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Locknie HSU
Singapore Management University, lockniehsu@smu.edu.sg

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TRADE AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY IN ASEAN: MAPPING PRIORITIES TO ECONOMIC TREATY NEGOTIATIONS

Locknie Hsu*

Abstract: The 10 members of the Association of Southeast Asian Nations ("ASEAN") share common objectives in economic, sociocultural and political-security integration. Addressing environmental concerns is an important consideration which traverses different areas of integration policymaking. ASEAN has, in recent years, emphasised the importance of environmental considerations, including environmentally sound technologies ("ESTs") which may contribute to its climate change mitigation and adaptation efforts, in its law and policymaking. This article discusses the nexus between ASEAN's needs for the transfer of ESTs and the group's economic treaty negotiations. Through a "mapping" of such needs to free trade agreement areas, it aims to provide a pathway to new considerations and opportunities to facilitate the transfer of ESTs, particularly when ASEAN conducts reviews and negotiations of such agreements.

Keywords: *Association of Southeast Asian Nations, environmental goods and services, environmentally sound technologies, free trade agreements, sustainable development, trade barriers*

I. Introduction

The Association of Southeast Asian Nations ("ASEAN") represents 10 member states which share objectives in economic, sociocultural and political-security integration.[1] Environmental sustainability is an important area of joint policymaking and is being implemented through a number of initiatives which cut across different integration areas.[2]

To promote balanced social development and a sustainable environment, the *ASEAN Socio-Cultural Community ("ASCC") Blueprint 2025* identified three key

* Professor, Yong Pung How School of Law, Singapore Management University. lockniehsu@smu.edu.sg. The author is grateful to Ms Maxine Hong for her kind assistance in formatting and house style aspects.

1 These areas of integration are seen in ASEAN's three Communities. See ASEAN, "Our Communities", available at https://asean.org/our-communities/ (visited 20 July 2022).

2 See ASEAN Declaration on Environmental Sustainability (done on 20 November 2007, published online on 13 June 2012) ("ASEAN Declaration on Environmental Sustainability"), available at https://asean.org/asean-declaration-on-environmental-sustainability/ (visited 20 July 2022). See also the Hanoi Plan of Action (adopted 15 December 1997, published online on 19 June 2012) Pt VI, available at https://asean.org/hanoi-plan-of-action/ (visited 20 July 2022).

areas, with accompanying strategic measures, namely: (1) conservation of sustainable management of biodiversity and natural resources, (2) promotion of environmentally sustainable cities, (3) response to climate change, and (4) sustainable consumption and production.[3] The ASEAN *Framework on the Circular Economy for the ASEAN Economic Community* ("AEC") refers to the use of technology in "greening" of supply chains, the promotion of "green technology", "technology exchange" and a "community-wide collaborative approach and cooperation mechanism, including sharing of best practices and technology".[4]

In October 2021, the members of ASEAN issued a Joint Statement prior to the 26th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change held in Glasgow, Scotland, highlighting the need for international cooperation and assistance to support the ASEAN members and other developing countries for financing and "*the development and transfer of environmentally sound technology*, scientific research, and capacity building, for mitigation and adaptation measures, as stipulated under the UNFCCC and the Paris Agreement. . ."[5] (emphasis added).

What, then, are environmentally sound technologies ("ESTs") (sometimes known as "green technology")? While there is no single definition, the following meaning provided by the United Nations Environment Programme ("UNEP") is a useful one for present purposes:

> Environmentally Sound Technologies (ESTs) are technologies that have the potential for significantly improved environmental performance relative to other technologies. ESTs protect the environment, are less polluting, use resources in a sustainable manner, recycle more of their wastes and products, and handle all residual wastes in a more environmentally acceptable way than the technologies for which they are substitutes. ESTs are not just individual technologies. They can also be defined as total systems that include know-how, procedures, goods and services, and equipment, as well as organizational and managerial procedures for promoting environmental sustainability.[6]

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3 See ASEAN Secretariat, "ASEAN Socio-Cultural Community Blueprint 2025" (ASEAN Secretariat 2016), paras.14–16, available at https://www.asean.org/wp-content/uploads/2012/05/8.-March-2016-ASCC-Blueprint-2025.pdf (visited 20 July 2022).

4 See ASEAN, "Framework for Circular Economy for the ASEAN Economic Community" (21 October 2021) ("Framework for Circular Economy for AEC"), 3, 6, 7, available at https://asean.org/asean-adopts-framework-for-circular-economy/ (visited 20 July 2022).

5 ASEAN Joint Statement on Climate Change to the 26th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (adopted 26 October 2021), para.17, available at https://asean.org/asean-joint-statement-on-climate-change-to-the-26th-conference-of-the-parties-to-the-united-nations-framework-convention-on-climate-change-unfccc-cop-26/ (visited 20 July 2022).

6 See UN Environment Programme, "Environmentally Sound Technologies", available at https://www.unenvironment.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/environmentally-sound (visited 20 July 2022).

The aforementioned definition highlights two key features of ESTs: (1) ESTs have the potential to improve environmental performance relative to other technologies; (2) ESTs are not just technologies, but they also include goods and services deploying such technologies, know-how and organisational and managerial systems. As such, a study of ESTs and their transfer calls for an examination of a variety of policy areas and laws. For example, given that ESTs may be developed with a degree of creativity, effort and investment, intellectual property laws—such as patent laws—play an important role in regulating the exploitation and transfer of ESTs. In addition, as services play an important role in the use of environmental goods, and in the operation of environmental projects, rules—whether impeding or facilitative - on the supply and investment in such services are also relevant.

In terms of physical goods or equipment which embody ESTs, the ease or difficulty of moving such goods and equipment across borders is another significant consideration. In this regard, tariff and non-tariff barriers imposed by countries may form obstacles to their transfer. In terms of services which include ESTs, barriers set out in the WTO's General Agreement on Trade in Services ("GATS"), such as quotas on service suppliers or discriminatory measures, would be relevant. In the area of investments, barriers to investments which employ or develop goods and services which make use of ESTs may take the form of discriminatory measures, or approval and operational restrictions in the host country.

More broadly, national environmental policies, foreign direct investment and procurement can also have an impact on the transfer of technology.[7] "Green" development policies and cross-border "green finance" initiatives may also play a part. A number of international instruments and mechanisms exist to promote ESTs. Among these are the United Nations' platforms promoting ESTs.[8]

Given the importance of environmental policy and the role of ESTs in such policy in ASEAN, this article explores the potential role of economic agreements in facilitating EST transfer to and in the region. Section II provides an overview of the interface between trade and ESTs, and key agreements and legal issues of

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7 See, eg, United Nations Environment Programme ("UNEP"), "The Trade-Technology Nexus: A Key Enabling Force for Achieving the Sustainable Development Goals", available at https://www.unep.org/explore-topics/technology/what-we-do/technology-dialogue-series/technology-trade-nexus-key-enabling (visited 20 July 2022); David Popp, "The Role of Technological Change in Green Growth" (World Bank Policy Research Working Paper, 2012), available at www.enterprise-development.org/wp-content/uploads/The_Role_of_Technological_Change_in_Green_Growth.pdf (visited 20 July 2022). On channels of transfer of technology in general, see for example, Bernard M Hoekman, Keith E Maskus and Kamal Saggi, "Transfer of Technology to Developing Countries: Unilateral and Multilateral Policy Options" (2005) 33(10) World Development 1587–1602, available at https://openknowledge.worldbank.org/handle/10986/14181 (visited 20 July 2022).

8 See UNFCC, "Climate Technology", available at http://unfccc.int/ttclear/tec/tech-transfer-framework.html (visited 20 July 2022); United Nations Department of Economic and Social Affairs, "Climate Change: Technology Development and Technology Transfer" (Background Paper for Beijing High-level Conference on Climate Change: Technology Development and Technology Transfer, Beijing, November 2008). See also UNFCC, "Technology Executive Committee", available at http://unfccc.int/ttclear/tec (visited 20 July 2022); UN Climate Technology Centre & Network website, available at https://www.ctc-n.org/ (visited 20 July 2022).

relevance. Section III highlights the commercial avenues for transfer of ESTs within ASEAN, while Section IV explores the untapped potential in economic agreements by mapping ASEAN's environmental goals to FTA opportunities, given that FTA reviews and negotiations allow states to consider various manners of collaboration in support of environmental technology transfers. Section V explains other opportunities for EST transfer in ASEAN under non-FTA initiatives.

II. Trade and ESTs: Overview

Transfer of ESTs to developing countries has been addressed in a number of major international instruments. These include the United Nations Framework Convention on Climate Change ("UNFCC"), the 2030 Agenda for Sustainable Development and the Sustainable Development Goals ("SDGs"), the Paris Climate Agreement, Bali Action Plan and Cancun agreements. Impediments to the transfer of EST goods may exist in the form of tariffs and non-tariff barriers, which would be subject to the general disciplines (and exceptions) found in the WTO's multilateral agreements, such as the GATT, Agreement on Technical Barriers to Trade and the TRIPS Agreement.

The Environmental Goods Agreement ("EGA"), which potentially eliminates barriers to trade in EST goods, is under negotiation at the World Trade Organization ("WTO").[9] These negotiations were launched in July 2014 by 18 participating economies (which account for the most global trade in environmental goods) and the present number has grown to 46.[10] The EGA aims to reduce tariffs on environmental goods, including those used in producing clean and renewable energy, improving energy and resource efficiency and reducing air, water and soil pollution. It would therefore help to promote access to such goods globally. Obvious limitations—apart from the fact that the agreement is still under negotiation—include the fact that it is not a multilateral negotiation involving all WTO members.

There are also definitional issues, if one compares the definitions of environmental goods in the EGA, the Asia-Pacific Economic Cooperation ("APEC")[11] and the Organisation for Economic Co-operation and Development ("OECD"). ESTs can

9 WTO, "Environmental Goods Agreement (EGA)", available at https://www.wto.org/english/tratop_e/envir_e/ega_e.htm (visited 20 July 2022).

10 The present EGA participants are Australia; Canada; China; Costa Rica; the European Union (representing Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom); Hong Kong, China; Iceland; Israel; Japan; Korea; New Zealand; Norway; Singapore; Switzerland; Liechtenstein; Chinese Taipei; Turkey and the United States; see https://www.wto.org/english/tratop_e/envir_e/ega_map_e.htm (visited on 20 July 2022).

11 See APEC 2012 Leaders' Declaration (September 2012), available at https://www.apec.org/Meeting-Papers/Leaders-Declarations/2012/2012_aelm (visited 20 July 2022). For the APEC list of goods, see APEC, "Annex C – APEC List of Environmental Goods", available at https://www.apec.org/Meeting-Papers/Leaders-Declarations/2012/2012_aelm/2012_aelm_annexC (visited 20 July 2022).

include goods, services and technologies that help in the reduction of greenhouse gas emissions and adaptation to the effects of climate change. These include renewable or "clean" energy technologies and those promoting the efficient use of energy. Negotiations for the EGA do not cover EST-related *services* and investment barriers.[12]

Apart from the EGA, WTO members' commitments with regard to environmental services under the WTO's General Agreement on Trade in Services ("GATS") (as well as further negotiations on such services), the TRIPS Agreement and the plurilateral Agreement on Government Procurement are also relevant in that they contain rules which can impact the transfer of ESTs.[13]

A. Agreement on Trade-Related Aspects of Intellectual Property Rights

The WTO Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS"), a multilateral treaty, provides for rules and standards in relation to trade-related intellectual property rights ("IPRs"), including patents, copyright and trademarks, and their enforcement, while also containing a number of "flexibilities". Subject to such flexibilities and any waivers by members, WTO members must comply with the minimum level of intellectual property protection and enforcement requirements in the Agreement. This includes patent protection requirements, which are of particular interest to owners of patent-protected ESTs and potential transferees of such technology. TRIPS provisions can have implications for transfers of technology, such as arts.8.2, 39, 40 and 66.2. In addition, art.39 requires WTO members to provide protection for undisclosed information, which, in the present context, may include trade secrets relating to environmental goods and services.

The Government Procurement Agreement ("GPA") is a plurilateral agreement, that is, it is not an agreement that binds all members of the WTO; its disciplines on procurement therefore bind only those WTO members which are party to the agreement.[14] Bilateral and regional trade agreements also often contain negotiated

12 See William A Reinsch, Emily Benson and Catherine Puga, "The Environmental Goods Agreement: A New Frontier or an Old Stalemate?" *CSIS* (28 October 2021), available at www.csis.org/analysis/environmental-goods-agreement-new-frontier-or-old-stalemate.com (visited 20 July 2022). See also Arun Jacob and Anders K Møller, "Policy Landscape of Trade in Environmental Goods and Services" (ARTNeT Working Paper Series No. 166, 2017), available at www.unescap.org/sites/default/files/AWP%20No.%20166.pdf (visited 20 July 2022), and in the relevance of environmental services and transfers of technology, see in particular, 32–37.

13 See eg, the reference by US Trade Representative, Ambassador Katherine Tai to "climate-related technologies" in her testimony to the US Senate Finance Committee, at her Nomination hearing on 25 February 2021, and her reference to goods *and* services in her answer to Question 6, page 21, available at https://www.finance.senate.gov/imo/media/doc/Katherine%20Tai%20Senate%20Finance%20Committee%20QFRs%202.28.2021.pdf (visited 20 July 2022).

14 The GPA was revised in 2012. At the time of writing, there are 21 parties which are party to the GPA (covering 48 WTO members, counting the EU and its 27 member states as one party). Additionally, at the time of writing, 11 WTO members, including Brazil, China, Kazakhstan and the Russian Federation, are in the process of GPA accession.

government procurement commitments. As governments are procurers of environmental goods and services, procurement activities may be avenues for transfer of ESTs, leading to a possible role for economic agreements to include provisions which facilitate such transfers.

Another WTO agreement which may be relevant is the Agreement on Technical Barriers to Trade ("TBT"), which contains disciplines on mandatory product standards applied by WTO members to cross-border trade in goods, including EST goods.

Apart from the WTO, other multilateral agencies also address the transfer of ESTs. The World Intellectual Property Organization ("WIPO"), for example, has, apart from examining the role of IPRs in access to ESTs,[15] actively promoted transfer of ESTs through its "WIPO Green" programme, which was established in 2013. This initiative facilitates access to IPRs in ESTs through a fee-free, publicly accessible database and helps to match "technology seekers" (including small and medium enterprises or SMEs) with those which have relevant ESTs.

III. Avenues for Commercial Transfers of ESTs in ASEAN

ESTs may be transferred in a variety of commercial settings, including their outright purchase, importation, spillover transfers, investment and training activities.[16] Cooperative arrangements between states, such as those in which commercial parties from different states may be "matchmade" with each other, may offer another avenue for transfers.

It may not be immediately evident that economic agreements such as Free Trade Agreements ("FTAs") can play a role in promoting such transfers, but various possibilities exist, particularly in chapters containing sustainable development provisions and/or "cooperation" arrangements. More "conventional" provisions of FTAs such as those addressing movement of goods and services may also be negotiated to address ease of transfer of EST-related goods and services.

IV. Untapped Potential: Mapping ASEAN Environmental Goals to FTA Opportunities

ASEAN member states promote the transfer of technology in a number of collaborative initiatives and plans.[17] An example is the *Framework on the Circular*

15 See eg, WIPO, "Innovation and Diffusion of Green Technologies: The Role of Intellectual Property and Other Enabling Factors" (2015), available at www.wipo.int/edocs/pubdocs/en/wipo_rep_gc_2015_1.pdf (visited 20 July 2022).

16 See Fukunari Kimura, Tomohiro Machikita and Yasushi Ueki, "Technology Transfer in ASEAN Countries: Some Evidence from Buyer-Provided Training Data" (2016) 49 Econ Change Restruct 195.

17 For a detailed analysis of ASEAN and transfer of technology policies and frameworks, see UNEP, "Trade in Environmentally Sound Technologies in the ASEAN Region: A Report of the Environment

Economy for the ASEAN Economic Community ("AEC Framework").[18] Significantly, the AEC Framework joins efforts across areas of integration in the AEC and the ASCC.[19] It also directs attention to the relevance of, *inter alia*, regional supply chains and micro-, small and medium enterprises ("MSMEs") in what is referred to as the "ecosystem for circular products and services". To achieve its goals, the AEC Framework sets out a number of new initiatives, "strategic goals" and "guiding principles". Strategic Goal 3 is of particular relevance here:

> **"Strategic Goal 3: Sustainable and Inclusive Growth**
>
> Public and private finance communities are increasingly seeking Environmental, Social and Governance ("ESG") opportunities as a part of growing international and domestic trend towards investment portfolios whose profit go hand in hand with sustainability. ASEAN has an opportunity to lead this global shift given its rapid industrialisation, wealth in natural resources, and economic integration, by becoming a hub for circular innovations, *promoting complementarities in regional supply chains through technology exchange*, whilst taking into account the different levels of development of the [ASEAN member states]. ASEAN needs to create an enabling environment to sustain growth and accelerate it such as through enhancing innovative business models and coordinating resources towards circular investments". (Emphasis added)

Principle 4 of the AEC Framework also encourages ASEAN-wide coordination on knowledge, technology transfer and capacity-building. It highlights the possibility of "online platforms for best practices, or partnerships with research networks, the private sector, and other stakeholders", which could help promote such transfer of technology.[20]

More specifically, in the present context, ASEAN has identified *climate finance* and *transfer of technology* as "key priorities".[21] Examples of technologies of interest for climate adaptation in member states include climate-smart agriculture, water balance systems, flood and typhoon hazard and early warning systems, integrated water resource development and disease surveillance systems. Given that ASEAN policymakers are keen to balance growing Information and

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and Trade Hub and UNEP-[Technical University of Denmark] Partnership" (2018) ("Trade in Environmentally Sound Technologies in the ASEAN Region").

18 See ASEAN, "Framework for Circular Economy for AEC" (n. 4).

19 See s.D10 of ASEAN Secretariat, "Roadmap for an ASEAN Community 2009–2015" (ASEAN Secretariat 2009), available at https://www.asean.org/wp-content/uploads/images/ASEAN_RTK_2014/2_Roadmap_for_ASEAN_Community_20092015.pdf (visited 20 July 2022). See also s.3.4.1.

20 See generally, ASEAN Secretariat, *ASEAN State of Climate Change Report* (ASEAN Secretariat 2021) ("*ASEAN State of Climate Change Report*"), available at https://asean.org/book/asean-state-of-climate-change-report/ (visited 20 July 2022).

21 *Ibid*.

Communication Technology ("ICT") needs and energy use, the transfer of technology which can help achieve such a balance would also be of interest.[22] Cleaner coal technology is another area in which ASEAN member states may benefit from transfers of technology.[23] Under the ASEAN Plan of Action for Energy Cooperation Phase 2, 2015–2025, ASEAN member states aim to transition to a 23 per cent share of renewable energy in its total primary energy supply by 2025.[24] A number of collaborative projects which facilitate the transfer of technology under the Plan are already ongoing.[25]

A. Potential for EST Transfer to ASEAN in the Context of FTAs

Within the ASEAN region, the objective of promoting transfer of ESTs can be seen in a number of "soft law" documents.[26] For instance, the *ASEAN Declaration on Environmental Sustainability* of 2012 clearly refers to the "transfer of environmentally-sound technologies".[27] Technology has been identified as one of three "enabling environment" factors for ASEAN to enhance its climate change adaptation ambitions.[28] More recently, diffusion of technology which promotes the Circular Economy in ASEAN in the context of trade obstacles has been thrown into sharper relief, as can be seen in the proposed initiatives under Strategic Priority 2:

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22 See Myriam Akhoun, "How Singapore and Asia's Tech Sector Can Lead in Renewable Energy Adoption" *Business Times* (Singapore, 28 June 2021), available at www.businesstimes.com.sg/asean-business/how-singapore-and-asia%E2%80%99s-tech-sector-can-lead-in-renewable-energy-adoption (visited 20 July 2022).

23 See ASEAN Centre for Energy (ACE) and World Coal Association (WCA), "Clean Coal Technology in ASEAN: Balancing Equity, Security and Sustainability" (2021), available at https://aseanenergy.sharepoint.com/PublicationLibrary/Forms/AllItems.aspx?id=%2FPublicationLibrary%2F2021%2FPublications%202021%2FVALCOE%2Epdf&parent=%2FPublicationLibrary%2F2021%2FPublications%202021&p=true&ga=1 (visited 20 July 2022).

24 ACE, "ASEAN Plan of Action for Energy Cooperation (APAEC) 2016–2025" (2020), available at https://aseanenergy.org/asean-plan-of-action-for-energy-cooperation-apaec-phase-ii-2021-2025/ (visited 20 July 2022).

25 See, for example, Randi Kristiansen and Lucila Arboleya, "Southeast Asia Can Reach Clean Energy Targets by Investing in Transmission" *International Energy Agency* (5 February 2021), available at www.iea.org/commentaries/southeast-asia-can-reach-clean-energy-targets-by-investing-in-transmission (visited 20 July 2022).

26 See generally, UNEP, "Trade in Environmentally Sound Technologies in the ASEAN Region" (n. 17).

27 See ASEAN Declaration on Environmental Sustainability (n. 2), para.2, available at https://asean.org/asean-declaration-on-environmental-sustainability/ (visited 20 July 2022). Paragraph 2 contains a number of statements including the member states' commitment: "to intensify regional and international cooperation in promoting, sharing and implementing environmentally sustainable practices, including the transfer of environmentally-sound technologies, the enhancement of human and institutional capacities and the promotion of sustainable consumption and production patterns".

28 *ASEAN State of Climate Change Report* (n. 20), 113. The other two factors are finance and human resource. On the importance of technology and its diffusion in addressing climate change in ASEAN, see also 115–116, 119–121, 124–127 and 134, and the role of technology transfer in ASEAN member states, in Appendixes A and B.

(a) Alleviate unnecessary barriers to and promote trade, investment, and innovation in environmental goods and services *to ensure the diffusion of the best available circular technologies*.
(b) *Facilitate movement* of second-hand goods and materials across border to support circularity efforts, such as through the development of a taxonomy to help minimise unnecessary regulatory burdens.
(c) *Ensure compatibility of environmental goods and services in ASEAN bilateral and multilateral trade negotiations*.
(d) Support businesses in their supply chain management efforts, which may *include technical advisory and consultative services*, testing beds for emerging technologies, and other ancillary services, where unnecessary trade barriers for CE exists.
(e) *Consider a review of existing agreements and regulations* with aim of identifying entry points for circularity and addressing possible trade barriers. (Emphasis added)[29]

In order to achieve the aforementioned trade objectives, it is necessary to identify and assess ASEAN's environmental technology needs. The following is a concise assessment of technology needs with regard to climate change adaptation in ASEAN:[30]

> Assessments of technology needs for climate change adaptation are *at a nascent stage in most ASEAN countries*, and countries rely upon a range of technologies in their adaptation strategy development and implementation. Technologies such as climate-smart agriculture, water balance systems, flood and typhoon hazard and early warning systems, integrated water resource development, disease surveillance systems appear prominently among the adaptation strategies listed by the ASEAN countries. *However, the related policy and strategy documentation often fails to identify the extent of technological development, how far it has been adopted, and where the new technologies can be sourced from*. At the regional level, technological cooperation is taking shape at a rapid pace with establishment of the Committee on Science and Technology, and Plan of Action on Science, Technology and Innovation ("PASTI") 2016–2025, which can play vital roles in technological cooperation in the ASEAN region (ASEAN, 2017). PASTI identified climate change as one of the priority areas of action and aims to develop climate prediction models, climate impact assessments, regional climate data sets and climate data processing through the engagement of academia and the private sector. These

29 ASEAN, "Framework for Circular Economy for AEC" (n. 18), especially proposed initiatives under Strategic Priority 2, at 8.
30 *ASEAN State of Climate Change Report* (n. 20), 54. For high-priority technologies identified, see 71–72.

> measures are expected to enhance technological cooperation on climate change adaptation in the near future. (Emphasis added)

It is worth highlighting that, given the importance of agricultural food production in ASEAN, the transfer of technologies to promote sustainable agri-food production and supply chains can be expected to be of strong interest.[31]

It is clear that a multi-stakeholder, ASEAN-wide effort is seen as necessary, as Principle 4 in promoting the Circular Economy in ASEAN shows, below:

> **Principle 4: Encourage ASEAN-wide coordination on knowledge, technology transfer, and capacity building.**
>
> Effective implementation of ASEAN CE initiatives requires close *cross-sectoral and cross-pillar coordination*, especially between the AEC and ASCC, and engagement with the broader stakeholders. A *Community-wide* collaborative approach and cooperation mechanism, *including sharing of best practices and technology*, shall be encouraged to advance CE in the region. As well, mechanisms to support these endeavours shall be established, such as online platforms for best practices, or partnerships with research networks, the private sector, and other stakeholders.[32] (Emphasis added)

Such an approach supports the above objectives of identifying priority EST needs in ASEAN and addressing trade obstacles which may impede transfer of such technology.

B. EST Goods Barriers

Tariffs, non-tariff measures ("NTMs") and underdeveloped regulatory frameworks have been identified as obstacles in EST trade.[33] ASEAN member states, which are

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31 See ASEAN, "Strategic Plan of Action for ASEAN Cooperation on Crops 2016–2020", available at https://asean.org/wp-content/uploads/2016/10/Strategic-Plan-of-Action-for-ASEAN-Cooperation-on-Crops-2016-2020.pdf (visited 20 July 2022); 2016–2025 Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry (endorsed 10 September 2015), available at https://asean-crn.org/vision-and-strategic-plan-for-asean-cooperation-in-food-agriculture-and-forestry-2016-2025/ (visited 20 July 2022); ASEAN, "ASEAN Guidelines on Promoting Responsible Investment in Food, Agriculture and Forestry" (particularly Guideline 6) https://www.aseanraiguidelines.org/#:~:text=The%20ASEAN%20Guidelines&text=The%20ASEAN%20Guidelines%20on%20Promoting,and%20environmentally%20sustainable%20and%20inclusive (visited 20 July 2022. See also generally, Mohannad Alobid, Said Abujudeh and István Szucs, "The Role of Blockchain in Revolutionizing the Agricultural Sector" (2022) 14(7) Sustainability 4313.

32 ASEAN, "Framework for Circular Economy for AEC" (n. 18), 7.

33 See UNEP, "Trade in Environmentally Sound Technologies in the ASEAN Region" (n. 17), especially VI and Parts 2, 4.3 and 4.4.

part of APEC—such as Brunei Darussalam, Malaysia, the Philippines, Singapore, Thailand and Vietnam - have reduced tariffs on environmental goods.[34]

NTMs may take a number of forms, ranging from technical standards to burdensome procedural requirements. It has been observed that the reduction of tariffs on environmental goods and *complementary* goods, and of NTMs, could have an impact on trade in environmental goods (and by extension, transfers of ESTs embodied in them).[35]

C. EST Services and Investment Barriers

Services are an important part in addressing environmental improvement and climate change mitigation and adaptation.[36] Related to the supply of services, cross-border investments which may allow for the use and diffusion of ESTs are also highly pertinent.

As an example, the OECD/Eurostat lists 10 environmental service categories under the Pollution Management Group:[37]

(a) Air pollution control,
(b) Wastewater management,
(c) Solid waste management (further divided into: (1) hazardous waste collection, treatment and disposal; (2) waste collection, treatment and disposal; and (3) waste recovery and recycling (excludes manufacture of new materials or products from waste and scrap),
(d) Remediation and clean-up of soil, surface water and groundwater,
(e) Noise and vibration abatement,
(f) Environmental R&D,
(g) Environmental contracting and engineering,
(h) Analytical services, data collection, analysis and assessment,
(i) Education, training, information, and
(j) Other.

Transfer of technology in the aforementioned and other EST-related services would be beneficial to ASEAN to help develop long-term expertise in management of

34 *Ibid*., 11. The study also found an "untapped market in ESTs in the ASEAN region" at 20. For a discussion of ASEAN tariff rates on environmental goods between 2002 and 2015, see Arun Jacob and Anders K Møller, "Policy Landscape of Trade in Environmental Goods and Services" (n. 12), 22.

35 See Arun Jacob and Anders K Møller, "Policy Landscape of Trade in Environmental Goods and Services" (n. 12), 23 and 27–32, and UNEP, "Trade in Environmentally Sound Technologies in the ASEAN Region" (n. 17), 22–37.

36 See eg, Ronald Steenblik, Dominique Drouet and George Stubbs, "Synergies between Environmental Services and Trade in Environmental Goods" (OECD Trade and Environment Working Paper, 2005), 1.

37 *Ibid*., 6. See also generally, UNEP, "Trade in Environmentally Sound Technologies: Implications for Developing Countries" (2018) ("Trade in Environmentally Sound Technologies: Implications for Developing Countries").

environmental and sustainability issues.[38] EST services of high priority to ASEAN member states could, for instance, be first mapped against existing services barriers and investment barriers under domestic regimes, in order for an ASEAN-wide negotiation of reduction of such barriers to be held meaningfully.

Apart from the examples of services mentioned earlier, other EST areas in which ASEAN member states could benefit from are natural resource extraction, management of water resources and rivers and port and railway systems. Notably, these are major areas of economic activity within the region, some of which have gained more traction in recent years under initiatives such as the Belt and Road Initiative ("BRI"), whose projects hold great potential for trade in environmental goods and deployment of environmental construction services and processes, for instance.[39] The BRI holds similar (if not even greater) potential for trade in environmental services as well, given that services form an integral part of many BRI projects.[40] Finally, environmental impact assessment ("EIA") is another area in which EST and expertise transfer could benefit ASEAN.[41]

D. Sustainable Finance—Financial Services and EST Transfer

Sustainable finance has been identified as a means of promoting the circular economy in ASEAN and therefore a contributor to its environmental goals.[42]

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38 For other examples of areas in which technology and expertise are needed, see text accompanying notes 20 to 23, above.

39 See Arun Jacob and Anders K Møller, "Policy Landscape of Trade in Environmental Goods and Services" (n. 12), 17–19. For an overview of BRI commercial activities, including infrastructure projects, see generally Basil C Bitas, *ASEAN and the Belt and Road Initiative* (Academy Publishing, 2021).

40 See generally, Arun Jacob and Anders K Møller, "Policy Landscape of Trade in Environmental Goods and Services" (n. 12), 32–37.

41 See eg, *Environmental Impact Assessment—ASEAN Guidelines for Business Project Development in ASEAN Economic Community (AEC*), prepared by the Thai Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment, and PTT Public Company Limited (November 2018).

42 See text accompanying n. 21 and n. 20. See also Strategic Priority 4 of ASEAN's "Framework for Circular Economy for AEC" (n. 4), as also set out below ("CE" stands for Circular Economy):

Strategic Priority 4: Competitive Sustainable Finance and Innovative ESG Investments

Competitive Green finance and social entrepreneurship are crucial in the transition towards CE. Foremost is support for sustainable investments from both private and public financial institutions, to promote the three strategic goals of a resilient economy, resource efficiency, and sustainable growth. Other potential ways to promote CE are mainstreaming CE in AEC-related projects, facilitating competitive financing for sustainable projects including large scale multilateral infrastructure initiatives, and financing new business models that support the transition to CE. A regional taxonomy in line with international developments would provide clarity to investors, thus encouraging the mobilisation of sustainable finance and investment capital into activities that support ASEAN's transition towards a circular economy.

Innovative financial instruments such as green financing can be leveraged for the upgrading of production technology along the value chains and for promoting production technologies that warrant circularity and sustainability.

As a first step towards implementing ASEAN's sustainability and Circular Economy goals, the ASEAN Taxonomy Board released the *ASEAN Taxonomy on Sustainable Finance* (Version 1) in November 2021.[43] The Taxonomy is seen to be a significant step in developing a regional taxonomy which is "interoperable" with other regional and international taxonomies, so as to attract sustainable finance investments to ASEAN.[44] The initiative could spawn projects in regions such as ASEAN in which ESTs are transferred in order to achieve environmental goals of both the EU and ASEAN.

The common nomenclature and understanding as to what constitutes components of "sustainable finance" are valuable and can be harnessed to build cooperation and liberalisation initiatives in ASEAN FTAs. This, in turn, can promote the transfer of ESTs through relevant services and related investments.

V. ASEAN: Potential of Non-FTA Initiatives in Transfers of ESTs[45]

A. EST Transfer in ASEAN: Potential Role of the Belt and Road Initiative (BRI)

The BRI was announced in 2013 by President Xi Jinping of China and aims to support efforts at, *inter alia*, sustainable development and promote cooperation agreements on "green economy".[46] It seeks to link the Europe–Asia–Africa region in land and sea trade connectivity, comprising a Silk Road Economic Belt and a

43 See ASEAN Taxonomy Board, "ASEAN Taxonomy for Sustainable Finance" (November 2021), available at https://asean.org/wp-content/uploads/2021/11/ASEAN-Taxonomy.pdf (visited 20 July 2022). The rationale for the Taxonomy has been stated as follows:

> A regional Taxonomy can provide alignment on underlying principles and serve to inform AMS (ASEAN member state) policy makers, AMS stakeholders in financial markets, and international investors.
>
> . . .
>
> The need for a taxonomy has been identified as a key impetus to widen participation and access among market players in an inclusive manner. An ASEAN Taxonomy will help harmonise the definitions of green and sustainable activities and assets across the AMS. At the same time, the Taxonomy must consider the specific situation of the AMS, many of which are in a state of development and growth. This will enable it to act as a tool for transition for high emission sectors and provide access to funding for sustainable projects, assets and activities. (page 18)

44 See *Ibid*., 2, 8, 22, 40, 48 and 49.

45 See generally, Appendix 1 of Sharon Seah and Melinda Martinus, "Gaps and Opportunities in ASEAN's Climate Governance" (2021) (5) ISEAS-Yusof Ishak Institute, available at https://www.iseas.edu.sg/wp-content/uploads/2021/03/TRS5_21.pdf (visited 20 July 2022). See also ASEAN, available at https://asean.org/our-communities/asean-socio-cultural-community/environment/ (visited 20 July 2022).

46 See President Xi Jin Ping's speech (n. 48). See also the Green Investment Principles for Belt and Road Development, available at https://greenfdc.org/green-investment-principle-gip-belt-and-road-initiative/. See also generally, Lachlan Carey, "Chinese Multilateralism and the Promise of a Green Belt and Road" *CSIS Brief* (5 November 2019), available at www.csis.org/analysis/chinese-multilateralism-and-promise-green-belt-and-road (visited 20 July 2022).

twenty-first-century Maritime Silk Road.[47] The BRI is supported by, *inter alia*, several of China's state-owned enterprises ("SOEs") and Chinese banks.[48] Infrastructure project funding along the Belt and Road region is also being provided by other bodies such as the Asian Infrastructure Investment Bank ("AIIB"), a multilateral bank established in 2016.[49] The BRI and associated entities have the potential to drive the use of ESTs and transfer of ESTs among BRI participant countries. There is also an increasing emphasis on the employment of "green finance" in BRI projects, which could entail the use of ESTs in construction and transportation—and technology cooperation and exchange.[50] A recent example is the establishment of the Belt and Road Environmental Technology Exchange and Transfer Center (Shenzhen).[51] In relation to ASEAN, specific energy platforms, such as the China-ASEAN Clean Coal Conversion Technology Cooperation and Exchange, also have the potential to promote EST innovation and transfers.[52]

B. EST Transfer in ASEAN: The Potential of the EU's Global Gateway Initiative

In December 2021, the EU launched the Global Gateway initiative in which up to €300 billion could be mobilised to promote sustainability links between the EU and other countries and regions.[53] The initiative aims to promote sustainable

47 See Chinese Ministry of Foreign Affairs website, available at https://www.mfa.gov.cn/ce/cegv/eng/zywjyjh/t1675564.htm (visited 20 July 2022). See also, Wendy Wu, "China's Silk Road Fund 'Seeking Investment Projects in Europe'" *South China Morning Post* (22 March 2017), available at www.scmp.com/news/china/diplomacy-defence/article/2081067/chinas-silk-road-fund-seeking-investment-projects (visited 20 July 2022).

48 President Xi Jinping of China reiterated the goals of the initiative at the Belt and Road Summit in Beijing on 14 May 2017; the full text of his speech, including references to China's SOEs (the China Development Bank and the Export-Import Bank of China) in supporting funding projects along the route, is available at www.scmp.com/topics/belt-and-road-2017-summit (visited 20 July 2022).

49 The AIIB has an Environmental and Social Framework (version as at May 2021); see https://www.aiib.org/en/policies-strategies/_download/environment-framework/AIIB-Revised-Environmental-and-Social-Framework-ESF-May-2021-final.pdf (visited 20 July 2022), and generally, Martin A Weiss, "Asian Infrastructure Investment Bank (AIIB)" (Congressional Research Service, 2017), available at https://sgp.fas.org/crs/row/R44754.pdf (visited 2 August 2022).

50 See eg, Hou Liqiang, "BRI Projects Given Green Emphasis" *China Daily* (25 November 2021), available at https://english.www.gov.cn/news/topnews/202111/25/content_WS619ee13cc6d0df57f98e57ef.html (visited 20 July 2022).

51 See Ministry of Foreign Affairs of the People's Republic of China, "Initiative Offers Path to Green Growth" (29 April 2019), available at https://www.mfa.gov.cn/ce/ceasean/eng/ztbd/01/t1659311.htm (visited 20 July 2022).

52 For other platforms, see also ACE, "ASEAN Centre for Energy (ACE) and China Energy Technology & Economics Research Institute (CETERI) MoU Signing" (29 April 2021), available at https://aseanenergy.org/asean-centre-for-energy-ace-and-china-energy-technology-economics-research-institute-ceteri-mou-signing/ (visited 20 July 2022).

53 See European Commission, "Global Gateway: Up to €300 Billion for the European Union's Strategy to Boost Sustainable Links around the World" (1 December 2021), available at https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6433 (visited 20 July 2022).

and high-quality infrastructure development in partnership with non-EU parties.[54] While further details are not available at the time of writing, the plan will be taken forward through "Team Europe" initiatives.[55] Given the EST expertise within the EU, this new initiative could potentially play a very important role in transfer of EST technology to countries in ASEAN. It would also build on existing technology exchange and cooperation platforms between the EU and ASEAN, such as EU–ASEAN Greentech Transfer Initiative[56] and the EU–ASEAN Green Manufacturing Technologies.[57]

C. *The US Indo-Pacific Economic Framework*

Announced in late 2021, the US Indo-Pacific Economic Framework ("IPEF") aims to build on the United States' broader Indo-Pacific activities, including pursuing economic and development projects in the Indo-Pacific region.[58] At the time of writing, details of this new Framework are not yet available, although "green technology", supply chains and investment activities are expected to form part of the framework's focal areas.[59] Again, as the Framework is being developed at the time of writing, further details are not yet available. However, the *Indo-Pacific Strategy* of the United States, released in February 2022, provides some pertinent information of relevance on environmental technologies, such as its stated plans, shown in the following excerpts:

> . . . we will deepen long-standing cooperation with ASEAN while launching new high-level engagements on health, *climate and environment, energy*, transportation, and gender equity and equality. . . .[60]

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54 *Ibid*.

55 *Ibid*.

56 See "EU-ASEAN GreenTech Transfer Initiative", available at https://greentechtransfers.eu/ (visited 20 July 2022). The EU has also signed FTAs with two ASEAN member States to date—Singapore and Vietnam—which each contains a Trade and Sustainable Development chapter; see https://www.mti.gov.sg/Improving-Trade/Free-Trade-Agreements/EUSFTA and https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2020:186:FULL&from=EN#page=132 respectively (visited 20 July 2022).

57 See European Commission, "EU and ASEAN Collaborate on Green Manufacturing Technologies", available at https://ec.europa.eu/info/events/eu-and-asean-collaborate-green-manufacturing-technologies-2021-mar-22_en (visited 20 July 2022).

58 See The White House, "Indo-Pacific Strategy of the United States" (February 2022), available at www.whitehouse.gov/wp-content/uploads/2022/02/U.S.-Indo-Pacific-Strategy.pdf (visited 20 July 2022).

59 See *Ibid*., 9, 11, 14, and Joint Ministerial Statement by Australia, New Zealand, Singapore and U.S. on the Indo-Pacific Economic Framework (17 November 2021), available at www.mti.gov.sg/Newsroom/Press-Releases/2021/11/Joint-Ministerial-Statement-by-Australia-New-Zealand-Singapore-and-US-on-the-IndoPacific (visited 20 July 2022). See also, eg, Yuka Hayashi, "U.S. Readies New Asia-Pacific Economic Strategy to Counter China; Biden Administration Aims to Work More Closely with Asian Nations on Trade Issues, But Some Say Effort Won't Substitute for Previous Pact the U.S. Abandoned" *Wall Street Journal* (Washington, 6 February 2022), available at https://www.wsj.com/articles/u-s-readies-new-asia-pacific-economic-strategy-to-counter-china-11644148801 (visited 20 July 2022).

60 The White House, "Indo-Pacific Strategy of the United States" (n. 58), 9.

> . . . The United States will work with partners to develop 2030 and 2050 targets, strategies, plans, and policies consistent with limiting the global temperature increase to 1.5 degrees Celsius, and will seek to serve as the preferred partner as the region transitions to a net-zero future. Through initiatives like Clean EDGE, we will incentivize *clean-energy technology investment and deployment*, seek to drive energy-sector decarbonization, and foster climate-aligned infrastructure investment. . . .[61] (Emphasis added)

On 23 May 2022, it was announced that 7 of the 10 member states of ASEAN would be participating in the IPEF.[62] Among other objectives, the Framework is expected to include cooperation on technologies, as shown in the following excerpt:[63]

> Clean Energy, Decarbonization, and Infrastructure: In line with our Paris Agreement goals and efforts to support the livelihood of our peoples and workers, we plan to accelerate the development and deployment of clean energy technologies to decarbonize our economies and build resilience to climate impacts. This involves *deepening cooperation on technologies*, on mobilizing finance, including concessional finance, and on seeking ways to improve competitiveness and enhance connectivity by supporting the development of sustainable and durable infrastructure and *by providing technical assistance*. (Emphasis added)

(i) Economic treaty provisions prohibiting performance requirements in the form of imposed transfers of technology

Certain bilateral investment treaties ("BITs") and free trade agreements already contain investment obligations, which relate to transfer of technology, in the context of prohibiting technology transfer *as an investment barrier*. For example, art.10.9 of the US–Peru Trade Promotion Agreement provides as follows:[64]

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61 *Ibid*., 14.

62 See White House statements at www.whitehouse.gov/briefing-room/statements-releases/2022/05/23/fact-sheet-in-asia-president-biden-and-a-dozen-indo-pacific-partners-launch-the-indo-pacific-economic-framework-for-prosperity/ (visited 20 July 2022) and www.whitehouse.gov/briefing-room/statements-releases/2022/05/23/statement-on-indo-pacific-economic-framework-for-prosperity/ (visited 20 July 2022).

63 White House statement at www.whitehouse.gov/briefing-room/statements-releases/2022/05/23/statement-on-indo-pacific-economic-framework-for-prosperity/ (visited 20 July 2022).

64 Article 10.9, para.3 (b) clarifies that para.1(f) does not apply:

> "(i) when a Party authorizes use of an intellectual property right in accordance with Article 31 of the TRIPS Agreement, or to measures requiring the disclosure of proprietary information that fall within the scope of, and are consistent with, Article 39 of the TRIPS Agreement; or

1. *No Party may*, in connection with the establishment, acquisition, expansion, management, conduct, operation, or sale or other disposition of an investment of an investor of a Party or of a non-Party in its territory*, impose or enforce any requirement or enforce any commitment or undertaking*:
. . .
(f) *to transfer a particular technology*, a production process, or other proprietary knowledge to a person in its territory; (For greater certainty, nothing in paragraph 1 shall be construed to prevent a Party, in connection with the establishment, acquisition, expansion, management, conduct, operation, or sale or other disposition of an investment of an investor of a Party or of a non-Party in its territory, from imposing or enforcing a requirement or enforcing a commitment or undertaking to train workers in its territory, *provided that such training does not require the transfer of a particular technology, production process, or other proprietary knowledge to a person in its territory)*.
. . .
2. No Party may condition the receipt or continued receipt of an advantage, in connection with the establishment, acquisition, expansion, management, conduct, operation, or sale or other disposition of an investment in its territory of an investor of a Party or of a non-Party, on compliance with any requirement: [paras.(a)–(d) omitted]
3. (a) Nothing in paragraph 2 shall be construed to prevent a Party from conditioning the receipt or continued receipt of an advantage, in connection with an investment in its territory of an investor of a Party or of a non-Party, on compliance with a requirement to locate production, supply a service, train or employ workers, construct or expand particular facilities, or carry out research and development, in its territory.

(Emphasis added)

A small number of FTAs, on the other hand, provide environment-related exceptions in order to allow transfer of technology requirements in certain circumstances.[65] An example is the Chile–Canada FTA, whose art.G-06.6 (within the Performance Requirements provision) provides as follows:

> . . . Provided that such measures are not applied in an arbitrary or unjustifiable manner, or do not constitute a disguised restriction on international trade or investment, nothing in paragraph 1(b) or (c) or 3(a) or (b) shall

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(ii) when the requirement is imposed or the commitment or undertaking is enforced by a court, administrative tribunal, or competition authority to remedy a practice determined after judicial or administrative process to be anticompetitive under the Party's competition laws . . .".

See generally, Kenneth J Vandevelde, *US International Investment Agreements* (Oxford University Press, 2009).

65 See also art.10.7(3) of the Chile-Korea FTA, art.10.7(3) of the Chile-Australia FTA and art.10.5(3) of the Chile-US FTA. The exception provision appears in both the 2004 and 2012 of the US Model BITs.

be construed to prevent a Party from adopting or maintaining measures, including environmental measures:

(a) necessary to secure compliance with laws and regulations that are not inconsistent with the provisions of this Agreement;
(b) necessary to protect human, animal or plant life or health; or
(c) necessary for the conservation of living or non-living exhaustible natural resources.[66]

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership ("CPTPP")—which counts four ASEAN members among its signatories - restricts the imposition of transfer of technology requirements by signatory states but includes an exception provision resembling the one detailed earlier.[67]

The existence of treaty provisions disciplining the use of performance requirements in the form of transfers of technology by foreign investors, such as those mentioned earlier, does not mean that transfers cannot take place. Technology owners and acquirers can always negotiate on commercial terms to purchase or use such technology. In the context of transfers of ESTs in ASEAN, financing options for effecting such transfers is an important consideration for its less economically developed members.

VI. Some Negotiating Possibilities for Transfers of ESTs in ASEAN

Areas in ASEAN FTAs, which may play a role in promoting or facilitating EST transfers, include commitments in relation to trade in goods and services, investments, trade and sustainability and FTA-specific cooperation platforms.

A. EST Transfers—Trade Arrangements and Beyond

ASEAN-wide FTAs and bilateral agreements of individual ASEAN member states may already contain cooperation and review provisions upon which member states may further build EST transfer arrangements.

The EU-CARIFORUM Economic Partnership Agreement provides for the transfer of technology in the following terms and may offer ASEAN a starting point to consider when negotiating EST transfer and cooperation provisions in its FTAs:

66 Text available at www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/chile-chili/fta-ale/index.aspx?lang=en (visited 20 July 2022).

67 See arts.9.9 and 9.10(d); text available at www.mfat.govt.nz/vn/trade/free-trade-agreements/free-trade-agreements-in-force/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-cptpp/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-text-and-resources/#bookmark0 (visited 20 July 2022). The four ASEAN member states which are CPTPP signatories are Brunei Darussalam, Malaysia, Singapore and Vietnam.

Article 142

Transfer of technology

1. The EC Party and the Signatory CARIFORUM States agree to exchange views and information on their practices and policies affecting transfer of technology, both within their respective regions and with third countries. This shall in particular include measures to facilitate information flows, business partnerships, licensing and subcontracting. *Particular attention shall be paid to the conditions necessary to create an adequate enabling environment for technology transfer in the host countries, including issues such as development of human capital and legal framework.*[68] (Emphasis added)

The EU–Singapore FTA Chapter on Trade and Sustainable Development[69] provides more specific language, as seen from the following excerpt of art.14:

Article 12.11

Trade and Investment Promoting Sustainable Development

1. The Parties resolve to make *continuing special efforts to facilitate and promote trade and investment in environmental goods and services, including through addressing related non-tariff barriers*. The Parties also recognise the usefulness of efforts to promote trade in goods that are the subject of voluntary or private sustainable development assurance schemes, such as eco-labelling, or fair and ethical trade.

2. The Parties *shall pay special attention to facilitating the removal of obstacles to trade or investment concerning climate-friendly goods and services, such as sustainable renewable energy goods and related services and energy efficient products and services, including through the adoption of policy frameworks conducive to the deployment of best available technologies and through the promotion of standards that respond to environmental and economic needs and minimise technical obstacles to trade*. . . .

(Emphasis added)

If one uses the above as a starting point, it is possible to further develop the commitments above in the context of an ASEAN agreement with a trade partner (whether the EU or another) by first identifying priority environmental goods and services and "climate-friendly goods and services" (mapping these to goods and services

68 Text available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:22008A1030(01) (visited 20 July 2022).

69 See Chapter 12. Text available at: European Commission, "News", available at https://trade.ec.europa.eu/doclib/press/index.cfm?id=961 (visited 20 July 2022).

which are important to promoting the Circular Economy and sustainability in the AEC, as mentioned earlier). The next step would be to negotiate the reduction or removal of specific trade and/or investment barriers which may exist in relation to such goods and services. For EST-related goods, the reduction or removal of TBTs and the introduction of trade facilitation measures may be points of consideration.

Another issue relating to the scope of goods for coverage of prioritised liberalisation is that of how to handle "dual use" goods; these are goods which may have environmental uses as well as other commercial uses.[70] ASEAN and its trade partners will have to consider whether to include only goods whose end uses are purely environmental or those which may be dual use and have non-environmental end uses as well, since this can be an obstacle in negotiations.[71]

On a practical level, it appears that as far as agencies for handling the transfer of technology in ASEAN member states are concerned, the approaches differ, with some states having multiple agencies and others having none.[72] It may therefore be useful to clarify among ASEAN member states the appropriate contact points for EST transfer activities.

B. ESTs: Technology Transfer and MSMEs

MSMEs form a large part of the business landscape in ASEAN and could be engaged in EST transfer activities.[73] For diffusion and adoption of ESTs in ASEAN countries to be effective, inclusion of MSMEs in technology transfer arrangements is therefore critical. To this end, MSMEs can also be involved in the development of innovative ESTs themselves.

In the context of FTAs, cooperative arrangements for EST transfers to ASEAN MSMEs should be more actively explored and considered. In particular, FTAs—such as the Regional Comprehensive Economic Partnership Agreement

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70 The meaning of the term, "dual use", here is to be distinguished from its use in the separate context of strategic goods which may have both commercial and military uses; see eg, Singapore's regulation of such goods at: Singapore Customs, "List of Dual-Use Goods", available at www.customs.gov.sg/businesses/strategic-goods-control/strategic-goods-control-list/list-of-dual-use-goods (visited 20 July 2022).

71 See Trade in Environmentally Sound Technologies: Implications for Developing Countries (n. 37), xix, *10, 13,* 16, 30 and 67, and various trade-related recommendations for the transfer of ESTs in UNEP, University of Malaya and Technical University of Denmark, "Trade in Environmentally Sound Technologies – Opportunities and Challenges in ASEAN" (2019), available at https://wedocs.unep.org/handle/20.500.11822/28322 (visited 20 July 2022).

72 See AANZFTA, "ASEAN Technology Transfer Offices", available at https://aanzfta.asean.org/aanzfta-sector-portals/intellectual-property-sector/ip-for-business/asean (visited 20 July 2022).

73 See ASEAN, "Development of Micro, Small, and Medium Enterprise in ASEAN (MSME)", available at https://asean.org/our-communities/economic-community/resilient-and-inclusive-asean/development-of-micro-small-and-medium-enterprises-in-asean-msme/ (visited 20 July 2022). See also, Amy Chew, "Southeast Asia's SMEs Emit More Carbon than Cambodia and Need State Help to Change, Specialists Say" *South China Morning Post* (Kuala Lumpur, 4 March 2022), available at www.scmp.com/week-asia/economics/article/3169063/southeast-asias-smes-emit-more-carbon-cambodia-and-need-state (visited 20 July 2022).

("RCEP")[74]—which contain provisions on cooperation in relation to promotion of MSMEs activities offer opportunities to integrate EST transfer arrangements which may benefit such entities.

C. Services: Sustainable Finance and Movement of Natural Persons

Given the relevance of sustainable finance in ASEAN's environmental plans, liberalisation of services relevant to ESTs can be an adjunct policy to the reduction of tariffs and NTMs in relation to EST goods.[75]

In relation to financial services, the launch of the *ASEAN Taxonomy on Sustainable Finance (version 1)* provides a "common language" which may facilitate negotiations in trade liberalisation in respect of sustainable or "green" finance services (and related investments) by ASEAN member states, by providing a common understanding on the types of services (and service-related investments[76]) which may be considered for liberalisation in FTA negotiations. Such liberalisation can, in turn, help to promote and speed up transfers of ESTs to the region.[77]

A further area in which FTAs may help promote EST transfers is through provisions relating to an FTA's Services Chapter commitments in relation to movement of natural persons. FTA partners may explore specific arrangements which remove barriers in order to facilitate the movement of personnel, with or to gain EST expertise, into each other's territories. These could include, respectively, exchange programmes and employee training programmes.[78]

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74 The text of the Regional Comprehensive Economic Partnership Agreement ("RCEP") is available at https://rcepsec.org/legal-text/ (visited 20 July 2022). At the time of writing, the RCEP had entered into force in 11 of its 15 signatory states; see RCEP, "RCEP Agreement Enters into Force" *RCEP* (1 January 2022), available at https://rcepsec.org/2022/01/14/rcep-agreement-enters-into-force/ (visited 20 July 2022).

75 It has been found that the state of liberalisation in such services in ASEAN is varied; see UNEP, "Trade in Environmentally Sound Technologies in the ASEAN Region" (n. 17), 27–28.

76 See Strategic Priority 4 of ASEAN's "Framework for Circular Economy for AEC" (n. 4).

77 See ASEAN Taxonomy Board, "ASEAN Taxonomy for Sustainable Finance" (n. 43), 48: ". . . In the first ASEAN State of Climate Change Report issued recently, the ASEAN Secretary General noted that "to support the speedy and just transition to net-zero [for ASEAN], there is a need to *significantly boost access to climate finance as well as knowledge and technology transfer on key priority areas*, such as adaptation and mitigation measures, disaster risk reduction, and clean energy transition". *Such action will not be possible without the necessary financing creating an impetus to support industries making sustainable business decisions. A taxonomy, together with a transition pathway and disclosures, is key to ensuring financing flows to where it is needed*. Given how intertwined the different segments of the financial sector—banking, capital markets and insurance—are, it is also important that the ASEAN Taxonomy enables all these segments to *use a common language*. The Taxonomy has also been designed to allow it to have multiple utilities, including as a guide to allocating capital, a tool to support risk assessment and a reference for those undertaking their climate change action journey". (Emphasis added)

78 See ASEAN Secretariat, *ASEAN Plan of Action on Science, Technology and Innovation (APASTI) 2016–2025 Implementation Plan* (ASEAN Secretariat 2017) and its key performance indicators which include EST, human resource and talent mobility factors; see generally, 29–33, as well as EST references in Thrust 1 and 3, Annex 1, 2, 6, 8.

D. Provisions to Promote "Greening" of Supply Chains

ASEAN supply chains may be made more environment-friendly through the deployment of suitable technology that enhances energy efficiency in logistics, traceability of products and carbon-mapping.[79] To promote the use of such technology, ASEAN economic agreements could include provisions which remove barriers to devices relevant to such technology, such as tracking sensors and software in ASEAN trade, and incentives to for businesses in ASEAN and its trade partners to collaborate on the use of blockchain applications to record the carbon footprint of logistics operations and traceability of goods traded.[80] At present, ASEAN countries such as Singapore have been actively negotiating Digital Economy Agreements ("DEAs"), which help to promote newer technologies such as blockchain technology, but so far, they have not directly addressed collaborative uses of such technologies to address sustainability in regional supply chains.[81] A number of ASEAN FTAs contain "E-commerce" chapters, and again, these do not presently explicitly draw a link between the use of such technologies and sustainable trade.[82] This is therefore another area of untapped potential in negotiations.

VII. Conclusion

The transfer of ESTs in ASEAN can take place through a number of avenues, including through commercial purchases and licensing arrangements. Such technologies may be embodied in environmental goods, services and IPRs. Efforts of the WTO and regional groups such as APEC and ASEAN aim to reduce barriers to transfers of environmental goods (which may contain ESTs). At the bilateral and regional levels, there is scope for rethinking the role of economic agreements, such as FTAs, in promoting trade in such goods and services so as to allow for more transfers of ESTs. This entails considering (and negotiating) how to "embed" EST-focussed commitments in chapters of such agreements, in order to improve the flow of EST goods and complementary goods, EST-related services and investments in the manufacture of EST goods and supply of related services. As explained earlier,

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79 Such uses of technology are clearly relevant to ASEAN: see Strategic Priority 3 of ASEAN's "Framework for Circular Economy for AEC" (n. 4), as well as Part 6: Enablers.

80 See Katja Schechtner and Andrew Lombardi, "Forging Links: Unblocking Transport with Blockchain?" (2021), available at www.itf-oecd.org/sites/default/files/docs/forging-links-unblocking-transport-blockchain.pdf; Michael Wang, Bill Wang and Ahmad Abareshi, "Blockchain Technology and Its Role in Enhancing Supply Chain Integration Capability and Reducing Carbon Emission: A Conceptual Framework" (2020) 12(24) Sustainability 10550. See also Alita Sharon, "Thailand Using Blockchain Tech to Help Trace Organic Rice" *OpenGov* (26 November 2019), available at https://opengovasia.com/thailand-using-blockchain-tech-to-help-trace-organic-rice/ (visited 20 July 2022).

81 See Singapore Ministry of Trade and Industry, "Digital Economy Agreements", available at www.mti.gov.sg/Improving-Trade/Digital-Economy-Agreements (visited 20 July 2022). The first Digital Economy Partnership Agreement was signed in 2020 between Singapore, Chile and New Zealand.

82 An example is the RCEP.

some possible existing areas in FTAs to explore such "embedding" include trade in goods (to address tariffs and NTMs applied to EST goods and complementary goods), trade in services, investments, sustainable development, SMEs, technology deployment for "green" supply chains, "green" agri-food production and related cooperation activities. Other relevant considerations include the establishment of common understanding on the criteria for what might qualify as "green" finance, "green" infrastructure and "green" supply chains in ASEAN, and the potential uses of technology to check the fulfilment of such criteria.[83] The aforementioned considerations at the negotiating level could unleash the untapped potential of FTAs to facilitate a greater transfer of ESTs in the ASEAN region.

83 A concern arising around "green" activities is the potential of "greenwashing", in which inaccurate or false claims as to sustainability of goods or products might be made. See, eg, "Singapore Aims to Curb 'Greenwashing' via Stress Tests, Technology: MAS" *Straits Times* (Singapore, 8 November 2021), available at www.straitstimes.com/business/banking/singapore-aims-to-curb-greenwashing-via-stress-tests-technology-mas (visited 20 July 2022). See also generally, UNCTAD, "Harnessing Blockchain for Sustainable Development: Prospects and Challenges" (2021).