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Measuring Progress on the Supply Chain Connectivity Framework Action Plan (SCFAP III) 2022–2026: Indicators and Policy Practices

APEC Policy Support Unit

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EXECUTIVE SUMMARY

This report aims to identify suitable indicators to measure progress on supply chain connectivity issues and to recommend policy practices that can contribute to resolving the chokepoints identified in the APEC Supply Chain Connectivity Framework Action Plan (2022–2026). The indicators and policy practices identified in this report will be used in formulating the mid-term and final assessment of SCFAP III in 2024 and 2027, respectively.

The APEC Policy Support Unit (PSU) has identified 69 relevant indicators related to the five chokepoints under SCFAP III. The general approach to measure the progress of SCFAP III is to compare group aggregates computed for APEC and several benchmark groups using the selected external indicators. Indicators are selected if they have met the selection criteria, and then further cleaned and validated. Aggregate or group values for APEC and the benchmark groups are then computed for each indicator. The aggregate values reflect the progress of APEC as a group.

The indicators in this report should be considered as indicative and to be used alongside other qualitative analysis, rather than as definitive measures of progress. They are based on secondary data and not exclusively designed for SCFAP III, but can still offer valuable insights for reviewing SCFAP III progress. Instead of setting fixed targets, the APEC PSU suggests using benchmark groups to measure progress. The benchmark groups chosen are ASEAN, the European Union (EU) and the Organisation for Economic Co-operation and Development (OECD), as they provide relevant references for APEC's progress.

In terms of policy practices, the APEC PSU has attempted to identify relevant best practices for the five chokepoints by conducting desktop research focusing on APEC relevant works as well as to make efforts to consult with relevant APEC fora, such as the APEC Business Advisory Council (ABAC), the Committee on Trade and Investment (CTI), the Economic Committee (EC), the Small and Medium Enterprises Working Group (SMEWG), the Sub-Committee on Customs Procedures (SCCP), the Telecommunications and Information Working Group (TEL), the Digital Economy Steering Group (DESG) and the Transportation Working Group (TPTWG).

Highlights from the policy practices under each chokepoint are outlined below.

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges

The suggested policy practices under Chokepoint 1 include fostering interoperability, upgrading government systems, reducing barriers and risks, building trust, promoting innovation and digital readiness, and strengthening cooperation while utilising emerging technologies.

Chokepoint 2: Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks

In tackling Chokepoint 2, the policy practices emphasise the digitalisation of ports and logistics networks, adoption of digital technology, fostering openness to innovation, private sector involvement in infrastructure development, improving bureaucratic efficiency and regulations, and investing in physical and digital infrastructure to support the digital economy.

Chokepoint 3: Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains

For Chokepoint 3, the suggested measures cover actions related to cross-border data flows, digital trade provisions, the FinTech environment, and leveraging international standards for data sharing and cybersecurity.

Chokepoint 4: Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable

To address Chokepoint 4, the policy practices focus on promoting green and sustainable supply chain management, adopting the bio-circular-green (BCG) economy model, utilising digital technology for eco-friendly dispute resolution, empowering micro, small and medium enterprises (MSMEs) in green supply chains, and driving sustainable practices through environmental, social and governance (ESG) integration.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains

Finally, under Chokepoint 5, the policy practices aim to support MSMEs in accessing and integrating into global supply chains. The measures include digitalisation, technological innovation, capacity building and engagement in Authorised Economic Operator (AEO) programmes, among others.

1. INTRODUCTION

In 2022, Phase Three of the APEC Supply Chain Connectivity Framework Action Plan (SCFAP III) 2022–2026 was endorsed by APEC members, with a view to supporting APEC businesses in building secure, resilient, sustainable and open supply chains that create a predictable, competitive and digitally interconnected Asia-Pacific region for all.

The targeted chokepoints under SCFAP III are:

- Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges
- Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks
- Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains
- Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable
- Lack of targeted support to facilitate micro, small and medium enterprises' (MSMEs) access and integration into global supply chains

The APEC Policy Support Unit (PSU) is tasked with identifying suitable indicators/data sources and conducting research, in consultation with relevant APEC fora, to recommend policy practices for supply chain connectivity that can be used to measure and contribute to the progress of SCFAP III.

1.1 OBJECTIVES AND TASKS

This project aims to identify suitable indicators/data sources and conduct research to recommend policy practices for supply chain connectivity that can be used to measure and contribute to the progress of SCFAP III.

In Chapters 3 and 4, the report has identified suitable indicators/data sources and recommended policy practices for supply chain connectivity that can be used to measure and contribute to progress on SCFAP III.

2. QUANTITATIVE METHODOLOGY TO MEASURE PROGRESS ON SCFAP III

2.1 SELECTION CRITERIA FOR QUANTITATIVE INDICATORS

To identify and select quantitative indicators to measure progress on Phase Three of the APEC Supply Chain Connectivity Framework Action Plan (SCFAP III), the APEC Policy Support Unit (PSU) has used the following criteria:

- ***Relevance***: The indicators and data should provide relevant insights to measure and reflect the progress of key concerns under each chokepoint.
- ***Validity***: The indicators and data should bring consistent and accurate findings to monitor and evaluate the progress, such as having good coverage of reporting economies.
- ***Reliability***: The data must be collected from reliable sources with reasonable accuracy, verifiable methodologies, and should have been used in literature and publications.
- ***Feasibility***: The data should be publicly available and accessible, and retrievable with relative ease.
- ***Timeliness***: The data should be updated at reasonably regular intervals and have minimal risks of being discontinued, as well as match future monitoring timelines.
- ***Comparability***: The data and indicators can be compared over time and against benchmark groups in accurate and meaningful ways.

2.2 MEASUREMENT AND BENCHMARKING APPROACH

The general approach to measure the progress of SCFAP III is through producing group aggregates using external indicators for APEC and benchmark groups. Data are selected only if they meet the selection criteria, and are cleaned, validated and computed to generate aggregate values for APEC and the benchmark groups. They reflect the progress of APEC as a group, and not the progress of individual economies within APEC.

It is important to note that the indicators and data reflect static results at the time of reporting, and they should be viewed as indicative and used alongside other qualitative analysis rather than as definitive measures of progress. In addition, the indicators are based on secondary data, which may not be exclusively tailored for SCFAP III. However, they can still provide valuable insights that can be helpful for SCFAP III-related work.

In generating APEC aggregates, the APEC PSU computes statistics such as sum, simple average and median to facilitate interpretation and replicability as well as validation of data. Weighted average is used from time to time when it is deemed appropriate and meaningful. Most of the weighted averages are weighted based on population.

Instead of setting fixed targets, the APEC PSU proposes using benchmark groups to measure progress. The groups for benchmarking are not necessarily similar to APEC, as groups with different characteristics and at varying development status can be important sources of reference and comparison for APEC. Given such considerations, ASEAN, the European Union (EU) and the Organisation for Economic Co-operation and Development (OECD) are used as benchmarks.

Using benchmark groups for progress monitoring offers several advantages compared to traditional fixed targets. Fixed targets often involve setting specific numerical goals for economies to achieve within a specified timeframe. While fixed targets provide clear objectives, they may lack flexibility and fail to consider diverse circumstances and conditions.

In contrast, benchmark groups provide a more dynamic and comparative approach to measuring progress. Instead of rigid numerical goals, benchmark groups enable comparisons among various groupings, each with its unique characteristics in terms of economic landscape, policy conditions and developmental contexts.

2.3 DATA SOURCES

The proposed indicators are based on data collected from publicly available sources, including:

- ***OECD Trade Facilitation Indicators database***: A ten-year old database updated every two years, covering comprehensive border procedures issues such as automation, governance, internal and external cooperation on trade facilitation. The database covers 20 APEC economies as well as economies in the benchmark groups.

- ***UN Global Survey on Digital and Sustainable Trade Facilitation***: A joint initiative by the UN Regional Commissions, covering 143 economies (including 18 APEC economies) and 58 measures related to the World Trade Organization (WTO) Trade Facilitation Agreement, and emerging regional and global initiatives, such as the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific (CPTA). The survey is conducted every two years, and the survey data for available years generally reflect implementation as of the first quarter of the year.

- ***World Bank***: Data and statistics covering a wide range of relevant topics and indicators, such as the Logistics Performance Index (LPI), the World Development Indicators, environmental, social and governance (ESG) data, etc.

- ***UNCTADStat***: A statistics portal by the United Nations Conference on Trade and Development (UNCTAD) offering comprehensive data on trade in goods and services, as well as data measuring the progress of infrastructure development for trade facilitation and connectivity, such as the Liner Shipping Connectivity Index.

- ***Other data sources*** include APEC, the International Renewable Energy Agency (IRENA), the International Telecommunication Union (ITU), the United Nations Sustainable Development Goals (SDG) Indicators database, the World Economic Forum, among others.

The indicators for each of the chokepoints under SCFAP III are outlined in Chapter 3.

3. PROPOSED QUANTITATIVE INDICATORS FOR SCFAP III CHOKEPOINTS

3.1 CHOKEPOINT 1: INEFFICIENT DIGITALISATION OF END-TO-END SUPPLY CHAINS, INCLUDING BORDER PROCEDURES AND TRADE DOCUMENTATION EXCHANGES

Twenty-nine indicators from the OECD Trade Facilitation Indicators database and the UN Global Survey on Digital and Sustainable Trade Facilitation are used to monitor progress on this chokepoint.

Both datasets are updated every two years, although the years of update may differ. As of July 2023, the OECD Trade Facilitation Indicators have been updated for 2022, whereas the most recent results from the UN Global Survey on Digital and Sustainable Trade Facilitation are from the 2021 survey. For this reason, the APEC Policy Support Unit (PSU) proposes to use both datasets for a more timely and comprehensive analysis for the upcoming mid-term review of Phase Three of the APEC Supply Chain Connectivity Framework Action Plan (SCFAP III) in 2024.

Box 3.1. OECD Trade Facilitation Indicators

What do the indicators tell us?

The Organisation for Economic Co-operation and Development (OECD) Trade Facilitation Indicators offer a comprehensive framework for evaluating and monitoring global trade facilitation progress aligned with the World Trade Organization (WTO) Trade Facilitation Agreement.

The indicators encompass four key policy areas. The first area, transparency and predictability, focuses on providing accessible information, incorporating feedback mechanisms, and facilitating specific functions for businesses. Indicators in this category include information availability, engagement of the trade community, and the provision of advance rulings.

The second area, formalities, assesses the efficiency and effectiveness of administrative processes at borders. This involves indicators such as the time taken for new or adjusted trade-related regulations to come into effect, the proportion of trade transactions processed before goods arrival, and the extent of coverage provided by certified trader programmes.

The third area, institutional arrangement and cooperation, examines the structures, guidelines, and frameworks in place for stakeholder consultations and inter-agency collaboration at border points. This category evaluates the level of coordination and collaboration among various entities or agencies involved in trade facilitation.

Lastly, infrastructure and services focus on the quality and availability of supporting infrastructure and services that facilitate trade. This includes aspects such as customs automation systems, trade-related infrastructure, and the utilisation of electronic data interchange.

Linkages to SCFAP III chokepoints

The Trade Facilitation Indicators encompass various policy areas essential for tackling the complex challenges encountered by supply chains. For instance, the assessment of formalities

evaluates the efficiency of administrative processes at the border and the scope of certified trader programmes, thereby promoting efficient digitalisation of supply chains, particularly at the border.

Additionally, institutional arrangements and cooperation play a critical role in addressing challenges related to data flows and cross-border payments. By evaluating the coordination and collaboration among the different entities involved in trade facilitation, the Trade Facilitation Indicators contribute to fostering cooperation and coordination to ensure the seamless operation of supply chains.

Source: OECD (n.d.-b).

Overall, OECD members are performing better than the APEC region in terms of digitalisation of border procedures across most indicators (Table 3.1). According to the most recent results of the OECD Trade Facilitation Indicators database, APEC scored high on import and export declarations cleared electronically, with its members having digitalised around 90 percent of such clearances. However, that remains lower than its OECD peers, which have almost fully digitalised their trade declarations. While in some APEC economies, only 30 percent of import and export procedures allow for electronic processing, all OECD members have digitalised at least 96 percent of such procedures (indicators A.1 to A.3).

Table 3.1. Proposed indicators to measure progress on Chokepoint 1

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
A.1	Percent of import declarations cleared electronically	2022	89%	99%	30% - 100%	96% - 100%	18
A.2	Percent of export declarations cleared electronically	2022	93%	100%	30% - 100%	99% - 100%	16
A.3	Percent of import and export procedures that allow for electronic processing	2022	89%	99%	30% - 100%	90% - 100%	15
A.4	Pre-arrival processing supported by the possibility to lodge documents in advance in electronic format (score, 0 to 2, where 2 designates best performance)	2022	1.70	1.89	1 - 2	1 - 2	20
A.5	Import and export procedures allow for the electronic payment of duties, taxes, fees and charges (including inspections fees, licenses, permits, other fees) collected upon importation and exportation (score, 0 to 2, where 2 designates best performance)	2022	1.80	1.97	1 - 2	1 - 2	20
A.6	Electronic payment system integrated with the automated declaration/cargo processing systems (score, 0 to 2, where 2 designates best performance)	2022	1.75	1.87	0 - 2	1 - 2	20
A.7	Risk management applied and operating in an automated environment (score, 0 to 2, where 2 designates best performance)	2022	1.90	1.97	1 - 2	1 - 2	20

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
A.8	Single Window supported by information technology (score, 0 to 2, where 2 designates best performance)	2022	1.75	1.58	0 - 2	1 - 2	20
A.9	IT systems capable of accepting and exchanging data electronically (score, 0 to 2, where 2 designates best performance)	2022	1.95	2.00	1 - 2	2 - 2	20
A.10	Automated processing system includes functions allowing for the release of goods subject to conditions (i.e., guarantee) (score, 0 to 2, where 2 designates best performance)	2022	1.50	2.00	0 - 2	2 - 2	20
A.11	Digital certificates and signatures in place (score, 0 to 2, where 2 designates best performance)	2022	1.80	2.00	0 - 2	2 - 2	20
A.12	Automated processing for Customs declarations available full-time (24/7) (score, 0 to 2, where 2 designates best performance)	2022	1.80	1.95	0 - 2	0 - 2	20
A.13	Quality of telecommunications and IT (score, 0 to 2, where 2 designates best performance)	2022	1.26	1.48	0 - 2	0 - 2	19
A.14	Implementation rate of paperless trade facilitation (0% to 100%, 100%=full implementation)	2021	87%	86%	30% - 100%	52% - 100%	18
A.15	Implementation rate of cross-border paperless trade facilitation (0% to 100%, 100%=full implementation)	2021	64%	63%	0% - 94%	22% - 94%	18
A.16	Automated Customs system (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.83	2.87	2 - 3	2 - 3	18
A.17	Internet connection available to Customs and other trade control agencies (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.83	3.00	2 - 3	3 - 3	18
A.18	Electronic Single Window system (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.61	1.97	0 - 3	1 - 3	18
A.19	Electronic submission of Customs declarations (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.83	2.87	2 - 3	2 - 3	18
A.20	Electronic application and issuance of import and export permit (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.56	2.55	0 - 3	0 - 3	18
A.21	Electronic submission of sea cargo manifests (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.89	2.52	2 - 3	0 - 3	18

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
A.22	Electronic submission of air cargo manifests (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.67	2.39	2 - 3	0 - 3	18
A.23	Electronic application and issuance of preferential certificate of origin (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.28	2.77	0 - 3	1 - 3	18
A.24	E-payment of Customs duties and fees (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.72	2.93	0 - 3	2 - 3	18
A.25	Electronic application for Customs refunds (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.11	2.00	0 - 3	0 - 3	18
A.26	Electronic exchange of Customs declaration (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.59	1.90	1 - 3	0 - 3	18
A.27	Electronic exchange of certificate of origin (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.72	1.25	0 - 3	0 - 3	18
A.28	Electronic exchange of sanitary & phyto-sanitary certificate (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.72	1.42	0 - 3	0 - 3	18
A.29	Electronic application and issuance of sanitary & phyto-sanitary certificates (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.22	1.87	0 - 3	0 - 3	18

Source: APEC PSU calculations using data from OECD Trade Facilitation Indicators and UN Global Survey on Digital and Sustainable Trade Facilitation.

Notably, all member economies of the OECD have fully implemented information technology (IT) systems capable of accepting and exchanging data electronically (indicator A.9), an automated processing system allowing for the release of goods subject to conditions (A.10) and digital certificates and signatures (A.11) as well as made Internet connection available to Customs and other trade control agencies (A.17). Meanwhile, the progress in APEC is still uneven: in areas such as quality of telecommunications and IT (A.13) or an automated processing system allowing for the release of goods subject to conditions (A.10), up to one-third of APEC members scored 0, indicating the lowest level of implementation (Table 3.2).

Table 3.2. Progress of APEC economies on selected Chokepoint 1 indicators, 2022

No.	Indicator	No. of economies scoring under 50%	No. of economies scoring 50% and above
A.1	Percent of import declarations cleared electronically	2	16
A.2	Percent of export declarations cleared electronically	1	15
A.3	Percent of import and export procedures that allow for electronic processing	2	13

		Number of economies scoring 0	Number of economies scoring 1	Number of economies scoring 2
A.4	Pre-arrival processing supported by the possibility to lodge documents in advance in electronic format	0	6	14
A.5	Import and export procedures allow for the electronic payment of duties, taxes, fees and charges (including inspections fees, licenses, permits, other fees) collected upon importation and exportation	0	4	16
A.6	Electronic payment system integrated with the automated declaration/cargo processing systems	1	3	16
A.7	Risk management applied and operating in an automated environment	0	2	18
A.8	Single Window supported by information technology	1	3	16
A.9	IT systems capable of accepting and exchanging data electronically	0	1	19
A.10	Automated processing system includes functions allowing for the release of goods subject to conditions (i.e., guarantee)	5	0	15
A.11	Digital certificates and signatures in place	2	0	18
A.12	Automated processing for Customs declarations available full-time (24/7)	2	0	18
A.13	Quality of telecommunications and IT	7	0	12

Note: Scores are coded 0, 1 or 2, where 2 corresponds to the best performance as defined specifically in each question in the OECD Trade Facilitation Indicators Questionnaire (OECD n.d.-a).
Source: APEC Policy Support Unit (PSU) calculations using data from OECD Trade Facilitation Indicators.

The data from both the OECD Trade Facilitation Indicators and the UN Global Survey on Digital and Sustainable Trade Facilitation show that the APEC region outperforms OECD as well as the EU and ASEAN when it comes to the electronic Single Window (indicator A.8 and A.18). The electronic submission of sea and air cargo manifests through an electronic Single Window is better implemented in APEC, with no members scoring lower than 2 (indicators A.21 and A.22). Evaluated by simple average values, the APEC region also has better implementation progress than the OECD in electronic application/issuance and exchange of trade-related documents and procedures, such as customs refund (A.25), certificate of origin (A.27), sanitary and phyto-sanitary (SPS) certificate (A.28 and A.29). However, there remain gaps in the implementation rate between APEC economies, as suggested by the wider score distribution in APEC than in OECD in various areas.

3.2 CHOKEPOINT 2: INADEQUATE INFRASTRUCTURE DEVELOPMENT TO SUPPORT ROBUST MULTI-MODAL CONNECTIVITY AND LOGISTICS NETWORKS

Eleven indicators from the World Bank's 2023 Logistics Performance Index (LPI) Report are used to monitor the progress under Chokepoint 2. In addition, other data on connectivity and digital infrastructure are included to supplement the measurement of progress on Chokepoint 2 (Table 3.3).

Table 3.3. Proposed indicators to measure progress on Chokepoint 2

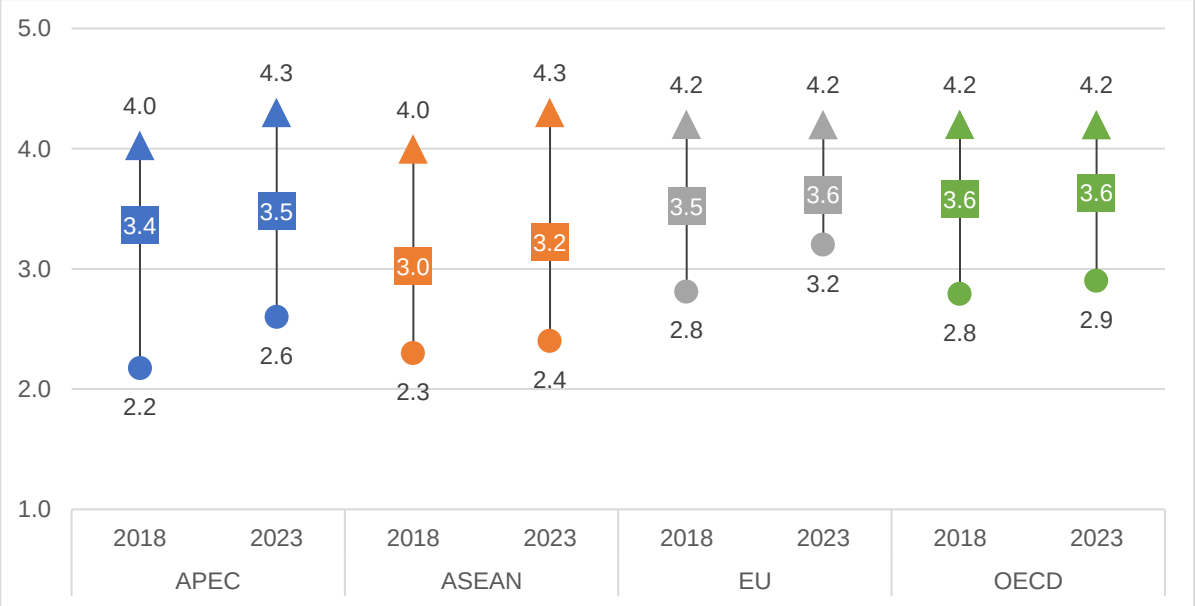
No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
B.1	Logistics Performance Index (LPI), overall score (1=low to 5=high)	2023	3.5	3.6	2.6 - 4.3	2.9 - 4.2	20
B.2	LPI customs and border management score, (1=low to 5=high)	2023	3.3	3.5	2.4 - 4.2	2.5 - 4.1	20
B.3	LPI trade- and transport-related infrastructure score, (1=low to 5=high)	2023	3.5	3.7	2.4 - 4.6	2.7 - 4.4	20
B.4	LPI international shipments score, (1=low to 5=high)	2023	3.3	3.4	2.3 - 4.0	2.7 - 4.1	20
B.5	LPI logistics competence and quality score, (1=low to 5=high)	2023	3.5	3.7	2.6 - 4.4	2.9 - 4.3	20
B.6	LPI timeliness score, (1=low to 5=high)	2023	3.7	3.8	2.9 - 4.3	3.2 - 4.3	20
B.7	LPI tracking and tracing score, (1=low to 5=high)	2023	3.6	3.7	2.5 - 4.4	2.9 - 4.3	20
B.8	LPI container ships' turnaround time at port weighted by ship's TEU (days)	June 2022	1.5	1.6	0.6 - 3.2	0.4 - 3.2	20
B.9	LPI aviation import dwell time (days)	Q2 2022	1.6	1.6	0.3 - 2.6	0.7 - 3.2	19
B.10	LPI consolidated dwell time, import (days)	May-Oct 2022	5.6	9.6	2.5 - 8.8	3.2 - 19.8	20
B.11	LPI consolidated dwell time, export (days)	May-Oct 2022	5.2	8.2	1.5 - 10.4	2.8 -16.5	20
B.12	Container port throughput per 1000 population (TEU)*	2021	191.7	201.8	37 - 6,871	62 - 1,128	19
B.13	Liner Shipping Connectivity Index (maximum 2004=100)	2021	62.4	51.4	7 - 171	7 - 111	20
B.14	Liner Shipping Connectivity Index, quarterly (maximum Q1 2006=100)	Q4 2022	65.3	52.1	7 -178	7 - 113	21
B.15	DHL Global Connectedness Index	2021	59.6	67.2	29 - 84	50 - 85	21
B.16	Fixed broadband subscriptions per 100 inhabitants	2021	24.4	35.0	0 - 44	16 - 49	21
B.17	Mobile broadband subscriptions per 100 inhabitants	2021	112.6	115.3	11 - 227	71 - 227	21

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
B.18	Secure Internet servers per 1 million people	2020	27,715	49,507	111 - 140,808	330 - 277,082	20
B.19	Internet broadband download speed, fixed broadband (median megabits per second)**	March 2023	122.0	96.1	15 - 235	33 - 220	21
B.20	Internet broadband download speed, mobile broadband (median megabits per second) **	March 2023	47.7	62.6	18 - 120	12 - 144	21
B.21	Networked Readiness Index	2022	63.5	68.0	47 - 80	50 - 80	18

TEU=20-foot equivalent unit.
Note: * Values for APEC and OECD for indicator B.12 are weighted average based on population; ** APEC and OECD values for fixed and mobile broadband speed are median values.
Source: APEC PSU calculations using data from World Bank Logistics Performance Index (LPI) and World Development Indicators; UNCTADstat; DHL Global Connectedness Index; International Telecommunication Union (ITU) Statistics; Speedtest Global Index and Network Readiness Index.

While the average overall LPI score for APEC remains marginally lower than the OECD and EU, there has been an improvement in the performance of all those groups between 2018 and 2023 (Figure 3.1). The performance gap between APEC economies has not seen significant improvement in the five years between 2018 and 2023, whereas the difference between EU members has narrowed.

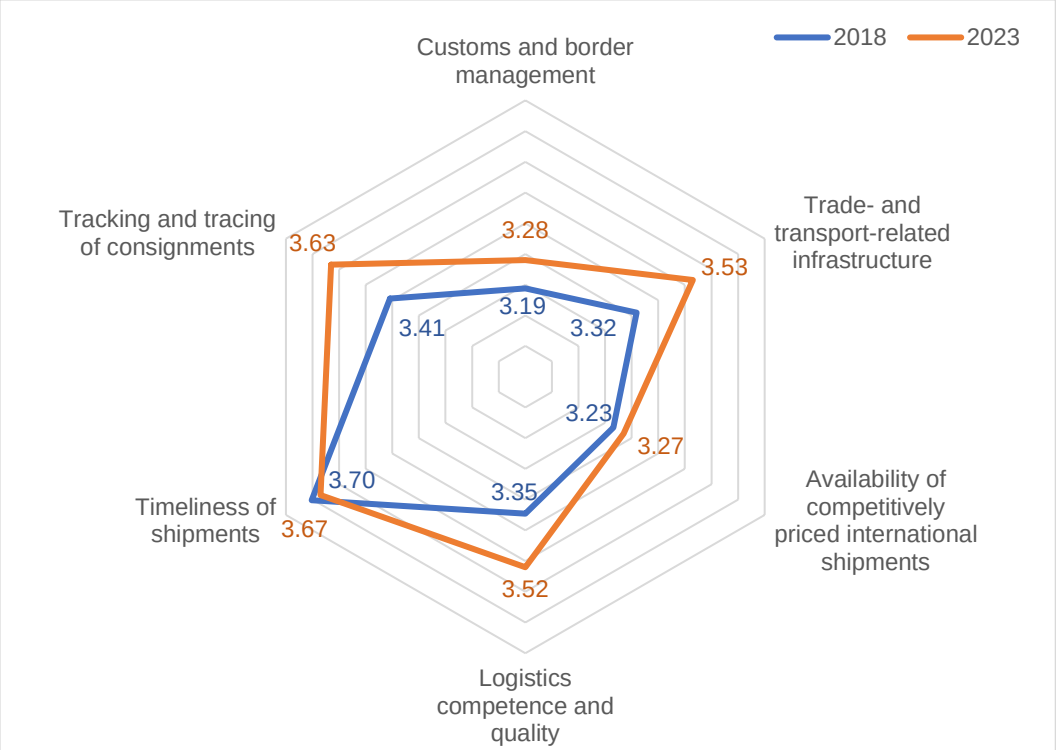
Figure 3.1. Logistics Performance Index (LPI), 2018 and 2023



▲=maximum value; ■ =simple average, ● =minimum value
Source: APEC PSU calculations using data from the World Bank LPI database.

Notably, while the APEC region saw improvement in most dimensions of the LPI between 2018 and 2023, the score for timeliness of shipments[1] declined marginally after the COVID-19 pandemic (Figure 3.2). The same pattern was also recorded across the benchmark groups: timeliness scores went down slightly in the EU and more markedly in OECD (Table 3.4).

Figure 3.2. Dimensions of logistics performance in APEC economies, 2018 and 2023



Source: APEC PSU calculations using data from the World Bank LPI database.

Table 3.4. Change in Logistics Performance Index (LPI) score, 2018–2023

LPI indicator	Change between 2018 and 2023 (%)			
	APEC	ASEAN	EU	OECD
Customs and border management	3	8	2	2
Trade- and transport-related infrastructure	6	14	4	3
Availability of competitively priced international shipments	1	4	2	0
Logistics competence and quality	5	7	6	4
Timeliness of shipments	-1	1	-1	-3
Tracking and tracing of consignments	6	8	4	2

Source: APEC PSU calculations using data from the World Bank LPI database.

The decline in timeliness between 2018 and 2023 may reflect the bottlenecks and delays caused by the COVID-19 pandemic. Nonetheless, key indicators on supply chain lead time and export and import delays suggest that the APEC region is performing better than both the EU and OECD. The average consolidated dwell time recorded between May and October 2022 for both export and import in the EU and OECD was nearly double that of APEC (Table 3.5). The wide

[1] The LPI report defined this as the 'frequency with which shipments reach consignees within scheduled or expected delivery times'. See World Bank (n.d.-a).

range of delays for all regions suggests that there are significant gaps in the performance of individual economies in all groups, yet APEC members seem to have better managed export and import delays during the observed period of May–October 2022. The LPI 2023 report indicates that, on average, it takes 44 days for a container to complete its journey from the port of export to the destination port, with more than 60 percent of this duration spent on ships. Moreover, the report highlights that the primary factor contributing to the low reliability of delivery times is the time taken to handle trade processes in the importing economy.

Table 3.5. Logistics Performance Index (LPI) key indicators on supply chain lead time 2022

Indicator	APEC	ASEAN	EU	OECD	Period
Cargo ships' average turnaround time weighted by ship's TEU (days)	1.5	1.4	1.6	1.6	June 2022
Aviation average import dwell time (days)	1.6	1.8	1.7	1.6	Q2 2022
Export delays: average consolidated dwell time (days)	5.2	4.0	8.5	8.2	May–October 2022
Import delays: average consolidated dwell time (days)	5.6	5.1	10.6	9.6	May–October 2022

TEU=20-foot equivalent unit.
Note: Dwell time refers to 'the lead time between the first and last events at the same location in a supply chain and is used mostly in the context of ports and airports'. Consolidated dwell time refers to the sum of dwell times at port and other intermediate inland locations during the importing/exporting phase (World Bank 2023).
Source: APEC PSU calculations using data from the World Bank LPI database.

Box 3.2. Logistics Performance Index (LPI) indicators

What do the indicators tell us?

The LPI indicators offer insights into the quality of trade- and transport-related infrastructure, the efficiency of arranging competitively priced international shipments, the competence and reliability of logistics services, the ability to track and trace consignments, and the timely delivery of shipments. In summary, the LPI captures the critical factors influencing trade logistics performance including areas for policy regulation (such as customs, infrastructure and services) and supply chain performance outcomes (including cost, reliability and time). The LPI indicators can also be used to benchmark logistics performance against global standards and identify areas that need improvements.

Linkages to SCFAP III chokepoints

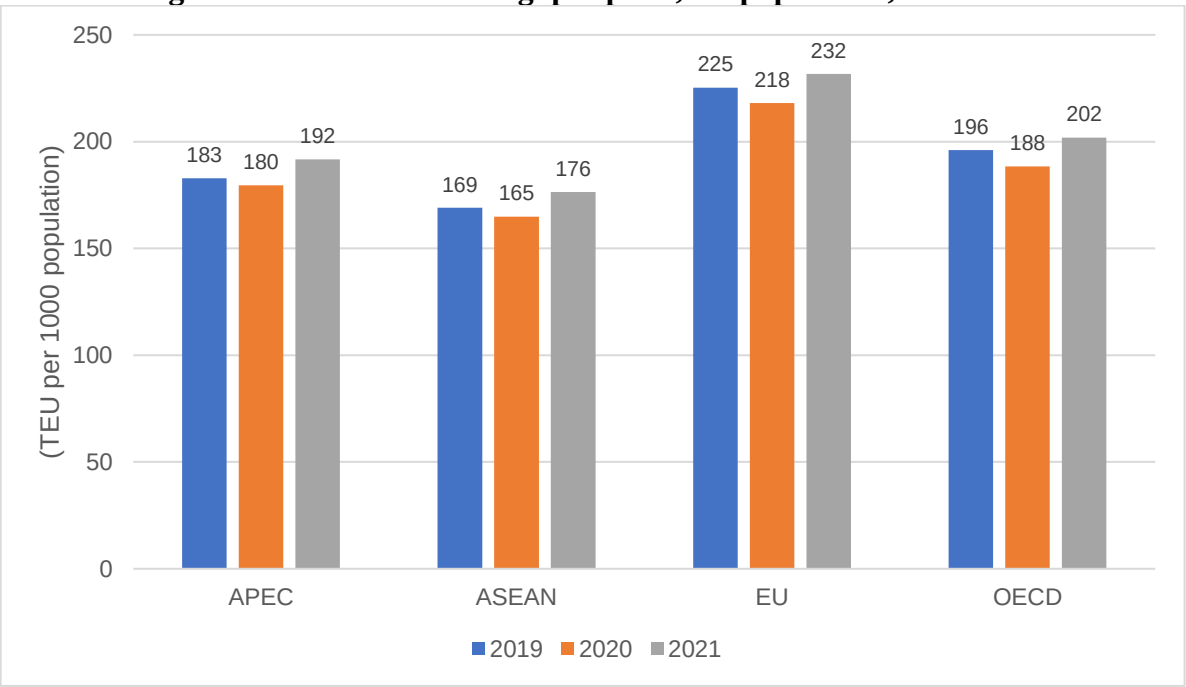
To provide an example, the LPI indicator on the quality of trade- and transport-related infrastructure can be used to assess the state of infrastructure development important to trade and logistics. A low score on this indicator signals potential inadequacies in the infrastructure needed to support robust multi-modal connectivity and logistics networks, and raises concerns about the readiness and capacity of the infrastructure to handle the demand of modern supply chains; this indicator thus signifies the importance of investing in the necessary upgrades to support efficient and resilient supply chains.

Additionally, the overall LPI score also serves as a useful indicator to evaluate the level of trade-related infrastructure development; as binding constraints for low logistics performance could be traced to infrastructure, productivity, or clearance procedures. In addition, the LPI indicators is well linked with the SCFAP III overall objective, which is to support APEC businesses in building secure, resilient, sustainable and open supply chains.

Source: World Bank (2023).

Data on container throughput pre- and post-pandemic also highlight the impact of the disruption on APEC and across the benchmark groups (Figure 3.3). The number of containers handled in APEC, measured in 20-foot equivalent units (TEUs) per 1,000 population, went down from 183 to 180 in 2020, before bouncing back to 192 in 2021. The same trend was witnessed in the OECD as well as in ASEAN and the EU, with the APEC region reporting lower numbers than the EU and OECD in all three years.

Figure 3.3. Container throughput per 1,000 population, 2019–2023



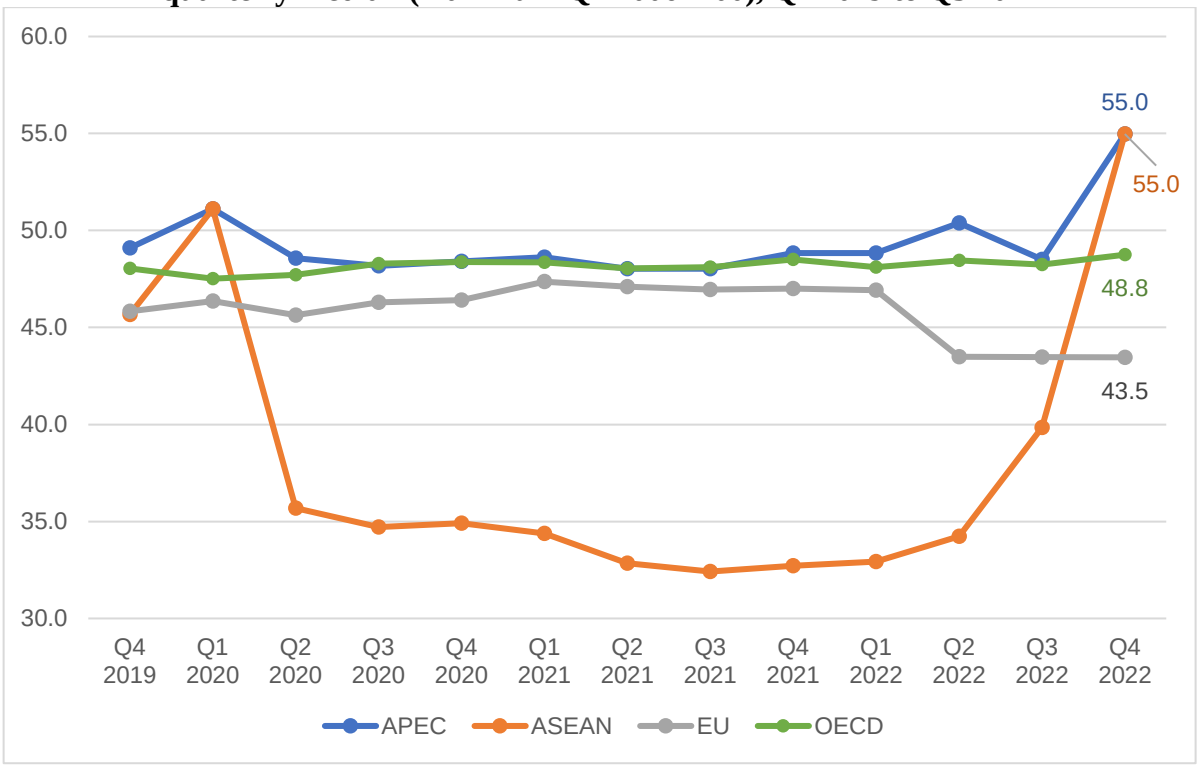
Source: APEC PSU calculations using annual container port throughput data from UNCTADstat and population data from the World Bank World Development Indicators.

Similarly, measures on connectivity also witnessed drops between 2019 and 2022. The United Nations Conference on Trade and Development (UNCTAD) Liner Shipping Connectivity Index measures how well economies are integrated into the global liner shipping networks. The index is based on the number of ship calls, their container carrying capacity, the number of services and companies, the size of the largest ship, and the number of other economies connected through direct liner shipping services (UNCTAD 2022).

In the second quarter of 2020 when the COVID-19 pandemic spread more widely, the Liner Shipping Connectivity Index in APEC began to decline. It then fluctuated at a level lower than the peak observed in the first quarter of 2020 (Figure 3.4). A weaker index score indicates potential infrastructure gaps that need to be addressed to enhance operations at each port of entry, and signals an opportunity for the economy to better integrate into global supply chains. By the fourth quarter of 2022, however, the index score has bounced back in APEC and surpassed the OECD and EU.

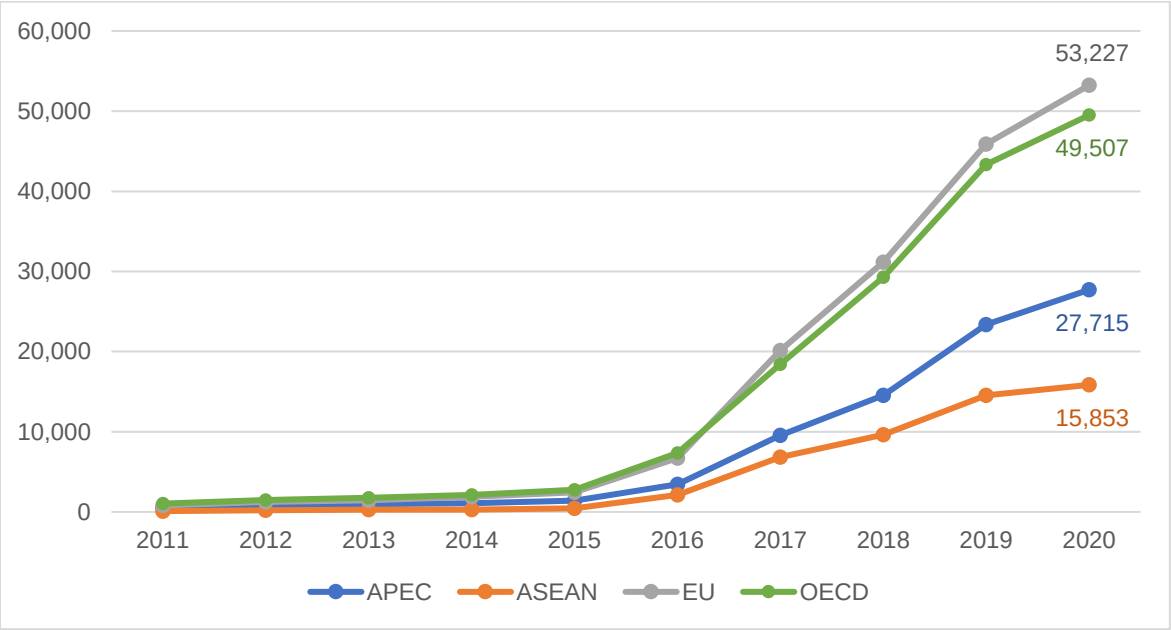
The DHL Global Connectedness Index, which measures connectivity based on four key pillars, namely, trade, capital, information and people, also reflects the same pattern. Scores declined in 2020 but subsequently rebounded in 2021. Throughout 2019–2021, the APEC region consistently reported lower scores on the Global Connectedness Index compared to the EU and OECD. The index offers a broad assessment of the level of an economy's global connectivity, which indicates the availability and/or quality of both soft and hard infrastructure that support global flows. The infrastructure could include container ports to manage the trade of goods, well-connected airports to ease travel, and fast and reliable Internet to seamlessly move capital – these overlap with the infrastructure needed to build robust a multi-modal connectivity network. The Global Connectedness Index can thus serve as a reference point to identify areas that may impede greater connectivity, which is a crucial component in achieving the SCFAP III's overarching goal of supporting APEC businesses in building secure, resilient, sustainable and open supply chains that create a predictable, competitive and digitally interconnected Asia-Pacific region.

Figure 3.4. Liner Shipping Connectivity Index, quarterly median (maximum Q1 2006=100), Q4 2019 to Q3 2022



Source: APEC PSU calculations using data from UNCTAD Liner Shipping Connectivity Index.

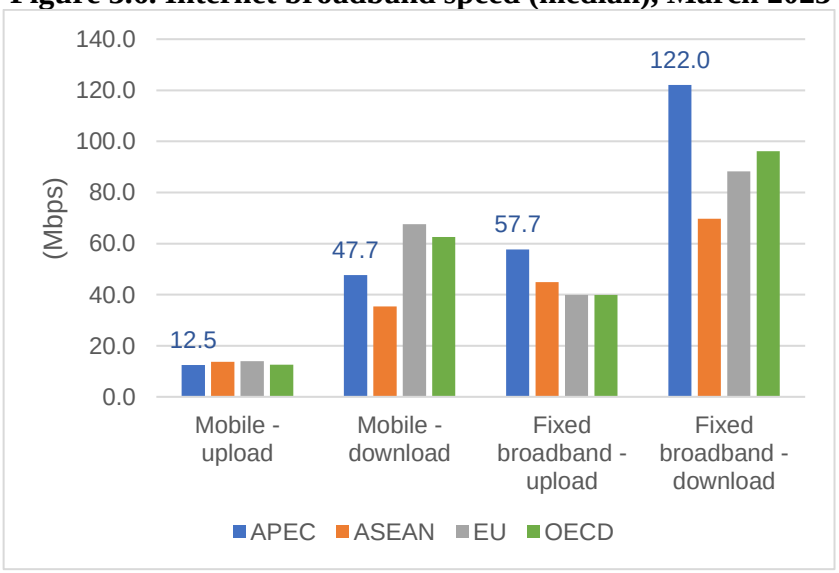
Figure 3.5. No. of secure Internet servers per 1 million people, 2011–2020



Source: APEC PSU calculations using data from Speedtest Global Index.

The APEC region has witnessed rapid enhancements in digital infrastructure in the past decade. By 2020, the number of secure Internet servers[2] per 1 million people in APEC had reached nearly 28,000, although this is still significantly lower than the EU and OECD (Figure 3.5). Mobile broadband subscription in APEC caught up with the EU region in 2021, reaching 113 subscriptions per 100 inhabitants. As of March 2023, median fixed broadband speed in the APEC region was significantly higher than not only the OECD, but also the EU and ASEAN (Figure 3.6).

Figure 3.6. Internet broadband speed (median), March 2023



Source: APEC PSU calculations using data from World Bank World Development Indicators.

[2] Defined as the number of distinct, publicly trusted TLS/SSL certificates found in the Netcraft Secure Server Survey. See World Bank (n.d.-b).

3.3 CHOKEPOINT 3: INSUFFICIENT COOPERATION ON DATA FLOWS AND CROSS-BORDER PAYMENTS TO SUPPORT INCREASINGLY DIGITALISED SUPPLY CHAINS

Seven indicators from the OECD Trade Facilitation Indicators database and the UN Global Survey on Digital and Sustainable Trade Facilitation are used to monitor progress in cooperation on data flows and cross-border payments under Chokepoint 3 (Table 3.6).

Table 3.6. Proposed indicators to measure progress on Chokepoint 3

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
C.1	Cross-border cooperation and coordination of the activities of agencies involved in the management of cross-border trade, with a view to improving border control efficiency and facilitating trade (score, 0 to 2, where 2 designates best performance)	2022	1.60	1.79	1 - 2	1 - 2	20
C.2	Cross-border coordination/harmonisation of data requirements and documentary controls (score, 0 to 2, where 2 designates best performance)	2022	1.45	1.92	0 - 2	1 - 2	20
C.3	Cross-border coordination/harmonisation of the different computer systems (score, 0 to 2, where 2 designates best performance)	2022	0.85	1.05	0 - 1	0 - 2	20
C.4	Cross-border Paperless Trade Facilitation (UN) (Implementation rate of measures that enables cross-border mutual recognition, and exchange of trade-related data and documents in electronic form through institutional arrangements and operational mechanisms) (0% to 100%, 100%=full implementation)	2021	64%	63%	0% - 94%	22% - 94%	18
C.5	Laws and regulations for electronic transactions (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.44	2.60	0 - 3	0 - 3	18
C.6	Recognised certification authority (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.39	2.67	0 - 3	0 - 3	18
C.7	Paperless collection of payment from a documentary letter of credit (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.82	2.12	0 - 3	0 - 3	18

Source: APEC PSU calculations using data from OECD Trade Facilitation Indicators and UN Global Survey on Digital and Sustainable Trade Facilitation.

The APEC region reported lower average scores than the OECD on six out of the seven indicators, with the most significant gap observed with indicator C.2, which scores progress on the implementation of cross-border coordination/harmonisation of data requirements and documentary controls. The maximum possible score for indicator C.2 is 2, which some APEC economies recorded, indicating that coordination and harmonisation have been achieved in terms of common data definitions and the types of information requested, and established mechanisms for timely exchange of information (such as interoperability of domestic Single Windows) (OECD n.d.-a). The OECD achieved an average score of 1.92, indicating nearly full implementation, compared to APEC's score of 1.45. As a customs union, the EU achieved a score of 2. The progress is significantly slower in APEC, with just around half of the members fully implementing data harmonisation (Table 3.7).

Table 3.7. Progress of APEC economies on Chokepoint 3 indicators, 2021/2022

No.	Indicators	No. of economies scoring		
		0	**1**	**2**
C.1	Cross-border cooperation and coordination of the activities of agencies involved in the management of cross-border trade, with a view to improving border control efficiency and facilitating trade	0	8	12
C.2	Cross-border coordination/harmonisation of data requirements and documentary controls	1	9	10
C.3	Cross-border coordination/harmonisation of the different computer systems	3	17	0

Note (C.1 to C.3): Scores are coded 0, 1, or 2, where 2 corresponds to the best performance as defined specifically in each question in the OECD Trade Facilitation Indicators Questionnaire (OECD n.d.-a).

No.	Indicators	No. of economies scoring			
		0	**1**	**2**	**3**
C.5	Laws and regulations for electronic transactions	1	0	7	10
C.6	Recognised certification authority	2	0	5	11
C.7	Paperless collection of payment from a documentary letter of credit	5	0	5	7

Note (C.4 to C.6): Scores are usually coded 0=not implemented; 1=pilot stage of implementation; 2=partial implementation; or 3=full implementation (UN 2021a).

Source: APEC PSU calculations using data from OECD Trade Facilitation Indicators and UN Global Survey on Digital and Sustainable Trade Facilitation.

Notably, APEC, the EU and the OECD scored least well on cross-border coordination and harmonisation of computer systems (C.3). None of the APEC economies have fully coordinated or harmonised their computer language and systems with neighbouring economies, although work is under way to identify harmonisation strategies in 17 APEC members (Table 3.7).

Box 3.3. UN Global Survey on Digital and Sustainable Trade Facilitation

What do the indicators tell us?

The UN Global Survey on Digital and Sustainable Trade Facilitation offers an assessment on the progress of more than 140 economies in implementing reforms that are aligned with the World Trade Organization (WTO) Trade Facilitation Agreement as well as other regional and global initiatives on paperless trade or e-trade, such as the recent Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific (CPTA).

Rates of trade facilitation implementation are calculated using data collected through a fact-based questionnaire that covers nearly 60 trade facilitation measures in the Trade Facilitation Agreement. These measures are categorised into four groups.

The first group is general trade facilitation measures, which covers areas such as transparency of import–export regulations, formalities of pre-arrival processing and post-clearance audits, establishment of a National Trade Facilitation Committee, and transit facilitation.

The second group covers paperless trade within and across borders. Specific measures that are relevant to this area include the availability of an electronic Single Window system, as well as the ability to submit and exchange custom declarations electronically.

The third group of measures on sustainable trade facilitation covers those related to small and medium enterprises (SMEs), agricultural trade and women's participation; while the fourth area covers other trade facilitation, including trade finance facilitation and trade facilitation in times of crisis.

Linkages to SCFAP III chokepoints

The survey provides a comprehensive framework for evaluating the state of trade facilitation, within economies, and regionally and globally. Survey questions on paperless trade, for example, are aimed at measuring how much specific customs procedures have been digitalised. This offers insights into the precise areas where economies have done well and those that require additional work, while also adding to a broader assessment of supply chain efficiency.

Also of relevance to SCFAP III are the survey questions on measures related to SMEs. These are helpful in gaining a quantitative understanding of the involvement of SMEs in global supply chains. This allows for the formulation of targeted policies aimed at increasing and maintaining SME participation in global trade, which is integral to global economic growths.

Source: UN (2021b, 2023)

3.4 CHOKEPOINT 4: LACK OF UNDERSTANDING ON GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND INCREASING PRESSURE FOR SUPPLY CHAINS TO BE SUSTAINABLE

Six indicators from the World Bank, World Economic Forum, United Nations Statistics, International Renewable Energy Agency, and others are used to monitor progress on sustainable supply chains in Chokepoint 4 (Table 3.8). There remain significant gaps between the APEC region and OECD across most indicators.

Table 3.8. Proposed indicators to measure progress on Chokepoint 4

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
D.1	Number of companies publishing sustainability reports (as share of listed domestic companies)*	2020	11%	14%	1% - 30%	1% - 84%	18
D.2	World Economic Forum (WEF) Energy Transition Index	2023	59.1	64.7	47.3 - 66.3	54.1 - 78.5	17
D.3	Share of renewable energy in total electricity generation (%)	2020	28%	45%	0% - 80%	6% - 100%	21
D.4	Adjusted savings: natural resources depletion (% of GNI)	2020	2.1%	0.4%	0% - 10.8%	0% - 4.6%	19
D.5	Adjusted savings: carbon dioxide damage (% of GNI)	2020	1.9%	1.0%	0.6% - 4.8%	0.2% - 2.4%	19
D.6	Greenhouse gases emissions per capita (in tonnes of carbon dioxide equivalent)**	2021	8.5	9.0	1.3 - 16.9	2.0 - 16.9	18

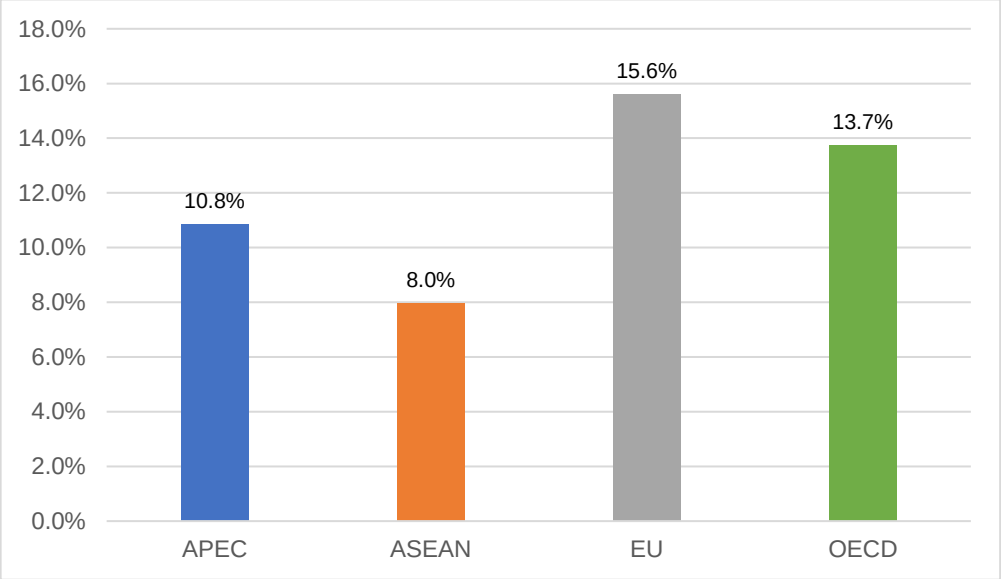
GNI=gross national income

Note: * APEC and OECD values for indicator D.1 are weighted average based on number of listed domestic companies; **APEC and OECD values for indicator D.6 are weighted average based on population.

Source: APEC PSU calculations using data from UN Sustainable Development Goals (SDG) Indicators, World Economic Forum (WEF) Energy Transition Index, International Renewable Energy Agency Statistics, World Bank World Development Indicators, and Statistical Review of World Energy.

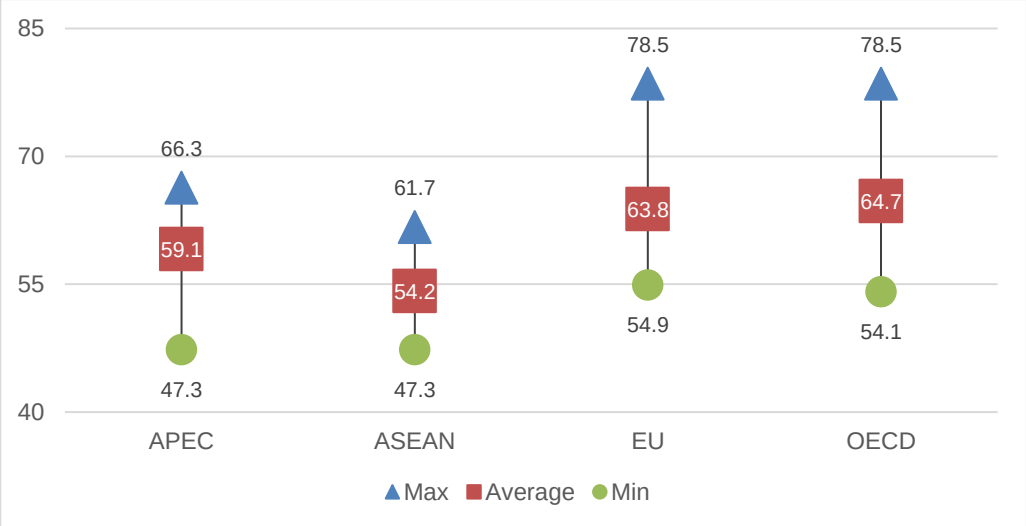
Expressed as share of listed domestic companies, indicator D.1 measures private sector efforts in publishing business sustainability information, such as in annual reports (UN DESA n.d.). Less than 11 percent of businesses in APEC published information on sustainability in 2020, lower than the OECD (14 percent) and the EU (16 percent) (Figure 3.7). However, the number of companies publishing sustainability information has increased in the last five years in APEC as well as globally.

Figure 3.7. No. of companies publishing sustainability reports (% of listed domestic companies), 2020



Source: APEC PSU calculations using data from UN SDG Indicators.

Figure 3.8. Energy Transition Index, 2023



Source: APEC PSU calculations using data from WEF Energy Transition Index.

APEC also lags the EU and OECD in the transition toward cleaner energy, according to World Economic Forum (WEF) (Figure 3.8). In 2023, the APEC region scored an average of 59.1 on the WEF's Energy Transition Index, which assesses the performance of current energy systems and the transition readiness of economies. APEC has seen its average score improve in the last few years, going from 54.6 in 2014 to 59.1 in 2023, but there remains an opportunity for the region to accelerate energy transition as it works toward building sustainable and resilient supply chains.

Box 3.4. Energy Transition Index

What do the indicators tell us?

The Energy Transition Index by the World Economic Forum (WEF) measures the performance of an economy's existing energy system and assesses its readiness to transition to cleaner energy sources. In the 2023 edition, the framework used to calculate the index was revised to incorporate a broader approach to ensuring the equity, security and sustainability of current energy systems while strengthening transition readiness.

An equitable energy system provides affordable access to energy, ensures competitive prices to facilitate economic activities, and maintains cost-reflective pricing while protecting vulnerable consumers and small enterprises. The system is considered secure if the energy mix is diversified, the energy supply is broad and resilient, and the power grids are reliable. Lastly, a sustainable system is one that is energy efficient, mitigates emissions of greenhouse gases and increases the share of clean energy.

Meanwhile, energy transition readiness considers the extent that regulatory frameworks are paired with a credible commitment toward net-zero emissions to encourage greater use of clean energy, promote energy efficiency and improve access to energy. It also focuses on the strength of the financial sector in mobilising capital toward energy transition, as well as the relevant human capital and infrastructure to nurture new industries linked to the transition.

Linkages to SCFAP III chokepoints

The Energy Transition Index serves as a framework to track progress on the energy transition, which is a crucial element in fostering a more sustainable future. The index goes beyond decarbonisation of the energy system to focus on building an environment that is equitable, inclusive and conducive for the economy to make the transition. This broader view of energy transition helps policymakers to better grasp the various aspects that contribute to overall sustainability of the global economy, including in the management of supply chains.

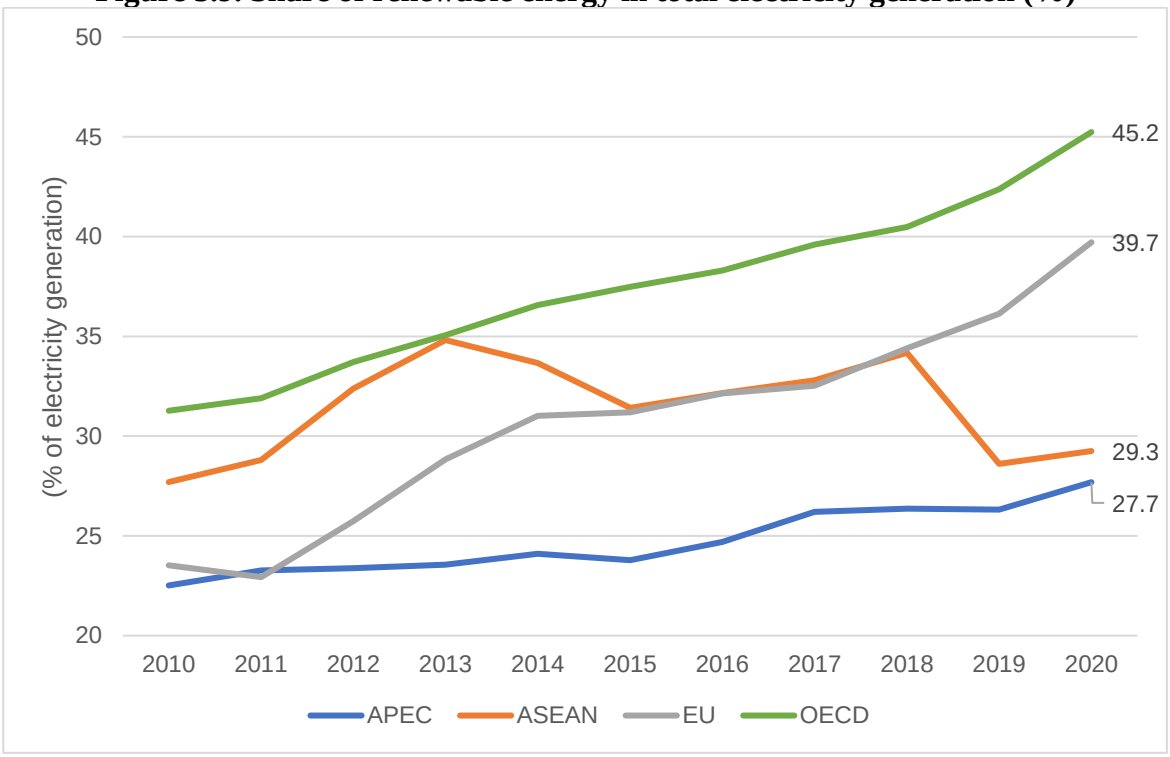
The different components of the index can be used to identify areas where economies have done well and those that require further improvement. This allows for more targeted policymaking to address constraints in the transition toward cleaner energy, and in the process achieve a more holistic greening of supply chains.

Source: WEF (2023).

Amid growing global concern about climate change and the energy crisis, demand for clean energy has become more pressing. Since 2016, global investment in clean energy has outpaced investment in fossil fuels, and this gap has continued to widen, particularly accelerating since the onset of the COVID-19 pandemic. Renewables and electric vehicles are expected to be the key drivers of the growth in global clean energy investment, which is projected to be 24 percent between 2021 and 2023 (IEA 2023). In APEC, accelerating the progress to double the share of renewable energy in the energy mix from 2010 levels by 2030 was also emphasised in the Aotearoa Plan of Action (APEC 2021). From this perspective, for electricity generation, the progress of renewable energy adoption in APEC seems modest (Figure 3.9). This suggests more concerted efforts are needed to enhance sustainability in supply chains, as well as to realise the Putrajaya Vision 2040.

More projects in other technologies to produce low-emission energy, such as clean hydrogen, have been initiated in APEC. As of 2023, there are 73 operational hydrogen projects in APEC member economies, accounting for 33 percent of the total number of projects in operation globally. In addition, there are 24 projects under construction in the APEC region; 47 have reached the final investment decision (FID); and over 100 are in the feasibility study stage recorded (IEA 2022b and APEC PSU staff calculations). While hydrogen energy contributed only about 2.5 percent of global final energy consumption in 2021 (IEA 2022a), with the growing and unmet demand for clean energy, there is room for low-emission energy sources such as clean hydrogen to expand in the energy mix.

Figure 3.9. Share of renewable energy in total electricity generation (%)

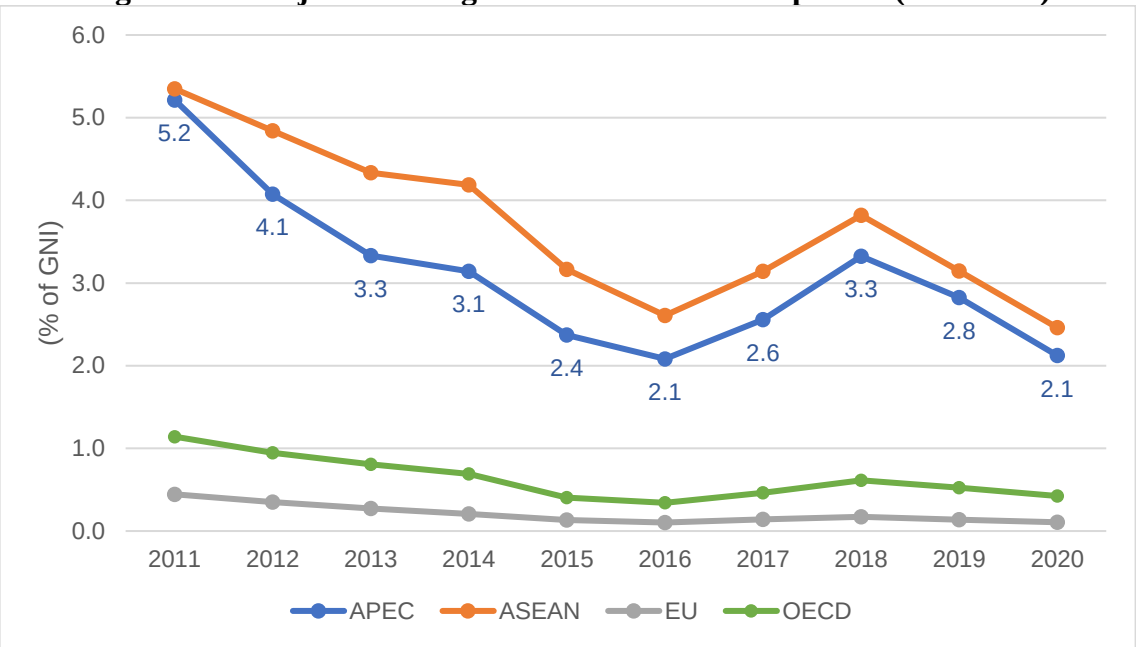


Source: APEC PSU calculations using data from International Renewable Energy Agency Statistics.

At the same time, natural resources depletion (defined as the sum of net forest depletion, energy depletion, and mineral depletion expressed as a percentage of gross national income, or GNI) remains significantly higher in APEC at 2.1 percent of GNI, compared with less than 0.5 percent in the OECD and EU. The progress made in the last decade toward reducing the rate of natural resources depletion appears promising, although there is room for further improvement to prevent setbacks, as witnessed in APEC between 2016 and 2018 (Figure 3.10).

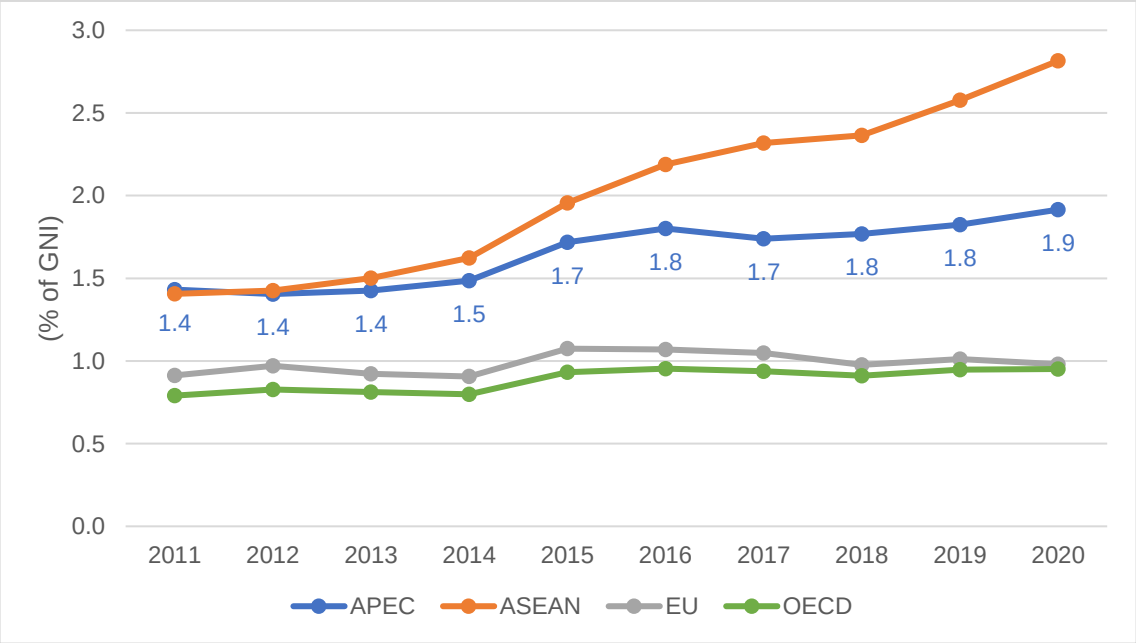
Correspondingly, APEC has experienced a higher negative economic impact from carbon dioxide emissions compared to the OECD and EU. The estimated cost of this impact is around USD 40 per tonne of emissions from burning fossil fuels and from manufacturing cement, which is known for its high carbon-intensity process (IEA n.d.). As a percentage of GNI, the carbon dioxide impact in APEC has increased from 1.4 percent in 2011 to 1.9 percent in 2020. In comparison, the indicator remained largely stable in the OECD and EU during the same period (Figure 3.11).

Figure 3.10. Adjusted savings: Natural resources depletion (% of GNI)



GNI=gross national income
Source: APEC PSU calculations using data from World Bank World Development Indicators.

Figure 3.11. Adjusted savings: Carbon dioxide damage (% of GNI)



GNI=gross national income.
Source: APEC PSU calculations using data from World Bank World Development Indicators.

APEC is a significant contributor of greenhouse gas emissions. As of 2021, APEC economies accounted for 64 percent of global carbon dioxide equivalent (CO_2e) emissions, more than double the share emitted by the OECD (Table 3.9). On average, an APEC citizen contributed more than 8 tonnes of CO_2e emissions in 2021, higher than their EU peers. It is interesting to note that CO_2e emissions per capita went down in all regions in 2020 when COVID-19 hit and

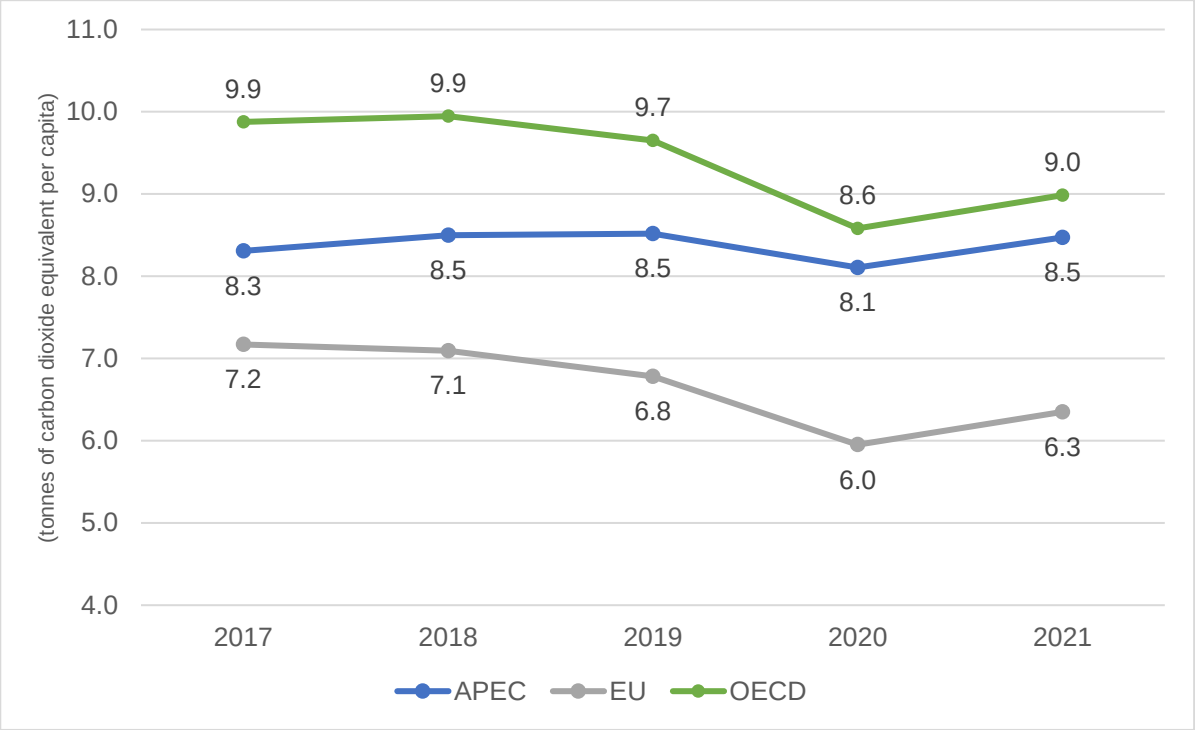
many economies went into lockdowns, hence slowing down economic activities. The figures bounced back in 2021 (Figure 3.12).

Table 3.9. Share of global carbon dioxide equivalent (CO_2e) emissions from energy, process emissions, methane and flaring

	2017 (%)	2018 (%)	2019 (%)	2020 (%)	2021 (%)
APEC (18 members)	63	63	63	64	64
ASEAN (5 members)	4	5	5	5	5
EU (21 members)	8	8	7	7	7
OECD (31 members)	34	34	33	31	31

Source: APEC PSU calculations using data from Statistical Review of World Energy.

Figure 3.12. Carbon dioxide equivalent emissions per capita (tonne)



Source: APEC PSU calculations using data from Statistical Review of World Energy.

3.5 CHOKEPOINT 5: LACK OF TARGETED SUPPORT TO FACILITATE MSMEs' ACCESS AND INTEGRATION INTO GLOBAL SUPPLY CHAINS

Six indicators from the UN Global Survey on Digital and Sustainable Trade Facilitation are used to measure progress in facilitating the participation of micro, small and medium enterprises (MSMEs) in global supply chains under Chokepoint 5 (Table 3.10).The APEC region's progress in supporting MSMEs is on par with that of the OECD. Although the implementation rate of trade facilitation measures for SMEs (indicator E.1) in 2021 remained modest for both groups (under 60 percent), APEC has a marginally better score of 57 percent. The implementation rate is from the UN Global Survey on Digital and Sustainable Trade Facilitation and is computed based on the implementation of Single Window, the Authorised Economic Operator (AEO) scheme and measures that enhance SMEs' access to trade information as well as the representation of SMEs in the National Trade Facilitation

Committee. The UN survey results suggest that the progress on trade facilitation for SMEs remained limited even in developed economies (UN 2021b).

Table 3.10. Proposed indicators to measure progress on Chokepoint 5

No.	Indicator	Year	Simple average		Range of values		No. of APEC economies
			APEC	OECD	APEC	OECD	
E.1	Implementation rate of trade facilitation measures for SMEs (0% to 100%, 100%=full implementation)	2021	57%	54%	0% - 100%	0% - 100%	18
E.2	Trade-related information measures for SMEs (score, 0 to 3, 3 indicates measures fully implemented)	2021	2.56	2.81	0 - 3	2 - 3	18
E.3	SMEs in AEO scheme (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.33	1.32	0 - 3	0 - 3	18
E.4	SMEs' access to Single Window (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.61	1.27	0 - 3	0 - 3	18
E.5	SMEs in National Trade Facilitation Committee (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.50	1.72	0 - 3	0 - 3	18
E.6	Other special measures for SMEs (score, 0 to 3, 3 indicates measures fully implemented)	2021	1.81	1.28	0 - 3	0 - 3	18

SME=small and medium enterprise
Source: APEC PSU calculations using data from UN Global Survey on Digital and Sustainable Trade Facilitation.

Table 3.11. Progress of APEC economies on Chokepoint 5 indicators, 2021/2022

No.	Indicator	No. of economies scoring under 50%		No. of economies scoring from 50%	
E.1	Implementation rate of trade facilitation measures for SMEs	7		11	
		No. of economies scoring 0	No. of economies scoring 1	No. of economies scoring 2	No. of economies scoring 3
E.2	Trade-related information measures for SMEs	1	0	5	12
E.3	SMEs in AEO scheme	7	3	3	5
E.4	SMEs' access to Single Window	6	1	5	6
E.5	SMEs in National Trade Facilitation Committee	7	2	2	7
E.6	Other special measures for SMEs	3	1	8	4

AEO=Authorised Economic Operator; SME=small and medium enterprise
Note: Scores are usually coded 0=not implemented; 1=pilot stage of implementation; 2=partial implementation; or 3=full implementation. Implementation rates are calculated using simple averages of implementation score of relevant individual measures (UN 2021a).
Source: APEC PSU calculations using data from UN Global Survey on Digital and Sustainable Trade Facilitation.

The APEC region outperforms all other benchmark regions (ASEAN, EU, OECD) in terms of the access of SMEs to Single Windows (indicator E.4). Efforts by governments such as

developing a Single Window interface for mobile devices, setting up computing centres where SMEs can access the Single Window, or defining targets and goals for use of the Single Window by SMEs are examples of measures under indicator E.4.

Areas for further improvement include the participation of SMEs in the AEO scheme and the representation of SMEs in the National Trade Facilitation Committee (Table 3.11). In these areas, nearly half of the APEC members score below 2. There remain significant variations among APEC economies in terms of SMEs that are certified AEOs: up to 70 percent of AEOs in some economies are SMEs, while the figure can be as low as 3 percent in others (Sierra Galindo and Rodríguez 2020).

3.6 KEY TAKEAWAYS

Chokepoint 1

While both APEC and the OECD have achieved significant success in clearing import and export declarations electronically, the OECD remains ahead, having nearly achieved near-full digitalisation of trade declarations, while APEC members have digitalised approximately 90 percent of such clearances. However, in terms of Single Window implementation supported by information technology, the APEC region surpasses not only the OECD but also the EU and ASEAN.

Chokepoint 2

While most dimensions of the LPI index have shown improvements across different groups of economies, the scores for timeliness of shipments have experienced slight declines in APEC and the EU, and more significant declines in the OECD.

Over the past decade, the APEC region has witnessed rapid advancements in digital infrastructure. As of 2020, the number of secure Internet servers per 1 million people in APEC has reached nearly 28,000, although this remains significantly lower than the numbers in the EU and OECD. In 2021, mobile broadband subscriptions in APEC have also caught up with the EU region, reaching 113 subscriptions per 100 inhabitants.

Chokepoint 3

The biggest gap between APEC and their OECD counterparts is in the area of AEO: OECD has an average score of 1.9 on this indicator, whereas APEC's average score stands at 1.3.

Chokepoint 4

In 2020, less than 11 percent of businesses in the APEC region published information on sustainability, which is lower than the rates observed in the OECD (14 percent) and the EU (16 percent). However, it is worth noting that the number of companies publishing sustainability information has increased both in APEC and globally over the past five years.

When it comes to natural resources depletion, defined as the combined depletion of net forests, energy, and minerals as a percentage of GNI, APEC still faces a significant challenge.

Chokepoint 5

In terms of the access of SMEs to the Single Window, the APEC region outperforms other benchmark regions such as ASEAN, the EU and the OECD. However, there are still areas that require further improvement, such as the participation of SMEs in the AEO scheme and the involvement of SMEs in the National Trade Facilitation Committee.

4. RELEVANT POLICY PRACTICES TO ADDRESS SCFAP III CHOKEPOINTS

Phase Three of the APEC Supply Chain Connectivity Framework Action Plan (SCFAP III) identified five chokepoints that need to be addressed to build secure, resilient, sustainable and open supply chains. These chokepoints include ineffective digitalisation; inadequate infrastructure; insufficient data flows and cross-border payments cooperation; lack of understanding of green supply chain practices; and lack of support for the integration of micro, small and medium enterprises (MSMEs) into global supply chains. Addressing these policy issues is highly relevant for businesses to stay competitive, especially in the post-COVID economic landscape, where supply chain disruptions are becoming more common and costly. Table 4.1 illustrates the costs experienced by different industries due to supply chain disruption.

Table 4.1. Several estimates of costs of supply chain disruptions in various industries

Industry	Average Cost of Supply Chain Disruption (USD)
Manufacturing	610,000
Retail	1.1 million
Pharmaceuticals	1.5 million
Oil and gas	2.2 million
Automotive	2.5 million
High-tech	3.5 million

Note: The expenses incurred due to supply chain disruptions can differ significantly based on the industry and the particular circumstances of the disruption.
Source: Zapoj (2023).

Inefficient digitalisation, for example, can prevent firms from building stronger capabilities in agility and visibility. And inadequate infrastructure hinders the efficient movement of goods and services, resulting in delays, spoilage, lost sales and cash flows, decreased customer satisfaction, and limited business growth. However, the adoption of digital trade/ecommerce platforms and the implementation of digital supply chain transformations have the potential to enhance customer service by 30 percent, reduce costs by up to 20 percent (Saenz, Borrella and Revilla 2022), and add value of up to USD 1.5 trillion globally to the logistics sector (Jones 2023).

A digital trade/e-commerce platform has the potential to provide significant benefits and impact for APEC. According to research by NZIER (2021), the adoption of a digital trade/ecommerce environment in APEC could yield an average yearly gain in the range of NZD 1 to 2 billion for 10 years. These gains come from several benefits, including increased productivity by moving away from paper-based systems, improved connectivity as trade barriers are removed, predictive gains from big data, increased visibility and trust, and inclusive gains by allowing MSMEs to connect to global trade (NZIER 2021).

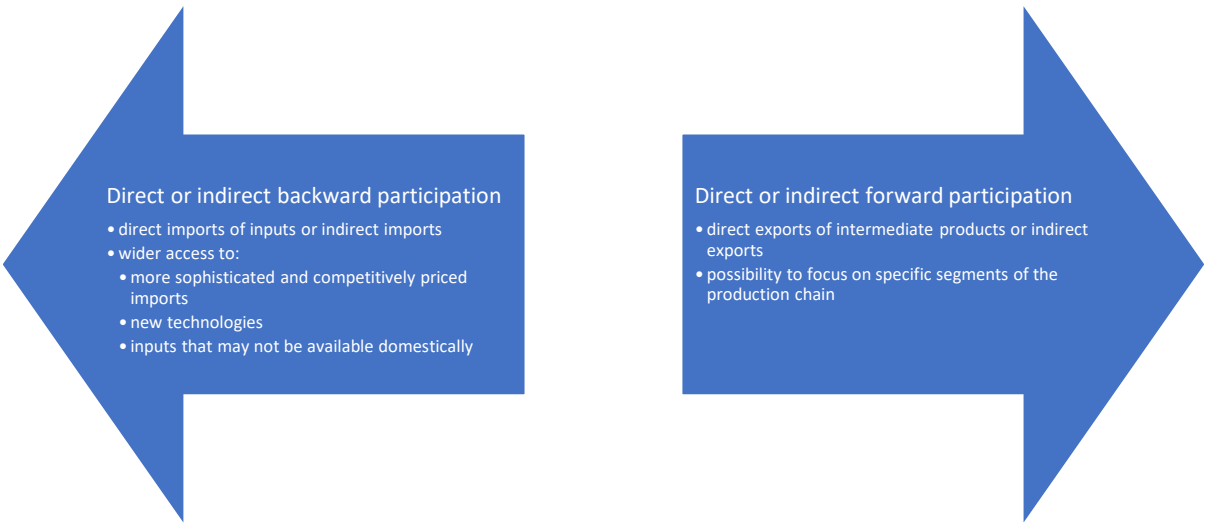
Inadequate infrastructure development can increase trade costs and prevent wider market access. Investing in transportation infrastructure could cut trade costs by more than 25 percent in Indonesia and around 15 percent in China and the Philippines (ADB and ADBI 2009). Cross-border payments have also been a significant contributor to global commerce, generating revenues of USD 224 billion in 2019 from a total of USD 130 trillion in transactions (McKinsey & Company 2020). Improving cross-border payments is essential for businesses, especially

since they have traditionally been slow, expensive and risky (Adrian et al. 2022). The increasing digitalisation of supply chains presents new avenues for improving cross-border supply chain finance (Ramadurai and Hanspal 2020) that will further sustain the growth of e-commerce post-pandemic (Christensen 2021).

To progress toward a sustainable supply chain, it is essential to understand green supply chain practices. Embracing sustainable business practices, such as transitioning toward a circular economy, has the potential to significantly reduce resource use and represents a lucrative USD 4.5 trillion growth opportunity (Accenture 2015). This approach prioritises reduction of raw material use, redesign, re-use, repair, remanufacturing, and recycling throughout the entire value chain. Ignoring sustainable environmental policies, on the other hand, could mean, for some economies, up to 15 percent of their GDP being put at risk (Tansan et al. 2023). At the corporate level, implementing sustainability initiatives appears to improve financial performance due to better risk management and increased innovation (Whelan et al. 2021).

In addition to these issues, lack of support for MSMEs in accessing global supply chains may lower labour income, job creation, and employment absorption. In 2020, labour income declined nearly 11 percent, or USD 3.5 trillion, due to the disruption, and sales dropped 50 percent for SMEs and 40 percent for large firms. By participating in global value chains (Figure 4.1), MSMEs can gain access to inputs, technology, and a wider range of markets (World Bank and WTO 2019). As a result, MSMEs that engage in international trade are more likely to survive and grow.

Figure 4.1. How MSMEs can benefit from global value chains



MSME=micro, small and medium enterprise
Source: Adapted from Figure 6.1 in World Bank and WTO (2019).

The next sections contain summaries of the policy practices gathered from relevant APEC fora and desktop research by the APEC Policy Support Unit (PSU). In total, over 60 documents or reports were submitted and reviewed to identify relevant policy practices for the five chokepoints (please refer to Appendix B for the list of reports and documents).

4.1 CHOKEPOINT 1: INEFFICIENT DIGITALISATION OF END-TO-END SUPPLY CHAINS, INCLUDING BORDER PROCEDURES AND TRADE DOCUMENTATION EXCHANGES

This section provides the relevant policy practices for tackling inefficient digitalisation of end-to-end supply chains. The policy practices include fostering interoperability, upgrading government systems, reducing barriers and risks, building trust, enhancing supply chain management, promoting innovation and digital readiness, and strengthening cooperation while utilising emerging technologies.

By implementing these practices, economies can create a conducive environment for open and competitive markets, boost business resilience, ensure inclusivity, and harness the potential of innovation and digitalisation for sustainable growth. Implementation of these measures will allow a seamless flow of information, improve efficiency, reduce barriers and foster trust in digital solutions.

Some of the key policy practices include:

- developing and upgrading a Single Window system on a digital platform
- fostering cross-border interoperability and collaboration
- upgrading government systems through digital transformation
- building trust and innovation in digital solutions

Table 4.2 summarises the policy practices highlighted in the submissions from APEC economies and research by the APEC PSU.

Additionally, to address the lack of standards and interoperability issues, governments and organisations are turning to technologies like blockchain to establish trusted and verifiable cross-border trade information systems. Harmonisation of regulations related to cross-border data flows and stakeholder confidence in the digital trade environment are crucial for successful implementation.

Table 4.2. Summary of policy practices for Chokepoint 1

Policy Practice	Description	Impact	Example
Develop and upgrade Single Window (SW) system on a digital platform to strengthen connectivity, cooperation and interoperability	To develop and continually improve the SW system, providing traders with a centralised platform while improving coordination, cooperation and cross-border data exchange	Efficiency, accuracy and connectivity can be improved by avoiding duplicate requests and eliminating paper-based submissions.	A new-generation SW could act as a unified paperless platform for businesses to submit all trade-related documents to the government (business-to-government, B2G) for trade declarations and customs clearance. It will also have the technical capacity to potentially integrate with private sector business-to-business (B2B) platforms in the future and connect with other economies' SWs (UNESCAP 2018).

Policy Practice	Description	Impact	Example
Foster interoperability to facilitate cross-border exchanges of data between public and private entities	Improve seamless flow of information, data exchange and collaboration among stakeholders.	Streamlined processes, reduced costs, improved efficiency and visibility.	Digital trade platforms connecting Customs authorities, shippers, banks, and marine logistics (Lai and Kumar 2022).
Upgrade government systems through digital transformation	Drive digital transformation by leveraging existing resources, ensuring policy support, managing technological integration and creating a supportive onboarding experience.	Results in improved government processes, builds trust and fosters collaboration with stakeholders.	Upgrading from manual document verification to a paperless system led to substantial reduction in processing times, which contributes to addressing barriers to adoption and maximising the benefits for businesses and consumers.
Reduce risks and barriers to entry for adopters of digital technologies	Facilitate and support businesses in adopting digital solutions.	Increased adoption of digital technologies and improved competitiveness.	To promote the adoption of digital technologies in supply chains by establishing or strengthening public–private partnerships and utilising incentives or procurement contracts to encourage their adoption and use.
Build trust and innovation in digital solutions	Promote confidence in using digital technologies for trade.	Increased adoption of digital solutions and reduced resistance to digitalisation.	Incorporate ethics oversight and review as an integral part of the governance process in adopting new technologies; establish a data protection regime that is transparent, up to date and consistent with international practices to mitigate cybersecurity risks; and build confidence in digital technologies.
Seek advanced ways to facilitate and manage international supply chain using artificial intelligence (AI)	Utilise AI to optimise and secure supply chain processes.	Improved supply chain management and increased efficiency.	AI can effectively address pain points (such as inaccurate or obscured information, absence of real-time updates, and intricate decision-making processes) by streamlining inventory replenishment, offering real-time visibility, and enabling intelligent decision making (Chang 2020).

Policy Practice	Description	Impact	Example
Invest in innovative ecosystems, digital upskilling, and quality telecommunications infrastructure.	Promote innovation, skills development, and digital readiness.	Enhanced and wider digital adoption, and increased productivity.	Governments should invest in digital skills training programmes and enhance access to telecommunications infrastructure to bridge the digital divide.
Develop World Trade Organization (WTO)-consistent digital trade rules	Establish rules prioritising simplicity, interoperability, and international standards	Smooth, secure and inclusive cross-border digital trade and e-commerce	Ensure that digital trade rules avoid policy fragmentation, reduce compliance burden for MSMEs and promote participation in digitalised supply chains.

Source: Compiled by APEC PSU.

4.2 CHOKEPOINT 2: INADEQUATE INFRASTRUCTURE DEVELOPMENT TO SUPPORT ROBUST MULTI-MODAL CONNECTIVITY AND LOGISTICS NETWORKS

This section outlines the policy practices and recommended approaches to address inadequacies in the infrastructure required to support connectivity and logistics networks. These measures involve various actions, including the digitalisation of ports and the transformation of associated logistics networks, the adoption of digital technology, the establishment of public–private partnerships and collaboration, fostering a culture of openness toward innovation and change, promoting private sector involvement in infrastructure development and investment, improving bureaucratic efficiency and regulations, and investing in both physical infrastructure that supports the digital economy and foundational digital infrastructure. An open and stable trading system also encourages investment in infrastructure, as businesses have access and confidence in the steady flow of goods and services across borders under the global value chains (GVCs) (Hochman et al. 2013). Development of GVCs may therefore benefit from maintaining an open, non-discriminatory, rules-based, predictable, and stable multilateral trading system, as embodied in the WTO (APEC CTI 2022c).

Some of the key policy practices include:

- improving efficiency in bureaucracy and regulation for infrastructure development
- building resiliency in infrastructure access and service
- fostering collaboration between the private sector and policymakers in developing vibrant digitalised systems
- modernising physical and digital infrastructure
- enhancing digital infrastructure and connectivity by encouraging investment in frontier technologies

Table 4.3 summarises the policy practices highlighted in the submissions from APEC economies and research by the APEC PSU.

Table 4.3. Summary of policy practices for Chokepoint 2

Policy Practice	Description	Impact	Example
Improve efficiency in bureaucracy and regulation related to public–private partnership (PPP) for infrastructure development	Implement technical guidance or standard operating procedures for the PPP approval process and accelerate government support.	Developing a credible pipeline of bankable projects to support prioritisation of public expenditure and attract private investment.	Streamline the approval process and develop standard operating procedures, such as in the case of the Indonesia Infrastructure Guarantee Fund (IIGF), which provides government guarantees for PPP projects, while ensuring effective appraisal, approval and monitoring (Isdijoso 2021).
Build resiliency in infrastructure access and service	Adoption of digital technology to support connectivity and cross-border access to remote working, health, and learning technologies, to mitigate disruption and pursue recovery.	Ensure uninterrupted trade flow of goods and services, particularly during and after disruption.	Digitalise trade processes through increasing the use of electronic documentation and platforms, which can help to ensure continuous global trade flows.
Foster collaboration between the private sector and policymakers in developing vibrant digitalised systems	Digital connectivity requires the government promoting interconnected information platforms, cooperation between ports, and the construction of a multi-modal transport information network to facilitate efficient data exchange seamless integration of various transportation modes.	Collaboration will reduce connectivity gaps, promote digital technology adoption, and encourage innovation.	Explore potential digitalisation projects along the global supply chain. For example, the Port of Singapore and the Port of Shanghai provide successful case studies of port digitalisation through their commitment to innovation and sustainability while emphasising the importance of coordination, leadership support, talent cultivation, and standardised data exchange.
Modernise physical and digital infrastructure	Support supply chain automation, using, for example, Internet of things (IoT) technologies, artificial intelligence (AI), blockchain and robotics; and foster the development of electronic trading platforms to facilitate the integration of services into supply chains.	Enabling efficient and reliable supply chain communication and connectivity as well as enabling smoother and more efficient transactions.	Seek opportunities to implement digital systems, such as equipping the maritime industry with harmonised digital documents and ensuring transparency in shipping and border policies.

Policy Practice	Description	Impact	Example
Enhance digital infrastructure and connectivity by encouraging investment in frontier technologies	Prioritising investment in high-speed broadband networks, expanding digital network coverage to include gigabit-level full fibre and 5G connections, utilising state-of-the-art hardware and software components, and facilitating the adoption of interoperable trusted digital identities.	Strengthen digital foundation and improve data-sharing networks.	With advanced technology, greater utilisation of Authorised Economic Operator (AEO) programmes across borders will allow Customs to identify and target shipments more effectively and permit quicker release of goods.

Source: Compiled by APEC PSU.

4.3 CHOKEPOINT 3: INSUFFICIENT COOPERATION ON DATA FLOWS AND CROSS-BORDER PAYMENTS TO SUPPORT INCREASINGLY DIGITALISED SUPPLY CHAINS

The policy practices for addressing Chokepoint 3 identify measures to tackle insufficient cooperation on data flows and cross-border payments as a hindrance to supporting increasingly digitalised supply chains. Measures covered in this section cover policies such as establishing international standards and agreements to ensure smooth cross-border data flows, enhancing digital trade provisions, fostering an enabling environment for FinTech, and leveraging international standards for data sharing and cybersecurity.

Some of the key policy practices include:

- developing international standards and agreements to facilitate data flows
- ensuring the comprehensive coverage and effective implementation of digital trade provisions
- facilitating access to open government data (OGD) to foster cross-border information sharing and enable commercial applications
- taking into account key policy considerations in developing cross-border payments and remittances
- promoting trust and interoperability in cross-border data flows through regulatory cooperation and digital connectivity
- building an enabling environment for FinTech

Table 4.4 summarises the policy practices highlighted in the submissions from APEC economies and research by the APEC PSU.

In the realm of trade and border management, technology, particularly information and communication technology (ICT), has emerged as a key tool to enhance efficiency and inclusivity. The adoption of digital technologies by border agencies and ports has opened up new avenues for improving trade processes. These advancements enable the optimisation of shipping for essential and emergency items, particularly during times of crises, by facilitating information sharing and risk management (APEC SCCP 2021c).

Nevertheless, these innovations also pose challenges. One such challenge is ensuring seamless communication and interoperability among different systems, especially when dealing with

multiple jurisdictions or various agencies within an economy. Additionally, the security and resilience of these systems against cyber threats must be prioritised to safeguard critical trade and border-related operations. Lastly, it is crucial to ensure that these technological advancements do not exacerbate existing inequalities or create new ones. This entails considering accessibility and digital skills, ensuring that no one is left behind due to a lack of access or the inability to effectively utilise digital technologies.

By recognising these challenges and taking appropriate measures, we can harness the potential of technology to foster a more efficient, secure and inclusive trade and border management ecosystem (APEC SCCP 2021c).

Table 4.4. Summary of policy practices for Chokepoint 3

Policy Practice	Description	Impact	Example
Develop international standards and agreements to facilitate data flows	Developing international standards and agreements to ensure cross-border data flows while recognising domestic laws and concerns around privacy and security.	Restrictions on cross-border data flows hamper the operation of digital tools, delaying the pandemic response and raising costs for businesses.	Encourage the promotion of e-invoicing and the use of other electronic paperless business communications focusing on international and interoperable standards, such as the Peppol E-Invoicing standard.
Ensure the comprehensive coverage and effective implementation of digital trade provisions	Increasing coverage, supporting cross-border data flows, promoting interoperability, fostering cybersecurity collaboration, and closely monitoring the implementation of digital provisions.	Increase the volume of digital trade leading to increased investment, stronger market access and competition as well as enabling productivity improvement	This could be achieved by increasing the participation of economies in digital economy agreements (DEAs), such as the DEA between Australia and Singapore, or multilateral trade agreements like the Regional Comprehensive Economic Partnership (RCEP).
Facilitate access to open government data (OGD)	Placing OGD at the top of domestic and APEC-level agendas, designing effective stakeholder engagement policies, promoting interoperable standards, and strengthening governance frameworks.	By enhancing transparency, accountability, and innovation, OGD can foster cross-border information sharing and enable commercial applications.	Work toward centralising official open data sources for easier public access. The Open Data Philippines portal offers access to government datasets such as budget, spending, procurement, and disaster risk reduction and management data. In the US, Data.gov provides access to over 250,000 datasets from government agencies, including data on climate, crime and health.

Policy Practice	Description	Impact	Example
Take into account key policy considerations in developing cross-border payments and remittances	Adopting considerations such as availability, accessibility, affordability, efficiency, interoperability, safety and sustainable development to encourage innovation and competition.	The expansion of convenient, secure, and affordable cross-border payments will result in greater financial connectivity, eventually supporting remittance flows of migrant workers as well as the regional trade and tourism industries (Bank of Thailand 2022).	Set up a steering committee chaired by regulators, such as central banks, to oversee the implementation of projects relating to cross-border payments and remittances. The committee can learn from the experience of successful cases such as the Cross-border QR Payment Connectivity initiative, between Thailand and Viet Nam (March 2021), Thailand and Malaysia (June 2021), Thailand and Indonesia (August 2021), and Malaysia and Indonesia (January 2022).
Build an enabling environment for FinTech	Promoting FinTech development through expertise building, public–private partnerships, innovation funding, regulatory sandboxes, and establishment of innovation centres.	FinTech solutions are integral to promoting cross-border digital trade, levelling the playing field on cross-border payments, and driving greater adoption and new applications in modern trade value chains and sustainable financing.	Discussion platforms and innovation groups can enhance the exchange of experiences in international FinTech sandboxes. Launching regional or global sandboxes can benefit the cross-border ecosystem of FinTech companies.
Foster cross-border data flows for resilient digital economies	Developing international standards and agreements to facilitate cross-border data flows, while taking into consideration domestic laws and concerns regarding privacy and security.	Minimise regulatory heterogeneity and support economies in aligning their domestic regulations with international standards.	Encourage transparency and regulatory impact assessment for all new regulation affecting data flows.
Promote trust and interoperability in cross-border data flows through regulatory cooperation and digital connectivity	Developing policies that balance regulatory goals such as privacy, security, financial regulation, and law enforcement without hindering cross-border data flows.	Enable businesses and consumers to leverage digital connectivity and interoperability to foster digital connectivity and prevent restrictions on cross-border data flows.	Establishing trust services as an electronic service for the creation, verification and validation of electronic signatures, electronic seals, electronic registered delivery services and certificates.
Strengthen data infrastructure and digital market for enhanced cross-border transactions	Strengthening data infrastructure through adopting pen data standards, promoting secure cross-border data flows, and building digital market infrastructure for MSME supply chain finance.	Digitalisation enables easier access to finance for MSMEs, especially during the initial stages of the order-to-payment cycle where traditional credit underwriting is challenging.	By using digital platforms and KYC procedures, MSMEs can access financial services more easily and at a lower cost, which can help to promote their growth and development.

Source: Compiled by APEC PSU.

4.4 CHOKEPOINT 4: LACK OF UNDERSTANDING ON GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND INCREASING PRESSURE FOR SUPPLY CHAINS TO BE SUSTAINABLE

The policy practices for Chokepoint 4 aims to address the lack of understanding of green supply chain management practices and the increasing pressure to be sustainable. Chokepoint 4 poses a barrier to achieving environmentally sustainable and socially responsible supply chains.

APEC practices focus on promoting green and sustainable supply chain management, promoting the bio-circular-green (BCG) economy model, harnessing digital technology for eco-friendly dispute resolution, empowering MSMEs to participate in green supply chains, and driving sustainable practices through environmental, social and governance (ESG) integration. By implementing these practices, stakeholders can enhance their understanding of green supply chain management and work toward sustainable solutions.

Some of the key policy practices include:

- promoting environmentally sustainable supply chains through encouraging green procurement, knowledge sharing, and standards implementation
- driving sustainable supply chains through promoting the BCG economy model
- harnessing digital technology for eco-friendly dispute resolution in supply chains
- empowering MSMEs' participation in green supply chain
- driving sustainable practices through ESG integration
- supporting the transition to a low carbon economy through leveraging trade and investment for sustainable solutions

Table 4.5 summarises the policy practices highlighted in the submissions from APEC economies and research by the APEC PSU.

Table 4.5. Summary of policy practices for Chokepoint 4

Policy Practice	Description	Impact	Example
Promote environmentally sustainable supply chains through encouraging green procurement, knowledge sharing, and standards implementation	Encourage green government procurement and green procurement policies by large companies, promote knowledge sharing on adopting a green business model from successful companies to MSMEs for increased global market opportunities, advocate for the establishment of green standards and certifications aligned with international norms.	Expansion of green supply chain network and development.	Encouraging larger companies and successful green companies to share best practices on adopting a green business model to MSMEs to increase their opportunities in engaging in international markets where green standards are widely accepted.

Policy Practice	Description	Impact	Example
Drive sustainable supply chains through the bio-circular-green (BCG) economy model	Private sector adoption, with government providing support, is crucial in ensuring successful implementation of the BCG economy model; governmental engagement through media, forums and symposiums can raise awareness and foster connections among regulators, start-ups, investors and consumers; tax benefits and initiatives like increased government purchasing of green products and regulatory modernisation can encourage MSMEs to embrace eco-friendly materials and practices.	Increased awareness and adoption of the BCG economy model through government support and private sector adoption.	Making the BCG economy model widely known and encouraging its application by government agencies, the private sector, and educational institutions.
Harness digital technology for eco-friendly dispute resolution in supply chains	Advocates the use of digital technology and online dispute resolution to resolve disputes in an environmentally friendly manner.	Provides quicker and cheaper methods for dispute resolution.	Utilising online dispute resolution platforms to provide MSMEs with efficient and environmentally friendly ways to resolve disputes.
Strengthen global collaboration for cost-effective emissions reduction in supply chains	Promotes closer international ties and learning from peers to design more efficient and collaborative emission reduction systems.	Facilitates emissions reductions at lower costs and improved liquidity.	Economies or firms with a high degree of integration in trade and commerce find low-cost ways to reduce emissions and access liquidity through collaboration and knowledge sharing (Lin, Moon, and Yin 2011).
Empower micro, small and medium enterprise (MSME) participation in green supply chains	Encourages comprehensive financing support for MSMEs, debt solutions, financial inclusion programmes, and participation in global initiatives.	Supports green supply chain and development.	Providing financing support and debt management; participating in global initiatives for the transition to a nature-positive, net-zero economy; engaging with the private sector for industry supply-chain piloting and nature-related disclosure requirements.

Policy Practice	Description	Impact	Example
Drive sustainable practices through environmental, social and governance (ESG) integration in financing decisions	Enabling lenders and investors to incentivise businesses in the region to adopt sustainable practices through developing global standards for incorporating ESG factors in financing decisions.	Encourages borrowers and issuers to progressively align their practices with the sustainable development goals (SDGs), contributing to the advancement of sustainable development.	By investing in green bonds, which are issued to finance environmentally friendly projects, lenders and investors can incentivise businesses to adopt sustainable practices and reduce their environmental impact.
APEC Business Advisory Council (ABAC) Climate Leadership Principles for Business	The principles provide guidance on the adoption of effective practices and policies related to climate change.	The principles can serve as a valuable model for enterprises to embrace and implement practices that contribute to addressing climate change at the enterprise level.	Encourage businesses to adopt practices in line with the principles, such as measuring and reducing the greenhouse gas footprint, undertaking effective climate change risk assessment and adaptation, as well as seeking a sustainable and equitable transition toward a low-carbon economy.
Support the transition to a low-carbon economy through leveraging trade and investment for sustainable solutions	Increasing access to practical tools, fostering innovation and utilising market mechanisms to address carbon emissions through closer ties in trade and investment network.	Achieving a sustainable, low-carbon economy	APEC to serve as a collaborative platform to develop interoperable ESG taxonomies and carbon emissions trading markets, enhance disclosure practices, facilitate sustainable infrastructure financing, and incentivise MSMEs to align their operations with sustainable objectives.

Source: Compiled by APEC PSU.

In sum, efforts are underway to promote sustainable practices and address environmental challenges in supply chains and global trade. Various initiatives and principles have been developed to guide businesses and governments in adopting environmentally friendly policies. However, success depends on overcoming challenges that hinder the progress toward sustainable supply chains, such as limited awareness, lack of collaboration, and inefficient dispute resolution methods. There is also a need for international cooperation and cost-effective emission reduction strategies.

4.5 CHOKEPOINT 5: LACK OF TARGETED SUPPORT TO FACILITATE MSMEs' ACCESS AND INTEGRATION INTO GLOBAL SUPPLY CHAINS

Micro, small and medium enterprises (MSMEs) play a vital role in driving growth and employment opportunities. However, these enterprises face numerous challenges, including difficulties in adopting digital technologies, accessing financing, navigating complex trade processes, and integrating into global value chains. The policy practices for Chokepoint 5 aim to support MSMEs and address the barriers they face in accessing and integrating into global supply chains, particularly in the areas of digitalisation, technological innovation, capacity

building, and engagement in AEO programmes. By implementing targeted support measures, policymakers can foster an enabling environment for MSMEs to thrive in the global marketplace.

The following policy practices outline various strategies aimed at supporting MSMEs and enhancing their ability to survive and thrive in the face of disruption:

- nurturing MSME adaptation and resilience in an evolving market landscape
- empowering MSMEs for innovative integration.
- advancing MSMEs in the tourism sector
- unlocking financing, market access and capacity building
- enhancing dispute resolution for MSMEs in cross-border trade
- fostering collaborative strategies and supportive measures for inclusive MSME engagement in AEO programmes
- driving digital transformation and empowering digital solutions for MSMEs

Table 4.6 summarises the policy practices highlighted in the submissions from APEC economies and research by the APEC PSU.

The summary highlights various policy practices and policy recommendations aimed at supporting MSMEs and promoting their resilience across different themes such as supply chain finance, digital transformation, skill building, collaboration and trade facilitation. These measures aim to provide practical solutions and support for MSMEs, enabling them to thrive and succeed in a rapidly changing business landscape.

Table 4.6. Summary of policy practices for Chokepoint 5

Policy practice	Description	Impact	Example
Nurture micro, small and medium enterprise (MSME) adaptation and resilience in an evolving market landscape	Implementation of comprehensive support for digitalisation, fostering partnerships with digital platform firms, facilitating digital supply chain financing, cultivating a forward-thinking mindset	Overcoming barriers to growth and increased resilience	Providing omni-channel training and fostering collaboration with community-based organisations.
Empower MSMEs for innovative integration	Leveraging technological innovation, promoting environmentally friendly practices, simplifying trade processes	Increased innovation and adoption of environmentally friendly practices	Implementing artificial intelligence (AI) and blockchain solutions for informed decision making and sustainability improvement for MSMEs
Advance MSMEs in the tourism sector	Development of pro-MSME tourism policies, unique approaches based on emerging trends, exploration of multiple financing sources, workforce skills assessment, establishing occupational standards	Increased participation of MSMEs in the tourism sector, improved workforce skills and diversified financing sources	Facilitate linkages between MSMEs and the tourism sector through the use of technology. Mexico's Connecting Tourism, for example, matches supply and demand in the full supply chain of its tourism industry with a user-friendly virtual platform and mobile applications and online video tutorials.

Policy practice	Description	Impact	Example
Unlock financing, market access and capacity building	Implementing innovative financing mechanisms, developing platforms for market connectivity, and offering comprehensive training and skill development initiatives	Empowering MSMEs and enhancing their capacity and skills to participate in global value chains	Assisting MSMEs to access the market, available financing options, and customers by providing platforms for logistics and services
Enhance dispute resolution for MSMEs in cross-border trade	Offering online negotiation, mediation and arbitration services to resolve commercial cross-border disputes, particularly for MSMEs	Efficient and green resolution of commercial cross-border disputes	Online dispute resolution (ODR), such as that available under the APEC ODR Collaborative Framework, is an inexpensive and quick way for MSMEs to resolve commercial cross-border disputes.
Collaborative strategies and supportive measures for inclusive MSME engagement in Authorised Economic Operator (AEO) programmes	Adopting collaborative strategies and implementing supportive measures, such as tailored evaluation processes, streamlined certification procedures, increased training and dissemination efforts, and (availability of) financing tools.	Inclusive MSME participation in AEO programmes	Provide supporting tools and collaborate with trade associations to raise MSME awareness and access to support for AEO certification. Other example includes incorporating other government agencies into AEO programs to bring more direct benefits to SMEs, thus serve as an incentive for small firms to join. In addition, promoting collaboration between MSMEs and large enterprises, with added benefits for trading with certified MSMEs, will facilitate MSMEs' capabilities to meet AEO requirements (APEC SCCP 2021b).
Drive digital transformation and empowering digital solutions for MSMEs	Addressing societal trust and engagement with AI, providing government programmes and guidance for MSMEs to develop AI capabilities, promoting reskilling and upskilling initiatives, enabling access to finance and markets through digitalisation and financial innovation	Improved AI capabilities and increased digital empowerment for MSMEs	Promote and build trust in AI by leveraging the experience of industries and sectors that have seen successes utilising the technology. For example, banks and FinTech start-ups are already using AI in outreach, education and communications to close the digital literacy gap and include individuals more fully in the economy.

Source: Compiled by APEC PSU.

4.6 KEY TAKEAWAYS

Chokepoint 1

Policy practices for tackling inefficient digitalisation of end-to-end supply chains include measures such as fostering interoperability, upgrading government systems, reducing barriers and risks, building trust, promoting innovation and digital readiness, and strengthening cooperation while utilising emerging technologies.

Chokepoint 2

The suggested measures involve various actions, including the digitalisation of ports and the transformation of associated logistics networks, the adoption of digital technology, the establishment of public–private partnerships and collaboration, fostering a culture of openness toward innovation and change, promoting private sector involvement in infrastructure development and investment, improving bureaucratic efficiency and regulations, and investing in both physical infrastructure that supports the digital economy and foundational digital infrastructure.

Chokepoint 3

Measures to address this chokepoint cover policies such as establishing international standards and agreements to ensure smooth cross-border data flows, enhance digital trade provisions, foster an enabling environment for FinTech, and leverage international standards for data sharing and cybersecurity.

Chokepoint 4

APEC practices focus on promoting green and sustainable supply chain management, promoting the BCG economy model, harnessing digital technology for eco-friendly dispute resolution, empowering MSME participation in green supply chains and driving sustainable practices through ESG integration.

Chokepoint 5

The policy practices for Chokepoint 5 aim to support MSMEs and address the barriers they face in accessing and integrating into global supply chains; particularly in the areas of digitalisation, technological innovation, capacity building and engagement in AEO programmes.

5. CONCLUSION AND WAY FORWARD

The report has identified 69 indicators to measure progress on the five chokepoints identified under SCFAP III (described in Appendix A) and a set of policy practices that can help address the chokepoints (listed in Appendix B). The identified indicators and policy practices would be the instruments for formulating the mid-term and final assessment of SCFAP III in 2024 and 2027 respectively.

In essence, to effectively implement SCFAP III and achieve the desired outcomes, it is crucial to:

- give priority to implementing the policy practices identified for each chokepoint (summarised in Table 5.1), taking into account their unique challenges and opportunities

- monitor and assess progress using the identified indicators to gauge the effectiveness of implemented measures and make necessary adjustments

- continuously review and update policies and practices in response to emerging technologies, global trends and evolving market dynamics

- strengthen regional and international cooperation to tackle cross-border challenges and promote innovation and digitalisation

By considering these recommendations and leveraging the identified indicators and policy practices, SCFAP III can effectively address the five chokepoints and provide tangible benefits to contribute to the implementation of Aotearoa Plan of Action through promoting resilient supply chains and responsible business conduct, strengthening digital infrastructure, accelerating digital transformation and narrowing the digital divide.

Table 5.1. Summary of policy practices for SCFAP III

Chokepoint	Measures/Actions	Champion Economy
Chokepoint 1 Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges	• Fostering interoperability • Upgrading government systems • Reducing barriers and risks • Building trust • Enhancing supply chain management • Promoting innovation and digital readiness • Strengthening cooperation while utilising emerging technologies	Korea Peru Singapore The United States
Chokepoint 2 Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks	• Digitalisation of ports and logistics networks • Adoption of digital technology • Establishment of public–private partnerships and collaboration • Fostering a culture of openness toward innovation and change • Promoting private sector involvement in infrastructure development and investment • Improving bureaucratic efficiency and regulations • Investing in physical and foundational digital infrastructure	Japan
Chokepoint 3 Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains	• Establishing international standards and agreements for smooth cross-border data flows • Enhancing digital trade provisions • Fostering an enabling environment for FinTech • Leveraging international standards for data sharing and cybersecurity	China Korea
Chokepoint 4 Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable	• Promoting green and sustainable supply chain management • Promoting the bio-circular-green (BCG) economy model • Harnessing digital technology for eco-friendly dispute resolution • Empowering MSME participation in green supply chains • Driving sustainable practices through environmental, social and governance (ESG) integration	The United States
Chokepoint 5 Lack of targeted support to facilitate micro, small and medium enterprises' (MSMEs) access and integration into global supply chains	• Supporting MSMEs in accessing and integrating into global supply chains • Addressing barriers in digitalisation and technological innovation • Capacity building • Engagement in Authorised Economic Operator (AEO) programmes	Chile The Philippines

Source: Compiled by APEC PSU.

APPENDICES

APPENDIX A. QUANTITATIVE INDICATORS

Table A.1. List of quantitative indicators to measure progress under SCFAP III

Chokepoint	Indicator no.	Indicators	Year	No. of APEC economies
1. Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges	A.1	Percent of import declarations cleared electronically	**2022**	**18**
	A.2	Percent of export declarations cleared electronically	**2022**	**16**
	A.3	Percent of import and export procedures that allow for electronic processing	**2022**	**15**
	A.4	Pre-arrival processing supported by the possibility to lodge documents in advance in electronic format (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.5	Import and export procedures allow for the electronic payment of duties, taxes, fees and charges (including inspections fees, licenses, permits, other fees) collected upon importation and exportation (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.6	Electronic payment system integrated with the automated declaration/cargo processing systems (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.7	Risk management applied and operating in an automated environment (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.8	Single Window supported by information technology (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.9	IT systems capable of accepting and exchanging data electronically (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.10	Automated processing system includes functions allowing for the release of goods subject to conditions (i.e., guarantee) (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.11	Digital certificates and signatures in place (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.12	Automated processing for Customs declarations available full-time (24/7) (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	A.13	Quality of telecommunications and IT (score, 0 to 2, where 2 designates best performance)	**2022**	**19**
	A.14	Implementation rate of paperless trade facilitation (0% to 100%, 100%=full implementation)	**2021**	**18**
	A.15	Implementation rate of cross-border paperless trade facilitation (0% to 100%, 100%=full implementation)	**2021**	**18**
	A.16	Automated Customs system (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.17	Internet connection available to Customs and other trade control agencies (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.18	Electronic Single Window system (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.19	Electronic submission of Customs declarations (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.20	Electronic application and issuance of import and export permit (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.21	Electronic submission of sea cargo manifests (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.22	Electronic submission of air cargo manifests (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.23	Electronic application and issuance of preferential certificate of origin (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.24	E-payment of Customs duties and fees (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.25	Electronic application for Customs refunds (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.26	Electronic exchange of Customs declaration (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.27	Electronic exchange of certificate of origin (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**

Chokepoint	Indicator no.	Indicators	Year	No. of APEC economies
	A.28	Electronic exchange of sanitary & phyto-sanitary (SPS) certificate (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	A.29	Electronic application and issuance of SPS certificates (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
2. Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks	B.1	Logistics Performance Index (LPI), overall score	**2023**	**20**
	B.2	LPI Customs and border management score	**2023**	**20**
	B.3	LPI trade- and transport-related infrastructure score	**2023**	**20**
	B.4	LPI international shipments score	**2023**	**20**
	B.5	LPI logistics competence and quality score	**2023**	**20**
	B.6	LPI timeliness score	**2023**	**20**
	B.7	LPI tracking and tracing score	**2023**	**20**
	B.8	LPI container ships' turnaround time at port weighted by ship's TEU (days)	**June 2022**	**20**
	B.9	LPI aviation import dwell time (days)	**Q2 2022**	**19**
	B.10	LPI consolidated dwell time, import (days)	**May-Oct 2022**	**20**
	B.11	LPI consolidated dwell time, export (days)	**May-Oct 2022**	**20**
	B.12	Container port throughput per 1000 population (TEU)	**2021**	**19**
	B.13	Liner Shipping Connectivity Index (maximum 2004=100)	**2021**	**20**
	B.14	Liner Shipping Connectivity Index, quarterly (maximum Q1 2006=100)	**Q4 2022**	**21**
	B.15	DHL Global Connectedness Index	**2021**	**21**
	B.16	Fixed broadband subscriptions per 100 inhabitants	**2021**	**21**
	B.17	Mobile broadband subscriptions per 100 inhabitants	**2021**	**21**
	B.18	Secure Internet servers per 1 million people	**2020**	**20**
	B.19	Internet broadband download speed, fixed broadband (median megabits per second)	**March 2023**	**21**
	B.20	Internet broadband download speed, mobile broadband (median megabits per second)	**March 2023**	**21**
	B.21	Networked Readiness Index	**2022**	**18**
3. Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chain	C.1	Cross-border cooperation and coordination of the activities of agencies involved in the management of cross-border trade, with a view to improving border control efficiency and facilitating trade (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	C.2	Cross-border coordination/harmonisation of data requirements and documentary controls (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	C.3	Cross-border coordination/harmonisation of the different computer systems (score, 0 to 2, where 2 designates best performance)	**2022**	**20**
	C.4	Cross-border Paperless Trade Facilitation (UN) (implementation rate of measures that enables cross-border mutual recognition, and exchange of trade-related data and documents in electronic form through institutional arrangement and operational mechanisms) (0% to 100%, 100% = full implementation)	**2021**	**18**
	C.5	Laws and regulations for electronic transactions (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	C.6	Recognised certification authority (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	C.7	Paperless collection of payment from a documentary letter of credit (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
4. Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable	D.1	Number of companies publishing sustainability reports (as share of listed domestic companies)	**2020**	**18**
	D.2	World Economic Forum (WEF) Energy Transition Index	**2023**	**17**
	D.3	Share of renewable energy in total electricity generation (%)	**2020**	**21**
	D.4	Adjusted savings: natural resources depletion (% of GNI)	**2020**	**19**
	D.5	Adjusted savings: carbon dioxide damage (% of GNI)	**2020**	**19**
	D.6	Greenhouse gas emissions per capita (in tonnes of carbon dioxide equivalent)	**2021**	**18**

Chokepoint	Indicator no.	Indicators	Year	No. of APEC economies
5. Lack of targeted support to facilitate MSMEs' access and integration into global supply chains	E.1	Implementation rate of trade facilitation measures for SMEs (0% to 100%, 100% = full implementation)	**2021**	**18**
	E.2	Trade-related information measures for SMEs (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	E.3	SMEs in AEO scheme (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	E.4	SMEs' access to Single Window (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	E.5	SMEs in National Trade Facilitation Committee (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**
	E.6	Other special measures for SMEs (score, 0 to 3, 3 indicates measures fully implemented)	**2021**	**18**

AEO=Advanced Economic Operator; OECD=Organisation for Economic Co-operation and Development; SCFAP III=Phase 3 of the APEC Supply Chain Connectivity Framework Action Plan: SME=small and medium enterprises; WEF=World Economic Forum

Data sources:

- **Chokepoint 1**: A.1 to A.13: OECD Trade Facilitation Indicators; A.14 to A.29: UN Global Survey on Digital and Sustainable Trade Facilitation
- **Chokepoint 2**: B.1 to B.11: World Bank Logistics Performance Index (LPI); B.12 and B.14: UNCTADstat; B.13 and B.18: World Bank World Development Indicators; B.15: DHL Global Connectedness Index; B.16 and B.17: International Telecommunication Union (ITU) Statistics; B.19 and B.20: Speedtest Global Index; B.21: Network Readiness Index.
- **Chokepoint 3**: C.1-C.3: OECD Trade Facilitation Indicators; C.4-C7: UN Global Survey on Digital and Sustainable Trade Facilitation
- **Chokepoint 4**: D.1: UN Sustainable Development Goals (SDG) Indicators; D.2: WEF Energy Transition Index; D.3: International Renewable Energy Agency Statistics; D.4-D.5: World Bank World Development Indicators; D.6: Statistical Review of World Energy.
- **Chokepoint 5**: E.1-E.6: UN Global Survey on Digital and Sustainable Trade Facilitation

APPENDIX B. POLICY PRACTICES

This section details the policy practices for Phase Three of the APEC Supply Chain Connectivity Framework Action Plan (SCFAP III) associated with the identified chokepoints.

Table B.1. Policy practices for Chokepoint 1

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
1	Guidelines for Paperless Trade (APEC SCCP 2021a)	• Economies should create a single-entry point for traders to submit import/export/transit documentation through a Single Window system (using technology) and avoid duplicate requests for documentation unless in limited, urgent circumstances. • Economies should accept electronic documents and certificates as the legal equivalent of paper versions, allow electronic import/export/transit declarations and permits, use their Single Window for advance cargo information and allow electronic signatures to protect against fraud. • Economies should adopt or maintain procedures that provide for advance electronic submission and processing of information before the physical arrival of the goods to enable release on arrival unless further processing is deemed necessary.	Adoption of the best practice guidelines can assist all traders, especially micro, small and medium enterprises (MSMEs) to engage with APEC Customs authorities electronically.
2	Compendium of Best Practice Technology Solutions for Single Window Interoperability (APEC CTI 2019b)	To address the lack of standards and interoperability issues in cross-border transactions, governments and businesses are turning to new technology such as blockchain which enables a trusted and verifiable cross-border trade information system.	Application of new and innovative technology can save time and money by eliminating the need to replicate and report similar information to authorities. The collaboration between industry and governments in the development and adoption of international standards for digital solutions can facilitate smoother and more efficient cross-border trade.

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
3	Economic Impact of Adopting Digital Trade Rules: Evidence from APEC Member Economies (APEC CTI 2023b)	• Cross-border paperless trade requires the set-up and operation of multiple measures in concert, such as information technology (IT) border systems for EDI-based exchange, Single Windows, domestic rules on the legal validity of electronic documents and signatures, capacity building in Internet access, and digital skills to boost use of paperless trade by MSMEs and e-traders. • There is a need for greater harmonisation of regulations related to cross-border data flows to improve implementation of provisions. • Policymakers should support the implementation of provisions that encourage cross-border data flow and promote stakeholder confidence in the digital trade environment.	The commissioned research gives policymakers in APEC economies a clearer sense of the economic significance of modern digital trade, including e-commerce provisions. The increased use of digital technologies in supply chains can help reduce costs, improve efficiency and enhance transparency.
4	Utilizing Digital Technology in the Field of Trade Facilitation under the Current COVID-19 Pandemic and Beyond: Best Practices Sharing Workshops (APEC CTI 2021c)	• The success of digital trade systems depends on cross-border interoperability, and collaboration among governments and other stakeholders, as well as overcoming cybersecurity risks, inclusivity barriers and unfair competition. • Digital trade platforms connect stakeholders in trade transactions and help them with important tasks such as completing documents, making payments or tracking cargo. They can reduce costs, simplify logistics and facilitate seamless flow of information. • E-signatures, e-payments and virtual assistant solutions are supported by underlying enabling technologies with the potential to expand access to global supply chains and promote inclusivity, such as artificial intelligence (AI), blockchain and 5G. • Truly interoperable digital platforms should facilitate cross-border exchanges of data between public and private entities, including Customs authorities, shippers, banks and more.	Promoting interoperability and addressing cybersecurity risks will encourage digital technology adoption and solutions in the area of trade facilitation through e-commerce platforms and Single Windows, among others. Digital technologies, such as trade and e-commerce platforms, social media and the Internet, provide opportunities for MSMEs to overcome restrictive challenges and bridge gaps with larger companies.

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
5	Best Practices Sharing Workshop: Utilising Digital Technology in the Field of Trade Facilitation under the Current COVID-19 Pandemic and Beyond (Phase II) (CTI, 2021)	• Foster interoperability to facilitate cross-border exchanges of data between public and private entities. • Best practices for governments to upgrade their own systems include: ○ Leveraging existing resources and starting with simple, internally developed solutions. ○ Ensuring policy support for the upgrade process. ○ Managing new technological integrations. ○ Creating supportive onboarding experience to help companies and technology service providers access assistance as needed. ○ Adopting cloud technologies from the beginning to enable easier expansion. ○ Making conscious effort to continuously develop and improve the basic layers of enabling application programming interfaces (APIs). • Government agencies can play a leading role in reducing risks and lowering barriers to entry for adopters of digital technologies. • Foster trust in digital solutions among businesses and the wider population.	Communicating and sharing value: Digital technologies offer a variety of benefits to businesses, consumers, and economies, such as greater efficiencies, reduced costs, and access to a wider range of goods and services. However, barriers to adoption still exist, such as start-up costs, security concerns and a lack of digital literacy. Although there are specific solutions to each challenge, effective communication about the advantages of new technologies is a common solution.
6	Utilizing Digital Technology in the Field of Trade Facilitation under the Current COVID-19 Pandemic and Beyond (APEC CTI 2021c, 2023d)	• Economies should offer digital technologies that provide several benefits to businesses and consumers, including greater efficiencies, reduced costs, and access to a broader range of goods and services. • APEC Customs authorities should introduce electrical freight inspection. • Economies within APEC should cooperate more to foster interoperable digital systems through collaboration that benefit stakeholders across sectors and economies.	Adoption of the best practices among APEC economies can facilitate the flow of goods and services.
7	APEC Policy Brief on EAASR and ASCR: Services Competitiveness and Structural Reform (APEC EC and APEC GOS 2022)	Enhance services competitiveness and digitalisation through: • Fostering innovation ecosystems and investment in digital enablement. • Investing in digital upskilling and reskilling of workforces. • Investing in quality telecommunications infrastructure to support digital readiness. • Reducing the regulatory compliance cost burden on businesses to reduce digital regulatory inefficiencies.	Both trade liberalisation and domestic regulatory reform in digital services sectors will boost the breadth and depth of global value chain (GVC) integration in the region. Access to digital services can also help enhance GVC resilience.

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
8	Enhanced APEC Agenda for Structural Reform: Individual Action Plans (APEC EC 2022d)	The EAASR seeks to contribute to APEC's overarching goal of promoting strong, balanced, inclusive, innovative and sustainable growth, through measures in line with the following four pillars: • Creating an enabling environment for open, transparent and competitive markets. • Boosting business recovery and resilience against future shocks. • Ensuring that all groups in society have equal access to opportunities for more inclusive, sustainable growth, and greater well-being. • Harnessing innovation, new technology and skills development to boost productivity and digitalisation. Under the EAASR, economies submitted individual action plans (IAPs) that outline their structural reform initiatives through to 2025. Economies were encouraged to nominate reform actions under all four pillars and across all sectors, particularly services, to ensure IAPs are suitably ambitious and comprehensive, together with quantitative and qualitative indicators to enable future monitoring and review.	Some examples related to the digital economy are mentioned in the IAPs: • Promoting digitisation of businesses and industries to enhance their competitiveness and resilience • Revisiting regulations in light of digital technology to remove unnecessary barriers to digital trade and investment • Using new digital technologies such as blockchain, AI and the Internet of things (IoT) to improve supply chain management • Developing new initiatives such as promoting digital skills and literacy and improving access to digital infrastructure and services
9	Customs Strategic Framework on Building Connectivity: 3M Plus 3S Initiative (APEC SCCP 2019)	• APEC Customs would endeavour to build Smart Borders, enable Smart Logistics, and promote Smart Trade (3S) through stronger cooperation in Mutual Recognition of Control, Mutual Assistance of Enforcement, and Mutual Sharing of Information (3M). • Strengthen connectivity among APEC members through closer cooperation on Single Window interoperability. • Enhance the use of new technologies, such as automatic threat recognition, big data and AI in the Customs risk analysis process.	Improve effectiveness and efficiency of border procedures and controls which can lead to better risk management and trade facilitation.
10	The Future of Trade and Border Management to 2030 (APEC SCCP 2020b)	Emerging technologies like blockchain can help Customs agencies improve their cross-border trade systems by integrating stakeholders into a transparent environment that promotes efficiency, visibility, security and responsiveness.	This can help governments overcome the limitations of the current Single Window platform used to streamline border clearance processes

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
11	Trade Facilitation Measures to Mitigate Trade Disruptions: COVID-19 Lessons and Response Toolkit (APEC SCCP 2021d)	Mitigate trade disruptions through: • Accepting scanned documents. • Enabling online payments. • Paperless trade measures. • Electronic certificates of origin. • Exempt stamping requirements. • Electronic delivery orders. • Single Windows and online clearance systems.	The measures will better prepare border agencies to face future global supply chain disruption.
12	The Future of Trade Building Blocks: Laying the Building Blocks – Outcomes Report (APEC SCCP 2021c)	• APEC economies could consider the use of shared KYC (know your customer) databases within their economy, and the promotion of standardised e-KYC frameworks within and between economies, to facilitate and streamline end-to-end digital authorisations securely. • APEC economies should encourage the adoption of digital technologies in supply chains through a number of different mediums including: establishing or strengthening public–private partnerships; and/or utilising incentives, subsidies or procurement contracts to encourage, promote, or in some cases, require adoption and use of digital technologies. • APEC should consider ways to assist economies that are lacking in resources to adopt digital technologies, using international standards, for APEC-wide risk management.	The proposed measures can enhance the efficiency, reduce costs and improve risk management of the supply chain.
13	Best Practices Guidelines on Customs Control for COVID-19 Related Goods (APEC SCCP 2022)	Customs authorities are encouraged to employ advanced technologies and innovations to improve border control efficiency while the movement of legitimate trade is being maintained, especially during emergency situations.	Utilising advanced technologies in border control can significantly accelerate the clearance process, enabling quicker turnaround times and cost savings for businesses

Chokepoint 1: Inefficient digitalisation of end-to-end supply chains, including border procedures and trade documentation exchanges			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
14	ABAC 2020 Report to APEC Economic Leaders (ABAC 2020b)	• Facilitating data flow in marine logistics: adopt and promote interoperability among Single Window platforms. • Establishing trust services: trust services provide a means of ensuring the legitimacy and dependability of data (such as electronic signatures, electronic seals or time stamps, electronic certificates), which serves as a foundation for facilitating the seamless digitisation of business activities.	• Maritime transport is crucial to global trade, but its complexity and dependence on various ecosystems require an integrated system of interoperability to expedite marine logistics and the entire supply chains processes. • Automating and digitising business contracts and transactions can enhance the visibility and resilience of supply chain.
15	ABAC 2021 Report to APEC Economic Leaders (ABAC 2021)	Enhance interoperability of digital systems for trade and supply chain connectivity: • Accelerate the implementation of the APEC Internet and Digital Economy Roadmap in areas of greatest impact for business. • Establish interoperable paperless trade systems across the region. • Support an enabling ecosystem for e-signatures. • Develop a regional implementation plan for global data standards. • Encourage cooperation on data governance in relation to privacy including the APEC Cross-border Privacy Rules system. • Prioritise effective cybersecurity.	APEC can foster the interoperability of existing digital systems and enhance the digitalisation of supply chains by addressing gaps that prevent end-to-end digitalisation, thus contributing to a secure digital trade and supply chain connectivity system.
16	ABAC 2022 Report to APEC Economic Leaders (ABAC 2022)	Establish a smooth, secure, trusted and inclusive cross-border digital trade and e-commerce by developing World Trade Organization (WTO)-consistent digital trade rules that prioritise simplicity and interoperability, and are based on international standards, where applicable, to avoid digital policy fragmentation and to reduce the compliance burden, particularly on MSMEs.	Easing compliance burden for MSMEs to participate in digitalised supply chains.

Table B.2. Policy practices for Chokepoint 2

Chokepoint 2: Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
1	Promote Supply Chain Connectivity by Enhancing and Better Understanding Digital Innovation in APEC Port Industry (APEC TPTWG 2022b)	The digitalisation of ports requires collaboration between the government and enterprises, with the government promoting interconnected information platforms, cooperation between ports and the construction of a multi-modal transport information network.	Enhancing smart infrastructure and fostering a culture of openness toward innovation and change can help address bottlenecks and increase the maturity of ports by creating a common level of understanding and better embracing digital transformation.
2	Peer Review and Capacity Building on APEC Infrastructure Development and Investment: Indonesia (APEC PSU 2019)	Promote private sector participation in infrastructure development and investment: • Improve efficiency in bureaucracy and regulation through setting up technical guidance or standard operating procedures for public–private partnership (PPP) process approval. • Further acceleration in government support and facilities. • More efficient land acquisition process. • Strengthen PPP contract enforcement to reduce vulnerability to political and regulation changes. • Improvement in risk mitigation strategy.	Efforts to drive private firms to participate in infrastructure development and investment should begin by developing a supportive institutional environment for public–private contracting and the enforcement of property rights, among others.
3	APEC Virtual Public–Private Dialogue (PPD) on Emerging Opportunities and Challenges in Implementing the APEC Connectivity Blueprint 2025 (APEC CTI 2021a)	Sustaining connectivity in the region: • Support opening of infrastructure such as port and airports, services such as maritime and aviation and digital infrastructure to facilitate free flow of trade in goods and services during and post-pandemic. • Adoption of digital technology will provide a major confidence boost to businesses seeking to invest in productive capacity. • Collaboration between the private sector and policymakers on reducing the connectivity gaps should be nurtured. • Digital technology should be fully utilised; and innovation and invention of new technologies must be promoted to facilitate business travellers and other stakeholders.	• Opening and adoption of physical and digital infrastructures in order to support multi-modal connectivity and logistics networks for free flow of trade in goods and services. • Adoption of the latest digital technology such as blockchain will allow seamless and uninterrupted transfer of data on supply availability; identification of supply and demand; ability to connect in real time with logistic providers; and utilisation of Authorised Economic Operator (AEO) in clearing goods at Customs.

Chokepoint 2: Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
4	Policy Roundtable for the Safe Passage of APEC Maritime Crew, 6 September 2022 – Summary Report (APEC TPTWG 2022a)	• Support the development of digitalised systems in the maritime industry, which should adopt harmonised digital documents and digital operation systems to ensure seamless operations despite shocks. • Ensure transparency in shipping and border policies and regulations, as well as availability of necessary digital infrastructure in ships and ports.	The event highlighted the need for a healthy, highly skilled and motivated maritime workforce to support the ever-increasing demand for goods and products transported by sea through a sophisticated supply chain network. The recommendations will support a well-functioning global logistics network.
5	Workshop on Effective Domestic Policymaking for Stimulating Economic Upgrading through Global Value Chains (APEC CTI 2022c)	• Modernise physical and digital infrastructure. • Support servitisation of supply chains through the development of electronic trading platforms. • Increasing supply chain automation with Internet of things (IoT) technologies, artificial intelligence (AI), blockchain, robotics as well as data standardisation and facilitation of data exchange on transportation (especially maritime). • Maintaining an open, non-discriminatory, rules-based, predictable and stable multilateral trading system, as embodied by the World Trade Organization (WTO). • Improve the WTO rules to address modern-day challenges and trends in global trade (including the development of common approaches to e-commerce regulation). • Resist the growth of trade protectionism, including in the form of unilateral trade restrictions.	Joint efforts by the APEC economies in promoting a more effective infrastructure development would enable a more efficient functioning of supply chains and global value chains.
6	2018 APEC Economic Policy Report on Structural Reform and Infrastructure (APEC EC 2018)	Structural policies to support quality infrastructure: • Developing a credible pipeline of bankable projects to support prioritisation of public expenditure and attract private investment. • Ensuring regulatory systems are adaptive and incentivise technology uptake and innovation. • Ensuring sufficient resiliency of infrastructure, fiscal balances and entities to potential disruptive events, which can minimise costs and disruption over time.	Without adequate infrastructure such as transportation, business and logistics services will be affected. The recommendations from the report could help to address the infrastructure gap and deficit in APEC economies.

Chokepoint 2: Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
7	The Future of Trade Building Blocks: Laying the Building Blocks – Outcomes Report (APEC SCCP 2021c)	APEC economies should prioritise investment in high-speed broadband networks in partnership with the private sector, to create the foundations of digital economies and societies capable of supporting data-sharing networks to the benefit of APEC-wide risk management.	Prioritising investment in high-speed broadband networks in partnership with the private sector can have significant economic benefits for multi-modal connectivity and logistics in APEC economies. It can improve supply chain management, enhance interconnectivity, attract more investment in transportation infrastructure, and improve risk management.
8	Best Practice Guidelines for APEC Customs Administrations to Facilitate the Distribution of COVID-19 Vaccines and Related Goods (APEC CTI 2021b)	Economies should put in place adequate facilities and technical infrastructure at the border to enhance the readiness of the supply chain. This should address potential challenges associated with the handling of time- and temperature-sensitive COVID-19 vaccines and related goods.	Putting in place these measures can positively affect trade by guaranteeing the timely and efficient transportation of goods, reducing the likelihood of spoilage or product damage. As a result, traders, manufacturers and exporters gain more confidence, potentially leading to an upsurge in international trade and investment.
9	Network Virtualization, Disaggregated Networks, and Open Telecommunications Architecture in APEC (Gillott and Vartabedian 2023)	The use of cutting-edge hardware and software components is an advantage of Open Radio Access Network (Open RAN) solutions as this diversifies the vendor ecosystem for mobile network operators (MNOs). This leads to increased competition, innovation and lower pricing, reducing vendor lock-in. Enabling competition among vendors leads to lower network structuring cost and supply stability. Open RAN can reduce the amount of physical infrastructure needed at cell sites.	It supports implementing the use of state-of-the-art hardware and software components from multiple vendors for Open RAN technology. This will reduce maintenance and capital expenditure by driving (emerging) competition among multiple vendors.
10	ABAC 2022 Report to APEC Economic Leaders (ABAC 2022)	The APEC Business Advisory Council (ABAC) is urging the development of a framework to achieve safe and seamless cross-border travel on a regional scale, align different policies and practices, as well as strengthen data security and technology to create a user-friendly experience. • Promote alignment of current regional travel standards and practices. • Collaborate with the private sector on a pilot scheme to develop digitally interoperable travel portals. • Leverage the APEC Business Travel Card (ABTC) system to enable vaccination system interoperability.	The COVID-19 pandemic highlighted the need for economies to maintain cross-border connectivity during times of challenges to minimise supply chain disruptions caused by border restrictions.

Chokepoint 2: Inadequate infrastructure development to support robust multi-modal connectivity and logistics networks			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**

11	ABAC 2022 Report to APEC Economic Leaders	• Invest in the physical infrastructure that undergirds the digital economy:
		  ○ Build and execute digital master plans, including digital infrastructure, with appropriate measurement mechanisms.
		  ○ Enhance digital network coverage with gigabit-level full fibre and 5G connections, and ensure inclusive and reliable access.
		  ○ Expand growth in information and communications technology (ICT) by encouraging public and private investment in frontier technologies, as well as investment in digital education.
		  ○ Expedite public and private sector cloud adoption, including cloud-first policies, to accelerate vertical industry digitalisation.
		• Establish enabling foundational digital infrastructure including through a proposed APEC platform for cybersecurity and the adoption of interoperable trusted digital identities.
			The development of physical infrastructure such as 5G, broadband, and data centre facilities can enable connectivity and encourage faster and wider uptake of digital technologies, especially amid increasingly digitalised supply chains.

Table B.3. Policy practices for Chokepoint 3

Chokepoint 3: Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
1	ABAC COVID-19 Report: Laying the Groundwork for Economic Recovery and Resilience (ABAC 2020a)	• Develop international standards and agreements to ensure cross-border data flows while recognising domestic laws and concerns around privacy and security. • Minimise regulatory heterogeneity. • Provide support to economies aligning domestic regulation with international standards. • Encourage transparency and regulatory impact assessments for all new regulation affecting data flows.	The COVID-19 pandemic highlighted the importance of data and technologies; and restrictions on cross-border data flows hamper the operation of digital tools (predictive analysis, artificial intelligence and machine learning), delaying the pandemic response and raising costs for businesses.
2	Economic Impact of Adopting Digital Trade Rules: Evidence from APEC Member Economies (APEC CTI 2023b)	• Increase coverage of digital trade provisions between APEC member economies. • Support implementation of provisions that encourage cross-border data flows. • Promote interoperability as a core principle in the development of digital trade infrastructure. • Focus on provisions to build consumer trust to improve participation of individual consumers and micro, small and medium enterprises (MSMEs) in digital trade. • Focus on cybersecurity collaboration to strengthen digital trade infrastructure in APEC. • Pursue programmes that support consumers, businesses and policymakers to more actively participate in contributing to a vibrant digital trade environment. • Pursue initiatives to track the implementation of digital trade provisions, to support development of targeted capacity-building initiatives.	Addressing gaps in digital trade provisions and its implementation will help ensure economies achieve the intended benefits of the provisions, which may help address the current issues of insufficient digital trade provisions.

Chokepoint 3: Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
3	Facilitating Access to Open Government Data: Frameworks and Practices (APEC CTI 2023c)	• Put open government data (OGD) at the top of domestic and APEC-level agendas. • Design an Open Data policy for effective stakeholder engagement. • Implement and sustain supportive policy frameworks. • Make datasets visible, accessible and usable. • Promote the use of interoperable standards. • Strengthen governance frameworks. • Implement OGD across government organisations to streamline and rationalise processes. • Put citizens' needs and experiences at the centre of OGD initiatives. • Incentivise public sector organisations to actively collaborate in the OGD space. • Follow guidelines and best practices around OGD. • Drive and support research and development (R&D) specifically for OGD. • Position OGD as a key tool for crisis readiness and response.	OGD for transparency of non-sensitive government to enhance the accessibility and use of public information across borders. Not only do public institutions become more transparent and accountable when making datasets available, these datasets also can enable innovation and enhance commercial applications.
4	APEC Policy Considerations for Developing Cross-border Payments and Remittances (APEC 2022b)	Policy considerations include availability, accessibility, affordability, efficiency, interoperability, safety, and sustainable development. Policies should encourage innovation and competition to meet consumer needs.	• The policy considerations aim to address challenges in cross-border payments, such as high cost, low speed, limited access and inadequate transparency wherein implementation is subject to each member's discretion and negotiation with its counterparties. • Financial connectivity will facilitate more convenient, secure and cost-effective transactions, supporting the trade and tourism industries and aid in the revival of the post-COVID-19 economy.

Chokepoint 3: Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
5	Building an Enabling Environment for FinTech (APEC EC 2022c)	Promote development of emerging technologies for trade and sustainable finance by considering the following approaches: • Develop in-house government expertise on key innovations, in line with domestic capacity-building initiatives on digital upskilling and upgrading of existing technology infrastructures. • Establish public–private partnership to allow greater collaboration between public and private sector in the development of cutting-edge technologies. • Provide capital for research and development, such as through an innovation fund that is dedicated to helping bring breakthrough technologies to market. • Evaluate the use of regulatory sandboxes given the nascency of the technology applications. • Establish innovation centres to foster market growth and serve as a one-stop hub for relevant information on emerging technologies.	FinTech solutions are integral to promoting cross-border digital trade and levelling the playing field on cross-border payments. Innovative products and services that draw on advancements in FinTech discussed in this report are driving greater adoption and new applications in modern-day trade value chains and sustainable financing.
6	FinTech Regulatory Sandboxes Capacity Building Summary Report (APEC EC 2021)	• Active dialogue/collaboration with market participants; cross-agency cooperation; and international cooperation. • Flexible testing scope or key success indicators to facilitate business innovation. • Clear, transparent communication throughout the sandbox process.	APEC economies recognise the importance of international cooperation in developing FinTech sandboxes. Discussion platforms and innovation groups could facilitate better exchange of experiences on international FinTech sandboxes. Additionally, the launch of regional or global sandboxes could be beneficial, considering the cross-border nature of many FinTech companies.

Chokepoint 3: Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
7	The Future of Trade Building Blocks: Laying the Building Blocks – Outcomes Report (APEC SCCP 2021c)	• APEC should encourage the promotion of e-invoicing and the use of other electronic paperless business communications beyond current levels, with a focus on international and interoperable standards, such as the Peppol E-Invoicing standard. • APEC economies should seek ways to strengthen sharing of cybersecurity alerts at levels that include Customs offices and also sharing of anti-cybersecurity measures. • Data, data sharing and data use within and between APEC economies will increase with the shift to digital and automated processes, and as such APEC economies should leverage international standards to facilitate interoperability and data flows. • APEC should facilitate capacity building between economies to ensure best-practice development and adoption, and implementation of data sharing architecture, and each economy should encourage appropriate and relevant training for all parties, including Customs personnel, to ensure ongoing use and understanding. • APEC economies should find ways to increase the value and reduce the costs for MSMEs to join the APEC Cross-border Privacy Rules (CBPR) system.	Trade modernisation and border management of the future must be underpinned by an enabling framework, ongoing adoption of digital technologies, and safe and secure sharing of information across borders.
8	ABAC 2020 Report to APEC Economic Leaders (ABAC 2020b)	• Address unnecessary barriers to, and build trust in, cross-border data flows and expand international regulatory cooperation to develop interoperability mechanisms. Initially, the focus should be on privacy, consumer protection and cybersecurity. • APEC should fully implement the Internet and Digital Economy Roadmap by developing policies to address regulatory goals such as privacy, security, financial regulation and law enforcement without impeding cross-border data flows.	To prevent cross-border data flow restrictions within APEC and promote digital connectivity, regulations should be adopted to enable businesses and consumers to benefit from digital connectivity, with a focus on interoperability to prevent digital policies and regulations from becoming barriers to trade.

Chokepoint 3: Insufficient cooperation on data flows and cross-border payments to support increasingly digitalised supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
9	ABAC 2022 Report to APEC Economic Leaders (ABAC 2022)	• Bolster data infrastructure by adopting Open Data standards to expand value creation and improving the requisite secure cross-border data flows. • Build the digital market infrastructure for MSME supply chain finance, promote the development of interoperable Open Data systems, and coordinate efforts to develop central bank digital currencies to ensure their future interoperability and effectiveness in promoting cross-border transactions.	Digitalisation is particularly impactful in trade and supply chain finance. It facilitates access to finance for MSMEs, for which traditional credit underwriting is very difficult at the earlier stages of the order-to-payment cycle.

Table B.4. Policy practices for Chokepoint 4

Chokepoint 4: Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
1	APEC Strategy for Green, Sustainable and Innovative MSMEs (APEC 2017)	• Encourage green government procurement and green procurement policies by large companies to encourage micro, small and medium enterprise (MSME) suppliers to provide environmentally sustainable goods and services. • Encourage larger companies and successful green companies to share best practices on adopting a green business model with MSMEs to increase their opportunities to engage in international markets where green standards are widely accepted. • Establish green standards and certifications, eco-labelling schemes consistent with international standards, as well as the effective implementation of environmental laws.	Expansion of green supply chain network and development.
2	APEC Bio-Circular-Green (BCG) Symposium – Summary Report (APEC CTI 2022a)	• Make the bio-circular-green (BCG) economy model more widely known and encourage its application by all stakeholders. i.e., government agencies, the private sector especially MSMEs, educational institutions, etc. • Draft of policy recommendations to initiate the roadmap and strategy of the BCG economy model in a non-binding mode. • Link science and technology. Discussions with APEC's Policy Partnership on Science, Technology and Innovation (PPSTI). • Provide more case studies from a variety of industry sectors in future symposium. • Consider collective actions by fora for future planning while economies start individual action by promoting the BCG economy model or strengthening its current policy and implementation. • Assess and link the outcome of all relevant APEC projects aimed at promoting the BCG economy model to improve future projects. • Form key alliances with organisations beyond APEC to support innovative and sustainable initiatives.	Promoting BCG economy model to stakeholders to raise awareness and understanding of green supply chain management (GSCM) practices which can offer guidance to firms, including MSMEs, on how to make the supply chains more sustainable

Chokepoint 4: Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
3	APEC Economic Policy Report 2022: Structural Reform and a Green Recovery from Economic Shocks (APEC 2022a)	Using digital technology to enhance legal infrastructure and promote economic growth has become crucial. Online dispute resolution (ODR) plays a key role by providing MSMEs with quicker, cheaper and environmentally friendly ways to resolve disputes.	Strengthening the economic and legal infrastructure can boost efficiency and catalyse new green supply chains and enterprises leading to reduced pressure on resource use.
4	APEC Stocktake of Carbon Pricing Initiatives (APEC EC 2022b)	Closer international ties may expand functionality and allow for more emissions reductions at lower prices, while learning from peers could help in designing systems in a more efficient and collaborative manner. Economies with a high degree of integration in trade and commerce can find low-cost ways to reduce emissions and access liquidity.	The potential barriers to integration in carbon pricing include differences in ambition levels, emission ceilings, approaches to offset limitations, price control, measurement, reporting and verification (MRV), etc. Overcoming these barriers could lead to better policies and cost-efficient emissions reductions in the region.
5	Bangkok Goals on Bio-Circular-Green (BCG) Economy, endorsed through the 2022 Leaders' Declaration (APEC 2022a)	• Support global efforts to comprehensively address all environmental challenges, including climate change, extreme weather and natural disasters, for a sustainable planet, particularly in terms of climate mitigation, adaptation and resilience. • Drive progress on sustainable and inclusive trade and investment; and ensure that such investment also support APEC members' environmental policies. • Promote environmental conservation, sustainable use and management of natural resources, as well as halting and reversing biodiversity loss. • Advance resource efficiency and sustainable waste management toward zero waste.	Expansion of green supply chain network and development.

Chokepoint 4: Lack of understanding on green supply chain management practices and increasing pressure for supply chains to be sustainable			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
6	Guidebook: APEC Best Practices on SMEs High Impact Policy (APEC 2022c)	• Provide comprehensive financing support for MSMEs at all stages of the business life cycle. • Offer debt solution and management arrangements to aid financially distressed companies. • Conduct outreach and awareness programmes to promote financial inclusion and education. • Join global initiatives to support the transition to a nature-positive, net-zero economy. • Engage with the private sector on key industry supply-chain piloting to prepare for nature-related disclosure requirements and inform related government policies and programmes.	Encourage green supply chain and development.
7	ABAC 2020 Report to APEC Economic Leaders (ABAC 2020b)	Enable lenders and investors to incentivise businesses in the region to progressively adopt sustainable practices through an active APEC role in developing global standards for incorporating environmental, social and governance (ESG) factors in financing decisions.	Lenders and investors can help accelerate companies and governments' alignment of practices with the sustainable development goals (SDGs) by integrating ESG factors in their financing decisions to incentivise borrowers and issuers to progressively align with SDGs.
8	ABAC 2021 Report to APEC Economic Leaders (ABAC 2021)	The APEC Business Advisory Council (ABAC) has developed the Climate Leadership Principles for Business to guide the development of relevant practices and policies. APEC economies should also engage in dialogue on how to develop sound, mutually reinforcing, World Trade Organization (WTO)-consistent, and coordinated trade and other policy responses to climate change.	The set of Principles developed by ABAC can serve as a model to adopt practices to address climate change at the enterprise level.
9	ABAC 2022 Report to APEC Economic Leaders (ABAC 2022)	Trade and investment can play a key role, including through increasing access to practical tools, accelerating innovation and leveraging market mechanisms for carbon. APEC should provide a platform for members to collaborate in developing interoperable ESG taxonomies and carbon emissions trading markets, improving disclosure, enabling the financing of sustainable infrastructure and incentivising MSMEs to align their operations with sustainable goals.	Achieving an effective transition to a low carbon economy will be central to the implementation of the Aotearoa Plan of Action and must be a critical element of the Free Trade Area of the Asia-Pacific (FTAAP). ABAC's Climate Leadership Principles can be used as a matrix through which to assess and regularly benchmark all climate-related work streams in APEC, including supply chains.

Table B.5. Policy practices for Chokepoint 5

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
1	Ready for the 'Next Normal': How MSMEs Should Adapt to an Evolving Market Landscape (APEC SMEWG 2022)	• Comprehensive support for digitalisation. • Partnership with digital platform firms. • Health-focused sustainability strategy. • Digital supply chain financing. • Foresight and futuristic mindset. • Omni-channel training and consultation. • Diverse-owned micro, small and medium enterprise (MSME) database. • Procurement process simplification. • Collaboration with community-based organisations. • MSME representatives in competition agencies.	Digital skills and access to digital technology are essential to MSME resilience.
2	Fostering Greater SME Participation in Global Value Chains Resources (APEC CTI 2022b)	• Technologies, such as artificial intelligence (AI) and blockchain, can inform SMEs' decision-making processes, improve their environmental and social credentials, and provide new channels to reach customers and investors. • SMEs need more support to shift their business process to be more environmentally friendly as a response to demand from stakeholders and to comply with environment-related regulations imposed by export markets. Initiatives such as providing them with information about the steps to achieve carbon neutrality may help them to better make the shift better. • Trade processes need to be simplified further, including through digitalisation.	Lack of technologies, difficulties in greening business processes and red tape in export are among challenges faced by SMEs in seeking deeper participation in global value chains (GVCs). Providing targeted support for SMEs can lead to more access and deeper integration into GVCs.
3	APEC Workshop on Opportunities and Challenges for GVCs during COVID-19 Pandemic and Post-Pandemic Economic Recovery (APEC CTI 2023a)	To effectively support the smooth integration of firms and enterprises into GVCs, the public sector should focus on assisting MSMEs through policies for promotion of trade and investment and for creation of an enabling environment for investors and businesses.	Public sector can help support MSMEs to better integrate into GVCs by issuing policies for trade and investment promotion and creating an enabling environment for investors and businesses.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
4	APEC Workshop on Promoting SMEs' Integration into Global Value Chains in Services – Logistics (APEC CTI 2017)	• Governments should enact policies to attract investment, to enhance SMEs' competitiveness and integrate them into GVCs: o create programmes to support their participation in value chains. o develop an efficient innovation system that facilitates investments in knowledge, technology dissemination, skills upgrading and entrepreneurship. o help link SMEs to lead firms. o improve investment climate. • SMEs should innovate and upgrade their capabilities in supply chain management to remain competitive in global trade. • Governments can cooperate with lead firms to provide capacity-building modules for SMEs on supply chain connectivity, corporate governance, and sustainability. • Assign a government agency to facilitate SMEs' integration into GVCs. • Establish websites to enhance awareness and knowledge sharing among SMEs (including regulations updates on areas related to trade/GVCs). • Governments can facilitate SMEs' adoption of world standards and credible certifications.	The recommendations are for governments to provide targeted support for SMEs in the logistics sector for better integration into GVCs.
5	SMEs' Integration into Global Value Chains in Services Industries: Tourism Sector (APEC CTI 2019b)	• Use a governance-based approach to develop pro-MSME tourism policies that address the challenges and opportunities faced by MSMEs. • Develop unique approaches to assist MSMEs in tourism based on emerging trends and the competitiveness of existing offerings. • Explore multiple sources of financing, including government mechanisms, financial institutions, as well as support from non-governmental organisations (NGOs) and international organisations. • Perform a workforce skills assessment for the tourism sector to determine skills and labour deficiencies and barriers faced by workers in accessing relevant skills and jobs. • Create occupational standards for the tourism sector to define the necessary skills, learning outcomes and training methods for curricula development.	These policy interventions aim to address global value chain challenges in the tourism sector, including access to funding and financial support, bureaucracy and regulations, market-based challenges, workforce and labour skills shortages, managerial and business skills, and lack of technology, technological capacity and digital skills.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
6	Final Review of the Boracay Action Agenda Study Report (APEC SMEWG 2021)	• Promote a favourable regulatory and business environment for MSMEs in GVCs in services and in logistics. • Promoting MSMEs' integration by providing capacity-building support such as preparing e-learning programmes and providing skills standards and skill certification programmes. • Assist MSMEs to access the market, available financing options, and customers by providing platforms for logistics and services. • The perennial problem of limited access to financing for MSMEs may be addressed by supply chain financing and secured transactions reform. • Address the lack of a common definition or standard for the region regarding MSMEs. • Promote green, SMART (utilises SMART factory production) and interconnected MSMEs. • Opportunity to enhance MSMEs' competitiveness in the region through capacity-building workshops, in which the APEC Business Advisory Council (ABAC) plays a crucial role. • APEC STAR Database could be revived to provide MSMEs with valuable and accessible information. • APEC could establish a separate APEC Initiatives Database akin to the APEC Project Database.	Adopting policy recommendations and addressing the identified challenges can assist MSMEs to participate in international trade, particularly in global value chains
7	The APEC Collaborative Framework for ODR of Cross-border B2B Disputes – Overview (APEC EC 2019)	Under the APEC Online Dispute Resolution (ODR) Collaborative Framework, APEC partners with ODR providers located in APEC economies that have opted into the framework. These ODR providers offer online negotiation, mediation and arbitration services, particularly for MSMEs, to resolve commercial cross-border disputes in a cost-effective and efficient manner.	Facilitating the provision of efficient and cost-effective ODR services for MSMEs will encourage MSMEs to engage and integrate into global supply chains.
8	APEC Policy Brief on EAASR and ASCR: Services Competitiveness and Structural Reform (APEC EC and APEC GOS 2022)	Collaboration toward regulatory equivalence, convergence or even harmonisation, where possible, needs to take centre stage in trade policy reforms.	As trade costs come down to a certain level, medium-sized firms consider entering foreign markets and trade liberalisation has a much larger effect.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
9	Stocktake of APEC Online Dispute Resolution Technologies (APEC EC 2022e)	The report concludes that member economies have made progress on ODR but the full potential of ODR is yet to be discovered. There is no unified definition of ODR due to constantly emerging new trends in technology. ODR is a paradigm change in the dispute resolution system and technological solutions should facilitate and improve the settlement process. To fully realise the potential of ODR, member economies should: • Raise awareness. • Create effective legislation. • Improve ODR-related infrastructure.	Dispute resolution remains one of the main challenges in trading, while the sustainability and growth of MSMEs are very much dependent on the culture of dispute resolution and the way they interact with their counterparties.
10	Manual of Best Practices according to the AEO Benefits Survey under Pillar 3 WCO SAFE Framework (APEC SCCP 2020c)	Increase collaboration between Customs authorities and other government agencies to increase Authorised Economic Operator (AEO) certification, which can create opportunities to include more SMEs.	AEO programmes can simplify Customs clearance and security to make it easier for SMEs to access global supply chains.
11	Integrating SMEs in Authorized Economic Operator Certification: Improving SME Participation in APEC Secure Trade (APEC SCCP 2021b)	• AEO programmes should consider the differences between the benefits that each type of operator seeks when certifying as an AEO. • Customs administrations should endeavour to review their programmes and be aware that the programmes should not lower their standards for SMEs, but evaluation of compliance by these companies should be more flexible. It is important to recognize the context in which SMEs operate and if the evidence they present is consistent with the identified risks. • AEO programmes must make greater efforts to fulfil requirements for training and dissemination and, especially, strive to have programmes in which the certification processes are faster, more familiar and more understandable, with special emphasis on the incorporation of SMEs. • Economies should look for or adopt tools to support the AEO certification process of SMEs, and work with trade associations to raise awareness of these tools among SMEs. • Customs administrations should work more diligently to involve other government agencies in AEO programmes. This collaboration between organisations can lead to direct benefits for SMEs by reducing clearance times and costs.	Facilitating SME's AEO certification will enhance SME participation in AEO and secure global trade.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
12	APEC Customs Time Release Study: Case Study of AEO MRAs between APEC Member Economies (APEC SCCP 2020a)	The benefits of AEO mutual recognition agreements/arrangements (MRAs) and government-to-business communications, such as awareness-raising activities and training programmes, play a crucial role in determining whether SMEs will apply for AEO certification.	The facilitation of AEO MRAs will strengthen supply chain security and trade facilitation.
13	Learning Workshop in Artificial Intelligence: Experiences of APEC Economies (APEC TEL, 2022)	One of the issues identified during the workshop was the level of engagement, openness and trust society has toward AI as a concept and AI companies in particular. • Federal agencies (such as the US Small Business Administration) can and should have programmes that assist SMEs in developing AI. The US Small Business Administration has many programmes that help small businesses export and find financing. Universities can also step in and often partner with government on small business development centres (SBDCs) that can include AI training, etc. • Government can provide SMEs with clear guidance on best practices for the governance and procurement of AI systems and data management, and to help SMEs have certainty on establishing trustworthy processes for the use of AI. • AI and machine learning can identify cost, time and resource efficiencies that exceed those of teams of people working using traditional methods. By using big data analytics and machine learning to digitally model specific use cases, better returns on investment will be achieved along with a better overall business outcomes. • By applying the analytical capabilities of AI to data collected by the Internet of things (IoT), companies can identify and understand patterns and make more informed decisions that impact companies and users.	The project promotes the responsible use of AI in public and private sectors, in order to improve organisational capacity, productivity, as well as effective adoption of AI technologies in a wide range of applications, while aiming to ensure that the benefits of AI can be experienced broadly and equitably. One of the objectives of the project is to support the business sector, mainly SMEs in developing APEC economies, by sharing information on experiences related to AI and solutions for different sectors.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
14	ABAC 2020 Report to APEC Economic Leaders (ABAC 2020b)	• Enable MSMEs' access to finance and markets by accelerating digitalisation and financial innovation such as inclusive open banking and know-your-customer (KYC) procedures. • Promote reskilling and upskilling of MSMEs, including their digital transformation, to ensure business continuity and participation in international trade and commerce.	• Improving MSMEs' access to finance can facilitate their participation in global supply chains by helping to lessen the disproportionately higher costs they have to bear to obtain capital for business. • Skills development is important in the recovery from COVID-19, particularly for MSMEs, by building the resilience of workers and firms.
15	ABAC 2021 Report to APEC Economic Leaders (ABAC 2021)	• APEC economies need to support MSMEs through digital empowerment, addressing systemic barriers to entrepreneurship through targeted research, and improving the APEC MSME Marketplace. • Economies should also commit to establish timely payment policies for all government purchases. • APEC should establish a 'one-stop shop' digital platform that makes available the best of the region's digital skills programmes and helps the active start-up ecosystem to connect and access trade and investment opportunities. • APEC should champion the adoption of interoperable e-invoicing and support better border and tax policies on low-value e-commerce shipments.	MSMEs have been adversely affected by the pandemic and must improve their digital literacy and capabilities to adapt to the changing business landscape. Access to digital tools and an enabling environment is crucial, where focus should be on developing interoperable e-invoicing and recognition of e-signatures and business-friendly tax treatment of low-value e-commerce shipments, to support resilience, competitiveness, and agility of MSMEs in cross-border trade.

Chokepoint 5: Lack of targeted support to facilitate MSMEs' access and integration into global supply chains			
No.	**Document name**	**Summary of policy practices**	**Relevance / Impact**
16	ABAC 2022 Report to APEC Economic Leaders (ABAC 2022)	Reset and revitalise the MSME economy by focusing efforts toward key areas: • Promoting digital transformation: leverage public–private partnerships to develop digital skills; prioritise simple and interoperable digital trade rules to reduce compliance burden on MSMEs; promote logistics, fulfilment and e-commerce platforms that can scale up MSMEs' international growth. • Enhancing sustainable practices: facilitate MSMEs' engagement in international trade by tackling trade and technical barriers, digitalising customs procedures and facilitation measures; leverage private sector resources to integrate MSMEs led by women, Indigenous people, youth into GVCs; support women's participation in meeting post-pandemic challenges; develop tailored capacity building and entrepreneurial innovation ecosystems. • Building the digital market infrastructure for supply chain finance: introduce interoperable e-invoices and establish supporting infrastructure; assist members to develop foundational digital infrastructure (trusted digital ID system, enabling financial services data ecosystems, interoperable payment systems); facilitate regional cooperation to promote interoperability of digital supply chain platforms.	Revitalising and enhancing MSMEs' capacity to grow their business and participate in cross-border trade and global supply chains in an inclusive and sustainable manner.

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