



# SUMMARY OF **ERIA** **RESEARCH** **PROJECTS** **2022**



# RESEARCH SUMMARY 2022

Edited by *Tyagita Silka Hapsari and Isabella Italia Gentajaya*  
Cover and Layout Design by *Suku Tangan*

## TABLE OF CONTENTS

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### Deepening Economic Integration

#### 01 | DIGITAL ECONOMY

Accelerating Digital Transformation in ASEAN and East Asia 12

*Lurong Chen*

Developing a Framework for Internet Health Metrics – Data  
Sourcing, Metrics, and Scoring System 13

*Lurong Chen and Yurie Ito*

Digital Government and Online Public Services: A Booster for the  
Digital Economy 14

*Lurong Chen*

#### 02 | ECONOMIC INTEGRATION

The EU-China Comprehensive Agreement on Investment: Lesson  
Learnt for Indonesia 15

*Lili Yan Ing and Junianto James Losari*

Financial Services Trade Liberalization in Indonesia: Policy Patterns  
and Economic Linkages 16

*Lili Yan Ing and Fauziah Zen*

Local Content Requirements: Facilitation or Restriction 18

*Lili Yan Ing, Gene Grossman, Mar Mellitz, Susan Stone*

Non-Tariff Measures in Australia, China, India, Japan, Korea,  
and New Zealand 19

*Lili Yan Ing, Denise Penello Rial, Muhammad Riqzy Anandhika,  
Gracia Hadiwidjaja*

ERIA Research in RCEP (Phase 2): Understanding the Opportunities  
and Challenges 21

*Dionisius Narjoko and Shandre Thangavelu*

Study on the Regional Comprehensive Economic Partnership (RCEP)  
from International Relations Perspectives 23

*Keita Oikawa, Fusanori Iwasaki, and Shujiro Urata*

13th ASEM Summit: Multilateral Cooperation for a Resilient,  
Sustainable, and Rules-based Future for Asia-Europe Meeting 24

*Anita Prakash*

Regional Integration in Indo-Pacific: Connectivity, Cooperation,  
and New Supply Chain Linkages 26

*Anita Prakash*

### 03 | GLOBALISATION

Global Trade and Recovery After COVID-19	29
<i>Paresh Narayan, Ha Thi Thanh Doan, Fukunari Kimura, and Shujiro Urata</i>	
Non-tariff Measures and Firms in the Global Value Chain	31
<i>Ha Thi Thanh Doan</i>	
Impacts of COVID-19 on Indonesia's Trade	33
<i>Lili Yan Ing and Yessi Vadila</i>	
Revision of the Institute of Developing Economies/Economic Research Institute for ASEAN and East Asia-Geographical Simulation Model (IDE/ERIA-GSM) Baseline Scenario for the New Normal and Re-examination of the Impact Analysis on ASEAN Economies	34
<i>Satoru Kumagai, Ruth Banomyong, Ikumo Isono, Takuma Matsuda, Kenmei Tsubota, Kazuhiro Nara, Toshitaka Gokan, Keola Souknilanh, and Kazunobu Hayakawa</i>	
4th Phase of Global Value Chains, Urban Amenities and City Agglomerations: Structural Transformation and GVC Unbundling in East Asia	36
<i>Dionisius Narjoko and Shandre Thangavelu</i>	
Survey of the Impact of COVID-19 on Business Activities and Supply Chains in East Asia and the ASEAN Region	38
<i>Keita Oikawa</i>	
UK-ASEAN Trade: Strengthening the Supply Chain Linkages	40
<i>Anita Prakash, Alicia Garcia-Herrero, and David Martinez Terragano</i>	
Reconnecting ASEAN: An Assessment of the Pandemic Effects and Policy Response on Connectivity	42
<i>Fauziah Zen, Ruth Banomyong, Trinh TT Huong, Ibrahim K. Rohman, Jun Jie Woo, Hidekazu Ito, and Suhaiza Zailani</i>	

---

## Narrowing Development Gaps

### 04 | AGRICULTURE

Enhancing Food Supply Chain Resilience and Food Security in ASEAN with Utilisation of Digital Technologies	45
<i>Masanori Kozono, Venkatachalam Anbumozhi, Deepayan Debnath, Suresh Babu, Meinhard Breiling, Eiji Yamaji, Sundaram Gunasekara, Paul P.S. Teng and, Montesclaros Jose Ma Luis Pangalangan</i>	

## 05 | HEALTHCARE AND AGEING

<b>Health and Long-term Care Information in Ageing Asia</b>	<b>47</b>
<i>Reiko Hayashi, Takuma Kato, Toru Suzuki, Katsuhisa Kojima, Yoshimi Chitose, Masataka Nakagawa, Ruoyan Gai, Keita Suga, Ryo Oizumi, Yukiko Senda, Zhenzhen Zheng, Ting Feng, Do Hoon Kim, Lolito R.Tacardon, Halimah Awang, Nur Fakhri Ab Rashid, Luong Quang Dang, Khaing Khaing Soe, and Nyi Nyi U</i>	
<b>Resilient Long-term Care for the Elderly Under the COVID-19 Pandemic</b>	<b>49</b>
<i>Takeo Ogawa, Takuma Kato, Katsuhiko Kikuchi, Hiromi Kinebuchi, Shun Ohno, Tri Bud Rahardjo, Susiana Nugraha, and Kaysorn Sumpowthong</i>	
<b>An Agent of Care Technology Transfer: Trends and Challenges of Migration of Care Workers Across Borders</b>	<b>51</b>
<i>Yuko Hirano, Osuke Komazawa, Tri Budi W Rahardjo, Susiana Nugraha, Misako Higashijima, Shun Ohno, Kunio Tsubota, Reiko Ogawa, Yasuhiro Shiozu, Yoichi Hiruma, Yukari Amano, Ryota Endo, and Yuzurihara Kazuma</i>	
<b>Comparison of Clinical Trials Regulatory Framework in ASEAN Countries: A Systematic Review</b>	<b>53</b>
<i>Antonio Villanueva, Marlinang Siburian, Maria Ruriko Umamo Urbiztondo, Nattha Kerdasakundee, Tatsuo Iiyama, Takuma Kato, Narufumi Sukanuma</i>	
<b>Health Economics Alternatives for Safe Travel</b>	<b>54</b>
<i>Antonio Villanueva, Regina Berba, Kulkanya Choekphaibulkit, Septelia Inawati, Adeeba Kamarulzaman, Vivi Lisdawati, Norio Ohmagari, and Paulyn Ubial,</i>	
<b>Needs of Multi-Regional Clinical Trials in Southeast Asia</b>	<b>56</b>
<i>Antonio Villanueva, Kulkanya Choekphaibulkit, Tatsuo Iiyama, Adeeba Kamarulzaman, Nattha Kerdasakundee, Sifa Muchanga, Benjamin Sablan, Marlinang Siburian, and John Mark Velasco</i>	
<b>Pandemic Best Practices: Balancing Health &amp; Economy</b>	<b>57</b>
<i>ERIA Healthcare Unit</i>	
<b>Quality and Characteristics of Randomized Clinical Trials in ASEAN Countries</b>	<b>58</b>
<i>Antonio Villanueva, Marlinang Siburian, Sifa Marie-Joelle Muchanga, Tatsuo Iiyama, Takuma Kato, and Narufumi Sukanuma</i>	
<b>Support for Southeast Asian Multi-Regional Clinical Trial Network (Indonesia, the Philippines, Thailand, Viet Nam)</b>	<b>60</b>
<i>Antonio Villanueva, Tatsuo Iiyama, Asuka Nagatani, and Takuma Kato</i>	
<b>Support for Southeast Asian Multi-Regional Clinical Trialists Capacity Building (Cambodia)</b>	<b>61</b>
<i>Antonio Villanueva, Tatsuo Iiyama, Takuma Kato, and Asuka Nagatani</i>	

## 06 | SMEs

- Development of Small and Medium-sized Enterprises (SMEs) in Eastern Indonesia 62

*Lili Yan Ing, Anika Widiyana, and Ben Shepherd*

- The Participation of Micro, Small and Medium Enterprises in ASEAN's Digital Economy 63

*Dionisius Narjoko and Cassey Lee*

---

## Sustainable Economic Development

## 07 | CIRCULAR ECONOMY

- Circular Economy Road Map for ASEAN 66

*Venkatachalam Anbumozhi and Michikazu Kojima*

- ASEAN Implementation Framework of Circular Economy 68

*Intan Ramli, V. Anbumozhi, R. Shrestha, and A. Joko Purwanto*

## 08 | DISASTER MANAGEMENT

- Innovations and Experiences in Financing Disaster Risk Reduction 69

*Venkatachalam Anbumozhi, Meinhard Breiling, Yamaji Eiji, and Mikio Ishiwatari*

## 09 | ENVIRONMENT

- Development and Dissemination of Technical Guidelines for Plastics and Resin Pellets Leakage Prevention from Factories and Informal Recycling Sector in Asean 71

*Guilberto Borongan*

- Regional Knowledge Centre for Marine Plastic Debris 73

*Michikazu Kojima, Ayako Mizuno, Ellen Putri Edita, Hendro Putra Johannes, and Fusanori Iwasaki*

## 10 | G20

- Indonesia's G20 Presidency: 'G20: New Normal, New Technologies, New Financing' 75

*Lili Yan Ing, Dani Rodrik, and Jeffrey Sachs*

- Towards international Agreement on Marine Plastic Pollution: The role of the G20 76

*Michikazu Kojima, Hendro Putra Johannes, Ellen Putri Edita, Fusanori Iwasaki, R. Andreas Kraemer, Alin Halimatussadiyah, Romadhani Ardi, and Astryd Viandila Dahlan*

## 11 | SDGs

- An Assessment of COVID-19 Impact on the Trajectory of Sustainable Development Goals 78  
*Venkatachalam Anbumozhi, Fukunari Kimura, and Kaliappa Kalirajan*

## 12 | TECHNOLOGY

- Technology Needs Assessment and Financing Solutions for ASEAN Smart Cities 80  
*Venkatachalam Anbumozhi and Sivanappan Kumar, Bundit Lim, and KC Tay*
- Adaptability of ASEAN to Disruptive Technologies Driving Circular Low-carbon Economy in the Post-COVID-19 Era 82  
*Venkatachalam Anbumozhi, Xianbin Yao, Henry Wykes, and Kaliappa Kalirajan*

---

## Energy-related Research

## 13 | EFFECTIVE USE OF ENERGY

- Impact of COVID-19 on Financing the Low-carbon Energy Transition 85  
*Venkatachalam Anbumozhi, Fukunari Kimura, and Kaliappa Kalirajan*
- Analysis of East Asia Summit (EAS) Future Mobility Fuel Scenario Considering the Sustainable Use of Biofuels and Other Alternative Vehicle Fuels 87  
*Venkatachalam Anbumozhi, Shinichirou Morimoto, Nwong Chollacoop, and Shabir Gheewala*
- Public Acceptance of Nuclear Power for Optimised Use 89  
*Tomoko Murakami and Venkatachalam Anbumozhi*
- Small Modular Nuclear Reactor Deployment 91  
*Venkatachalam Anbumozhi, Tomoko Murakami, Kenji Kimura, Takehiro Iwata, Emiri Yokota, and Tomofumi Shibata*
- Applicability of Clean Coal Technology for Comprehensive and Optimal Carbon-neutral Solutions in ASEAN 93  
*Yamada Fumiko, Han Phoumin, Japan Coal Energy Center team,*
- Electricity Market Reforms in ASEAN, China, India, and Japan 95  
*Han Phoumin, Farhad Taghizadeh-Hesary, Fukunari Kimura, Rabindra Nepal, Ehsan Rasoulinezhad, Ali Hassan, Dayong Zhang, Chin-Hsien Yu, Xinghao Li, Sangeeta V. Sharma, Maxensius Tri Sambodo, Youngho Chang, Muhammad Mohsin, Sajid Iqbal, Muiy Yang, Deepak Sharma, Phouphet Kyophilavong, Inpaeng Sayvaya, Hadi Farabi Asl, Ariana Soemanto, Ervan Mohi, Muhammad Indra al Irsyad, Antonius Bintarto Ekoprasetyo, and Purwanto*



Collectives of Best Practices and Policies to Promote Carbon Capture, Utilisation, and Storage (CCUS) Development and Deployment: Policy Implications for ASEAN and East Asia <i>Han Phoumin, and Shigeru Kimura et al.</i>	97
Economic Analysis of Large-Scale Deployment of Solar Photovoltaic (PV) with Battery Storage in ASEAN <i>Han Phoumin, and Fukunari Kimura et al.</i>	99
Revisiting Electricity Market Reforms – Lessons for ASEAN and East Asia <i>Han Phoumin, Rabindra Nepal, Fukunari Kimura, Gazi Salah Uddin, Farhad Taghizadeh-Hesary, Anupama Sen, Tooraj Jamasb, Hammed Musibau, Thai Ha Le, Paul Simshauser, Ou Tang, Maziar Sahamkhadam, Muhammad Yahya, Pontus Cerin, Jakob Rehme, Anupam Datta, Sakib Amin, Gopal Sarangi, Xunpeng Shi, Keying Wang, Norasikin Ahmad Ludin, Fairuz Chahchuli, Norul Hamid, and Besma Glac</i>	101
Seeking for Best Power System Combined with Hydropower Generation system in Lao PDR <i>Shigeru Kimura, Alloysius Joko Purwanto, and Keisuke Ueda</i>	103
Strategic Oil Stockpiling in Myanmar <i>Tetsuo Morikawa, Shigeru Kimura and Han Phoumin</i>	104
Decarbonization of ASEAN energy systems toward net-zero emission scenarios <i>Shigeru Kimura, Han Phoumin, and A. Joko Purwanto</i>	105
Philippines Energy Efficiency Indicators of Commercial Buildings and Industrial Factories <i>Shigeru Kimura, Leong Siew Meng, and A. Joko Purwanto</i>	106
Study for Possibility of Promoting Quantitative Evaluation Indicators for Strengthening Energy Resilience in East Asia Region <i>Hiroki Kudo</i>	107
The Strategies of National Oil Companies (NOC) in South East Asia under Energy Transition <i>Ichiro Kutani</i>	109
Vehicle Technology Impact Assessment Model Development for Indonesia version 2.0 (VEIA-ID 2.0) <i>Alloysius Joko Purwanto and Dian Lutfiana</i>	110
Market Penetration Assessment of Biodiesel (B100) and Bioethanol (E100) as Road Transport Fuels in Indonesia <i>Alloysius Joko Purwanto and Dian Lutfiana</i>	111
Policies and Infrastructure Development for the Wider Penetration of Electric Vehicles (EVs) in ASEAN Countries <i>Naoko Doi and Alloysius Joko Purwanto</i>	112

Pathways for Developing Countries to Achieve Carbon Neutrality (T20 Policy Brief)	113
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*A. Joko Purwanto, Venkatachalam Anbumozhi, Dian Lutfiana, Citra Indah Nur Setyawati, Alin Halimatussadiah, Prof. Wing Thye Woo, Prof. Widodo Wahyu Purwanto*

Carbon Competitiveness of Economics	115
-------------------------------------	-----

*Takamine Akira, Kobayashi Yoshikazu, and The Institute of Energy Economics, Japan*

## 14 | INTERNATIONAL COOPERATION

Renewable Energy Transition in South Asia: The Role of Regional Energy Trade	116
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*Venkatachalam Anbumozhi, Saswata Chaudhury, Ritu Mathur, and Kamna Waghray*

Solar Supply Chain Development in the North East India and ASEAN	118
--	-----

*Venkatachalam Anbumozhi, Bhupendra Singh, V.G. R. Chandran, and K. Yamaguchi*

Preparation of Energy Outlook and Analysis of Energy Saving Potential in East Asia Region	120
---	-----

*Shigeru Kimura, Han Phoumin and Alloysius Joko Purwanto, 16 working group members from EAS 16 countries except Japan, ERIA, and IEEJ*

The Strategic and Economic Value of Joint Oil Stockpiling Arrangements for Middle East Exporters and ASEAN Importers	121
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*Tetsuo Morikawa*





# **Deepening Economic Integration**

## 01 Accelerating Digital Transformation in ASEAN and East Asia

*Lurong Chen*

### SUMMARY

The study will follow two main tracks: a tech track that focuses on technology adoption and a policy track that focuses on digital strategy and policy adopted by Asian countries. The tech track focuses on new information and communication technology and business models such as (i) artificial intelligence and machine learning, (ii) big data and cloud computing, (iii) Internet of Things, (iv) financial technology or fintech, (v) blockchains, (vi) social media, and (vii) servicification. Studies on each subject will include consideration of data flow, technology transfer, privacy protection, consumer protection, cybersecurity and intellectual property rights, and other related issues, particularly human skills development. The policy track monitors and accesses the policy effort to promote digital transformation in the region. The track will build a framework of policy analysis based on the policy checklists developed by the Organisation for Economic Co-operation and Development and the United Nations Conference on Trade and Development and the monitoring system used by the European Union, and then apply the framework to examine the digital strategies and policy plans of Asian countries.

### POLICY IMPLICATIONS

1. Policy instruments to overcome the barriers to using new technology and unlock its potential either nationally or regionally or both.
2. Actions to solve problems that may occur in digital transformation, and risk management to avoid failure that may come from directionality, demand articulation, policy coordination, or reflexivity.
3. A preliminary framework or a prototype of monitoring system on digital transformation in ASEAN and East Asia.
4. Market demands and policy response regarding human skills development for digitalisation, especially for developing economies in the region.

#### Geographic Scope

ASEAN Member States

## 02 Developing a Framework for Internet Health Metrics – Data Sourcing, Metrics, and Scoring System

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*Yurie Ito and Lurong Chen*

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### SUMMARY

The research project will build on the achievements of the first-phase study. It aims to further develop the framework for internet health metrics by addressing some areas of policy highlights.

Developing the scoring system will be a useful application of the metric framework. It will help policymakers and other users better understand key symptoms of unhealthiness/sickness in cyberspace, as well as their origins and potential risks. Particularly for developing countries, the scoring system could provide preliminary information on the country's internet health and be used as a reference to identify areas of capacity building to promote secured and sustainable digital infrastructure development.

CyberGreen plans to develop and maintain a prototype database and data platform to test the full workflow from data collection to scoring.

### POLICY IMPLICATIONS

The Internet Infrastructure Health Metrics Framework will allow ASEAN Member States (AMSs) to measure their overall risk, understand how it changes over time, and how it compares to one another. It helps AMSs evaluate consistent periodic measurements and provide decision support in managing cyber risk factors and developing rational, data-driven internet public health policies.

#### Partner Organisation

CyberGreen

#### Geographic Scope

ASEAN Member States

## 03 Digital Government and Online Public Services: A Booster for the Digital Economy

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*Lurong Chen*

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### SUMMARY

The project has a twofold objective. First, deeply examine the main viewpoints/arguments on key issues related to digital government that are currently under debate globally and provide insights on the implication of digital government to economic development based on economic analysis of the impacts of digital government to international trade, investment, and global value chains. Second, from the perspective of ASEAN and East Asia, explore the possibility and feasibility of combining the progress of digital government and the development of digital economy. It presents policy options with the list of priorities to promote digital government.

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### POLICY IMPLICATIONS

- a. Strategy and policy to facilitate adopting new tools, new models, and new trends in providing public service online
  - b. Policy instruments to overcome the barriers and unlock the potential of using digital government
  - c. Regional co-operation to improve the coverage and quality of region-wide online public service
- 

### Geographic Scope

ASEAN Plus Six countries

## 04 The EU-China Comprehensive Agreement on Investment: Lesson Learnt for Indonesia

*Lili Yan Ing and Junianto James Losari*

### SUMMARY

The European Union (EU) and China have recently reached an agreement: the EU-China Comprehensive Agreement on Investment (CAI). As one of the most recent investment agreements concluded by the EU, the paper aims to assess specific concessions made in the agreement, and provides lessons learnt for Indonesia on the ongoing negotiations of the Indonesia-EU free trade agreement, the Comprehensive Economic Partnership Agreement (IEU CEPA). The paper will present an overview of the main areas covered under the CAI, assess the potential impacts of the CAI on EU investment into Indonesia, and set out lessons that can be learnt from the CAI. This is a joint publication by ERIA and the Ministry of Trade of Indonesia.

15

### POLICY IMPLICATIONS

Presents an overview of the main areas covered under the CAI, assess the potential impacts of the CAI on EU investment into Indonesia, and set out lessons that can be learnt from the CAI.

#### Partner Organisation

Ministry of Trade of Indonesia

#### Geographic Scope

China, European Union, Indonesia

## 05 Financial Services Trade Liberalization in Indonesia: Policy Patterns and Economic Linkages

*Lili Yan Ing and Fauziah Zen*

### SUMMARY

This report has shown significant potential benefits for further liberalisation of financial services in Indonesia. At the moment, financial services in Indonesia are highly regulated, and a number of important barriers exist that can impede the entry of foreign financial services providers. A carefully executed liberalisation could imply economic

Based on the OECD Services Trade Restrictiveness Index (STRI), Indonesia is among the most restrictive economies in the Asia-Pacific region and South Asia in commercial banking and insurance services. benefits that materialise through reducing services trade costs and increased productivity in downstream industries.

The STRI is a regulatory database and a composite index that records and measures barriers to services trade across 22 services sectors and 50 economies globally.

Financial services providers can serve foreign markets in two main ways: through cross-border exports (Mode 1) or by establishing agencies, branches or subsidiaries in the host country (Mode 3).

In the case of Mode 1 services trade, financial institutes usually continue to be supervised by their home country regulators. Many emerging markets, including Indonesia, do not allow cross-border trade in most commercial banking or insurance activities, including lending, deposit-taking, life insurance and non-life insurance.

Mode 3 services trade is possible in Indonesia with some restrictions. For example, fully owned subsidiaries of foreign companies are not allowed in Indonesia, forcing most financial services companies that seek to enter the Indonesian market to initiate joint ventures with local companies. Other restrictions occur to the movement of natural persons, economic needs testing, and locations of the branches. Compared with other emerging economies, especially in Asia,



the restrictions in Indonesia mostly come from foreign entry barriers. Among favourable conditions in Indonesia's banking regulations are non-discriminatory taxes, transparent regulations, and granting due process to foreign providers.

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## POLICY IMPLICATIONS

A reform to close half of the gap to the best-performing country in each sector will reduce more than one-third of Indonesia's current level of regulatory restrictiveness to services trade. The impact is most pronounced in some sectors that are crucial inputs for other services and manufacturing activities. In the commercial banking sector, services trade costs could fall by almost 60%, while insurance services could benefit from more than 40% trade cost reductions. An exercise to see the impact of this further liberalisation on value-added per employee (productivity) indicates an increase of 8% on average in Indonesia's manufacturing sector. As one of the major industries in Indonesia, the textile industry is the most impacted industry, which is expected to experience the highest productivity gains (+14.5%).

Careful reform in these areas could significantly reduce the level of services trade costs in Indonesia, with beneficial spillover effects to downstream businesses and consumers. To protect the stability of Indonesia's financial sector, any reform efforts should proceed gradually and pay careful attention to potential vulnerabilities in the financial sector.

17

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### Partner Organisation

Trade in Services Division (TSD), OECD

### Geographic Scope

*Indonesia*

## 06 Local Content Requirements: Facilitation or Restriction

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*Lili Yan Ing, Gene Grossman, Mar Mellitz, Susan Stone, and others*

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### SUMMARY

Local content requirements (LCRs) are one of economic instruments used to protect infant domestic industry or create employment. But do they really work and achieve their goals? Some argue that East Asian-governed markets such as China, Japan, Republic of Korea, and Taiwan have successfully boosted their economies through export-oriented policies supported by LCR regulations. Do the data tell the real story?

Discussions on this issue will be documented in the 10 chapters of the book.

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### POLICY IMPLICATIONS

- Provides review of LCR policy and regulations
  - Economic analyses on the impacts of LCRs on Indonesia's exports and investment
- 

### Geographic Scope

Global with focus on Indonesia

## 07 Non-Tariff Measures in Australia, China, India, Japan, Korea, and New Zealand

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*Lili Yan Ing, Denise Penello Rial, Muhammad Riqzy Anandhika, Gracia Hadiwidjaja, and others*

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### SUMMARY

This report presents details of the NTM found to be applied in all six East Asian countries initially included in the Regional Comprehensive Economic Partnership (RCEP) negotiations: Australia, People's Republic of China, Republic of India, Japan, Republic of Korea, and New Zealand.

Results show that every country applies thousands of NTM, each of them affecting usually more than a hundred products (at tariff line disaggregation level). Most of the NTM fall in the SPS or TBT categories. This is also a pattern observed in the TRAINS global NTM database for other countries outside this region.

This report consists of eight chapters. Chapter 1 introduce the general concept of NTMs, including the classification we use in this report and the process of data collection and how the NTM database can be relevant in international trade discourses.

Chapter 2 discussing the region with overall views on trade in Australia, China, India, Japan, Republic of Korea and New Zealand. Of course, this chapter will necessarily discuss the countries on RCEP and ASEAN contexts, as well as key NTM statistics on individual countries.

Chapter 3 until 8 discuss the NTMs in Australia, China, India, Japan, Republic of Korea, and New Zealand. Some general statistics are shown to explaining the collected NTMs by the type, issuing agencies, product affected, and the number of measures affected, while authors also discussing relevant countries' specific issues.

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## POLICY IMPLICATIONS

Presents details of the NTM found to be applied in all six East Asian countries initially included in the Regional Comprehensive Economic Partnership (RCEP) negotiations: Australia, People's Republic of China, Republic of India, Japan, Republic of Korea, and New Zealand.

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### Partner Organisation

UNCTAD and Ministry of Trade of Indonesia

### Geographic Scope

Australia, China, India, Japan, Korean, and New Zealand

## 08 ERIA Research in RCEP (Phase 2): Understanding the Opportunities and Challenges

*Dionisius Narjoko and Shandre Thangavelu*

### SUMMARY

The project continues and builds on the earlier phase (ie. Phase 1) of a study on RCEP. Motivated by lack of knowledge about the value added of RCEP and the complexity in the modalities or mechanism of RCEP commitments, the Phase 1 aims at exploring the agreement, predicting the potential benefit from implementation of the agreement, outlining and discussing challenges, and identifying the areas of improvement, as well as of adjustment in respect to the post pandemic era.

The research is designed to have three key elements in respect to topics on RCEP, that is: (1) analytics, (2) database, and (3) monitoring measures/study. The first discusses key economic issues on and related to the implementation of the agreement. This has been started in the Phase 1 and will be continued in Phase 2.

It is important to state that monitoring element is built within the idea that ERIA shall be one of key institutions that regularly monitor the implementation of RCEP, consistent with the mandate given to the Institute as the 'think-tank' for the EAS process.

The second element has also been started in Phase 1, especially with the creation of the 'ADB-ERIA RCEP Services Commitment Database'. Information from this database has started to be used by a paper on services in Phase 1 of the project. Another database that the project would like to put within the project is the database of RCEP's ROO, which is the basis of also one paper in Phase 1 project. The third element is yet to be started fully although at this moment there is an effort to prepare for this by some work in firstly defining measures relevant for monitoring purpose. This activity will naturally increase over time along with the expected more intensive application of the commitments in RCEP.

Finally, the project is clearly relevant for the ASEAN and EAS process. As for Phase 1, the output of the project will contribute as ERIA deliverable to Cambodia's ASEAN Chairmanship 2022. Some output of the Phase 2 could be contributed as ERIA deliverable to Indonesia's ASEAN Chairmanship in 2023.

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## POLICY IMPLICATIONS

This research project is expected to improve our understanding about commitments under RCEP and the expected benefit as well as the challenges. For policy, the research is thus useful for the member states to continue the efforts to refine the commitments, as well as to constantly improve country level policy programs in attempt to help private sector to maximize the gain from the agreement.

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### Geographic Scope

ASEAN and EAS countries

## 09 Study on the Regional Comprehensive Economic Partnership (RCEP) from International Relations Perspectives

*Keita Oikawa, Fusanori Iwasaki, and Shujiro Urata*

### SUMMARY

Bilateral free trade agreements (FTAs) in ASEAN and the East Asia region began in the early 2000s and have been developing over the last 2 decades whilst multilateral and large-scale or mega FTAs were promoted in the late 2000s and the 2010s. One result of the regional economic integration process was the Regional Comprehensive Economic Partnership (RCEP), a mega FTA signed on 15 November 2020 amongst ASEAN Member States, Australia, China, Japan, the Republic of Korea, and New Zealand.

Why was the RCEP concept proposed? How was it negotiated? What are the characteristics of this mega regional economic integration initiative?

The project tries to understand these questions by adopting a holistic approach that analyses the history and negotiation process of RCEP to obtain lessons for policymakers dealing with future regional economic agreements. The project would also analyse the relationship with other mega-regional FTAs, particularly the Trans-Pacific Partnership, concerning promoting (or suppressing) the RCEP negotiations.

The project will cover the following themes: history of RCEP, ERIA's role for RCEP, RCEP with regards to the ASEAN community building and ASEAN centrality, RCEP and ASEAN dialogue partners, impact of RCEP on the other regions, future of RCEP, and expectations of RCEP.

### Geographic Scope

ASEAN, Australia, China, European Union, India, Japan, Republic of Korea, New Zealand, United States

## 13th ASEM Summit: Multilateral Cooperation for a Resilient, Sustainable, and Rules-based Future for Asia–Europe Meeting

Anita Prakash

### SUMMARY

The Asia–Europe Meeting (ASEM) is a unique cooperation initiative, with scope for transnational cooperation between member countries through regional and sub-regional activities. Since its inception in 1996, ASEM has played a key role as a forum for dialogue and cooperation in connecting Asia and Europe. ASEM is wide enough to accommodate global and intercontinental development priorities. And yet, it localises connectivity amongst member countries for partnerships for economic growth, trade and investment, quality infrastructure, skills development, education, sustainable development, and climate change. As the shadow of the COVID-19 pandemic holds sway in Europe and Asia, the hosting of the 13th ASEM in Cambodia assumes greater significance. This plenary study for Cambodia—the chair and host of the 13th ASEM Summit meeting—envisages an inclusive and prosperous growth pathway for the Asia–Europe region through multilateral cooperation and sustainable development.

Section 1 describes the concept, features, and plans with respect to Asia–Europe connectivity. Section 2 describes the most important links between Asia and Europe: trade, investment, and economy, highlighting the Asia–Europe region’s preparedness for the digital economy from institutional, infrastructure, and regulatory policy perspectives. Section 3 is devoted to human development issues of gender, youth, and labour mobility. Section 4 covers the sustainable development experiences in Asia and Europe, with particular attention to energy, water management, and sustainability in connectivity plans. Section 5 concludes the study and underlines the role of ASEM in supporting a multilateral order and moving towards a sustainable, inclusive, and prosperous Asia–Europe region.

The study brings together scholars and practitioners from Asia and Europe who have shared their academic and practical wisdom in their chapters. The deputy prime minister of Cambodia has acknowledged and approved the book.



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## Partner Organisation

The Royal Government of Cambodia's  
Ministry of Foreign Affairs, New Zealand  
Institute of Economic Research,  
International Trade Centre, Clingendael  
Institute, Friburg University, University of  
Lausanne, National University of Singapore,  
Ideacorp, Asian Vision Institute

## Geographic Scope

Asia, Europe

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## Related Publications

Prakash, A (ed) (2018), Brussels Report on Strengthening Asia Europe Connectivity : Drawing Synergy from Global Development and Governance Programmes. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/brussels-report-on-strengthening-asia-europe-connectivity-drawing-synergy-from-global-development-and-governance-programmes/>

Hawke, G., A. Prakash, W. Kemp, et al (2016), Asia-Europe Connectivity Vision 2025: Challenges and Opportunities. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/asia-europe-connectivity-vision-2025-challenges-and-opportunities/>

Prakash, A., M.O. Heijmans, W. Zweers, et al (2018), ASEM Connectivity Inventory. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/asean-connectivity-inventory/>



## 11 Regional Integration in Indo-Pacific: Connectivity, Cooperation, and New Supply Chain Linkages.

*Anita Prakash, and others from Pacific (Pacific Secretariat, New Zealand, EU, Hongkong, India, and Indonesia)*

### SUMMARY

In 2017, when the Economic Research Institute for ASEAN and East Asia (ERIA) developed the ASEAN Vision 2040, it was agreed that Asia-Pacific could not sufficiently represent current economic linkages in East Asia. Still, Indo-Pacific was not acceptable to many writers, as they believed it to represent security connotations, primarily led by the United States (US). The ASEAN Vision 2040 settled for the Indo-Asia-Pacific construct instead. However, in 2018, Japan's Prime Minister Shinzo Abe's speech at the UN's General Assembly changed the focus of economic linkages and cooperation in the region. Free and Open Indo-Pacific was emphasised as the platform of all economic cooperation and connectivity in the region and between Asia-Africa and Asia-Europe. The Quadrilateral Security Dialogue or Quad was revived, bringing in the US as a major economic partner whilst underplaying its security focus, and actively engaging Australia and India, with ASEAN in the centre for greater economic linkages amongst the partners.

ASEAN too has brought out its ASEAN Outlook on Indo-Pacific, which was endorsed by the East Asia Summit in 2019. The ASEAN Outlook on Indo-Pacific recognises ASEAN's centrality in the new architecture of Indo-Pacific. The reality, however, is that the Indo-Pacific region is an economic construct along the Indian Ocean, in which several alternate plans and groups of countries are working on their mutual relations and combined strengths. The new plans aim to create new or alternative supply chains or strengthen the existing ones to address changing political and economic realities in Asia, and to accommodate the partners' interests from outside Asia.

The Indo-Pacific region requires greater connectivity—both in infrastructure and institution—and investments to realise several connectivity plans and supply chain linkages proposed by member countries. The region is preparing for greater participation in the digital economy and must rapidly undertake digital transformation to remain engaged in the value chain of a more digitalised global economy.

The study will cover the economic interlinkages in the Indo-Pacific region, especially covering the active promotion by governments of the infrastructure connectivity plans, trade, and investment facilitation frameworks in the region, Australia–Japan– India, Australia–Japan–US, the Mekong Region, the Trilateral Highway, Asia Africa Growth Corridor, Masterplan on ASEAN Connectivity, and ASEAN Covid Recovery Framework, etc. The study will map the diverse connectivity plans and evolving supply chains in the region and with regions in Africa and the European Union, which contribute to the economic architecture in Indo-Pacific. The mapping exercise will bring out the interlinkages between apparently different plans and initiatives and draw out the underlying synergy in the Indo-Pacific architecture. The facilitating and leadership role of governments in realising trade and investments, development of capacities, and promoting new supply chain linkages will be especially examined as this approach is different from the organic evolution of connectivity, capacity, and supply chain linkages in Asia-Pacific since the 1970s. This mapping and taxonomy of the policy-led economic architecture in Indo-Pacific will be helpful in understanding the cooperation amongst governments for new developing economic linkages through infrastructure development, investments, governance of the new value chains, and participation in digital economy in the region.

Existing literature and data on connectivity, digital economy, and supply-chain integration in the region will be used to map the infrastructure plans and projects and economic integration in the region. Trade and investment data sourced from ASEAN, Asian Infrastructure Investment Bank, United Nations Economic and Social Commission for Asia and the Pacific, etc. will be analysed to project the changing dynamics in investments, infrastructure, and supply chains.

## POLICY IMPLICATIONS

Governments are taking a more proactive role in the economic and strategic aspects of the regional architecture. New alignments are taking place in the form of physical, institutional, and strategic cooperation for supply chain linkages and connectivity plans. Trade and investment patterns are undergoing change, especially with the arrival of the digital economy. The pandemic has especially especially when participating in the global digital economy. To accomplish this, the study will cover the emerging economic architecture and supply chain linkages amongst countries and regions in Indo-Pacific.

It will especially bring out policy certainty from governments, especially for joint partnerships and bilateral and trilateral cooperation for connectivity and supply chains, investments and infrastructure development, the blue economy, and governance of and participation in the

new digital economy. The study will delineate the international cooperation aspects of trade and investment and new pathways for development in Indo-Pacific.

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## Geographic Scope

Asia, European Union, Indo-Pacific, Oceania, Pacific, United States

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## Related Publications

Tay, S., S. Armstrong, P. Drysdale, P. Intal Jr. (eds) (2019), ASEAN Vision 2040 Volume II: Collective Leadership, ASEAN Centrality, and Strengthening the ASEAN Institutional Ecosystem. Jakarta: ERIA. Downloadable from: <https://www.eria.org/research/asean-vision-2040-volume-ii-collective-leadership-asean-centrality-and-strengthening-the-asean-institutional-ecosystem/>

Kimura, F., S. Umezaki, A. Prakash (eds) (2020), The India–Myanmar–Thailand Trilateral Highway and Its Possible Eastward Extension to Lao PDR, Cambodia and Vietnam: Challenges and Opportunities. ERIA Research Project Report 2020-02. Jakarta: ERIA. Downloadable from: <https://www.eria.org/research/the-india-myanmar-thailand-trilateral-highway-and-its-possible-eastward-extension-to-lao-pdr-cambodia-and-vietnam-challenges-and-opportunities/>

Prakash, A. (2018). Asia Africa Growth Corridor: Development Cooperation and Connectivity in the Indo-Pacific. ERIA Policy Brief 2018-03. Jakarta: ERIA. Downloadable from <https://www.eria.org/research/asia-africa-growth-corridor-development-cooperation-and-connectivity-in-the-indo-pacific/>



## 12 Global Trade and Recovery After COVID-19

*Paresh Narayan, Ha Thi Thanh Doan, Fukunari Kimura, and Shujiro Urata*

### SUMMARY

The COVID-19 pandemic has severely impacted world trade and is predicted to lead to the collapse of world trade at a magnitude greater than that caused by the global financial crisis in 2008, considered the greatest collapse since the Great Depression. The impact of the COVID-19 pandemic constitutes a demand and a supply shock whereas the 2008 crisis was mainly a demand shock.

Policies associated with the pandemic, particularly lockdowns, may have curbed its spread but at significant costs, including disconnections in global value chains (GVCs), widespread job losses, and significant declines in output across the various components of GVCs such as design, production, marketing, and distribution. The disruptions to GVCs are not surprising given that globalisation in trade has been such that the world is now closely interconnected through intermediate and final goods trade.

Whilst the negative impact of GVC disruption is widely discussed at the aggregate level, it is not extended evenly across regions, sectors, and firms. In Southeast Asian countries where international supply chains are prominent, early evidence has suggested robustness and resilience of the supply chains. Firms with diverse cross-country networks and strong ties with similar partners tend to be more resilient and to achieve growth amidst the pandemic. Nevertheless, the alteration of suppliers, customers, or production locations results in irreversible structural shifts of GVCs. The pandemic has pushed GVCs to become more diversified and more regionalised, with policymakers increasingly concerned about how to re-nationalise GVCs to prevent disruptions induced by events like the COVID-19 pandemic and build resilience and sustainability. The overall negative effect of the pandemic has seen ASEAN countries focusing more on creating jobs and sustaining recovery to revive economic growth after the pandemic. For instance, the Accelerated

COVID-19 Economic Support Workshop, held on 5 May 2021, focused on the theme 'Turning Adversity into Opportunity: ASEAN's Participation in Global Value Chains in a Post-COVID-19 World'. A common understanding amongst ASEAN and similar countries is that GVCs need to be better implemented to withstand future unprecedented shocks like the COVID-19 pandemic.

The COVID-19 pandemic has also increased geopolitical tensions between countries in their quest to achieve self-sufficiency amidst breakdowns in GVCs. For developing countries, such as the ASEAN countries, the disruption to GVCs, increase in geopolitical tensions, and massive decline in trade pose threats to their major sources of revenue to fund important projects and achieve the Sustainable Development Goals.

The research aims to understand (1) the impact of the COVID-19 pandemic on the changing trade and GVC landscape; (2) the effectiveness of policies in addressing effects of the COVID-19 pandemic on trade; (3) the role of international transportation in influencing GVCs and international trade; (4) the role of non-tariff measures, regulatory reform, and regulatory cooperation in facilitating international trade; (5) the evolution of digital trade and the role of multilateral trading system and regional cooperation in facilitating international trade; (5) how the COVID-19 pandemic shock has impacted the digital economy via the trade perspective; and (6) how trade wars fueled by geopolitical tensions affect international trade during the COVID-19 pandemic.

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## POLICY IMPLICATIONS

Policy recommendations to deal with the COVID-19 pandemic and similar extreme events for the ASEAN countries.

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### Partner Organisation

Monash University

### Geographic Scope

Global with focus on ASEAN

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### Related Publications

Todo, Y., K. Oikawa, M. Ambashi, F. Kimura, S. Urata (2021), Robustness and Resilience of Supply Chains During the COVID-19 Pandemic: Findings from a Questionnaire Survey on the Supply Chain Links of Firms in ASEAN and India. ERIA Discussion Paper 2021-40. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/database-and-programmes/robustness-and-resilience-of-supply-chains-during-the-covid-19-pandemic-findings-from-a-questionnaire-survey-on-the-supply-chain-links-of-firms-in-asean-and-india/>

## 13 Non-tariff Measures and Firms in the Global Value Chain

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*Ha Thi Thanh Doan*

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### SUMMARY

Tariff as a traditional trade policy tool has declined worldwide. However, the proliferation of non-tariff measures (NTMs) has raised concerns that these can be used as disguised trade barriers in place of tariffs. NTMs incur procedural costs and compliance costs for firms and can thus impede trade. This burden disproportionately affects small firms in developing countries, which often lack resources to comply with stringent requirements imposed by their developed counterparts. Research on trade impact of NTMs has evidence supporting the argument that NTMs restrict trade flows.

Lively policy debates at both national and international levels have dealt on how to tackle NTMs and whether these should be eliminated. Elimination, however, is not an option since NTMs serve legitimate purposes in many cases. NTMs such as sanitary and phytosanitary measures and technical barriers to trade are public policy tools to address market failures. Quality standards, for example, ensure health and safety for customers, protecting them from fraudulent and low-quality products.

Also, NTMs reduce the risk of information asymmetry, inducing higher demand for good-quality products. By shifting demand, NTMs can incentivise firms to invest in product and process innovation.

An important feature of the current trade landscape is the rapid expansion of global value chains (GVCs), where production stages are fragmented across borders. This highly connected production network emphasises the need for policy transparency and effectiveness since the impact of trade policy is transmitted along the supply chain. This interconnectedness has important implications for the design and implementation of regulations. On the one hand, the potential trade restrictiveness of NTMs can accumulate as intermediate inputs are traded across countries, hampering competitiveness of firms. A regulation favouring domestic producers in upstream sectors can hurt those in downstream sectors. Regulatory dissimilarity across countries further exacerbates the problem since multi-destination exporters have to conform with different sets of regulations. On the other hand, access to better inputs—thanks to the adoption of international

31

SUMMARY OF ERIA RESEARCH PROJECTS 2022

standards and better market opportunities for high-quality final products—could induce demand and, consequently, encourage quality upgrading and export of firms. As such, NTMs could play a non-trivial role in shaping production and investment decision of firms involved in GVCs.

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## POLICY IMPLICATIONS

This topic is important for at least two reasons. First, it relates to the discussion on trade facilitation and connectivity. How to engage firms, particularly small and medium-sized enterprises in developing countries, in GVCs is of great interest for policymakers. NTMs can affect the production decision of firms as both demand and supply shifters. Facing standards, firms will need to adjust quality, quantity, and prices of their final products and, as a consequence, their decision to import and export. So far, few studies have empirically addressed this issue.

Second, the prevalence of negative perceptions of NTMs as barrier leads to inappropriate approaches and interventions. A policy favouring firms in upstream sectors may have negative consequences for firms in downstream sectors. For effective policy design, it is necessary to have a proper understanding of both the pros and cons of NTMs, taking into consideration input–output linkages. Instead of the trade–concession approach, countries should consider streamlining NTMs as part of their national competitiveness agendas. The research can thus contribute to the policy debate in East Asia, where streamlining NTMs is one of the key priorities in the regional integration agenda.

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### Geographic Scope

East Asian countries

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### Related Publications

Doan, T. T. H., S. Rosenow (Eds) (2019). Non-Tariff Measures –An Update. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/non-tariff-measures--an-update/>

Non-Tariff Measures in Australia, China, India, Japan, New Zealand, and the Republic of Korea: Preliminary Findings (2020). Jakarta: UNCTAD, ERIA.

Downloadable from: <https://www.eria.org/publications/non-tariff-measures-in-australia-china-india-japan-new-zealand-and-the-republic-of-korea-preliminary-findings/>

Shepherd, B. (2021), Effective Rates of Protection in a World With Non-Tariff Measures and Supply Chains: Evidence from ASEAN. ERIA Discussion Paper 2021–27. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/effective-rates-of-protection-in-a-world-with-non-tariff-measures-and-supply-chains-evidence-from-asean/>



## 14 Impacts of COVID-19 on Indonesia's Trade

*Lili Yan Ing and Yessi Vadila*

### SUMMARY

The unprecedented shock caused by COVID-19 has significantly affected global trade. The global merchandise trade volume recorded its sharpest ever decline – 14.3% (qoq) in the second quarter (Q2) of 2020, resulting in an annual contraction of 9.2% in 2020. Indonesia –the largest economy in Southeast Asia– also experienced a sharp decline in trade. In 2020, the volume of Indonesia's exports and imports dropped by 11.3% and 6.6% year on year (yoy) respectively (Statistics Indonesia, 2021a). One important note is that even before the pandemic (since early 2018), Indonesia's exports declined at higher rates than its imports. The pandemic has magnified the issues.

This paper examines how COVID-19 affects Indonesia's trade. Section 2 reviews the impacts of the COVID-19 pandemic on world trade. Section 3 presents Indonesia's current trade. Section 4 presents empirical analyses on how COVID-19 affects Indonesia's exports and imports. Section 5 concludes.

This is a joint publication by ERIA and the Ministry of Trade of Indonesia.

### POLICY IMPLICATIONS

The findings can shed light on efforts to improve understanding of Indonesia's trade, and thus help to formulate appropriate targeted responses to improve Indonesia's trade performance

#### Partner Organisation

Ministry of Trade of Indonesia

#### Geographic Scope

Indonesia

## 15 Revision of the Institute of Developing Economies/Economic Research Institute for ASEAN and East Asia-Geographical Simulation Model (IDE/ERIA-GSM) Baseline Scenario for the New Normal and Re-examination of the Impact Analysis on ASEAN Economies

*Satoru Kumagai, Ruth Banomyong, Ikumo Isono, Takuma Matsuda, Kenmei Tsubota, Kazuhiro Nara, Toshitaka Gokan, Keola Souknilanh, and Kazunobu Hayakawa*

### SUMMARY

The full extent of the impact of the COVID-19 pandemic on the economy remains elusive, partly because of the ever-changing nature of the situation. Policy attempts to move to a new normal are underway in many countries, with many experts predicting that 2022 will be a turning point.

The project aims to revise the baseline scenario of the Institute of Developing Economies/Economic Research Institute for ASEAN and East Asia-Geographical Simulation Model (IDE/ERIA-GSM) with a view to initiating the new normal. It also re-estimates the impact of the pandemic on countries and regions around the world. IDE/ERIA-GSM is a computable general equilibrium model based on spatial economics jointly developed by ERIA and IDE since 2007 and used to analyse the economic effects of trade and transport facilitation measures (Kumagai et al. 2008).

In revising the baseline scenario, it is important to set out what the new normal will look like. For example, shipping, air transport, and logistics have been disrupted as of 2022, partly due to the COVID-19 pandemic, but also because the pandemic has brought to light existing structural problems in the industry before the pandemic. The effects of disruption caused by structural problems can be long-lasting and there is no guarantee that the situation will return to the previous state even after the COVID-19 pandemic.

Signs point to a changing urban structure caused by the pandemic, which ERIA will continue to analyse.

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## POLICY IMPLICATIONS

The revision of the IDE/ERIA-GSM baseline scenario is followed by a simulation analysis to be reflected in policy recommendations.

A comparison between the baseline scenario and the hypothetical scenario, in which the COVID-19 pandemic did not exist, will help identify what economic impacts would occur in ASEAN, which regions would be more severely affected, and which ASEAN countries would need to be focused on.

In the aftermath of the COVID-19 pandemic, infrastructure projects have been postponed to prevent the spread of the disease or to replace budgets. As analysed in the Comprehensive Asia Development Plan 3.0 (ERIA, forthcoming), ASEAN countries have shifted their attention to transport infrastructure projects such as rural infrastructure development, intra-city transport, and high-speed rail. The delay of these projects could have a negative impact on rural development.

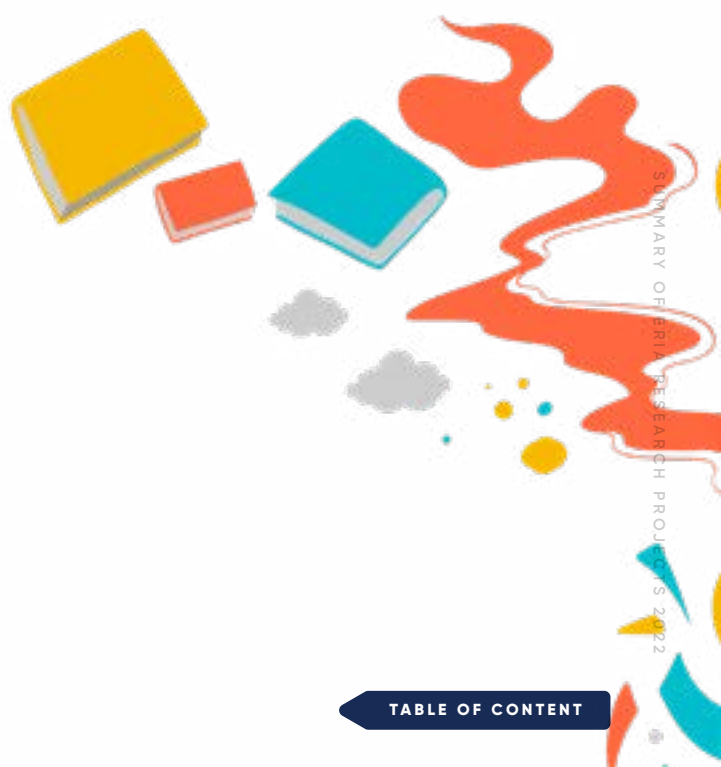
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### Partner Organisation

Institute of Developing Economies–Japan  
External Trade Organization

### Geographic Scope

Global with focus on East Asia



## 16 4th Phase of Global Value Chains, Urban Amenities and City Agglomerations: Structural Transformation and GVC Unbundling in East Asia

*Dionisius Narjoko and Shandre Thangavelu*

### SUMMARY

This project is the 4th phase of the research on the role of urban amenities in global value chains (GVC) and agglomeration. It builds and continues the previous research, expanding to explore other aspect or element of urban amenities in their role to strengthen or facilitates deeper and wider GVC and agglomeration.

As the basis analytical framework of this research, Glaeser et. al (2015) highlight the importance of cities to create urban networks that creates innovation and entrepreneurship to spur the economic growth. Urban networks, through urban amenities, increase the global economies of scale through innovation in services and global linkages, which in turn attract skilled workers to move and live in large and mega cities due to the higher returns from global urban networks.

The role of urban amenities becomes more important in East and Southeast Asia as economies in these regions are well connected through their networks of production along the GVC. In fact, some countries in these regions, especially the Southeast Asia ones, have started to move to the 3rd unbundling where has involved greater services and human capital in the part of the GVC.

The research in this phase (the Phase 4) is rather special as it is partly motivated by the COVID-19 pandemic and some uncertainties lingering the regions in how they manage IPN and GVC in the future, for the post-pandemic period. Countries in these regions are undergoing significant structural transformation in the GVC activities from the pandemic shock. The pandemic is expected to increase the intensification of digital technologies and level of urban agglomerations driven by communication and telecommunications technologies. For this reason, the Phase 4 focuses on the impact of urban amenities and agglomeration in attracting and creating innovative activities in services in terms of digital transformation, attracting skilled workers, driving creativity and entrepreneurship, and increasing the global and regional service linkages in the global production value chain.

It is expected that the digital transformation and urban networks and linkages will accelerate in the pandemic and post-pandemic recovery. Papers in this phase will be directed to address issues under these topics and in the context of post-pandemic, with a broad objective to learn how digital transformation and urban networks as well as linkages can evolve and/or be maximize to strengthen GVC-IPN in the future.

In addition to it, this phase also continues the research agenda of creating ERIA Urban Amenities Index. To this end, the research has created the index for major cities in the following countries: Indonesia, Vietnam, Korea, India, and China. The Phase 3 is undertaking more countries, namely Cambodia, Thailand, and Malaysia, albeit the work on these countries is likely to be extended throughout the 2022.

The Phase 4 study could be useful for ASEAN for its plan or strategy in responding to the pandemic.

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## **POLICY IMPLICATIONS**

The study is expected to provide insights on how to move forward with digital transformation in respect to aligning urban amenities as a factor of the growth in IPN-GVC especially in the context of post pandemic

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### **Geographic Scope**

East and Southeast Asia

## 17 Survey of the Impact of COVID-19 on Business Activities and Supply Chains in East Asia and the ASEAN Region

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*Keita Oikawa*

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### SUMMARY

The Economic Research Institute for ASEAN and East Asia (ERIA) conducted from November 2020 to February 2021 an extensive questionnaire survey of business associations. Done via the internet, the survey involved 1,789 firms that responded effectively, including local businesses, large and small and medium-sized enterprises, and multinational firms from ASEAN Member States (AMSs) and India. The survey showed that a significant number of firms had taken advantage of growth opportunities. Almost half of them saw positive sales growth in 2020 and more than half expect to increase employment in the next few years. One possible explanation is the resilient supply chains in the regions. The survey observed robust supply chain links and responses between the firms. Many firms responded quickly to the COVID-19 shock and reconstructed their customer and supplier relationships as well as production locations to a non-negligible degree. The geographic diversity of customers and suppliers creates resilience of supply chains, which results in higher performance in the long run.

### POLICY IMPLICATIONS

- The labour market should be flexible enough so that firms may employ the necessary workers and use the COVID-19 shock to improve their businesses.
- Promoting firms to invest in digital technology to enhance supply chain resilience is necessary to maintain and increase regional industrial competitiveness during and after the COVID-19 pandemic.
- Human resource development, particularly strengthening digital skills, is critical. Governments should provide firms, particularly small and medium-sized enterprises, with technical and financial assistance to enhance the digital skills of employees through education and training.

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#### Geographic Scope

ASEAN, India

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## Related Publications

K. Oikawa, Y. Todo, M. Ambashi, F. Kimura, and S. Urata (2021), *The Impact of COVID-19 on Business Activities and Supply Chains in the ASEAN Member States and India*. ERIA Discussion Paper 2021-17. Jakarta: ERIA

Downloadable from: <https://www.eria.org/uploads/media/discussion-papers/FY21/The-Impact-of-COVID-19-on-Business-Activities-and-Supply-Chains-in-the-ASEAN-Member-States-and-India.pdf>

K. Oikawa, Y. Todo, M. Ambashi, F. Kimura, and S. Urata (2021), *Economic Policies to take Advantage of the Vigorous Private Dynamism in AMS and India during the COVID-19 Crisis*. ERIA Policy Brief 2021-02. Jakarta: ERIA

Downloadable from: <https://www.eria.org/uploads/media/policy-brief/Economic-Policies-Vigorous-Private-Business-ASEAN-India-during-Covid-19.pdf>

Todo, Y., K. Oikawa, M. Ambashi, F. Kimura, S. Urata (2021), *Robustness and Resilience of Supply Chains During the COVID-19 Pandemic: Findings from a Questionnaire Survey on the Supply Chain Links of Firms in ASEAN and India*. ERIA Discussion Paper 2021-40. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/database-and-programmes/robustness-and-resilience-of-supply-chains-during-the-covid-19-pandemic-findings-from-a-questionnaire-survey-on-the-supply-chain-links-of-firms-in-asean-and-india/>

## 18 UK–ASEAN Trade: Strengthening the Supply Chain Linkages

*Anita Prakash, Alicia Garcia-Herrero, and David Martinez Terragano*

### SUMMARY

The Department of International Trade of the United Kingdom (UK) and the United Kingdom Mission to ASEAN requested the Economic Research Institute for ASEAN and East Asia (ERIA) to deliver this project. Its scope and objectives are developed jointly with ERIA.

The study assesses the resilience of supply chains before and during the COVID-19 pandemic and recommends the policy actions required to deepen the ASEAN–UK global value chain (GVC) integration and facilitate UK's greater participation in the Indo-Pacific economic architecture with ASEAN at the centre. The UK is looking towards greater integration into Asia and playing a significant role in the emerging economic architecture in the Indo-Pacific in which ASEAN has a central role. Towards this, the study contributes to understand the performance and resilience of supply chains in ASEAN during the COVID-19 pandemic, implement the expansion and deepening of the UK–ASEAN trade and investment relationship, and deepen integration with the goods and services value chains in ASEAN and East Asia.

Through these, the UK will also support ASEAN's strategy for strengthening its economic resilience in the post-COVID-19 recovery and rebuilding.

As the UK is now a dialogue partner of ASEAN, it will be important from a partnership perspective to work on their current strengths as well as address the gaps in the supply chain linkages. The study has drawn evidence from existing ERIA research projects and survey on supply chains. Authors from Asia and the Pacific and Europe who specialise in the study of supply chains in East Asia and between Asia and Europe have contributed in developing the study. The ERIA survey on supply chains in ASEAN especially complements the study by covering operations of UK firms in ASEAN during the COVID-19 period.

The research covers the ASEAN and UK–ASEAN trade scenario and key ASEAN supply chains industries, including, but not limited to, healthcare, agriculture and agritech, digital trade, and green development and manufacturing.

The results of the study were reported to the UK–ASEAN Economic Ministers Meeting in August 2021.



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## POLICY IMPLICATIONS

The research analyses current UK–ASEAN trade integration and GVC performance and recommends policy actions for deeper integration in goods trade and expansion of services trade, including regional free trade agreements. The research results were reported to the UK–ASEAN Economic Ministers meeting in 2021, the Brunei Chair of ASEAN, and other ASEAN Member States to analyse trade within ASEAN and between ASEAN and the UK to establish where supply chains have been resilient, areas which require policy and resource support, and how to build supply networks in the post-COVID-19 economic recovery. The results will help strengthen and expand UK–ASEAN trade relations.

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### Partner Organisation

Economic Research Institute for ASEAN and East Asia; The United Kingdom Mission to ASEAN; Department of International Trade, UK; Foreign Commonwealth and Development Office, UK; and ASEAN Secretariat

### Geographic Scope

ASEAN, East Asia, the Indo-Pacific, United Kingdom

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### Related Publications

Aggarwal, R., Q. Chaudry, A. Prakash, M. Saeed, E. Salluzzi (eds) (2019), *Asia–Europe Economic Connectivity: Global Value Chain Structures in ASEM Region*. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/asia-europe-economic-connectivity-global-value-chain-structures-in-asean-region/>

Shepherd, B., A. Prakash (2021), *Global Value Chains and Investments: Changing Dynamics in Asia*. ERIA Research Project Report 2021-01. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/global-value-chains-and-investment-changing-dynamics-in-asia/>

## 19 Reconnecting ASEAN: An Assessment of the Pandemic Effects and Policy Response on Connectivity

*Fauziah Zen, Ruth Banomyong, Trinh TT Huong, Ibrahim K. Rohman, Jun Jie Woo, Hidekazu Ito, and Suhaiza Zailani*

### SUMMARY

The COVID-19 pandemic hits hard the world, including East Asia. The Asian leaders have budgeted more than \$200 million for fiscal support to contain the pandemic and save the economy (EIU data, retrieved 2 January 2021). But the uncertainty is still high. The pandemic mainly hurts the economy, not through its direct effects on infected people's health status but on the pandemic's responses. Some industries are hit harder by the pandemic than others, especially air transportation, accommodation and food services, performing arts and sport, and education services. In an intently connected region, such as Southeast Asia, abrupt declines in these industries bring multiplier effects to the whole economy. Airlines passengers dropped by 80% to 100%, and according to WTTC's baseline scenario, over 121 million jobs will be impacted in the global Travel & Tourism sector, with a loss of \$3.4 trillion in global GDP<sup>5</sup>. Both differences and similarities of the ASEAN member states' economic stress call for closer cooperation than ever. This study aims to answer what types of cooperation urgently needed for ASEAN to save its economy and speed up the recovery process. The study also refers to the ASEAN Comprehensive Recovery Framework (ASEAN CRF), adopted in the 37th ASEAN Summit<sup>6</sup>. The first of ASEAN CRF's key principles is to focus on the relevant programs which need to be prioritized, accelerated, or highlighted. In line with this principle, this study will focus on ASEAN's connectivity aspects during the pandemic and estimate the post-pandemic situation.

Three focus areas are transport, trade, and e-commerce (TTeC) which are crucial in the region's connectivity. The pandemic effects on transport and shipping are severe in the assessed countries. The domino effects from disrupted shipping has disorganized the distribution of global cargo, leading to imbalanced cargo supply with many Asian countries experience supply shortages. Air transportation, together with tourism industry, are among the hardest sectors hit by the pandemic with sharp declines of all airline passengers globally. On contrary, e-commerce experience a booming transaction, due to sharp reduction of off-line shopping, diversion from other household expenses, and the increasing support from e-commerce platforms.

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## POLICY IMPLICATIONS

AMSs shall work together to overcome the challenges.

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### Geographic Scope

Indonesia, Japan, Malaysia, Singapore, Thailand, Viet Nam



# **Narrowing Development Gaps**

## 20 Enhancing Food Supply Chain Resilience and Food Security in ASEAN with Utilisation of Digital Technologies

*Masanori Kozono, Venkatachalam Anbumozhi, Deepayan Debnath, Suresh Babu, Meinhard Breiling, Eiji Yamaji, Sundaram Gunasekara, Paul P.S. Teng and, Montesclaros Jose Ma Luis Pangalangan*

### SUMMARY

Although COVID-19 pandemic negatively affected ASEAN's agriculture and food supply chains to some extent, it also accelerated digital transformation of agriculture and food systems in ASEAN, which lead to enhancing the resilience of food production systems and modernizing agriculture. Firstly, this study examines the impact of COVID-19 on ASEAN food security through scenario analysis. Also, the current situation of the utilization of digital technology in ASEAN agriculture and food supply chains is revealed through questionnaire and interview surveys, and the future direction is shown. In addition, the study examined the advanced cases in Europe, Japan and the United States regarding application of digital technology in agriculture as well as government initiatives to promote digitalization of agriculture, which can be transferrable to ASEAN.

By organising knowledge sharing workshops, this study supported development of the ASEAN Guidelines on Promoting the Utilization of Digital Technologies for ASEAN Food and Agricultural Sector in a participatory way. The guidelines was endorsed by the ASEAN Ministers of Agriculture and Forestry.

### POLICY IMPLICATIONS

- Critical reflections on the imperatives of digital technology transformation of ASEAN Member States in support of supply chain resilience and associated policy recommendation towards enhanced food security.
- ASEAN guidelines on futuristic public policy reforms, strategic vision and best practice –for effective utilisation of digital technologies in food and agriculture sector

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### Partner Organisation

University of Missouri, University of Technology, Wien, University of Tokyo, University of Wisconsin, Nanyang Technological University, Southeast Asian Regional Center for Graduate Study and Research in Agriculture, ASEAN Secretariat

### Geographic Scope

Europe, Japan, Southeast Asia, the United States

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### Related Publications

V. Anbumozhi, F. Kimura, S. M. Thangavelu (2020). *Supply Chain Resilience. Reducing Vulnerability to Economic Shocks, Financial Crises, and Natural Disasters*. Singapore: Springer

## 21 Health and Long-term Care Information in Ageing Asia

*Reiko Hayashi, Takuma Kato, Toru Suzuki, Katsuhisa Kojima, Yoshimi Chitose, Masataka Nakagawa, Ruoyan Gai, Keita Suga, Ryo Oizumi, Yukiko Senda, Zhenzhen Zheng, Ting Feng, Do Hoon Kim, Lolito R.Tacardon, Halimah Awang, Nur Fakhri Ab Rashid, Luong Quang Dang, Khaing Khaing Soe, and Nyi Nyi U*

### SUMMARY

The 2018 ERIA research project, Demand and Supply of Long-term Care for the Older Persons in Asia, conducted by the same research team of this study, clarified the situation of long-term care demand and supply in East Asia and Southeast Asia using mainly population census data for international comparison. Based on the research, this new project has been conducted with a wider scope of target countries stretching across all areas of Asia, including India, Iran, Sri Lanka, and other countries in South-Central and Western Asia, to see if the experience of East Asia and Southeast Asia is relevant to countries in Asia in general.

This report focuses on tracking cause-of-death statistics as they are crucial in monitoring health and important in calculating Sustainable Development Goal (SDG) indicators. However, cause-of-death statistics in Asia are often insufficient. Even amongst registered deaths, causes of death are not properly stated and compiled.

The project has been conducted to find solutions by listing and comparing health statistics systems of target countries.

According to widely accepted epidemiological transition theory, causes of death should shift from communicable to non-communicable diseases as society develops. In 2019, data showed that ASEAN+3 were already post-transition countries in contrast with many low-income countries in other regions, especially Africa, where most deaths were caused by communicable, maternal, perinatal, and nutritional conditions. It means that the burden of non-communicable diseases is increasing in ASEAN and other Asian countries.

Meanwhile, communicable diseases have not been eradicated even in high-income countries. In 2019, a large percentage of communicable diseases was

attributed to respiratory infections, including pneumonia, one of the significant causes of death of older persons. In addition, the COVID-19 pandemic started in 2020, raising the number of deaths caused by communicable diseases.

Death registration and statistical procedures are inherent to each country and it is essential to know the original data collected by the country authority. The paper is expected to offer baseline knowledge to tackle these challenges.

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## POLICY IMPLICATIONS

Compile existing evidence on health and long-term care demand and supply by comparing objective statistics. The data will be disseminated and be referred to by policymakers.

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### Partner Organisation

Department of International Research and Cooperation, National Institute of Population and Social Security Research

### Geographic Scope

Brunei Darussalam, Cambodia, China, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam  
Census only: In addition to the above, Armenia, India, Iran, Jordan, Kyrgyzstan, Mongolia, Nepal, State of Palestine, Sri Lanka, and Turkey

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### Related Publications

Hayashi, R. (2018). *Demand and Supply of Long-term Care For Older Persons in Asia*. ERIA Research Project Report 2018-8. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/demand-and-supply-of-long-term-care-for-older-persons-in-asia/>



## 22 Resilient Long-term Care for the Elderly Under the COVID-19 Pandemic

*Takeo Ogawa, Takuma Kato, Katsuhiko Kikuchi, Hiromi Kinebuchi, Shun Ohno, Tri Bud Rahardjo, Susiana Nugraha, and Kaysorn Sumpowthong*

### SUMMARY

The COVID-19 disease disproportionately affects older people in terms of severity and mortality, with hospitals and long-term care (LTC) facilities reported to be transmission hotspots of this disease. Clusters of COVID-19 cases have emerged in LTC facilities and the death toll caused by the virus in these facilities cannot be ignored even if deaths have recently decreased because of strengthened health protocols.

With the most aged population in the world, Japan has the disadvantage in controlling this infectious disease, although it has not seen disastrous spread of the COVID-19 virus or high mortality in its LTC facilities compared with other countries in Europe and the United States, which also have a high proportion of older people.

LTC providers in Japan are developing resilience as a business continuity plan in the midst of the COVID-19 pandemic. In the study, management of the physical infrastructure and human relations is an element in designing a plan that conforms to international standards.

In ASEAN countries where care for the elderly is often entrusted to families and communities, mass infections in LTC facilities may not be visible. But with their ageing populations, ASEAN countries must develop resilience against infectious diseases in the near future and develop LTC facilities.

The study focuses on two aspects: management and operation of physical infrastructure such as LTC facilities and management and operation of human relations such as amongst residents, working people, and visitors.

The study also aims to evaluate how the resilience of LTC for the elderly against infectious diseases has been realised in Japan, and to design and shift it as a training module that can be widely utilised for Asian countries.

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## POLICY IMPLICATIONS

Collect reports from Indonesia, Japan, and Thailand about the impact of COVID-19 on LTC facilities and potential cross-border care workers.

Recommend policies to protect older people from infectious diseases, suggest business continuity plans for LTC providers regarding unexpected disasters, and offer tips for self-care of healthcare workers.

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### Partner Organisation

Keishin Gakuen

### Geographic Scope

Indonesia, Japan, and Thailand

## 23 An Agent of Care Technology Transfer: Trends and Challenges of Migration of Care Workers Across Borders

*Yuko Hirano, Osuke Komazawa, Tri Budi W Rahardjo, Susiana Nugraha, Misako Higashijima, Shun Ohno, Kunio Tsubota, Reiko Ogawa, Yasuhiro Shiozu, Yoichi Hiruma, Yukari Amano, Ryota Endo, and Yuzurihara Kazuma*

### SUMMARY

Circulation of long-term care workforce is one of the most important agendas of the Asia Health and Wellbeing Initiative. It was launched by Japan to promote regional cooperation to create vibrant and healthy societies where people can enjoy long and productive lives.

Japan has opened its labour market for healthcare industries under bilateral economic partnership agreements to accelerate Japan's trade with Indonesia, the Philippines, and Viet Nam. Since Japan's signing of the agreement with Indonesia in 2008, with the Philippines in 2009, and with Viet Nam in 2014, Japan has accepted thousands of nurses and care workers from these countries. Of these, approximately 400 nurses and 1,000 care workers have passed the national exam for nursing care workers to become full licensees in Japan and thus may stay and work without restrictions. Those who fail the exam must return to their home countries.

In recent years, the Japanese government has created several new programmes to accept foreign care workers. To make these programmes mutually beneficial to Japan and the sending countries, it is crucial to discuss how such cross-border care workers can be utilised in their home countries. However, as the authors have learnt from the experiences of Economic Partnership Agreement programme returnees, care workers have no career path in their home countries. A well-organised career recognition system for care workers is required if countries are to maximise the knowledge and skills that returned care workers bring. This will also improve the social and economic status of care workers in many Asian countries who have a crucial role in creating societies where people can enjoy active, healthy, and productive ageing. The project aims to develop a training programme for oral care and swallowing function rehabilitation, which can be used for pre-departure training of potential cross-border care workers. The study also aims to contribute to the education of healthcare workers in the sending countries, where rapid population ageing is taking place.

51

SUMMARY OF ERIA RESEARCH PROJECTS 2022

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## POLICY IMPLICATIONS

Provide an example of effective circulation of care workers and contribute to the standardisation of care skills.

Provide suggestions for labour-market policymaking for long-term care in the region.

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### Geographic Scope

Indonesia, Japan, and Viet Nam

## 24 Comparison of Clinical Trials Regulatory Framework in ASEAN Countries: A Systematic Review

*Antonio Villanueva, Marlinang Siburian, Maria Ruriko Umano Urbiztondo, Nattha Kerdsakundee, Tatsuo Iiyama, Takuma Kato, Narufumi Suganuma*

### SUMMARY

Southeast Asia with its growing economy, large patient pool, and landscape of attractive diseases has made it a favorable destination for other countries of higher income to implement their investigations. Regulatory harmonisation can help the region to keep up with the more advanced regions and to enable mutual acceptance of clinical data by regulatory authorities of different regions. For this purpose ASEAN has made the effort to facilitate international studies and to standardize the conduct of clinical research to follow international standards such as the International Conference on Harmonization (ICH) guidelines for clinical research by the issuance of the ASEAN Common Technical Dossier (ACTD) for medicines and ASEAN Common Technical Requirements (ACTR) for medical devices. Nevertheless, there is still unequal growth in the clinical research among the countries within the region albeit the harmonization that has been approved on paper. This study aims to identify some of the uniquenesses in the regulatory framework for the conduct of clinical trials in several ASEAN Member States. Among the characteristics that will be identified include the dossiers, regulatory structures, import-export requirements, foreign investment policy, and timeline. Information will be extracted from published journals and documents from local languages. Furthermore, the effects of the varying frameworks to the number of approved applications from local and overseas applicants in each respective country will be compared. The result of the study will be useful as reference for the improvement of regulatory implementations in each country and the region.

### POLICY IMPLICATIONS

Recommendations that can streamline the operations and management of multi-regional clinical trials in the region will have a direct impact on healthcare and health market expectations since the regulatory authority in each country ultimately approves of products that enter its health investigations and health market.

#### Partner Organisation

National Center for Global Health and Medicine, Kochi University

#### Geographic Scope

ASEAN Member States (Indonesia, Malaysia, the Philippines, Thailand, Singapore)

## 25 Health Economics Alternatives for Safe Travel

*Antonio Villanueva, Regina Berba, Kulkanya Chokephaibulkit, Septelia Inawati, Adeeba Kamarulzaman, Vivi Lisdawati, Norio Ohmagari, and Pauly Ubial,*

### SUMMARY

Throughout the pandemic, the RT-PCR nasopharyngeal swab test and COVID-19 vaccines have been required globally to identify the SARS-CoV-2 virus at many ports of entry and exit, in order to travel. Although safe and effective alternatives are available, these requirements have been retained in some regions including Southeast Asia. Among the alternatives, rapid antigen-antibody tests have been proposed. However, the target phase of the disease differs from RT-PCR swab which can identify the virus during the early presymptomatic phase while antigen tests generally identify symptomatic individuals only, and antibodies are detected at even later phases.

Nevertheless, there is another RT-PCR test, the saliva test, which is similar to the RT-PCR swab because it can identify the virus genetically yet produces results swiftly with minimal logistic requirements, less exposure to the healthcare personnel, and most significantly at half the cost. Moreover, diagnostic trials have shown its sensitivity and specificity to be almost at par with the RT-PCR swab test.

This policy paper does not suggest that the saliva test can replace the swab, but rather proposes that the RT-PCR saliva test can substitute for the RT-PCR swab throughout Southeast Asian ports of entry and exit, and further discusses the option of natural immunity as evidenced from medical certificates as a substitute for the popular vaccine card. Emphasized alongside other alternatives, these measures can balance health and economy more effectively and efficiently, and their underlying principles should be taken into consideration more seriously in future pandemics.

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## POLICY IMPLICATIONS

Recommendations will establish public health policy alternatives for safe travel while balancing health and economy.

Recommendations may further explore the capacity of developing Member States to integrate such medical devices into their healthcare systems and health markets.

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### Partner Organisation

Mahidol University, National Center for Global Health and Medicine, Red Cross Philippines, RSPI Sulianti Saroso, Universiti Malaya, University of Indonesia-Jakarta, University of the Philippines-Manila

### Geographic Scope

ERIA Member States, in particular Indonesia, Japan, Malaysia, the Philippines, Thailand

## 26 Needs of Multi-Regional Clinical Trials in Southeast Asia

*Antonio Villanueva, Kulkanya Chokeyhaibulkit, Tatsuo Iiyama, Adeeba Kamarulzaman, Nattha Kerdusakundee, Sifa Muchanga, Benjamin Sablan, Marlinang Siburian, and John Mark Velasco*

### SUMMARY

Quality health data from clinical trials is used as evidence for creating proper healthcare policies. Therefore, the clinical trial must follow medical and regulatory mandates and guidelines. Because of international trade and standards created by global institutions such as the World Health Organisation, the International Council on Harmonisation, and the International Standards Organisation, such investigational studies have grown into multi-regional clinical trials (MRCTs). Such MRCTs determine the efficacy and safety of medicines, medical devices, and vaccines, as well as healthcare systems.

More so evident during the pandemic, however, were quite a number of obstacles in MRCT operations and management, in particular Southeast Asia. Experts from various ERIA Member States discuss their experiences with these obstacles, including the clinical trial planning stage, implementation on site, collection of data, and reporting.

### POLICY IMPLICATIONS

Implementing recommendations on how to better streamline MRCTs within ERIA Member States should facilitate the production of quality evidence which in turn decreases the difficulties in entering the developing health markets of Southeast Asia.

#### Partner Organisation

ARISE, Mahidol University Siriraj Institute for Clinical Research, National Center for Global Health and Medicine Department of International Trials, Universiti Malaya, University of Indonesia Institute of Medical Education and Research, University of the Philippines National Institutes of Health National Clinical Trials and Translation Center

#### Geographic Scope

ERIA Member States, in particular Cambodia, Indonesia, Japan, Malaysia, the Philippines, Thailand

#### Related Publications

COVID-19 Pandemic Best Policy Strategies: Balancing Health and Economy  
<https://www.eria.org/news-and-views/covid-19-pandemic-best-policy-strategies-balancing-health-and-economy-part-1/>



## 27 Pandemic Best Practices: Balancing Health & Economy

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ERIA Healthcare Unit

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### SUMMARY

Because of the demands by several ERIA Member States to share regional observations of pandemic best practices and the fact that the COVID-19 pandemic is reaching its end, this virtual conference, the first of its kind in the region, will invite experts from this year's ASEAN chair and hard-hit Member States to share what they believe have become best practices toward balancing health and economy. Experts have thus been invited from Australia, Cambodia, India, Indonesia, Japan, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam. Articles, Op-Eds, and academic publications (commentaries) are expected to arise from the presentations.

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### POLICY IMPLICATIONS

Recommendations for best practices to better prepare against upcoming pandemics, not only beneficial within the region but also outside, especially for developing economies across the globe.

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#### Partner Organisation

Ministries of Health and COVID-19 Task  
Forces of selected ERIA Member States

#### GEOGRAPHIC SCOPE

ERIA Member States

57

## 28 Quality and Characteristics of Randomized Clinical Trials in ASEAN Countries

*Antonio Villanueva, Marlinang Siburian, Sifa Marie-Joelle Muchanga, Tatsuo Iiyama, Takuma Kato, and Narufumi Suganuma*

### SUMMARY

The South East Asia region has made effort to facilitate international study and to standardize the conduct of clinical research to follow international standards such as the International Conference on Harmonization (ICH) guidelines for clinical research by the issuance of the ASEAN Common Technical Dossier (ACTD) and ASEAN Common Technical Requirements (ACTR). A randomized clinical trial (RCT) is a clinical research that provides a high level of evidence for safety and efficacy and is generally required to gain authority approval. There is limited information on the quality of Randomized Clinical Trials (RCTs) conducted within the ASEAN region.

In this study, data will be extracted from databases of published peer-reviewed literatures such as MEDLINE, EMBASE, OVID or ATHENS, etc.

The inclusion criteria are:

1. report of clinical research involving only ASEAN countries from 2010–2021
2. published in English.

Search keywords will include clinical trials, randomized, clinical research, name of ASEAN countries and the period 2010–2021. Randomly selected RCTs will be analyzed using the Cochrane risk of bias tool. The RCTs will then be classified into high risk of bias, medium risk of bias, and low risk of bias. Characteristics of RCTs including type of disease, type of intervention, target population, sample size, study design, type of comparisons/controls, sponsor, funding source, and countries involved, will be identified. Logistic regression analysis will be used to identify which characteristics are associated with the quality of RCTs.

Understanding the quality and characteristics of RCTs in the ASEAN region could serve as good reference toward the improvement of its conduct and for sponsors to bring their trials into the region.

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## POLICY IMPLICATIONS

Recommendations made can enhance the quality of data from clinical research and trials in the region, which can thus improve evidence-based policies that can more directly impact healthcare and the regional health markets.

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### Partner Organisation

National Center for Global Health and  
Medicine, Kochi University

### Geographic Scope

ASEAN Member States plus  
(Brunei Darussalam), Cambodia, Indonesia,  
Lao, Malaysia, Myanmar,  
the Philippines, Singapore, Thailand, Timor  
Leste, Viet Nam

## 29 Support for Southeast Asian Multi-Regional Clinical Trial Network (Indonesia, the Philippines, Thailand, Viet Nam)

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*Antonio Villanueva, Tatsuo Iiyama, Takuma Kato, and Asuka Nagatani*

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### SUMMARY

Starting from its birth in 2016, the National Center for Global Health and Medicine (NCGM) Center for Clinical Studies' Department of International Trials has grown into the center of a regional network that has reached beyond ASEAN and East Asian countries in order to learn, share, and carry out quality multi-regional clinical trials. Currently, for the region, its focus is on maintaining satellite offices in the University of Indonesia, University of the Philippines National Institutes of Health, Thailand's Mahidol University Siriraj Hospital, and Viet Nam's Bach Mai Hospital. Although these satellites have already been established, through a Memorandum of Understanding with NCGM, ERIA can provide support while having access to these satellites. Particularly during the pandemic, the satellites proved worthwhile for country representatives to be able to monitor research and other activities in each country.

### POLICY IMPLICATIONS

Recommendations will be made on how specific support efforts, especially during pandemics, can enhance the quality of multi-regional clinical trials in the region and thus the quality of data being used as evidence by regulatory authorities ... which have a direct impact on healthcare and health market expectations.

#### Partner Organisation

National Center for Global Health and Medicine, Bach Mai Hospital, Mahidol University, University of Indonesia, University of the Philippines

#### Geographic Scope

ASEAN Member States, in particular Indonesia, the Philippines, Thailand, Viet Nam

# 30 Support for Southeast Asian Multi-Regional Clinical Trialists Capacity Building (Cambodia)

Antonio Villanueva, Tatsuo Iiyama, Takuma Kato, and Asuka Nagatani

## SUMMARY

Hand-in-hand with streamlining operations and management of multi-regional clinical trials in ERIA Member States toward the production of quality data that can be used as evidence by regulatory authorities who approve of medicines and medical devices entering their respective markets, capacity building of the clinical trialists is part and parcel of assuring quality results. Aside from academic and vocational knowledge of good clinical practice, hands-on experience is necessary to imbibe the requirements of good clinical trials. Several years ago, the National Center for Global Health and Medicine Center for Clinical Studies' Department of International Trials began hosting such training for Southeast Asian delegates in Tokyo. Held every January, pre-pandemic sessions expanded to include Osaka University's International Trial Center as a co-host, and delegates from Africa (the Democratic Republic of the Congo) were added to those from Indonesia, the Philippines, Thailand, and Viet Nam. Through a Memorandum of Understanding between NCGM and ERIA, ERIA would like to support the continuation of these capacity building efforts by extending support for ASEAN chair delegates annually. In other words, if the training proceeds in January 2023, the additional delegates would be selected from Cambodia.

## POLICY IMPLICATIONS

Recommendations will be made on how specific support efforts, in particular capacity building of Southeast Asian clinical trialists, can enhance the quality of multi-regional clinical trials in the region and thus the quality of data being used as evidence by regulatory authorities ... which have a direct impact on healthcare and health market expectations.

### Partner Organisation

National Center for Global Health and Medicine

### Geographic Scope

ASEAN Member States, in particular Cambodia, Japan

## 31 Development of Small and Medium-sized Enterprises (SMEs) in Eastern Indonesia

*Lili Yan Ing, Anika Widiana, Ben Shepherd, and others*

### SUMMARY

The COVID-19 pandemic has hit the Indonesian economy across sectors, particularly micro, small, and medium-sized enterprises (MSMEs). MSMEs contribute 63% of Indonesia's gross domestic product and absorb 93% of employment. The COVID-19 pandemic is the worst crisis in Indonesia's modern era and its impact on MSMEs can become a threat to the national economy. For the Indonesian government, the next 3 years are crucial to putting the economy back on the right track of development, with particular focus on the development of Eastern Indonesia: West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Maluku, and Papua. The selection of these regions is based on the government's development priorities in the tourism sector in Eastern Indonesia, where the creative industry is also a priority as it is an inseparable part of tourist attractions.

The study aims to identify and map the obstacles and potentials of Eastern Indonesia and provide insights to the central government and local governments to promote investment and accelerate the development of Eastern Indonesia.

### POLICY IMPLICATIONS

Provides inputs to the policymaking process of the Government of Indonesia in fostering the development of MSMEs, especially in Eastern Indonesia.

#### Partner Organisation

Indonesia Service Dialogue Council, Ministry of Trade, Coordinating Ministry for Maritime and Investment Affairs

#### Geographic Scope

Indonesia (Eastern Indonesia)

## 32 The Participation of Micro, Small and Medium Enterprises in ASEAN's Digital Economy

*Dionisius Narjoko and Cassey Lee*

### SUMMARY

Micro, small and medium enterprises (MSMEs) accounts for more than 90% of total enterprises in ASEAN countries. About 70% of total employment in the region is provided by MSMEs. In cognizance of this, the development and promotion of MSMEs as well as their role in regional economic integration are emphasized in the AEC Blueprint 2025.

Some of the key MSME-related issues identified in the Blueprint include innovation, internationalization (exporting and GVC participation), intellectual property protection and utilization, e-commerce and financial inclusion. Many of the strategic measures related to these areas involve the application of digital technologies. Hence, participation in the digital economy is a crucial element in the development of MSMEs.

The goal of the research project will be to assess the current state of MSMEs' participation in the digital economy. The project will also provide policy assessments and recommendations for MSME development through their participation in the digital economy.

The project can be considered as one of the deliverables of ERIA for the Indonesia's ASEAN Chairmanship 2023. This continues the 'tradition' whereby during Indonesia's ASEAN Chairmanship in 2011, ERIA proposed the ASEAN SME Policy Index which has now become one of major reference for ASEAN in the monitoring of the implementation of ASEAN Economic Community for SME.

This project was jointly proposed by ERIA and ISEAS-Yusof Ishak Institute (Singapore) on the basis of an invitation from ISEAS to conduct the second collaborated project on SME theme. The first was done in the past around 2014-15.

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## POLICY IMPLICATIONS

The project is expected to produce policy recommendations in the following areas:

- A broad policy framework aimed at enhancing MSME development through participation in the digital economy consistent with the goals of the AEC Blueprint
- Detailed medium-term and long-term policies required to enhance MSMEs' participation in the digital economy in such a way as to enhance their performance.

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### Partner Organisation

ISEAS-Yusof Ishak Institute

### Geographic Scope

ASEAN





# Sustainable Economic Development

65

SUMMARY OF ERIA RESEARCH PROJECTS 2022

## 33 Circular Economy Road Map for ASEAN

*Venkatachalam Anbumozhi and Michikazu Kojima*

### SUMMARY

The current linear production process or take–make–dispose economic model leads to waste of raw materials and resources, which the Association of Southeast Asian Nations (ASEAN) can no longer afford. To remain competitive, ASEAN Member States (AMSs) have no choice but to move towards a more circular economic model, under which the value of products and materials is maintained for as long as possible and production of waste is minimised. At the ASEAN level, the formulation and elaboration of this concept are found in many recent ministerial statements and in ASEAN Socio–Cultural Community and ASEAN Economic Community sub–sector group working agendas. Discussed at an abstract level, however, such grand vision risks becoming a buzzword, disconnected from the sectoral needs and aspirations of keeping ASEAN production networks sustainable and competitive. Conversely, several initiatives on circular economy exist at the global level.

Finland, for example, has developed a blueprint, ‘Leading the cycle: Finnish road map to a circular economy 2016–2025’, which outlines a multi-pronged strategy that Finland and the European Union could take to become a ‘truly’ circular economy by 2025. The proposed Finnish approach looks holistically at developing initiatives and policies in various stages of the life cycle of products and materials: resource use, consumer, retail, distribution, firm-to-firm transactions, manufacturing, material processing, primary sector, transport, and logistics.

The study aims to design such a framework (2020–2040) for ASEAN (or perhaps a more eclectic one based on studies of other leading nations as well) to study the extent to which ASEAN and other benchmark countries (Australia, China, Germany, Japan, the Republic of Korea, New Zealand, etc.) have developed road maps, either explicitly or implicitly, for transitioning to circular economies. The study method involves three steps: (i) developing a standard format in which the previous study results of the Economic Research Institute for ASEAN and East Asia will be integrated to create a template of collected data and information,

(ii) identifying experts from AMSs and benchmark countries to prepare circular economy road maps for each AMS, and (iii) using the collected information that provides insights on new policies needed and the science technology and innovation (STI) interface approaches to foster a circular economy in participating countries at different stages of their life cycle.

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## POLICY IMPLICATIONS

- A rationale and analytical framework with critical analysis on benchmark country studies
- A road map report presenting the findings that will provide understanding of the level of policy sophistication attained by each country and the STI interface needed at various stages of the circular economy
- A formulation of South–South and North–South cooperation projects to enable AMSs to transition to circular economies

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### Partner Organisation

Institute for Development Economics

### Geographic Scope

ASEAN and East Asia

67

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## Related Publications

Anbumozhi, V., K. Ramanathan, H. Wyes (eds.), (2020), Assessing the Readiness of Industry 4.0 and the Circular Economy. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/assessing-the-readiness-of-industry-40-and-the-circular-economy/>

Anbumozhi, V., F. Kimura (eds.), (2018). Industry 4.0: Empowering ASEAN for the Circular Economy. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/industry-40-empowering-asean-for-the-circular-economy/>

Anbumozhi, V., J. Kim (eds.) (2016). Towards a Circular Economy: Corporate Management and Policy Pathways. ERIA Research Project Report 2014–44. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/towards-a-circular-economy-corporate-management-and-policy-pathways/>

## 34 ASEAN Implementation Framework of Circular Economy

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*Intan Ramli, V. Anbumonshi, R. Shrestha, and A. Joko Purwanto*

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### SUMMARY

ERIA, upon the request of the ASEAN Secretariat, is developing an Implementation Plan of the Framework (Implementation Plan). The Implementation Plan will first address the 5 Strategic Priorities under the Framework and focus on how they could be applied in the initiatives by the identified ASEAN sectoral bodies, while acknowledging the different playing field between AMS. In addition, there should be effective monitoring mechanisms in the form of Key Performance Indicator (KPI), and a gap analysis in place to ensure the effectiveness of the proposed initiatives or deliverables under the Implementation Plan.

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### POLICY IMPLICATIONS

As the outcome of this initiative, the Implementation Plan should be used by ASEAN member states as the base of adoption of circular economy providing common understanding, awareness, and principles.

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#### Partner Organisation

ASEAN Secretariat

#### Geographic Scope

ASEAN countries

## 35 Innovations and Experiences in Financing Disaster Risk Reduction

*Venkatachalam Anbumozhi, Meinhard Breiling, Yamaji Eiji, and Mikio Ishiwatari*

### SUMMARY

The study examines the experiences of the Association of Southeast Asian Nations (ASEAN) Member States in financing integrated disaster risk-reduction (DRR) strategies, and innovations needed, particularly business continuity plans (BCPs) and adaptation road maps (ARMs). The study investigates the priorities in financing DRR from the perspective of ARMs for food security and resilience of value chains by asking questions about the equity and adequacy of past efforts. More questions need to be asked about the role of public and private sectors, international financing, and the institutional architecture needed for the ASEAN Agreement on Disaster Management and Emergency Response.

Five papers covering the international experiences of action on BCPs and ARMs, as well as consequences of further actions, are analysed, and the benefits of such actions are quantified. To find out the role of the public sector in implementing BCPs and ARMs, the papers review the international financial assistance received under the categories of disaster prevention and preparedness, emergency responses, and reconstruction and rehabilitation under the categories of technical support to economic assistance.

Private investment in implanting BCP and ARM through such schemes as personal and institutional insurance is elaborated as essential for enhancing resilience of ASEAN countries, communities, and their assets. Two papers document the drivers of new innovative financing measures that are cost-effective and instrumental in preventing and reducing the losses and contribute to BCP and ARM in terms of job creation and economic growth. Five papers, through a bottom-up approach, share best ideas on innovative financing of DRR.

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## POLICY IMPLICATIONS

- Justifiable mix of public, private, and international financing of BCPs, ARMs, and the ASEAN Agreement on Disaster Management and Emergency Response
  - The ways and means to improve the capacity of sectoral policies to achieve global value chain resilience and food security from the perspective of DRR
  - Innovative financial instruments for DRR in the context of sectoral investments, official development assistance, and climate policies aimed at DRR
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### Partner Organisation

Asian Disaster Risk Reduction Centre

### Geographic Scope

ASEAN and East Asia

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### Related Publications

Anbumozhi, V., M.K. Yousri and D. Lutfiana (2019), 'Mainstreaming Resilience into SDGs and Agricultural Trade Pacts: Why and How?', in Anbumozhi, V., M. Breiling, and V. Reddy (eds.), *Towards a Resilient ASEAN Volume 1: Disasters, Climate Change, and Food Security: Supporting ASEAN Resilience*. Jakarta, Indonesia: Economic Research Institute for ASEAN and East Asia, pp. 385-409.

Downloadable from: [https://www.eria.org/uploads/media/Books/2019-Towards-a-Resilient-ASEAN-Vol1/17\\_Disaster-Climate-change-vol.1-Chapter-13.pdf](https://www.eria.org/uploads/media/Books/2019-Towards-a-Resilient-ASEAN-Vol1/17_Disaster-Climate-change-vol.1-Chapter-13.pdf)

Anbumozhi, V., J. Gross, S. Wesiak (2019), *Towards a Resilient ASEAN Volume 2: Advancing Disaster Resilience and Climate Change Adaptation: Roadmap and Options for Implementation*. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/towards-a-resilient-asean-volume-2-advancing-disaster-resilience-and-climate-change-adaptation-roadmap-and-options-for-implementation/>

## 36 Development and Dissemination of Technical Guidelines for Plastics and Resin Pellets Leakage Prevention from Factories and Informal Recycling Sector in ASEAN

*Guilberto Borongan*

### SUMMARY

The project aims to contribute in preventing the plastics and resin leakage into marine environment through the promotion of proper best practices and guidelines at resin producing factories and recycling facilities/junk shops in ASEAN Member States.

The outcome of the project is linked to Framework III C.2 of the ASEAN Framework of Action on Marine Debris. Specifically, the proposed project aims to raise awareness, enhance the capacity of key resin producing factories as well as informal sector recycling groups such as (small and large scale recycling enterprises and intermediaries) in plastic leakage hotspot cities in the ASEAN to prevent plastic leakage into the marine environment. The project is expected to achieve the following outcomes:

- A. Understand the present status and sources of leakage associated with handling and pre-processing of recovered plastic waste for the informal recycling actor groups and pellet losses logistical handling, including factory processing operations.
- B. Develop and update context-appropriate guidelines and best practices for preventing plastics leakage at pre-processing and handling activities of informal recyclers and resin pellet losses at factories.
- C. Share knowledge, capacity building, and promotion of the specific guidelines, lessons learned and best practices from the first two outputs of the project through training and awareness-raising activities of key actors and stakeholders.

There are 3 work packages expected from this project, as following:

1. Situation Assessment of status and plastic leakages related to operations of informal recycling actors and plastic industry
2. Development and or update of context-specific draft guidelines/manual and best practices for preventing plastics (by informal recyclers) and pellet losses by factories
3. Capacity building and awareness-raising through training and knowledge sharing among key actors and stakeholders in ASEAN Member States.

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## POLICY IMPLICATIONS

The project will offer proper best practices and guidelines for resin producing factories and recycling facilities/junk shops in ASEAN Member States. Such best practices and guidelines could be beneficial for the government in issuing relevant policies to manage the informal sector who is dominating the waste management system in the region.

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### Partner Organisation :

Regional Resource Centre for Asia and the Pacific (RRC.AP) at the Asian Institute of Technology (AIT)

### Geographic Scope

ASEAN countries





### SUMMARY

The Regional Knowledge Centre for Marine Plastic Debris (RKC-MPD) is an information clearinghouse on marine plastic pollution in ASEAN+3 countries, which aims to facilitate national and regional cooperation by promoting relevant policies and good practices amongst the ASEAN Member States. The centre was established in October 2019 as a subsidiary body of the Economic Research Institute for ASEAN and East Asia (ERIA). RKC-MPD is expanding its data-gathering and resource network for capacity development by identifying key local experts in the plastic policy and marine plastic leakage, identifying national and regional networks on ocean environmental studies, identifying and enhancing capacity development of national hubs for material flow analysis, and identifying private sector partners for gathering information as well as for outreach activities. Several projects grouped into four pillars are for consideration under the RKC-MPD: capacity development of ASEAN governments and support for policy formulation; capacity development on information, administration, research, and investigation that contribute to policy formulation; information sharing for international frameworks or initiatives; and information sharing to raise awareness and promote efforts by the private sector and citizens. The region needs a knowledge centre for circular economy and ERIA could propose that the RKC-MPD fulfil the role.

Most recently, the RKC-MPD has developed a private sector platform on its website ([rkcmpd-eria.org](http://rkcmpd-eria.org)). In ASEAN+3 countries, the private sector has been helping reduce plastic waste and marine plastic debris. The platform hosts information submitted by private companies from all ASEAN+3 countries to showcase their products, services, or technologies that help reduce plastic waste and marine plastic debris. The RKC-MPD website also contains good practices, including ASEAN+3 national frameworks, government initiatives, scientific knowledge, and voluntary initiatives to reduce plastic waste and marine plastic debris.

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## POLICY IMPLICATIONS

To tackle marine plastic debris, each government should expand waste collection and proper disposal, raise awareness, reduce single-use plastics, promote the circular economy of plastics, and others. The region has various good practices, which should be shared.

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### Partner Organisation :

Institute for Global Environmental Strategies  
(IGES)

### Geographic Scope

ASEAN+3 countries

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### Related Publications

Op-ed: 'Fighting plastic waste: Voluntary initiatives no longer enough' by Hendro Putra Johannes and Ayako Mizuno in *The Jakarta Post*, 17 November 2021 (<https://www.thejakartapost.com/opinion/2021/11/16/fighting-plastic-waste-voluntary-initiatives-no-longer-enough.html>);

Op-ed: 'Plastic waste: Voluntary initiatives alone are no longer enough' by Hendro Putra Johannes and Ayako Mizuno in *The Manila Times*, 11 November 2021, (<https://www.manilatimes.net/2021/11/11/opinion/columns/plastic-waste-voluntary-initiatives-alone-are-no-longer-enough/1821718>)

Academic paper: 'Applying the extended producer responsibility towards plastic waste in Asian developing countries for reducing marine plastic debris' by Hendro Putra Johannes, Michikazu Kojima, Fusanori Iwasaki, Ellen Putri Edita in *Waste Management & Research: The Journal for a Sustainable Circular Economy*, SAGE Journals (<https://journals.sagepub.com/doi/full/10.1177/0734242X211013412>)

Website content: Information clearinghouse on marine plastic debris in ASEAN+3 countries (<https://rkcmpd-eria.org/>)

## 38 Indonesia's G20 Presidency: 'G20: New Normal, New Technologies, New Financing'

*Lili Yan Ing, Dani Rodrik, Jeffrey Sachs, and others*

### SUMMARY

Starting 30 October 2021, Indonesia officially assumed the Group of Twenty (G20) presidency for 2022. The presidency is poised to contribute much to global development, which is still recovering from the health and economic crises brought by the COVID-19 pandemic. For the 2022 G20 leadership role, Indonesia has proposed the theme of 'Recover Together, Recover Stronger.' To this presidency, Indonesia has committed to lead discussions that result in concrete actions to globally achieve an inclusive, people-centred, and environment-friendly and sustainable growth. The 2022 G20 presidency is Indonesia's great opportunity as a developing economy to represent the concerns and voices of developing economies regarding the post-COVID-19 pandemic recovery strategy, rebalance economic power, and give importance to inclusive growth.

75

### POLICY IMPLICATIONS

Provides policy notes and presentations related to economic recovery, digital transformation, and inclusive growth and sustainable development

#### Partner Organisation

Group of Twenty (G20) Indonesia, Ministry of Trade of Indonesia, International Economy Association, and Ministry of Finance of Indonesia

#### Geographic Scope

Global

## 39 Towards international agreement on marine plastic pollution: The role of the G20 (Policy brief for the T20/G20 Indonesian Chairmanship 2022)

*Michikazu Kojima, Hendro Putra Johannes, Ellen Putri Edita, Fusanori Iwasaki  
R. Andreas Kraemer, Alin Halimatussadiyah, Romadhani Ardi, and Astryd Viandila Dahlan*

### SUMMARY

Marine plastic pollution has become a critical issue at a global scale, that brings detrimental environmental impacts, including the death of marine species caused by plastic entanglement and ingestion of plastics in their digestive systems. Southeast Asia region is considered the biggest contributor of marine plastics. A recent study shows that this region (except Lao PDR) disposes more than 55% of the total output of plastic waste into the oceans. To overcome the issue, several international treaties have been enacted. At the global scale, the London Convention, the International Convention for the Prevention of Pollution from Ships (MARPOL), the Convention on the Law of the Sea (UNCLOS), and the Basel Convention are among the prominent treaties to address the issue. However, those regulations lack comprehensive discussions on the life cycle of plastics, legally binding agreements, monitoring methods, and quantified targets.

Therefore, it is fundamental to create a new international treaty that encompasses all components related to plastic pollution. The policy brief investigates the gaps in the existing international treaties on marine plastic pollution and proposes components that need to be considered in a new treaty. This work will complement the G20 work on marine plastic pollution. Furthermore, since the G20 summit will be held in Indonesia this year, the focus of this policy brief will not only be relevant to G20 countries but also Southeast Asia region as the biggest contributor of marine plastics. Apart from that reason, the Southeast Asia is a 'victim' of waste colonialism since it struggles to manage the waste that is received from other big countries, including the G20 countries. Since the G20 Hamburg Summit (2017), G20 countries have continued discussing the marine plastic issue and reached a common global vision of "Osaka Blue Ocean Vision" to reduce additional marine plastic litter pollution to zero by 2050 through a comprehensive life-cycle approach. To achieve this vision, a comprehensive international treaty is required. Furthermore, Southeast Asia is regarded as the major source of marine plastic debris. As such, it is a good opportunity to address this issue in the upcoming G20 Summit that will be held in Indonesia, one of the significant contributors in the region.

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## POLICY IMPLICATIONS

Based on the identified gaps, G20 countries could initiate a new international treaty that covers the following components:

1. Relevant international treaties and initiatives with common but differentiated responsibilities
2. International reporting mechanism to compile global efforts and data and to evaluate the progress
3. Scientific panel to harmonize monitoring methods and conduct periodical review of plastic impacts on ecosystems and human health and other relevant topics
4. Capacity building for developing countries (e.g., monitoring in rivers or oceans, wastewater treatment facilities to capture microplastics from cloth-washing process, institutional arrangement for inter-municipal cooperation on waste management)
5. Mandatory requirements, including ban on primary microplastics (e.g., microbeads of plastics) (except biodegradable plastics).

These components could be brought for further consideration and discussion in the G20 process. The new treaty is essential not only for 'victim' countries, but also for plastic exporters among G20 countries to avoid distortions in competition and barriers to international trade.

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### Partner Organisation

Ecologic Institute (Germany)  
Universitas Indonesia (Indonesia)

### Geographic Scope

G20 countries

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### Related Publications

RKC-MPD (2022), *National Framework to Tackle Marine Plastic Debris*. RKC-MPD Website (<https://rkcmpd-eria.org/framework-regulations/>)

## 40 An Assessment of COVID-19 Impact on the Trajectory of Sustainable Development Goals

*Venkatachalam Anbumozhi, Fukunari Kimura, and Kaliappa Kalirajan, plus other academics*

### SUMMARY

This study assesses the progress in the implementation of Sustainable Development Goals (SDGs) in ASEAN, India and China using the above framework conditions in the context with three main propositions. First, translating the SDGs into regional economic integration strategies during the pandemic recovery can enhance the link between global objectives and the multifaceted reality of an ASEAN community building process, and providing a strategic option to strengthen the regional approaches. Secondly, a regional approach on complementarities to SDGs can facilitate the definition of relevant targets/indicators and enhance the monitoring and evaluation framework. In so doing it could also offer the scope to integrate more closely ASEAN community's social and environmental concerns into existing economic, social and political frameworks. Thirdly, focusing just on the geo-economic sphere – the area where south east and East Asian economic integration is relatively more advanced – will prove the hypothesis that effective regional integration through mega trade agreements such as the Regional Comprehensive Economic Partnership (RCEP) can support the Asia's transformation agenda and foster more inclusive and sustainable growth.

### POLICY IMPLICATIONS

- Provision of a high-level overview of strength and weakness and the distance countries must travel to meet the SDGs in the context of COVID-19 pandemic
- Required regional cooperation strategies for the national implementation of the 2030 agenda from the perspective of ongoing ASEAN community endeavours
- SDG corporate reporting benchmark for the private sector

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**Partner Organisation :**

National Council for Research, Thailand,  
Padjadjaran University, Indonesia

**Geographic Scope**

ASEAN, China and India

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**Related Publications**

Anbumozhi, V., K. Kalirajan (eds), (2022), *Sustainable Development Goals and Pandemic Planning*. Singapore: Springer

Anbumozhi, V (2016). *How ASEAN can Advance the SDG Agenda*. Jakarta: ERIA <https://www.eria.org/news-and-views/how-asean-can-advance-the-sdg-agenda/>



## 41 Technology Needs Assessment and Financing Solutions for ASEAN Smart Cities

*Venkatachalam Anbumozhi and Sivanappan Kumar, Bundit Lim, and KC Tay*

### SUMMARY

The smart city concept embeds an element of urban design that uses highly advanced technologies wherein energy services become one big and highly complex cyber-physical system, in which computer-based algorithms improve the quality of life of residents and build a sustainable and clean environment. The study adopted a gap analysis of converting a city into a smart city by reviewing what had been done in major cities with regard to the energy revolution: energy access and resilience, conceptualising a smart city based on the level of development and willingness to adapt and reform. Learning from these experiences, a plan of action and a public-private community protocol are proposed for smart city programmes in East Asia Summit (EAS) countries. The study selected six cities to form the Association of Southeast Asian Nations (ASEAN) Smart Cities Network (ASCN), a collaborative platform where ASEAN cities can learn from one another's experiences in adopting smart technology, identify solutions, and, more importantly, engage industry and global partners to work towards the common goal of making urban development sustainable and their cities liveable.

The study established key performance indicators for the introduction of sector-wide smart technologies. It developed an assessment tool that can be applied to 26 pioneer cities in the network to assess energy saving and avoid emissions. The study analysed 10 digital applications and found that cities could use them to improve energy conservation by 10%–30%. The study found that even the most cutting-edge smart cities are still at the beginning of their journey. Smart cities add digital intelligence to existing urban systems, making it possible to do more with less. Connected applications put real-time, transparent information into the hands of users to help them make better energy choices. Users can save time, reduce energy use, and even help boost social connectedness. When cities function more efficiently, they also become more productive places to do business.



Amongst other positive economic and social outcomes in Singapore, the study found that these tools could reduce emissions by 8%–10%, shorten an average commute by 15%–20%, and cut greenhouse gas emissions by 10%–15%. Still, many cities have yet to implement some of the applications that could have the biggest impacts.

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## POLICY IMPLICATIONS

- Operational definition of smart cities and key performance indicators for assessing the readiness of ASEAN cities to become smart cities enabled by information and communications technology
- A methodology to assess energy saving and emission reduction under digital city conditions
- Policy integration at different levels of government for operationalisation of smart cities in ASEAN

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### Partner Organisation

Asian Institute of Technology

### Geographic Scope

East Asia Summit countries

81

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### Related Publications

*Realising Smart Cities Workshop, 23–24 July, Chiang Mai.*

<https://www.eria.org/database-and-programmes/enhancing-the-readiness-of-asean-smart-cities/>

*Global Solutions Journal Journal 7*

<https://www.global-solutions-initiative.org/wp-content/uploads/2021/05/Global-Solutions-Journal-7-Summit-2021-Edition.pdf>



## 42 Adaptability of ASEAN to Disruptive Technologies Driving Circular Low-carbon Economy in the Post-COVID-19 Era

*Venkatachalam Anbumozhi, Xianbin Yao, Henry Wyes, and Kaliappa Kalirajan*

### SUMMARY

Experts largely agree that the challenge of achieving climate goals and resource-efficiency targets, such as those set forth in the Paris Agreement, will be nearly impossible to achieve without pursuing all options, including adoption of the disruptive digital technologies to manage greenhouse gas (GHG) emissions and bring resource efficiency. The integrated circular low-carbon economy concept builds on the principles of circular economy and applies them to managing GHG emissions: to reduce carbon that must be managed in the first place, to reuse carbon as an input to create feedstocks and fuels, to recycle carbon through the natural carbon cycle with renewable energy, and, unique to circular economy, to remove excess carbon and store it for alternate uses. For ASEAN, the digitally aided circular low-carbon economy is an integrated and inclusive approach to accelerate the transition towards more comprehensive, resilient, and climate-friendly energy and industry systems that support and enable green recovery in the post-pandemic era.

This would enable Association of Southeast Asian Nations (ASEAN) Member States (AMSs) to take advantage of all emerging disruptive digital technologies, forms of energy, and climate mitigation opportunities and resource-efficiency opportunities according to resource availability, economic costs, and national circumstances. The study is intended to provide an impulse for embracing emerging digital, resource-efficient, and zero-emission technologies in developing and emerging economies of ASEAN and East Asia in support of the implementation of the ASEAN Comprehensive Recovery Framework (ACRF), the consolidated pandemic exit strategy for the region. The objectives of the study are to review the progress made in AMSs in the implementation of ACRF strategic priority areas and identify enabling factors and the role of disruptive technologies; to enhance understanding on how a combination of advanced ICTs are being utilised by the private and public sectors to promote the adoption of circular low-carbon approaches; and to provide insights on policy measures in the context of ACRF such as stakeholder engagement and partnerships, financing and resource mobilisation, and

institution and governance to address the challenges in scaling up disruptive technologies in support of decarbonisation and circular economy approaches.

and institution and governance to address the challenges in scaling up disruptive technologies in support of decarbonisation and circular economy approaches.

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## POLICY IMPLICATIONS

- A set of policy recommendations to AMSs and their dialogue partners to address the challenges in scaling up regional response to the emerging-to-disrupting digital, resource-efficient, and low-carbon technologies in support of decarbonisation and circular economy
- Proposition of a new regional cooperation architecture within the context of ACRF to support, help, and build green economic recovery in the aftermath of the COVID-19 pandemic

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### Partner Organisation

Australian National University

### Geographic Scope

ASEAN and East Asia

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### Related Publications

Anbumozhi V. K. Kalirajan, X. Yao (Eds), (2022), *Rethinking Asia's Low-Carbon Growth in the Post-Covid World: Towards a Net-Zero Economy*. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/rethinking-asias-low-carbon-growth-in-the-post-covid-world-towards-a-net-zero-economy/>



## **Energy-related Research**

## 43 Impact of COVID-19 on Financing the Low-carbon Energy Transition

*Venkatachalam Anbumozhi, Fukunari Kimura, Kaliappa Kalirajan plus other academics*

### SUMMARY

Asia's historical development is at a crossroads. Twenty months into the coronavirus pandemic, the cumulative economic and financial impacts are estimated to be much worse than those of the 1997 Asian economic crisis and the 2008 global financial crisis. Governments across ASEAN and East Asia have deployed a significant amount of emergency capital in their response to the pandemic, with an initial focus on protecting livelihoods.

As countries move towards long-term deep decarbonisation and a circular Net Zero economy, recovery from the pandemic has offered a rare opportunity to realign energy, innovation, trade, and fiscal policies into macro-economic planning and national budgets towards a new sustainable development paradigm. This book reviews and assesses the low-carbon green growth policies, practices, and economic recovery packages and identifies implementation gaps and new opportunities. The detailed analyses embedded in the chapters cover a wide range of impact strategies at sectoral level and identify immediate economy-wide actions required to realise the Net Zero future.

Based on a review of countries' experiences, this volume concludes that past climate actions have entailed progressive bottom-up, sectoral, low-carbon, green growth initiatives that are relatively fast and easy to implement and that provided incremental co-benefits. Realising the Net Zero Future by 2050 will require much higher levels of technology absorption, crowding in finance, and strong institution building. It urges public and private actors to harness the potentials of regional cooperation based on market principles, which will reduce the cost of transformation to the Net Zero economy.

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## POLICY IMPLICATIONS

- Policy reforms needed to support the role of private finance in achieving the Net Zero economy
  - Key policy levers and risk mitigation that governments can use to unlock the technology and financing potentials
  - Pathways to harness the opportunities for regional cooperation to scale up national level actions in energy, transport, agriculture and industry sectors
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### Partner Organisation

Australian National University

### Geographic Scope

ASEAN +6

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### Related Publications

Anbumozhi V. K. Kalirajan, X. Yao (Eds), (2022), *Rethinking Asia's Low-Carbon Growth in the Post-Covid World: Towards a Net-Zero Economy*. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/rethinking-asias-low-carbon-growth-in-the-post-covid-world-towards-a-net-zero-economy/>

Anbumozhi V. K. Kalirajan, F. Kimura (Eds), (2018), *Financing for Low-carbon Energy Transition Unlocking the Potential of Private Capital*. Singapore: Springer

Anbumozhi V. K., P. Wolff, X Yao (2020), *Policies and Financing Strategies for Low-Carbon Energy Transition: Overcoming Barriers to Private Financial Institutions*. ERIA Discussion Paper 2019-38. Jakarta: ERIA

Downloadable from: <http://www.eria.org/publications/policies-and-financing-strategies-for-low-carbon-energy-transition-overcoming-barriers-to-private-financial-institutions/>

Anbumozhi V. K., M. LoCastro, D. David, D. Lutfiana, T. F. Rakhmah (2019), *Unlocking the Potential of Private Financing for Low-carbon Energy Transition: Ideas and Solutions from ASEAN Markets*. ERIA Discussion Paper 2019-27. Jakarta: ERIA

Downloadable from: <http://www.eria.org/publications/unlocking-the-potential-of-private-financing-for-low-carbon-energy-transition-ideas-and-solutions-from-asean-markets/>

## 44 Analysis of East Asia Summit (EAS) Future Mobility Fuel Scenario Considering the Sustainable Use of Biofuels and Other Alternative Vehicle Fuels

*Venkatachalam Anbumozhi, Shinichirou Morimoto, Nwong Chollacoop, and Shabir Gheewala*

### SUMMARY

Greater efforts than ever before are being made to decarbonise transport in the Association of Southeast Asian Nations (ASEAN) and East Asia Summit (EAS) countries. With a quarter of total carbon dioxide (CO<sub>2</sub>) emissions coming from transport energy use, three options can reduce emissions: reduce transport energy demand, improve vehicle fuel efficiency, and replace mobility fuel with low-carbon approaches such as use of biofuel and electricity. The report analyses the future scenario of mobility in selected EAS countries, which strongly contributes to the Sustainable Development Goals (SDGs) and considers the necessary balance between CO<sub>2</sub> reduction in transport, biofuel use, and mineral resource demand stimulated by electrification of vehicles. The policies and strategies for biofuels and mobility electrification are examined and the existing research on sustainable use of biofuels documented. Databases are created to evaluate the availability of mineral resources such as neodymium and cobalt as well as the potentials of reducing carbon emission of biofuel in India, Indonesia, Malaysia, the Philippines, and Thailand.

87

### POLICY IMPLICATIONS

- A combination of electrical vehicle introduction and biofuel utilisation is the most effective in reducing oil consumption and CO<sub>2</sub> emission. Electric vehicle penetration has a positive effect on promoting the use of biofuel in supporting agriculture.
- Whilst electrical vehicle promotion will contribute mainly to gasoline reduction, the imbalance between gasoline and diesel fuel consumption remains an issue in Thailand since diesel fuel consumption is much higher than gasoline consumption. Hence, reducing diesel fuel consumption should be prioritised through an appropriate blend of biodiesel.
- Effects of the introduction of biofuel to oil consumption and/or reduction of CO<sub>2</sub> emission are limited to new vehicles.

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### Partner Organisation

National Institute of Advanced Industrial  
Science and Technology

### Geographic Scope

India, Indonesia, Malaysia, the  
Philippines, and Thailand

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### Related Publications

Morimoto, S., S. Gheewala, N. Chollacoop, V. Anbumozhi (eds.), (2021), *Analysis of Future Mobility Fuel Scenarios Considering the Sustainable Use of Biofuels and Other Alternative Vehicle Fuels in EAS Countries*. ERIA Research Project Report 2021-18. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/analysis-of-future-mobility-fuel-scenarios-considering-the-sustainable-use-of-biofuels-and-other-alternative-vehicle-fuels-in-eas-countries/>





## 45 Public Acceptance of Nuclear Power for Optimised Use

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*Tomoko Murakami and Venkatachalam Anbumozhi*

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### SUMMARY

All over the world, public acceptance of nuclear power is a crucial factor in deciding public and private investment in nuclear power plants. It is important, therefore, to understand the determinants of public acceptance of nuclear power and the driving factors behind individual perceptions. The report examines the effects of local economic benefits, social inclusion, and effective communication on risk management. Different levels of stakeholder acceptance and related driving factors to effect changes in perceptions are identified through field visits and interactive workshops in Finland, Japan, the United Kingdom, and the United States. Local economic wealth creation, lower cost of generating electricity, and low-carbon energy provision appear to have the strongest positive effect on public acceptance of nuclear power. The report identifies and recommends an effective communication and risk-sharing mechanism amongst sub-regional authorities and non-governmental organisations that could lead to positive changes in community perception.

89

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### POLICY IMPLICATIONS

- Develop effective communication channels across stakeholders on differing perceptions and stance on required safety and local economics of nuclear power plants.
- Third-party non-governmental players could provide better understanding on key safety issues affecting trust and perceptions amongst stakeholders.

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#### Partner Organisation :

Institute for Development Economics

#### Geographic Scope

ASEAN and East Asia

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## Related Publications

Murakami, T., V. Anbumozhi (eds.), (2017), *An International Analysis of Public Acceptance of Nuclear Power*. ERIA Research Project Report 2017-03. Jakarta: ERIA.

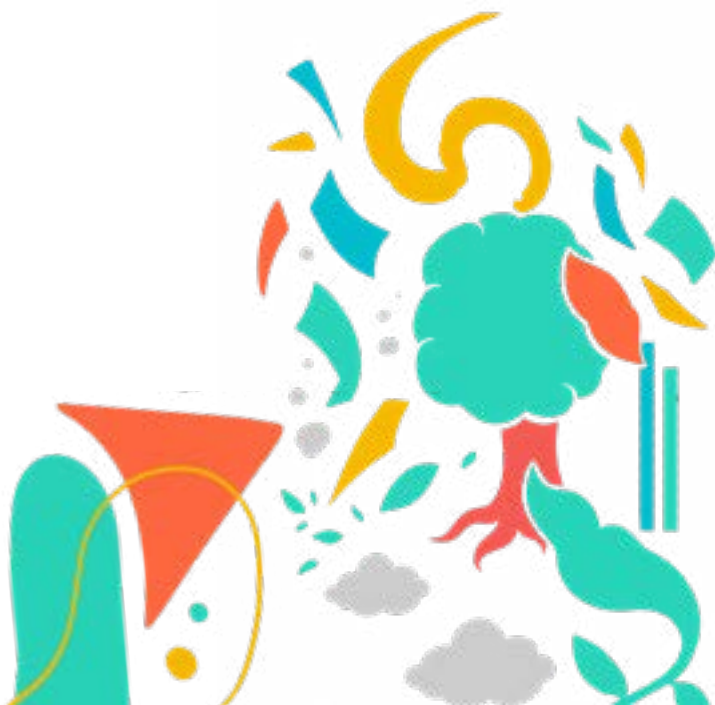
Downloadable from: <https://www.eria.org/publications/an-international-analysis-of-public-acceptance-of-nuclear-power/>

Murakami, T., V. Anbumozhi (eds.), (2020), *Improving Nuclear Safety and Use: An International Analysis*. ERIA Research Project Report 2020-10. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/improving-nuclear-safety-and-use-an-international-analysis/>

Murakami, T., V. Anbumozhi (eds.), (2020), *Securing the Resilience of Nuclear Infrastructure against Natural Disasters*. ERIA Research Project Report 2020-06. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/research/securing-the-resilience-of-nuclear-infrastructure-against-natural-disasters/>



## 46 Small Modular Nuclear Reactor Deployment

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*Venkatachalam Anbumozhi, Tomoko Murakami, Kenji Kimura, Takehiro Iwata, Emiri Yokota, and Tomofumi Shibata*

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### SUMMARY

Small modular reactors (SMRs) are nuclear fission reactors smaller than conventional reactors. They can be manufactured at a plant and brought to and installed at site. SMRs allow less on-site construction, increased containment efficiency, and enhanced safety due to passive nuclear safety features and thus have been proposed as a way to bypass financial and safety barriers that have inhibited the construction of large conventional nuclear reactors in recent decades. This interest in SMRs is driven by a desire to reduce the impact of capital costs and provide power away from large grid systems.

The study examines the applicability of SMRs in the context of the Association of Southeast Asian Nations (ASEAN). Since small reactors are envisaged as replacing fossil fuel plants in many advanced countries, the study reviews the market conditions and licensing requirements in those countries and the regulatory and safety imperatives needed in developing economies for the commercial deployment of SMRs.

The study also investigates international cooperation between the SMR-producing countries and potential newcomer countries in the fields of nuclear energy planning, conduct of feasibility studies, and new low-carbon infrastructure development.

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### POLICY IMPLICATIONS

- Develop attractive business environments for SMR vendors and investors in energy-deficit countries.
- Improve infrastructure provisions including regulations necessary for the deployment of SMRs.
- Conduct open discussions on international cooperation in the countries about the future utilisation of nuclear energy, including SMRs.

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### Partner Organisation

The Institute for Energy Economics Japan

### Geographic Scope

ASEAN and East Asia

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### Related Publications

Murakami, T., V. Anbumozhi (eds.), (2021), *Global Situation of Small Modular Reactor Development and Deployment*. ERIA Research Project Report 2021-07. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/global-situation-of-small-modular-reactor-development-and-deployment/>



## 47 Applicability of Clean Coal Technology (CCT) for Comprehensive and Optimal Carbon-neutral Solutions in ASEAN

*Yamada Fumiko, Han Phoumin, Japan Coal Energy Center team,*

### SUMMARY

To support a meaningful ASEAN energy transition towards carbon neutrality by 2050, ASEAN will need to shift from traditional technologies towards clean energy and technologies by upgrading all existing facilities with optimal carbon-neutral solutions. In this way, ASEAN will need to investigate the next generation's carbon coal technology (CCT); carbon capture and storage (CCS); carbon capture, utilisation, and storage (CCUS); and carbon recycling by upgrading the current power infrastructure with tailor-made and optimal carbon-neutral solutions such as coal combustion with biomass, with ammonia, and with hydrogen. Further, the boiler types of power plants such as the ultra-super critical (USC), advanced ultra-super critical (A-USC), integrated gasification combined cycle (IGCC), and integrated coal gasification fuel cell combined cycle (IGFC) types will need to be equipped with environmental facilities and operation techniques such as flexibilisation measures for each ASEAN Member State (AMS). ASEAN still depends on coal and natural gas to meet the increasing electricity demand in the region. To address surging demand, it is expected that power plant development will proceed towards a well-balanced optimal generation mix with coal, gas, and renewables. Coal and liquefied natural gas (LNG) are still the main energy sources for surging economic expansion in some AMSs because of their affordability and reliability despite the worldwide decarbonisation trend. According to the 6th ASEAN Energy Outlook published in 2020, both renewables capacity and share will remarkably increase with total energy demand. Fossil energy such as coal and LNG will also increase even in the modal case of ASEAN target scenario.

Whilst the energy situation is quite different in AMSs, most countries are required to facilitate a carbon-neutral policy even if they are mainly using fossil energy in this energy transition era. A stepwise transition by experienced CCT might be a practical way for these countries. Former Japan Prime Minister Yoshihide Suga unveiled a major shift in Japan's position on climate change: the country is now aiming to become carbon neutral by 2050. The government is aggressively facilitating energy improvement of current CCT and research and development of next-generation CCT, CCS, CCUS, and carbon recycling.

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## POLICY IMPLICATIONS

- Adopt Japan's experience and strategies for ASEAN's carbon neutrality as ASEAN and Japan share similar energy systems of fossil fuel dependency and shift towards carbon neutrality through upgrade of technologies and best energy mix of renewables and clean energy.
- Provide policy recommendations to support ASEAN in energy transition towards carbon neutrality

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### Partner Organisation :

Japan Coal Energy Center

### Geographic Scope

ASEAN, Japan

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### Related Publications

Carbon Neutrality



## 48 Electricity Market Reforms in ASEAN, China, India, and Japan

*Han Phoumin, Farhad Taghizadeh-Hesary, Fukunari Kimura, Rabindra Nepal, Ehsan Rasoulizadeh, Ali Hassan, Dayong Zhang, Chin-Hsien Yu, Xinghao Li, Sangeeta V. Sharma, Maxensius Tri Sambodo, Youngho Chang, Muhammad Mohsin, Sajid Iqbal, Mui Yang, Deepak Sharma, Phouphet Kyophilavong, Inpaeng Sayvaya, Hadi Farabi Asl, Ariana Soemanto, Ervan Mohi, Muhammad Indra al Irsyad, Antonius Bintarto Ekoprasetyo, and Purwanto*

### SUMMARY

The electricity sector reform aims to modernise the sector's infrastructure, rules, policies, and procedures to allow more efficiency and for clean energy to have a fair share in the power competition/wholesale/retail electricity market. In this way, inefficient power will be phased out gradually. The Association of Southeast Asian Nations (ASEAN) electricity market has made remarkable progress over the past 2 decades, substantially increasing the electrification ratio. However, it has not yet achieved free-market competition and universal electrification and has not implemented emission-reduction plans. On the other hand, thermal power generation in China still accounted for about 71.2% of total energy in 2020. China is committed to achieving carbon neutrality by 2060, an ambitious plan for the world's largest carbon dioxide emitter. A significant reform in the electricity market for energy transition is required to achieve this ambitious target. India's per capita electricity consumption is still lower than the world's average. By 2047, India's energy demand is likely to grow at an average compound annual growth rate of 4.7%, of which electricity demand may increase from the present 16% to 29% in 2047. Several reforms in the energy market, including the electricity market, are required to have sufficient green power supply for this tremendous demand.

Electricity market reforms are not limited to developing countries. Even in Japan, with a developed energy market, the government has ongoing reforms in the electricity market aimed at securing stable supply of electricity, lowering electricity rates to the maximum extent possible, and expanding electricity choices for consumers and businesses. The book provides empirical studies investigating and evaluating the electricity market reforms in Southeast Asia, China, India, and Japan. The book analyses electricity market policy reforms plans, market liberalisation, tariff reform, electricity trade, renewable energy integration, resource allocation, and the sustainability of the electricity market in the region and these countries. It provides policy recommendations to foster reforms and increase market efficiency.

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## POLICY IMPLICATIONS

- Energy policy reforms for free electricity market competition
- Step-by-step approaches to free electricity market
- Impacts of liquefied natural gas pricing mechanisms on the energy mix in ASEAN
- Electricity market reforms to accelerate development of renewables and clean energy

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### Partner Organisation

Several universities and institutions

### Geographic Scope

ASEAN, East Asia

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### Related Publications

Phoumin, H., R. Nepal, F. Kimura, G. S. Uddin, F. T. Hesary (eds.), (2022), Revisiting Electricity Market Reforms Lessons for ASEAN and East Asia. Singapore: Springer





## 49 Collectives of Best Practices and Policies to Promote Carbon Capture, Utilisation, and Storage (CCUS) Development and Deployment: Policy Implications for ASEAN and East Asia

*Han Phoumin, and Shigeru Kimura, et al.*

### SUMMARY

The Asia Carbon Capture, Utilisation, and Storage (ACCUS) Network was successfully launched on 22–23 June 2021 by ASEAN member countries, Australia, Japan, and the United States and more than 100 international organisations, companies, and financial and research institutions that share the vision of carbon capture, utilisation, and storage (CCUS) development throughout the Asian region. The network's members have expressed their intention to share the vision of the Asia CCUS Network that aims to contribute to the decarbonisation of emissions in Asia through collaboration and cooperation in developing and deploying CCUS. The network's mission is to facilitate deployment of CCUS by promoting knowledge sharing through forums, conferences, workshops, and meetings; conducting research studies on technical, economical, and legal standards of CCUS in the East Asian Summit region; and holding capacity-building training workshops to bridge the knowledge gap on CCUS. The Asia CCUS Network provides opportunities for countries in the region to work and collaborate on the low-emission technology partnership that will eventually help to build capability of countries, through research collaboration and innovation, to lower the cost of CCUS technology and its deployment.

At the 1st Asia CCUS Network Forum held on 22–23 June 2021, it was concluded that CCUS and carbon recycling are crucial technologies for the ASEAN region to achieve carbon neutrality amidst climate and energy security concerns. Also discussed were the need to bring more CCUS projects to the commercialisation stage, issues such as the lack of an adequate legal framework to address liability, and the need to resolve a technical framework through pilot projects. It was expected that to accelerate the deployment of CCUS in the ASEAN region, there was a need to bridge the gap and to implement knowledge and experience sharing amongst the ASEAN and Asian regions. The role of CCUS is crucial in clean energy transition as it is the only technology that contributes to directly reducing emissions in the identified economic sectors with high energy intensity and to removing CO<sub>2</sub> to balance unavoidable emissions.

97

One way to reduce emission is carbon recycling. After capturing CO<sub>2</sub>, it is used to create new materials and products. Instead of just sequestering CO<sub>2</sub>, it will be utilised to make everything, from fuel, concrete, and shoes, to cleaning products, plastics, and food. This allows actual recycling of emissions and creating a circular carbon economy.

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## POLICY IMPLICATIONS

Deployment of CCUS needs appropriate supporting policies and investment. Thus, in supporting the development of a CCUS policy, technical experts will need to understand the technical aspect of CCUS and its technologies. To help policymakers develop policies in support of CCUS development and deployment, the study will bring the best collective practices in terms of policies and CCUS technologies that can be adopted for ASEAN and East Asia.

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### Partner Organisation

Several institutions that are members of ACCUS

### Geographic Scope

Global

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### Related Publications

Kimura, S., K. Shinch, S. Kawagishi, U. Coulmas (eds.), (2020), Study on the Potential for the Promotion of Carbon Dioxide Capture, Utilisation, and Storage in ASEAN Countries: Current Situation and Future Perspectives. ERIA Research Project Report 2020-21. Jakarta: ERIA.

Downloadable from: <https://www.asiaccusnetwork-eria.org/publications/study-on-the-potential-for-the-promotion-of-carbon-dioxide-capture-utilisation-and-storage-in-asean-countries>

Kimura, S., K. Shinch, U. Coulmas, A. Salmura (eds.), (2020), Study on the Potential for Promoting Carbon Dioxide Capture, Utilisation, and Storage (CCUS) in ASEAN Countries Vol. II. ERIA Research Project Report 2021-25. Jakarta: ERIA.

Downloadable from: <https://www.asiaccusnetwork-eria.org/publications/study-on-the-potential-for-the-promotion-of-ccus-in-asean-countries-volii>

## 50 Economic Analysis of Large-scale Deployment of Solar Photovoltaic (PV) with Battery Storage in ASEAN

*Han Phoumin, and Fukunari Kimura, et al.*

### SUMMARY

Despite some contradictions on the timeline for net zero emissions and other climate policies, the 26th UN Climate Change Conference of the Parties (COP 26) set a path to achieve climate goals such as phasing out coal, ending fossil fuel subsidies, putting a price on carbon, protecting vulnerable communities, and delivering \$100-billion climate finance commitment. Translating these into policy actions will have enormous impact on investment in clean technologies, renewables, and clean fuels. The outcome of COP 26 will influence national policies across the globe and work towards formation of low-carbon societies, with global warming limited to below 2°C.

To achieve energy transitions towards carbon neutrality by 2050, ASEAN needs to move from its heavy dependence on fossil fuel towards a clean energy system. It is predicted that ASEAN will continue to see a rise in energy demand until 2050. ASEAN's energy mix shows that coal, oil, and natural gas make up 80% of its primary energy supply. Any policy for a clean energy system, therefore, will need to redesign the system to accommodate renewable energy sources, i.e. wind, solar, hydropower, geothermal, and biomass. The increase in renewables will need to be combined with deployment of clean technology that is still costly and thus requires solutions. The emission rates in ASEAN and India continue to rise, which go against the Paris Agreement. Hence, to avoid harm from the rising temperature, ASEAN Member States (AMSs) need to immediately lower their emission rates to achieve the climate-reduction or carbon neutrality goal. It is important for ASEAN to look at the types of renewable and locally available resources and ensure that the transition is cost affordable.

Solar energy has good potential to be included in the ASEAN energy mix whilst wind energy can only work for some countries such as Indonesia, the Philippines, and Viet Nam. Some important barriers to large-scale deployment of wind power and solar power remain. Wind power and solar power are intermittent and require battery support and backup from other renewable sources to prevent outages. Compared with other resources such as thermal and coal, deployment costs of these renewable energy sources are high. However, if ASEAN electricity integration

progresses faster, resources from other regions can be used to support intermittent energy from sun and wind. For example, countries in the Mekong sub-region with hydropower energy resources could provide power backup for AMSs that utilise solar power and wind power. This would allow a higher integration of solar power and wind power into the ASEAN infrastructure of power connectivity given the status of energy infrastructure and policy stage.

With innovation in technology and policy changes, however, ASEAN could see net-zero emission by 2050 and the energy mix would include a higher share of solar, wind, biomass, geothermal, and hydropower energy. Since solar resource is abundant in all ASEAN countries, it is important for the region to deploy large-scale solar PV renewable resources with battery storage.

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## POLICY IMPLICATIONS

Focus on the effective policy and programmes to support large-scale solar PV and battery storage.

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### Partner Organisation

Several universities and institutions

### Geographic Scope

ASEAN, East Asia

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### Related Publications

Renewables and clean technologies

## 51 Revisiting Electricity Market Reforms – Lessons for ASEAN and East Asia

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*Han Phoumin, Rabindra Nepal, Fukunari Kimura, Gazi Salah Uddin, Farhad Taghizadeh-Hesary, Anupama Sen, Tooraj Jamasb, Hamed Musibau, Thai Ha Le, Paul Simshauser, Ou Tang, Maziar Sahamkhadam, Muhammad Yahya, Pontus Cerin, Jakob Rehme, Anupam Datta, Sakib Amin, Gopal Sarangi, Xunpeng Shi, Keying Wang, Norasikin Ahmad Ludin, Fairuz Chahchuli, Norul Hamid, and Besma Glau*

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### SUMMARY

The book combines the fundamentals of industrial organisation theories based on microeconomic foundations, applied econometrics, and environmental and natural resource economics in undertaking a comprehensive review of reforms of the power sector and its impact on industrial and socio-economic performance. The book provides the intellectual groundwork necessary for understanding the workings and interactions of today's reforming power markets such as in ASEAN and East Asia that are striving to achieve the energy policy trilemma of affordability, energy sustainability, and energy security. The topics addressed in this book include application of welfare theorems such as competition in energy markets, market failures such as lack of electricity access, analysis of forecasting models under volatility, energy resource allocation such as renewable energy, and competitive designs of energy markets. Country-specific and regional case studies are used to analyse the progress and outcomes of market-driven electricity reforms across the reforming and advanced electricity markets.

Therefore, the book derives policy lessons and provides policy recommendations in reforming power markets for ASEAN and East Asia, taking stock of more than 3 decades of global experience with power sector reforms. The electricity markets case studies are carefully chosen and supported by extensive data analyses as appropriate. The energy economics and policy book is highly recommended to readers who seek an in-depth and up-to-date integrated overview about the evolving literature and status on electricity market reforms with a particular reference to Asia.

101

SUMMARY OF ERIA RESEARCH PROJECTS 2022

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## POLICY IMPLICATIONS

- Energy policy reforms for free electricity market competition
- Step-by-step approaches to free electricity market
- Impacts of liquefied natural gas pricing mechanisms on the energy mix in ASEAN
- Electricity market reforms to accelerate development of renewables and clean energy

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### Partner Organisation

Several universities and institutions

### Geographic Scope

ASEAN, East Asia

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### Related Publications

Phoumin, H., R. Nepal, F. Kimura, G. S. Uddin, F. T. Hesary (eds.), (2022), Revisiting Electricity Market Reforms Lessons for ASEAN and East Asia. Singapore: Springer

## 52 Seeking for Best Power System Combined with Hydropower Generation system in Lao PDR

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*Shigeru Kimura, Alloysius Joko Purwanto, and Keisuke Ueda*

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### SUMMARY

Lao PDR is a rich hydropower resource country and its generation share was more than 60% in 2018. However, the hydropower output sharply goes down in dry season due to less water flow. Consequently, Lao PDR has to import electricity from Thailand in that season. In order to solve this issue, Lao PDR has an option to facilitate floating solar PV system on water of the dam because solar PV works well in dry season. So that relation between hydropower and solar PV is complementary and in addition, no need of additional transmission line to solar PV system. This study checks how floating solar PV system works for stable power output as a hybrid power system on computer simulation of solar power generation based on hourly basis solar radiation data of nearest city from the hydropower dam.

### POLICY IMPLICATIONS

Hybrid power system to combine hydropower and solar PV will contribute sustainable energy development and energy supply security in Lao PDR.

#### Partner Organisation

TEPCO Power Grid, Floating solar PV company (TBC)

#### Geographic Scope

Lao PDR

## 53 Strategic Oil Stockpiling in Myanmar

*Tetsuo Morikawa, Shigeru Kimura and Han Phoumin*

### SUMMARY

Oil demand in Myanmar will increase significantly, on the other hand, more than 90% of oil demand will be imported especially from Singapore continuously. Thus, Myanmar's oil supply security should be maintained and strategic oil stockpiling will an option for Myanmar regarding oil supply security. This project studies a. kinds of stockpiling, b. appropriate stock level, c. sharing of private/public stock and d. legal and policy framework and e. roadmap of setting stockpiling system until 2040.

### POLICY IMPLICATIONS

Indicate appropriate roadmap to setup oil stockpiling system on the short, middle and long-term points of view.

#### Partner Organisation

Institute of Energy Economics, Japan

#### Geographic Scope

Myanmar





## 54 Decarbonisation of ASEAN Energy Systems Toward Net-Zero Emission Scenarios

*Shigeru Kimura, Han Phoumin, and A. Joko Purwanto*

### SUMMARY

ERIA and IEEJ are elaborating long-term net-zero emission scenarios for the energy systems of the 10 ASEAN Member States (MS). Linear programming model that simulates the cost-optimal deployment of energy technologies under technical constraints is used for that purpose. The model encompasses the total energy system including energy transformation and all end-use energy service demand sectors in ASEAN MS. The work comprises of modeling and consultations with each of the ASEAN Member States' energy ministry.

### POLICY IMPLICATIONS

The study shall provide net-zero emission scenarios that the ASEAN Member States can use as inputs to develop their long-term energy system plans to achieve their net-zero emission or carbon neutrality pledges

#### Partner Organisation

Institute of Energy Economic Japan (IEEJ)

#### Geographic Scope

10 ASEAN Member States



## 55 Philippines Energy Efficiency Indicators of Commercial Buildings and Industrial Factories

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*Shigeru Kimura, Leong Siew Meng, and A. Joko Purwanto*

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### SUMMARY

The Department of Energy of the Philippines (PDOE) will promote energy efficiency and conservation in accordance with the newly promulgated Energy Efficiency and Conservation Act, which was signed on 12 April 2019 to institutionalize energy efficiency and conservation as a way of life for the Filipinos, PDOE should prepare benchmarks to indicate current level of EEC. This project will support the Energy Utilization and Management Bureau (EUMB) of the PDOE to prepare energy efficiency indicators (EEI) to focus on commercial buildings and industrial factories, through capacity building on staff of EUMB on the correct preparation of EEI.

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#### Partner Organisation

The Department of Energy of the Philippines (PDOE)

#### Geographic Scope

The Philippines



## 56 Study for Possibility of Promoting Quantitative Evaluation Indicators for Strengthening Energy Resilience in East Asia Region

Hiroki Kudo

### SUMMARY

The East Asia region has been continuously challenged with natural disasters, ranging from earthquakes, volcano eruptions, tsunamis, mass movements, hurricanes to heavy snows, and other manmade disasters besides pose risks and threats to global energy supply chains. Energy resiliencies support East Asia region to achieve energy security and sustainable development, which contains economic prosperity and environmental sustainability.

The quantitative evaluation indicators on energy resiliency is assumed to be calculated as a quantitative indicator by modeling risks against natural disasters, etc. based on information on facilities and other facilities related to various demand sectors. By referring to the average value of the indicators of the relevant sectors, each consumer can use it as a guide to what should be improved to ensure energy supply in the event of a natural disaster.

The study team will investigate the possibility of introducing quantitative evaluation indicators for energy resilience focusing on disaster resilience in major East Asian countries, and share and discuss the results among the countries concerned. As a result, the aim is to help promote efforts to strengthen energy resilience in the East Asia region.

The methodology used would comprise of online workshops organization and survey among the participating countries, data and information based-analysis, and building of quantitative indicators.

In the development process of the APEC Energy Security Principle published by APEC in 2020, it is assumed that the APEC member economy, which agrees with the development of the principle (Australia, Hong Kong, China, Indonesia, Malaysia, Singapore, Chinese Taipei, Thailand, The United States and Vietnam), will be a leading candidate country and will take an approach.

By clarifying the risks to the energy supply chain due to disasters ((both natural and manmade disasters) in the surveyed countries and promoting the introduction of quantitative evaluation indicators for energy resilience focusing on disaster's impacts, the study is expected to support promoting policies for strengthening energy resilience in the East Asia region.

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## POLICY IMPLICATIONS

This study shall show up the importance and relevances of quantitative evaluation indicators on energy resiliency to support promoting policies for strengthening energy resilience in the East Asia region.

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### Partner Organisation

Institute of Energy Economics Japan (IEEJ)

### Geographic Scope

Australia, Hong Kong, China, Indonesia, Malaysia, Singapore, Chinese Taipei, Thailand, The United States and Viet nam

## 57 The Strategies of National Oil Companies in South East Asia under Energy Transition

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*Ichiro Kutani*

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### SUMMARY

This study aims to derive a guidance, which envision carbon neutral goal in the mid-century, for what kind of strategy the ASEAN National Oil Companies (NOCs) can take in response to significant change in business environment due to global climate actions. The strategies to be analyzed include any kinds those related to energy.

The main methodology to be deployed comprises of literature study and organization of a series of workshops that shall include representatives of NOCs and government officials from ASEAN countries aiming at discussing strategy, opportunities, and challenges for NOCs to achieve gradual energy transition. The study seeks to elaborate a set of policy recommendations in the direction of (i) encouraging the government and NOCS to prepare for low carbonization/ decarbonization of the oil and natural gas sectors in Southeast Asian countries, (ii) seeking possible strategies that include the use of hydrogen and CCUS technologies, and (iii) supporting the establishment of a hydrogen/carbon chain in Asia which enable sustainable economic development of the region.

### POLICY IMPLICATIONS

This study shall provides Ministries of Energy and NOCs in Indonesia, Malaysia, Thailand, and Vietnam with recommendations on strategies to take to adapt for energy transition objectives of the countries

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#### Partner Organisation

Institute of Energy Economics Japan (IEEJ)

#### Geographic Scope

Indonesia, Malaysia, Thailand, Vietnam

## 58 Vehicle Technology Impact Assessment Model Development for Indonesia version 2.0 (VEIA-ID 2.0)

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*Alloysius Joko Purwanto and Dian Lutfiana*

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### SUMMARY

This project will develop a vehicle technology impact assessment model for Indonesia to assess the effects of energy, environment, and transport policies on energy consumption, greenhouse gas emissions, air pollution, and changes in the road transport sector towards 2050. The model will be the second version (VEIA-ID 2.0), which is an extension of the first version (VEIA ID 1.0). The first version (VEIA-ID 1.0) represents road transport vehicle fleet structure in Indonesia, consisting of passenger and freight transport categories and all road vehicle types; fuels; propulsion technologies; and age categories.

The second version (VEIA ID 2.0) to be developed will include non-road modes, i.e. rail transport (passenger and freight), air transport (passenger and freight) and freight maritime transport. Apart from the inclusion of those non-road transport modes, the second version will also be an improvement relative the first version in term of (i) demand forecasting where origin–destination survey results from the Ministry of Transportation will be used as calibration benchmark, (ii) more detailed vehicle stock modelling of motorcycle and bus modes, and (iii) additional air pollution modeling.

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### POLICY IMPLICATIONS

The model will assess road transport policy measures such as efficiency standards, flanking measures, pricing, fuel quality, etc. to help stakeholders flesh out policy recommendations.

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#### Geographic Scope

Indonesia

## 59 Market Penetration Assessment of Biodiesel (B100) and Bioethanol (E100) as Road Transport Fuels in Indonesia

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*Alloysius Joko Purwanto and Dian Lutfiana*

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### SUMMARY

This study aims to deliver a road map that allows optimal and sustainable penetration of high-percentage blended biofuels and flexible-fuel engine vehicles in Indonesia towards 2035, which should serve as a main strategy to reduce the country's energy import bills and increase its energy self-sufficiency.

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### POLICY IMPLICATIONS

The results of the study will allow the Government of Indonesia to set its sustainable objectives on blending biofuels with conventional fuels used in road transport and formulate accompanying policies.

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#### Partner Organisation

Ministry of Industry

#### Geographic Scope

Indonesia

111



## 60 Policies and Infrastructure Development for the Wider Penetration of Electric Vehicles (EVs) in ASEAN Countries

*Naoko Doi and Alloysius Joko Purwanto*

### SUMMARY

The study will conduct both quantitative and qualitative analysis with the focus on 5 ASEAN Countries, i.e., Brunei Darussalam, Indonesia, Malaysia, Thailand, and Viet Nam.

The methodology to be used would consist of five elements: (i) the analysis of the current policies and regulations that aims at wider diffusion of EVs in those ASEAN countries, EV enablers (such as policies, regulation, production basis, financing, and human resources) in relation to ownership, manufacturing, and development of charging infrastructure, (ii) impact assessment of EV deployment on energy savings and CO<sub>2</sub> emissions reduction, and (iii) the analysis of the Total Cost of Ownership (TCO) for passenger vehicles, buses, trucks and bikes from the use of EVs, and compare it with that of ICEVs, HEVs, and PHEVs.

Finally, the study would elaborate of recommendations for ASEAN countries to formulate necessary policies to achieve wider diffusion of EVs, to develop infrastructure, and to coordinate EV batteries manufacturing supply chain.

### POLICY IMPLICATIONS

The study shall provide ASEAN Member States, especially their Ministries of energy with a set of policy recommendations which is an important input to formulate policy measures and strategies to achieve wider diffusion of electric vehicles

#### Partner Organisation

Institute of Energy Economics Japan (IEEJ)

#### Geographic Scope

Brunei Darussalam, Indonesia, Malaysia, Thailand, and Viet Nam.



## 61 Pathways for Developing Countries to Achieve Carbon Neutrality (T20 Policy Brief)

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*A. Joko Purwanto, Venkatachalam Anbumozhi, Dian Lutfiana, Citra Indah Nur Setyawati, Alin Halimatussadiyah, Prof. Wing Thye Woo, Prof. Widodo Wahyu Purwanto*

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### SUMMARY

The G20 Rome Leaders' Declaration recognizes the critical relevance of achieving global net zero greenhouse gas emissions by mid-century through acceleration of mitigation, adaptation, and finance activities. The Conference of the Parties (COP) 26 also reaffirms the long-term global goal to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels which requires rapid, deep, and sustained reductions in global greenhouse gas emissions and to net zero around mid-century.

By focussing on developing countries of the Association of Southeast Asian Nations (ASEAN), this policy brief aims to provide developing countries in general with several pathways to achieve carbon neutrality and to recommend appropriate assistance and co-operation that can be expected from the Organisation for Economic Co-operation and Development (OECD) countries.

This research will address four essential points: (i) the advantages of the ASEAN region in terms of its biomass richness, (ii) the potential for energy connectivity within the region, (iii) the adoption of new technologies such as carbon capture, use, and storage (CCUS) and new energy sources or carriers such as hydrogen and ammonia, and (iv) the relationship between decarbonization and the economy.

Deepened insights on the indicative pathways and research points will be derived by organizing linking these research activities with those of the G20 Energy Transition Working Group (ETWG). The research team also intends to deliver its findings at the 40th ASEAN Ministers on Energy Meeting in September 2022.

### POLICY IMPLICATIONS

The pillar of G20 Indonesia Presidency 2022 Energy Transition is 'Global Cleaner Energy Systems and Just Transitions', that aims at 'achieving global deal to accelerate energy transition'. G20 Indonesia Presidency defines its pathway to achieve carbon neutrality by endorsing international collaboration to accelerate the reduction of energy-related greenhouse gas emissions through

various decarbonization methods. Accelerating the process of decarbonization through international collaboration is the knowledge gap that is being closed by this policy brief through its focus on the carbon neutral pathways for the developing countries whilst considering co-operation potential with the developed economies.

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#### **Partner Organisation**

Institute for Economic and Social Research,  
University of Indonesia (LPEM – UI), Jeffrey  
Cheah Institute on Southeast Asia, Chemical  
Engineering Department, Faculty of Engineering,  
University of Indonesia

#### **Geographic Scope**

Focus on ASEAN countries,  
but implication on G20 countries

Takamine Akira, Kobayashi Yoshikazu, and The Institute of Energy Economics, Japan

SUMMARY

The study will assess the impact of Europe’s Carbon Border Adjustment Mechanism (CBMA) on future products from Asia. As Europe strengthens its climate change narrative, some measures will be implemented by the life-cycle assessment method to evaluate the carbon intensity of various products and services. If, in the near future, CBMA is implemented strictly, it will have huge implications for the future export of products/services produced in ASEAN countries. Thus, the high carbon intensity of energy can become an economic risk in the future, including in ASEAN. Therefore, lowering or decarbonising one’s own economy not only helps protect the environment but also enhances opportunities for future economic growth. From this perspective, the study aims to analyse the outlook for carbon intensity in ASEAN. At the same time, it is important to understand changes in carbon competitiveness relative to countries or regions that may compete in the export market. This knowledge will be the starting point for considering actions to strengthen the economic competitiveness of the ASEAN region even in the low-carbonised world of the future.

POLICY IMPLICATIONS

Provide recommendations to ASEAN to transition to low-carbon economy to gain from the future policy that favours low-carbon products.

Partner Organisation

The Institute of Energy Economics, Japan

Geographic Scope

ASEAN, Europe, Japan

Related Publications

Carbon neutrality

## 63 Renewable Energy Transition in South Asia: The Role of Regional Energy Trade

*Venkatachalam Anbumozhi, Saswata Chaudhury, Ritu Mathur, and Kamna Waghray*

### SUMMARY

South Asia has recently shown about 7% economic growth (World Bank, 2019). In spite of persistent economic growth, however, South Asian countries remain energy-constrained and lack energy access. Significant improvement in energy access as well as energy demand in these countries has been made in recent years, but 100% access to electricity and clean cooking fuel in rural areas has yet to be achieved. Achieving energy security and energy sustainability is an important agenda for most of these countries. Integrating renewable energy resources into the national energy mix is important for energy sustainability and security as this will complement the limited availability of fossil fuel and address environmental sustainability. However, technological backwardness and the poor network are a major challenge for reliability of renewable energy in these countries.

Regional integration and renewable energy trade can facilitate renewable energy transition in South Asian countries. The study is expected to indicate prospects for regional cooperation in South Asian countries and implications for other regions like Southeast Asia and provide insights regarding increasing regional trade especially in renewable energy. This would not only balance the inter- and intra-regional energy demand and supply but also help neighbouring economies transition towards renewable energy. The study is built upon the hypothesis that renewable energy transition through regional trade is likely to help the member countries move towards better and sustainable economic growth and fulfill their environmental obligations.

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## POLICY IMPLICATIONS

The study is expected to indicate the prospects for regional cooperation in South Asian countries and its implications for Southeast Asia and provide insights regarding increasing regional trade especially in renewable energy.

Renewable energy transition through regional trade is likely to help the member countries move towards better and sustainable economic growth and fulfill their environmental obligations.

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### Partner Organisation

The Energy Research Institute

### Geographic Scope

India, South Asia, and ASEAN

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### Related Publications

Anbumozhi, V., I. Kutani, M. P. Lama (eds.), (2019). Energising Connectivity between Northeast India and its Neighbours. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/energising-connectivity-between-northeast-india-and-its-neighbours/>

*Venkatachalam Anbumozhi, Bhupendra Singh, V.G. R. Chandran, and K. Yamaguchi*

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### SUMMARY

Securing regional supply chain for solar energy will play an important role in meeting regional energy security in the coming years. The growing energy needs of the Northeastern Region (NER) of India, the focus of photovoltaic component manufacturing in several ASEAN Member States (AMSs), have created unique opportunities in securing regional solar supply chain. Given the speed of change in cost reduction and increasing demand, a strong case can be made for the international community to participate and build a strong regional supply chain and/or production networks.

The study examines the demand opportunities and identifies key structural issues affecting solar manufacturing and provides policy insights to enable the creation of a regional supply chain and develop a framework for improved energy access through solar power mini-grids in NER, and its implications on neighbouring Myanmar. The key objectives of the study include identifying and formulating strategies, standards, and requisites for development of regional solar supply chain involving NER and major ASEAN economies, and assessing the potential for multilateral cooperation for technology upgrade, capital expenditure support for regional solar manufacturing, development of integrated solar manufacturing hubs, promotion of clustered research and development project funding, and low-cost financing to support solar photovoltaic-based mini-grid systems in NER.

### POLICY IMPLICATIONS

- Estimation of demand opportunities over the next 20 years across solar supply chain in NER and ASEAN
- Value-added analysis on key elements for securing a regional solar supply chain and/or international production networks

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## Partner Organisation

Confederation of Indian Industries

## Geographic Scope

India, ASEAN

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## Related Publications

Anbumozhi, V., I. Kutani, M. P. Lama (eds.), (2019). *Energising Connectivity between Northeast India and its Neighbours*. Jakarta: ERIA.

Downloadable from: <https://www.eria.org/publications/energising-connectivity-between-northeast-india-and-its-neighbours/>



## 65 Preparation of Energy Outlook and Analysis of Energy Saving Potential in East Asia Region

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*Shigeru Kimura, Han Phoumin and Alloysius Joko Purwanto, 16 working group members from EAS 16 countries except Japan, ERIA and IEEJ*

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### SUMMARY

In 2021–22, ERIA updates EAS energy outlook and saving potential using latest available data of 2018 and 2019. Usually two scenarios, BAU and APS (including aggressive EEC and RE) are updated but this time one more scenario will be produced namely low carbon energy transition or carbon neutral by 2050 or after. Consequently, future energy balance table (EBT) should include hydrogen/ammonia and CCS/CCU and these inclusions are first time for the working group members. The final report will analyze three scenarios, BAU, APS and low carbon energy transition and extract that achievement of carbon neutral by 2050 is hard for EAS countries.

### POLICY IMPLICATIONS

Current and future available technologies which are EEC, RE including VRE, hydrogen/ammonia and CCS/CCU will be needed for achieving carbon neutral in Asia region.

#### Partner Organisation

Institute of Energy Economic, Japan

#### Geographic Scope

EAS region

#### Related Publications

*Kimura, S., H. Phoumin (eds.), (2020), Energy Outlook and Energy Saving Potential in East Asia Region 2022. Jakarta: ERIA.*

Downloadable from: <https://www.eria.org/publications/energy-outlook-and-energy-saving-potential-in-east-asia-2020/>



## 66 The Strategic and Economic Value of Joint Oil Stockpiling Arrangements for Middle East Exporters and ASEAN Importers

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*Tetsuo Morikawa*

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### SUMMARY

This research will cater to policymakers and facilitate understanding of the differing responses and outcomes on the question of energy security and the role of joint venture oil storage facilities.

This study will conduct literature review, cost benefit analysis, and a workshop.

While literature survey covers strategic petroleum reserve, the cost benefit analysis would be based on scenarios of stockpiling development options and supply disruptions to the horizon 2030. IEEJ, King Abdullah Petroleum Studies and Research Center (KAPSARC), and ERIA will host a workshop of all relevant agencies in government, private and state-owned oil companies, and researchers to share study outcome and to raise awareness of oil stockpiling in ASEAN.

The study is expected to deliver policy recommendations on the continuation and on the effectiveness of oil stockpiling policies and on what ASEAN importers should do in this issue.

121

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### POLICY IMPLICATIONS

The study shall provide a set of policy recommendations on the continuation and on the effectiveness of oil stockpiling policies and strategies in ASEAN for energy policy makers and ASEAN importers especially in relation to the Middle East oil exporters.

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#### Partner Organisation

Institute of Energy Economic Japan (IEEJ)

#### Geographic Scope

Indonesia, Philippines, Malaysia



Sentral Senayan II 6th floor  
Jalan Asia Afrika No. 8  
Gelora Bung Karno, Senayan  
Jakarta Pusat 10270, Indonesia

Phone (62-21) 57974460  
Fax (62-21) 57974463

