



Chapter 5

Thailand's Perspective

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1. Introduction

The Association of Southeast Asian Nations (ASEAN) and China established a dialogue relationship in 1991. In 2003, the parties raised the level of their relations to the Strategic Partnership for Peace and Prosperity. In terms of economic relations, the ASEAN–China Free Trade Area (ACFTA), which is ASEAN’s first free trade agreement (FTA) with an external partner, came into effect in 2003 for the Early Harvest Programme. During the last 2 decades, ASEAN–China bilateral trade has expanded more than tenfold, reaching US\$669 billion in 2021. China is ASEAN’s largest trading partner and the second largest non-ASEAN investor.

Recent changes in the global environment, including the United States (US)–China economic tensions, digital transformation, the need to implement the 2030 Agenda for Sustainable Development, and the coronavirus disease (COVID-19) pandemic, which resulted in supply chain disruption, have become trade and investment issues pertinent to businesses. It is necessary to examine the issues that the ACFTA 3.0 needs to consider, including how to solve the ACFTA’s implementation challenges and add new areas of cooperation to become a new, modern, and comprehensive FTA. The upgraded ACFTA will improve the existing economic linkages between ASEAN and China, thereby supporting ASEAN and China growth and prosperity.

The purpose of this study is to identify impediments and potential areas of improvement for the ASEAN–China FTA, as well as potential mutually beneficial areas for further cooperation between ASEAN and China.

2. Impacts of the ACFTA on ASEAN Economic Development

Economic partnership between ASEAN and China has been developed since 2001, with an agreement to implement an ASEAN–China FTA within 10 years. Since its inception, six elements have been included in the framework of cooperation, according to Chirathivat (2002):

- (i) Trade and investment facilitation measures, which cover a wide range of issues such as the removal of non-tariff barriers, mutual acceptance of standards and conformity assessment procedures, and the promotion of trade in services.
- (ii) Provision of technical assistance and capacity building, particularly to new ASEAN Member States (AMS), to expand their trade with China.
- (iii) Positive consideration in terms of promotion measures, consistent with the World Trade Organization rules, to be given to non-World Trade Organization AMS.
- (iv) Expansion of cooperation in various areas, such as finance, tourism, agriculture, human resources development, industrial cooperation, intellectual property rights, environment, and energy.

- (v) Establishment of an ASEAN–China FTA within 10 years, with special and differential treatment given to Cambodia, the Lao People's Democratic Republic (Lao PDR), Myanmar, and Viet Nam.
- (vi) Establishment of appropriate institutions between ASEAN and China to carry out the framework of cooperation.

As part of the cooperation framework, the ACFTA was established with the main target of eliminating tariffs¹ by January 2010. This can be considered as the starting point of the fully functioning ACFTA. The agreement has been assessed in many studies. Since the early years of the agreement, Chirathivat (2002) expected that the ACFTA would bring net gains to both parties. Computable general equilibrium (CGE) simulation analysis using the Global Trade Analysis Project (GTAP) database shows that this strategic move should cause more trade creation than trade diversion, with positive welfare gains for both ASEAN and China. Many studies conducted along the ACFTA growth path found positive welfare outcomes (Chirathivat, 2002; Kitwiwattanachai, Nelson, and Reed, 2010; Lakatos and Walmsley, 2012; Li, Scollay, and Maani, 2016). The ACFTA was also expected to create structural changes in AMS and China because of the exploitation of comparative advantage in the agreement commitments (Yang and Chen, 2008).

During the development of the ACFTA in the past 2 decades, some research has pointed out that, for ASEAN and East Asia, regional trade agreements (e.g. The East Asia Free Trade Area or the ASEAN Free Trade Area) tend to generate higher trade volume and welfare gains than bilateral trade agreements (e.g. the ACFTA or the ASEAN–Korea FTA) (Kitwiwattanachai, Nelson, and Reed, 2010). Nonetheless, expanding ASEAN regional trade agreements to include more collaboration from non-partners, especially the large economies in Asia, will always bring benefits in terms of trade volume and welfare gain to all economies involved. Focusing on sectoral trade caused by the ACFTA, Yang and Martinez-Zarzoso (2014) showed that the trade effects of the agreement are positive not only within ASEAN and China but also with trading partners outside the bloc. The study also showed that the top four sectors receiving benefits from trade creation are other manufactured goods, chemical products, machinery and transport equipment, and agricultural products, respectively. These results were confirmed by Tham and Yi (2014), especially in terms of trade creation in manufactured goods.

The benefits of these continuous relationships are demonstrated statistically. China is ASEAN's most important trading partner, in terms of both exports and imports. This could be due in part to the agreement. As indicated in Table 1, China was only marginally surpassed by the US in terms of export value with ASEAN, accounting for a share of almost 15%. Moreover, China is the top destination for ASEAN imports, with a share of almost 23% (Table 5.1).

¹ Except the sensitive list and highly sensitive list.

Table 5.1 ASEAN Top 5 Destinations of Exports and Imports of Goods, 2022

Country/Region	Exports		Country/Region	Imports	
	Value (US\$ billion)	Share (%)		Value (US\$ billion)	Share (%)
ASEAN	449.8	22.9	ASEAN	406.6	21.6
United States	290.9	14.8	China	431.3	22.9
China	290.8	14.8	Korea	141.9	7.5
EU-27	176.4	9.0	Japan	135.3	7.2
Japan	133.3	6.8	United States	129.5	6.9

ASEAN = Association of Southeast Asian Nations, EU = European Union, US = United States.

Source: ASEAN (n.d.), ASEANStats Data Portal. <https://data.aseanstats.org> (accessed 5 April 2024).

When examining trade in goods between China and ASEAN, it becomes evident that China plays a crucial role in ASEAN's trade dynamics for various commodities. Table 5.2 demonstrates that ASEAN's international markets rely heavily on the Chinese economy. The trading value between China and ASEAN accounted for more than 20% of export and import trading values for several commodities. In terms of ASEAN's exports, these items include Harmonized System (HS) 72 iron and steel, HS39 plastics and articles, HS29 organic chemicals, and HS08 fruits and nuts. These commodities constitute a significant portion of ASEAN's exports to China, indicating its reliance on the Chinese market. On the import side, the notable items are HS85 electrical machinery, HS84 machinery and mechanical appliances, HS39 plastics and articles, HS72 iron and steel, HS73 iron and steel articles, HS29 organic chemicals, HS38 chemical products, and agricultural goods such as HS15 and HS08. These imports highlight ASEAN's dependence on China for electrical machinery, fuel, machinery, chemical products, and agricultural goods.

The trading patterns mentioned above indicate the strong economic interconnection between China and ASEAN, with China being a crucial trading partner for AMS. This underscores the significance of the China–ASEAN trade relationship and its impact on the economies of both parties.

Table 5.2 Top 5 Traded Goods Between China and ASEAN, 2022

HS	Commodity	Value (US\$ billion)	Share of ASEAN total exports of the product (%)
Exports			
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles	89.4	16.0
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	29.2	12.6
72	Iron and steel	20.3	42.2
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	20.0	10.5
39	Plastics and articles thereof	12.2	22.7
Imports			
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles	136.7	28.3
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	68.0	35.2
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	19.5	5.8
39	Plastics and articles thereof	19.3	28.3
72	Iron and steel	17.1	28.7

ASEAN = Association of Southeast Asian Nations, HS = Harmonized System..

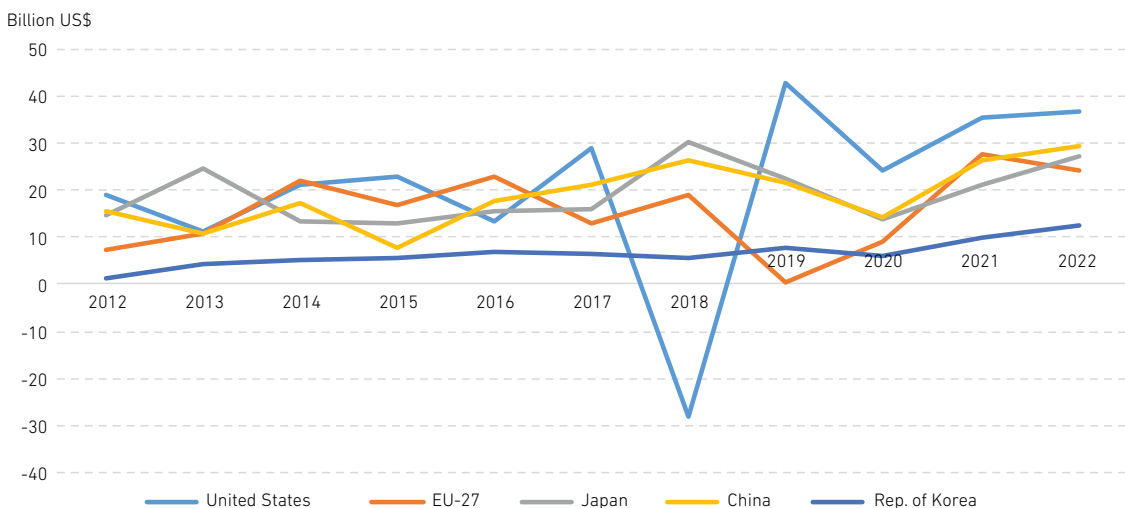
Source: ASEAN (n.d.), ASEANStats Data Portal. <https://data.aseanstats.org> (accessed 5 April 2024).

China has also been one of Thailand’s primary trading partners for the past decade. According to statistics published by the Bank of Thailand, China’s share in Thailand’s total trade has experienced a notable increase – rising from 13.4% of Thailand’s trade in 2012 to 19.2% in 2021.

Investment generation is one of the expected by-products of the ACFTA. Lakatos and Walmsley (2012) assessed this effect by using a dynamic CGE model (GTAP database), compared with static CGE, while Li, Scollay, and Maani (2016) assessed the topic using the gravity model. The results from both studies show that the overall impacts of the ACFTA will be positive on investment flows for both parties. Moreover, Li, Scollay, and Maani (2016) showed that the stimulation of foreign direct investment (FDI) caused by the ACFTA includes both horizontal and vertical FDI in both directions. The authors also found that the positive effect of the ACFTA on FDI comes mainly from the 2005 agreement on trade liberalisation in goods, which also helped develop production networks because more vertical FDI accompanies the trade liberalisation of intermediate goods. Lakatos and Walmsley (2012) also showed that the impact of the ACFTA will cause a significant investment creation effect (and an insignificant investment diversion effect). However, the detailed results have shown that the gains are not uniformly distributed within ASEAN. Significant benefits, in terms of an economic boost and an increase in rates of return on investment, are shown on liberalising members of ASEAN. In addition, Li and Maani (2018) studied the impacts of the ACFTA on FDI for China’s manufacturing industry and found the existence of market-seeking FDI and the vertical fragmentation effect in China.

Statistics on investment show that the value of FDI inflows from China to ASEAN has been steadily increasing over the last decade. As indicated in Figure 1, FDI inflows from China (including Chinese mainland and Hong Kong SAR) to ASEAN have nearly doubled, from around US\$15.7 billion in 2012 to nearly US\$29.4 billion in 2022, making China the second largest source of FDI to ASEAN of the year.

Figure 5.1 Flows of Inward FDI to ASEAN by Source Country, 2012–2022



ASEAN = Association of Southeast Asian Nations, EU = European Union, FDI = foreign direct investment.

Source: ASEAN (n.d.), ASEANStatsDataPortal. <https://data.aseanstats.org> (accessed 31 January 2024).

By value of investment, the ASEAN industries receiving Chinese FDI are highly concentrated in manufacturing, communication, real estate, logistics, and finance. These are just a few of the numerous areas that are seeing an increase in FDI from China.

On the downside of the ACFTA, in addition to the previously mentioned negative implications, such as the uneven distribution of benefits from the agreement, another drawback for the agreement is regarding labour wage inequality. According to the findings of Kitwiwattanachai, Nelson, and Reed (2010), countries with abundant unskilled labour (such as China) will benefit from the agreement, whereas countries with a high number of skilled workers (such as Japan and the Republic of Korea (henceforth, Korea)) are expected to have worse real wage inequality. Moreover, lack of communication from the macroeconomic level to individual enterprises leads to limited understanding and utilisation of the agreements. Furthermore, many AMS are concerned about Chinese products flooding their markets, which might result from potentially unbalanced trade between ASEAN and China, as well as amongst AMS (Jianren, 2012).

3. Good Practices and Lessons When Implementing the ACFTA

Following the implementation of the ACFTA through the Early Harvest Programme in 2003 and the official launch of the ACFTA in 2010, total trade between ASEAN and China increased from US\$64 billion in 2003 to US\$236 billion in 2010, and then reached US\$669 billion in 2021. The tenfold increase in ASEAN–China bilateral trade has demonstrated stronger economic relations.

According to The Department of International Trade Promotion of Thailand (DITP)², the ACFTA utilisation rate increased rapidly from 88.57% in 2018 to 109.29% in 2022. With a utilisation rate of more than 80%, the ACFTA was one of Thailand's top three utilised FTAs by 2022.

This makes the ACFTA one of Thailand's highest performing FTAs because of its high utilisation rate. During the first quarter of 2023, the ACFTA's utilisation rate was 86.53%, with 53.85% coming from the manufacturing sector and 46.15% coming from the agricultural sector. The following are the most utilised categories under the ACFTA:

- (i) Rubber products (13%)
- (ii) Cassava (10%)
- (iii) Durian (7%)
- (iv) Cassava starch (5%)
- (v) Fresh fruits (longan, lychee, rambutan) (3%)

² <https://tax.dtn.go.th/en/calculate>

- (vi) Frozen meat (3%)
- (vii) Sugar (3%)
- (viii) Coconut (2%)
- (ix) Aluminium scape (2%)

The implementation of the ACFTA unveils two important lessons: non-tariff measures (NTMs) and trade facilitation. Interviews with Thai businesses disclosed issues pertinent to these two areas of trade. The first difficulty is with trademarks. Some Thai businesses must deliver their products to the Chinese market through a specific vendor that has registered the Thai product's trademark in China, even if the trademark is Thai. One of the interviewees suggested that there should be mutual recognition in this matter.

The second issue relates to cross-border transit. Shipments are required to undergo processing at border customs checkpoints and pass inspections. However, difficulties may arise when these checkpoints have limited opening hours or when only a few are operational. In addition, some customs checkpoints may be newly established and lack sufficient facilities to facilitate efficient border transportation.

The third issue is about the lack of procedure transparency. One business person referred to a case in which their company identified a Chinese certification agency for containers exporting to China, only to find that the containers had to be certified by another body in China. This caused a delay in transportation.

4. Evolution of ASEAN's Regional Policy Towards China

China is one of ASEAN's 11 Dialogue Partners, with diplomatic relations established since the start of the dialogue in 1991. Their collaboration was promoted to the Strategic Partnership for Peace and Prosperity in 2003. In 2018, the ASEAN–China Strategic Partnership Vision 2030 was commemorated as a future direction for building an open, inclusive, and sustainable world of peace, security, and common prosperity (ASEAN, 2018).

In terms of economic cooperation, the ASEAN–China Strategic Partnership Vision 2030 intends to strengthen economic cooperation between ASEAN and China for a mutually advantageous future. ASEAN and China want to improve trade, investment, and tourism flows between the two parties by implementing and upgrading the ACFTA. New areas of cooperation are being promoted, such as e-commerce, intellectual property rights, and clean energy. The two parties also intend to increase physical and institutional connections, as well as to deepen collaboration in areas such as financial cooperation; maritime economic cooperation; and science, technology, and innovation (ASEAN, 2018).

The dialogue relationship between ASEAN and China continues to grow, and the parties' economic relationship has grown in terms of trade, investment, tourism flows, and connectivity. The year 2023 marks the 20th anniversary of the ASEAN–China Strategic Partnership and the 32nd anniversary of ASEAN–China Dialogue Relations.

Deepening and broadening economic relations between ASEAN and China can be seen from both the regional and national levels. At the regional level, the ACFTA was the first FTA with an external party. In 2002, China and AMS signed the Framework Agreement on Comprehensive Economic Cooperation, which formed the legal basis for the creation of the ACFTA.

The ACFTA includes three agreements aimed at facilitating the free flow of goods, services, and investments. First, the ASEAN–China Trade in Goods Agreement proposes tariff reductions and tariff line removal. Second, the Agreement on Trade in Services aims to liberalise and substantially eliminate discriminatory measures in various service industries. Third, the Investment Agreement seeks to promote and facilitate investment flows within China and the ASEAN region. This agreement includes provisions to assure fair and equitable treatment for investors, non-discriminatory treatment in the case of nationalisation or expropriation, and compensation for losses.

The ACFTA 1.0 was established in 2010, with zero tariffs covering more than 90% of both parties' taxed items. The ACFTA 2.0, the upgraded version, was released in 2019 with expanded market access for both sides. Chinese leaders proposed the development of the ACFTA 3.0 at the ASEAN–China Special Summit to Commemorated the 30th Anniversary of ASEAN–China Dialogue Relations in November 2021 (Global Times, 2022). The ACFTA upgrade negotiations are intended to ensure that the ACFTA contributes to the further development and expansion of ASEAN–China economic relations, as well as the post-pandemic economic recovery of both regions.

The Regional Comprehensive Economic Partnership (RCEP) strengthens the ties of AMS and China. According to the ASEAN–China Strategic Partnership Vision 2030, this is one of the accomplishments between the two parties. ASEAN and China completed negotiations on a modern, comprehensive, high-quality, and mutually beneficial RCEP agreement with Australia, Japan, Korea, and New Zealand, which came into force on 1 January 2022. The RCEP marked the successful launch of the world's largest free trade area and represented a new milestone for East Asian economic integration.

At the national level, Singapore and Cambodia are developing bilateral FTAs with China. On 23 October 2008, Singapore and China signed the China–Singapore Free Trade Agreement (CSFTA), China's first comprehensive bilateral FTA concluded with an ASEAN economy. Singapore and China intend to advance the ACFTA's liberalisation of goods trade and further liberalise services trade. The CSFTA was upgraded in 2018 to improve the standard of rules in trade facilitation, rules of origin, economic and technological cooperation, and e-commerce. In 2020, the two parties upgraded the agreement again to support further liberalisation of service trade and investment using the negative list model.

Singapore and China announced in April 2023 that substantive negotiations on the FTA upgrade were completed, which will improve market access for each other's businesses and provide for more transparent and high-level economic rules. Both parties agreed to elevate their bilateral relationship to an 'all-round, high-quality future-oriented partnership' (Xinhua News Agency, 2023). This is the first time China has adopted the negative list approach for services and investment liberalisation in FTAs (MOFCOM, 2023). The CSFTA upgrade is critical in accelerating the ongoing negotiations for the ACFTA 3.0, further upgrading of the RCEP, and laying an institutional foundation for China's application to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), of which Singapore is a member (Xuanmin and Jingyi, 2023).

Despite calls by the US for decoupling, Singapore's upgrade of the CSFTA shows that it is committed to deeper cooperation with China. Singapore and China also work together to promote regional integration and supply chain stability through the implementation of the RCEP and the establishment of the New International Land–Sea Trade Corridor, which serves as a significant trade route between western Chinese provinces and AMS. Singapore and China will both benefit from the multiple effects of synergies created by improved regional economic, trade, and investment linkages, as well as the resumption of connectivity and people-to-people contacts (Xuanmin and Jingyi, 2023).

The Cambodia–China Free Trade Agreement (CCFTA) is the second Chinese bilateral FTA with an ASEAN economy, whereas it is Cambodia's first bilateral FTA. This agreement was signed in 2020 and came into effect on 1 January 2022. Cambodia and China agreed to cooperate in a comprehensive strategic partnership and jointly build a community with a shared future. Cambodia is also cooperating in the joint construction of the Silk Road Economic Belt and the 21st Century Maritime Silk Road (Medina, 2021).

The CCFTA covers a wide range of sectors, including trade, tourism, investment, transportation, and agriculture. Over 90% of tariff lines in bilateral trade in goods have zero tariffs. Although most of the trade between Cambodia and China is tariff-free under the ACFTA, the CCFTA extends tariff-free trade to over 340 items, including seafood products, garlic, cashew nuts, and dried chilli. Cambodia seeks to benefit from an increase in bilateral trade with China through the CCFTA to partially compensate for the loss of Everything but Arms status from the European Union (EU) in 2020 (Medina, 2021).

Cambodia intends to leverage and improve its agriculture industry by utilising Chinese manufacturing or product efficiency. Since 2010, Beijing has been Cambodia's top source of development aid, particularly financing for agriculture-related projects. Another advantage Cambodia hopes to gain from the CCFTA is the attraction of Chinese tourists (Medina, 2021).

5. Suggested Issues for the ASEAN–China 3.0 Talks

Aside from increasing trade and investment liberalisation and facilitation, AMS must focus on new areas of cooperation for the ACFTA 3.0 negotiations. ASEAN and China face several common development challenges, including an increasing risk of global recession, the acceleration of supply chain and value chain restructuring, digital and green transformation, and the implementation of the United Nations (UN) Sustainable Development Goals (SDGs) by 2030.

Given this situation, ASEAN and China could enhance comprehensive cooperation to foster regional economic recovery and build a shared future. This could be achieved by focusing on strengthening macroeconomic policy cooperation, enhancing trade and investment, bolstering supply chain resilience, improving customs systems interconnectivity, facilitating cross-border flows, investing in sustainable and green infrastructure, and promoting digital integration. Furthermore, the two parties should deepen supply chain and value chain integration, as well as participate in the green transition and develop the digital economy. Improving physical and digital connectivity between the two areas is required for free flow of goods, services, capital, and labour (CIKD, 2023).

The new areas of cooperation that should be included in the ACFTA 3.0 are the digital economy, the green economy/sustainable development, supply chain resilience, and trade facilitation.

5.1. Digital economy

Digital technology has transformed how we engage in economic activities, including production, consumption, trading, and investment. Countries across the world recognise the importance of digital transformation and its impact on economic activity and competitiveness. Because of its widespread impact on all economic sectors and social development via digital technology and infrastructure, the digital economy is increasingly regarded as the engine of economic growth – increasing capital and labour productivity and fostering global value chain participation.

ASEAN and China are highly complementary in the development of the digital economy, and both may benefit from extensive opportunities for cooperation (CIKD, 2023). ASEAN is one of the fast-growing digital economies, with gross merchandise value doubling from US\$102 billion in 2019 to US\$194 billion in 2022. In 2025, the value is expected to reach US\$330 billion. Furthermore, an additional 100 million internet users have joined the internet since 2020, resulting in an estimated 460 million internet users in 2022 (Google, Temasek, and Bain & Company, 2022). ASEAN needs to develop its digital economy, and the region's large market for the digital economy and digital infrastructure provides opportunities for foreign enterprises and investors.

China is a global leader in digital industrialisation, including cross-border trade, digital infrastructure, and digital payments, and it has significant comparative advantages in industrial digitisation, including the industrial internet of things and intelligent manufacturing (CIKD, 2023). China's digital economy is growing rapidly and plays an important role in the new global economic structure. In 2021, China was the world's second largest digital economy, accounting for US\$7.1 trillion, after only the United States, which had a value of US\$15.3 trillion (Chu, 2023). Based on this, ASEAN and China may foster successful collaboration to support each other in their endeavours to develop their digital economies.

According to López González and Jouanjean (2017), governments must prioritise data flows, digital connectivity, and interoperability when developing trade policies. This is because digital trade is all about data transfer, and countries must be linked to connect and move data. Interoperability is also important for international connection since businesses must be able to connect across borders to operate in multiple countries.

Digital connectivity is a critical step in the development of the digital economy. Countries must build digital infrastructure, digital skills, and data protection and cybersecurity rules and regulation. In connecting the markets, both parties must be able to connect, communicate, and complete digital transactions (Herman and Oliver, 2021). Although ASEAN's overall digital development level is satisfactory, there is significant variation between countries, with the Lao PDR and Myanmar struggling to embrace digital transformation (Table 5.3).

Table 5.3 Stages of Digital Development in ASEAN Member States

Country	Infrastructure & access			Internet usage	Enablers & barriers	
	Network coverage: percentage of population covered by at least 4G mobile network, 2019	Mobile phone ownership: individuals owning a mobile phone, 2019 (% of population)	Mobile and fixed broadband subscriptions: active mobile broadband subscriptions per 100 inhabitants, 2019	Percentage of population using the internet, 2019	ICT prices: mobile broadband basket as a percentage of GNI per capita, 2020	ICT skills (basic skills, standard skills, advanced skills), 2019 (% of population with a skill level)
Brunei	95	94	148	95	0.3	60, 36, 28
Cambodia	80	33 ^a	96	41	1.6	29, 3, 1
Indonesia	98	64	81	48	1.3	60, 20, 4 ^b
Lao PDR	43 ^a	n.a.	49	26 ^b	2.4	n.a.
Malaysia	87	96	127	84	0.9	59, 51, 8
Myanmar	75 ^a	62 ^b	93 ^a	24 ^b	1.0	n.a.

Country	Infrastructure & access			Internet usage Percentage of population using the internet, 2019	Enablers & barriers	
	Network coverage: percentage of population covered by at least 4G mobile network, 2019	Mobile phone ownership: individuals owning a mobile phone, 2019 (% of population)	Mobile and fixed broadband subscriptions: active mobile broadband subscriptions per 100 inhabitants, 2019		ICT prices: mobile broadband basket as a percentage of GNI per capita, 2020	ICT skills (basic skills, standard skills, advanced skills), 2019 (% of population with a skill level)
Philippines	80 ^a	79	68 ^b	43	1.4	6, n.a., 1
Singapore	100	88	156	89	0.4	54, 36, 7
Thailand	98	88 ^b	87	67	1.2	21, 9, 1
Viet Nam	97	n.a.	72	69	1.0	n.a.

ASEAN = Association of Southeast Asian Nations, GNI = gross national income, ICT = information and communication technology, n.a. = not available.

^a Data from 2018, as data from 2019 were unavailable.

^b Data from 2017, as data from 2019 were unavailable.

Sources: Sermcheep (2022).

Cross-border e-commerce is a significant digital trade area in which ASEAN and China can collaborate. Despite the resumption of offline shopping and e-commerce businesses' increased focus on profitability, ASEAN's e-commerce continues to develop. The value of ASEAN's e-commerce is expected to reach US\$211 billion in 2025 (Google, Temasek, and Bain & Company, 2022). The rapid expansion of e-commerce presents opportunities for the creation of new technologies that respond to market demand, which could lead to the transformation of the digital economy. AMS should seize opportunities for further collaboration in the digital economy (Sefrina, 2023). Furthermore, there is room for additional e-commerce expansion because ASEAN's e-commerce accounts for only 3%–5% of total retail sales in 2020, whereas e-commerce in China accounts for nearly 30% (Thongsaichon, 2020). As a result, an e-commerce chapter should be included in the ACFTA 3.0.

The COVID-19 pandemic provided an opportunity to deepen regional cooperation in the digital economy, and this will lead to digital economy integration. According to Sefrina (2023: 2), 'digital economy integration does not necessarily mean the removal of trade barriers, but rather a platform for digital economy interoperability in a secure environment'.

The commitments to digital economy integration can be categorised into three groups: (i) market access, such as customs duties, the movement of natural persons, and access to data; (ii) rules and regulations, such as intellectual property rights, competition, and personal data protection; and (iii) facilitation, including paperless trade, digital signatures, and digital authorisation (Yean, 2021).

The elements of e-commerce to be included in the ACFTA can be drawn from existing initiatives relating to the digital economy. Table 4 summarises the digital-related clauses in major digital economy agreements, including the United Kingdom–Singapore FTA; the Singapore–Australia FTA; the Digital Economic Partnership Agreement (DEPA) amongst Singapore, New Zealand, and Chile; the CPTPP; the RCEP; and the ASEAN Agreement on Electronic Commerce (Sefrina, 2023). The first three digital economy agreements (DEAs) – notably the United Kingdom–Singapore DEA, the Singapore–Australia DEA, and the DEPA – are new DEAs that address growing and crucial issues, including artificial intelligence. A DEA for ASEAN and China could be built on the RCEP because it is the most recent commitment made by both parties on the digital economy.

Table 5.4 Comparison of Digital-Related Clauses in Major Digital Economy Agreements

Item	UKSDEA	SADEA	DEPA	CPTPP	RCEP	AAEC	Other	New DEA
Digital trade provisions commitments to facilitate digital trade	✓	✓	✓	✓	✓	✓		
No customs duties on electronic transmissions	✓	✓	✓	✓	✓		5	3
Non-discrimination of digital products	✓	✓	✓	✓	✓		4	3
Domestic electronic transactions framework	✓	✓	✓	✓	✓	✓		
Electronic authentication and signatures	✓	✓		✓	✓	✓		
Cross-border transfer of information by electronic means	✓	✓	✓	✓	✓	✓		
Paperless trading	✓	✓	✓	✓	✓	✓		
Electronic invoicing	✓	✓	✓				3	3
Electronic payments	✓	✓	✓			✓		
Express shipments	✓	✓	✓	✓			3	2
Online consumer protection	✓	✓	✓	✓	✓	✓		
Cooperation on competition policy	✓	✓	✓				3	3
Personal information protection	✓	✓	✓	✓	✓	✓		
Unsolicited commercial electronic messages	✓	✓	✓	✓	✓		5	3
Submarine telecommunications cable systems	✓	✓					2	2
Location of computing facilities for financial services	✓	✓					2	2
Data innovation	✓	✓	✓				3	3
Open government data	✓	✓	✓				3	3
Source code	✓	✓		✓			3	2
Digital identities	✓	✓	✓				3	3

Item	UKSDEA	SADEA	DEPA	CPTPP	RCEP	AAEC	Other	New DEA
Standards and conformity assessment for digital trade	√	√					2	2
Artificial intelligence	√	√	√				3	3
Fintech and Regtech cooperation	√	√	√				3	3
Dispute settlement	√	√	√	√	√	√		
Number of Clauses	23	24	19	13	10	9		

AAEC= ASEAN Agreement on Electronic Commerce, ASEAN=Association of Southeast Asian Nations, CPTPP= Comprehensive and Progressive Agreement for Trans-Pacific Partnership, DEA=Digital Economy Agreement, DEPA=Digital Economy Partnership Agreement, RCEP=Regional Comprehensive Economy Partnership, SADEA= Singapore-Australia Digital Economy Agreement, UKSDEA= United Kingdom-Singapore Digital Economy Agreement.

Notes: In the 'Other' column, shaded figures indicate what is not addressed in four of five agreements other than the AAEC. The shading in the 'New DEA' column indicates what is not addressed in the RCEP or CPTPP but is Addressed in all three new DEAs (UKSDEA, SADEA, and DEPA)

Source: Author, based on Elms (2022), Sawatari (2022), and Sefrina (2023).

The e-commerce chapter in the ACFTA 3.0 should at least include the aspects referred in the RCEP.

Thus, the e-commerce chapter should include:

- Trade facilitation: paperless trading, electronic authentication, and electronic signatures
- Online consumer protection
- Online personal information protection
- Domestic regulatory frameworks
- Data issues
- Customs duties
- Small and medium-sized enterprise (SME) cooperation
- Transparency
- Cybersecurity
- Cross-border e-commerce
- Cooperation: digital infrastructure development, capacity building, and sharing of information, experience, and best practices
- Dispute settlement

These items address the three aspects of digital economy integration – market access, rules and regulations, and facilitation.

It is difficult for the ACFTA to establish the same level of binding rules and regulations as those found in agreements like the CSFTA, the United Kingdom–Singapore DEA, the Singapore–Australia DEA, and the DEPA, since AMS are at different stages of development. Thus, the ACFTA should have grace provisions and provide technical assistance for some AMS.

Furthermore, ASEAN is laying the foundation for an integrated ASEAN digital economy as outlined in the Bandar Seri Begawan Roadmap of 2021, through the ASEAN Digital Economy Framework Agreement. The development of ASEAN's digital economy integration could supplement the ACFTA's digital economy integration.

Potential benefits and costs to ASEAN and China

1. A digital economy agreement between ASEAN and China could help govern cross-border e-commerce. In contrast to the traditional trade chapter, which focuses on market access, a digital-related commitment would encourage domestic regulatory reforms and soft cross-border collaboration on issues such as digital identities, cybersecurity, consumer protection, and digital inclusion (Warren and Fan, 2022). These are necessary developments to permit the expansion of cross-border e-commerce and digital transactions, which serve as part of a new engine of growth for the region.
2. As ASEAN and China's e-commerce become more connected, AMS digital connectivity will improve, and the value of digital transactions will rise. This readiness in the digital economy and economic potential could attract non-AMS to invest in the region.
3. Thailand's large enterprises have opportunities to participate in the global market, and Thai micro, small, and medium-sized enterprises could gain access to a larger market. Micro, small, and medium-sized enterprises benefit the most from consistent and interoperable digital regulations (Warren and Fan, 2022).
4. As business opportunities increasingly rely on digital means, and governments are unable to guarantee universal access or develop digital skills, some groups may experience a digital divide and be unable to participate and benefit from this integration.

Some foreseeable challenges

1. The disparity in the development of digital connectivity throughout the ASEAN region could pose difficulties regarding digital economy integration. Infrastructure development (universal access, affordable, and seamless connectivity) is necessary, as well as interoperability, capacity building, and data governance (rules and regulations on data movement, localisation, and personal data protection that are aligned and consistent with those at the international level).
2. Digital economy integration involves providing a platform for digital economy interoperability in a secure environment (Sefrina, 2023). To truly integrate the digital economy, countries may need to revise and reform domestic regulations, where necessary, to align them with international and regional best practices.

Policy suggestions

1. To drive negotiations forward on this issue, AMS should emphasise the shared benefits that this agreement will provide. It will be necessary to do research on the potential impact of the ACFTA's digital economy integration on ASEAN and China. Since AMS are at different levels of development, having the same binding clauses for all AMS creates difficulties for some countries. Thus, preparing technical assistance for some countries, as in the RCEP, is needed to move these negotiations forward. Furthermore, emphasis on consumer protection and building trust are critical for growth in this area.
2. Issues related to the digital economy should be in the upgrade of the agreement. However, since many issues are beyond the remit of the agreement, AMS should prioritise implementation of the ASEAN Digital Economy Framework

2.1. Data collection and update on digital economy integration readiness

AMS and China are at different levels of digital development. Some AMS are more prepared than others to implement the agreement. It is necessary to assess specific countries' readiness. The ASEAN Digital Integration Index, established with the assistance of the United States Agency for International Development, is an example of an index that can assess the readiness of AMS, thus providing insights into the readiness of each AMS. This index is built on six pillars: (i) digital trade and logistics, (ii) privacy and cybersecurity, (iii) digital payments and identities, (iv) digital skills and talent, (v) innovation and entrepreneurship, and (vi) institutional and infrastructure readiness. The non-existence of a necessary legal framework should be noted as well because the absence of certain rules and regulations, such as personal data protection, can slow down the process (Sefrina, 2023).

2.2. Technical assistance

Data on countries' readiness is critical for designing appropriate interventions or technical assistance for countries in need. Such assistance could take the form of other members sharing their knowledge, experience, and best practices to improve infrastructure development, capacity building, and assistance with digital rules and regulations.

2.3. Flexible timeline

Since AMS are at various levels of digital development, and the agreement on digital economy issues represents a commitment for all 10 AMS and China, some countries require a grace period to adjust.

2.4. Roles of government and the private sector

The development of the digital economy requires the cooperation of both the public and private sectors. As an investor and service provider, the private sector drives the digital economy, while the government creates an environment that encourages and supports technological investment and growth. Infrastructure and access to services issues that may impede digital economy integration can be addressed by the private sector. Public–private sector involvement and public–private partnerships could be a starting point for addressing the issues mentioned above (Sefrina, 2023).

5.2. Green economy

According to the Global Risk Report 2023 (World Economic Forum, 2023), the risk profile for the next 10 years concentrates on environmental risk rather than other types of risk. Environmental risk factors include failure to mitigate climate change, failure to achieve climate change adaptation, natural disasters and extreme weather events, and biodiversity loss and ecosystem collapse. The Paris Agreement was signed in 2015 at the UN Climate Change Conference (COP 21) and has been in force since 2016. Adopted by 196 parties, the Paris Agreement is a legally binding international treaty on climate change. According to the agreement, ‘Its overarching goal is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels”’ (United Nations, n.d.).

Several recent summits have underlined the increasing importance of environmental risk compared with a decade ago. The SDGs or the Global Goals serve as a prime example of global cooperation. Adopted by the UN in 2015, they represent a universal initiative aimed at reducing poverty, promoting peace and prosperity, and safeguarding the planet. The private sector has also promoted awareness in doing business in terms of profit, people, and the planet. The 2021 UN Climate Change Conference (COP 26) raised commitments amongst member nations for a carbon-neutral economy and net zero emissions. Without implementation amongst countries by the private and public sectors, climate change will cause serious natural disasters such as floods, biodiversity loss, food insecurity, global warming, and likely new kinds of pandemics.

The EU has taken climate change and environmental degradation seriously and has introduced the European Green Deal to tackle the environmental risk. It aims to transform the EU into a modern, resource-efficient, and competitive economy. The European Commission proposed EU policies to reduce net greenhouse gas (GHG) emissions by at least 55% below 1990 levels by 2030. The policy tools are related to NTMs, financial support, renewable energy and environmental taxation, new manufacturing and agricultural production processes, research and innovation, and more efficient logistics. The European Green Deal aims to provide current and future generations with a better quality living environment, clean energy, food security, efficient transportation, clean technology, a recycle–reuse–repair system, and competitive and resilient industry.

China also underlined its commitment towards the green economy in the 11th Five-Year Plan (2006–2010). The plan aims to use renewable energy sources to limit environmental pollution. China later included seven major targets for reducing pollutant emissions, improving drinking water sources and quality, controlling the pollution caused by hazardous chemicals and dangerous waste, improving urban environmental infrastructure operations, reversing ecological deterioration, improving nuclear safety, and enhancing environmental regulatory institutions. Again, the overall objective is to reduce carbon emissions, achieve efficient energy consumption, and undertake reforestation.

In 2020, President Xi Jinping announced that China would reduce carbon emissions at a pace ahead of its commitment by reaching the carbon emissions target in 2030 and carbon neutrality by 2060. In 2021, China introduced (i) the Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy, and (ii) the Action Plan for Reaching Carbon Dioxide Peak Before 2030. China's policy framework is known as the 1+N Policy Framework, where 1 represents the working guidance and N refers to an unspecified number of auxiliary policy documents targeting specific industries, regions, fields, and goals. In 2022, China's State Council issued the Guiding Opinions on Accelerating the Establishment and Improvement of a Green and Low-Carbon Circular Development Economic System, which set broader goals for China's transition towards a green economy (Table 5.5).

Table 5.5 China's Transition to Green, Low-Carbon, and Circular Economy – Key Tasks

Goals	Tasks
Improving the production system	<ul style="list-style-type: none"> • Promoting green upgrading of industries • Accelerating green development of agriculture • Improving the level of green development of the service industry • Expanding green and environmental protection industries • Improving the recycling level of industrial parks and industrial clusters • Building a green supply chain
Improving the circulation system	<ul style="list-style-type: none"> • Creating green logistics • Strengthening the recycling of renewable resources • Establishing a green trade system • Promoting the consumption of green products • Advocating a green and low-carbon lifestyle
Improving the consumption system	<ul style="list-style-type: none"> • Promoting the consumption of green products • Advocating a green and low-carbon lifestyle
Accelerating the green upgrading of infrastructure	<ul style="list-style-type: none"> • Promoting the green and low-carbon transformation of the energy system • Promoting the construction and upgrading of urban environmental infrastructure • Improving the green development of transportation infrastructure • Improving the urban and rural living environment

Goals	Tasks
Building a market-oriented green technology innovation system	<ul style="list-style-type: none"> • Encouraging research and development of green and low-carbon technologies • Accelerating the transformation of scientific and technological achievements
Improving a system of laws, regulations, and policies	<ul style="list-style-type: none"> • Strengthening the support of laws and regulations • Improving the price mechanism for green charges • Increasing fiscal and tax support • Vigorously developing green finance • Improving green standards, green certification system, and statistical monitoring system • Cultivating green trading market mechanism

Source: Zhou and Huld (2022).

According to Zhou and Huld (2022), foreign investors can participate in three aspects of this process. First, they can avail of new opportunities for emerging economic partners regarding FDI in innovation and technologies to assist China during the transition towards a green economy. These include green goods and services and green energy, as well as carbon emissions reduction. Second, foreign investors can help upgrade the existing investment, operation, and supply chain for efficient production processes with low energy consumption, low pollution emissions, and a recycle–reuse process. Products and services can carry the green certified mark. Last, China needs to achieve compliance with international standards on green products and services. Its laws, regulations, and standards must meet global green standards or trading partners' regulations and standards, such as the European Green Deal. Firms' satisfaction of environmental, social, and governance (ESG) requirements must be documented for international trade and investment.

For ASEAN, Han et al. (2022) evaluated the green development level within AMS. The findings showed that there are differences between a high degree and low degree of green development amongst AMS. Countries with a low or modest degree of green development have problems with low economic growth and environmental preservation, whereas countries with a high degree of green development can enjoy the benefits of a high-level coordinated development economy, society, and environment. ASEAN needs to perform capacity building for coordination of green development. An example at the firm level is the ASEAN Comprehensive Recovery Framework, which includes the transition towards a green and circular economy via SMEs. SMEs will be promoted as engines for green economic recovery and growth. The challenge is to provide SMEs with financial access, regulatory compliance, and updated information. During the 33rd ASEAN Senior Officials' Meeting on Environment in 2023, the secretary of state at Cambodia's Ministry of Environment stated that AMS are focused on environmental work, green economy development, smart cities, sustainable infrastructure, and comprehensive economic recovery, centred on sustainable production and consumption. Green economy development is the focus of ASEAN for the next decade.

Thailand and the green economy

In dealing with the green economy, a taxonomy is required to provide a common framework for classifying economic activities for stakeholders, market participants, regulators, and policymakers to understand the definition, processes, standards, qualifications, and promotion required to achieve sustainability goals. Using this framework, a country can then achieve the SDGs, ESG, a bio-circular green economy model (BCG), and carbon emissions targets. The EU's taxonomy includes climate change mitigation, climate change adaptation, the sustainable use and protection of water resources, the transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems. ASEAN's taxonomy is based on climate change mitigation, climate change adaptation, the preservation of healthy ecosystems and biodiversity, the promotion of resource resilience, and the transition to a circular economy. The Thai taxonomy is expected to align with the EU taxonomy.

Thailand, with the cooperation of the private and public sectors, has defined a national taxonomy classification of economic activities according to sustainability level. The guiding principles are to support the transitional period to achieve the sustainability objectives, to prevent greenwashing, and to bring national standards into line with global standards. The Thailand Taxonomy Board, which was established to handle this matter, consists of representative agencies such as the Bank of Thailand, the Securities and Exchange Commission, the Office of Insurance Commission, the Federation of Thai Industries, the Eastern Economic Corridor (EEC) Board, the Thailand Greenhouse Gas Management Organization, and the Ministry of Energy. The first phase of the implementation of the taxonomy classification relates to the energy and transportation sector, with 23 activities and the objective of climate change mitigation. The next phase will cover GHG emissions activities, at least in the manufacturing and agricultural sectors. The design of the related taxonomy measures and activities will be based on environmental science. The implementation of the taxonomy will follow a traffic-light system: green for activities that clearly and substantially contribute to GHG emissions mitigation; amber for activities that contribute to a credible transition towards green, in line with the national determined contributions; and red for activities that have no climate-aligned goals or that are out of scope for a credible transition. The colour code will specify whether an activity is eligible or not.

A detailed description of the first phase, involving the energy and transport sectors, is given below.

- **Energy sector** – includes solar energy generation; wind energy generation; hydropower energy generation; geothermal-based energy generation; bioenergy generation; natural gas energy generation; marine energy generation; electricity generation from renewables to non-fossil, gaseous, and liquid fuels; cogeneration of heating, cooling, and power using renewable sources of energy production for heating/cooling using waste heat; the installation and operation of electric heat pumps; heating and cooling distribution transmission and distribution networks for renewable and low-carbon gases, including green hydrogen storage of electricity thermal energy and green hydrogen; and the transmission and distribution of electricity.

- **Transport sector** – includes transport via railways, other passenger land transport, urban and suburban passenger land transport, freight transport by road, enabling infrastructure for low-emissions transport, sea and coastal water transport, inland water transport, retrofitting of sea and coastal freight, and passenger water transport.

Additionally, the principles of Do No Significant Harm and Minimum Safeguard Measures aim to ensure that the operational activities undertaken for environmental purposes must not affect social dimensions such as human rights, labour rights, gender equality, and more.

The Thailand Board of Investment (BOI) and Eastern Economic Corridor (EEC) play important roles in promoting FDI in Thailand as well as establishing new green industries. The BOI focuses on investment promotion and the provision of tax incentives, which have become major tools in attracting FDI. The new investment promotion strategy (2023–2027) is set to restructure the Thai economy in three areas: (i) innovation, technology, and creativity; (ii) competitiveness and the ability to adapt quickly; and (iii) inclusiveness for environmental and social sustainability. In addition to tax incentives, the BOI will promote the provision of tax and non-tax benefits, integrate investment support tools, facilitate service providers, connect and build industry networks, and create more business opportunities. For green technology, the BOI concentrates on carbon capture, utilisation, and storage in three main industries: (i) electric vehicles, (ii) a full spectrum of upstream electronics, and (iii) digital infrastructure and transformation for business operators.

It is worthwhile noting that nine new investment promotion programmes became effective on 3 January 2023: (i) the promotion of targeted industries, (ii) the competitive enhancement programme, (iii) the retention and expansion programme, (iv) the relocation programme, (v) investment stimulation measures and economic recovery, (vi) the smart and sustainable industrial upgrade programme, (vii) investment promotion for SMEs, (viii) area-based promotion measures, and (ix) the social and local development investment programme. The new BOI strategies are about restructuring industries and strengthening supply chains, accelerating industrial transformation to smart and sustainable industries, enhancing the competitiveness of SMEs and start-ups and connecting to the global market, and promoting investment based on the potential of each area to generate inclusive growth. The priority industries are BCG, electric vehicles, smart electronics, and the digital and creative industries.

The EEC is an area-based development initiative for transforming Thailand's traditional industries into new advanced industries. The new advanced industries consist of modern agriculture, biorefineries, modern automotives, aviation, robotics, and more. The BCG strategy is applied to the EEC's energy consumption, resource and waste management, and business ecosystem. The corridor aims to achieve net zero emissions with green energy and carbon credit trading. The EEC also plans to achieve international standards of production under the green and circular economy, such as ISO 14021/14024/14025, to upgrade the overall business ecosystem.

Here, Electric Vehicle industry provides an example of the green economic model. The production of electric vehicles comprises electric motorcycles, hybrid electric vehicles, plug-in hybrid electric vehicles, and battery electric vehicles (BEVs). BEVs rely only on batteries to operate. BEVs will be our focus since this study relates to the Green Economic (Pure green) model. The major automobile manufacturers in ASEAN, which mostly produce internal combustion engine (ICE) vehicles, are located in Thailand (1.6 million units), Indonesia (1.1 million units), Malaysia (0.5 million units), and Viet Nam (0.2 million units). (ASEAN Briefing, 2019)

The shift from ICE to electric vehicles is a challenge for Thailand as the ICE automobile industry is sizeable – it employs nearly 1 million workers and generates a large amount of export income. The technology as well as research and development come from FDI, and knowledge transfer is limited. First-tier investment is mostly from Japanese and European firms, while local Thai firms play the role of supporting manufacturers, known as second- and third-tier firms. In 2023, the Federation of Thai Industries expects ICE automobile production to reach 1.95 million units, with 1.05 million units serving the export market. On the demand side, although domestic demand in Thailand can absorb nearly half of the automobile production, the export of automobiles and parts is very high and is ranked amongst the top five Thai export products. Therefore, to transform the ICE industry into a BEV industry in Thailand, we need new investment from firms that have experience in BEVs, likely from China, with local BEV demand to support the new investment initiatives. To attract FDI and create local demand, some government incentives are crucial. Currently, AMS compete to promote BEV production and lack business cooperation.

On the ASEAN demand side, according to a McKinsey report quoted in Tham (2023), BEV adoption as a percentage of total new passenger vehicles was 0.7%, 0.3%, and 0.1%, respectively, for Thailand, Malaysia, and Indonesia in 2021. Singapore also has high demand, in second place after Thailand, but is not likely to be a production base. Thailand is therefore the fastest growing purchaser of BEVs and is moving towards becoming the electric vehicle production hub in the region. To attract FDI for BEV industrial development, some AMS have introduced government promotional policies to create demand and/or supply.

To transform the ICE automobile industry into a BEV industry, the regional value chain (RVC) must be analysed throughout the whole process, i.e. acquiring raw materials, securing adequate technology and its knowledge transfer, attracting FDI, developing an efficient production line, creating sizeable market demand, and establishing efficient services such as charging stations. Since no single AMS can complete the BEV production chain alone, the RVC must be developed amongst AMS together with China, Korea, and/or Japan.

Chinese manufacturers are more advanced in BEV production technology than manufacturers in Korea or Japan. China has 94 electric vehicle brands, including both established and start-up firms, with a sizeable domestic market. According to Counterpoint (2023), sales of passenger BEVs and plug-in

hybrid electric vehicles in China increased by nearly 87% year on year in 2022. BYD, Wuling, Chery, Changan, and GAC are some of the top Chinese producers. China also has a wide range of electric vehicle start-ups such as Nio, Xpeng, Neta, AITO, IM Motors, Zeeker, Aiyas, and Livan, which are performing well.

Japanese car companies tend to develop more advanced automobiles (e.g. hydrogen cars) rather than BEVs, while Korean producers have been relatively slow in developing the electric vehicle industry, with only a few brands. However, Japan still has a long way to go in developing the hydrogen car industry. Therefore, the development of BEV production in ASEAN is likely to rely heavily on China, and the ACFTA will be the basis of ASEAN–China RVC success. Nonetheless, ASEAN will welcome FDI from Japan and Korea when new technology is available, utilising the ASEAN–Japan Comprehensive Economic Partnership, the ASEAN–Korea Free Trade Area, or the RCEP.

Tham (2023) mapped BEV production in ASEAN, together with green infrastructure such as green electricity power supply and the national grid. The value chain analysis and supporting industries are outlined in Table 5.6.

Table 5.6 BEV Production in ASEAN

Parts	Indonesia	Malaysia	Thailand	Viet Nam
Mineral resources (nickel)	Yes	No	No	Yes
Electric vehicle battery production	Planned	In production	In production	Planned
Battery swapping	Yes	Planned	Yes for e-motorbikes	No
Semiconductor chips	No	Yes	Yes	No
Assembly of electric vehicles	Yes	Planned	Yes	Yes
Battery recycling	No	No	Planned	No
R&D activities	No	No	Yes	Yes
Greening the Grid*	10%	8%	8%	23%

ASEAN = Association of Southeast Asian Nations, BEV = battery electric vehicle, R&D = research and development.

* Renewable energy supply as a percentage of total power supply (including fossil fuels) in 2021.

Source: Tham (2023).

Government policies to support the creation of the BEV industry are needed for ASEAN BEV producers. Table 5.7 is summarised from Tham (2023), with updated information from Thai promotional policies.

As battery production, semiconductor manufacturing, and software development are key success factors for BEVs, no single AMS has all the essential elements for establishing an autonomous BEV industry. A Vietnamese BEV firm introduced the VinFast brand to the global market in 2018, but it has not yet achieved commercial success. Indonesia and Viet Nam have comparative advantages in battery

production due to an abundance of nickel, which is the most important metal for making lithium-ion battery cathodes. Indonesia is the top global source of nickel. Indonesia and Australia have 22% and 21% of global nickel reserves, respectively (Statista, 2024). Currently, world nickel production mainly comes from Indonesia, the Philippines, Russia, New Caledonia, Australia, Canada, and China. China invested heavily in nickel production in Indonesia before exports of unprocessed nickel were banned. However, the presence of nickel resources is not sufficient to establish a BEV industry.

Table 5.7 Government Policies to Support the Creation of the BEV Industry

Policy area	Indonesia	Malaysia	Thailand	Viet Nam
Promote domestic demand	Luxury tax incentive and lower parking tariffs	Road tax incentive and income tax deductible	Cut excise tax and import duties but the amount sold must be equal to the amount produced in 2025	Exempt registration fee and lower consumption tax and several tax more incentive
Charging stations	SOEs to supply 31,000 stations in 2030	10,000 stations in 2025	12,000 in 2030 and 36,500 stations in 2035	2,000 stations completed
Targets	Minimum of 20% of cars will be EVs by 2025, and ICE banned by 2035 (demand)	10% of the market will be EVs by 2023 and 20% by 2025 (demand)	EV hub for ASEAN in 2025, and EVs represent 30% of total car production by 2030 (supply)	500,000 units by VinFast in 2025 (supply)
Production and FDI	Custom duty exemptions for parts and charging equipment	FDI incentives such as tax allowances and custom duty exemptions	Corporate tax and import tariff exemptions for production machines	N/A

ASEAN = Association of Southeast Asian Nations, BEV = battery electric vehicle, EV = electric vehicle, FDI = foreign direct investment, ICE = internal combustion engine, N/A = not available, SOE = state-owned enterprise.

Source: Tham (2023) with updated information from Thailand.

Semiconductors are essential for controlling automobiles and making batteries for BEVs. Taiwanese, US, and Korean firms are the main producers of semiconductors (Shiphub, n.d.), while China is the world's largest BEV battery producer (77% of global BEV battery production), mainly from CATL (Bhutada and Parker, 2023). The supply of semiconductors from the US, Korea, and Taiwan is an important input factor for Chinese battery production. The Chinese technology and semiconductor production industry lags Taiwan, the US, and Korea in semiconductors (GlobalData, 2021), but Chinese firms are gradually improving to fill knowledge gaps. To sum up, BEV batteries require international production networks and depend on both nickel-rich nations and semiconductor-making nations.

The ASEAN Leaders' Declaration on Developing Regional Electric Vehicle Ecosystem was issued at the ASEAN Summit in May 2023 to develop ASEAN's BEV industry. The objectives are to fill in the BEV development gap, strengthen regional competitiveness, and improve regional weaknesses to construct BEV RVCs. The ACFTA will be a key success factor in developing an ASEAN BEV production base, as China has an extremely advanced electric vehicle industry and is the world's largest BEV producer. Thailand is the main ASEAN customer of Chinese BEV products such as MG, BYD, and Neta. The Thai government provides tax subsidies of B80,000–B120,000 per BEV, but this will only apply to BEVs made in Thailand from 2025. Therefore, several Chinese BEV firms have established operations in Thailand to qualify for the subsidy and retain their market share. Technology transfer and FDI from China will prepare Thailand to be the BEV production hub of ASEAN.

To support the new investment and participate in the green economy, Thailand has invested in renewable energy as the power source for new industries. Renewable energy will increasingly replace traditional fossil fuel sources to produce electricity. This will help create a green production process for BEVs.

The BEV industry and green energy will satisfy government commitments on carbon neutrality and net zero emissions. New ACFTA negotiations will be needed for establishing a BEV industry in ASEAN and China to reduce the cost of unbundling or fragmentation of the production process and to cut service-linked costs. To support initial BEV sales and create regional demand and supply, ACFTA parties will link nickel supply, semiconductor and BEV battery production technologies, software development, automobile assembly, green energy supply, and regional demand. The importance of cooperation in this sector was underlined in the ASEAN Leaders' Declaration on Developing Regional Electric Vehicle Ecosystem.

Potential benefits and costs to ASEAN and China

1. ASEAN and China share similar environmental values, which are consistent with the global trend towards environmental protection, and mitigation and adaptation to climate change. The position of Thailand is to support such initiatives and to prepare the implementation of the related measures. The first step that has been done is to design the Thailand Taxonomy, with detailed standards and processes.
2. To create a green regional supply chain between China and ASEAN, the production process – ranging from downstream to upstream – must be in line with international standards on green and environmental measures. To export products to trading partners such as the EU, ASEAN and China must share information and have common regulations that comply with the European Green Deal.

3. Mutual benefits can be realised in some newly developed industries, such as smart electronics and electric vehicles. These two industries are of interest to both ASEAN and China since ASEAN has natural resources and consumer markets, while Chinese firms have technology and experience in production and marketing.
4. To benefit from the new green or environmental protection rules, information sharing between ASEAN and China is required. In addition, ASEAN and China need to collaborate to negotiate a new green and sustainable strategy and regulations at the global level.
5. The challenge for ASEAN and China is to develop a common understanding, on and standards for, sustainability. Capacity building and technical assistance should be provided to less developed areas.

Challenges facing domestic reforms

1. To implement a green RVC, a large amount of funding is needed for infrastructure development for clean energy, green production processes, green logistics and marketing, and waste treatment.
2. The development pace is different amongst AMS and China. Flexibility in financial contributions and adjustment periods should be allowed for less developed members.
3. Job losses may occur in some industries and countries due to the shutdown of non-green businesses. Remedies and reskilling and upskilling of workers must be provided, but concerns surround who will bear the cost of adjustment.

Policy recommendation for negotiation and implementation of the agreement

1. A joint feasibility study is required in the first phase for strengthening cooperation, sharing knowledge, sharing experience, and sharing best practices.
2. Awareness regarding green initiatives and sustainability needs to be heightened amongst the citizens of ASEAN and China. It is important that lifestyle adjustments are embraced.
3. ASEAN and China should support industries that need adjustment periods, technology, and financial support.
4. ASEAN and China should cooperate in negotiating with other nations and make optimal use of their comparative advantages to serve global demand.

5.3. Supply chain resilience

The COVID-19 pandemic alerted the world to supply chain disruptions. ‘Decoupling’ was the term used when the production chain of Western economies (especially the US) was disrupted by Eastern economies (especially China) as a result of the US–China trade war and the pandemic. However, at the Group of Seven (G7) Summit in 2023, the term indicating supply chain disruption was ‘de-risking’, which is a sign of the importance of global supply chains. This suggests that global value chains (GVCs) cannot be entirely disaggregated. On the contrary, supply chains should be expanded and should have a better and stronger network to reduce potential challenges in the future.

The importance of developing GVCs for the world economy has been evident for many years. ASEAN and China have partially developed GVCs within the bloc via the ACFTA. However, given the disruptions, the main concern is how to achieve GVCs’ resilience. Ongoing negotiations on the ACFTA 3.0 could strengthen GVCs by putting this issue on the table.

Resilience in the broader economic sense may include the ability to recover, grow, and sustain in an inhospitable economic environment. Firms participating in GVCs mostly see resilience as discovering the right equilibrium between operational efficiency and risk mitigation. Resilience could also mean securing the resource base through human development, decarbonising GVCs, and making the available technology more inclusive. Thus, the building blocks to create a resilient value chain should deal with factors affecting firms’ participation in GVCs. Those factors include factor endowment and capital, geography, domestic industrial capacity, trade policy and FDI, institutional quality, connectivity, and macroeconomic factors (Fernandes, Kee and Winkler, 2020).

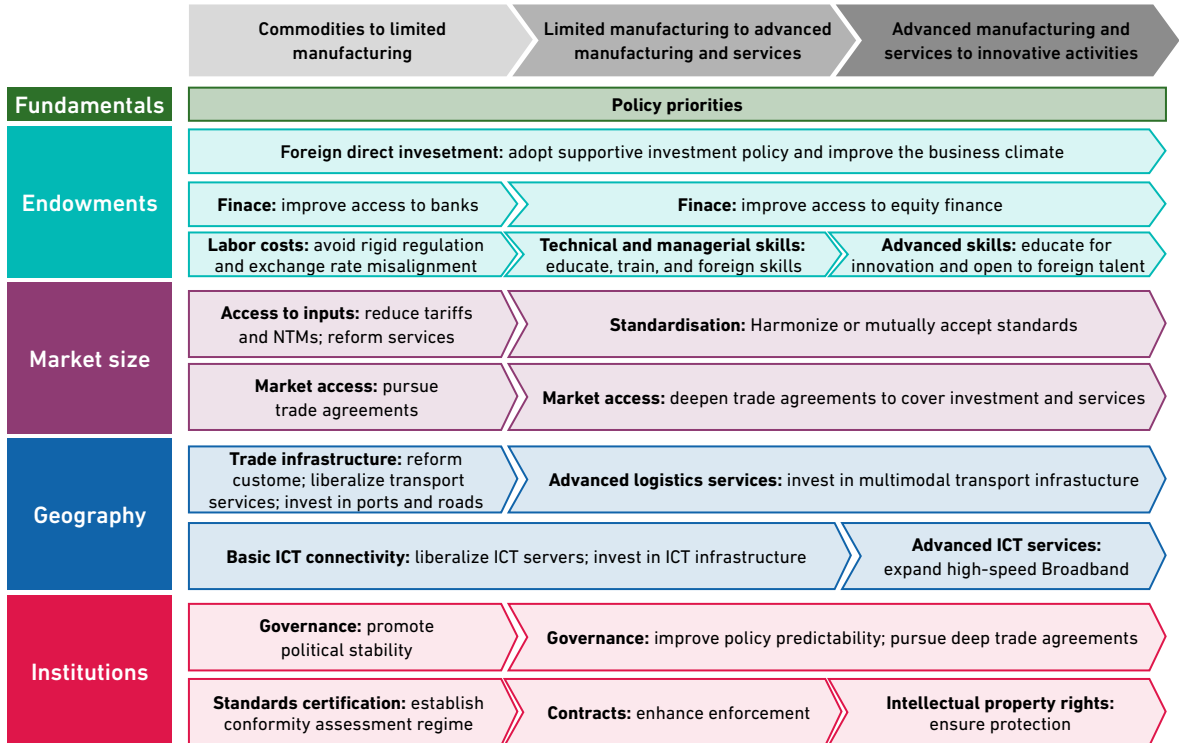
Although firms (multinational enterprises) created the building blocks of GVCs, policymakers should create an economic environment to support resilient value chains. OECD (2020) suggested that the governance of reliable GVCs requires multinational enterprises to develop their own risk management strategies. Such strategies, according to He (2021), include securing alternative supply and distribution channels, arranging for reasonable production capacity, engaging in new partnerships, and expertly handling relevant information. Moreover, the entire GVCs could be considered as multiple RVCs, which are easier to manage relative to the entire global network. This fits into the context of the ACFTA perfectly. Multiple RVCs should be extensions of the common tasks that could stabilise GVCs, such as maintaining an open, stable trade and investment regulatory environment and supporting a secure knowledge sharing platform.

Debate surrounds whether the gains from participating in GVCs outweigh the risks of shock transmission. OECD (2021) showed that the benefits involved in participating in GVCs outweigh the risks, although some sectors may be more exposed to risk than others. Nonetheless, GVC involvement needs to be structured towards resilience, as mentioned above. Policymakers could play important roles in building a conducive environment for GVC participation. AMS and China have participated significantly at the lower end of GVCs (He, 2021). Therefore, moving towards resilient RVCs would be of common interest for both parties, since it would strengthen comparative advantages and move upstream in the GVC. With good management and support from the governments of the two parties, benefits in the form of efficiency gains from building resilient RVCs and GVCs could be huge, along with lower risks of transmission of any future shocks.

However, GVC participation will also introduce challenges. The theory of the international division of labour reveals that different countries can specialise in different stages of production in international trade. Overall, there are welfare gains when each stage of the production process is carried out by a country that is specialised in that task to generate an efficient GVC. This entails two main challenges: (i) the distribution of benefits from involvement in supply chains, and (ii) maintaining a country's specialisation to ensure supply chain resilience. The first challenge underlines the difficulty of evenly distributing the benefits of involvement in supply chains to each AMS. ASEAN as a group needs to reach a consensus on how each country plays a role in the supply chains to make the development inclusive to all AMS. The second challenge could be a core factor in creating resilient supply chains. ASEAN as a group, and each AMS, need to produce strategic plans to strengthen their comparative advantages. This could guarantee involvement in supply chains.

In *the World Development Report 2020*, the World Bank separated GVC involvement into four main levels, from weak to strong involvement: (i) commodities level, (ii) limited manufacturing level, (iii) advanced manufacturing and services level, and (iv) innovative activities level. The World Bank (2020) showed that the fundamental factors for GVC involvement are factor endowments, market size, geography, and the quality of institutions. World Bank (2020) put together policies that can support each of these factors for each level of GVC participation (Figure 5.2). These policy suggestions could create a fundamental building block to achieve supply chain resilience.

Figure 5.2 Examples of Policies Supporting GVC Participation, Classified by Level and Fundamental Factors



GVC = global value chain, ICT = information and communication technology, NTM = non-tariff measure.

Source: World Bank (2020).

Up to this point, from the pandemic to the idea of creating resilient supply chains at a global or regional level, the process of keeping value chains going is important for each phase. OECD (2020) provided policy recommendations for each phase of the pandemic (Table 5.8). These recommendations could be a building block for generating resilient supply chains in the future.

Table 5.8 Main Policy Recommendations for GVCs – From Crisis to the Future

Crisis	Recovery	New normal
Maintain operations of essential GVCs and increase supply	Help to restart GVCs	Promote robustness and resilience in GVCs
Facilitate trade by removing trade barriers and by ensuring the smooth functioning of international transport and customs	Maintain an open trade and investment environment to reduce the time to recover and continue to support trade facilitation	Create a stable regulatory environment (including through trade and investment agreements that can include provisions for the smooth operations of GVCs)
Prioritise shipments for essential goods and adapt rules for movement of key personnel	Address financial and other issues of firms that can delay the recovery of GVCs and support MSMEs	Promote standards and certification procedures, including risk awareness; review transport, logistics, and customs clearance regulations to better mitigate disruptions
Increase supply of essential goods by facilitating investment and operation permits and by expediting certification procedures	Adapt health measures to the needs of firms operating in an international environment	Develop stress tests for critical supply chains and include criteria for robustness of supply chains in government procurement procedures on a non-discriminatory basis. Promote the diffusion of digital technologies that can improve information systems for risk management (e.g. internet of things)

GVC = global value chain; MSMEs = micro, small, and medium-sized enterprises.

Source: OECD (2020).

With these policy recommendations in mind, to prepare and collaborate on a system to improve those factors to serve supply chain resilience, countries need to develop three strategic plans: (i) development to facilitate the compatibility of products and services; (ii) the development of cooperative programmes, exchanges of expertise, and best practices; and (iii) the development of workforce capabilities to enhance strength (Phoolpipat, 2021). These plans can be carried out by applying the following policies recommended by CAITEC et al. (2020):

- (i) Carry out a holistic analysis of supply chain connectivity to include essential services as well as human resources and intermediate inputs for the production of essential products.
- (ii) Improve both physical and soft infrastructure: production, logistics, and new and digital technologies.
- (iii) Ensure supply chain resilience by strengthening the development of domestic supporting industries and ensuring the openness of and circulation in the domestic market, as well as the diversification of production bases and procurement sources.
- (iv) Strengthen regional coordination and dialogue to deepen supply chain connectivity and intra-regional trade, especially the implementation of FTAs and the signing and early entry into force of the RCEP.
- (v) Address cross-border bottlenecks by implementing the necessary reforms to simplify and expedite border formalities and exploring the expansion of trade facilitation initiatives.
- (vi) Prioritise investment in information and communication technology infrastructure and corresponding human resources development, and promote the use of digital technology in supply chains, with the aim of achieving end-to-end trade digitisation.

So far, the policy recommendations have mostly come down to cross-national collaboration, especially trade, which is at the heart of all these agreements. Thus, with a robust relationship, as we believe the ACFTA has been, the first objective is to strengthen trade cooperation. Reducing pressure on the trading system, lowering protectionism, and removing uncertainty could sustain trade openness (World Bank, 2020), resulting in a strong structure for GVC resilience. Nonetheless, collaboration beyond trade policy, such as in taxes, regulation, competition policy, and infrastructure, is essential (World Bank, 2020).

5.4. Trade Facilitation

Trade facilitation is an important aspect in achieving free flow of goods across borders. Land transportation is an essential avenue for trade with China along the route from Thailand to the Lao PDR, and finally to China. Logistics performance should be analysed to better understand ASEAN and China's trade facilitation capacity. The main way of improving logistics performance is to reduce causes of complication when products move across borders. Some key issues may help and should be on the negotiation table: the ASEAN Single Window (ASW) and cross-border e-commerce.

The ASW was developed to facilitate and streamline trade and customs processes amongst AMS. It allows traders, exporters, importers, and customs authorities to submit and receive trade-related documents and data electronically through a single point of entry. This digital platform helps reduce paperwork, simplify administrative procedures, enhance transparency, and expedite the clearance of goods across borders.

Each AMS has made a commitment to establish a national single window (NSW) within their respective countries. To integrate the system, AMS are linked to the ASEAN Single Window (ASW) gateway application via a secure network and distribute data from their own gateway model, which is developed and installed regionally by each AMS. The ASW began in 2013 when Singapore, Thailand, the Philippines, Malaysia, Indonesia, and Brunei Darussalam developed NSWs. Viet Nam launched its NSW in 2018, but found that its implementation did not meet expectations, especially for enterprises (Indira and Kusumasari, 2020).

Since the launch of the ASW and the subsequent exchange of trade data between countries to boost their international trade activities, many countries have used the Logistics Performance Index (LPI) to evaluate and rank their country's logistics performance. The LPI score provides assessments of six aspects: (i) customs and border management, (ii) transport-related infrastructure, (iii) the availability of competitively priced international shipments, (iv) logistics competence and quality, (v) the timeliness of shipments, and (vi) the ability to track and trace. It is also used as a measure of trade facilitation.

Table 9 shows the LPI for China and AMS from 2007 to 2023. The indexes reflect a significant improvement in Chinese logistics performance during the past decade. Singapore has been one of the top 10 scorers since 2012. Amongst AMS, Thailand, the Philippines, and Viet Nam have shown improvement in their LPI. In addition, China, Malaysia, and Thailand are amongst the top 10 upper middle-income scorers, while the Philippines, Viet Nam, and Indonesia are the top 10 lower middle-income scorers. The Lao PDR, Cambodia, and Myanmar did not achieve a rating of 3.0 on the LPI, indicating that their logistics capabilities and trade facilitation measures are lower than those of other AMS.

Table 5.9 LPI Index for China and ASEAN Member States, 2007–2023

Country	2007	2010	2012	2014	2016	2018	2023	Note
Singapore	4.19	4.09	4.13	4.00	4.14	4.00	4.3	Top 10 scorer in 2012, 2014, 2016, 2018, and 2023
China	3.32	3.49	3.52	3.53	3.66	3.61	3.7	Top 10 upper middle-income scorer in 2012, 2014, 2016, 2018, and 2023
Malaysia	3.48	3.44	3.49	3.59	3.43	3.22	3.6	
Thailand	3.31	3.29	3.18	3.43	3.26	3.41	3.5	
Philippines	2.69	3.14	3.02	3.00	2.86	2.90	3.3	Top 10 lower middle-income scorer in 2012, 2014, 2016, 2018, and 2023
Viet Nam	2.89	2.96	3.00	3.15	2.98	3.27	3.3	
Indonesia	3.01	2.76	2.94	3.08	2.98	3.15	3.0	
Cambodia	2.50	2.37	2.56	2.74	2.80	2.58	2.4	
Lao PDR	2.25	2.46	2.50	2.39	2.07	2.70	2.4	
Brunei Darussalam	N/A	N/A	N/A	N/A	2.87	2.71	N/A	
Myanmar	1.86	2.33	2.37	2.25	2.46	2.30	N/A	

ASEAN = Association of Southeast Asian Nations, LPI = Logistics Performance Index, N/A = not available.

Source: World Bank (2023).

Table 5.10 shows the performance of trade facilitation in China and ASEAN according to the six components in 2023. Discrepancies are present in the logistics performance of AMS in every aspect. The scores on four components – customs, international shipments, logistics competence and quality, and timeliness – of China, Malaysia, and Thailand vary only slightly, except for the infrastructure component where China outperformed these countries during the period of study.

Table 5.10 Six Components of Logistics Performance in 2023

Country	LPI		Customs		Infrastructure		International shipments		Logistics competence		Tracking & tracing		Timeliness rank	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Singapore	1	4.3	1	4.2	1	4.6	2	4.0	1	4.4	1	4.4	1	4.3
China	19	3.7	31	3.3	14	4	14	3.6	20	3.8	23	3.8	30	3.7
Malaysia	26	3.6	31	3.3	30	3.6	8	3.7	28	3.7	29	3.7	30	3.7
Thailand	34	3.5	31	3.3	25	3.7	22	3.5	38	3.5	34	3.6	46	3.5
Philippines	43	3.3	59	2.8	47	3.2	47	3.1	46	3.3	49	3.3	21	3.9
Viet Nam	43	3.3	43	3.1	47	3.2	38	3.3	53	3.2	41	3.4	59	3.3
Indonesia	61	3.0	59	2.8	59	2.9	57	3.0	65	2.9	65	3.0	59	3.3
Cambodia	115	2.4	110	2.2	125	2.1	121	2.3	110	2.4	80	2.8	109	2.7
Lao PDR	115	2.4	101	2.3	108	2.3	121	2.3	110	2.4	105	2.4	101	2.8

LPI = Logistics Performance Index.

Source: World Bank (2023)

The efficiency of customs and border management clearance is one common factor where China and most AMS can still find room for improvement together. This is because the score of the customs aspect lies between 2.8 to 3.3 for China, Malaysia, Thailand, the Philippines, Viet Nam, and Indonesia, which is lower than their overall logistics performance. For countries with low LPI scores, such as Cambodia and the Lao PDR, both the customs and infrastructure scores are below the overall LPI score. The LPI scores show that AMS use different levels of NSWs, which could affect the implementation of the ASW. Indira and Kusumasari (2020) proposed a roadmap for the ASW that involves integrating it with transportation management to develop trade facilitation via transportation. This integration could help enhance the system's readiness to connect with all border trade functions. The roadmap should include improving the e-customs process and ensuring that all modes of transportation are accessible to customers throughout the region.

Fang et al. (2022) reported that cross-border e-commerce between ASEAN and China grew remarkably during the pandemic (2020–2022). In recent years, several major infrastructure projects, such as the China–Lao PDR Railway, have enhanced China–ASEAN connectivity and facilitated the cross-border flow of parts and components. China and ASEAN have become each other's biggest trading partner (Li and Qianzheng, 2022).

To facilitate cross-border e-commerce between ASEAN and China, the following tasks should be carried out to strengthen ASEAN's access to China:

- Build a standardised cross-border logistics monitoring platform that helps integrate all cross-border logistics and transportation data between ASEAN and China. This platform should integrate data from various logistics and transportation providers, enabling real-time tracking, monitoring, and coordination of shipments.
- Promote cross-border e-commerce business-to-business exports and imports by providing one-stop customs declaration and inspection services for cross-border e-commerce enterprises. This will allow businesses that are engaged in cross-border e-commerce to save time and reduce administrative burdens.
- Align standards and rules for e-commerce and digital trade between China and ASEAN. Harmonising standards and rules related to e-commerce and digital trade will help promote seamless transactions between China and ASEAN. This includes aligning product standards, data protection and privacy regulations, electronic signatures, cybersecurity measures, and other relevant areas.

References

- ADB (2022), 'ASEAN Gears Up for a Shift to Electric Vehicles', ADB Southeast Asia Development Solutions (SEADS), 16 August. <https://seads.adb.org/solutions/asean-gears-shift-electric-vehicles>
- ASEAN (n.d.), Overview of ASEAN–China Relations. <https://asean.org/our-communities/economic-community/integration-with-global-economy/asean-china-economic-relation/>
- (2018), 'ASEAN–China Strategic Partnership Vision 2030'. Jakarta: ASEAN Secretariat. <https://asean.org/wp-content/uploads/2018/11/ASEAN-China-Strategic-Partnership-Vision-2030.pdf>
- ASEAN Briefing (2019), The ASEAN Automobile Industry: Top Destinations for Manufacturers. <https://www.aseanbriefing.com/news/aseans-automobile-industry/>
- Bank of Thailand (2022), 'Thailand Taxonomy Paper – Draft for Public Consultation.' <https://www.bot.or.th/en/financial-innovation/sustainable-finance/green/public-hearing-thailand-taxonomy-phase1.html>
- Bhutada, G. and S. Parker (2023), 'Visualizing China's Dominance in Battery Manufacturing', *Visual Capitalist*, 19 January. <https://www.visualcapitalist.com/chinas-dominance-in-battery-manufacturing/>
- CAITEC, ERIA, JETRO, KIEP, and ASEC (2020), 'Joint Study on 10+3 Cooperation for Improvement of Supply Chain Connectivity (SCC)'. https://asean.org/wp-content/uploads/2021/08/Joint-Study-on-10-3-Cooperation-for-Improvement-of-SCC_Public.pdf
- Chirathivat, S. (2002), 'ASEAN–China Free Trade Area: Background, Implications and Future Development', *Journal of Asian Economics*, 13(5), pp.671–86.
- Chu, E. (2023), 'China's Digital Economy: Full Steam Ahead', HKTDC Research, 2 February. <https://research.hktdc.com/en/article/MTI40TE5MTYwMg#:~:text=According%20to%20the%20Digital%20China,reached%20360%20million%3B%20the%20country%27s>
- CIKD (2023), 'Prosper Thy Neighbor: An Overview of China-ASEAN Economic and Financial Cooperation Since the Asian Financial Crisis and the Way Forward'. Beijing: Center for International Knowledge on Development.
- Counterpoint (2023), Global Passenger Electric Vehicle Market Share: Q1 2022–Q4 2023. <https://www.counterpointresearch.com/insights/global-electric-vehicle-market-share/#>
- Dara, V. (2022), 'Green Economy a Focus at ASEAN Environmental Meetings', *The Phnom Penh Post*, 6 October. <https://www.phnompenhpost.com/business/green-economy-focus-asean-environmental-meetings>
- European Commission (2023), The European Green Deal – Striving to Be the First Climate-Neutral Continent. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

- Fang, Z., R. Juanatas, J. Niguidula, and W. Zhou (2022), 'Optimization of China ASEAN Cross-Border E-Commerce Development Path Under the Background of RCEP in the Post-Epidemic Era', in Y. Jiang et al. (eds.) *Proceedings of the 2022 2nd International Conference on Economic Development and Business Culture (ICEDBC 2022)*, Advances in Economics, Business and Management Research. Dordrecht: Atlantis Press, pp.1864–68.
- Fernandes, A., H.L. Kee and D. Winkler (2020), 'Determinants of Global Value Chain Participation: Cross-Country Evidence', *Policy Research Working Paper*, No. 9197. Washington, DC: World Bank.
- GlobalData (2021), 'Top 20 Semiconductor Companies by Revenue Recorded Healthy Growth, Says GlobalData', 8 July. <https://www.globaldata.com/media/business-fundamentals/top-20-semiconductor-companies-revenue-recorded-healthy-growth-says-globaldata/>
- Global Times* (2022), 'ASEAN–China Free Trade Area's 3.0 Version Echoed the Development Needs of Both Sides – Envoy', 20 November. <https://www.globaltimes.cn/page/202211/1280012.shtml>
- Google, Temasek, and Bain & Company (2022), *e-Conomy SEA 2022: Through the Waves, Towards a Sea of Opportunity*. https://services.google.com/fh/files/misc/e_conomy_sea_2022_report.pdf?utm_source=bain&utm_medium=website&utm_campaign=2022
- Han, M.S., Q. Yuan, S. Fahad, and T. Ma (2022), 'Dynamic Evaluation of Green Development Level of ASEAN Region and Its Spatio-Temporal Patterns', *Journal of Cleaner Production*, 362(15), 132402.
- Haydon, K. (2021), 'ASEAN Supply Chain Links with China and the Perils of Decoupling', *East Asia Forum*, 10 November. <https://eastasiaforum.org/2021/11/10/asean-supply-chain-links-with-china-and-the-perils-of-decoupling/>
- Herman, P. and S. Oliver (2021), 'Trade, Policy, and Economic Development in the Digital Economy'. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3956638
- He, M. (2021), 'Global Value Chain in the Post-COVID Era: Implications for Regional Cooperation of ASEAN and China', *Open Journal of Political Science*, 11(4), pp.739–51.
- Indira, A. and B. Kusumasari (2020), 'Boosting Logistics in Indonesia and Vietnam Through Staged Development of the Single Window System: A Government Intervention', *Public Policy and Administration*, 19(4), pp.92–113.
- Jianren, L. (2012), 'Early Review of ACFTA', in K.E. Flick and K.M. Kemburi (eds.) *ASEAN–China Free Trade Area: Challenges, Opportunities and the Road Ahead*. Singapore: S. Rajaratnam School of International Studies, pp.11–16.
- Kitwiwattanachai, A., D. Nelson, and G. Reed (2010), 'Quantitative Impacts of Alternative East Asia Free Trade Areas: A Computable General Equilibrium (CGE) Assessment', *Journal of Policy Modeling*, 32(2), pp.286–301.
- Lakatos, C. and T. Walmsley (2012), 'Investment Creation and Diversion Effects of the ASEAN–China Free Trade Agreement', *Economic Modelling*, 29(3), pp.766–79.

- Li, C. and W. Qianzheng (2022), 'Robust Cross-Border e-Commerce Cooperation', *Beijing Review*, 18 July. https://www.bjreview.com/Opinion/Voice/202207/t20220718_800301129.html
- Li, Q. and S. Maani (2018), 'Detecting Positive Effects of the ASEAN–China Free Trade Agreement on Foreign Direct Investment', *International Economics and Economic Policy*, 15(1), pp.69–87.
- Li, Q., R. Scollay, and S. Maani (2016), 'Effects on China and ASEAN of the ASEAN–China FTA: The FDI Perspective', *Journal of Asian Economics*, 44, pp.1–19.
- López González, J. and M. Jouanjean (2017), 'Digital Trade: Developing a Framework for Analysis', *OECD Trade Policy Papers*, No. 205. Paris: Organisation for Economic Co-operation and Development.
- Medina, A.F. (2021), 'Cambodia Ratifies Free Trade Agreement with China', *ASEAN Briefing*, 13 September. <https://www.aseanbriefing.com/news/cambodia-ratifies-free-trade-agreement-with-china/>
- MOFCOM (2023), 'China and Singapore Announced that They Have Completed Substantive Negotiations on the FTA Upgrade', Ministry of Commerce People's Republic of China, News release, 3 April. http://fta.mofcom.gov.cn/enarticle/chinasingaporeen/chinasingaporeennews/202304/53766_1.html
- MTI (2020), 'Digital Economy Partnership Agreement (DEPA)', Ministry of Trade and Industry, Singapore. <https://www.mti.gov.sg/Trade/Digital-Economy-Agreements/The-Digital-Economy-Partnership-Agreement>
- Myat, S.H., Q. Yuan, S. Fahad, and T. Ma (2022), 'Dynamic Evaluation of Green Development Level of ASEAN Region and Its Spatio-Temporal Patterns', *Journal of Cleaner Production*, 362, 132402.
- OECD (2020), 'COVID-19 and Global Value Chains: Policy Options to Build More Resilient Production Networks', *OECD Policy Responses for Coronavirus (COVID-19)*, 3 June. <https://www.oecd.org/coronavirus/policy-responses/covid-19-and-global-value-chains-policy-options-to-build-more-resilient-production-networks-04934ef4/>
- (2021), 'Global Value Chains: Efficiency and Risks in the Context of COVID-19', *OECD Policy Responses for Coronavirus (COVID-19)*, 11 February. <https://www.oecd.org/coronavirus/policy-responses/global-value-chains-efficiency-and-risks-in-the-context-of-covid-19-67c75fdc/>
- OECD and ASEAN (2021), *Facilitating the Green Transition for ASEAN SMEs – A Toolkit for Policymakers*. <https://asean.org/book/facilitating-the-green-transition-for-asean-smes-a-toolkit-for-policymakers-2/>
- Pengman, H. and K. Kettapan (2018), 'The Development of a Single Window Integrated with Transportation Management in ASEAN', *Veridian E-Journal*, Silpakorn University, 11(4), pp.879–88.
- Phoolpipat, R. (2021), 'The US "Supply Chain Resilience" Policy and an Opportunity to Improve Thai Trade' (in Thai), *Matichon*.
- Satthapiyakun, N. (2023), 'Thailand's EEC Spearheads Partnerships for Sustainability', *Thailand Now*. <https://www.thailandnow.in.th/current-affairs/thailands-eec-spearheads-partnerships-for-sustainability/>

- Sefrina, M. (2023), 'Understanding the ASEAN Digital Economy Framework Agreement: A Means to Support ASEAN Integration', *ERIA Policy Brief*, No. 2023-01. Jakarta: Economic Research Institute for ASEAN and East Asia (ERIA).
- Sermcheep, S. (2022), 'Digital Investment and the Post-Pandemic Recovery in ASEAN', in S. Kathuria (ed.) *Age of Ferment: Developments in Asian–Europe Trade Relations*. Tokyo: Konrad-Adenauer-Stiftung's Regional Economic Programme Asia (SOPAS), pp.35–56.
- Shiphub (n.d.), 'World's Top Semiconductor Producers'. <https://www.shiphub.co/worlds-top-semiconductors-producers/> (accessed 25 April 2024).
- Statista (2024), 'Leading countries based on nickel reserves worldwide as of 2023'. <https://www.statista.com/statistics/273634/nickel-reserves-worldwide-by-country/> (accessed 25 April 2024).
- Tham, S.Y. (2023), 'The Critical Role of Electric Vehicles in Malaysia's New Industrial Master Plan (NIMP 2030)', *ISEAS Perspective*, No. 81. Singapore: ISEAS – Yusof Ishak Institute.
- Tham, S.Y. and A.K.J. Yi (2014) 'Re-Examining the Impact of ACFTA on ASEAN's Exports of Manufactured Goods of China', *Asian Economic Papers*, 13(3), pp.63–82.
- The Nation (2022), 'BOI Frames New 5-Year Investment Promotion Strategy to Pave Way for New Economy', 17 October. <https://www.nationthailand.com/thailand/economy/40021104>
- (2023), 'Thailand Is Promoting Its Green Transformation to US Investors', 8 February. <https://www.nationthailand.com/thailand/economy/40024739>
- Thongsaichon, N. (2020), 'Digital Economy: New Type of Economy That Will Drive Thai Economy' (in Thai), SETInvestnow, 27 December. <https://www.setinvestnow.com/th/knowledge/article/121-digital-economy-new-way-to-drive-thai-economics>
- United Nations (2015), The Paris Agreement. <https://unfccc.int/process-and-meetings/the-paris-agreement>
- Warren, M. and Z. Fan (2022), 'Digital Economy Agreements Are a New Frontier for Trade – Here's Why', World Economic Forum, 24 August. <https://www.weforum.org/agenda/2022/08/digital-economy-agreements-trade/>
- World Bank (2020), *World Development Report 2020: Trading for Development in the Age of Global Value Chains*. Washington, DC: World Bank.
- World Bank (2023), Logistics Performance Index (LPI). <https://lpi.worldbank.org/report> (accessed 25 April 2024).
- World Economic Forum (2023), *The Global Risks Report 2023*, 18th Edition. Geneva: World Economic Forum.
- Xinhua News Agency (2023), China, Singapore Vow to Advance All-Round High-Quality Future-Oriented Partnership. <https://eng.yidaiyilu.gov.cn/p/0HK20SEF.html> (accessed 25 April 2024).

- Xuanmin, L. and C. Jingyi (2023), 'China, Singapore Complete "Substantial Negotiation" on FTA Upgrade, Pact Set to Be the Highest Opening-Up Level of the World's No. 2 Economy to Date', *Global Times*, 2 April. <https://www.globaltimes.cn/page/202304/1288421.shtml>
- Yang, J. and C. Chen (2008), 'The Economic Impact of the ASEAN–China Free Trade Area: A Computational Analysis with Special Emphasis on Agriculture', in C. Chen and R. Duncan (eds.) *Agriculture and Food Security in China: What Effect WTO Access and Regional Trade Agreements?* Canberra: ANU Press, pp.372–407.
- Yang, S. and I. Martinez-Zarzoso (2014), 'A Panel Data Analysis of Trade Creation and Trade Diversion Effects: The Case of ASEAN–China Free Trade Area', *China Economic Review*, 29, pp.138–51.
- Yean, T.S. (2021), 'Digital Commitments in ASEAN's Free Trade Agreements', *ISEAS Perspective*, 163. Singapore: ISEAS – Yusof Ishak Institute.
- Zhou, Q. and A. Huld (2022), 'What Is China's Green and Low-Carbon Plan and Why Is It Relevant to Foreign Investors?', *China Briefing*, 6 June. <https://www.china-briefing.com/news/what-is-chinas-green-and-low-carbon-plan-and-why-is-it-relevant-to-foreign-investors/>