, including various modes, using CNG/LPG/biofuel by 2030. Thailand has set specific production targets, aiming for a cumulative production of 250,000 EVs, 3,000 electric buses, and 53,000 electric motorcycles by 2025. Furthermore, they plan to have 30% of all vehicles produced, including two and three-wheelers, light-duty vehicles, and urban buses, to be EVs by 2030. Similarly, Singapore has introduced measures to promote clean energy models which are assumed to be EVs, with a goal to have 100% of new car and taxi sales represented by such models by 2030. Additionally, they have set a target to phase out internal combustion engine (ICE) vehicles by 2040. India also is a signatory to the clean energy ministerial EV30@30 campaign which aims to reach a 30% sales share for electric vehicles by 2030 among the participating countries[2].

To achieve the above-mentioned targets, countries have rolled out policies with various incentives such as tax waivers/ subsidies (Table 1). The Philippines Comprehensive Roadmap for the Electric Vehicle Industry offers incentives for consumers, including tax exemptions and discounts, as well as streamlined vehicle registration processes[3]. Similarly, the 2022 February subsidy program in Thailand has introduced subsidies for consumers, enhancing the appeal of electric vehicles in the

region. The Indonesian government has been actively supporting the manufacturing and adoption of electric vehicles (EVs) through a range of policies and incentives. To attract investment and encourage local production of EVs, Indonesia offers various incentives and tax breaks to EV manufacturers. These incentives include tax holidays, reduced import duties on EV components, and exemptions from luxury goods tax for locally produced EVs.

Table 1: EV Policies Support in ASEAN Nations

Country	Tax Waivers / Subsidies	R&D and capacity building	Infrastructure
Indonesia	●	●	●
Thailand	●	●	●
Vietnam	●		●
Philippines	●	●	●
Singapore	●	●	●
Malaysia	●		●

Source: Khan et al., 2022[4] and author's analysis

Scope of India-ASEAN EV-Sector Collaborations

Despite incentives, EV sector in India and ASEAN is facing several challenges. Procurement of critical minerals, development of charging infrastructure, production of EVs and research and development of battery technologies are four critical factors responsible for the overall development of the EV sector globally. Since a country can only develop certain sub-segment independently, regional cooperation becomes imperative for the rapid development of EV sector. ASEAN countries and India pose numerous promising collaboration opportunities across the EV value chain, ranging from raw material sourcing to recycling.

Critical Minerals play a pivotal role in electric vehicles and are essential for battery performance and longevity. However, the supply chain of several critical minerals such as Lithium, Nickel, Cobalt, and Graphite etc. encounters a challenge due to the high concentration of these minerals in a handful of countries. ASEAN countries cumulatively produce almost 47% of global nickel, 35% of global tin and also accounts for high share in the production other critical minerals,

including bismuth, tungsten, rare earth, and bauxite (Table 2). ASEAN nations like Indonesia and the Philippines possess significant nickel and cobalt reserves. Indonesia stands out as a global leader in nickel reserves, boasting an estimated 21 million tons, approximately 22% of global reserves[5]. Additionally, India has discovered 5.9 million tons of lithium in Jammu and Kashmir. However, India needs upstream capabilities like mining and refining of these critical minerals. Regional cooperation between ASEAN countries becomes more significant to address the challenges of critical mineral sourcing and processing requirements. Indian EV manufacturers have an opportunity to engage with mining companies in countries like Indonesia and the Philippines through long-term supply contracts. Moreover, exploring joint ventures can strengthen the value chain for mining and processing critical raw materials not only in India but also across ASEAN countries. India can take a cue from the recently forged Mineral Security Partnership (MSP) and pave the way for India-ASEAN collaboration on critical minerals to strengthen the overall regional supply chain for these essential resources.

Table 2: ASEAN Countries' Global Share for Minerals Used in EV[6]

Mineral	**Use in EV**	**ASEAN absolute production trend (2015-2020)**
Nickel	EV Battery	46.84%
Tin	EV Battery	34.84%
Rare earth	EV motors and charging infrastructure	9.35%
Copper	EV motor, battery, wiring, charging station	4.30%
Manganese	EV battery	3.95%
Cobalt	EV battery	3.06%

EV battery technology is still a work in progress. Massive Research and Development efforts are required improve safety and performance of batteries. At the same time, R&D efforts are also required to develop recycling technologies with high material recovery to minimise the problem of E-waste. ASEAN-India cooperation in this sphere holds a great potential. The ASEAN-India Science and Technology Fund (AISTDF), established by the Department of Science and Technology and the Ministry of External Affairs, presents a valuable platform for collaborative R&D across the region. The focus should encompass battery technologies tailored to the ASEAN region, solid-state batteries, recycling technologies, and batteries like Sodium-Ion, which offer reduced dependence on raw materials with geopolitical risk. The Central Electro Chemical Research Institute, operating under the Council of Scientific and Industrial Research, already

involved in exploring technologies such as sodium-ion and solid-state batteries, could be a pivotal anchor in this collaborative endeavour.

Apart from critical minerals and R&D on battery technologies, Government agencies and manufacturers across the region can collaborate to implement standardized charging infrastructure. This approach will enhance accessibility to the EV across the member nations and aid the productivity of manufacturers by eliminating the need for manufacturing of multiple chargers. Since ASEAN aims for connecting the connectivity, a robust plan for setting up standardised charging infrastructure across the region should be planned, especially on the highways connecting the member countries. One potential project could involve the flagship India-Myanmar-Thailand trilateral 1400-km long highway project, which fosters road connectivity between India and ASEAN nations to boost trade, business, and tourism ties.

Conclusion

India-ASEAN collaboration in the EV sector promises economic benefits and demonstrates a shared commitment to combat climate change and reduce greenhouse gas emissions. By working hand in hand, India and ASEAN can drive the electrification of transport, foster green growth, and contribute significantly to a greener and more sustainable future for the region and beyond. The prospects of this collaboration are bright, and the collective efforts hold the potential to shape a transformative and environmentally conscious EV sector in both India and ASEAN countries.

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About AIC

Considering the work of the ASEAN-India Eminent Persons Group (AIEPG), and its Report with recommendations for forging a closer partnership for peace, progress and shared prosperity, the Heads of the State/Government of ASEAN and India at the ASEAN-India Commemorative Summit 2012, held at New Delhi on 19-20 December 2012, recommended the establishment of ASEAN-India Centre (AIC), which was formally inaugurated by the Hon'ble External Affairs Minister of the Government of India on 21 June 2013 at RIS. AIC serves as a resource centre for ASEAN Member States and India to fill the knowledge gaps that currently limit the opportunities for cooperation. AIC works with the Ministry of External Affairs (MEA), Government of India and undertakes evidence-based policy research and provide policy recommendations.

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