AZEC Sectoral Initiatives towards carbon neutrality/net-zero emissions
***Attached document to the 2nd AZEC Ministerial Meeting Joint Statement in 2024**

I. Background:

In December 2023, last year, the Asia Zero Emission Community (AZEC) partner countries affirmed the "AZEC principles", highlighting the importance of "triple breakthrough", namely addressing climate change, economic growth and energy security simultaneously, as well as the importance of "one goal, various pathways", which underscores that there are various and practical pathways towards net-zero emissions, taking into account different national circumstances and starting point of each country, including, but not limited to, its industrial structures, social contexts, geographies, and stages and rates of development.

Energy demand in many AZEC partner countries is expected to grow in the future, due to rapid urbanization, population and income growth. In order to reduce dependence on fossil fuels in the power, transport, and industry sectors while meeting the growing demand for energy and affordable energy access, transitions that utilize new and existing clean technologies are essential.

To foster cooperation among AZEC partner countries in this critical decade as well as taking steps to implement the CMA.5 decision on the Global Stocktake (GST), our Ministers welcome the launch of the following three initiatives, namely, **AZEC Initiative to promote Zero Emission Power, AZEC Initiative to create Sustainable Fuel Markets, and AZEC Initiative to establish Next-Generation Industry**.

Recognizing that there is no one-size-fits-all approach to energy transitions as there is considerable diversity in AZEC partner countries, such as geographical features, industrial structures, and stage of development to shape pathways and approaches towards the decarbonization, the cooperation through these initiatives will be carried out in cooperation with interested AZEC partner countries/relevant entities, in line with their nationally determined energy transition approaches, in cooperation with the Asia Zero Emission Center in the Economic Research Institute for ASEAN and East Asia (ERIA). The initiatives will be conducted by a suit of supporting tools, including support for technology deployment, capacity building, financing and the development of policy and

measures, taking into consideration various national circumstances among AZEC partner countries.

II. Three initiatives to promote carbon-neutrality/net-zero emissions in AZEC partner countries.

i. AZEC Initiative to promote Zero Emission Power (AZEC Zero Emission Power Initiative)

Purpose:

AZEC partner countries are taking steps to contribute to global efforts, including to tripling renewable energy capacity globally by 2030. However, considering that many AZEC partner countries are currently dependent on fossil-fuel thermal power plants and most of their thermal power generation fleets are still relatively young, decarbonizing the power sector, particularly thermal plants, is one of the focal points in tackling climate change while ensuring access to affordable energy and addressing energy security. This initiative aims at maximizing introduction of renewable energy and promoting zero-emission thermal power generation in AZEC partner countries through a range of approaches as follows:

Possible areas of cooperation:

- To publicize updated decarbonization roadmaps towards net-zero emissions including power sector which align with reality of each country.
- To support development of policies and measures to promote clean energy by sharing other countries' examples, such as through improvement of enabling environments for demand side sector to procure renewables, and regulations for hydrogen, ammonia, biomass, biogas, Carbon Dioxide Capture, Utilization and Storage (CCUS).
- To facilitate efforts to use existing power generation systems effectively, such as introducing the concept of "Hybrid Dam" meaning advanced dam systems which are strengthened flood control operations and are promoted hydropower generation.
- To promote zero emission thermal power generation, particularly to decarbonize coal power generation through/combing a range of options, such as using biomass, biogas, hydrogen, and ammonia; repurposing to flexible sources; early retirement together with converting to zero

emission power; switching to low or zero-emission power generation; and retrofitting with Carbon Dioxide Capture and Storage (CCS)/CCUS.
- To support use of carbon intensity-based emission calculation methodology for hydrogen and ammonia and to exchange knowledge in technology and safety standards of hydrogen and ammonia.
- To support development of CCS legislation, including dissemination of the CCS guidelines published by Japan Organization for Metals and Energy Security (JOGMEC), and sharing knowledge of cross-border CO2 transport.
- To enhance replacement of diesel by distributed renewable-based power and expansion of energy access.
- To study national and regional electricity grid system to advance grid reinforcement to accommodate renewable energy, including contribution to ASEAN Power Grid.
- To study institutional design for promoting the use of Distributed Energy Resources (DER) with cybersecurity in ASEAN.

ii. AZEC Initiative to create Sustainable Fuel Markets (AZEC Sustainable Fuel Initiative)

Purpose:

With the expected increase in passenger vehicles, road fleets, aviation, and shipping in AZEC partner countries, decarbonizing the transport sector is essential to the global effort to transition away from fossil fuels.

Given that large portion of vehicle stock, as well as almost all of aviation and shipping run by oil, supplying sustainable fuels, including biofuels, Sustainable Aviation Fuel (SAF), and e-fuels is considered as one of the practical options to steadily reduce emissions. For example, in the international aviation sector, competition to secure SAF and its feedstock is intensifying in order to achieve the long-term global aspirational goal (LTAG) adopted by the International Civil Aviation Organization (ICAO) Assembly to achieve net zero carbon emissions by 2050. This initiative aims to support AZEC partner countries to secure sustainable fuels using biomass and other resources in Asia, with a view to developing a sustainable fuels supply chain centered on Asia in the future.

Possible areas of cooperation:

- To conduct feasibility studies on sustainable fuels for transportation, including aviation, road transport, heavy duty, shipping, and the maritime sectors; such as expanding the use of SAF in the aviation sector, biofuels including biodiesel and bioethanol, and hydrogen and ammonia in more modes of transportation, and to formulate a roadmap of sustainable fuel demand and supply in Asia, based on the sectoral feasibility studies.
- To promote projects, such as demonstration projects, to create sustainable fuels markets, including development of supply chains.
- To share best practices on the production, operation, distribution, and retail of sustainable fuels.
- To explore the potential of the combination of sustainable fuels and high-performance mobility equipment such as flexible/dual-fuel and hybrid engines.
- To identify gaps in fuel supply infrastructure such as bunkering facilities and explore solutions.
- To develop infrastructure for sustainable fuels including bunkering for vessels as measures to decarbonize ports under the Carbon Neutral Port framework.

iii. AZEC Initiative to establish Next Generation Industry (AZEC Next-Generation Industry Initiative)

Purpose:

Manufacturing industry in Asia plays a significant role in its economy, with a relatively high share of manufacturing value-added in its Gross Domestic Product (GDP). Decarbonization in the manufacturing industry sector is becoming increasingly important as a corporate strategy to respond to the demand from global companies to reduce GHG emissions per product in their whole supply chain. One of the approaches to address the need to establish green manufacturing supply chain and help countries attract foreign direct investment is to create “carbon neutral industrial parks”, where companies in the industrial zone can manufacture their products by using electricity generated from clean power sources and promoting energy efficiency. Furthermore, considering the significant role that automobile industry plays in Asian economy, addressing the

decarbonization in the automotive industry in Asia is also important. This initiative aims to establish next-generation industry in Asia by focusing on the decarbonization efforts in industrial parks and automobile industry through a range of approaches as follows:

Possible areas of cooperation:

- To conduct demonstration projects to support the introduction of energy management and CO2 emissions visualization system, energy saving and renewable energy.
- To provide capacity building program to develop human resources in order to promote energy efficiency.
- To formulate a report towards carbon-neutrality/net-zero emissions in industrial parks, sharing the efforts of exemplary industrial parks which use energy efficiency, renewable energy, or DER effectively.
- To support the development of necessary policies and measures to facilitate decarbonization in industrial parks, such as through improvement of enabling environments for demand side sector to procure renewables.
- To promote the use of CCUS/Carbon recycling in industrial sector, and to support development of CCS legislation, including dissemination of the CCS guidelines published by Japan Organization for Metals and Energy Security (JOGMEC), and sharing knowledge of cross-border CO2 transport.
- To develop master plan of energy provision for next-generation automotive industry strategy for ASEAN-Japan to pursue multi pathway transitions by taking advantage of strength of ASEAN and promoting Internal combustion engines (ICEs) and Hybrid Electric Vehicles (HEVs) combined with the use of sustainable fuels while investing in Battery Electric Vehicles (BEVs) for the future.
- To strengthen automotive manufacturing and exportation capabilities in multi-pathways from hybrids to EVs, such as human resource development, supplier support, decarbonization of manufacturing processes, demonstration of EVs and e-fuels.
- To consider the possibility of using hydrogen and ammonia in industrial parks including FCVs.

III. The way forward

Utilizing inputs from AZEC partner countries and related organizations, the Asia Zero-Emission Center in ERIA plays a central role in preparing a report on research progress, and a direction of regional cooperation relevant to the three initiatives, and policy options including transition/green finance and high integrity carbon market schemes, as well as in facilitating stakeholders' engagement in order to serve as the platform articulated in the AZEC Leaders' Joint Statement in December 2023.