Centre for Strategic and International Studies

GIP Green Investment Principles ASEAN Chapter

Universitas Islam Internasional Indonesia

The Emerging Carbon Pricing Landscape in Southeast Asia



Research Paper



Research paper by CSIS Indonesia as the Secretariat of Green Investment Principles (GIP) ASEAN Chapter, and Faculty of Economics and Business Indonesian International Islamic University (UIII)

The Emerging Carbon Pricing Landscape in Southeast Asia

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This research paper serves as a platform for the research community to disseminate research findings and create a space for dialogue to exchange ideas. The writing team extends sincere appreciation to all parties who contributed to the completion of this paper. Special thanks are also extended to GIP ASEAN Chapter Co-Chairs, Mari Elka Pangestu and Rino Donosepoetro and Secretary General of GIP ASEAN Chapter, Yose Rizal Damuri, for their valuable support and guidance. The view expressed here belong to the writing team and are not intended to be associated with CSIS Indonesia

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List of Abbreviation

A6IP	Article 6 Implementation Partnership
AA	Rating grade (BeZero / Sylvera carbon credit rating)
AACM	ASEAN Alliance on Carbon Markets
ACCF	ASEAN Common Carbon Framework
ACCU	Australian Carbon Credit Unit
ACE	ASEAN Centre for Energy
ACMF	ASEAN Capital Markets Forum
AEC	ASEAN Economic Community
AECC	ASEAN Economic Community Council
AFOLU	Agriculture, Forestry and Other Land Use
AI	Artificial Intelligence
AMRO	ASEAN+3 Macroeconomic Research Office
AMS	ASEAN Member States
APAEC	ASEAN Plan of Action for Energy Cooperation
APG	ASEAN Power Grid
ASCN	ASEAN Strategy for Carbon Neutrality
ASEAN	Association of Southeast Asian Nations
ASEAN-BAC	ASEAN Business Advisory Council
ASPEN	ASEAN Strategic Plan on Environment
AWGCC	ASEAN Working Group on Climate Change
BAU	Business as Usual
BNNMT	Bộ Nông nghiệp và Môi trường (Viet Nam Ministry of Agriculture and Environment)
BPDLH	Badan Pengelola Dana Lingkungan Hidup (Indonesian Environment Fund Agency)
BTR	Biennial Transparency Report
C3S	Copernicus Climate Change Service
CA	Corresponding Adjustment
CBAM	Carbon Border Adjustment Mechanism
CCB	Climate, Community & Biodiversity (Standards)

CCCI	Coal to Clean Credit Initiative
CCP	Core Carbon Principles
CCTS	Carbon Credit Trading Scheme (India)
CDM	Clean Development Mechanism
CME	Climate Change Mitigation and Energy (as in ETC/CME)
CN	Carbon Neutrality
COP	Conference of the Parties (e.g., COP26, COP28, COP29, COP30)
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CO_2	Carbon Dioxide
CSIS	Centre for Strategic and International Studies (Indonesia)
CVM-DCE	Contingent Valuation Method – Discrete Choice Experiment
DCCE	Department of Climate Change and Environment (Thailand)
DEMATEL	Decision-Making Trial and Evaluation Laboratory
DNA	Designated National Authority
E-DSGE	Environmental Dynamic Stochastic General Equilibrium (model)
EDGAR	Emissions Database for Global Atmospheric Research
EM	Emerging Markets
EMF	Energy Modeling Forum
ERIA	Economic Research Institute for ASEAN and East Asia
ERs	Emission Reductions
ESG	Environmental, Social and Governance
ETC	European Topic Centre
ETS	Emissions Trading System
EU	European Union
EUR	Euro
FCPF	Forest Carbon Partnership Facility
FOLU	Forestry and Other Land Use
FY	Fiscal Year
G20	Group of Twenty
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEFA	ASEAN Green Economy Framework Agreement

GFLL-SL	Governance, Forest Landscapes and Livelihoods – Southern Laos (Project)
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GIP	Green Investment Principles
GSSS	Green, Social, Sustainability and Sustainability-linked (Bonds)
GST	Goods and Services Tax
$GtCO_2e$	Gigatonnes of Carbon Dioxide Equivalent
GX-ETS	Green Transformation Emissions Trading Scheme (Japan)
HACI	High Integrity ASEAN Carbon Initiative
ICAO	International Civil Aviation Organization
ICAP	International Carbon Action Partnership
ICMA	International Capital Market Association
ICVCM	Integrity Council for the Voluntary Carbon Market
IDCTA	Indonesia Carbon Trade Association
IDR	Indonesian Rupiah
IDXCarbon	Indonesia Carbon Exchange
IEA	International Energy Agency
IET	International Emission Trading
IETA	International Emissions Trading Association
IFC	International Finance Corporation
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
ISSB	International Sustainability Standards Board
ITMO	Internationally Transferred Mitigation Outcome
JCM	Joint Crediting Mechanism
JI	Joint Implementation
K-ETS	Korea Emissions Trading System
KMP	Katingan Mentaya Peatland Restoration and Conservation Project
KRW	South Korean Won
Lao PDR	Lao People's Democratic Republic
LCCP	Low-Carbon Scenario Compatible with the Paris Agreement Target

LDC	Least Developed Country
LPG	Liquefied Petroleum Gas
LT-LEDS	Long-Term Low Emission Development Strategy
LTS	Long-Term Strategy
LTS4CN	Long-Term Strategy for Carbon Neutrality
LULUCF	Land Use, Land-Use Change and Forestry
MAF	Ministry of Agriculture and Forestry (Lao PDR)
MCEE	Ministry of Climate, Energy and Environment (Republic of Korea)
MCMA	Malaysia Carbon Market Association
MEE	Ministry of Ecology and Environment (China)
MEMR	Ministry of Energy and Mineral Resources (Indonesia)
MfE	Ministry for the Environment (New Zealand)
MNRE	Ministry of Natural Resources and Environment (Thailand)
MoC	Memorandum of Collaboration
MOEF	Ministry of Economy and Finance (Republic of Korea)
MOF	Ministry of Finance
MRA	Mutual Recognition Agreement
MRV	Measurement / Monitoring, Reporting and Verification
MSME	Micro, Small and Medium Enterprises
Mt	Metric Tonne (million tonnes)
$MtCO_2e$	Million Tonnes of Carbon Dioxide Equivalent
MW	Megawatt
NCCS	National Climate Change Secretariat (Singapore)
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
NUS	National University of Singapore
NZ	Net-Zero
NZD	New Zealand Dollar
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OJK	Otoritas Jasa Keuangan (Financial Services Authority, Indonesia)
PACM	Paris Agreement Crediting Mechanism

PLN	Perusahaan Listrik Negara (Indonesian state electricity utility)
PM	Prime Minister
POJK	Peraturan OJK (OJK Regulation)
PPI	Pengendalian Perubahan Iklim (Climate Change Control), as in SRN PPI
PR	Presidential Regulation (Indonesia)
PT	Perseroan Terbatas (Indonesian limited liability company)
PTBAE-PU	Persetujuan Teknis Batas Atas Emisi – Pelaku Usaha (Technical Approval of Emission Cap for Business Actors, Indonesia)
QĐ-TTg	Quyết định – Thủ tướng (Prime Minister's Decision, Viet Nam)
R&D	Research and Development
RBP	Result-based Payment
REC	Renewable Energy Certificate
REDD+	Reducing Emissions from Deforestation and Forest Degradation (plus conservation, sustainable forest management and enhancement of carbon stocks)
RM	Malaysian Ringgit
RMU	Rimba Makmur Utama (as in PT RMU)
RSIS	S. Rajaratnam School of International Studies
RUUPIN	Rang Undang-Undang Perubahan Iklim Negara (National Climate Change Bill)
SDGs	Sustainable Development Goals
SEA	Southeast Asia
SGD	Singapore Dollar
SIDS	Small Island Developing States
SME	Small and Medium Enterprises
SPE-GRK	Sertifikat Pengurangan Emisi Gas Rumah Kaca (GHG Emission Reduction Certificate, Indonesia)
SRN	Sistem Registri Nasional (National Registry System, Indonesia)
SRUK	Sistem Registri Unit Karbon (Carbon Unit Registry System, Indonesia)
SSFA	Singapore Sustainable Finance Association
T-VER	Thailand Voluntary Emission Reduction Program

TAB	Technical Advisory Body (ICAO)
TAF-GTEI	Technical Assistance Facility to the Green Team Europe Initiative
TGO	Thailand Greenhouse Gas Management Organization
THB	Thai Baht
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP FI	United Nations Environment Programme Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
V-ETS	Voluntary Emissions Trading Scheme (Thailand)
VCM	Voluntary Carbon Market
VCS	Verified Carbon Standard (Verra)
VCU	Verified Carbon Unit

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Executive Summary

Carbon pricing has evolved into a central pillar of climate, fiscal, and financial policy. As of April 2026, 47 carbon taxes and 40 emissions trading systems (ETSs) cover approximately 29% of global greenhouse gas (GHG) emissions, generating around USD 107 billion in public revenue in 2025. The benefits of this expansion, however, remain unevenly distributed: middle- and lower-income countries account for roughly 70% of emissions covered by carbon pricing but only about 1% of its revenue, reflecting the comparatively low prices they apply. The central policy question is therefore no longer whether to price carbon, but how to design instruments that are environmentally effective, fiscally sound, and politically durable.

For ASEAN, this question has acquired particular urgency. The region's share of global emissions rose from 4.7% to approximately 6% over the past decade, with the power sector accounting for more than 40% of emissions growth since 2010. Delay in carbon pricing exposes ASEAN Member States (AMS) to three interrelated risks. The first is trade competitiveness: excluding Singapore, ASEAN was a net exporter of 27.5 $MtCO_2$ embedded in trade in 2023, and the EU Carbon Border Adjustment Mechanism (CBAM), which phases in from 2.5% of embedded emissions in 2026 to 100% by 2034, deducts only carbon prices paid in the exporting country. The second is forgone green finance, as a credible price signal strengthens the investment case for the green, social, sustainability, and sustainability-linked bond market, which reached around USD 54 billion in issuance in 2024. The third is forgone fiscal revenue, illustrated by Singapore, where carbon tax receipts rose from about SGD 200 million a year to SGD 658.8 million in 2024 following a rate increase. Against this backdrop, this study maps ASEAN's carbon pricing landscape across regional institutions, national instruments, and international benchmarks.

A Regional Agenda Built from the Bottom Up

ASEAN's approach has been incremental and largely bottom-up, where carbon pricing emerged as a single supranational instrument. National instruments preceded any regional position. Only since 2023 have carbon markets entered the ASEAN Chairmanship agenda, through the ASEAN Strategy for Carbon Neutrality (ASCN). Singapore's 2027 Chairmanship, coinciding with its industry association's leadership of the ASEAN Common Carbon Framework (ACCF), presents a plausible window for further regional progress, although carbon markets have yet to be declared a formal priority.

Two structural features define the regional landscape. First, no single ASEAN body is responsible for carbon pricing. Responsibility is distributed across the environment, capital-market, energy, and industry tracks, so regional attention rises and falls with the

priorities of each Chair. Second, the ASCN pursues interoperability through the comparability of data, namely inventories, measurement, reporting and verification (MRV), and disclosure, rather than through the convergence of price signals. Its carbon-market strategies carry no quantified indicators, benchmarks, or timelines, and delivery is deferred to existing sectoral bodies without a dedicated coordinating mechanism.

Diverse National Instruments, Common Constraints

National implementation reflects wide variation in economic structure, institutional capacity, and policy priorities. Singapore operates the region's only economy-wide carbon tax, currently SGD 45/tCO_2e and legislated to reach SGD 50–80 by 2030. Indonesia operates ASEAN's only compliance ETS, has legislated but deferred a carbon tax, and hosts the region's largest voluntary carbon market. Thailand combines an established crediting program with a carbon component in its fuel excise and a pending Climate Change Act, while Viet Nam is piloting an ETS for 2025–2028 and Malaysia is finalizing a carbon tax. The overall trajectory is therefore a gradual shift from voluntary markets towards a more diverse ecosystem, rather than a uniform move towards ETSs or carbon taxes. International engagement remains at an upstream stage: despite some ninety host-approved activities in the pipeline, no AMS yet has a registered Article 6.4 activity, and Thailand remains the only AMS to have recorded internationally transferred mitigation outcomes (ITMOs).

The case studies reveal a division of functions: Singapore anchors compliance demand, Indonesia supplies credits, and Thailand leads on international linkage, yet no member state holds all three. Indonesia possesses the broadest set of instruments but among the lowest prices globally, as the binding constraint is demand: no enforceable obligation compels domestic entities to buy, the stringency of the power-sector cap is effectively set by electricity tariff policy, the carbon tax designated as the ETS penalty has not entered into force, and no revenue-recycling mechanism has been published. Singapore demonstrates the value of a legislated multi-year price trajectory, MRV rules codified before rates became material, visible household rebates, and strict integrity screening of international credits. However, its small emissions base of around 55 MtCO_2e cannot absorb regional supply, and its conditions are not readily transferable to larger economies. Thailand built dedicated institutions early and achieved the first-ever ITMO transfer under the Paris Agreement, yet its domestic price signal remains modest, with less than one-tenth of certified credits from its Voluntary Emission Reduction Program (T-VER) purchased for offsetting and its mandatory framework delayed by political turnover.

Lessons from International Benchmarks

Benchmarking against the EU, China, the Republic of Korea, and New Zealand yields several lessons that allow ASEAN to exploit a latecomer's advantage. Robust MRV must precede cap-setting, as the EU's first-phase over-allocation shows. Coverage is best expanded in phases from power to industry, conditional on measurement and administrative capacity. Intensity-based allocation is a workable entry point provided that a pathway towards tighter caps is published in advance, as in China. Price outcomes depend on the stringency of targets relative to business-as-usual rather than on coverage or cap type, as Korea's broad coverage and low price illustrate. Supply-management mechanisms should be designed at the outset. The intended use of revenue should be legislated before rates rise: regional survey evidence suggests that public support hinges on visible reinvestment in clean energy, with most willingness to pay concentrated at prices of up to around USD 10/tCO_2e. Finally, New Zealand's experience makes full integration of forestry into compliance pricing a cautionary case for forest-rich AMS, for whom Singapore's model of capped, high-integrity offset use is more transferable.

Policy Recommendations

Regional integration should be pursued as a gradual process of interoperability rather than uniformity. ASEAN does not require a single carbon price or a single regional market. Instead, it should strengthen shared infrastructure, improve policy coordination, and build mechanisms for mutual recognition, with action in three areas.

Build the foundations for interoperable, high-integrity carbon infrastructure. AMS should agree on minimum MRV requirements, common terminology, data-quality standards, and approaches to preventing double counting, starting with priority sectors. A pilot for registry interoperability among a small group of AMS, focused initially on data standards and unit identifiers, should precede wider adoption, drawing on the regional renewable energy certificate framework as an institutional reference. Targeted technical assistance and peer learning should support AMS at earlier stages of market development.

Strengthen institutional coordination and policy coherence. ASEAN should establish a clear coordination function linking the ASEAN Secretariat, the ASEAN Working Group on Climate Change, the ACMF, finance and economic bodies, and the ASEAN Centre for Energy, tasked with maintaining a regional overview of carbon pricing developments and coordinating technical work on MRV and Article 6. The proposed ASEAN Green Economy Framework Agreement offers a vehicle to anchor carbon pricing within the region's green-economy architecture, while the successive Chairmanships of Singapore and Thailand provide an opportunity for continuity.

Integrate carbon pricing with international markets, trade, and sustainable finance. Participation in Article 6 should be grounded in sectoral mitigation roadmaps, NDC and long-term strategy alignment, and safeguards against overselling mitigation outcomes needed for national targets. ASEAN should develop compatible approaches to product-level emissions accounting and to documenting domestic carbon prices for CBAM-exposed sectors, and should connect carbon pricing revenues to taxonomy-aligned investment, blended finance, and transition projects.

At the national level, credibility depends on clear implementation pathways: a defined rate, commencement date, and revenue-use arrangement for carbon taxes; a published maturation pathway for ETSs; and, above all, enforceable sources of demand. Together, these measures would turn a fragmented set of national instruments into a coherent, interoperable regional system that supports decarbonization, protects trade competitiveness, and mobilizes transition finance.



Introduction

Global Development of Carbon Pricing

Over the past three decades, rapid industrialization and technological progress have more than quadrupled global GDP, from approximately USD 23 trillion in 1990 to USD 107 trillion in 2023.[i] Yet, this growth has carried environmental costs largely excluded from conventional measures of economic performance. Annual fossil fuel CO_2 emissions increased from 21.1 $GtCO_2$ to 37.2 $GtCO_2$ over the same period,[ii] making 2023 among the warmest year on record, with global average temperature approximately 1.48°C above pre-industrial levels.[iii] This trajectory has been reinforced by persistent underpricing of environmental externalities, through fossil fuel subsidies, tax preferences, and regulated energy prices. The International Monetary Fund (IMF) estimated global fossil fuel subsidies at approximately USD 7 trillion (6-7% of global GDP) in 2023,[iv] reflecting both explicit government support and the implicit costs of unpriced environmental damages. These distortions underscored the need for policy instruments that internalize the environmental costs of carbon emissions and support the transition toward a more sustainable economy.

Although the impacts of historical emissions cannot be reversed, there remains a critical opportunity to avoid further damage. Addressing this market failure requires assigning an economic value to carbon emissions so that their environmental costs are reflected in economic decisions. Therefore, carbon pricing was developed, originally as a corrective market instrument designed to internalize the cost of emissions rather than generate revenue. Its foundations can be traced to Arthur Pigou's The Economics of Welfare (1920),[v] which established the principle of taxing negative externalities. Nearly a century later, this principle was extended to climate policy through the work of economists, such as William Nordhaus (2019),[vi] whose research on the social cost of carbon provides a framework for incorporating the economic costs of climate change into policy decisions.

International efforts to implement carbon pricing began with the Kyoto Protocol (1997), which introduced market-based mechanisms, including International Emission Trading (IET), Clean Development Mechanism (CDM), and Joint Implementation (JI), to help countries achieve emission reduction targets at lower cost. Building on this experience, the Paris Agreement (2015) shifted from binding commitments for developed countries to Nationally Determined Contributions (NDCs) for all parties and established Article 6, which provides a framework for international carbon market cooperation through bilateral trading, a UN-supervised crediting mechanism, and non-market approaches.

While international architecture evolved, the role of carbon pricing at domestic level underwent a quiet but consequential transformation of its own. Beyond its original corrective function, carbon pricing has expanded along two roles: 1) a direct source of public climate finance, and 2) an indirect catalyst that makes green financing more attractive.

First role: direct source of public climate finance. The fiscal turn has been driven by two converging forces. The initial force is the political economy. In many jurisdictions, carbon prices remain below the levels needed to drive meaningful decarbonization, partly because of their distributional effects and concerns over firms' competitiveness. These pressures can weaken public support and limit governments' willingness to raise carbon prices. Recent research suggested that earmarking carbon revenues for clear social and economic priorities can help address this challenge.[vii] Public support is also stronger when revenues are visibly directed toward green investment or transfers to vulnerable households, rather than justified solely by "Pigouvan" rationale.

The second force is the growing fiscal impact of carbon pricing. With global revenues exceeding USD 100 billion annually since 2023,[viii] carbon pricing has evolved from a marginal revenue source into a meaningful source of public climate finance. The World Bank increasingly recognizes the role of carbon pricing in mobilizing domestic revenue, supporting efficiency and innovation, and attracting international finance.[ix] Countries have adopted different approaches, from earmarking revenues for energy efficiency and renewable energy to directing them toward broader fiscal priorities.[x] As a result, the policy debate is shifting from whether carbon revenues should be earmarked toward how they can be integrated into broader climate, fiscal and decarbonization strategies.

Second role: indirect catalyst for private climate finance. This role operates through investment incentives. By raising the cost of carbon-intensive activities, a credible carbon price can shift the risk-return profile of investments toward low-carbon technologies without requiring direct public spending. In this case, carbon pricing improves the viability of renewable energy, energy efficiency, and other mitigation projects. Therefore, it strengthens the case for green bonds and sustainability-linked instruments.[xi] The two policies are thus complementary: carbon pricing strengthens incentives to reduce emissions in line with countries' NDC targets, while green finance channels capital toward the investments needed for the transition. This interaction is increasingly reflected in financial policy, with the G20 recognizing that carbon pricing can shape the transition strategies of firms and financial institutions.[xii] Thus, carbon pricing is evolving beyond a fiscal instrument into a key component of green finance architecture.

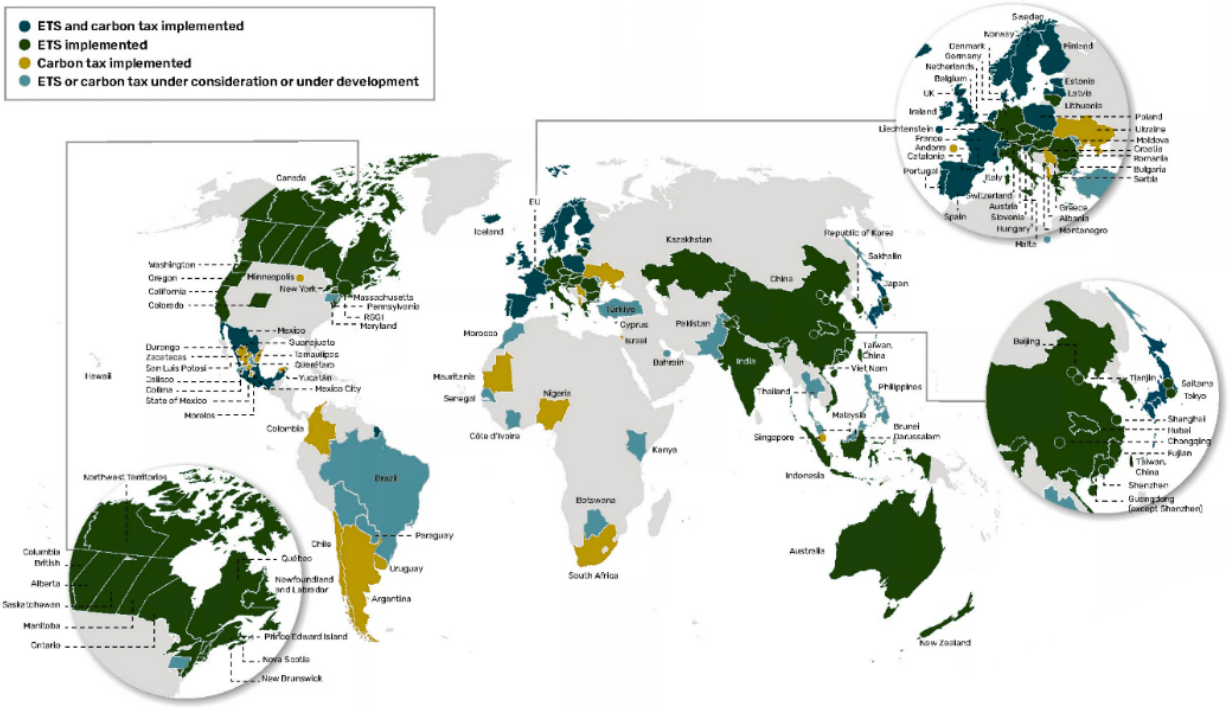
Taken together, these developments underscore the growing importance of carbon pricing in the global climate policy landscape. What began as a corrective mechanism grounded in "Pigouvian" logic has evolved into a significant policy instrument, one that raises substantial public revenue, mobilizes private capital, and anchors the credibility of national decarbonization strategies. However, this evolution has not been uniform as it has unfolded into three distinct instruments: 1) Carbon Taxes, 2) Emissions Trading Systems (ETS), and 3) Carbon Credit Mechanisms. Each instrument has its own design features, strengths, and implementation challenges.

The first two instruments fall into direct carbon pricing category, as both impose an explicit price on greenhouse gas (GHG) emissions, either by setting the price and letting the market determine the emission level (carbon taxes), or by capping emissions and letting the market determine the prices (ETS). In contrast, the crediting mechanisms fall under indirect carbon pricing, as they assign value to emission reductions, allowing verified reductions to be traded as offsets or credits.

Direct carbon pricing, through carbon taxes and ETS, has become an increasingly important component of national climate policy. As of 1 April 2026, direct carbon pricing instruments cover approximately 29% of global greenhouse gas emissions (GHG), comprising of 47 carbon taxes and 40 ETSs implemented across 47 countries.[xiii] The global carbon pricing landscape continues to expand, with five new national-level instruments introduced in 2025-2026 period. India's national Carbon Credit Trading Scheme (CCTS) is launched with a focused on hard-to-abate sectors. Japan's GX-ETS system entered its mandatory phase on April 1, 2026. Viet Nam has commenced the pilot implementation of its national ETS, covering compliance obligations for regulated facilities' GHG emissions in 2025 and 2026 through the end of 2028. Meanwhile, Mauritania and Serbia have introduced national carbon taxes.



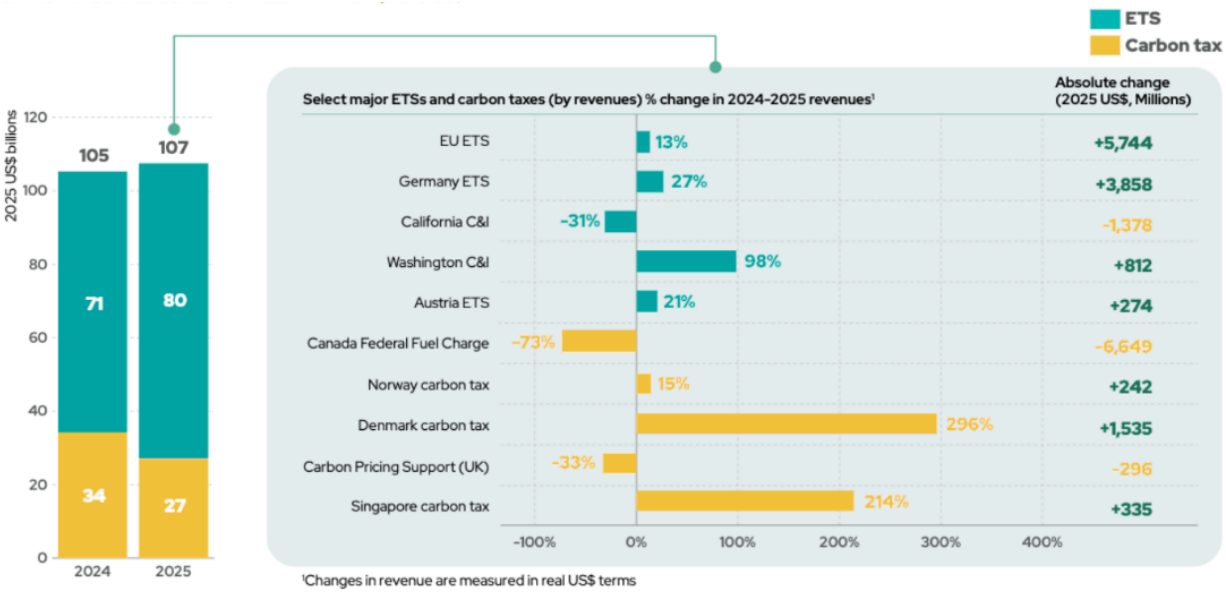
Figure 1. Map of ETS and Carbon Taxes Implemented, Under Consideration, or Under Development.



Source: World Bank (2026)

Carbon taxes and ETSs continue to serve as the primary policy instruments for directly pricing GHG. In aggregate, direct carbon pricing generated USD 107 billion in 2025, up 2% from the previous year. ETS accounted for around three-quarters of total revenues or USD 80 billion in nominal terms, up 13% y-y,[xiii] supported by higher allowance prices sold at government auctions in the ETS. Meanwhile, revenues from carbon taxes went down by 20% y-y to USD 27 billion[xiii], largely attributable to the removal of Canada's federal fuel charge. Revenue generation from direct carbon pricing continues to be uneven across countries. Although middle- and lower- income countries account for around 70% of emissions covered by carbon pricing, they generate only 1% of carbon pricing revenues.[xiii] This reflects the relatively low carbon prices adopted in these countries compared with high-income countries.

Figure 2. ETS and Carbon Tax Revenue, 2024-2025 (2025 USD).

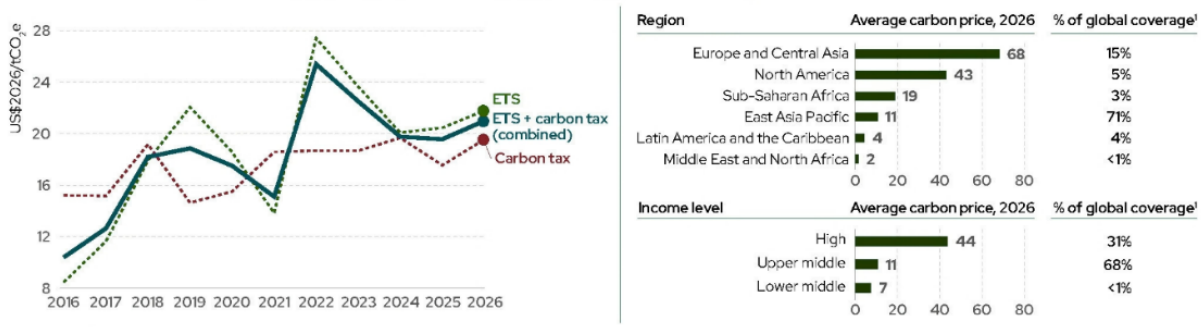


Source: World Bank (2026)

At the global level, the average carbon price for covered emissions reached nearly USD 21 /tCO_2e in the first quarter of 2026, representing a 7% increase from the previous year and more than double the level recorded a decade ago. This increase was driven by higher prices under both ETS and carbon taxes, with average prices reaching USD 22 /tCO_2e (+6.5% y-y) and USD 19.5 /tCO_2e (+11% y-y), respectively.[xiii]

However, rising carbon prices remain uneven across regions and income groups. As of 1 April 2026, Europe and Central Asia recorded the highest carbon price, followed by North America, Sub-Saharan Africa, and East Asia and the Pacific (see Figure 3).[xiii] A similar pattern is observed across income groups, with high-income economies applying substantially higher carbon prices than upper-middle-income and lower-middle-income countries.[xiii] The higher carbon prices observed in advanced economies partly reflect the greater use of auctioned emission allowances, which strengthen price discovery and generate additional public revenue. For example, California's Cap-and-Invest Program auctioned more than 40% of total allowances in 2025, while the EU ETS auctions up to 57% of allowances during its current trading phase.[xiii]

Figure 3. Average Carbon Price for ETS, Carbon Taxes, and Both Combined 2016-2026 (2026 USD/tCO2e).



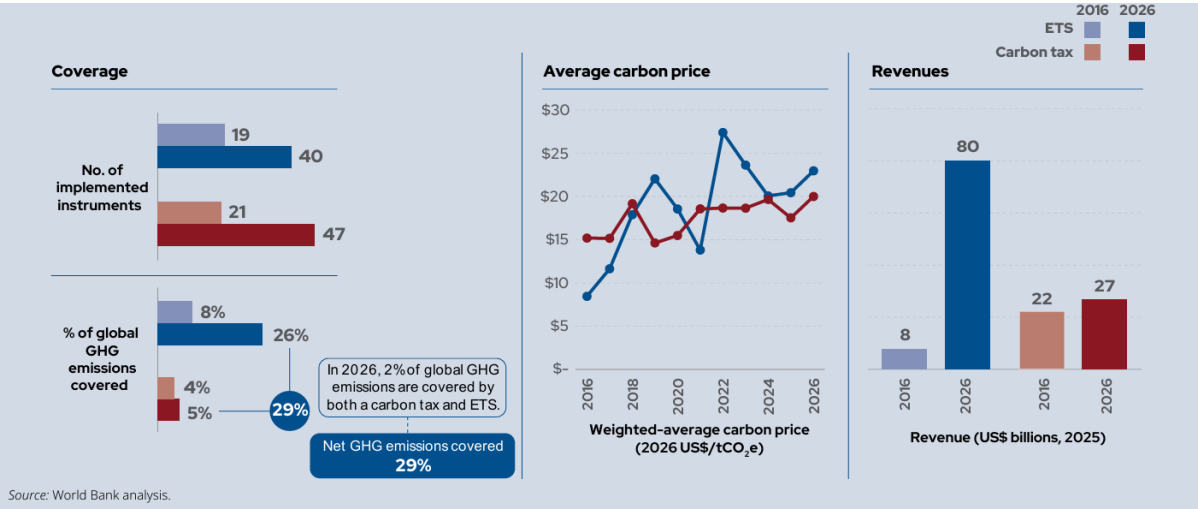
[1] Calculated as percentage of global GHG emissions covered by an ETS or carbon tax. Values exclude newly implemented ETSs in India, Japan and Viet Nam where carbon prices are not available at time of publication. Prices are as of April 1, 2026

Source: World Bank (2026)

Over the past decade, the role of direct carbon pricing has expanded considerably, even though the pace of development differs between carbon taxes and ETSs. Since 2016, 16 carbon taxes and 21 ETS' have been introduced worldwide.[xiii] Despite the larger number of carbon taxes, ETSs have become the dominant direct carbon pricing instrument in terms of emissions coverage. The share of GHG emissions covered by ETSs increased more than threefold, from less than 8% in 2016 to approximately 26% in 2026, whereas carbon taxes have consistently covered around 4-5% of global emissions over the same period.[xiii] Beyond direct carbon pricing, fuel excise taxes, the most common form of indirect carbon pricing, cover around 24% of GHG emissions across 79 countries.[xiii]

The growing prominence of ETSs is also reflected in revenue generation. Between 2016 and 2026, ETS revenues increased tenfold, from approximately USD 8 billion to USD 80 billion.[xiii] Meanwhile, carbon tax revenues rose more modestly from USD 22 billion to USD 27 billion.[xiii] As a result, ETSs have overtaken carbon taxes as the largest source of direct carbon pricing revenue. This shift is partly explained by the increasing use of auctioned emission allowances, which have gradually replaced free allocations in several mature ETSs. As more jurisdictions expand auctioning arrangements, ETS revenues are expected to increase overtime.

Figure 4. Carbon Taxes and ETS' Comparison (2016-2026).

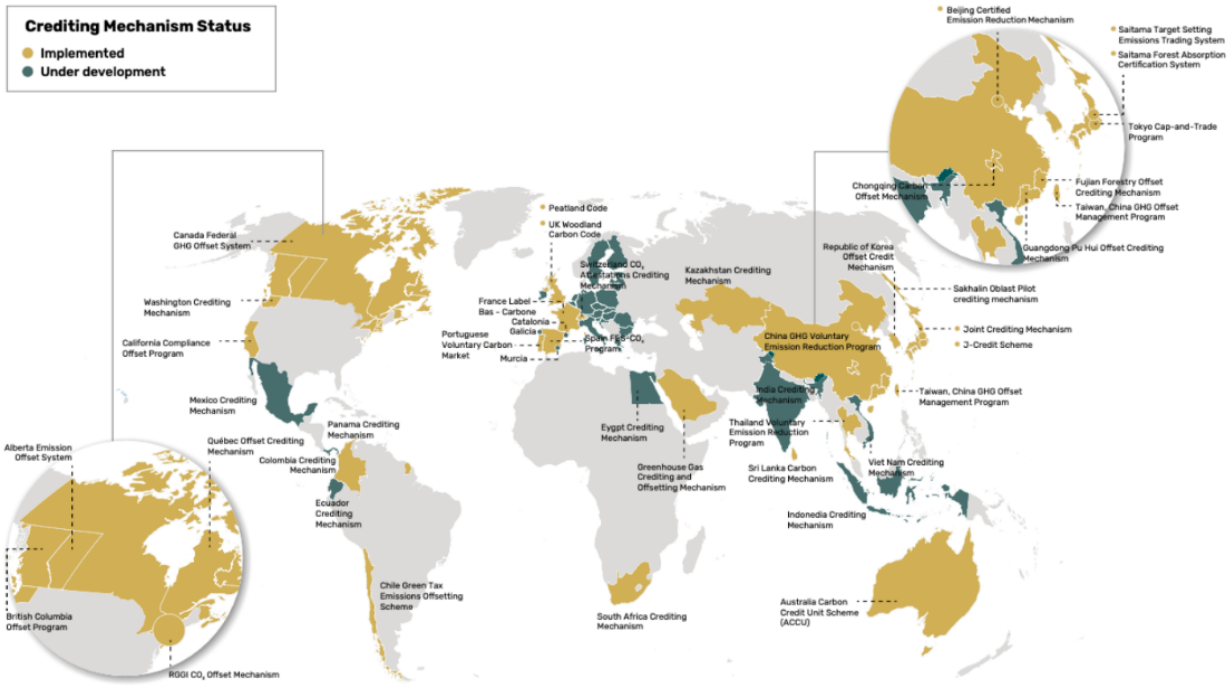


Source: World Bank (2026)

Carbon credits may be generated under governmental, independent, or international crediting mechanisms. Governmental mechanisms are established and administered by national or subnational governments, with examples including Thailand's Voluntary Emission Reduction (T-VER) Program, the Californian Compliance Offset Program, and the Australian Carbon Credit Unit (ACCU) Scheme. Independent mechanisms are operated by non-governmental organizations, the most prominent being Verra's Verified Carbon Standard (VCS) and the Gold Standard. International crediting mechanisms are administered by an international organization established with the authority of national governments, such as UN agencies (e.g., Paris Agreement Crediting Mechanisms / PACM). As of 1 April 2026, there are 34 governmental crediting mechanisms already implemented globally and 11 mechanisms under consideration or under development.[xiii]



Figure 5. Map of Governmental Crediting Mechanisms, Implemented or Under Development, as of April 1, 2026.



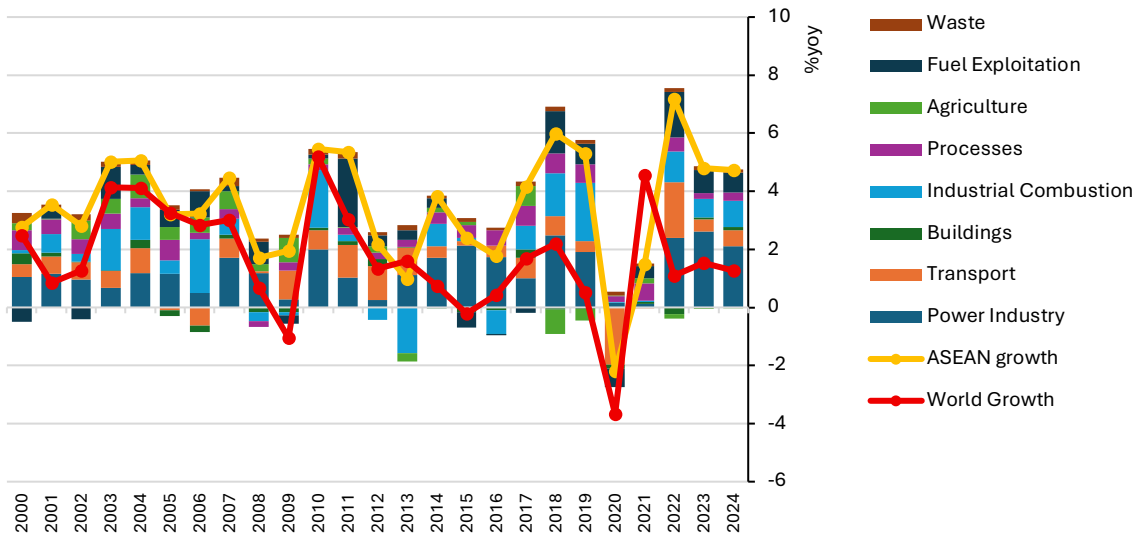
Source: World Bank (2026)

These developments show how quickly carbon pricing is expanding across jurisdictions, sectors, and instrument types. At the same time, they reveal wide variation in design choices, price levels, and market maturity. As more economies move from consideration to implementation, the central question is no longer whether to price carbon, but how to design instruments that are environmentally effective, fiscally sound, and politically durable. In this regard, the experience of the EU is particularly instructive. The EU Emission Trading System has operated since 2005, making it the world's longest running and most extensively reformed carbon market.

Global Carbon Pricing Implications for ASEAN

ASEAN's contribution to global GHG emissions is substantial and rising fast, as the region accounted for roughly 6% of global emissions in 2024, up from 4.7% a decade earlier. Emissions have grown consistently faster than the world average, driven disproportionately by the power sectors, which has accounted for over 40% of ASEAN's year-on-year growth since 2010. Curbing this large emission requires shifting the whole economy, yet losing momentum on carbon pricing would expose the region to three risk, which are reduced trade competitiveness, missed opportunities in green financing, and forgone fiscal revenues.

Figure 6. Driver of ASEAN Member States GHG Emissions Growth (exc. LULUCF)



Source: Author calculations based on EDGAR (2025)

The introduction of the EU CBAM has added urgency to the implementation of carbon pricing in ASEAN, as it puts the trade competitiveness of member states at risk. Excluding Singapore, ASEAN was a net exporter of embedded carbon in 2023, as they exported 27.5 Mt CO2 on a net basis. Viet Nam (+99.6 Mt CO2 in 2023) and Indonesia (+34.2 Mt) were the region's largest net exporters, making their carbon-intensive export sectors the most directly exposed to foreign border-carbon measures. Therefore, ASEAN exporters face stronger incentives to improve emissions reporting and adopt credible domestic carbon pricing to maintain access to European markets. The pressure is set to grow further, as major trading partners including Australia, Canada and New Zealand are considering introducing their own carbon border-related measures in the near term.

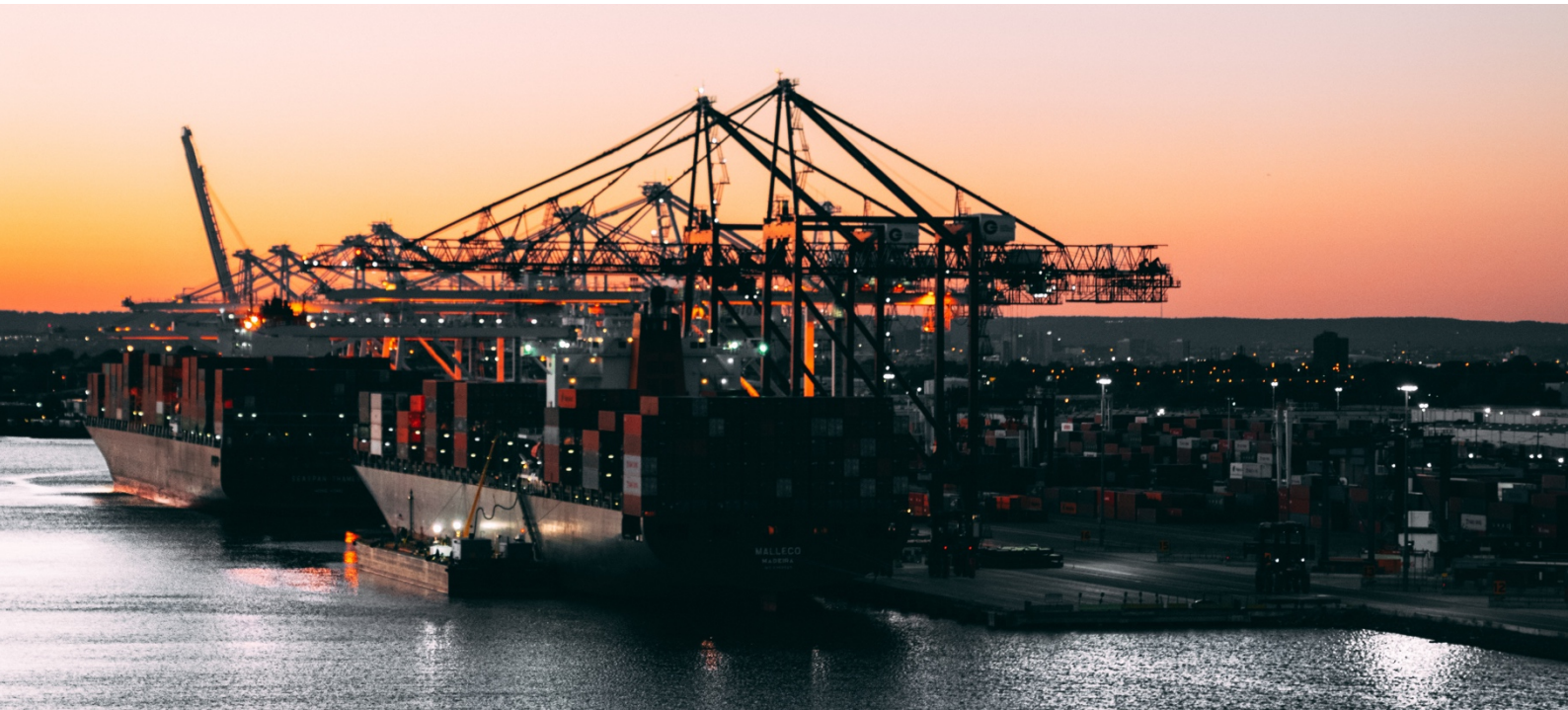
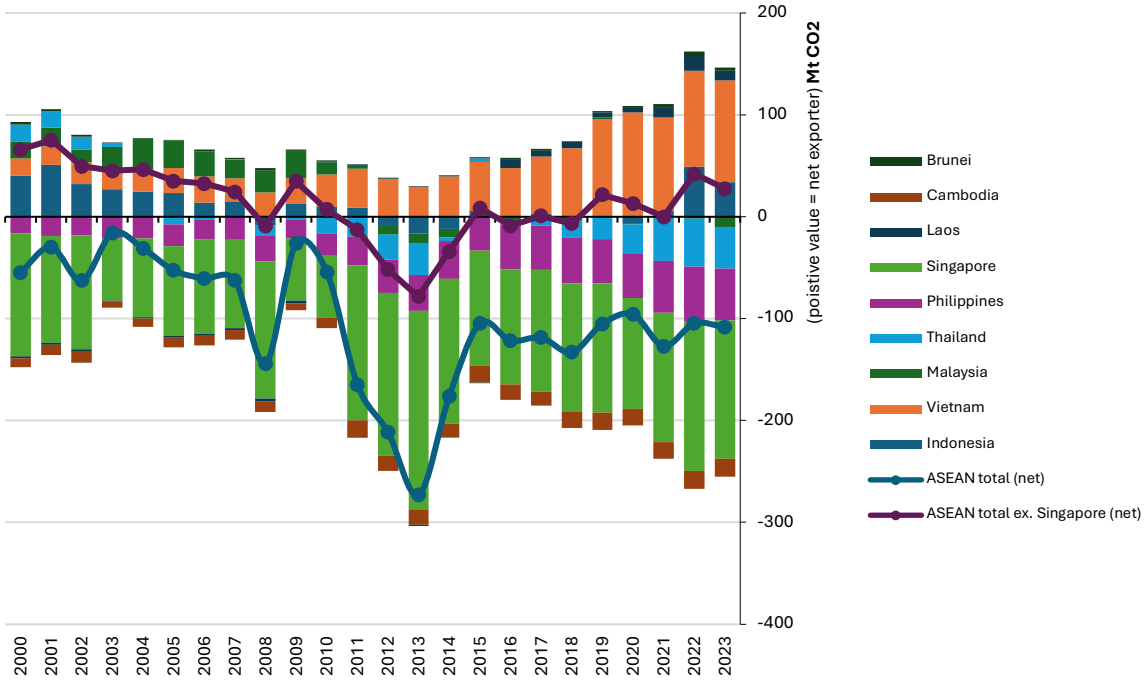


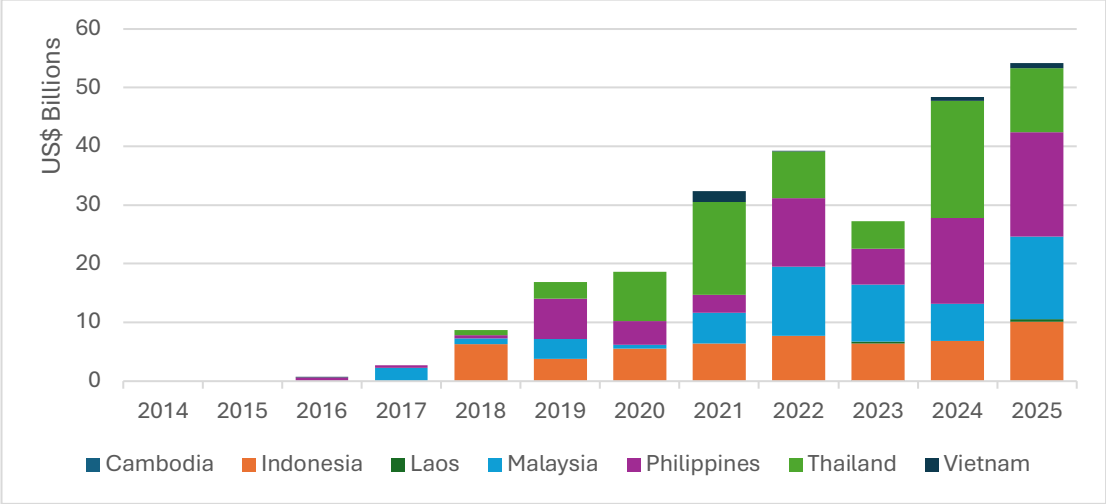
Figure 7. ASEAN Member States CO2 Emissions Embedded in Trade (positive value = net exporter)



Source: Authors Calculation based on Global Carbon Budget (2025) – with major processing by Our World in Data.

Carbon pricing is also able to mobilize sustainable and green financing by signalling policy credibility to investors and creating a more predictable environment for climate-aligned capital. A well-designed carbon price raises the relative cost of emissions-intensive activity, which in turn strengthens the business case for renewable energy, energy efficiency, and other low-carbon investments that green, social, sustainability, and sustainability-linked (GSSS) bonds are designed to finance. Latest trend in ASEAN's own GSSS bond market illustrates this potential as issuance grew from near zero before 2016 to about USD 54 billion in 2024, with Indonesia, Thailand, Malaysia, and the Philippines emerging as the region's leading issuers. This expansion has unfolded over the same period in which several ASEAN member states began legislating and piloting carbon pricing instruments.

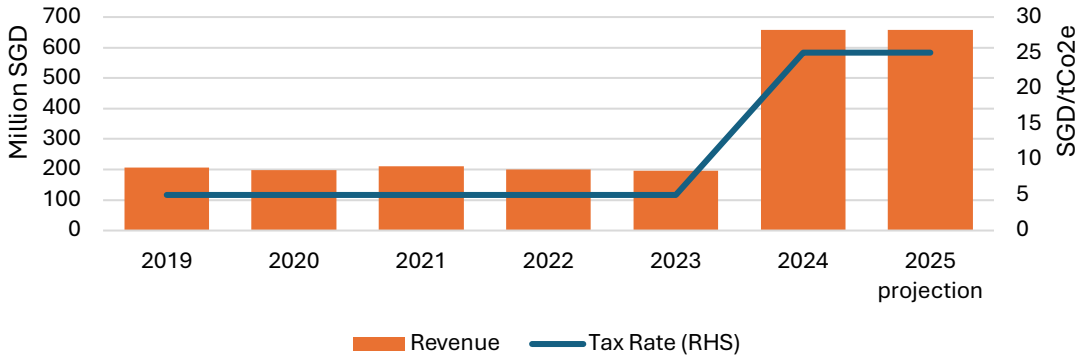
Figure 8. Issuance of Green, Social, Sustainability, and Sustainability-linked Bonds in ASEAN (exc. Singapore)



Source: Author Calculation based on Emerging Markets (EM) Sustainable Dataset, International Finance Corporation (IFC)

Carbon pricing can also generate a direct, recurring source of government revenue, expanding fiscal space for climate and development priorities. Singapore's carbon tax illustrates this: revenue held steady at around SGD 200 million per year from 2019–2023 under the SGD 5/tonne rate, then jumped to SGD 658.8 million in 2024 (SGD 657.3 million projected for 2025) as the rate rose to SGD 25/tonne, with a further increase to SGD 45/tonne in 2026–27 and a target of SGD 50–80/tonne by 2030 already legislated. Globally, carbon tax and ETS revenue reached roughly USD 108 billion in 2025. For ASEAN, where fiscal space is often constrained, carbon pricing offers a revenue stream that scales automatically with the price signal—and one that, as Singapore shows, can be earmarked directly toward climate and green-financing goals.

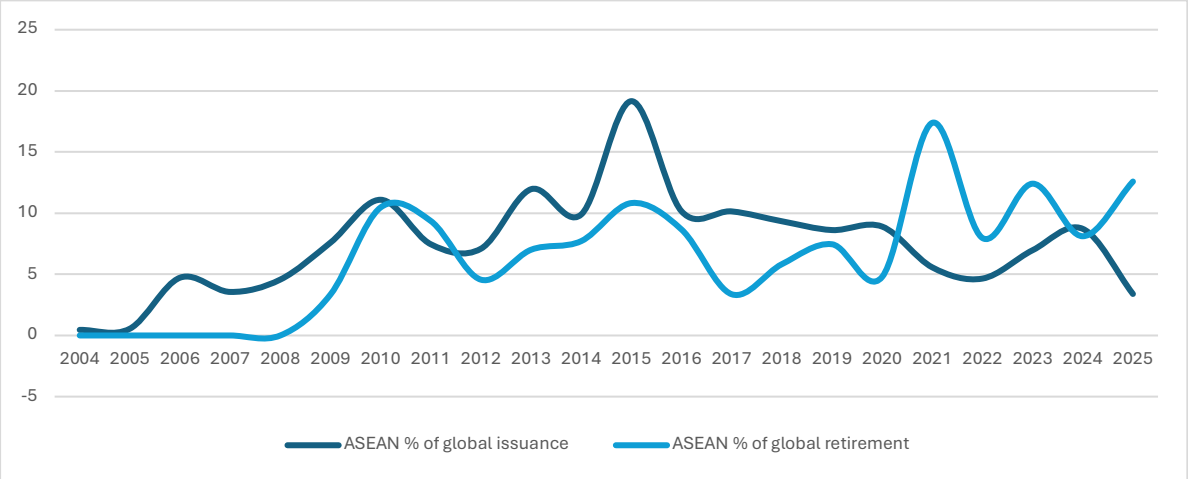
Figure 9. Carbon Tax Revenue in Singapore.



Source: Ministry of Finance, Singapore (2026)

Study also suggests that continued development of ASEAN carbon markets could generate up to USD 3 trillion in cumulative revenue by 2050, through annual emission reductions or removals of around 1.1 $GtCO_2$.[xiv] By 2050, this could include annual market values of USD 27 billion for REDD+, USD96 billion for blue carbon, and USD144 billion for biochar, potentially supporting 13.7 million jobs across the region.[xv] Figure 10 below shows Southeast Asia's share of global carbon credit issuance.

Figure 10. Annual Percentage of Global Carbon Credit Issuances and Retirements from Southeast Asia.



Source: Author's analysis based on dataset from Quartson et al. (2026)

Against this backdrop, carbon pricing in ASEAN is still at an early stage. Fewer than half of the member states have implemented carbon pricing instruments, while the rest are still studying and designing theirs. However, the region holds a latecomer's advantage in the ability to build on the EU's hard-learned lessons on cap-setting, price stability, and revenue recycling rather than repeating them. How each ASEAN member state conceives of carbon pricing remains an open question.

Therefore, this study aims to map and assess the carbon pricing landscape in ASEAN through three objectives. First, to study the regional development of carbon pricing, including the institutional settings, the role of regional bodies in shaping the agenda, and existing ASEAN initiatives. Second, to analyze the carbon pricing instruments in place and under development across ASEAN Member States, complemented by selected country case studies. Third, to draw lessons from international benchmarks and identify insights applicable to the ASEAN context.

Landscape of Carbon Pricing in ASEAN

Development of Carbon Pricing in ASEAN

ASEAN has coordinated a collective position on climate change since 2013, when it began issuing an annual joint statement to the Parties of the United Nations Framework Convention on Climate Change (UNFCCC).[xvi] Eight of the ten ASEAN Member States have since declared national net-zero or carbon-neutrality targets aligned with the Intergovernmental Panel on Climate Change's 1.5°C pathway; Myanmar and the Philippines remain the only member states without an economy-wide net-zero commitment.[xvii] This collective climate positioning, however, developed well ahead of any shared position on carbon pricing. Unlike the EU, where carbon pricing emerged as a single supranational instrument, ASEAN's approach to carbon pricing and market development has been incremental and largely bottom-up: individual member states piloted domestic instruments—voluntary crediting schemes, carbon taxes, exchange infrastructure—well before the bloc articulated a shared regional position, and only in the past three to four years has carbon market development been explicitly folded into the annual ASEAN Chairmanship agenda and into a formal regional strategy.

Table 1 presents an assessment of each carbon pricing milestone in ASEAN's development, examining whether that year's chairmanship was linked to its emergence or whether the milestone simply coincided with the chair year. This assessment applies four indicators: whether the development was named in the chair's official theme or pillars (*explicit agenda*), whether chair officials actively promoted it through summit or ministerial statements even without an explicit theme match (*active promotion*), whether the chairing country used a chairmanship-linked leadership seat in a relevant ASEAN body to advance it (*institutional leverage*), and whether a non-chair member state used that year's ASEAN platform to promote its own domestic development (*platform-borrowing*).

Table 1. ASEAN Carbon Pricing Milestones and Chairmanship Linkage

Year	ASEAN Chairmanship and Theme	Carbon Pricing Development	Indicators				Chair-Driven or Coincidental?
			Explicit Agenda	Active Promotion	Institutional Leverage	Platform-Borrowing	
2014	**Myanmar** "Moving Forward in Unity for a Peaceful and Prosperous Community	Thailand launches T-VER	x	x	x	X	**Coincidental**. T-VER absent from Myanmar's chairmanship theme, with no summit or ASEAN-platform promotion
2018	**Singapore** "Resilience and Innovative"	Singapore enacts the Carbon Pricing Act	x	x	n/a	x	**Coincidental**. A domestic Singaporean policy, not linked to the chairmanship theme
2020	**Viet Nam** "Cohesive and Responsive"	Viet Nam adopts the Law on Environmental Protection	x	~	x	X	**Coincidental**. A domestic Vietnamese legal reform, not linked to the chairmanship theme
2021	**Brunei Darussalam** "We Care, We Prepare, We Prosper"	ASEAN Taxonomy Board established; ASEAN Taxonomy for Sustainable Finance v1 released	x	x	~	x	**Partly chair-linked.** A regional finance-track initiative, timed to COP26 but not named in Brunei's theme
2022	**Cambodia** "ASEAN A.C.T."	Indonesia operates ETS; Malaysia launches the Bursa Carbon Exchange	x	x	x	x	**Coincidental**. Domestic regulatory/exchange launches by Indonesia and Malaysia, unconnected to Cambodia's chairmanship

2023	**Indonesia** "ASEAN Matters: Epicentrum of Growth"	ASEAN Strategy for Carbon Neutrality unveiled; AACM launched	~	~	n/a	n/a	**Mixed**. The Strategy is chair-driven, named under Indonesia's theme; AACM is coincidental, run through ASEAN-BAC's parallel track
2024	**Lao PDR** "ASEAN: Enhancing Connectivity and Resilience"	ASEAN Common Carbon Framework (ACCF) MoC signed at COP29	✓	✓	n/a	n/a	**Chair-driven**. Carbon neutrality was an explicit pillar of Laos's chairmanship
2025	**Malaysia** "Inclusivity and Sustainability"	ASEAN Economic Community Strategic Plan 2026–2030 adopts carbon-market interoperability as a Strategic Measure; ACMF issues the Guidance for an ASEAN Voluntary Carbon Market; ACCF reports a one-year stocktake at COP30	✓	✓	✓	~	**Chair-driven.** Actively promoted and institutionalized at ministerial level; Securities Commission Malaysia, as ACMF lead coordinator, co-led the VCM Guidance, whose underlying carbon market roadmap supported one of Malaysia's Priority Economic Deliverables
2026	**Philippines** "Navigating Our Future, Together"	Philippines–Singapore Article 6 implementation agreement signed at ASEAN Climate Week	x	~	~	✓	**Partly chair-linked**. ASEAN Climate Week hosted the Philippines' first Article 6 deal, which Singapore used to extend its carbon-credit network

**✓= evidence found; ~ = partial or indirect evidence; x = none; n/a = not applicable*

The region's earliest carbon-pricing infrastructure was national. Thailand's Greenhouse Gas Management Organization introduced the Thailand Voluntary Emission Reduction Program (T-VER) in 2014, establishing the region's first standing mechanism for generating and selling domestic voluntary carbon credits.[xviii] Singapore followed in 2018 by enacting the Carbon Pricing Act, making it the first ASEAN member state to legislate an economy-wide carbon tax, effective from 2019[xix], and separately signaled its longer-term ambition to become a regional hub for carbon services and trading.[xx] This pattern of national policy proceeding independently of the chairmanship calendar continued into Viet Nam's own 2020 chairmanship, its Law on Environmental Protection (2020), taking effect in 2022, introduced the region's next domestic legal basis for a carbon market. However, the law traced to Viet Nam's Paris Agreement compliance process rather than to its stated chairmanship priorities, which centered on regional peace and security, institution-building, and pandemic-era resilience.[xxi] Regional institutionalization began under Brunei Darussalam's 2021 chairmanship, when the ASEAN Taxonomy Board was established and released Version 1 of the ASEAN Taxonomy for Sustainable Finance—a common sustainable-finance classification that later carbon-market proposals would reference, even though it is not itself a carbon-pricing instrument. [xxii] National infrastructure continued to expand through 2022-23: Indonesia's Emissions Trading System began operating for coal-fired power in February 2023, and Malaysia's Bursa Carbon Exchange, the world's first Shariah-compliant voluntary carbon exchange, opened for trading.[xxiii]

From 2023 onward, carbon markets became an explicit chairmanship theme rather than a parallel private-sector track alone. Indonesia's 2023 chairmanship then produced the first clear intersection of chairmanship politics and carbon markets: the ASEAN Strategy for Carbon Neutrality was unveiled, explicitly naming carbon-market interoperability a regional pathway to a low-carbon economy, while the ASEAN Alliance on Carbon Markets (AACM) was launched under the ASEAN Business Advisory Council's parallel track as the first private sector-led body advocating cross-border carbon-market cooperation. [xxiv] Meanwhile, Laos' 2024 chairmanship named "Promoting Carbon Neutrality" a chairmanship pillar, and at COP29 five national carbon-market associations signed the Memorandum of Collaboration founding the ASEAN Common Carbon Framework (ACCF).[xxv] Malaysia's 2025 chairmanship elevated the ACCF into a flagship initiative. It featured at a carbon-pricing side event of the first ASEAN–EU Ministerial Dialogue on Environment and Climate Change and was formally acknowledged in the Joint Media Statement of the 57th ASEAN Economic Ministers' Meeting—ministerial-level recognition beyond the environment track alone.[xxvi] The ASEAN Economic Community Strategic Plan 2026–2030, finalized during Malaysia's year, also adopted the promotion of common recognition and interoperability among ASEAN carbon markets as a Strategic Measure. The year closed with two further milestones. On 3 November 2025, the ASEAN Capital

Markets Forum released its Voluntary Carbon Market Development Plan and the Guidance for an ASEAN Voluntary Carbon Market, developed with ERIA under the coordination of the Securities Commission Malaysia as ACMF lead coordinator; the Guidance cites the ACCF.[xxvii] The carbon market ecosystem roadmap behind it was framed as supporting Malaysia's Priority Economic Deliverables for its chair year, placing carbon markets on the chair's own economic agenda. At COP30, the ACCF also presented a one-year stocktake. Under The Philippines' chairmanship, during ASEAN Climate Week, Singapore and the Philippines signed an implementation agreement on carbon credits under Article 6 of the Paris Agreement—the Philippines' first and Singapore's eleventh such deal, allowing Singapore's carbon-tax-liable firms to buy eligible Philippine credits.[xxviii] Notably, the ACCF's own rotating chairmanship passed from Malaysia's association (MCMA) to Singapore's (SSFA) at a May 2026 meeting in Singapore, effective from the second half of the year.[xxix] More detailed assessments on ASEAN's carbon pricing initiatives are presented in the next subchapter.

Box 1. Projection Outlook for the 2027 ASEAN Chairmanship

Industry practitioners interviewed for this study expect Singapore's 2027 chairmanship to promote regional cooperation on Renewable Energy Certificates (RECs), and potentially fold carbon markets into that agenda, given Singapore's long-standing ambition to be the region's carbon buyer hub. Two independently verifiable developments lend this some weight: (i) the ASEAN Centre for Energy's regional REC framework is targeted for completion in 2027, and Singapore has already drafted a complementary cross-border REC framework as a pathfinder for it;[xxx] and (ii) the ACCF's rotating chairmanship passed from Malaysia's MCMA to Singapore's SSFA in mid-2026, placing Singapore's own industry body at the head of ASEAN's flagship carbon-market initiative just as Singapore prepares to chair ASEAN itself.[xxxi] However, official statements on Singapore's 2027 priorities through mid-2026—PM Lawrence Wong's remarks at the 48th ASEAN Summit and National Day Rally, and an RSIS analysis of ASEAN's economic agenda—centre on unity, single-market integration, AI adoption, and supply-chain resilience, with no explicit mention of carbon markets or RECs as a declared pillar.[xxxii] This outlook should therefore be read as a plausible, well-evidenced prediction pending Singapore's own chairmanship priority announcement, expected in late 2026—not a confirmed institutional commitment.

Existing ASEAN Initiatives on Carbon Pricing

The 2025 ASEAN Joint Statement on Climate Change called for greater regional cooperation on carbon markets and welcomed progress under Article 6, while encouraging the development and implementation of carbon-pricing instruments, including carbon taxes, emissions trading systems (ETS), and carbon markets, according to national circumstances. It also highlighted the ASEAN Common Carbon Framework (ACCF) and the High Integrity ASEAN Carbon Initiative (HACI) as regional initiatives to strengthen carbon-market development, environmental integrity, and demand for high-quality carbon credits.

As discussed in the first chapter, the emergence of carbon-related trade measures has further increased the relevance of carbon pricing for ASEAN, including EU's Carbon Border Adjustment Mechanism (CBAM). It has accelerated existing discussions around emission accounting, industrial decarbonization, competitiveness, and the design of domestic carbon-pricing instruments. In the first ASEAN-EU Ministerial Dialogue on Environment and Climate Change in September 2025, both sides recognized carbon pricing as a potentially cost-effective instrument for decarbonization and agreed to advance cooperation through technical exchanges and capacity building at both bilateral and regional levels, including regional ASEAN-EU workshop on carbon pricing and carbon markets.[xxxiii]

Moreover, ASEAN carbon-market development is also supported through cooperation with ASEAN+3. The current 2023-2027 cooperation plan explicitly includes support for ASEAN Member States in research and participates in carbon markets under Article 6 of the Paris Agreement.[xxxiv] Cooperation with Japan is particularly relevant as it has developed extensive experience with bilateral carbon-market cooperation through the Joint Crediting Mechanism (JCM). JCM provides a practical model for Article 6.2 cooperation, combining technology transfer and investment with the generation of internationally transferable mitigation outcomes. Japan has established JCM partnerships with multiple ASEAN Member States, including Indonesia, Viet Nam, Laos, Cambodia, Thailand, and Philippines.[xxxv]

The ASEAN Strategy for Carbon Neutrality (ASCN) was endorsed by ASEAN Economic Ministers in August 2023, which marked a shared commitment to address climate change issues within ASEAN region. This strategy aims to accelerate an inclusive transition towards a green economy, fostering sustainable growth whilst complementing national efforts through collective regional effort.[xxxvi] As highlighted in the previous CSIS report (2025),[xxxvii] the goal of carbon neutrality strategy is to add USD 3.0-5.3 trillion in GDP value, attract USD 3.7-6.7 trillion in green investment, and generate 49-66 million jobs across ASEAN by 2050.[xxxviii]

Table 2. ASEAN Carbon Market Governance Snapshot, As of Mid-2026

Dimension	Current State (as of mid-2026)
Regional strategy	ASEAN Strategy for Carbon Neutrality (2023); the ASEAN Economic Community Strategic Plan 2026–2030
Intergovernmental bodies	AWGCC coordinates ASEAN's UNFCCC positioning and climate cooperation themes (including a nascent "climate financing and market" theme); ACMF coordinates capital-markets policy, including its 2026 Guidance for an ASEAN Voluntary Carbon Market; ACE anchors the energy-sector link to carbon markets through APAEC
Industry-led initiative	The ASEAN Common Carbon Framework (ACCF)
External cooperation	ASEAN-EU cooperation on carbon pricing, launched at the first Ministerial Dialogue on Environment and Climate Change (Sept. 2025) and continued through a regional workshop in Brunei (May 2026) under the EU's TAF-GTEI, covering domestic carbon pricing design and Article 6 readiness—the latter examined in detail in the section on Article 6 development

There are two ASCN strategies that are relevant to carbon pricing in the region: Strategy 4 on Interoperable Carbon Markets and Strategy 5 for credible and common standards, which is explicitly instrumentalized toward capital (Box 2). This signals that ASEAN treats carbon markets as a regional-economic instrument and that cooperation and interoperability are the intended model aligned with the carbon neutrality strategy. Carbon markets enter ASCN as an efficiency-and-finance mechanism to unlock liquidity, attract capital, and monetize the region's carbon-sink endowment rather than solely as an environmental instrument, building pathways to attract necessary capital to the region and between member states.

ASCN attaches a specific operational agenda to Strategies 4 and 5. It calls for a common regional framework covering greenhouse gas inventory, MRV, and climate reporting, supported by a regional inventory drawing on digital tracking tools, and for corporate climate disclosure aligned with international benchmarks such as the ISSB standards.[xxxix] This is evidence of a shift from fragmented national decarbonization toward a coordinated regional system aligned with international norms within the architecture of Article 6 of the Paris Agreement, which supplies the legal basis for cooperative approaches and cross-border market interoperability.[xl] The instruments ASCN attached to carbon market are measurement, tracking, or disclosure infrastructure: interoperability is pursued through the comparability of data, not the convergence of price signals. The strategy makes no reference to a regional carbon price, a common floor, or any means of aligning the stringency of national instruments.

Box 2. ASEAN Carbon Neutrality

Key outcomes of the Carbon Neutrality Strategies

1. **Developed green industries**: capturing the full value of regional green value chains to unlock ASEAN manufacturing and export potential.
2. **Interoperability within ASEAN**: enabling the exchange of green electricity, products, and feedstocks to accelerate the roll-out of green technologies.
3. **Globally credible standards**: ensuring ASEAN remains a top destination for international capital to increase liquidity in regional markets.
4. **Green capabilities**: developing the necessary green talent and expertise within ASEAN to drive the climate transition.

Eight strategies of the carbon neutrality

1. **Accelerate green value chain integration**: establish cooperation frameworks & remove barriers to bring green products to market faster.
2. **Regional circular economy supply chains**: incorporate definitions & facilitate trade deals to support circular economy via regional trade.
3. **Connect green infrastructure & market**: Build interconnectivity for green technologies & decarbonization solutions to underpin regional deployment.
4. **Interoperable Carbon Markets**: develop credible carbon markets that are interoperable with each other & global markets.
5. **Credible & common standards**: develop taxonomies & definitions on GHG reporting, carbon credits & energy efficiency that align with the requirements of key markets.
6. **Attracting & deploying green capital**: build effective pathways to attract necessary capital to the region and between member states.
7. **Green talent development & mobility**: classify and ensure regional access to skills needed for carbon neutrality journey.
8. **Green best practice sharing**: share best practices in R&D, technology & green transition from within ASEAN and borrowing from the best of the world.

Source: ASEAN (2023). ASEAN Strategy for Carbon Neutrality.

Table 3. ASEAN Member States Decarbonization Target

Country	Announced Target	Energy-related CO2 Emission Reduction Target from 2017	Assumed Natural Carbon Sink (LULUCF) in Target Year
Brunei Darussalam	2050	-50% (3.5 Mt)	Brunei information (-4.4 Mt)
Cambodia	2050	+37% (26.0 Mt)	LTS4CN scenario 2050 (-50.2 Mt)
Indonesia	2060	-50% (245.5 Mt)	LCCP scenario 2050 (-300 Mt)
Lao PDR	2050	-100%	–
Malaysia	2050	-22% (164.0 Mt) *1	2016 inventory (-241 Mt)
Myanmar	2040 (in LULUCF)	-60% (12.0 Mt)	2040 unconditional NDC (-13 Mt)
Philippines	No defined year	-100%	–
Singapore	2050	-100%	–
Thailand	2065	-61% (95.5 Mt) *2	LTS carbon neutrality pathway (-120 Mt)
Viet Nam	2050	-54% (88.8 Mt) *3	2030 unconditional NDC (-59 Mt)

*****ASEAN = Association of Southeast Asian Nations; CN = carbon neutrality; CO2 = carbon dioxide; Lao PDR = Lao People's Democratic Republic; LCCP = low-carbon scenario compatible with the Paris Agreement target; LTS = long-term strategy; LTS4CN = long-term strategy for carbon neutrality; LULUCF = land use, land-use change, and forestry; Mt = metric tonne; NDC = nationally determined contribution; NZ = net-zero.
*1 Consistent with the National Energy Transition Roadmap (Ministry of Economy, 2023)
*2 Consistent with the long-term low emissions development strategy (Office of Natural Resources and Environmental Policy and Planning, 2022)
*3 Consistent with National Strategy on Climate Change by 2050 (Government of Viet Nam, 2022)

Source: ERIA (2025), cited by ACMF.

This assessment shows that ASEAN needs more detailed plans for each strategy, including: 1) carbon market plan to harmonize measurement, reporting and verification standards, and policies and 2) regional MRV framework development to enable high-quality carbon credits and provide policy support to enable interoperable carbon credits (e.g., advise on double-counting issues). This needs clear strategy prioritization, measurable monitoring and targets, and institutional coordination.[xli] ASEAN should prioritize strategies that reduce emissions in the two largest regional sources, energy and land-use sectors, which carbon markets score strongly on interoperability and credibility. In addition, Strategies 4 and 5 carry no quantified indicators, benchmarks, or timelines which need to be further strategized. Lastly, as the strategy created no dedicated

coordinating body and defers delivery to existing sectoral bodies, as highlighted in the previous subchapter, carbon market issue is a multisectoral issue where relevant bodies are split across the finance, environment, and energy pillars which underlines that the alignment across different bodies are crucial.

Moreover, ASEAN Economic Community Strategic Plan 2026-2030,[xlii] adopted on the 46th ASEAN Summit on May 2025 to implement the economic dimensions of the ASEAN Community Vision 2045, carries the ASCN's carbon-market ambition into an operative planning instrument. The document explicitly stated the strategic measure to "promote common recognition and interoperability amongst carbon markets in ASEAN," with a broader objective of building a supportive ecosystem to unlock green economy potential, enhancing resilience via climate adaptation, and accelerating the decarbonization of regional supply chains. ASEAN Economic Community Council is designated as the principal body accountable for implementation, and ASEAN Secretariat operates monitoring and evaluation reporting to the High-Level Task Force on ASEAN Economic Integration and the AECC, with review cycles commencing in the fourth year of implementation.

There is no single ASEAN body that owns carbon pricing. Instead, responsibility is distributed across at least four institutional tracks—capital markets, energy, environment/climate diplomacy, and industry—whose mandates overlap on carbon markets without any one of them holding exclusive authority over the agenda. This fragmentation is itself a defining feature of ASEAN's carbon pricing landscape and explains why chairmanship attention to carbon markets rises and falls depending on which track a given chair prioritizes.

ASEAN Working Group on Climate Change (AWGCC)

AWGCC ASEAN's principal body for implementing climate-related program across mitigation, adaptation, technology transfer, and climate finance, guided by the ASEAN Strategic Plan on Environment (ASPEN). It performs two core functions: building ASEAN's common negotiating position ahead of UNFCCC COPs—most visibly through the ASEAN Joint Statements on Climate Change, of which thirteen have been issued since 2007—and coordinating climate-related activities among member states in consultation with other sectoral bodies.[xliii] Institutionally, AWGCC sits beneath the ASEAN Environment Ministers and Senior Officials on Environment, with individual member states leading specific program themes and reporting progress back to the Working Group. Of AWGCC's eight thematic priorities under its 2019–2025 Action Plan, “climate financing and market” is the most directly relevant to this report: it covers awareness-raising and opportunity-mapping for climate finance and explicitly flags the potential development of a regional

Emissions Trading System—an aspiration that, as of this writing, remains at the exploratory stage rather than an active workstream.[xliv]

ASEAN Capital Markets Forum (ACMF)

ACMF groups securities regulators from all ten ASEAN member states. Its institutional development traces to the ASEAN Finance Ministers' Meeting in Danang (April 2008), which proposed a Group of Experts to draft an Implementation Plan supporting the capital-market integration objectives of the ASEAN Economic Community (AEC) Blueprint 2015—envisioning free movement of capital, unrestricted cross-border issuance, and investor access across the region.[xlv] The Forum pursued this through a combination of full harmonization (comparable to the EU model) and mutual recognition arrangements layered on a baseline of harmonized standards, sequenced to protect investor confidence and systemic stability. This work culminated in ACMF's Vision 2025, structured around three strategic objectives—pan-ASEAN connectivity, market inclusiveness, and market resilience—delivered through the ACMF Action Plan 2016–2020 and its 2021–2025 successor, most of whose initiatives were completed or on track by the end of the period.[xlvi] Carbon markets entered ACMF's remit as an extension of this capital-markets mandate: in 2026, ACMF issued its Guidance for an ASEAN Voluntary Carbon Market, aligning carbon-market standards with the ICVCM and CORSIA benchmarks used elsewhere in its sustainable-finance work—bridging carbon markets with the region's broader capital-markets integration agenda.[xlvii]

ASEAN Capital Market Framework works on the VCM has focused on strengthening market integrity, transparency, governance, and interoperability. Its initiatives also seek alignment with international integrity frameworks, including the Core Carbon Principles (CCPs) developed by the Integrity Council for the Voluntary Carbon Market (ICVCM) and the requirements relevant to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). These linkages are intended to strengthen confidence in the quality of carbon credits and facilitate their use across different markets and regulatory contexts.

ACMF has previously developed studies and policy documents on the development of the VCM in ASEAN. These initiatives recognize VCMs as a complementary tool for achieving regional climate objectives and provide insights for policymakers, regulators, and market participants in developing a credible and effective carbon market ecosystem in ASEAN.[xlviii]

ACMF has developed several studies and policy documents on the development of a VCM in ASEAN. These initiatives recognize the VCM as a complementary mechanism for supporting regional climate objectives and provide guidance for policymakers, regulators, and market participants. Key areas of focus include robust governance, transparency,

standardization, and verification, as well as measures to address market risks such as double counting, over-crediting, inconsistent quality, and market fragmentation. They also emphasize the importance of appropriate regulatory oversight and reliable market infrastructure. Box 3 summarizes the main initiatives and recommendations emerging from ACMF's work on the ASEAN VCM.

In 2025, ACMF launched the ASEAN Voluntary Carbon Market Development Plan and ASEAN Voluntary Carbon Market Guidance, building on its earlier Study on High-Quality Voluntary Carbon Market for ASEAN.[xlix] The Guidance aims to support the development of a credible and functioning VCM as part of ASEAN's broader pathway towards carbon neutrality. By strengthening integrity, interoperability, and regional cooperation, the framework seeks to facilitate private capital mobilization towards the net-zero transition while generating wider economic, social, and environmental benefits.

Box 3. ASEAN Voluntary Carbon Market Plan and Guidance

Immediate term initiatives

1. **Increase volume of "high-quality" credits and improve liquidity**

a. Raise awareness of VCMs and associated financials
b. Produce guidance for ASEAN project developers on developing high-quality projects
c. Promote corporate and investor education on the role of credits within structured transition plans and sustainability strategies, including targeted guidance on appropriate credit use for investors, funds, and corporate buyers
d. Advocate for regional initiatives to increase carbon project development, e.g. public–private partnerships to fund and support high-quality project development

2. **Provide oversight ensuring the integrity of credits generated and traded**

Establish consistent regulations and clear guidelines for credit generation and trading across the region

3. **Provide clarity across jurisdictions and encourage cross-trading**

Promote regional standardization of credits aligned with international frameworks to ensure credibility and facilitate cross-border trading, e.g. engaging key VCM standards and framework bodies on guidance for ASEAN-relevant project types

Parallel groundwork actions

1. **Prioritize ASEAN-specific projects:** Identify and prioritize project types aligned to regional needs: tropical forests, peatlands, mangroves, micro-hydro, biogas from agricultural waste, or community-based solar microgrids
2. **Outline ASEAN "high-quality" carbon projects:** Develop a roadmap highlighting and promoting ASEAN-specific high-quality projects, with case studies and examples
3. **Leverage existing ASEAN collaborations:** Identify existing regional platforms and initiatives (ACMF frameworks and tools, other ASEAN mechanisms) usable for primary and secondary VCM guidance and processes
4. **Monitor COP29 mechanisms:** Track development and implementation of the global carbon market mechanism agreed at COP29, with a view to incorporate it into ASEAN frameworks once operational

Recommendations and consideration points for VCM guideline

1. **Authorities should clarify legal and regulatory treatment within each jurisdiction.** Each jurisdiction clarifies legal treatment on its own but risks divergent interpretations and fragmentation that could undercut later harmonization.
2. **The guidance should use "emission reductions and/or removals."** Driven by Article 6's current exclusion of avoidance (reconsideration scheduled 2028) and IETA's position that the exclusion does not prevent REDD+ from being classified as reduction. Notes the Philippines has proposed avoidance activities under Article 6, e.g. shelving planned coal plants.
3. **Each AMS's registry should be designed to be interoperable.** Experts advised leveraging CAD Trust rather than building new infrastructure, since dataset standardization delivers interoperability without a centralized registry and avoids political complexity.
4. **The guidance should include "support for the transition" as an integrity criterion.** Low-carbon criterion accommodates differing AMS circumstances but does not strictly align with net zero by 2050, which may affect international demand for ASEAN credits.
5. **ASEAN's secondary market should be interoperable rather than a single centralized market.** Interoperable markets connect to global markets while accommodating each AMS's systems but may impede standardization and preserve some disintegration.

6. **Public disclosure requirements should account for platform market type and sales mechanism.** Recognizes that exchanges pool similar credits and keep counterparties anonymous, trading on price and unit alone to simplify transactions and improve liquidity.
7. **ASEAN should require all current and prospective credit users to set emission reduction targets consistent with national circumstances.** Current buyers are large corporates with net-zero commitments, and SME participation requires a lower entry threshold. Implementation shifts to awareness raising, guidelines, best practice sharing, and capacity building
8. **Due diligence expected of users should correspond to carbon market maturity.** Most corporate users do not disclose due diligence detail, and that in less developed ecosystems third-party services are scarce or costly, pushing buyers onto publicly available information. Capacity building is positioned as a precondition to tightening requirements
9. **ASEAN should work towards mandating third-party assurance for sustainability reports.** Each AMS should decide based on its own circumstances now, with a mandate introduced in future once markets mature, and regulators meanwhile expanding the pool of qualified assurance providers

Source: ACMF (2024); ACMF (2025)

The ASEAN VCM Guidance sets out approximately 35 criteria across four areas, broadly reflecting IOSCO's good practices for carbon markets: (1) regulatory frameworks; (2) primary-market issuance; (3) secondary-market trading; and (4) the use, disclosure, and retirement of carbon credits. The criteria build on ACMF's previous work and are tailored to the ASEAN context while maintaining consistency with relevant international standards. This approach is intended to improve market integrity and facilitate greater interoperability across ASEAN carbon markets.

As carbon pricing is increasingly used for influencing investment decisions and supporting low carbon transition, this report examines opportunities to integrate carbon pricing and carbon market instruments into ASEAN's sustainable finance architecture. The objective is not to treat carbon pricing as a sustainable finance instrument, but to clarify how carbon pricing signals, carbon market revenues, and carbon-related risks can interact with frameworks that guide the allocation of private capital towards sustainable and transition activities. This is particularly relevant to strengthening the role of financial institutions in mobilizing capital for credible green and transition projects. The need for greater interoperability and harmonization of sustainable finance frameworks across

ASEAN was also highlighted in CSIS (2025), which identified it as a key priority for strengthening the regional sustainable finance landscape.[i]

ASEAN's sustainable-finance architecture comprises of ASEAN Taxonomy for Sustainable Finance and several instrument standards developed under ACMF: the Green, Social, and Sustainability Bond Standards (built on the ICMA Green Bond Principles), the Sustainability-Linked Bond and Sustainable and Responsible Fund Standards, and the ASEAN Transition Finance Guidance. Together, these instruments establish common definitions, disclosure expectations, eligibility criteria, and financing structures intended to improve the credibility and comparability of sustainable finance instruments across ASEAN.

ASEAN Taxonomy provides a common regional language for identifying and classifying sustainable economic activities. It assesses activities against environmental objectives and applies safeguards. The framework evaluates the sustainability characteristics of the underlying economic activity rather than assigning a monetary value to its emissions.[ii] As discussed in the first chapter, carbon pricing is principally complementary, implemented through instruments such as carbon taxes, emissions trading systems, regulatory mechanisms, or voluntary credits, while the ASEAN sustainable finance architecture provides the classification and financing infrastructure through which capital can respond to those price and policy signals. As of 2026, Indonesia, Malaysia, the Philippines, Singapore, and Thailand, had developed or implemented national sustainable finance taxonomies. These national frameworks are voluntary and have been developed to reflect domestic policy priorities while increasingly aligning with the ASEAN Taxonomy.[iii]

In addition, ASEAN Transition Finance Guidance provides a bridge between sustainable finance and carbon-intensive activities. The guideline includes financing for credible transition pathways where activities cannot yet meet green criteria. Even though it does not establish or operate carbon-pricing mechanisms, it enables financial markets to respond to the wider policy and regulatory environment. Therefore, greater integration could focus on connecting the two systems, for example by using carbon-pricing revenues to support taxonomy-aligned investment, blended finance, or transition projects.

Box 4. Financial Institutions Role in Carbon Market Development

Based on our discussion with several financial institutions, the principal constraint on carbon-market development is no longer the availability of capital but the shortage of projects that meet financial institutions' requirements for financing. Capacity remains uneven: larger domestic and international banks are generally more advanced, while smaller institutions and MSME-focused segments continue to require practical tools, technical assistance, and stronger awareness. A credible project must present a clear transition objective, a defensible revenue model, an appropriate financing tenor, and identifiable buyers or off takers.

Financial Institutions are Constrained by Limited Capacity and Policy Misalignment

Financial stability remains first-order priority, which limits how quickly and uniformly financing can be mobilized across all sectors. Within banking, three areas of growth are generally required: outbuilding capacity, building supporting infrastructure, and building the market itself. Sustainability-linked lending is an important tool here, though it has strict requirements, which remain a barrier to wider adoption. Corporate and export-oriented clients are the easiest segment to engage, since they often have experience with value-chain pressure for transition planning. Renewable energy financing is more commonly utilized due to mandatory emission caps and its compatibility with banks' existing risk models, whereas FOLU (forestry and other land-use) projects remain unfamiliar territory requiring dedicated capacity building. Institutions with large MSME portfolios have not yet extended significant decarbonization financing to that segment.

Policy coherence is fundamental to improving project bankability. Misalignment among regulations, taxonomies, certification requirements, and sectoral policies raises transaction costs and creates uncertainty for both developers and financiers, and the associated paperwork is a burden for both sides to navigate. Banks are willing to support sustainable and transition activities but cannot proceed confidently when project eligibility or applicable standards remain unclear, particularly when a project does not fit cleanly within an existing taxonomy. Clearer classification systems, more consistent certification, targeted incentives, and digital tools that simplify assessment are therefore needed to reduce project evaluation costs. Regional sustainable finance taxonomies can support this process by improving transparency and reducing greenwashing,

although continued alignment across ASEAN will be important to avoid market fragmentation.

Early-stage climate-positive projects typically require compensation for longer investment horizons, pointing to a continued need for blended finance and dedicated de-risking instruments. A recurring question raised by financial institutions when considering barriers to sustainable finance is who is going to take the risk. This challenge is particularly relevant for projects involving uncertain revenues, new technologies, or sectors with limited financing track records.

Financial institutions across ASEAN increasingly recognize climate risk as a financial risk, driving greater integration of climate considerations into lending, investment, and insurance. Banks have generally been the most active, incorporating climate risks into credit assessments and financing renewable energy and sustainable infrastructure. Capital markets are also evolving through green bonds, sustainability-linked bonds, and transition finance instruments, although developing sufficient pipelines of investable low-carbon projects remains a challenge. Sustainable loans remain relatively smaller compared with sustainable bonds in some markets, reflecting the risk constraints faced by banks.

Insurance faces a different but equally important challenge. Insurers are directly exposed to increasing physical climate risks while also needing to price transition risks. Rising losses from extreme weather events may affect insurability and premiums across parts of the region. In this context, banks currently represent the strongest direct financial enablers of carbon-market development through project finance, corporate transition finance, and, in some cases, carbon-market infrastructure. Capital markets can help scale financing, while insurance can help manage the risks associated with the transition and increasing physical climate impacts.

Carbon-Market Growth Now Hinges on the Demand Side

Momentum in carbon-market development has shifted decisively toward the demand side: expanding the supply of carbon credits will not be sufficient without credible buyers, recognised uses, and a regulatory framework that sustains demand. A functioning compliance market is an important anchor, while bilateral arrangements under Article 6.2 of the Paris Agreement offer a route to internationally recognised demand. An emerging approach centres on securing buyers, guarantors, insurers, and off takers at an early stage, strengthening project cash flows and turning carbon revenue into part of a project's core commercial proposition rather than an uncertain supplementary benefit.

Nature-based solutions remain particularly challenging, as banks are less familiar with forestry, restoration, and land-based mitigation than with conventional energy projects. High-integrity projects require robust MRV, credible governance, and transparent benefit-sharing. Blended finance, philanthropic capital, and first-loss structures can help absorb early-stage risk, but investors still require trusted governance and a credible project pipeline, with pilot projects serving as proof of concept alongside clear local-community benefits.

ASEAN Centre for Energy (ACE)

ACE is an intergovernmental body established under the 1998 Agreement on ASEAN Energy Cooperation and, operating since 1999, serves as the region's energy think tank and implements the APAEC, a ten-year cooperation framework renewed each decade and aligned with the AEC's strategic objectives.[liii] Under APAEC Phase II (2021–2025), carbon pricing was framed primarily as an enabler of the region's energy transition rather than as a climate policy in its own right: nearly all member states were described as engaging with carbon pricing at some stage of assessment, design, or implementation, with Indonesia's ETS and Singapore's carbon tax cited as the most advanced examples, and broader carbon-market participation—predominantly voluntary—formalized through the ASEAN Strategy for Carbon Neutrality.[liv] The incoming APAEC 2026–2030 identifies sustainable finance as a key enabler for closing the region's renewable-energy investment gap—annual clean-power investment needs are estimated at USD 11.5–79.5 billion—and treats carbon markets as one channel for mobilizing that capital, a rationale echoed in the national climate commitments of Cambodia, Indonesia, and Singapore, each of which names carbon markets as a green-finance mobilization strategy.[lv] ACE's own assessment, however, is candid about the gap between ambition and implementation: carbon-market development across the region remains at an early stage,

with fluctuating supply and demand observed in Indonesia, Thailand, Malaysia, and Singapore, and with member states split between those that have already implemented market-based instruments (Indonesia, Thailand, Singapore) and those still building the regulatory and institutional foundations for future implementation (Malaysia, Viet Nam).[lvi]

ASEAN Plan of Action for Energy Cooperation (APAEC) is the sector's governing blueprint coordinated by the ASEAN Centre for Energy (ACE). It traces its mandate to the ASEAN Energy Cooperation Agreement, which established energy as one of the earliest domains of formalized regional cooperation. APAEC 2026-2030 carries that framework into alignment with ASEAN Community Vision 2045, organized around five core directions: advancing energy security and resilience, promoting cross-sectoral collaboration, accelerating the energy transition, ensuring inclusivity, and strengthening institutions and regional coordination.

AMS have collectively set targets for a 30% renewable energy share in total primary energy supply, a 45% share of renewable energy in installed power capacity, and a 40% reduction in energy intensity by 2030, relative to a 2005 baseline. APAEC also promotes greater cross-border electricity trade through the accelerated development of the ASEAN Power Grid (APG), alongside the regulatory, commercial, and technical arrangements required to support regional electricity market integration. Therefore, carbon pricing can complement energy policy objectives by creating an economy-wide signal that increases the relative attractiveness of lower-carbon technologies and investments. Greater interoperability among ASEAN carbon markets could strengthen this signal across borders and improve the competitiveness of renewable energy and other low-carbon projects.[lvii]



Renewable Energy Certificates (REC) provide a particularly relevant area where energy-market integration, carbon accounting, and market infrastructure intersect. Cross-border renewable electricity trade requires credible systems for tracking electricity generation and associated environmental attributes, including clear rules on ownership, registries, residual-mix accounting, and the prevention of double counting. These requirements are closely related to the broader infrastructure needed for credible carbon markets, particularly reliable monitoring, reporting and verification (MRV), interoperable registries, and harmonized methodologies.

The development of interoperable REC systems could present a practical first step towards wider regional market integration. Interoperability between existing pricing and market mechanisms could provide an initial stage towards developing a more coordinated ASEAN carbon-pricing approach. In this context, Singapore's REC initiative was highlighted as a potential early achievement for regional cooperation. While REC and carbon credits are distinct instruments, the institutional and technical infrastructure developed for REC interoperability could provide lessons for future ASEAN carbon market to strengthen the market infrastructure and accounting system, improve compatibility between national pricing and certification mechanisms, and greater coordination across member states.

ASEAN Alliance on Carbon Market (AACM) and the ASEAN Common Carbon Framework (ACCF)

The AACM was launched in September 2023 under Indonesia's ASEAN chairmanship, at the ASEAN Business & Investment Summit, as a legacy project of the ASEAN Business Advisory Council—the first private sector-led body advocating cross-border cooperation on carbon markets, established in recognition of carbon markets as a climate-financing instrument and of ASEAN's substantial natural-capital and carbon-removal potential.[lviii] Structured as a membership-based regional ecosystem, AACM organizes its work around five priority areas: supply (building project-developer and verification-body capacity), financing (de-risking mechanisms to mobilize capital), demand (building market confidence for ASEAN-origin credits), international communications, and the ACCF itself—its flagship policy vehicle for market interoperability and mutual recognition.[lix] The ACCF was founded by five national associations—AACM (regional), the Indonesia Carbon Trade Association, the Malaysia Carbon Market Association, the Singapore Sustainable Finance Association, and the Thailand Carbon Markets Club—and organizes its work around three workstreams, summarized in Table 4.

Table 4. ASEAN Common Carbon Framework (ACCF) Workstreams

Workstream	Focus	Key deliverables
A) Supply and Demand	Building developer capacity, scaling high-integrity carbon projects, and positioning ASEAN as a trusted credit source for buyers	Claims guidance; mutual recognition of methodologies across national crediting schemes; alignment with international mitigation programs for Article 6 credits; governance standards aligned with ICVCM/IOSCO/IETA
B) Market Infrastructure	Developing connected infrastructure, reducing cross-border barriers, and enabling exchange collaboration	Interoperable voluntary and compliance markets; at least one initiative addressing removal of cross-border trading barriers
C) Strategic Communications and Capacity Building	Technical training, industry collaboration, and strategic communications to engage stakeholders and promote market growth	Technical trainings; closed-door roundtables and conferences with partners (e.g., Malaysia Carbon Market Forum, IDCTA Conference, Ecosperity, ASEAN Climate Forum)

By late 2025, the ACCF had accumulated formal regional recognition well beyond its private-sector origins: it was acknowledged in the Joint Media Statement of the 57th ASEAN Economic Ministers' Meeting (September 2025) and in the ASEAN Joint Statement on Climate Change to COP30 and was cited in the ACMF's own Guidance for an ASEAN Voluntary Carbon Market. At COP30 in Belém, ACCF representatives presented a one-year stocktake describing the framework's progression "from a concept to a more concrete work plan,"[lx] and its rotating chairmanship transitioned from Malaysia's MCMA to Singapore's SSFA at a Steering Committee meeting held in Singapore during Ecosperity Week 2026—effective for the second half of the year, immediately ahead of Singapore's own ASEAN chairmanship in 2027.[lxi]



Implementation of Carbon Pricing in ASEAN Member States

This chapter examines the implementation of carbon pricing at the national level, focusing on Indonesia, Singapore, and Thailand as case studies. Together, these countries represent the main carbon pricing instruments currently operating in the region. Indonesia operates ASEAN's only compliance emissions trading system and is the region's largest supplier of voluntary carbon credits. Singapore has the region's longest-established carbon tax and is its principal buyer under Article 6. Thailand has developed a comprehensive legislative framework for carbon pricing and completed the region's first authorized international transfer.

Carbon Pricing Instrument in ASEAN Member States

ASEAN is increasingly using carbon pricing and carbon-market instruments, where ASEAN Member States (AMS) are adopting different combinations of instruments, such as carbon taxes, emissions trading systems (ETSs), voluntary carbon markets (VCMs), and international carbon-market mechanisms. These differences reflect variations in economic structure, emissions profiles, institutional capacity, and national policy priorities.

Singapore remains the most established carbon-pricing jurisdiction in ASEAN. Its economy-wide carbon tax, introduced in 2019, currently applies to facilities emitting at least 25,000 tCO_2e annually. The rate increased to SGD 45/tCO_2e in 2026 and 2027, with a previously announced trajectory towards SGD 50–80/tCO_2e by 2030. Singapore also allows eligible international carbon credits to offset up to 5% of taxable emissions, linking its domestic carbon tax to international carbon-market cooperation under Article 6.

Indonesia has developed a different model, combining a mandatory emissions trading system with domestic and international carbon-market mechanisms. Its power-sector ETS was launched in 2023 and expanded to cover additional power generation facilities. Indonesia also has a legislated carbon tax, although its implementation has been deferred. More recently, presidential and ministerial regulations have further established the regulatory framework for carbon pricing, including provisions governing domestic carbon-market mechanisms and international carbon-market cooperation under Article 6 of the Paris Agreement.

Thailand has developed a relatively active domestic crediting market through the Thailand Voluntary Emission Reduction (T-VER) and is preparing the foundations for a compliance market. It has also introduced a carbon-price component into the excise-tax structure for petroleum products at THB 200/tCO_2e. This should be distinguished from an economy-wide carbon tax, as the mechanism currently operates through the existing fuel-tax structure.

Viet Nam is developing a national carbon market centered on an ETS and carbon-credit trading. The country entered a pilot phase for its carbon market in 2025–2028, with full operation envisaged from 2028. In 2026, Viet Nam established the legal framework for its domestic carbon exchange and formally launched the trading platform in June, marking a significant step from market preparation towards operational carbon-market infrastructure.

Malaysia now moving towards a broader carbon-pricing framework while continuing to develop its voluntary carbon market. The National Carbon Market Policy is intended to provide a framework for both voluntary and compliant carbon markets, while the government is finalizing a national carbon-tax policy initially focused on the iron, steel, and energy sectors. As of June 2026, the carbon-tax policy was still in the finalization stage, meaning that Malaysia should be regarded as being in the transition from policy development towards implementation rather than as having an operational economy-wide carbon tax.

The remaining AMS are generally at earlier stages of carbon-pricing development. The Philippines is considering an ETS and broader carbon-pricing framework through proposed legislation, while Cambodia, Lao PDR, and Myanmar have focused primarily on carbon-crediting activities and readiness for international carbon-market participation. Brunei remains at an earlier stage, without an operational explicit carbon-pricing instrument. The overall picture is therefore one gradual movement from predominantly voluntary carbon markets towards a more diverse carbon-market ecosystem, rather than a uniform shift towards ETSs or carbon taxes.

The differences across AMS are not only a matter of policy preference. They also reflect differences in institutional ownership and implementation capacity. Not all Member States have clearly established which government institution holds responsibility for carbon pricing and carbon-market development. Where institutional mandates or points of contact remain unclear, it becomes more difficult to coordinate domestic policy and participate consistently in regional initiatives. These differences suggest that ASEAN interoperability cannot be achieved through a single regional standard alone. It requires progressive alignment of institutional mandates, legal definitions, MRV systems,

registries, crediting standards, and market rules, while allowing AMS to retain flexibility over their domestic systems.

Table 5. Overview of Carbon Pricing Instrument Implementation in ASEAN

Country	Carbon Tax	ETS	Voluntary Market / Crediting	Article 6 Engagement
Singapore	✓	x	✓	✓ (buyer, 11 IAs)
Indonesia	P	✓	✓	✓ (host)
Thailand	✓	P	✓	✓ (first ITMO)
Viet Nam	x	P (pilot)	✓	✓ (host)
Malaysia	P (on hold)	P	✓	P (host)
Philippines	x	P (bill)	✓	✓ (host)
Cambodia	x	x	✓	✓ (host)
Myanmar	x	x	✓	✓ (first 6.4 issuance)
Lao PDR	x	x	✓	✓ (host, JCM)
Brunei	x	x	x	x

**✓= in force/active; P = pipeline (announced, legislated, or pilot); x = none*

Carbon Tax

Carbon taxes remain concentrated in a small number of AMS and differ significantly in their design and coverage. Singapore operates the region's most established economy-wide carbon tax. The tax applies to large industrial facilities and provides a progressively increasing price signal. Eligible international carbon credits can also be used to offset a limited share of taxable emissions, creating a direct connection between Singapore's domestic carbon price and international carbon markets.

Indonesia has a legislated carbon levy, although its implementation has been deferred. The country's operational carbon-pricing framework has instead developed primarily through its ETS and associated carbon-market regulations. Thailand has introduced a

carbon-price component through its petroleum excise-tax structure. The mechanism provides a carbon-price signal within the existing fuel-tax system, rather than operating as an economy-wide carbon tax. Meanwhile Malaysia is developing a carbon-tax framework, initially focusing on emissions-intensive sectors including iron, steel, and energy. The instrument remains under development and should therefore be distinguished from operational carbon taxes elsewhere in the region.

Emissions Trading Systems

ETS development is concentrated in a smaller group of AMS and generally follows a phased, sectoral approach. Indonesia operates the region's most established ETS, initially covering the power sector. The system has subsequently expanded its coverage and provides the main operational compliance-market mechanism within Indonesia's broader carbon-pricing framework.

Viet Nam is developing its ETS through the national carbon-market pilot covering 2025–2028, with full implementation planned for the subsequent phase. The development of its domestic carbon exchange provides supporting infrastructure for emissions allowances and carbon-credit transactions. Malaysia is developing the foundations for a compliance carbon market as part of its broader National Carbon Market Policy and related regulatory development. Meanwhile Thailand and the Philippines remain at earlier stages of ETS development. Both are developing the policy and institutional foundations for future compliance mechanisms, although neither currently operates an economy-wide ETS.

The pattern observed is all the implementations start on one of sectoral and phased ETS development rather than immediate economy-wide systems. Power generation provides a practical entry point because emissions are relatively concentrated and monitoring requirements are more manageable. As MRV systems and institutional capacity improve, this approach could support gradual expansion into other sectors.

Voluntary Carbon Market

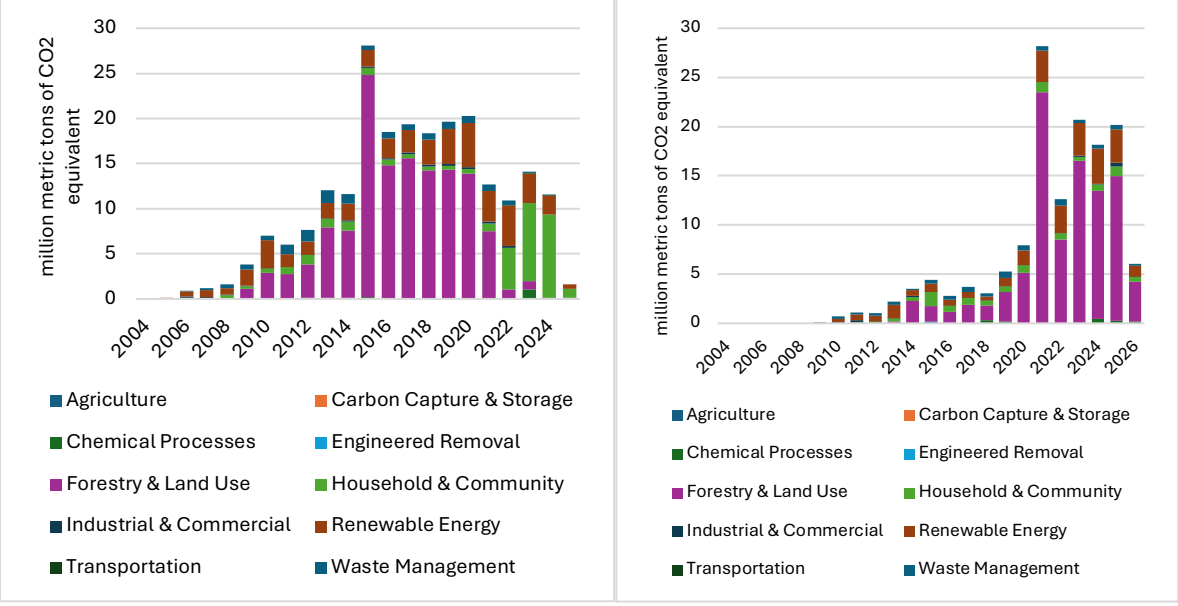
VCMs and domestic crediting mechanisms remain the most widespread form of carbon-market activity across ASEAN. They are particularly important in countries without operational compliance carbon-pricing systems and provide an entry point for domestic mitigation projects, private investment, and international climate finance.

Indonesia has developed a significant domestic carbon-market ecosystem, including the Indonesian Carbon Exchange (IDXCarbon), alongside regulatory arrangements for carbon credits and international market participation.

Thailand has one of the region's more established domestic crediting systems through the Thailand Voluntary Emission Reduction (T-VER) program, which provides a framework for developing and certifying domestic emission-reduction projects. Malaysia operates the Bursa Carbon Exchange and is developing additional domestic crediting mechanisms, including those related to forestry and nature-based solutions.

Viet Nam incorporates carbon credits into its emerging national carbon-market framework, allowing them to operate alongside emissions allowances and international carbon-market mechanisms. Other AMS, including Cambodia, Lao PDR, and Myanmar, have primarily engaged through carbon-crediting projects and international mechanisms rather than domestic compliance pricing. These markets therefore provide an important foundation for future participation in Article 6 and other international carbon-market arrangements. The figure and table below present the volume of carbon credit issued and retired across ASEAN Member States. In addition, Box 5 highlights one of the voluntary carbon credit projects considered a successful example of carbon credit issuance.

Figure 11. Annual Issuance (left) and Retirement (right) of Voluntarily Traded Carbon Credits in SEA by Project Sector



Source: Author's analysis based on dataset from Quartson et al. (2026)

Box 5. The Katingan Mentaya Project: A Case Study in AFOLU Voluntary Carbon Market

Project Description

The Katingan Mentaya Peatland Restoration and Conservation Project ("KMP") is a tropical peat-swamp forest protection and restoration project between the Mentaya and Katingan rivers in Central Kalimantan, Indonesian Borneo. It has operated since 2010 and protects 157,875 hectares of peatland, an area that was previously threatened with conversion and drainage for industrial acacia plantations.[lxii]

- **Certifications**: Verra's Verified Carbon Standard (VCS), Climate, Community & Biodiversity (CCB) Standard, CCB Triple Gold rated, and independently rated AA by both BeZero and Sylvera
- **Crediting period**: 60 years (2010–2070)
- **Estimated Volume**: 6–7.5 million Verified Carbon Units (VCUs) issued per year
- **2021–2023 issuance**: approximately 20 million credits were verified, resulting in 17.3 million VCUs after the buffer contribution
- **Pricing**: 2020-vintage credits have traded around USD 9–9.70/tCO2e, a premium over most comparable REDD+ credits

KMP is structured as a multi-party partnership rather than a single-developer project, distributing technical, financial, and social responsibilities to several parties, including 1) PT Rimba Makmur Utama (PT RMU) as Indonesian project developer and manager; holds overall responsibility for operations, government liaison, and delivery; 2) Permian Global as international investment partner providing remote sensing, MRV methodology, carbon marketing, and technical advisory support;[lxiii] 3) NGO partners for community development programs across the 39 villages in the wider project zone;[lxiv] 4) Wetlands International as technical partner;[lxv] 5) Verra as administrator of the VCS and CCB standards and associated carbon-credit registry.

What Makes Katingan Mentaya Project Successful?

Among ASEAN AFOLU projects, KMP is frequently presented as a model of best practice for large-scale REDD+ and peatland conservation. Several factors explain its success. A potential strength of KMP is its partnership structure, delegating responsibilities for carbon methodology, community relations, and delivery, to separate entities which reduces vulnerability of the project by reducing the risk of conflicts of interest, operational bottlenecks, and over-reliance on a single entity. The project's credibility is also reinforced by multiple independent verification, acquiring prestigious dual AA ratings from BeZero and Sylvera, which give buyers

external validation beyond Verra's certification.[lxvi] The project also benefits from a community-led development, in which benefit-sharing and livelihood programs were built through participatory planning with villages and local organizations, contributing to sustained community acceptance across approximately 34 villages.[lxvii] Regulatory adaptability is a major factor, as PT RMU cooperated with years of baseline re-verification and regulation changes, resulting in KMP positioning itself as the flagship project when Indonesia reopened issuance in 2026. The combined effect is price resilience, sustaining relatively strong prices, and signaling durability and earning buyer trust in the project's integrity.[lxviii]

Lessons Learned: Barriers to Progress

In 2021-2023, independent researchers and journalists questioned whether REDD+ baseline methodologies overstated how much deforestation the project prevented from its baseline,[lxix] which is a common criticism across the REDD+ sector. In addition, previous Presidential Regulation 98/2021 on "Carbon Economic Value," tied carbon trading to the country's Nationally Determined Contribution (NDC), increasing the importance of ensuring that existing carbon credit exports were aligned with Indonesia's own domestic climate goals.[lxx] These two pressures, i.e. credibility concerns and national accounting control, contributed to Indonesia's three-year (2022-2025) freeze on new AFOLU credit issuance while the government built a national carbon governance framework, freezing KMP issuance.[lxxi] The freeze created a prolonged period in which KMP could not generate new Verra-issued credits; meanwhile forest protection and community development programs were still ongoing to fulfil compliance requirements. AFOLU projects remain exposed to baseline uncertainty and to national regulatory timelines outside the developer's control, even when project-level execution is sound. Additionally, industry experts have argued that voluntary carbon-market demand alone may be insufficient to provide the scale and long-term revenue required for forest protection, strengthening the case for compliance-market mechanisms and more predictable carbon pricing.[lxxii]

Article 6 of the Paris Agreement

Article 6 of the Paris Agreement is the primary legally recognized framework for cross-border carbon trading, succeeding the Kyoto Protocol's Clean Development Mechanism, which had already channeled significant mitigation investment into the region.[lxxiii] Article 6.2 allows countries to trade Internationally Transferred Mitigation Outcomes (ITMOs) through bilateral or multilateral cooperative approaches while retaining national sovereignty over methodology; Article 6.4 instead establishes a centralized, UN-supervised project-crediting system administered through the Paris Agreement Crediting

Mechanism (PACM) and governed by a UNFCCC Supervisory Body.[lxxiv] Both mechanisms apply corresponding-adjustment rules to prevent double counting, and although Article 6 does not directly regulate domestic emissions trading systems or voluntary carbon markets, both are increasingly serving as a credibility anchor and capacity-building reference point for those parallel instruments across ASEAN.

National engagement distinguishes along demand-and supply-side lines. Singapore, with limited domestic mitigation potential, is the region's principal demand-side participant, using its International Carbon Credit framework to let carbon-tax-liable firms offset up to 5% of taxable emissions with eligible international credits.[lxxv] Indonesia, Thailand, and Viet Nam instead drive engagement from the supply side, underpinned by domestic legal reforms such as Indonesia's Presidential Regulation 110/2025 (which separates internationally transferable, corresponding-adjusted carbon units from domestic-only units) and Viet Nam's planned ETS, piloting from 2025 toward full operation by 2028.[lxxvi, lxxvii] Thailand offers the clearest illustration: the Bangkok E-Bus Program, authorized with Switzerland in 2022, was Asia's first authorized Article 6 mitigation activity and produced the first-ever cross-border ITMO transfer (1,916 units as of December 2023), with cumulative transfers reaching roughly 52,600 by 2026.[lxxviii] Japan is the region's most active external partner, linking close to thirty countries—including seven ASEAN member states—through its Joint Crediting Mechanism, reinforced by the ASEAN-Japan Joint Statement committing both sides to Article 6.2 cooperation and capacity building via the Article 6 Implementation Partnership (A6IP).[lxxix, lxxx] Most recently, the Philippines and Singapore signed the Philippines' first Article 6 Implementation Agreement on 30 April 2026, extending a Singaporean bilateral portfolio that already includes Cambodia, Malaysia, Viet Nam, and Thailand.[lxxxi] Table 6 consolidates these engagement patterns.



Table 6. Article 6 Engagement Across ASEAN Member States

Country	Role	Total Emissions	Emissions per Capita	Bilateral Agreements	Cooperative Approaches	Art. 6.2 Activities	ITMOs Transf./ Rec.	PACM Approved by Host	PACM Registered	A6.4 ERs Issued	Current NDC Vintage
Brunei Darussalam	Neither (domestic-focus; nascent host aspirant)	11.7 million tCO2e	25.54 tCO2e/person	0	0	0	0	0	0	0	NDC 3.0 (submitted 2025)
Cambodia	Host (seller)	126 million tCO2e	7.25 tCO2e/person	3	3	9	0	2	0	0	NDC 3.0 (2025)
Lao PDR	Host (seller)	53.6 million tCO2e	7.00 tCO2e/person	3	1	5	0	1	0	0	Revised First NDC (2030)
Indonesia	Host (seller), with some buyer-side ambition via the Japan JCM	1.57 billion tCO2e	5.59 tCO2e/person	4	1	40	0	14	0	0	Second NDC (2031–2035, 2025)
Malaysia	Host (seller)	402 million tCO2e	11.45 tCO2e/person	2	0	0	0	4	0	0	Third NDC (2035)
Philippines	Host (seller)	239 million tCO2e	2.08 tCO2e/person	2	1	10	0	7	0	0	First NDC (“Other” vintage)

Country	Role	Total Emissions	Emissions per Capita	Bilateral Agreements	Cooperative Approaches	Art. 6.2 Activities	ITMOs Transf./ Rec.	PACM Approved by Host	PACM Registered	A6.4 ERs Issued	Current NDC Vintage
Singapore	Buyer	64 million tCO2e	10.82 tCO2e/person	28	1	19	0	n/a (not a PACM host—no DNA/participation requirements filed)	0	0	Second NDC (2035)
Thailand	Host (seller), with the region's only recorded ITMO flow	457 million tCO2e	6.38 tCO2e/person	3	2	36	52.6 thousand	19	0	0	Third NDC (2035)
Timor-Leste	Aspiring host (pre-operational)	3.59 million tCO2e	2.59 tCO2e/person	0	0	0	0	0	0	0	NDC 3.0 (Third NDC, 2035)
Viet Nam	Host (seller)	479 million tCO2e	4.77 tCO2e/person	3	1	20	0	23	0	0	Revised First NDC (2030)

Source: Article 6 Implementation Partnership (A6IP) country profiles and the UNEP Copenhagen Climate Centre Article 6 Pipeline database.

Engagement remains at an early, upstream stage: no ASEAN member state has a PACM activity registered or Article 6.4 credits issued, despite ninety host-approved PACM activities already in the pipeline, led by Viet Nam (23), Thailand (19), and Indonesia (14). A two-speed Article 6.2 landscape is evident: Indonesia, Thailand, Viet Nam, and Singapore account for most registered activities, while Brunei, Malaysia, and Timor-Leste report none—Malaysia notably active on bilateral and PACM tracks yet without registered 6.2 activity. Singapore, holding 28 bilateral agreements (more than the rest of the region combined), is the clear principal buyer but has not filed as a PACM host, consistent with its net-buyer position. Thailand alone has recorded ITMO movement and maintains the region's most complete 6.2 reporting trail, making it the de facto regional benchmark. NDC vintage tracks readiness closely, but LDC/SIDS status alone does not determine it: Cambodia (LDC) has built relatively robust 6.2 infrastructure, while Timor-Leste (LDC and SIDS) remains largely pre-operational—suggesting domestic institutional commitment matters more than development status.

Result-based Payment (RBP)

In ASEAN, RBP is concentrated primarily in REDD+ and the forest or land-use sector. Most ASEAN Member States have developed some REDD+ infrastructure, but actual access to RBP depends on satisfying the UNFCCC requirements and demonstrating verified results.[lxxxii] Major channels include the Green Climate Fund (GCF) and the Forest Carbon Partnership Facility (FCPF), with payments subsequently reinvested in forest governance, conservation, restoration and community programs.[lxxxiii, lxxxiv] Indonesia REDD+ results for 2014–2016 generated 20.25 $MtCO_2e$ of verified emission reductions and USD 103.8 million from the GCF.[lxxxv] The funding supports Indonesia's national REDD+ strategy, forest governance, and social-forestry programmes.[lxxxvi] More recently, GCF approved USD 72 million for Viet Nam for REDD+ results in March 2026 and USD 61.5 million for Lao PDR in October 2025.[lxxxvii]

RBP is now an active and increasingly institutionalized instrument, with continuous development in its governance, legal implications and procedures, and policy guidelines and strategies. A major milestone came in October 2024 when GCF moved REDD+ RBP from a pilot into a permanent financing window and established a valuation of USD 8/tCO_2e for the 2024–2027 programming period.[lxxxviii] This increased predictability in two ways: eligible countries can now submit RBP proposals on a continuing basis rather than depending on the launch and funding availability of a temporary pilot, and they have a predetermined carbon price to calculate the value of eligible verified emission reductions. For ASEAN countries developing REDD+ programs, this provides a clearer and more durable source of potential demand for verified forest-carbon results.

Indonesia represents the strongest regional case to date. In October 2025, the GCF reported that USD 499.8 million had been committed to Indonesia under the RBP system, with USD 340.7 million disbursed, including USD103.8 million channeled through the GCF/UNDP project.[lxxxix] Lao PDR's 2025 approval, covering 14.39 $MtCO_2e$ of verified reductions for 2015–2018, is another important milestone.[xc]

However, RBP faces significant barriers. The principal challenge is high institutional and technical thresholds for demonstrating credible results. Countries need reliable forest monitoring, reference levels, safeguards, MRV and institutional capacity. Experience from the FCPF also shows that country reporting can be difficult and that capacity and financing gaps can delay implementation and payments.[xci] In addition, ASEAN countries face fragmented carbon-market rules, different levels of technical capacity and uncertainty over how forest-carbon instruments interact with domestic carbon markets.[xcii] However, while the ASEAN region is making progress towards developing carbon pricing instruments, RBP provides a distinctive merit as it creates a monetary incentive for verified mitigation where conventional compliance pricing is difficult to apply, especially in forests and land use.

RBP's strongest contribution is establishing the infrastructure (MRV, reference levels, registries, safeguards and national institutions) needed for ASEAN countries to participate in increasingly sophisticated carbon markets and Paris Agreement mechanisms. The recent GCF approvals for Indonesia, Lao PDR and Viet Nam suggest that RBP is moving from a pilot approach toward a more established component of Southeast Asia's carbon-finance architecture. Nevertheless, its scale and impact remain constrained by the availability of international finance, verification requirements and uneven national capacity.

Country Case Studies: Country-Level Policies and Framework

Each case follows the same structure, so that the three can be read against one another: the stages through which the instruments developed, the institutional setting and the distribution of authority within it, the industry and sector coverage, and an assessment of the regulatory and policy framework. Each draws on the interviews conducted for this study alongside published regulation and secondary sources.

The following table summarises the three cases across the building blocks of a functioning carbon market: the regulatory basis, the source of demand, the integrity and

infrastructure arrangements, the route to international access, exposure to carbon-related trade measures, the prevailing price, and the regional role each country plays.

Table 7. Building Blocks of Carbon Market Development in Singapore, Indonesia, and Thailand

Building Block	Singapore	Indonesia	Thailand
Regulation	Carbon tax trajectory (until 2030)	Presidential Regulation 110/2025, ongoing derivative regulation	Draft Climate Change Act approved by Cabinet, December 2025; enactment pending
Market & demand	Mandatory tax, demand anchor	Voluntary and compliance market	Thin mandatory scope, small voluntary market
Integrity & infrastructure	Strong MRV, offsets capped at 5%	SRN and SRUK	TGO registry
International access	12 Article 6 Implementation Agreements (11 plus Lao PDR)	New regulatory framework – connected to global market	Premium T-VER, deals with CH/JP/SG
Trade	Not exposed, price near benchmark	Not yet addressed	CBAM written into pending bill
Price (USD/tCO_2e)	Carbon tax: ~34, rising to 38–60 by 2030	Offset credit: ~3-4	Offset credit: ~3
Regional role	Strong in demand anchor	Largest voluntary supply	Most international deals signed

The three columns describe a region in which the instruments are spread across countries. Singapore sets mandatory price signal, Indonesia focuses on the supply while Thailand emphasizes the international linkages through deals. No member state holds all three at once. Thus, it brings issues related to interoperability of carbon markets rather than uniformity across ASEAN countries.

Indonesia

Indonesia holds the widest set of carbon pricing instruments of any ASEAN member state. As highlighted in the previous subchapter, it operates the region's only compliance emissions trading system, currently paused pending alignment with the revised regulatory framework; it has legislated a carbon tax that has not yet entered into force; it hosts Southeast Asia's largest voluntary crediting market; it receives results-based payments for verified forestry performance; and it is engaged under Article 6 as a host country. On volume, it is the region's principal supplier of carbon credits. Yet the price that emerges from this architecture is the lowest in the global sample. The World Bank Carbon Pricing Dashboard reports Indonesian allowances at approximately USD 1 /tCO_2e (IDR 12,000) in 2023 (during the pilot project phase). In 2026, Indonesia's ETS has undergone major regulatory overhaul driven by the replacement of the original carbon pricing framework. Since no allowance has traded since the scheme paused, exchange offset credits have cleared at roughly IDR 37,500–60,000 (USD 2–4) across 2025 and early 2026, above comparable international prices for the same project types.

The gap between institutional breadth and price outcomes is less a matter of instrument design than of market conditions. Indonesia has established a broad set of carbon pricing instruments, but their use is not yet supported by sufficiently strong demand or clear incentives. As a result, demand and market integrity remain key constraints on market development, reflected in the relatively weak price outcomes.

Progress and Development

Institutional Development

The legal architecture for carbon pricing in Indonesia is currently anchored in Presidential Regulation 110/2025, which supersedes the earlier Presidential Regulation 98/2021 and establishes the framework for carbon trading, results-based payments, and carbon levies in support of the Nationally Determined Contribution (NDC).[xciii] This is complemented by Law 7/2021, which provides the statutory basis for the carbon tax, including provisions for potential tax relief tied to participation in carbon trading or offset schemes. Recognition of internationally certified carbon units under the prior framework was contingent on the conclusion of a mutual recognition agreement (MRA) between Indonesia and the relevant certification body. This requirement was met for Gold Standard in May 2025 and for Verra in October 2025. Consequently, voluntary carbon activities certified under these two standards operated outside Indonesia's national regulatory architecture until their respective MRAs were finalized. Presidential Regulation 110/2025 revises this framework in response to these constraints. It integrates the compliance and voluntary markets into a single architecture, extends eligibility directly to international crediting standards without requiring a prior mutual recognition agreement, and removes the quota constraints that had previously limited cross-sector trading.[xciv]

The essence of the revision is a decentralized arrangement in which the relevant minister for each sector runs its instruments. The Ministry of Energy and Mineral Resources coordinates the power, oil and gas, transport and buildings subsectors, and its Directorate General of Electricity administers the power-subsector ETS; the Ministry of Industry holds the industrial subsectors, for both the ETS and the offset scheme; the Ministry of Agriculture, agriculture; the Ministry of Forestry, forestry, peat and mangrove; and the Ministry of Marine Affairs and Fisheries, blue carbon. The Ministry of Environment coordinates the waste subsectors and retains the national registry (SRN PPI), the issuance of emission reduction certificates (SPE-GRK) on the relevant minister's recommendation, and the authorization of international transfers. The Financial Services Authority (OJK) supervises the exchange and classifies carbon units as securities rather than commodities, a classification first established under Law 4/2023 on the Development and Strengthening of the Financial Sector and restated in POJK 14/2023, both since amended by Law 4/2026 and POJK 10/2026 respectively. The Ministry of Finance formulates policy for carbon levies (*Pungutan Atas Karbon*), including the carbon tax to which installations exceeding their cap are liable, and manages state revenue from carbon trading. A steering committee chaired by the Coordinating Minister for Food Affairs provides policy direction and leads cross-ministerial coordination, supervision and evaluation, including of the national carbon trading roadmap.

Under the new regulation, the Ministry of Environment issues SPE-GRK on the recommendation of the relevant sectoral minister, following registration in the carbon unit registry and independent verification.[xcv] Sectoral implementing regulations are being issued progressively. The forestry regulation entered into force in 2026 and the first four projects, all pre-existing international-standard projects, were approved in July 2026; the energy-sector regulation remained in harmonization as of September 2026. Holders of units not yet transacted have one year from promulgation to align with the new procedures, and pipeline projects continue rather than restart.

Demand is the binding constraint. A large volume of government-issued credits sits unsold on the exchange for extended periods while Indonesian entities with offset obligations purchase from other schemes, because no rule requires them to source domestically. Based on discussions with private-sector participants conducted for this study, the arithmetic facing a corporate buyer is straightforward: voluntary offsetting is a discretionary cost, in one case on the order of IDR 15 billion, and there is no consequence for declining to incur it. Financial institutions describe the same problem from the other side, reporting carbon-related exposure below 1% of the banking book, which they attribute to price levels and to the novelty of the asset class. Where a mandate does exist, as in the power sector before the pause, participation and project development follow.

Every operating constraint identified above is downstream of a single missing element: an enforceable obligation to buy.

Third-party verification capacity is still developing. Registry infrastructure alone will not lift prices: a registry satisfies one of the nine ICVCM Core Carbon Principles, and the remaining eight concern the quality of the underlying units.

Instrumental Development

Carbon Tax

Indonesia's carbon tax was legislated in 2021 under Article 13 of the Harmonization of Tax Regulations Law (Law 7/2021), at an initial rate of IDR 30,000/tCO_2e (approximately USD 2), with implementation originally planned for April 2022. Its design was comparatively simple relative to the ETS as a fixed floor price, administered by the Directorate General of Taxes rather than a sectoral ministry, with self-reported facility-level MRV. Coverage was set as nominally economy-wide. The start date has been deferred twice, and more than four years after passage the tax has never taken effect, meaning no entity currently carries the liability.

Presidential Regulation 110/2025 has developed the tax's designed relationship to the ETS. The regulation formally names the carbon tax as the penalty mechanism for ETS non-compliance, under Article 63, Paragraph 3.

Emission Trading System

Indonesia's ETS began as a voluntary, intensity-based pilot in 2021 covering 32 facilities, then moved to a mandatory launch in February 2023, with the opening of the IDXCarbon exchange that September. Coverage started narrow and sector-specific, which is a grid-connected coal-fired power plants only, comprising 99 units of 100 MW and above in the 2023 compliance year—and then widened, first to 146 units of 25 MW and above from 2024, and then far more substantially in Phase 2 (2025–2027), which pulled in captive coal- and gas-fired plants supplying energy-intensive industry and brought the total to 563 designated installations; even at that scale, the scheme has remained confined to the power subsector, said to represent somewhere between roughly 21% and 26% of national emissions. Planned expansion beyond power: the Ministry of Industry is preparing to bring in four industrial subsectors, namely, cement, metals, fertilizers, pulp and paper. Multi-sector and cross-sector compliance trading continues to be managed via the national steering committee.

ETS quotas—termed PTBAE-PU (*Persetujuan Teknis Batas Atas Emisi–Pembangkit Utilitas*)—are allocated on an intensity basis against a technology-specific generation benchmark rather than as an absolute cap, so a plant's obligation tracks its output rather than a fixed

volume. Allocation is free, with no auctioning. Surplus quota can be banked within a compliance phase for at most two years, but does not carry across phases—which is why unused Phase 1 surplus expired at the end of 2024 rather than rolling into Phase 2. The quota also functions as the system's compliance lever: non-compliance is penalized not through a separate fine but through a reduction in the following period's free allocation, cut by up to 85% where verified emissions exceed the quota, and by 25% for failing to report or trade.

The cap is legally binding, but the immediate sanction for non-compliance remains a reduction in the following period's free allocation (PTBAE-PU), to at most 85% where verified emissions exceed the quota, and by 25% for failing to report or to trade. However, the framework has transitioned from a flexible pilot to a strictly regulated compliance market under Presidential Regulation No. 110 of 2025, which formally institutes a carbon levy set at the prevailing market price to serve as a financial compliance backstop. While early intensity-based phases failed to constrain regulated generators and left participation net revenue-positive due to generous allowances, the system has expanded from 146 grid-connected installations to 563 installations, pulling in captive (off-grid) industrial power plants. Despite this expansion, the structural bottleneck remains tied to electricity pricing. Because carbon costs cannot be legally passed through to the regulated consumer electricity tariff, a rigid cap would heavily penalize the balance sheet of the state utility (PLN), which acts as the single price-regulated offtaker. As a result, the practical stringency of Indonesia's carbon cap is ultimately determined by national electricity tariff policy rather than independent climate targets.

The instrument that would supply the missing penalty has not yet entered into force. The carbon tax was legislated under the Harmonization of Tax Regulations Law 7/2021 at an initial rate of IDR 30,000 /tCO_2e (approximately USD 2) and was originally scheduled for April 2022, but has been deferred twice and remains prospective. Presidential Regulation 110 names no explicit penalty for non-compliance, referring instead to the carbon tax as the consequence, which is an enforcement backstop that does not yet exist. The legal instrument is in place; the timing of its introduction reflects fiscal and political-economy considerations rather than technical readiness.[xcvi] Revenue use is the dimension on which Indonesia is least specified. The ETS generates no government revenue since the allocation is free and there is no auctioning. Management of future carbon revenue by the Environment Fund (BPDLH) is planned but not yet regulated, and no recycling mechanism has been published for the eventual carbon tax. Among ETS-based mechanisms, Korea's Climate Response Fund, which ring-fences auction revenue for mitigation infrastructure and transition support, is the closest comparator. Microsimulation of the Indonesian carbon tax finds that the distribution of its burden depends more on the recycling scenario than on the rate itself, and that at least 25% of

revenue would need to be returned to insulate the poorest 40% of households from the price pass-through.[xcvii] A published revenue-use mechanism is therefore a precondition for raising the rate.

Carbon Offsets/VCM

Indonesia's voluntary carbon market predates its own domestic regulation. It became Southeast Asia's largest by volume years before Presidential Regulation 98/2021. Recognition of internationally certified units was instead handled indirectly, through a per-standard mutual recognition agreement (MRA) requirement: Gold Standard's MRA was concluded in May 2025 and Verra's in October 2025, meaning credits under both standards operated outside Indonesia's formal regulatory architecture until those agreements were finalized, years after the market itself was already active.

Law 4/2023 on the Development and Strengthening of the Financial Sector established carbon units as securities, thereby bringing carbon market activities within the broader financial sector regulatory framework. The framework was subsequently amended by Law 4/2026 to assign OJK a supervisory role over the carbon exchange, IDXCarbon, which was further affirmed through OJK Regulation (POJK) 10/2026. OJK continues to classify carbon units as securities under Law 4/2023 and its implementing OJK regulation.

The recent development has been to give the offset market a regulatory home for the first time, rather than to change how it operates day to day. Presidential Regulation (PR) 110/2025 explicitly regulates VCM through Articles 66–68, integrating it into the same architecture as the compliance market and allowing climate actions to be both recognized as emissions reductions and issued as tradable carbon credits. The MRA requirement has been dropped entirely, giving businesses freedom to use international crediting methodologies directly rather than waiting on a bilateral agreement, and Article 58(1) now permits both domestic and international credit trading without waiting for Indonesia's NDC targets to be met. For international trade, PR 110/2025 requires Authorization and Corresponding Adjustment (Article 68, and Article 56(2)): offset credits transferred abroad with CA applied are no longer counted toward Indonesia's own NDC, while credits without CA still are—a rule meant to prevent double counting, tracked through the new Carbon Unit Registry System (*Sistem Registri Unit Karbon*, SRUK) registry's ownership records, serialization, and export/import functions. SRUK divide the carbon units into two types by its issuers: GHG Emission Reduction Certificate (*Sertifikat Pengurangan Emisi Gas Rumah Kaca*, SPE-GRK), issued domestically by the Ministry of Environment, and non-SPE-GRK, issued by international standards like Verra or Gold Standard and simply recorded in SRUK.

Singapore

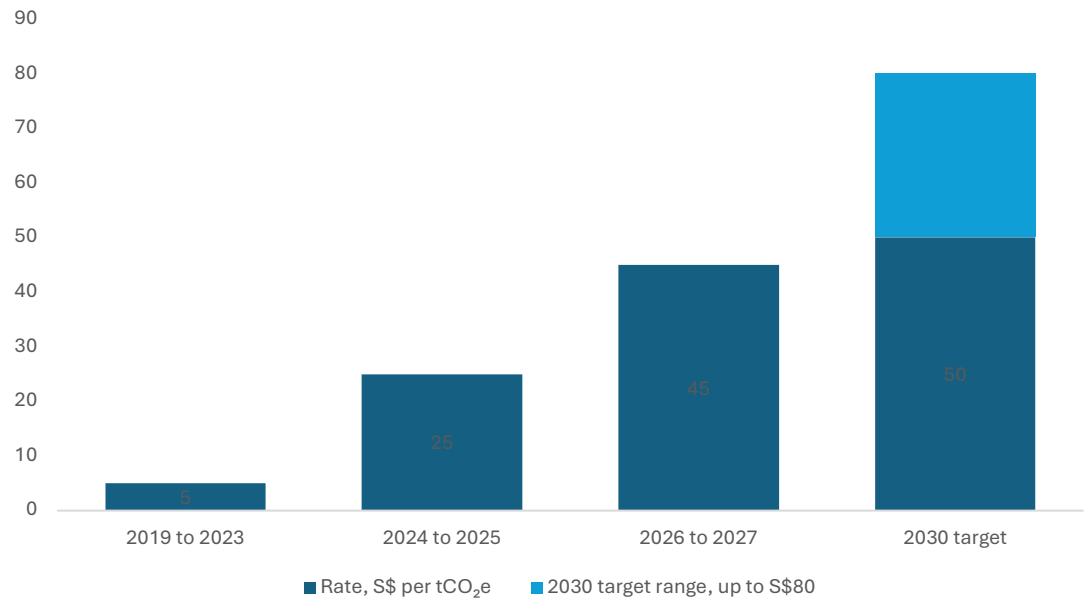
Singapore operates the oldest and most institutionally mature carbon pricing instrument in Southeast Asia, and it is the region's principal source of compliance demand for international credits. Its design choices therefore carry a regional significance out of proportion to the size of its emissions base. Examining Singapore's framework offers two key insights: it shows how a single-instrument carbon tax is built and sustained, while illustrating how that system shapes decarbonization incentives across neighboring ASEAN economies.

Understanding this system begins with the design of the carbon tax itself. The Carbon Pricing Act 2018 requires a liable facility to buy fixed-price carbon credits from the government and to surrender enough of them to cover the tax charged on its emissions for the year. Under the Act, a facility emitting 2,000 tCO_2e a year or more must register and report as a reportable facility, and a facility emitting 25,000 tCO_2e or more is classified as a taxable facility liable for the tax. About 50 facilities cross the second threshold, across manufacturing, power, waste and water, covering roughly 70% of national emissions and all seven greenhouse gases. Section 65 sets the consequence of non-payment at a financial penalty of 5% of the tax assessed and unpaid, with a further 1% of the unpaid amount for each completed month the liability stands beyond sixty days, to a maximum of three times the amount owed. Transition allowances for emissions-intensive trade-exposed sectors are awarded facility by facility against performance and decarbonization targets. The government has not published the share of refining and petrochemical emissions those allowances cover, or the effective rate that sector pays, citing commercial sensitivity. Carbon tax revenue for 2024 was estimated at about SGD 640 million, against an original projection of about SGD 1 billion.

Developments and Initiatives

Singapore's carbon tax was designed to provide long-term investment predictability by legislating a transparent, multi-year rate trajectory rather than relying on incremental policy adjustments. Introduced under the Carbon Pricing Act, enforced on 1 January 2019, as the first carbon pricing scheme in Southeast Asia.[xcviii] The rate was set at SGD 5 per tCO_2e in 2019-2023, rose to SGD 25 (around USD 19) in 2024-2025 and to SGD 45 (around USD 34) in 2026-2027, with a target range of SGD 50-80 (around USD 38-60) by 2030.[xcix] The trajectory was announced as a single multi-year package rather than legislated incrementally, which gave regulated entities a price-path signal that no other instrument in the region has matched, and the Act was amended by the Carbon Pricing (Amendment) Act 2022, which came into force on 7 March 2023, to align the instrument with the national net-zero 2050 target. Application has been graduated in practice, with large emitters facing the full obligation while smaller enterprises have been allowed a more gradual path.[c]

Figure 12. Singapore Carbon Tax Rate Trajectory from 2019-2030



Source: Compiled from the National Climate Change Secretariat.

Notes: The 2030 rate is a target range of SGD 50 to SGD 80.

To keep the administrative burden light while capturing the bulk of national emissions, Singapore codified strict measurement rules for its roughly 50 largest facilities before raising tax rates. Specifically, the tax applies to facilities emitting at least 25,000 tCO_2e a year, around 50 facilities across manufacturing, power generation, waste and water that together account for around 70% of national emissions, rising to around 80% when fuel duties are counted as indirect carbon pricing.[ci] Measurement, reporting and verification obligations are codified in the 2018 Carbon Pricing Regulations, which require third-party verification and align facility-level reporting with international practice. Fixing the measurement obligation in regulation before the rate became material removed the need to relitigate measurement rules with each increase, and the threshold design keeps the administered population small enough to verify rigorously. Policy coordination sits with the National Climate Change Secretariat, and the National Environment Agency administers reporting and collection.[cii]

By pairing carbon tax revenues with targeted fiscal rebates, Singapore cushions household impacts while framing carbon pricing through a lens of redistribution rather than a pure tax burden. Revenue from the tax supports decarbonization and industrial transition measures, and the tax is accompanied by U-Save rebates that cushion the household impact, reaching up to SGD 950 in FY2024. The rebates are delivered through the permanent GST Voucher scheme and the Assurance Package rather than hypothecated from carbon tax revenue, but they are the most visible revenue-related

arrangement in the region and frame the tax as redistribution rather than as a charge.[ciii] The comparator evidence in Chapter 3 identifies revenue visibility of this kind as the condition that has sustained rising prices elsewhere.

Singapore uses its domestic compliance framework as a regional anchor to drive demand for high-integrity international carbon credits rather than relying on a domestic crediting scheme. Singapore operates no domestic crediting scheme, and its link to carbon markets runs instead through international credits and Article 6. From 2024, taxable facilities may retire eligible International Carbon Credits against up to 5% of their taxable emissions, provided the credits originate from approved programs and from host countries with which Singapore has concluded an implementation agreement, carry corresponding adjustments, and meet the integrity criteria of the International Carbon Credit Framework.[civ]

To ensure local compliance drives real environmental outcomes, Singapore strictly screens international credit supply against rigorous environmental standards. Eligible credits must satisfy Singapore's seven environmental-integrity principles, which require that reductions be additional, real, quantified and verified, and permanent, that they be free of double counting, and that they cause no net harm and no leakage, alongside an Article 6 compliance requirement with a 2021 to 2030 vintage window, and they must appear on the published Eligibility List. A domestic compliance instrument thereby creates screened demand for high-integrity Article 6 supply, which is the mechanism by which Singapore functions as the region's demand anchor. It holds the largest portfolio of bilateral Article 6 agreements in ASEAN (Section 2.3), with twelve implementation agreements in all, four of them with ASEAN member states, namely Thailand in August 2025, Viet Nam in September 2025, the Philippines in April 2026, and Lao PDR in September 2026. Regional policy researchers consulted for this study characterize the approach in a single word, integrity, and note that the government has consistently prioritized real, measurable and additional reductions over the volume of eligible supply.[cv]

Singapore positions its domestic carbon accounting and credit framework as a blueprint for broader ASEAN harmonization ahead of its upcoming regional leadership role. At the regional level, Singapore has identified harmonization of MRV standards and carbon accounting methodologies as a first priority for regional cooperation and is developing a regional framework for emissions credits that it intends to present to ASEAN during its 2027 chairmanship, alongside its work with the I-TRACK Foundation on a regional renewable energy certificate framework.[cvi]

Singapore's sustainable finance taxonomy complements a growing regional network, providing financial institutions with a clear quantitative benchmark to assess transition risk. The Singapore-Asia Taxonomy, launched at COP28 in December 2023, followed the ASEAN Taxonomy for Sustainable Finance released at COP26 in November 2021, and the Philippines, Thailand, Malaysia and Viet Nam have since developed national frameworks of their own. Financial institutions in Singapore identify a credible carbon price as one of the few hard reference points available for pricing transition risk.[cvii]

Challenges

The instrument's limitations are of scale and transferability rather than of design. The 5% window is a compliance cushion for Singapore's own taxable facilities rather than a channel for regional demand. Applied to an economy whose emissions were 55.5 $MtCO_2e$ in 2023, and whose 2030 target is around 60 MtCO2e, it was never sized to absorb the supply the region is capable of generating.[cviii] Consequently, market practitioners caution against reading Singapore as the region's only demand center.

Stringent eligibility rules protect the integrity of the instrument, but they temporarily restrict market access for most regional suppliers. Since high-integrity criteria are enforced strictly, most current ASEAN credit supply remains ineligible for compliance use. As a result, the domestic demand and price signal reaches regional suppliers only when they have completed government-to-government agreements and methodology evaluations.

Unique domestic and structural conditions limit the direct transferability of Singapore's carbon tax framework to larger or more complex economies. Domestically, the tax operates in a small, high-income, highly urbanized, energy-importing economy with limited renewable potential, a liable base concentrated in around 50 facilities, and a fiscal position that permits visible household compensation. The government monitors international prices to manage leakage risk and operates no border adjustment, on the reasoning that its price is close to international benchmarks.[cix] These conditions are specific to the jurisdiction, and the instrument taken as a whole is not a template for larger and more diversified economies.

Thailand

Thailand was among the earliest ASEAN Member States to build dedicated carbon-market institutions. It has become the leading on international market cooperation under Article 6 in the region. Its domestic price signal, by contrast, remains modest, and the mandatory framework that would strengthen it has not yet been enacted. The distance between institutional ambition and operational effect is the defining feature of the case.

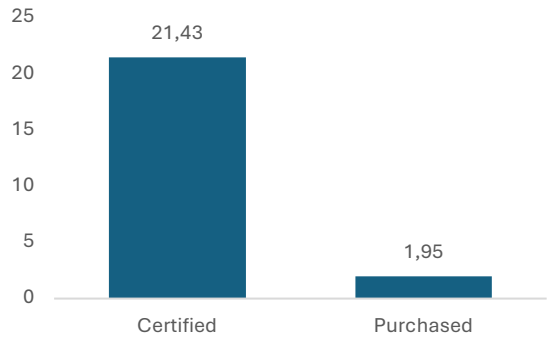
Developments and initiatives

Institutionally, Thailand's carbon market is anchored in the Thailand Greenhouse Gas Management Organization (TGO), a public organization established in 2007 under the Ministry of Natural Resources and Environment (MNRE). TGO administers the national crediting mechanism and its registry, sets standards for GHG measurement, reporting and verification (MRV), and serves as the national certifying body for emissions, reductions, and removals. Meanwhile, the Department of Climate Change and Environment (DCCE) carries the broader climate-policy—mandated to supervise and coordinate national climate change operations.[cx] In February 2026, TGO and the Global Green Growth Institute (GGGI) signed a Memorandum of Understanding on carbon market integrity, green finance and national and regional capacity building, including the exchange of Article 6 practice across ASEAN.[cxi]

The core of the domestic market to date is the Thailand Voluntary Emission Reduction Programme (T-VER), a project-based crediting mechanism launched in October 2023, with credits first traded in fiscal year 2014.[cxii] The programme operates two tiers. Standard T-VER is calibrated to domestic voluntary offsetting, whereas Premium T-VER, introduced in 2022, imposes more stringent requirements on additionality, safeguards, stakeholder consultation and non-permanence, consistent with Article 6.[cxiii] The International Civil Aviation Organization (ICAO) Council has approved Premium T-VER to supply eligible units for the first phase of CORSIA (2024–2026), limited to credits from projects whose first crediting period began on or after 1 January 2016 and to reductions achieved between 2021 and 2026, and conditional on a DCCE Letter of Authorization and a corresponding adjustment reported in Thailand's Biennial Transparency Report—making Premium T-VER the only national crediting programme in ASEAN with full CORSIA eligibility.[cxiv] The tiered design offers domestic developers a lower-cost entry route alongside an internationally recognised standard.

As of the first quarter of fiscal year 2025, TGO had certified 21.43 million tCO_2e of T-VER credits, of which 1.95 million tCO_2e had been purchased for offsetting (Figure 13). Most were generated from in the renewable energy sector. The average traded price reached THB 174.52 per tCO_2e (approximately USD 5) in that quarter, up from THB 125.05 in FY2024. Prices varied markedly by project type: forestry credits traded at THB 300–2,076 per tCO_2e, compared with THB 35–500 for biomass and THB 45–250 for solar.[cxv]

Figure 13. T-VER Credits Certified and Purchased, Cumulative ($MtCO_2e$)



Source: Thailand Greenhouse Gas Management Organization, as reported in ICAP (2026).

Thailand's first explicit mandatory carbon price emerged through the restructuring of existing fiscal instruments rather than through new primary legislation. Emissions-based taxation originated in the vehicle sector: passenger-car excise has been levied on CO_2 emissions rather than engine capacity since 1 January 2016, and a revised structure effective 1 January 2026 tightens emissions bands and phases in higher rates through 2030.[cxvi] For transport fuels, the Cabinet approved a draft ministerial regulation on 21 January 2025 that embeds a carbon component of THB 200 per tCO_2e (approximately USD 6) within the excise on petroleum products, including gasoline, diesel, jet fuel and LPG. [cxvii] The measure is revenue-neutral: the carbon component is carved out of existing excise rates rather than added to them, leaving tax liability and retail prices unchanged, and any increase above THB 200 requires Cabinet approval.[cxviii] Its near-term significance is therefore institutional rather than behavioural: it establishes carbon pricing as a legal category, assigns collection to the Excise Department, and creates the emissions-factor basis on which a higher rate could later be set.

Beyond these tax measures, Thailand's main legal step toward mandatory carbon pricing is the draft Climate Change Act. The Cabinet approved it in principle on December 2025. The draft would establish four carbon pricing instruments simultaneously—a mandatory emissions trading system (ETS), a product carbon tax, a carbon border adjustment mechanism and a regulated carbon credit market—together with a Climate Fund financed partly by ETS and border adjustment revenues. [cxix] The ETS would be administered by the DCCE, including allowance allocation, registries, trading is designed in three phases (Table 9). The first-phase scope of 222 facilities above a 25,000 tCO_2e threshold across seven industrial sub-sectors, covering approximately 42.6% of national emissions, with a 20 $MtCO_2e$ mitigation cap aligned with the draft third NDC, free output-based allocation, a 2028-2030 pilot and a 2030 onward first compliance period.[cxx] This sequencing mirrors the European phase-in on a compressed timeline. As of mid-2026,

the draft remained under review by the Office of the Council of State, with enforcement targeted for early 2027.

Table 8. Thailand Emissions trading System Development Phases

Phase	Period	Coverage	Share of GDP
Phase 1	2026 to 2028	Data collection and mandatory greenhouse gas reporting across transport, utilities, metals and cement	Around 10%
Phase 2	2028 to 2030	Pilot mandatory system extending beyond the 222 Phase 1 facilities to around 300 emitters, adding petroleum, chemicals, rubber and plastics	Around 10%
Phase 3	2030 onward	Full mandatory system with a domestic border adjustment mechanism, extending to agriculture, food and beverages, and electronics	Around 17%

Source: Compiled from Raksakulkarn (2025)

Thailand has also been an early mover in cooperative approaches under Article 6.2. Under its 2022 bilateral agreement with Switzerland, 1,916 ITMOs from the Bangkok E-Bus Programme were credited to the KliK Foundation's account in the Swiss Emissions Trading Registry on 15 December 2023; announced in January 2024, this constituted the first transfer of ITMOs for NDC use under the Paris Agreement.[cxxi] Further issuances approved in April 2026 brought cumulative transfers from the programme to 49,717 ITMOs.[cxxii] Equally notable is the origin sector: the first transfer came from urban transport rather than forestry, offering a useful reference point for other host countries, particularly in Southeast Asia.

Challenges

The principal challenge is legislative timing. The Climate Change Bill has passed through at least two formal rounds of public consultation—six regional hearings in February and March 2024, followed by a revised draft in November 2024—during which its scope widened from 169 to 202 articles, most notably through a new chapter establishing a carbon border adjustment mechanism.[cxxiii] Cabinet approval, originally anticipated in January 2025, was granted in principle only in December 2025, and the draft has since remained under review by the Office of the Council of State. The drafting process has also coincided with considerable political turnover. The Constitutional Court removed two successive prime ministers, in 2024 and in August 2025, and the House of Representatives was dissolved on 12 December 2025, ten days after Cabinet approval of the draft, with a general election held on 8 February 2026.[cxxiv, cxxv]

Until the Bill is enacted, the only mandatory price signal is the excise conversion, which by design leaves relative prices unchanged at the point of introduction. Price formation therefore rests on the voluntary market, where supply has developed ahead of demand: less than one-tenth of certified T-VER volume has been purchased for offsetting.[cxxvi] The two-tier standard, while inclusive, leaves almost all volume in the Standard tier: registered Premium T-VER projects are expected to deliver around 25,600 tCO_2e per year, compared with around 16.7 million tCO_2e per year for Standard T-VER projects.[cxxvii] In August 2024, the Integrity Council for the Voluntary Carbon Market (ICVCM) concluded that credits issued under current renewable energy methodologies would not receive its Core Carbon Principles label, on the grounds that they do not adequately demonstrate additionality.[cxxviii] Although this decision did not assess T-VER directly, it signals the benchmark that international buyers are likely to apply, and renewable energy projects account for most traded T-VER credits.

Once the Act enacted, three implementation questions arise. First, compliance costs are likely to fall unevenly. Exporters already exposed to EU CBAM have adapted to EU emissions reporting requirements, and the Trade Policy and Strategy Officer has singled out SMEs as the firms that most need to formalize their carbon accounting.[cxxix] Meanwhile, smaller firms face measurement, verification and registration costs that are fixed and therefore high relative to their size. Second, introducing four instruments simultaneously generates coordination costs, without assurance that all four will be enforced at the same pace; current plans already envisage the ETS and the Thai CBAM arriving years after the carbon tax. Third, the domestic border adjustment, introduced explicitly to address relocation risk once a domestic price applies, raises a question of incidence. Modelling of border carbon adjustments shows that large importing economies can shift part of the burden onto foreign exporters through terms-of-trade effects.[cxxx] For Thailand, this could turn a safeguard against leakage into an additional input cost for downstream manufacturers. Finally, local conditions shape delivery on the ground. Quality also conditions delivery on the ground. Work on Thai community forests finds that willingness to participate in carbon-linked forestry depends strongly on personal norms and socio-demographic factors, suggesting that market design alone will not determine outcomes.[cxxxi]



International Benchmarks and Lessons for ASEAN Member States

This section benchmarks four mature systems against the regional cases in Section 3 to draw lessons relevant to AMS. The analysis focuses on the design, implementation, and institutional arrangements and what lessons can be drawn, given the challenges of attributing emission outcomes to individual instruments and the differences in national contexts.

The benchmarking covered 10 non-ASEAN jurisdictions across six regions, covering China, Korea, Australia, New Zealand, the EU and associated states, Mexico, Chile, Argentina, Brazil, and South Africa (Table 9, ASEAN member states are presented separately in Table 10).

Table 9. Carbon Pricing Instruments and Net-Zero Commitments Across Jurisdictions

Jurisdiction	Region	Emissions trading system	Carbon tax	Voluntary market	Net zero target
China	East Asia	Operational	Not in place	Yes	2060
Korea	East Asia	Operational	Not in place	Yes	2050
Australia	Oceania	Operational	Not in place	Yes	2050
New Zealand	Oceania	Operational	Under consideration	Yes	2050
European Union and associated states	Europe	Operational	Not in place	Yes	2050
Mexico	Americas	Operational	Operational	Yes	2050
Chile	Americas	Under development	Operational	Yes	2050
Argentina	Americas	Under consideration	Operational	Yes	2050
Brazil	Americas	Scheduled	Not in place	Active	2050
South Africa	Africa	Not in place	Operational	Active	2050

Table 9 shows carbon pricing approaches vary considerably across regions. Emissions trading systems are more dominant in East Asia, Oceania, and Europe, while carbon taxes are more common in Latin America and Africa. Mexico and Chile also show hybrid approaches that combine different instruments. In addition, while net-zero commitments are widespread across jurisdictions, the adoption and implementation of carbon pricing instruments vary. This suggests that, for ASEAN, the key challenge is not a lack of stated climate ambition but translating these commitments into effective policy instruments.

Comparative Insights

Four non-ASEAN comparators were selected for in depth study. The EU is included as the mature reference system. China is included as the closest emerging-market and the largest system by covered emissions. Korea is included as East Asia's first mandatory national emissions trading system and the jurisdiction with the broadest sectoral coverage in the comparator set. New Zealand is included as the only major national system that integrates forestry directly into the compliance price.

Three of the jurisdictions in the wider survey carry lessons that are referenced later in this chapter. Australia operates a baseline-and-credit mechanism, which is the design family closest to the intensity-based allocation used in China and Indonesia. Brazil enacted federal legislation establishing an emissions trading system in 2024 and prescribes that 75% of future revenues finance decarbonization at covered facilities, which is the most explicit revenue earmarking in any system yet legislated. South Africa introduced Africa's first carbon tax in 2019 with high nominal coverage and a headline rate, and its experience of extensive allowances reducing the effective rate below the headline rate.

The comparison runs along nine dimensions, chosen for design relevance rather than for outcome measurement. Instrument design distinguishes cap-and-trade from carbon tax, hybrid, and baseline-and-credit arrangements, identifies absolute against intensity caps, and records the allocation method. Sectoral coverage records the share of national emissions covered, the sectors included, and facility-size thresholds. Price level and trajectory record the current price, the historical path, scheduled increases, and any floor or ceiling mechanism. Revenue use distinguishes general budget allocation from earmarking and records household rebates, industrial transition support, and innovation funding. Measurement and registry arrangements record verification requirements, data-quality history, and registry interoperability. Linkage and offsets record international credit eligibility and Article 6 readiness. Leakage controls record free allocation for emissions-intensive trade-exposed sectors, border adjustments, and output-based rebates. Political economy and just transition record the legislative

pathway, organized constituencies, and distributional incidence. Stages of development record the current operational phase and the published roadmap for the next.

Each comparator profile is built from the ICAP Status Report 2026, cross-checked against at least one peer-reviewed or institutional secondary source, and cells resting on a single source are flagged in the notes to the matrix.[cxxxii] Where a jurisdiction's cap type (absolute versus intensity-based) is not clearly documented in the source, the field is left blank, this affects the EU, Korea, New Zealand, Singapore, and Thailand, for which only China and Indonesia carry an explicit cap-type characterization in the current source base. Price and coverage in the Tables below are not comparable across instrument types.



Table 10. Comparison Matrix

Country/ System	Instrument design	Sectoral coverage	Price level and trajectory	Revenue use	Measurement and registry	International credits and offsets	Leakage controls	Political economy	Stage of development
Singapore	Carbon tax under the Carbon Pricing Act since 2019	Facilities at or above 25,000 tCO_2e, around 70%of national emissions, around 50 facilities	SGD 5 (2019 to 2023), SGD 25 (2024 to 2025), SGD 45 (2026 to 2027), SGD 50 to SGD 80 target by 2030	Decarbonisation and transition support; additional U-Save rebates cushion household impact	Emissions reports verified by accredited external verifiers before assessment. Administered by the National Environment Agency	International credits eligible up to 5% of taxable emissions from 2024	Carbon tax positioned as competitiveness strategy, no border adjustment	Emissions-intensive trade-exposed (EITE) transition framework provides transitional allowances and a consultation period for existing facilities adjusting to the tax trajectory	Operational since 2019, trajectory legislated to 2030
Thailand	Carbon tax at THB 200 per tCO_2e from early 2025, draft Climate Change Act of December 2025 establishing four instruments	Proposed first phase over 2026 to 2028 covering 222 facilities, around 42.64% of national emissions	Around USD 5.5 per tCO_2e tax, T-VER average around USD 5 per tCO_2e	Revenue-neutral by design, embedded in excise	Mandatory monitoring and reporting in the first phase. TGO administers the T-VER registry	First ITMO to Switzerland (December 2023), first JCM transfer to Japan (November 2025), Singapore Implementation Agreement (August 2025)	Domestic border adjustment contemplated in the third phase from 2030	Revenue-neutral design chosen to pre-empt public and business pushback. Export sectors' CBAM exposure is shaping the phase-in pace	First phase 2026 to 2028, second 2028 to 2030, third from 2030
Indonesia	Intensity-based emissions trading system for	Power, around 26% of national emissions, expansion to	No active compliance price: 2025 allocation postponed,	Indonesian Environment Fund, mechanis	National registry records issued credits; carbon units classified as securities	Eligibility for international credits at 5% under discussion,	Free allocation in pilot, no border adjustment	Cross-ministerial coordination, state-owned enterprise	Phase 1 2023 to 2024, Phase 2 2025 to 2027 (2025 allocation

Country/ System	Instrument design	Sectoral coverage	Price level and trajectory	Revenue use	Measurement and registry	International credits and offsets	Leakage controls	Political economy	Stage of development
	power, carbon tax legal under Law 7/2021	captive coal and gas in 2025	no allowances issued or traded as of January 2026. ~USD 2/tCO_2e was the last reported PTBAE-PU level before the postponement	m not yet specified	under OJK oversight (OJK 14/2023)	domestic credits issued as SPE-GRK		compliance unresolved	postponed), Phase 3 2028 to 2030
European Union	Cap-and-trade since 2005, Phase 4 running 2021 to 2030 with a linear reduction factor of 4.3 to 4.4%, a second system from 2027	Around 40% of emissions across power, industry, aviation, and maritime	EUR 64.74, around USD 70.07, average 2024 auction price	Approximately EUR 38.8 billion raised in 2024; Innovation, Modernisation, and Social Climate Funds	Mature measurement regulation, Union Registry interoperable across Member States	No international offsets since 2021, border adjustment phase-in from 2026 reducing free allocation	Border adjustment, free allocation for trade-exposed sectors, cross-sectoral correction factor	Second system linked to the Social Climate Fund	Four phases from 2005 to 2030, second system from 2027
China	National system since 2021 after provincial pilots from 2013, intensity-based with a	Power at around 5.2 billion tCO_2, plus steel, cement, and aluminium from 2024 to 2025	Modest price decline in 2025, 2024 average around USD 12	Not consolidated in this review	2024 Interim Regulations strengthened enforcement, data-quality reforms ongoing	Domestic offset mechanism restarted, Article 6 cooperation under negotiation	Addressed through the domestic offset mechanism and gradual transition	2035 Nationally Determined Contribution is the first absolute Chinese pledge at 7 to 10% from peak	Phase 1 2021 to 2025 covering power, Phase 2 2026 to 2030 covering expansion

Country/ System	Instrument design	Sectoral coverage	Price level and trajectory	Revenue use	Measurement and registry	International credits and offsets	Leakage controls	Political economy	Stage of development
	published roadmap to an absolute cap								
Korea	ETS since 2015 under the Framework Act on Low Carbon, Green Growth (2010); absolute cap. Phase 4 running 2026 to 2030 integrating the stability reserve within the cap and expanding auctioning	Around 73.5% of national emissions across power, industry, buildings, transport, and maritime	KAU24 average of KRW 9,582, around USD 7, price floor of KRW 7,020 set in July 2023	Climate Response Fund covering mitigation infrastructure, low-carbon innovation, and smaller-enterprise technology	Mature MRV administered by the Greenhouse Gas Inventory and Research Center, national allowance registry	Offset limit of 5% per entity. domestic credits (KCU) valid for five years	Trade-exposed sectors receive full free allocation under a leakage index above 0.2%	Industry associations lobbied for relaxed paid-allocation rules ahead of Phase 4, illustrating trade exposed sectors' influence over allocation design	Phase 1 2015 to 2017, Phase 2 2018 to 2020, Phase 3 2021 to 2025, Phase 4 2026 to 2030

Country/ System	Instrument design	Sectoral coverage	Price level and trajectory	Revenue use	Measurement and registry	International credits and offsets	Leakage controls	Political economy	Stage of development
New Zealand	System since 2008 under the Climate Change Response Act 2002; cap aligned with 2050 net zero, originally designed without a fixed domestic cap to accommodate forestry	Around 50% of national emissions across forestry, stationary energy, industrial processing, liquid fuels, and waste	NZD 64, around USD 38.75, floor in 2024 and NZD 68, around USD 41.17, in 2025, containment reserve at NZD 193	NZD 480.9 million, around USD 291.2 million, in 2024 and NZD 5.6 billion since inception, to general budget. four 2025 auctions failed to clear and 13.1 million units (6 million unsold plus 7.1 million in the reserve) were withdrawn	Self-reporting with government audits, third-party verification optional. NZ ETS Register	No international offsets since 2015	Free allocation for 26 trade-exposed activities at 90% or 60%, phase-down of 0.01% annually	Agriculture removed in November 2024	Operational since 2008, auctions from 2021, supply settings 2025 to 2029

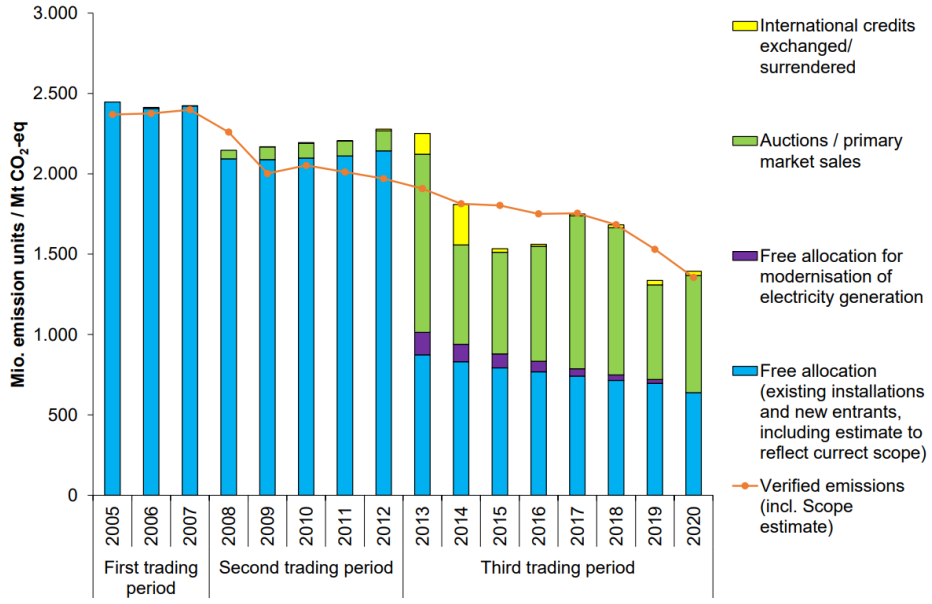
Source: Author's compilation based on ICAP (2026) and World Bank (2025), cross-checked against the peer-reviewed and institutional sources cited in the country narrative.

Notes: The matrix is design-focused, so cells report instrument-design facts and operational status rather than attributed emission-reduction outcomes. Four cells rest on a single source and are flagged for primary-source verification. The stages of development column summarises published phase boundaries, and transitions between phases are not always cleanly delimited in practice.

Taken together, the implementation experience of the four systems suggests that measurement, price-stability mechanisms, and allocation arrangements tend to become more developed over time. China shows how an intensity-based system enters, corrects its measurement problems and publishes an exit toward absolute caps, relevant lesson is how to combine an initial intensity-based design with a clear pathway towards tighter caps, supported by a robust verifier and market infrastructure as coverage expands. Korea shows that sectoral reach and price stringency are independent variables, since it covers around three quarters of national emissions while transmitting a price of around USD 7 because of extensive free allocation. This suggests that expanding coverage alone does not necessarily strengthen the price signal, but the design and stringency of allocation also matter.

The two longest-running systems in the sample, the EU ETS, established in 2005, and New Zealand's ETS, established in 2008, have the most developed institutional and administrative arrangements. The key difference between the four comparator systems and the early-stage ASEAN systems lies less in their years of operation than in their measurement and institutional capacity. The EU provides the mature reference on sequencing, on revenue governance. New Zealand is the only major system that integrates forestry directly into the compliance price, and its record of a price collapse driven by unrestricted international units, failed auctions above the floor and the withdrawal of agriculture makes it the cautionary case for forest-rich economies, the key lesson is that international linking and price-support mechanisms need to be carefully designed if forestry is brought into the compliance system.

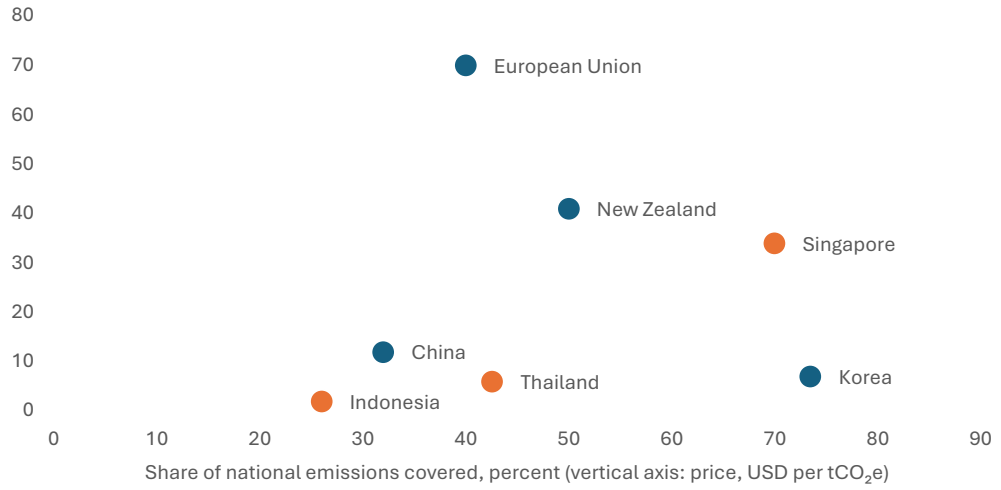
Figure 14. Supply and Demand Balance for Installations in the EU ETS



Source: ETC/CME Report 9/2021

Figure 15 plots the share of national emissions covered against the prevailing price for the four comparators and the three focus countries. The absence of any relationship between the two is itself the finding. Korea, for example, covers around three-quarters of its emissions but has a carbon price of only around USD 7, partly reflecting extensive free allocation. Indonesia has a similarly low price but a much narrower coverage, driven by different design and implementation factors.[cxxxiii, cxxxiv, cxxxv]

Figure 15. Share of National Emissions Coverage

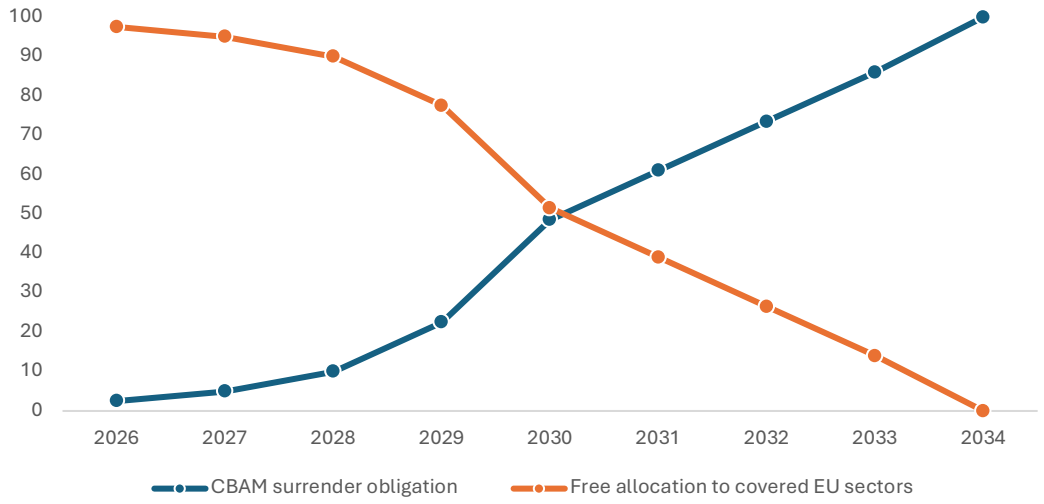


Source: Authors' compilation from ICAP (2026) and World Bank (2026).

Notes: coverage (horizontal axis, percent of national emissions) and price (vertical axis, USD per tCO_2e) in the comparator systems and the focus countries. Values as in the tables above. ASEAN focus countries in orange, comparators in blue.

The Figure below shows the schedule on which the European border adjustment phases in with the share of embedded emissions subject to CBAM certificate requirements increasing from 2.5% in 2026 to 100% in 2034, while free allocation for the corresponding EU sectors is phased out. Carbon price paid in the exporting country is deducted from the certificate liability, which is why the schedule now enters coverage decisions in Viet Nam, Malaysia and Thailand. OECD simulation indicates why the schedule matters beyond the certificate liability itself. Without CBAM, a tighter EU emissions cap is estimated to shift around 0.19 tonnes of CO_2 abroad for every tonne of emissions reduced within the EU; with it, leakage is not only eliminated but reversed, as EU importers switch toward lower-carbon suppliers or suppliers in jurisdictions with comparable carbon pricing.[cxxxvi] For ASEAN exporters, a credible domestic carbon price therefore serves both as a deduction against the certificate liability while strengthening the position of lower-carbon producers in the EU market.

Figure 16. EU CBAM Phase In and Withdrawal of Free Allocation in 2026-2034



Source: European Commission, CBAM Regulation (EU) 2023/956 and EU ETS Directive as amended, as summarized in ICAP (2026) and Dechezleprêtre et al. (2025).

Lessons Learned to ASEAN

The comparator evidence provides lessons across three areas: instrument design and supporting infrastructure, governance and institutional arrangements, and market development and regional coordination. The lessons are set out in that order, with attention to the conditions that may add relevance to ASEAN.

Instrument design and infrastructure for compliance credits

The first design lesson is phased coverage expansion from power into industry. China expanded its national system from the power sector alone to steel, cement and aluminum smelting under a March 2025 work plan. With the 2024 and 2025 compliance years governed by a November 2025 allocation plan, the expansion added around 3 billion tCO_2e of covered emissions and well over 1,000 companies, lifting coverage to more than 60% of national CO_2 emissions.[cxxxvii] Indonesia has followed the same template, beginning in 2023 with 99 grid-connected coal-fired units (146 in 2024) and designating around 563 installations, including captive coal and gas-fired plants, for 2025, although the 2025 allocation has been postponed pending regulatory revision and no allowances had been issued as of January 2026.[cxxxviii, cxxxix, cxl] Viet Nam's pilot, by contrast, started with trade exposed industrial sectors, showing that countries can adopt a different sequencing approach depending on their sectoral priorities and institutional readiness. Korea provides a different example, having achieved broad coverage early and subsequently focused more on strengthening the system than on further expanding its scope. The sequencing question for ASEAN Member States is therefore not simply whether to

expand coverage, but whether the necessary measurement and administrative capacity are in place to support each subsequent phase. [cxli]

The second is intensity-based allocation, provided that the maturation pathway is published alongside it. Intensity-based allocation is politically easier to introduce because it links the obligation to output rather than to an absolute ceiling, and it protects the system against both surplus and scarcity when activity levels diverge from projections. The corresponding risk is that industry treats the entry phase as the steady state and prices its investment decisions accordingly. China's published transition to an absolute cap paired with auctioning, and Korea's current move toward benchmarking covering more than 75% of eligible participants, both illustrate the maturation pathway being designed in advance rather than negotiated later under conditions of resistance.[cxlii] For ASEAN, the main lesson is to establish the intended direction of the system early, including how allocation rules will evolve as measurement, administrative, and market capacity increase. This lesson is relevant to domestic compliance systems under development, as China's system remains domestically focused. [cxliii]

A third design lesson is the choice that what matters most is the stringency of the target relative to business-as-usual emissions. An absolute cap set well above expected emissions will generate limited demand for allowances and a weak price signal, while a sufficiently stringent intensity-based target can generate stronger demand and higher prices. The implication for Indonesia and for the other intensity-based systems in the region is direct, low prices cannot be attributed to the choice of an intensity-based design alone. Moving to an absolute cap alone would not strengthen the price signal, but this would depend on how the cap is set relative to expected emissions. [cxliv]

A fourth lesson is cautionary and concerns the New Zealand experience with integrating forestry into its emissions trading system. Integrating forestry credits and obligations directly into the compliance price is technically coherent but politically exposed. In 2025, all four quarterly auctions failed to clear as secondary-market prices remained below the floor, and more than 13 million unsold units were permanently withdrawn.[cxlv, cxlvi, cxlvii] For ASEAN economies with large forest carbon stocks, including Indonesia, Viet Nam, Malaysia, Cambodia, and Laos, the model is therefore a cautionary template rather than an aspiration. Sector-wide forestry integration requires both a carbon price high enough to make sequestration credits economically meaningful and a political coalition stable enough to sustain the inter-sectoral transfer that such integration implies, and neither condition currently holds in the region. Such an approach requires both sufficient carbon-price incentives for sequestration and policy arrangements that can manage the distributional effects across sectors. Singapore's softer alternative, admitting high-integrity Article 6 credits against up to 5% of carbon tax liability, is considerably more

transferable because it creates a demand channel for forest carbon without placing the forestry sector inside the compliance obligation.[cxlviii]

The fifth lesson is coming from EU's first phase, which shows the importance of establishing a robust measurement and verification system before setting up the cap. In 2005, member states set national caps based on their own emissions estimates, with limited harmonization in data collection and verification. The resulting overallocation contributed to a surplus of allowances and a sharp decline in the carbon price towards the end of the phase. For AMS developing compliance systems, the key lesson is that the credibility of a cap depends on the quality of the measurement and verification infrastructure supporting it. This holds an important lesson, rather than repeating the two-decade learning curve, member states can anticipate and design against the problems the EU ETS initially faced.

In addition, mechanisms to manage allowance supply should be considered, rather than treated as a later stage of refinement. Oversupply and weak prices have emerged under different system designs. The EU spent much of Phase III managing a large surplus of allowances accumulated following the financial crisis and earlier over-allocation, first through the temporary postponement of auction volumes in 2014 and later through the Market Stability Reserve, which adjusts auction supply in response to the size of the surplus. Korea has also incorporated a market stability mechanism into its emissions trading system. New Zealand provides a different example where its 2025 auctions failed to clear because the auction price floor was above prevailing secondary-market prices. These experiences show that different systems can face price and supply-management challenges for different reasons. For AMS, the lesson is to establish clear rules for responding to surplus, weak prices, or other market imbalances at the design stage, rather than developing such mechanisms only after problems emerge.

Governance and institutional readiness

The first governance lesson is the importance of making the use of carbon pricing revenues visible, particularly where this can help build public and political support. Singapore's additional U-Save rebates of up to SGD 950 in FY2024, delivered alongside the carbon tax through the GST Voucher scheme rather than funded from its revenue, frame the tax as redistribution rather than as a charge.[cxlix] The European Social Climate Fund, operating from 2026 alongside the extension to buildings and road transport, is identified as the precondition for the political feasibility of that extension, a response to the Union's own experience of carbon costs falling disproportionately on lower-income households and coal-dependent regions. Korea's Climate Response Fund ring-fences auction revenue for mitigation infrastructure, low-carbon innovation, and smaller-enterprise technology support, and public acceptance in Korea is found to depend on

precisely that earmarking. New Zealand, which directs revenue to the general budget, provides the counterexample. The design implication is that the revenue mechanism should be published before the rate is raised rather than after, because a compensation scheme announced in response to opposition carries none of the credibility of one legislated in advance.

The distinction is relevant to ASEAN because regional evidence does not simply replicate the comparator pattern. A survey by the Economic Research Institute for ASEAN and East Asia found that around 70% were willing to pay a carbon price, with most support concentrated at levels of up to about USD 10, and that willingness to pay was tied mainly to reinvestment in clean-energy development and to regional coordination on border-adjustment exposure; assistance to low-income households raised support only at the highest price levels, although the sample is not nationally representative.[cl] Visible reinvestment therefore matters at least as much as compensation, and household rebates of the Singapore type are better read as a safeguard that protects legitimacy as the price rises than as the primary source of support. For ASEAN, the implication is not simply that carbon-pricing revenues should be recycled, but that their intended use should be established and communicated clearly as the system develops.

A second governance lesson is the combination of regulatory leadership with structured stakeholder consultation. The Korean model depends on state capacity to bind state-owned and quasi-state utilities into the system without prolonged negotiation, and on a benchmark-based allocation methodology that the government has the technical capacity to define and periodically update. Most ASEAN member states have less centralized regulatory capacity than Korea and less developed stakeholder infrastructure than the EU, which places them between the two models rather than close to either. The Korean system is relevant as a reference for the roles and capabilities required of the regulator, rather than as a model to be replicated in full. It depends on the ability to coordinate regulated entities, including state-owned enterprises, and to maintain the technical capacity needed to develop and update allocation rules.

A third governance lesson is about what Article 6 authorization costs the host country. Once an ITMO is authorized for international transfer, the corresponding mitigation outcome is subject to the Paris Agreement's accounting requirements and cannot simply be counted towards the host country's NDC without the corresponding adjustment. Host countries need a clear basis for determining which mitigation outcomes can be made available for international transfer while maintaining progress towards their NDC, this requires sectoral mitigation roadmaps, marginal abatement cost curves, and a pricing strategy that together establish which sectors, activity types, expected demand for international units, and the implications of different authorization volumes.

Market development and regional coordination

A further distinction is important for carbon market development is not every cross-border voluntary carbon market transaction requires a corresponding adjustment. Corresponding adjustments apply to mitigation outcomes transferred under Article 6.2 for use towards another Party's NDC, and to relevant authorized units under Article 6.4. A voluntary transaction outside these uses does not automatically need a corresponding adjustment.

Regional demand is also more concentrated than the policy discussion assumes. Singapore is treated as the region's demand center, but it is a small economy with comparatively low emissions of around 55 million tCO_2e in 2023, below its 2030 NDC level of around 60 $MtCO_2e$, and it cannot absorb ASEAN's potential credit supply at any plausible share of its carbon tax liability.[cli, cliii] A regional market thus cannot rely on a single anchor buyer. Sustained demand will also need to develop within the region's larger emitting economies through domestic compliance mechanisms, bringing the discussion back to the domestic instruments in Chapter 2. Rather than pursuing a single regional carbon market, a more practical approach is to build on interoperable registries, common approaches to integrity, and coordinated host-country positions under Article 6. This provides the basis for the recommendations in the following chapter.



Recommendation

This study finds that the development of carbon pricing in ASEAN presents both opportunities and institutional challenges. ASEAN Member States have adopted different approaches to carbon pricing, ranging from carbon taxes and emissions trading systems (ETSs) to voluntary carbon markets and currently exploring Article 6 mechanisms. These differences reflect variations in national circumstances, economic structures, institutional capacity and policy priorities.

The priority for ASEAN should therefore be to build institutional and technical foundations that allow different national systems to become increasingly compatible and connected. Regional integration should be understood as a gradual process of interoperability rather than uniformity, consistent with the ASEAN Strategy for Carbon Neutrality, which already identifies interoperable carbon markets and harmonized measurement, reporting and verification (MRV) as regional priorities. ASEAN does not need to establish a single carbon price or a single regional carbon market. Instead, ASEAN can strengthen common infrastructure, improve policy coordination and develop mechanisms for recognition and cross-border cooperation.

This study suggests that ASEAN should focus on three areas. First, the region should build interoperable and credible carbon-market infrastructure that allows different national systems to be recognized across borders. Second, ASEAN should strengthen institutional coordination and policy coherence across its climate, economy, finance, energy and capital-market tracks. Third, ASEAN should integrate domestic carbon-pricing systems more effectively with international carbon markets, trade and sustainable finance, ensuring that participation in international markets is supported by robust Article 6 arrangements and does not undermine national mitigation objectives.

Build the foundations for interoperability and high integrity carbon infrastructure
Developing more consistent monitoring, reporting and verification (MRV) approaches should be the starting point for regional cooperation while allowing AMS to retain flexibility in how these principles are implemented domestically. Cooperation could focus on minimum technical requirements, common terminology, data-quality standards and approaches to avoid double counting. ASEAN could initially focus on priority sectors where cross-border activity and mitigation potential are greatest.

Existing experiences with cross-border markets can provide useful institutional learning. Singapore's work with the I-TRACK Foundation to develop a regional Renewable Energy Certificate framework, for example, demonstrates how common tracking, registry and

accounting arrangements can facilitate cross-border transactions while retaining national systems. The experience is not directly transferable to carbon markets, given the greater complexity of carbon accounting and Article 6 requirements, but it should provide a useful example of interoperability. A practical next step would be to develop a pilot for registry interoperability among a small number of willing AMS before considering wider regional adoption.

At the regional level, ASEAN should manage both uneven market maturity and the absence of a consistently articulated regional position. A recommended regional priority is to develop pilot registry interoperability among several member states, focusing initially on data standards and unit identifiers, building on the existing regional carbon projects and crediting methodology database, clarity across jurisdictions and encourage cross-trading. Indonesia and Thailand were identified as relatively active markets, while several other member states remain at earlier stages of development. Most ASEAN-origin carbon-market supply is currently directed towards external buyers, while Singapore represents an important regional buyer through its carbon-pricing framework. Interoperability also depends on institutional capacity. ASEAN should strengthen mechanisms for technical assistance and peer learning on MRV, registry management, verification, carbon accounting and market oversight, particularly for Member States at earlier stages of market development.

Strengthen ASEAN institutional coordination and policy coherence

Building interoperable carbon market requires enabling institutions while carbon pricing increasingly intersects climate policy, energy, trade, industrial competitiveness, capital markets and sustainable finance. These areas are addressed through different ASEAN mechanisms and policy tracks, creating a risk of fragmented approaches and limited coordination.

ASEAN should therefore strengthen coordination among the ASEAN Secretariat, the ASEAN Working Group on Climate Change (AWGCC), the ASEAN Capital Markets Forum (ACMF), finance and economic institutions, and relevant energy bodies. Especially establish clearer coordination functions, including maintaining a regional overview of carbon-pricing developments, coordinating technical work on MRV and Article 6, facilitating policy dialogue across sectoral tracks, and identifying areas where national systems can become more compatible.

The proposed ASEAN Green Economy Framework Agreement (GEFA) could provide an additional institutional lever and could provide an opportunity to clarify how carbon pricing and carbon-market cooperation fit within ASEAN's broader green-economy architecture. ASEAN chairmanships could also help maintain momentum. In addition,

Singapore's upcoming chairmanship, followed by Thailand, provides an opportunity to build on existing initiatives on carbon pricing and carbon markets.

Integrate carbon pricing with international markets, trade and sustainable finance

Article 6 is an important component of ASEAN's international market infrastructure. It opens additional avenues for countries to combine carbon-market and non-market mechanisms in meeting their NDC targets, particularly the conditional components of those targets. Momentum toward greater use of carbon-market mechanisms is reinforced by growing interest among ASEAN member states in embedding domestic carbon pricing. Article 6.2 offers new funding sources through bilateral carbon-credit trading, although its use requires substantial preparatory work on policy, regulation, pricing, and technical carbon-accounting infrastructure.

At the regional level, ASEAN has set a target of carbon neutrality by 2050, with the energy sector accounting for the largest share of projected emissions. Meeting this ambition is estimated to require approximately USD 3.7-6.7 trillion in cumulative investment by 2050, in addition to nearly USD 212 billion needed to fund power grid interconnection over 2018–2040.[cliii] Historically, the region has relied heavily on public financial sources, domestic and international combined, for an estimated 87% of climate finance as of 2019, with bilateral partners contributing around 70% of international public finance, some 95% of which was provided in grant form.[cliv] Given the still-limited role of market-based instruments in the region's climate finance mix, Article 6 offers a further avenue for scaling market-based finance while complementing, rather than displacing, existing bilateral cooperation channels.

Given that most ASEAN member states remain at an early stage of Article 6 readiness, substantial institutional infrastructure will be required to align emerging schemes with existing climate governance structures, while balancing cost efficiency against the technical capacity needed to manage registration, emissions accounting, corresponding adjustments, and ITMO tracking. Measurement, reporting, and verification (MRV) systems developed for Article 6 purposes can, in principle, be linked to existing national MRV systems, both as a basis for emissions accounting and as a safeguard for the environmental integrity of any resulting transactions.

Carbon pricing should also be integrated into ASEAN's broader trade and sustainable-finance architecture. Carbon-border measures such as the EU's CBAM affect the competitiveness of ASEAN exports, while differences in product-level emissions accounting may increase compliance costs. ASEAN should therefore increase dialogue on carbon-related trade measures, develop compatible approaches to product-level emissions accounting for priority trade exposed sectors, and build capacity among

affected industries, in relevance to its carbon pricing initiatives. Existing trade agreements can provide platforms for this cooperation while expanding linkages with trade such as RCEP member countries.

Carbon pricing and sustainable finance should be developed as complementary components of the region's transition. The current guidelines Examining Singapore's framework offers two key insights: it shows how a single-instrument carbon tax is built and sustained, while illustrating how that system shapes decarbonization incentives across neighboring ASEAN economies.

Table 11. Recommended Measures by Instrument

Instrument	AMS Operating the Instrument	Recommended National Measures (Based on Instrument Implementation)	Recommended Regional (ASEAN) Cooperation
Carbon tax	Singapore (in force); Indonesia (legislated, not yet in force); Malaysia (announced for 2026); Thailand (carbon component within fuel excise)	**Under development:** Establish a clear implementation pathway, including the tax rate, commencement date and revenue-use arrangements, where applicable **In force:** Review tax trajectories and assess revenue use and distributional impacts.	Facilitate peer exchange on carbon tax trajectories, revenue use and compensation mechanisms; assess distributional impacts; and explore a common approach to documenting domestic carbon prices for consideration under carbon border adjustment mechanisms.
Compliance ETS	Indonesia (in force, allocation postponed); Viet Nam (pilot); Thailand (Climate Change Act approved), Malaysia, Philippines (in development)	**Under development:** Establish a clear maturation pathway, regulatory framework, and implementation arrangements **In force:** Clarify the implementation timeline, maturation pathway, and address outstanding design and operational issues.	Facilitate peer exchange on common minimum MRV requirements and benchmark methodologies. Encourage coordination of implementation timelines with national measurement and reporting capacity.
Voluntary carbon market	Indonesia, Thailand, Malaysia, Cambodia, Lao PDR, Myanmar, Philippines, Viet Nam	**Under development:** Strengthen domestic crediting frameworks, define eligibility rules and develop the infrastructure needed to support credible credit issuance and use. **In force:**	Develop common reference points on additionality, permanence, baselines, double counting, and safeguards, building on current standards, extension of the existing regional database of national carbon projects

Instrument	AMS Operating the Instrument	Recommended National Measures (Based on Instrument Implementation)	Recommended Regional (ASEAN) Cooperation
		Strengthen market integrity and transparency for high-quality carbon credits, improve liquidity, review eligibility rules	and crediting methodologies
Article 6	Singapore (buyer, 29 agreements); Indonesia, Thailand, Cambodia, Lao PDR, Viet Nam, Philippines, Malaysia (hosts)	**Under development:** An article 6 strategy grounded in sectoral roadmaps and the NDC/ LT-LEDS; a designated authority (6.4) and authorization arrangements (6.2); an overselling safeguard covering conditional and unconditional targets; eligible and ineligible activity lists; a tracking registry and initial report. **In force:** Strengthen authorization; reporting (initial report, annual information, BTR); CA accounting; and safeguards (environmental integrity, benefit-sharing, adaptation share, overall mitigation).	Facilitate peer exchange on reporting approach to corresponding adjustments and authorization; Coordinate hosts and buyers on common integrity standards, registry interoperability, bilateral agreement terms, and shared negotiation positions
Results-based payment	Indonesia, Viet Nam, Cambodia, Lao PDR	**Under development:** Establish institutional and legal foundations for participation, including benefit-sharing and MRV arrangements. **In force:** Strengthen benefit-sharing arrangements, clarify rights over the mitigation outcomes, and align program level verification with national MRV systems	Facilitate peer exchange on program design, disbursement and benefit-sharing arrangements across host countries

Appendix A. Country Profiles: Other ASEAN Member States

This appendix profiles the seven Member States not treated in depth in Section 3.2, using the same instrument-by-instrument structure. Each profile records the legal and institutional basis, the status of each instrument introduced in Section 3.1, the developments to date, the challenges identified, and the opportunities that follow. The profiles are compiled from the ICAP Status Report 2026, the World Bank's State and Trends of Carbon Pricing 2026, the Article 6 Implementation Partnership country profiles, national legislation and the secondary literature cited; where a claim rests on a single source, it is noted.[clv, clvi, clvii]

Table 12. Country Profiles of the Seven Other ASEAN Member States, by Instrument.

Country	Legal and institutional basis	Instruments: carbon tax, ETS, crediting, results-based payment, Article 6	Developments to date	Challenges	Opportunities
Viet Nam	Law on Environmental Protection 2020; Decree 06/2022 amended by Decree 119/2025 (in force August 2025); Decision 232/QD-TTg (2025); Decision 263/QĐ-TTg (February 2026) on aggregate pilot quotas and Decision 699/QĐ-BNNMT (February 2026) on facility-level allocation; Decree 29/2026 on the exchange; Circular 11/2026 on the national registry; Decree	No carbon tax. Pilot ETS from August 2025 to 2028 with full free allocation under intensity benchmarks for 2025 to 2026; full operation envisaged from 2029; offsets may cover up to 30% of allocation. Domestic crediting for waste and transport; Joint Crediting Mechanism projects with Japan. Article 6 host with 3 bilateral agreements, 20 Article 6.2 activities and 23 PACM	The pilot covers 110 facilities (34 thermal power plants, 51 cement and 25 iron and steel facilities), around 40% of national emissions; cement and steel are CBAM-covered sectors; 2025 allowance budget of 243.1 $MtCO_2e$ and 268.4 $MtCO_2e$ for 2026; domestic trading platform launched on 29 June 2026, with first allowance trades closing near USD 5/tCO_2e; NDC of 15.8% unconditional and 43.5% conditional	Price signal thin and not yet binding under free allocation and output-based limits, which are not an absolute cap; allocation led by the environment ministry but dependent on coordination with the industry and construction ministries; revenue recycling unresolved between efficiency and public-acceptability criteria[clviii]; firm participation	Coverage of two CBAM sectors could support deduction of a carbon price effectively paid once allocation tightens[clxi]; sectoral concentration allows a verifiable record at low compliance cost; Singapore's Act has informed the design of a future carbon tax[clxii]; the registry and Decree 112 provide the accounting base for Article

Country	Legal and institutional basis	Instruments: carbon tax, ETS, crediting, results-based payment, Article 6	Developments to date	Challenges	Opportunities
	112/2026 on international transfers; Ministry of Agriculture and Environment holds the mandate; Hanoi Stock Exchange operates trading, with custody and settlement by the Viet Nam Securities Depository and Clearing Corporation	approvals, the largest PACM pipeline in ASEAN, although none registered and no ITMOs transferred	reduction below BAU by 2030 (2022 NDC); NDC 3.0 in preparation	driven by institutional pressure rather than price[clix]; agricultural measurement capacity still maturing[clx]	6 and for exchange interlinkage with regional platforms
Malaysia	Twelfth and Thirteenth Malaysia Plans; National Energy Transition Roadmap; National Climate Change Policy 2.0; National Carbon Market Policy (2026); climate change bill consultation paper (October 2024); Sarawak climate legislation (November 2023); World Bank Partnership for Market Implementation	Carbon tax announced for iron, steel and energy, in finalization as of June 2026; ETS under consideration; Bursa Carbon Exchange (December 2022), the first Shariah-compliant voluntary platform, trading Verified Carbon Standard credits only; Article 6 host with two bilateral agreements and four PACM approvals	National Carbon Market Policy sets up a national registry, MRV guidelines and Article 6 procedures ahead of any pricing instrument; domestic auction reference prices of RM50 (Kuamut, 2024) and RM39.60 (Monsoon, 2025); Feasibility study on instrument design, registry and international alignment; National Industrial Master Plan 2030 and Steel Industry Roadmap 2035 sequence decarbonization in three phases; National Energy Policy 2022 to 2040 limits new	Tax rate and trajectory undisclosed and dependent on RUUPIN; revenue earmarking for green research and technology announced but not legislated; no revenue framework published; legal status of carbon credits unclear at federal level; exchange without a compliance anchor; readiness assessment ranks stakeholder buy-in, institutional capacity and legal clarity as highest-	Announcing the trajectory and the recycling mechanism together, as Singapore did; CBAM-aligned initial coverage; Sarawak's mandatory thresholds as a sub-national precedent; the National Carbon Market Policy as the bridge from voluntary to compliance

Country	Legal and institutional basis	Instruments: carbon tax, ETS, crediting, results-based payment, Article 6	Developments to date	Challenges	Opportunities
			coal and expands renewables[clxiii,clxiv]	leverage factors[clxv,clxvi]	
Philippines	Climate Change Act 2009 and the Climate Change Commission; Tax Reform for Acceleration and Inclusion Law 2017 (fuel excise); Department of Energy circular of September 2025 on energy-sector carbon credits; House Bill 11375, the Low Carbon Economy Investment Act, passed by the House in June 2025 and pending in the Senate, refiled as House Bill 2055 in the 20th Congress, approved by the Senate Committee on Climate Change in December 2025 and pending Senate deliberation	No explicit carbon tax, but fuel excise applies an implicit price to more than half of national emissions, with the coal excise equivalent to roughly EUR 1/tCO_2e; proposed cap-and-invest system; long-standing CDM and JCM participation; Article 6 host with 2 bilateral agreements, seven PACM approvals and a first implementation agreement, with Singapore, signed in April 2026	First transition credits associated with early coal retirement, formalized between ACEN and GenZero in August 2024; Verra approved the coal-retirement (CCCI) methodology in May 2025; energy-sector crediting framework in place; Singapore agreement establishes a joint committee and pre-approved methodologies	Senate passage uncertain, since earlier carbon pricing bills failed in the upper chamber; the implicit price is invisible as climate policy, generates no measurement infrastructure or tradable unit, and is unlikely to qualify as a deductible carbon price under a foreign border adjustment	The cap-and-invest design ties revenue to a domestic investment channel at the point of design; the coal-retirement crediting precedent has direct application in Indonesia and Viet Nam; the Singapore agreement provides a compliance-demand route
Brunei Darussalam	National Climate Change Policy (July 2020) with ten strategies to 2035, Strategy 6 targeting carbon pricing by 2025; Mandatory Greenhouse Gas Reporting	No carbon tax or ETS; no domestic crediting or voluntary market activity; no Article bilateral 6 engagement recorded	Mandatory reporting from designated installations provides the measurement foundation; the 2025 policy deadline for carbon pricing has passed	Hydrocarbons account for 58%of GDP, 92% of exports and 88% of fiscal revenue; no fuel taxes, petrol prices unchanged for more than two decades, and annual fossil-	IMF scenarios indicate that a USD 50 tax would deliver revenue of 1.6% to 7.2% of GDP at an economic cost of 0.1% to 1.2%, and that combining the tax with

Country	Legal and institutional basis	Instruments: carbon tax, ETS, crediting, results-based payment, Article 6	Developments to date	Challenges	Opportunities
	Directive (April 2023); NDC 3.0 (2025): 20% below BAU by 2035		without instrument	fuel subsidies of around USD 500 million, so that a carbon price would be largely offset by existing subsidies until subsidy reform precedes it	subsidy reform yields the largest reductions (single source); the reporting directive can be built on
Cambodia	Environmental and Natural Resources Code 2023 (12 books, 865 articles); Article 6 Operations Manual (January 2024) endorsed at Prime Minister level; National REDD+ Strategy 2017 to 2026; Long-Term Strategy for Carbon Neutrality (2021)	No carbon tax or ETS; active voluntary market, earning more than USD 12 million from credits in 2016 to 2020; Article 6 host with three bilateral agreements (Japan, Singapore, Korea), nine Article 6.2 activities, two PACM approvals and a dedicated registry	The Operations Manual retains a 10% domestic reserve of authorized volumes against the NDC, sets authorization periods of 5 to 45 years by project type, and concentrates Letters of Authorization in the Ministry of Environment; independent assessment ranks Cambodia among the most Article 6-ready ODA-eligible countries (single source); AMRO provides technical assistance on carbon pricing	Suspension of the Southern Cardamom REDD+ project by Verra in June 2023 following documented safeguard failures illustrates the reputational exposure of a strategy built on forest credits; least-developed-country capacity constraints	Head-of-government endorsement of authorization gives buyers confidence; the framework is a reference for other host countries; regional verifier capacity would reduce safeguard risk
Lao PDR	Decree on Carbon Credits (May 2025, 47 articles across 12 chapters); Decision 4565/MAF (September 2024) on forest carbon; National REDD+ Strategy 2021;	No carbon tax or ETS, and none planned; government crediting mechanism implemented; results-based payment under the Forest Carbon Partnership	Ownership, authorization and benefit-sharing rules set ahead of transaction volume rather than in response to it; the second country in East Asia and the Pacific to receive	Forest-concentrated supply faces the most sustained scrutiny on permanence, additionality and safeguards; first-generation	The 2025 decree manages integrity risk in advance; realized results-based revenue provides a verified track record for

Country	Legal and institutional basis	Instruments: carbon tax, ETS, crediting, results-based payment, Article 6	Developments to date	Challenges	Opportunities
	PACM host participation requirements submitted June 2026	Facility, up to USD 42 million for 8.4 $MtCO_2e$, with a first payment of USD 16 million for 3.2 $MtCO_2e$ received in July 2024; JCM projects; Article 6 host with three bilateral agreements (Japan, Korea), five Article 6.2 activities and one PACM approval	FCPF results-based payments	NDC still in force; revised NDC (2021) with a 2030 target	Article 6 pipelines
Myanmar	Environmental Conservation Law 2012; Myanmar Climate Change Policy 2019; PACM host participation requirements submitted July 2024; climate governance disrupted since 2021	No carbon tax or ETS; voluntary market active; JCM projects; host of the first Article 6.4 issuance, approved 26 February 2026 for a cookstove program with a Korean coordinating entity (initial batch of around 60,000 A6.4ERs), authorized for transfer to Korea; 8 PACM approvals, 2 registered and about 1.11 million A6.4ERs issued to date	Supervisory Body's revision of the fraction of non-renewable biomass reduced verified volumes by 41.5% relative to CDM monitoring; Green Climate Fund and Global Environment Facility programming covering 39 projects frozen; absence from COP26 through COP29; environmental oversight weakened	Safeguards, benefit-sharing and corresponding-adjustment accounting ordinarily depend on functioning host institutions	The Article 6.4 mechanism operates under international supervision and can impose integrity discipline and channel finance to mitigation in fragile contexts, although how far it substitutes for accountable host-country safeguards remains an open governance question

Appendix B. International Benchmark

This appendix contains the country narratives for the four comparator systems summarized in Section 4.2, followed by the benchmarking tables that underpin Chapter 4: the survey of 20 jurisdictions and the development phases of the comparator systems. The two nine-dimension comparison matrices are in Section 4.1. Interview evidence is reported in aggregate on the same basis as in Section 3.2.[clxvii]

Table 13. Development Phases of China, Korea, and EU ETS.

System	Phase	Period	Cap or coverage	Free allocation	Notes
China	Phase 1	2021 to 2025	Power sector only, around 4.5 billion tCO_2e	Intensity benchmarks	Combined heat and power and captive plants included
China	Phase 2	2026 to 2030	Expansion to steel, cement and aluminum; absolute caps and auctioning introduced for power	Benchmarks, declining	2035 NDC commits to 7% to 10% absolute reduction from peak
Korea	Phase 1	2015 to 2017	1,689 $MtCO_2e$	100%	Low transaction volume and high price volatility
Korea	Phase 2	2018 to 2020	1,777 $MtCO_2e$	97%	Trade-exposed sectors at 100%; borrowing limited to 15% in 2018
Korea	Phase 3	2021 to 2025	3,048 $MtCO_2e$ including reserve	Below 90%	Trade-exposed sectors still at 100%; banking and offset carry-over restricted
Korea	Phase 4	2026 to 2030	To be determined	Declining	Power-sector auction share rises from 15% in 2026 to 50% by 2030
European Union	Phase 1	2005 to 2007	Bottom-up National Allocation Plans	Around 100%	Penalty EUR 40 per tonne; power and energy-intensive industry
European Union	Phase 2	2008 to 2012	Plans around 6.5% below 2005	Around 90%	Penalty EUR 100 per tonne; aviation from 2012; nitrous oxide
European Union	Phase 3	2013 to 2020	Single Union-wide cap	Benchmark-based and declining	Aluminum, petrochemicals and ammonia added; international credits capped

System	Phase	Period	Cap or coverage	Free allocation	Notes
European Union	Phase 4	2021 to 2030	Union-wide cap; linear reduction factor 4.3% to 4.4%	Benchmark-based; border-adjustment phase-out 2026 to 2034	Maritime from 2024; second system from 2027

Source: Compiled from ICAP (2026) and IETA (2025)

China

China's national emissions trading system is the world's largest carbon market by covered emissions and the closest design analogue to the intensity-based systems operating and planned in ASEAN. Its relevance lies less in scale than in sequence. The Chinese experience covers a decade of subnational experimentation before national launch, a deliberate decision to peg allowance supply to output rather than to a fixed ceiling, a measurement crisis and the regulatory response to it, and a published pathway out of the entry design. Each stage has an ASEAN counterpart in prospect.

The national system launched in 2021, administered by the environment ministry and built on provincial pilots that had operated from 2013 with deliberately divergent designs, some in developed cities covering transport, buildings and energy use, others in industrial provinces concentrating on energy.[clxviii] Researchers involved describe the length of the pilot period as being as important as its content, because it built regulatory and corporate familiarity with an instrument that many participants, particularly in fossil-fuel sectors, did not initially accept, and it secured agreement between central and provincial governments on the principle of trading.[clxix] Allocation is baseline-based, so that allowance supply moves with activity. The design reflects the fact that national emissions had not peaked at launch, and it functions as a multi-sector tradable performance standard that avoids both a surplus when activity falls short of expectations and scarcity when it exceeds them. Coverage began with power at around 4.5 billion tCO_2e and was extended by the November 2025 allocation plan to steel, cement and aluminum for the 2024 and 2025 compliance years, adding around 3 billion tCO_2e and more than 1,000 companies.[clxx]

Prices have been modest, with a 2024 average of around USD 12 and a decline in 2025, but they have held at several times the Indonesian level.[clxxi] Researchers attribute this to a shared expectation, established through sustained communication between ministries and industry, that the price would rise over time within a range that different parties could accept.[clxxii] Empirical work also finds effects beyond the price signal, including

improved energy equity across 297 cities and stronger digital-green synergy within covered firms.[clxxiii, clxxiv] Measurement has been the system's central challenge. Early data-quality problems prompted the 2024 Interim Regulations, which strengthened enforcement and penalties, and the regulatory architecture now divides responsibility between the environment ministry, which governs the MRV institution, and the national market regulator, which oversees the market for verification services and technical standards.[clxxv] Researchers stress three conditions for credible measurement: high-level legislation that assigns responsibility and penalties, procedures matched to the technology and data available in each industry, and a verifier market in which verifiers are selected on merit and partly funded by government rather than wholly by the firms they verify, together with an information system that flags data-quality problems automatically.[clxxvi] Financial institutions have been deliberately kept out of the national market pending rules for their participation, while provincial pilots experiment with their involvement.

The trajectory out of the entry design has been published. The 2035 NDC commits China to an absolute reduction of 7% to 10% from peak, the first absolute Chinese pledge, and caps with auctioning are being introduced for sectors whose emissions are understood well enough to set one.[clxxvii] Alignment between the trading system and the NDC is coordinated between the environment ministry and the planning commission responsible for the overall target. Trade exposure has become a live consideration as the system reaches CBAM-covered sectors: inclusion of steel in the national market is estimated to offset up to 11.44% of border-adjustment certificate costs, which quantifies the competitiveness case for domestic coverage of trade-exposed sectors.[clxxviii] For ASEAN, the sequence from intensity-based entry with output-pegged supply, through measurement reform under regulatory pressure, to a published transition to absolute caps once sectoral emissions are understood, is the clearest available template for a large emerging-market system.

Republic of Korea

Korea launched its emissions trading system in 2015 as East Asia's first mandatory national scheme. Its relevance to ASEAN lies in a combination found nowhere else in the comparator set: very broad sectoral coverage sustained alongside a persistently modest price. The Korean case isolates the effect of allocation policy from the effect of scope and shows that reach and stringency are separate design variables.

The system was preceded by a target management system introduced in 2012, which gave regulators three years of facility-level reporting experience before allowances were issued, and it was built up in stages to cover six gases across industry, power, buildings,

transport, waste, maritime and domestic aviation, around 73.5% of national emissions by the third phase.[clxxix, clxxx] Prices have remained modest despite that reach. Allowances for the 2024 compliance year averaged KRW 9,582, around USD 7, and a floor of KRW 7,020 was introduced in July 2023 to arrest further decline.[clxxxi] Allocation explains most of the outcome. Emissions-intensive trade-exposed sectors receive full free allocation under a leakage index, benchmarking applies to twelve sub-sectors and grandfathering to the rest, and only around 11% of allowances were auctioned in the third phase. Broad coverage combined with extensive free allocation produces a system that reaches most of the economy while transmitting a weak marginal signal to the sectors most capable of abatement. Practitioners consulted for this study make the general point that the benchmarking method matters less to price formation and leakage than the stringency of the target and the allocation method, and that an intensity-based target set stringently produces a price where an absolute cap set loosely does not.[clxxxii]

The Fourth Basic Plan for 2026 to 2030 is a maturation move rather than an expansion move. It integrates the stability reserve within the cap, raises the auctioned share in the power sector from 15% in 2026 to 50% by 2030, extends benchmarking to more than 75% of eligible participants, and simplifies the sectoral structure into electricity and non-electricity segments.[clxxxiii, clxxxiv] Auction revenue flows to the Climate Response Fund for mitigation infrastructure, low-carbon innovation and smaller-enterprise technology, and survey evidence finds that public support for the instrument depends on that earmarking and on a progressive rate trajectory.[clxxxv] Two tensions persist, between the carbon-neutrality objective and continued fossil-based generation, and between coverage and the strength of the price signal.[clxxxvi] The institutional context bears on transferability. The Korean system adapted to centralized majoritarian politics and a regulated electricity market, and it depends on state capacity to bind state-owned and quasi-state utilities into the system without prolonged negotiation, which is the same question that conditions price trajectories in Indonesia, Viet Nam and Thailand.



European Union

The European system is mature reference. Operational since 2005, it is the oldest cap-and-trade system in force and the largest by trading value. Its value to ASEAN is as a twenty-year record of sequencing decisions and their correction rather than as a template. The first phase (2005 to 2007) was a pilot, with a cap of 2,096 $MtCO_2e$ aggregated from national allocation plans and at least 95% of allowances allocated free. Because Member States overestimated their emissions and lacked harmonized data collection, methodologies and third-party verification, the market was oversupplied and the price fell close to zero by the end of the phase. The second phase (2008 to 2012), aligned with the Kyoto commitment period, tightened the cap slightly to 2,049 $MtCO_2e$ and reduced free allocation to 90%, but the 2008 financial crisis depressed industrial output, left emissions below the cap, and ended the phase at around EUR 8. The third phase (2013 to 2020) replaced national caps with a single Union-wide cap of 2,084 $MtCO_2e$ declining by a linear reduction factor of 1.74% a year, made auctioning the default allocation method and removed free allocation from power. Oversupply nonetheless persisted, as international credits entered the market in large volumes, the cap was not adjusted to post-crisis activity, and surplus allowances banked from the second phase carried over.[clxxxvii] Policymakers responded by backloading auction volumes from 2014 and by launching the Market Stability Reserve in 2019 to absorb the surplus. The fourth phase (2021 to 2030) lowered the cap to around 1,570 $MtCO_2e$ and raised the linear reduction factor to 2.2%, then to 4.3% for 2024 to 2027 and 4.4% for 2028 to 2030, toward a 62% reduction against 2005. International credits are no longer eligible, auctioning covers up to 100% of allowances in power, aviation and shipping, maritime is included from 2024, and a second system for buildings and road transport follows from 2027.[clxxxviii] Installations covered at the start of 2024 had reduced emissions by 47.6% below 2005 levels.

Price and revenue are the least transferable features. The 2024 average auction price was EUR 64.74, around USD 70, and revenue reached EUR 43.6 billion in 2023 and approximately EUR 38.8 billion in 2024, flowing to national budgets, the Innovation Fund, the Modernisation Fund and the Recovery and Resilience Facility, with Member States obliged since 2023 to apply all relevant revenue to climate action and energy transformation.[clxxxix] This obligation is the Union's response to the distributional effects of the system, since carbon costs were passed through disproportionately to lower-income households and coal-dependent regions, and returning allowance revenue to the economy offsets that burden while financing the transition. The Social Climate Fund, operating from 2026, is identified as the precondition for the political feasibility of extending pricing to buildings and road transport.

The registry architecture is the feature of most direct relevance to a region considering interoperability rather than market unification. Since 2012 all Member States have used a single Union Registry, operated by the European Commission, that tracks ownership, transfer and cancellation of allowances, records verified emissions, and performs the annual reconciliation between allowances surrendered and emissions reported. Responsibilities are divided rather than pooled. Member States issue allowances, ensure measurement, auction non-free allowances, apply revenue and set penalties; the central administrator maintains the ledger. A single shared ledger coexisting with distributed national administration is a materially lower institutional threshold than harmonizing the underlying policies, and it is the model that the Recommendation's proposal for a registry interoperability pilot draws on.

Leakage controls operate through free allocation for 63 sectors covering around 94% of industrial emissions, a composite indicator combining trade and emissions intensity, and the border adjustment mechanism.[cxc] Following a transitional phase from 1 October 2023, in which importers reported the embedded emissions of covered goods without payment, the mechanism entered its definitive phase on 1 January 2026, with certificate sales from February 2027, certificate prices linked to EU ETS allowance prices, and the surrender obligation phasing in from 2.5% in 2026 to 100% in 2034 as free allocation to covered sectors is withdrawn.[cxci] For ASEAN exporters of cement, iron and steel, aluminium, fertilizers, electricity and hydrogen, the implication is a carbon cost at the European border rising on a published schedule, reduced by any carbon price paid in the exporting country. Practitioners note two qualifications: the price gap between European and ASEAN instruments will persist, so domestic pricing reduces rather than removes the liability, and the recognition of a foreign carbon price is technically demanding for systems that are intensity-based and rely on free allocation, which is the design most ASEAN systems have adopted.[cxcii] The design lessons that travel from the European experience concern sequencing rather than scale: the pace of cap tightening, the use of a stability reserve, benchmark-based allocation for trade-exposed sectors, and the ring-fencing of revenue.



New Zealand

New Zealand is included as the only major national system that integrates forestry directly into the compliance price. For a region holding substantial forest carbon stocks it is the most instructive available case, and the lesson it offers is primarily cautionary. Launched in 2008, the system sets its cap from the top down in line with the 2050 net-zero target, places points of obligation upstream wherever practical, and covers just over half of national emissions across forestry, stationary energy, industrial processing, liquid fuels, waste and synthetic gases.[cxciii] Post-1989 forest landowners earn units for sequestration and surrender them on harvest or deforestation, which makes forestry both a source of supply and a bearer of obligation; restrictions introduced in 2025 on converting farmland to forestry show that sector-wide inclusion generates land-use effects that require separate management.

Two episodes carry the lesson. An earlier price collapse over 2011 to 2013, driven by unlimited banking and unrestricted access to international units, produced a surplus that suppressed prices for years and prompted exit from the Kyoto market in 2015.[cxciv] More recently, agriculture, close to half of national emissions, was removed from the system by repeal of its pricing pathway in November 2024, and in 2025 all four quarterly auctions failed to clear as secondary prices remained below the NZD 68 floor, leading to the permanent withdrawal of more than 13 million units.[cxcv] A floor set above the market clears no volume and removes supply, which is a sound environmental outcome and a poor revenue outcome, and the tension is not resolvable by design. Revenue, NZD 480.9 million in 2024, flows to the general budget rather than being earmarked. Three design lessons follow: international linking must be managed to avoid importing volatility, free allocation should decline gradually, and sectoral integration is only as durable as the coalition that supports it. For ASEAN economies with large forest stocks, sector-wide forestry integration requires both a price high enough to make sequestration units meaningful and a political coalition stable enough to sustain the inter-sectoral transfer it implies, and neither condition currently holds. Singapore's alternative, admitting high-integrity Article 6 credits against a capped share of tax liability, creates a demand channel for forest carbon without placing the forestry sector inside the compliance obligation and is considerably more transferable.

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