

# The opportunity for carbon markets in ASEAN

National and regional policy considerations to aid  
development and increase interconnectivity



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# Foreword

**Valerio Magliulo,**  
*CEO and Co-founder,*  
*Abatable*

Solving the climate crisis requires nothing less than urgent, concerted action across all pillars of society. Global efforts to address the increasing concentration of CO<sub>2</sub> in our atmosphere are ramping up, buoyed by the rapid development of low-carbon energy technologies. However, we have far more work to do to reach the targets outlined in the Paris Agreement.

We are halfway through the so-called decade of action on climate change. This is a decade in which it is imperative we bend the global emissions curve downwards to a trajectory where emissions are falling year on year, rather than continuing on their upward trend. Unfortunately, the emissions gap – that gulf between where current policies on climate change are leading us and where emissions need to be to keep global temperature rises to 1.5C or 2C – continues to widen every year.

This is where carbon markets come in.

Designed correctly, carbon markets offer a powerful, market-driven mechanism for reducing emissions and directing capital towards efficient and effective climate solutions. They can channel private finance into growing new forests to draw CO<sub>2</sub> from the atmosphere. Into protecting existing forests to conserve vital carbon stores and stem biodiversity loss. Into developing cleaner and more efficient means of cooking or conserving energy, feeding the world with fewer environmental impacts, and supporting tomorrow's technologies to take CO<sub>2</sub> out of the atmosphere.

Ultimately, putting a price on CO<sub>2</sub> allows it to appear on company balance sheets and accounting mechanisms, enabling the invisible hand of the market to push us in a climate-friendly direction.

## Carbon pricing benefits

As the World Bank has outlined, revenues from the world's patchwork of 75 carbon pricing compliance schemes reached \$104bn in 2023 – and this is without the added revenue from the growing voluntary carbon market, which is projected under certain scenarios to reach \$1.1tn annually by 2050.

Governments are increasingly seeing the potential of carbon pricing instruments to tackle emissions, moving beyond putting a price on energy and heavy industry emissions to target sectors like shipping, aviation and waste. And, they are increasingly interlinking their compliance schemes with carbon crediting mechanisms to provide additional finance to project developers who are reducing or removing CO<sub>2</sub> from the atmosphere.

New UN carbon markets solidified at COP29, through Article 6 of the Paris Agreement, will provide additional finance to support countries' Paris Agreement climate commitments. This will in turn provide further opportunities for countries looking to harness carbon pricing to both drive emissions reductions and boost their economies.

## The opportunity

It is both of these opportunities for ASEAN – the environmental and the economic – that this report so strongly emphasises. Leveraging the vast potential of the ASEAN region, both in terms of its abundant natural resources and untapped local demand for carbon credits, could help support the reduction or removal of over one gigatonne of CO<sub>2</sub> a year by 2050, while generating up to \$3tn in cumulative carbon market revenue by the same date. This is all while creating up to 13.7 million green jobs.

The policy considerations in this report are designed to help ASEAN Member States create the regulatory environments to realise this potential through country-level and regional action.

Finally, it's also important to point out that the opportunity for ASEAN extends beyond these climate and economic benefits. Carbon markets are not just about reducing emissions; they come with an abundance of co-benefits, creating a better future for nature and people. By promoting a mix of approaches including nature-based solutions, carbon markets can help protect ASEAN's rich biodiversity while providing a sustainable income stream for communities.

At Abatable we believe in the power of carbon markets to help create a thriving future for climate, nature and people. We have been delighted to partner with the ASEAN Alliance on Carbon Markets on this report, which we hope serves as a catalyst for action to further develop ASEAN's emerging carbon markets to support this thriving future.

Capitalising on the opportunities presented here will enable a greener, more resilient future for ASEAN and, ultimately, for the planet.



# Foreword

**Dharsono Hartono,**  
*Permanent Chair, ASEAN Alliance on  
Carbon Markets*

The ASEAN region stands at a critical juncture in the global fight against climate change. From the coastal communities of the Philippines to the vast forests of Indonesia and Myanmar, Southeast Asia is experiencing first-hand the challenges posed by rising temperatures, extreme weather, and environmental degradation. The livelihoods of millions and the economic stability of the region are intertwined with the urgent need for climate action.

Yet, alongside these challenges lies a profound opportunity: ASEAN is home to some of the world's most valuable carbon stocks, making it uniquely positioned to play a leading role in advancing solutions for a sustainable future.

Carbon markets represent one such solution, offering a transformative mechanism to channel investments into high-impact climate projects while generating economic benefits for local communities. Many of these projects – spanning forestry, renewable energy, waste management, and other critical areas – are located in developing nations, where funding often remains a barrier. By monetising efforts to reduce emissions or enhance carbon sequestration, these markets provide essential resources for projects that deliver both environmental and socio-economic benefits.

The momentum in Southeast Asia is undeniable. Across the region, regulators are laying the groundwork for voluntary carbon markets and compliance carbon markets, recognising their potential to catalyse inward investments, boost GDP, create jobs, and protect biodiversity. These have the potential of creating trillions of dollars in economic benefits and millions of jobs, underscoring the significant role that carbon markets can play in shaping the region's future.

We are pleased to announce a collaborative partnership of the ASEAN Alliance on Carbon Markets with Abatable's expertise in carbon and economic impact analysis. This collaboration marks a pivotal step in driving meaningful insights and policy recommendations to enhance the carbon market landscape in the Southeast Asia region. Our joint efforts this year focus on quantifying the economic benefits of carbon markets across a variety of voluntary carbon market projects, including nature-based solutions, biochar, and emissions avoidance. By providing projections on inward investments and job creation through 2030 and 2050, this partnership aims to offer a clear, data-backed perspective on the transformative potential of carbon markets in the region and beyond.

As the first private sector-led organisation dedicated to advancing cross-border carbon market initiatives, the ASEAN Alliance on Carbon Markets is committed to scaling voluntary carbon markets across ASEAN and supporting the implementation of compliance markets in the region, promoting alignment and collaboration. Our goal is to establish a resilient regional ecosystem that encourages global partnerships. This policy report is part of our 2024 action programme, furthering our mission to champion carbon markets within ASEAN and on the global stage.

We extend our deepest gratitude to Abatable, as well as the researchers, authors, contributors, and partners whose dedication made this report possible. Our hope is that this report will encourage government bodies, private enterprises, small and medium-sized businesses, and state-owned entities throughout ASEAN to recognise their essential roles in fostering a resilient and sustainable carbon market.

This report is intended as a valuable resource for ASEAN Member States in developing policies that will enhance the region's carbon market infrastructure. Together, we are building a path toward a greener future, and we are excited to continue advancing our shared vision for economic growth and environmental responsibility across ASEAN and beyond.

# Foreword

**Dirk Forrister,**  
*President and CEO,*  
*IETA*

Carbon markets have evolved significantly since their emergence in the early 2000s, following the signing and ratification of the Kyoto Protocol. Over the years, these markets have expanded globally, with ASEAN emerging as a key region of growth and opportunity. ASEAN's unique position offers tremendous potential to drive meaningful climate action and economic transformation.

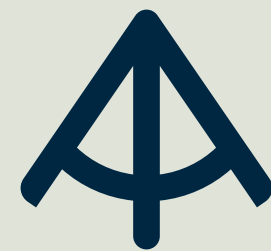
The region is home to 15% of the world's tropical forests and 35% of its coral reefs, making it a critical steward of some of the planet's most valuable natural assets. Simultaneously, ASEAN is characterised by a young, dynamic and rapidly growing population. This demographic is striving for greater prosperity, relying on energy systems that must remain affordable, accessible and reliable. However, ASEAN also faces a significant challenge: coal remains a dominant energy source, accounting for approximately 60% of the region's energy generation.

Balancing these competing priorities – protecting natural assets, supporting economic growth and transitioning to cleaner energy systems – requires innovative and pragmatic solutions. To achieve the goals of the Paris Agreement, ASEAN must implement mechanisms that both incentivise decarbonisation and support sustainable development.

Carbon markets present a powerful opportunity to meet these dual objectives. By enabling ASEAN to capitalise on its natural assets and economic dynamism, carbon markets can facilitate a transition to cleaner energy systems and support nature conservation while promoting regional prosperity. This report highlights the importance of designing carbon markets that adhere to international best practices, foster transparency and integrity, and align with each nation's Nationally Determined Contributions under the Paris Agreement.

IETA is dedicated to supporting ASEAN in this crucial journey. Through our global network of members and the Business Partnership for Market Implementation (B-PMI), we are ready to collaborate with policymakers, businesses and stakeholders to facilitate carbon pricing implementation. Together, we can help ASEAN unlock its full potential and build a sustainable, low-carbon future that benefits both the region and the world.

# Executive summary



The Association of Southeast Asian Nations (ASEAN) is one of the largest and most dynamic economic clusters in the world with a collective GDP of over \$3.4tn.

The region has developed comprehensive emissions-reduction plans under the Paris Agreement on climate change, however as ASEAN Member States have not yet decoupled their economic growth from their emissions output there is significant potential for carbon pricing mechanisms to help further drive decarbonisation.

There is room for ASEAN governments to play a crucial role in supporting the development of carbon pricing mechanisms in the region, helping develop new green industries to protect future ASEAN economic growth at the national and regional level.

## Putting a price on CO2

ASEAN governments can play a crucial role in enabling the conditions for putting a price CO2 emissions, either through supporting voluntary carbon pricing, where businesses can purchase carbon credits, or developing compliance schemes such as the implementation of a carbon tax or an emissions trading system. These can also be linked to the purchase and use of carbon credits.

They also have the option of tapping into nascent UN carbon markets through the Paris Agreement on climate change's Article 6.

ASEAN Member States are engaging with these markets in varying ways. From 2009 to 2024, the region generated over 233mn tonnes of CO2 equivalent in carbon credits – around 7% of global issuances. However, the region still holds significant decarbonisation potential that may be unlocked through carbon pricing.



# The future opportunity for ASEAN

Modelling undertaken for this report indicates that continuing to develop carbon markets in ASEAN could unlock a cumulative revenue of **\$3tn** for the region by 2050, through the reduction or removal of emissions equivalent to 1.1 gigatonnes of CO2 per year by the same date.

This total figure is made up of a potential total value of **REDD+** markets of **\$27bn** a year, a potential blue carbon market value of **\$96bn** a year, and a potential biochar carbon market value of **\$144bn** a year by 2050 (see **Figure 1**).

This could create **13.7 million jobs** in these new green industries within the region.

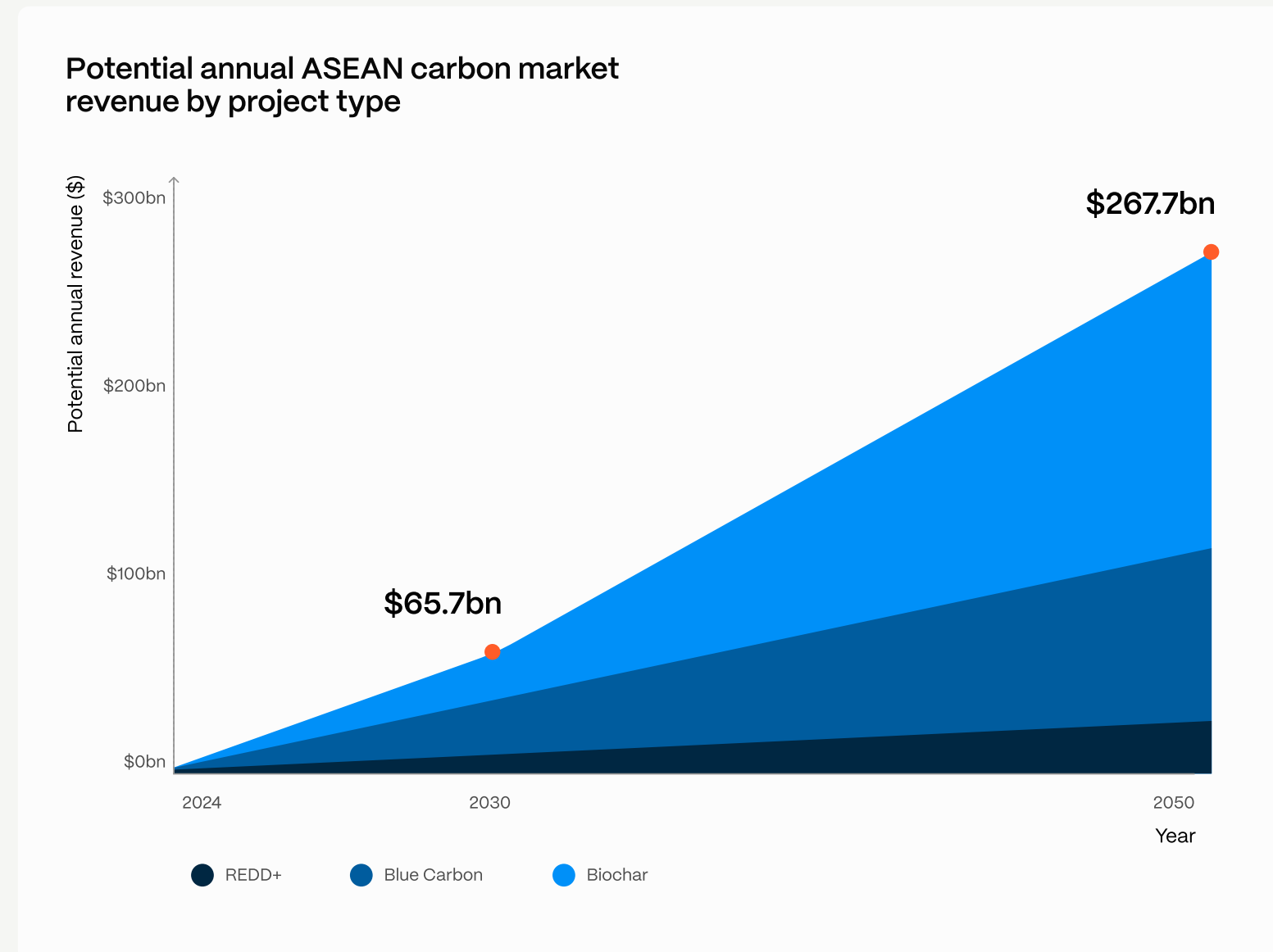


Figure 1. Potential annual ASEAN carbon market revenue by project type for 2030 and 2050

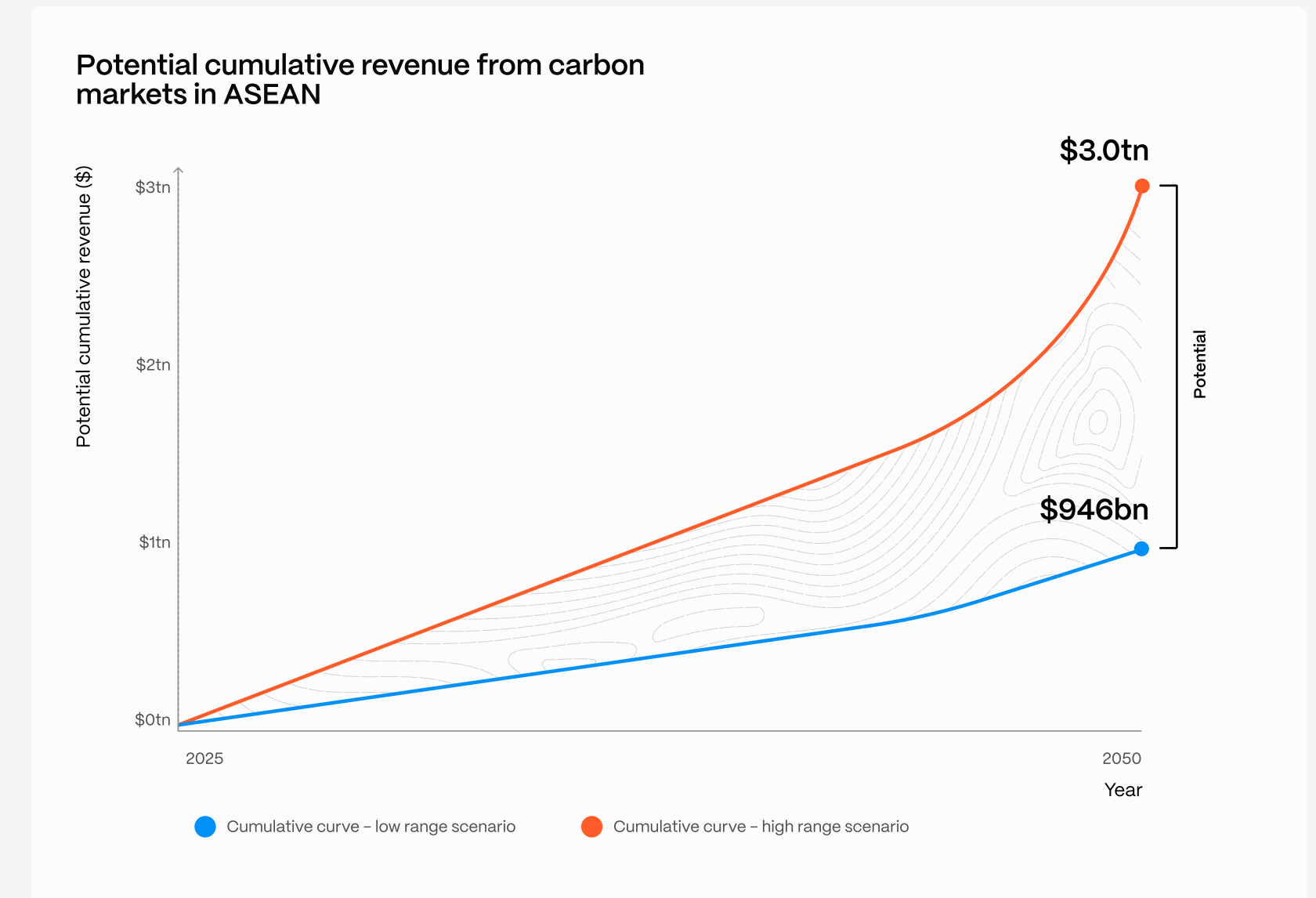


Figure 2. Cumulative carbon revenue curves for ASEAN from REDD+, blue carbon and biochar to 2050 under the modelled scenarios in this report





## Policy considerations to unlock this opportunity

This report offers **six specific carbon policy considerations** for ASEAN and its Member States to enable the significant opportunity carbon markets can bring to the region. The considerations are based on interviews with over 30 stakeholders across the ASEAN carbon market value chain, to enable this significant opportunity for the region.

By implementing these policy considerations, ASEAN can drive inward investment into the region, create a healthy ecosystem of carbon projects and create more reliable sources of demand for these projects.

As well as unlocking significant economic benefits, the development of carbon markets in ASEAN will help fight climate change, protect and restore biodiversity and create a positive future for the ASEAN population.



## The considerations:

1

### Develop carbon market regulation to provide policy clarity and create an attractive investment landscape

Countries that establish robust regulatory frameworks will maximise investment in carbon projects. They can also lay the groundwork for regional initiatives, and ASEAN Member States can share experiences and best practices to support building regional capacity within carbon markets.

2

### Ensure the requisite institutional and technical capacity to create a robust carbon market

Policymakers must ensure they have the necessary institutional and technical capacity to understand, build, and implement a robust carbon market landscape. Further, the private sector must have the necessary capacity for an efficient and flourishing market.

3

### Align standards around established best practice and allow for international standards to enable greater market access

ASEAN could work with international standards to localise some methodologies, as well as develop their own national methodologies that follow international best practices. Member States may also want to utilise each other's standards and build a regional set of methodologies and foster regional interlinkages.

4

### Develop robust domestic compliance schemes to create new and reliable demand for carbon projects

By implementing compliance schemes, such as an ETS or carbon tax, governments can put a cost on emitting companies' balance sheets, incentivising decarbonisation. Moreover, by creating interlinkages between these schemes and carbon projects by allowing the use of carbon credits to meet compliance, governments can drive demand towards carbon projects that reduce or remove emissions in their jurisdictions.

5

### Endorse and raise public awareness of voluntary carbon activity

ASEAN leaders should endorse carbon markets and find methods to build public awareness of their potential to establish the region as a global leader. This can be focused on fostering regional demand through rewarding voluntary purchases of carbon credits, recognising achievements in the market and fostering collaboration.

6

### Formulate Article 6 processes to open new avenues for international demand

ASEAN could look to facilitate a region-wide agreement that enables trading under Article 6.2. Once this has been developed and agreed upon, ASEAN could facilitate discussions with other buyer countries to strike Article 6.2 agreements. This would be attractive to buyer countries who would be able to maximise supply access in the region while only having to engage with the formalities of one agreement.

# ASEAN's climate context













## ASEAN's climate context

The Association of Southeast Asian Nations (ASEAN) is one of the largest and most dynamic economic clusters in the world. With a combined gross domestic product of [over USD \\$3.4tn](#) in 2023, and an average growth of 4.2% per year over the last decade, ASEAN as a region is the fifth largest economy in the world.

The economic structure of the ten ASEAN Member States – Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam – is economically diversified with manufacturing, trade, transportation, agriculture mining and quarrying, forestry and public sector activities generating nearly [68%](#) of the region's GDP.

This economic diversification and progress has not yet decoupled from the emission of greenhouse gases, a trend experienced in [other regions](#). In 2023, ASEAN Member States emitted around 3.5 billion tonnes of CO<sub>2</sub> equivalent (GtCO<sub>2</sub>e), [equivalent](#) to approximately 6% of global emissions.

Nearly 50% of ASEAN's emissions come from the **energy sector**, which contributes over 1.7 GtCO<sub>2</sub>e annually, and 30% originate from **land use change and forestry** (584 MtCO<sub>2</sub>e) and the **agricultural sector** (450 MtCO<sub>2</sub>e). Policies and actions in these three sectors will greatly determine the ASEAN emissions trajectory now and in the years to come.

Country	Annual GHG emissions in MtCO <sub>2</sub> e (% share of global total)	Top three emitting sectors (MtCO <sub>2</sub> e)	Net-zero target	NDC target
 Brunei Darussalam	12.23 (0.03)	Energy (10.8) Industrial processes (0.69) Land use change and forestry (0.24)	No net-zero target	Reduce GHG emissions by 20% below business as usual (BAU) by 2030
 Cambodia	74.85 (0.16)	Land use change and forestry (32.59) Agriculture (22.5) Energy (14.18)	Aims to achieve net zero by 2050	Reduce GHG emissions by 42% below BAU by 2030
 Indonesia	1,475.83 (3.11)	Energy (679) Land use change and forestry (476.85) Agriculture (154.16)	Has not communicated an explicit net-zero target but has a goal to reach peak national GHG emissions by 2030 and to progress further towards net-zero emissions by 2060 or sooner	Unconditionally reduce GHG emissions by 31.89% and conditionally by 43.20% below BAU by 2030
 Lao PDR	43.46 (0.09)	Energy (18.5) Agriculture (10.76) Land use change and forestry (9.7)	Seeks to achieve net-zero emissions by 2050	Unconditionally reduce GHG emissions by 60% below baseline scenario by 2030. Conditional target of reducing additional 45,691 ktCO <sub>2</sub> per year by 2030 through measures in LUCF, energy, agriculture and waste sectors
 Malaysia	367.76 (0.77)	Energy (243.39) Land use change and forestry (66.42) Industrial processes (23.99)	Pledged to achieve net zero by 2050	Reduce economy-wide carbon intensity (against GDP) by 45% in 2030 compared to 2005
 Myanmar	246.64 (0.52)	Land use change and forestry (112.66) Agriculture (59.37) Energy (32.01)	Pledged to achieve net zero by 2050	Unconditionally reduce 244.52 MtCO <sub>2</sub> e from 2020–2030, increasing to a 414.75 MtCO <sub>2</sub> e reduction conditional on support
 Philippines	227.52 (0.48)	Energy (136.79) Agriculture (61.43) Industrial processes (22.43)	No net-zero target	Reduce and avoid emissions by 75%, of which 2.71% is unconditional and 72.29% is conditional, for the period 2020–2030, against projected BAU economy-wide emission of 3,340.3 MtCO <sub>2</sub> e
 Singapore	64.3 (0.14)	Energy (69.64) Industrial processes (25.17) Waste (5.11)	Pledged to achieve net zero by 2050	Reduce emissions to around 60 MtCO <sub>2</sub> e in 2030 after peaking its emissions earlier
 Thailand	451.42 (0.95)	Energy (252.18) Industrial processes (97.77) Agriculture (70.73)	Committed to targets for carbon neutrality by 2050 and net-zero emissions by 2065	Unconditionally reduce GHG emissions by 30% and conditionally by 40% below BAU by 2030
 Viet Nam	458.14 (0.96)	Energy (307.93) Industrial processes (71.47) Agriculture (69.61)	Has a net-zero emissions target for 2050	Unconditionally reduce GHG emissions by 15.8% and conditionally by 43.5% below BAU by 2030

**Table 1.** Emissions levels, emissions sources and net-zero status of ASEAN countries

Sources: [Climate Watch Data](#) and [NDC Partnership](#), data as of the latest Paris Agreement Nationally Determined Contribution submissions. Countries' NDCs as [reported to UNFCCC](#).

When it comes to addressing these emissions, ASEAN Member States have adopted decarbonisation policies in line with their respective pledges under the Paris Agreement on climate change, known as Nationally Determined Contributions (NDCs) – see **Table 1**.

All Member States have stated their intention to complement these policies by adopting carbon pricing mechanisms to further drive decarbonisation across sectors. [Singapore and Indonesia](#) have enacted carbon taxes, and Indonesia has launched an [emissions trading scheme](#) for the power sector based on a [national decree](#) on the economic value of carbon.

Indonesia, Malaysia, and Viet Nam have signed up to diverse initiatives to further enable carbon pricing in each country, such as the [World Bank's Partnership for Market Implementation](#), while Lao PDR has held [stakeholder consultations](#) for a Decree on Carbon Credits. Thailand has developed and operates a [voluntary carbon crediting scheme](#) for carbon offsetting, whereas Indonesia, Malaysia, and Singapore now host carbon trading centres.

For more detail on these mechanisms across ASEAN Member States, see **Table 2** of this report.

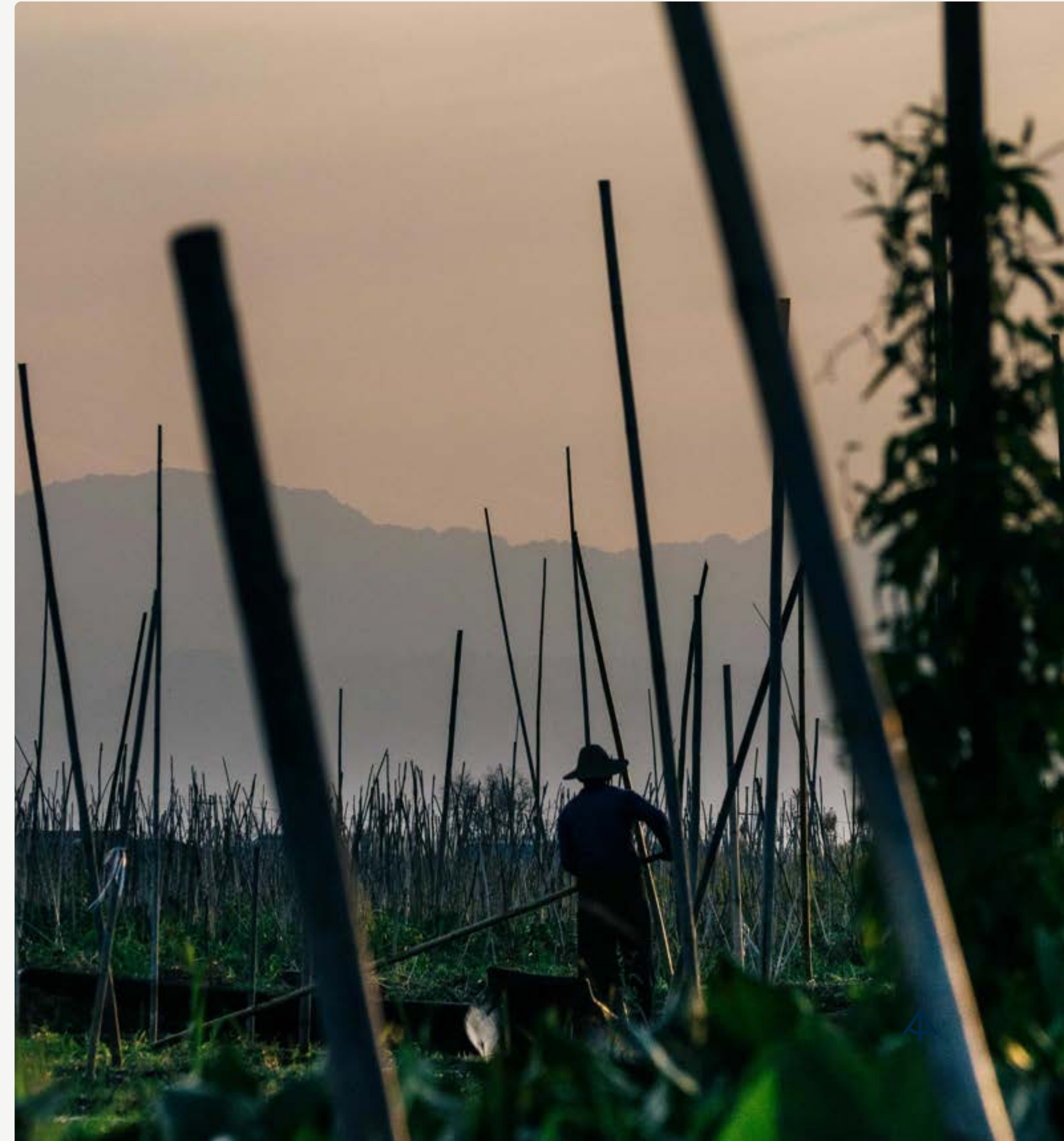
# 50%

of ASEAN's collective emissions come from the energy sector



# \$3.4 trillion

Combined GDP of ASEAN Member States



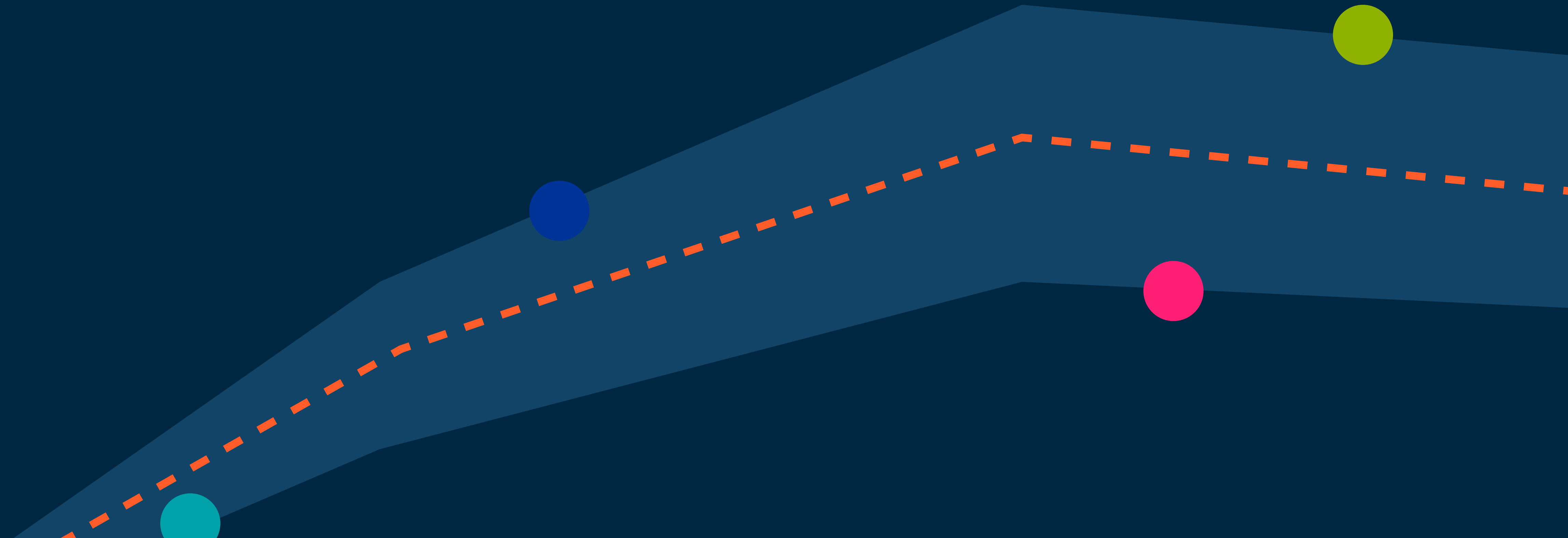
## Next steps

ASEAN can play a crucial role in supporting the development of carbon pricing mechanisms and mitigation activities by sharing best practices and facilitating a harmonisation of approaches. This can help expedite the decarbonisation of ASEAN economies and the development of new green industries, which will enhance ASEAN economic growth at a national and regional level.

This report highlights the environmental and economic potential of carbon markets for ASEAN and sets out a framework of recommendations for policymakers to facilitate this potential.



# Carbon pricing mechanisms



## Carbon pricing mechanisms

Putting a price on CO2 is a crucial tool to complement wider policies on climate change. It internalises the cost to emit, placing it on balance sheets, thus incentivising firms to reduce emissions.

Governments can regulate putting a price on CO2 via a **carbon tax**, which charges emitters a set cost to emit, or via an **emissions trading system (ETS)**, which sets emissions limits for certain economic sectors and creates an obligation for regulated entities to acquire emissions allowances in a quantity identical to their emissions levels.

These are compliance schemes that obligated sectors must partake in.

Alternately, firms may choose to offset their climate impact voluntarily by purchasing **carbon credits** produced by mitigation activities that either reduce or remove CO2 emissions.

Compliance and voluntary schemes are increasingly integrating, and governing bodies have allowed entities under compliance to utilise carbon credits to meet some or all of their compliance obligations.

While compliance schemes can generate significant revenues for governments to reinvest in green initiatives, the funding of projects through the voluntary market can facilitate the development of new green industries, technologies and job opportunities.

ature-based



Removals

Tech-based



Redu



# Carbon credit project types



## ARR (Afforestation, Reforestation and Revegetation)

Nature-based

Removals

ARR projects involve planting trees and vegetation on lands that were previously non-forested (afforestation) or restoring forests on lands that were deforested (reforestation). This removes CO2 from the atmosphere and enhances biodiversity.

Price range: Lower quartile \$8.50/t; Median \$15.0/t; Upper quartile \$26.0/t



## Biochar

Tech-based

Removals

Biochar projects involve the production and application of biochar, a stable form of carbon created by pyrolysing (heating in the absence of oxygen) organic materials. Biochar is used as a soil amendment to improve soil fertility and sequester carbon.

Price range: Lower quartile \$135.0/t; Median \$160.0/t; Upper quartile \$200.0/t



## Blue Carbon

Nature-based

Reduction

Removals

Blue carbon, or wetland restoration projects, focus on conserving and restoring coastal and marine ecosystems, such as mangroves, salt marshes, and seagrasses, which sequester and store significant amounts of carbon.

Price range: Lower quartile \$20.0/t; Median \$29.0/t; Upper quartile \$31.58/t



## Carbon capture and engineered solutions

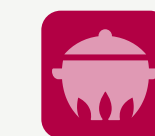
Tech-based

Reduction

Removals

Carbon capture and engineered solutions involve capturing CO2 emissions from industrial processes or directly from the atmosphere and storing them underground or using them in other industrial applications.

Price range: Lower quartile \$125.0/t; Median \$250.0/t; Upper quartile \$320.0/t



## Cookstoves and energy efficiency

Tech-based

Reduction

Cookstove and energy efficiency projects aim to reduce greenhouse gas emissions and improve public health by promoting the use of cleaner and more efficient cooking technologies and practices in developing countries.

Price range: Lower quartile \$5.50/t; Median \$7.0/t; Upper quartile \$8.26/t



### Improved forest management (IFM)

Nature-based

Reduction

Removals

Improved forest management projects focus on enhancing carbon sequestration and storage in existing forests through better forest management practices.

Price range: Lower quartile \$13.0/t; Median \$16.50/t; Upper quartile \$24.14/t

### Industrial energy and waste management

Tech-based

Reduction

Industrial energy and waste management projects focus on reducing emissions from industrial processes and waste management through improved efficiency and innovative technologies.

Price range: Lower quartile \$2.55/t; Median \$4.0/t; Upper quartile \$6.50/t

### REDD+

Nature-based

Reduction

REDD+ (Reducing emissions from deforestation and forest degradation in developing countries) projects focus on reducing emissions by preventing deforestation and forest degradation and promoting sustainable forest management, thus protecting and enhancing carbon stocks.

Price range: Lower quartile \$2.5/t; Median \$5.0/t; Upper quartile \$6.90/t

### Renewable energy

Tech-based

Reduction

Renewable energy projects replace fossil fuel-based energy sources with renewable alternatives.

Price range: Lower quartile \$1.45/t; Median \$2.70/t; Upper quartile \$4.0/t

### Soil carbon

Nature-based

Reduction

Removals

Soil carbon, or sustainable agriculture projects, aim to enhance soil health and increase agricultural landscapes' ability to sequester CO2 through improved farming practices. These practices help store more carbon in the soil, reduce greenhouse gas emissions and improve crop yields.

Price range: Lower quartile \$13.75/t; Median \$20.0/t; Upper quartile \$45.0/t

Source: Prices from Abatable's market intelligence platform from the last 12 months, excluding marketplaces; Prices as of 14 November 2024. Learn more about Abatable's data sources [here](#)



Country	Compliance mechanisms	Voluntary mechanisms	Article 6 agreements
Brunei Darussalam	Nothing under development	Voluntary market (Proposed)	No agreements signed
Cambodia	Nothing under development	Nothing under development	<b>Supplier</b> (Agreements with Japan, Singapore)
Indonesia	ETS (Operational) Carbon tax (Proposed)	SPE-GRK (Operational)	<b>Supplier</b> (Agreements with Japan, Norway, Singapore)
Lao PDR	Nothing under development	Nothing under development	<b>Supplier</b> (Agreements with Japan, Singapore, South Korea)
Malaysia	ETS (proposed) Carbon tax (Proposed)	Voluntary market (Proposed)	No agreements signed
Myanmar	Nothing under development	Nothing under development	<b>Supplier</b> (Agreement with Japan)
Philippines	ETS (Proposed)	Nothing under development	<b>Supplier</b> (Agreement with Japan, Singapore)
Singapore	Carbon tax (Operational)	Nothing under development	<b>Buyer</b> Implementation agreements with Ghana and Papua New Guinea;  Memoranda of Understanding with 20+ additional countries including (Cambodia, Indonesia, Lao PDR, Philippines, Thailand, Viet Nam)
Thailand	ETS (Proposed) Carbon tax (Proposed)	T-VER and T-VER Premium (Operational)	<b>Supplier</b> (Operational project with ITMOs transferred to Switzerland; Agreements with Japan and Singapore)
Viet Nam	ETS (Proposed)	Nothing under development	<b>Supplier</b> (Agreements with Singapore, Japan, South Korea)

## Paris Agreement, Article 6 – Emissions trading to meet national climate pledges

Article 6 of the Paris Agreement allows countries to cooperate and trade emissions reductions to achieve their NDC targets. Two Article 6 market mechanisms are under development, known as Article 6.2 and 6.4. Article 6.2, which is operational, is a decentralised system where bilateral or multilateral agreements are established between countries, and as a result 'Internationally Transferred Mitigation Outcomes' (ITMOs) are traded. Article 6.4, is a centralised mechanism overseen by the United Nations Framework Convention on Climate Change, and full operationalisation is still underway.

Under Article 6, the host country of mitigation activities can agree to transfer emissions reductions to other parties and not count them towards their own NDC targets. To ensure integrity, the selling country must authorise the transfer and an accounting mechanism known as a 'corresponding adjustment' is then applied to prevent double counting in national ledgers.

Article 6 is designed to allow countries to cooperate in support of the international achievement of emissions reduction targets. For host countries it can incentivise international finance to develop local climate mitigation activities and support the transfer of knowledge, skills and technologies. Buyer countries can enhance their environmental ambition by purchasing emission reductions from abroad.

### Key

- Nothing under development
- Proposed
- Operational
- Buyer
- Supplier

Table 2. A breakdown of how each ASEAN country is engaging with different types of carbon markets



# Carbon project potential in ASEAN



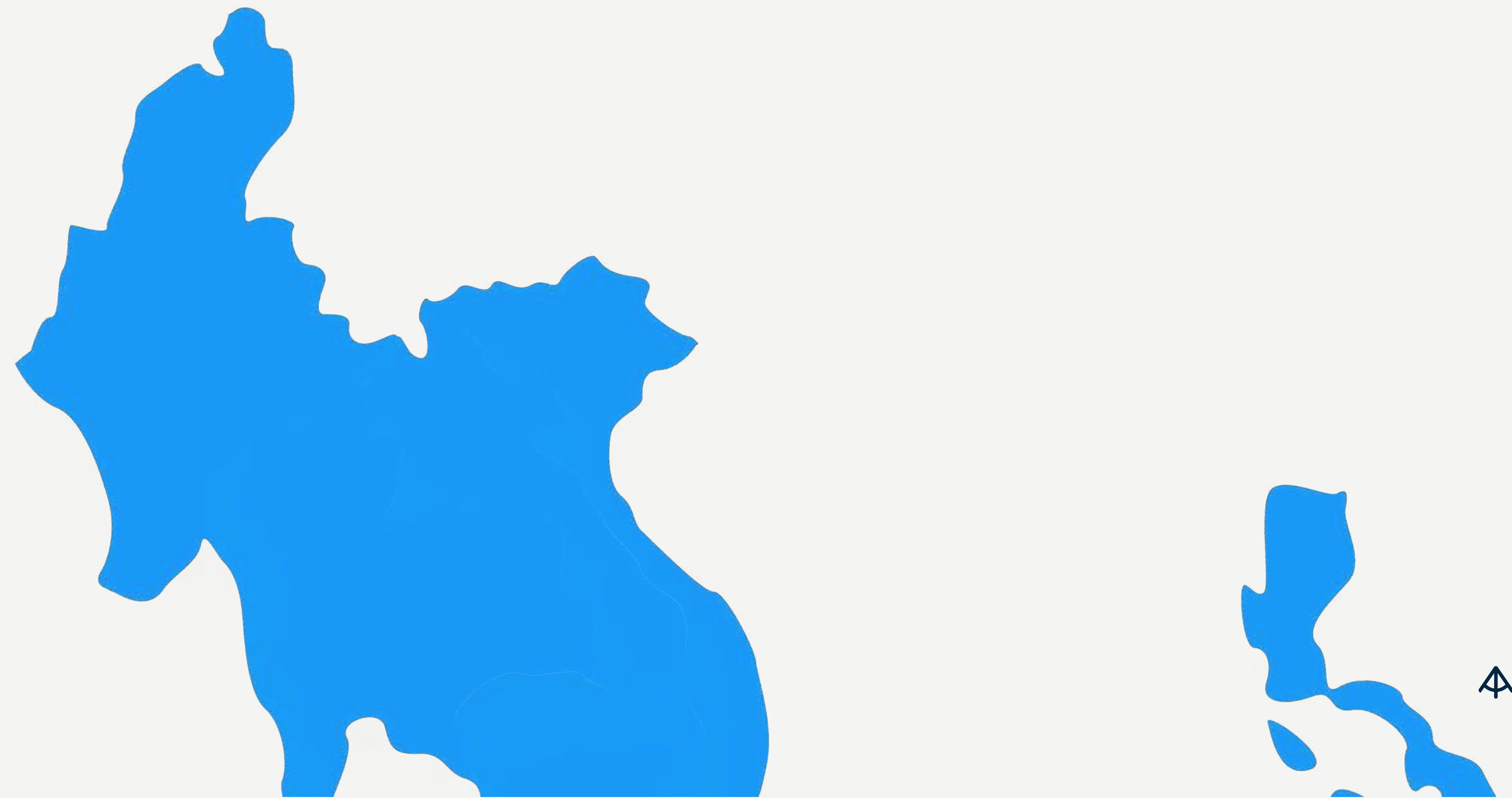
## Carbon project potential in ASEAN

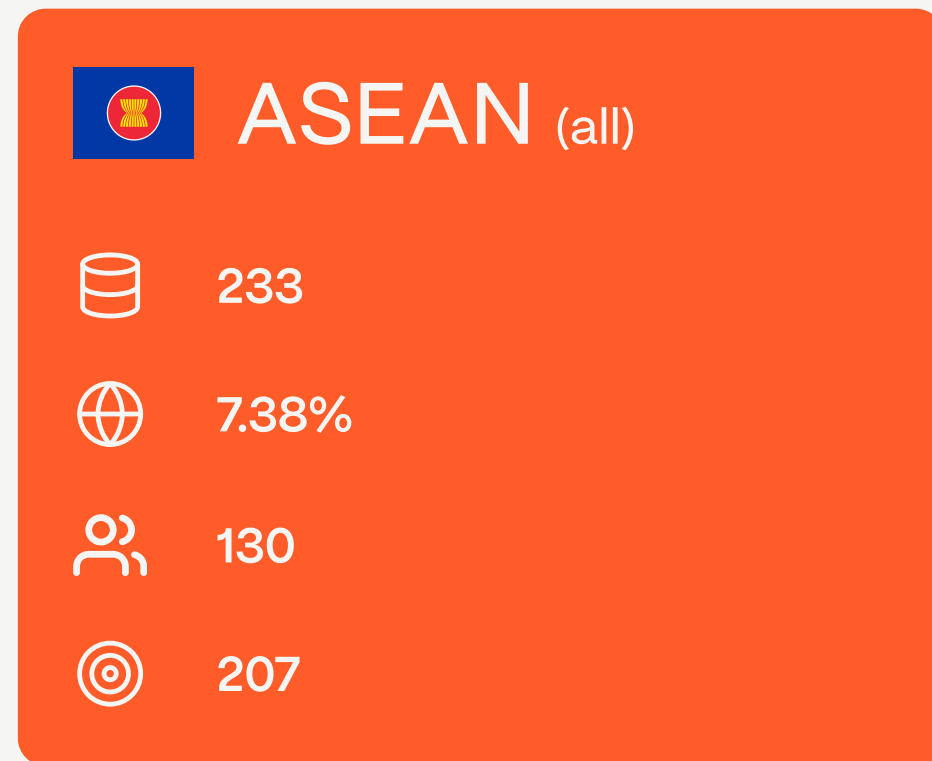
ASEAN has the potential to become a global leader in carbon markets, developing greater regional supply and demand that will facilitate inward investment to foster new green industries and growth whilst creating decarbonisation pathways for its members.

Historically, ASEAN has been active in the supply of voluntary credits from carbon projects. The region generated 233mn tonnes of CO2 equivalent (MtCO2e) in carbon credits from 2009 to 2024 – 7% of global issuances in that time – bringing an estimated value of \$466–1,165mn\* to the region (see **Figure 3**).

*\*Based on a credit price of \$2–\$5*

Indonesia and Cambodia have dominated historical supply. The countries are the seventh and tenth largest global suppliers of carbon credits since 2009 respectively. Their supply provision is dominated by REDD+ projects, while other ASEAN members have been historically large suppliers of renewable energy and cookstove projects.





### Legend

- Total issued credits (MtCO2e)
- Percentage of global Issuances
- Number of developers
- Number of projects



Figure 3. Supply of carbon credits from ASEAN countries – 2009 to 2024

Source: Abatable database, including the registries VERRA, Gold Standard, American Carbon Registry, Climate Action Reserve, ART Trees, BioCarbon and Cercarbono. Data as of 14 November, 2024



ASEAN countries are endowed with abundant natural carbon stocks and thus have great potential to supply carbon credits through nature-based solutions. Around [47%](#) of ASEAN's total land area is covered by forest ecosystems, but research has [found](#) that, between 2001 and 2019, ASEAN lost 610,000 km<sup>2</sup> of forest, more than half the region's original forest cover. Moreover, around 35% of the world's mangrove forests are located in ASEAN. There are therefore significant opportunities for ASEAN to look to expand REDD+, ARR and blue carbon projects to protect and expand forests and marine ecosystems.

Agriculture is a major part of ASEAN economies and emissions, with around [600,000 km<sup>2</sup>](#) of arable land in the region. ASEAN Member States are among the largest global producers of rice in the world, producing [195.5mn tonnes](#) of paddy rice in 2022. This presents opportunities for soil carbon and agroforestry projects to reduce emissions from this sector. This in particular highlights the opportunity in ASEAN for carbon credit methodologies that focus on the reduction of emissions from rice production, which are gaining prominence in the market.

Nature-based projects tend to produce significant additional benefits from the activity, for instance to local communities within the project boundaries who can gain employment, have their homes protected from additional ecosystem services and benefit from social initiatives within the project.

Nature-based projects can also play a significant role in protecting and restoring biodiversity, which is crucial to ASEAN as three of the [17 megadiverse countries](#) in the world are located in the region – Indonesia, Malaysia and the Philippines.

Finally, a novel project type ASEAN may look to develop is biochar. Biochar, which can be fed back into soil to facilitate carbon removal from the atmosphere, is created from agricultural or forestry residues, which ASEAN has an abundance of from its forests, rice husks and palm. Biochar has the added benefits of improving soil health and reducing fertiliser usage, therefore offering a full-circle solution for many ASEAN countries to reduce both agricultural waste and emissions and aid agronomic productivity.

## Early retirement of coal fired power plants

Carbon credits generated from the early retirement of coal-fired power stations may offer one potential decarbonisation solution for ASEAN's energy sector.

According to recent projections by the ASEAN Centre for Energy, ASEAN could double its primary energy supply by 2040, with demand tripling by 2050. However in 2020, 83% of ASEAN's energy mix came from fossil fuels and much of this from coal.

Coal-fired power stations often have long operational life spans, decades into the future, and therefore retiring them early is at a cost to jobs and lost revenue for their owners. This cost can be offset by the sale of carbon credits against the emissions reductions from retiring the plants, as well as funding new renewable energy opportunities that staff could be retrained in. Methodologies for this type of carbon project are currently under development, and there have been early efforts by Singaporean entities to fund pilot projects in this area.

With modelling suggesting global demand for voluntary carbon credits will reach 1.2 GtCO<sub>2</sub>e per year in 2030 and [5.4 GtCO<sub>2</sub>e per year in 2050](#), ASEAN Member States are in a good position to utilise their natural endowments to meet this expected growing demand and be compensated for this.

## Integrity concerns

Integrity in carbon markets is crucial to ensuring high-quality projects deliver measurable impact. This creates a credible system where climate finance drives actual CO<sub>2</sub> reductions and removals from the atmosphere.

Key tenets of high-integrity carbon projects include:

- ▲ Ensuring projects are additional, permanent and have safeguards against CO<sub>2</sub> leakage.
- ▲ Project data is transparently and accurately reported, with emission reductions verified by an independent third-party standard.
- ▲ Environmental and social safeguards are put in place, and free prior and informed consent is sought with local communities. A fair share of benefits should go to communities within the project boundaries.

Increasingly, integrity concerns have arisen on both the demand and supply sides of the voluntary carbon market (VCM), leading to greenwashing criticisms. Key industry initiatives, such as the [Integrity Council for the Voluntary Carbon Market \(IC-VCM\)](#) and the [Voluntary Carbon Markets Integrity Initiative \(VCMI\)](#), have sought to develop guidance and best practices for high-integrity carbon markets.





# The ASEAN carbon opportunity in numbers

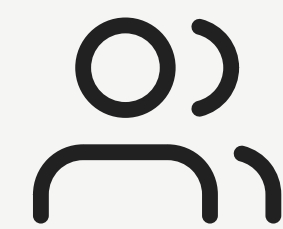


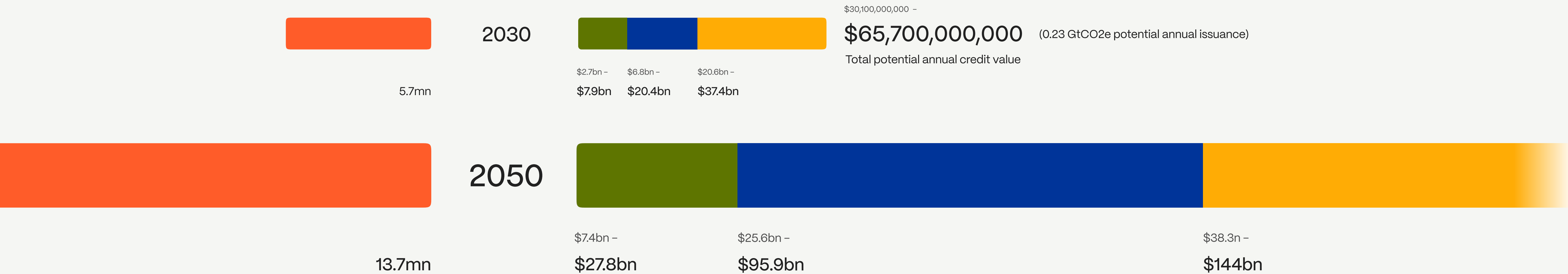
## The ASEAN carbon opportunity in numbers

Abatable has modelled the potential environmental and economic carbon market opportunities for ASEAN across several key project types. We calculate that unlocking the full potential of these project types could bring ASEAN more than 1.1 gigatonnes of carbon removals or reductions per annum, resulting in up to \$267bn of annual carbon revenue and thirteen million jobs created by 2050 (see **Figure 4**). This would create a cumulative revenue of **\$946bn – \$3tn** between 2025 and 2050.

# 13,700,000

Potential jobs created by 2050





REDD+ potential monetary value (\$)



Blue Carbon potential monetary value (\$)



Biochar potential monetary value (\$)



Total potential jobs created

Figure 4. The economic potential of carbon markets in ASEAN

Source: Abatable, using data available in its market intelligence platform and BNEF modelling. See Appendix 2 for detail.





\$71,400,000,000 –

**\$267,700,000,000**

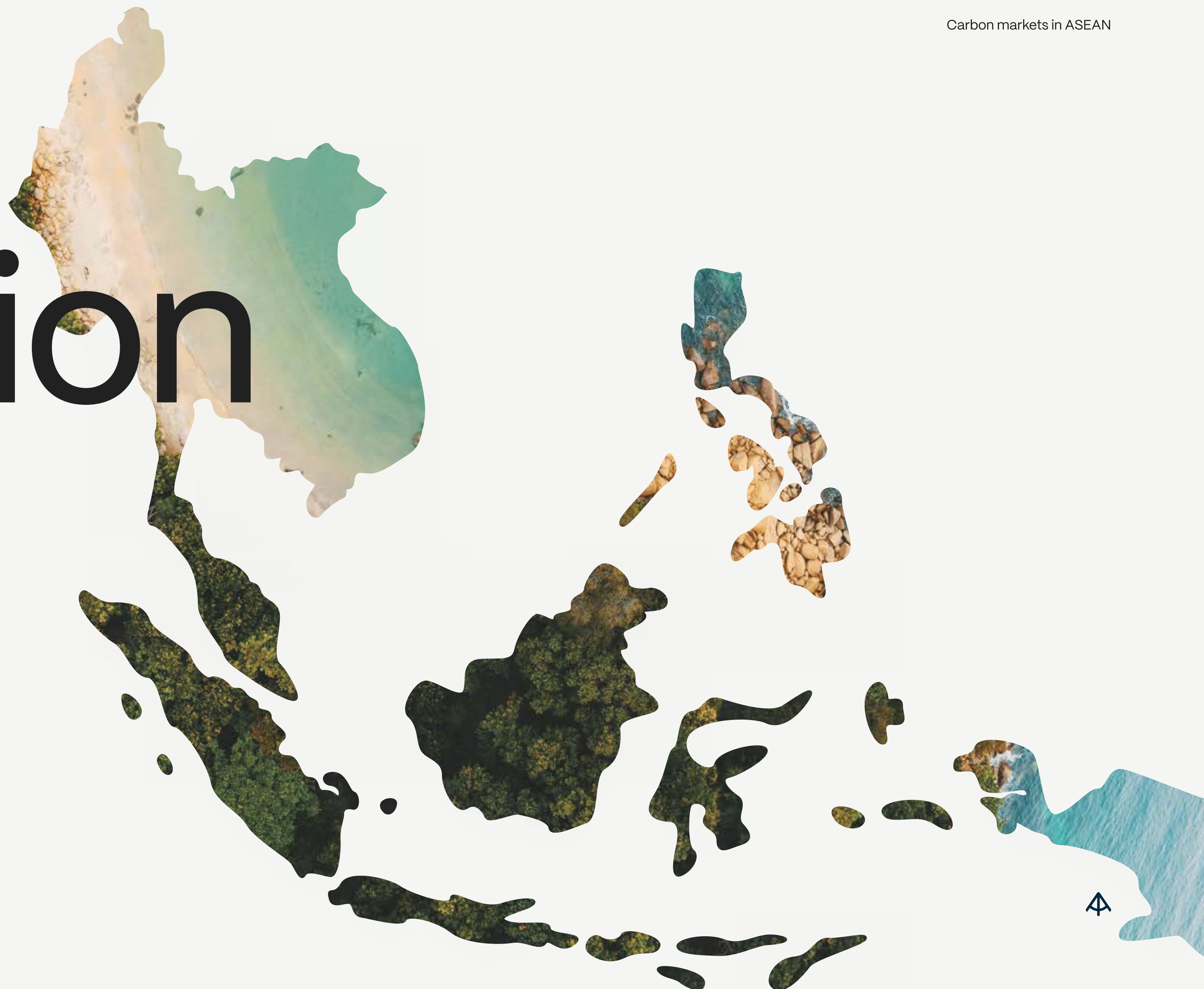
(1.12 GtCO<sub>2</sub>e potential annual issuance)

Total potential annual credit value (by 2050)

\$946bn –

# \$3 trillion

2025–2050 potential cumulative revenue



# Policy considerations for carbon markets in ASEAN



## Policy considerations for carbon markets in ASEAN

Current challenges on both the supply and demand side of the market are limiting ASEAN from achieving the opportunities outlined in this report. To understand these challenges and to suggest policies to address them, Abatable spoke with over 30 stakeholders across the carbon market value chain in ASEAN to inform this report.

Our considerations for policymakers follow.



# Carbon credit supply

## Consideration 1

Develop carbon market regulation to provide policy clarity and create an attractive investment landscape

Carbon market capital will not scale in ASEAN without clear and detailed regulations to support it. Stakeholders looking to invest and develop projects around the world flagged that regulatory risk has become a major issue, as governments have begun to implement policies that could be perceived negatively by the market.

Two examples impacting carbon credit supply were highlighted. A policy that in effect temporarily suspended the sale of carbon credits abroad, enacted in Indonesia, stifled demand and investment in new projects. Similarly, the implementation of unexpected new fees on carbon projects in Zimbabwe, later withdrawn, would have made some projects financially unfeasible. These two examples illustrate the importance of finding a balance between incentivising the development of carbon projects, contributing to national mitigation targets and generating revenue for a country. International capital providers are increasingly moving their capital to jurisdictions with clear regulatory landscapes.

Some of the most critical elements stakeholders stated they are now looking for in carbon market regulations include:

- ▲ **A definition of the role of voluntary carbon markets in achieving national targets, including the ability to export carbon credits and the application of corresponding adjustments.**  
Regulation can be designed to facilitate the continued operation of VCM projects hosted in the region and the export of credits, as well as provide a pathway for engaging in Article 6 cooperation options, including clarifying when corresponding adjustments apply.

- ▲ **Clear and standardised administrative processes for projects approvals and authorisation across ASEAN.**

Clear and standardised administrative processes for activity approvals or authorisation will ensure efficiency and enable market scaling. Countries can accelerate mitigation action in the ASEAN region via a clear project application and approval process that includes standardised documentation and timelines, a point of contact, and eligible methodologies for carbon projects to go ahead. In this way, any project in ASEAN could receive an equivalent legal project approval or authorisation from a designated government body. Definitions in the regulation of how to pertain legal ownership of carbon assets will also add clarity.

- ▲ **A definition of Article 6 mechanisms and processes.**

ASEAN Member States intending to authorise international transfers under Article 6 could define a homologated process for project proponents to apply for a 'Letter of Authorisation' from the host government. The eligible activities, the authorising body and the administrative process for this should be clearly defined in regulation.

This would enable ASEAN countries to diversify into additional carbon activities under Article 6.2 and 6.4 as well as the established voluntary market. Governments must be conservative when developing national rules for Article 6 engagement so as not to risk the achievement of their NDC targets. Missing targets, or revoking previously authorised credits, will have a negative impact on market perception by investors, participants and buyers, and have a damaging impact on a country's investment environment on carbon markets.



▲ **Transparency on all fees and benefit-sharing requirements.**

In addition to attracting investment, carbon projects can become a revenue-generation option for a country. Project proponents may accelerate investment and better understand potential returns when having full awareness of costs before developing a project. Fees could include national benefit-sharing rules, taxation or administrative fees. Enhanced transparency with clear and equitable benefit-sharing rules could reduce the negative perception of 'carbon colonialism' within the region. If Article 6 processes are included, the cost of Letters of Authorisation and corresponding adjustments could also be defined.

Countries establishing robust regulatory frameworks will maximise investment in carbon projects. They can also lay the groundwork for regional initiatives and, as we will discuss next, ASEAN Member States can share experiences and best practices to support building regional capacity within carbon markets.



## Case study – Ghana

Ghana published its [carbon market framework](#) in 2022, which provides detail on the country's institutional and regulatory framework for carbon markets, complementing the national registry it had already developed. The regulation established a 'Carbon Market Office' to deal with the day-to-day management of the framework and the operation of carbon markets in Ghana. It defined a role for VCM projects and clarified that these projects can account for any part of Ghana's NDC.

Ghana's carbon market framework also outlines an authorisation process and fee structure for the transfer of credits under Article 6 that could support its conditional NDC targets. This included a whitelist of project types that, if authorised, could be transferred under Article 6 and removed from Ghana's NDC. It also defined a red list of ineligible project types for export under Article 6.

Finally, the framework provides template documentation for project applications and authorisations, timelines, and administrative costs, easing the process for project developers operating in the country.

## Consideration 2

### Ensure the requisite institutional and technical capacity to create a robust carbon market

ASEAN countries have a wide variety of technical and institutional capabilities. Policymakers must ensure they have the necessary institutional and technical capacity to understand, build and implement a robust carbon market landscape. Further, the private sector must have the necessary capacity for an efficient and flourishing market.

Raising capacity across the region will also allow for the integration of markets at a regional level.

## A market network

At the regional level, ASEAN can support governments in capacity building by creating an 'ASEAN carbon market network' that allows ASEAN members to share their experiences and build networks of carbon market practitioners. This would help leverage the expertise within some countries for the benefit of the region.

ASEAN countries hold different strengths. For instance, Singapore has experience creating Article 6.2 agreements with links to a domestic carbon pricing instrument and its offsetting, while Thailand has experience developing its own carbon credit standard, methodologies and registry system, as well as the operating a voluntary market. Moreover, ASEAN could provide links to countries outside the region that have experience in carbon markets and bring them in to provide guidance and insights on specialist topics.

This platform could also bring in private sector experience. Private sector expertise across a range of areas in ASEAN, particularly in project development, investment and infrastructure development, could be leaned upon both nationally and regionally.

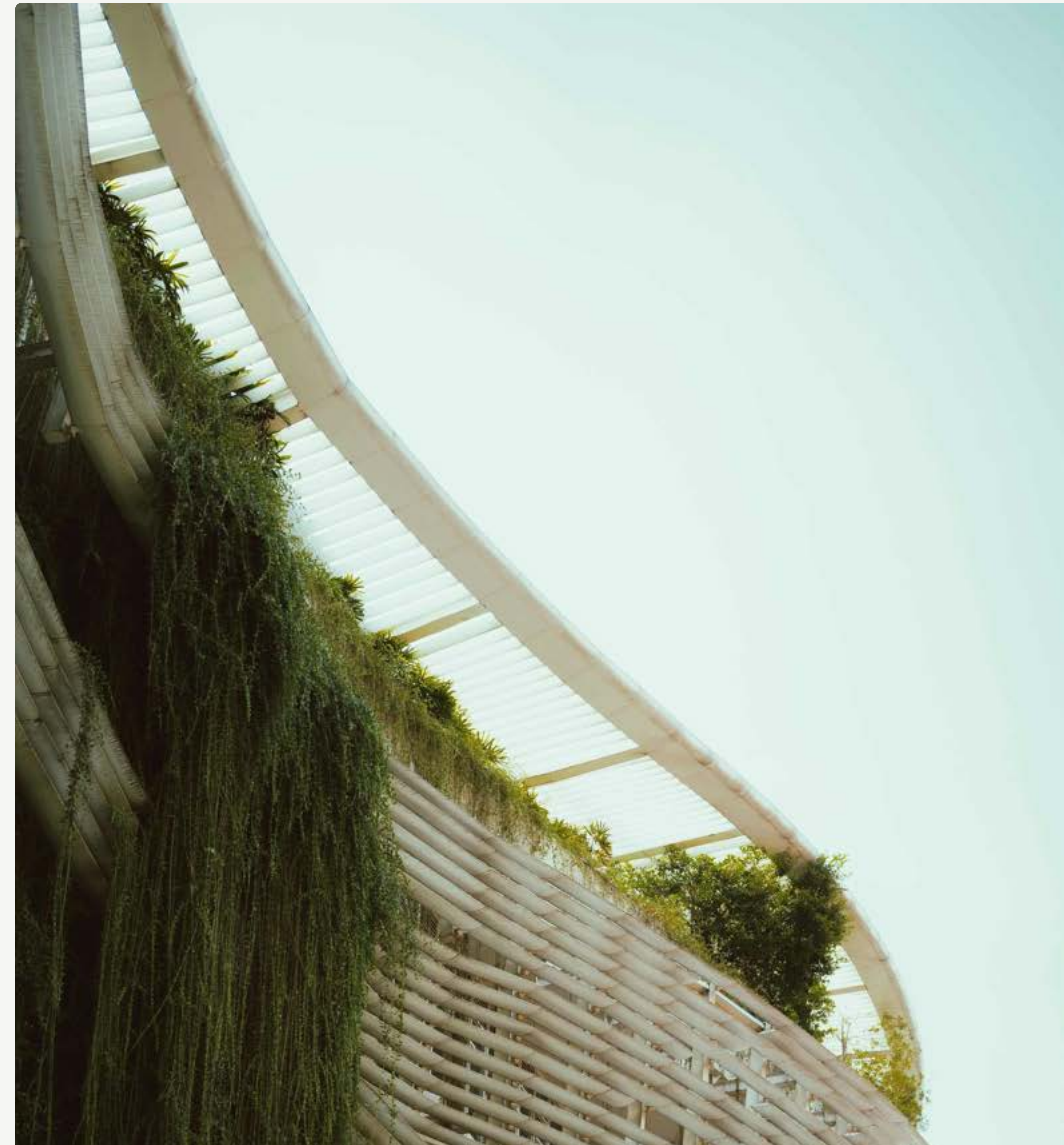
Finally, capacity-building entities could support relevant activities through this forum. Regionally, the Asia Centre for Carbon Excellence, supported by the Singapore Economic Development Board, was launched in 2024 to provide expertise to support regional governments with developing expertise in carbon trading and other areas, and this should be leveraged. Wider international capacity builders are already supporting ASEAN governments and can bring their expertise and support efforts.

## Offices, training and working groups

As part of this capacity-building process, policymakers should establish dedicated government offices to operate carbon market processes, enabling staff to develop technical skills and experience. This would allow domestic expertise to be developed and provide a clear point of contact within the country, enabling an efficient market. Members of these offices should also represent their country at ASEAN events to build harmonisation of markets within the region.

Research, development and training should also be a key focus. Governments could work with universities to create carbon courses, similar to how the National University of Singapore now runs dedicated courses on carbon market mechanisms. This helps build awareness, creates a skilled pool of labour, and facilitates the building of networks. ASEAN nations could leverage Singapore's work to develop their own training programmes.

Finally, ASEAN could build working groups on key topics to build regional understanding. These could be expert groups on key project types such as REDD+ or blue carbon, or on key market initiatives such as understanding IC-VCM, VCMI, rating agencies and other key evolving elements of the international market that are becoming increasingly relevant.



### Consideration 3

#### Align standards around established best practice and allow for international standards to enable greater market access

Interviewees for this report highlighted frictions when engaging with international carbon standards, which were often slow, costly and lacked methodologies relevant to the local context. Some ASEAN governments have developed or are in the process of developing national carbon standards and methodologies to support domestic projects, leveraging domestic mitigation potential, local data and expertise, creating options to retain more revenues nationally. However, these efforts could align with international best practices around environmental integrity to ensure the integrity and credibility of ASEAN-based carbon projects.

A limited number of ASEAN countries have recognised international carbon standards as eligible options for carbon projects, creating uncertainty on the validity of their use. International buyers of carbon credits often prefer projects registered with established and recognisable international standards, before following country-specific standards set according to domestic needs. Investment could be expanded if international and domestic standards were well aligned in their environmental integrity considerations.

## Localising international standards

To solve this, ASEAN could work with international standards to localise some methodologies or collaborate in the development of region-specific options or tools. For instance, methodologies using more nationally relevant data, with methodologies being translated into domestically relevant languages. Some strategically important project types could be selected to pilot this approach initially.

As an example, the Climate Action Reserve, which creates forestry methodologies as part of California's compliance scheme, developed its '[Mexico Forestry Protocol](#)' aligned to Mexico's forestry sector, which has enabled a tenfold growth of carbon forestry projects in the country. Localising international methodologies will simplify and improve project development, while still providing the recognisable standards that international buyers currently feel comfortable with.

## National development

At the same time, ASEAN Member States might choose to develop their own national methodologies to better capture other mitigation options not considered by international standards. These might be useful to streamline administrative processes and retain revenues domestically, particularly if projects issue carbon credits for domestic compliance or voluntary schemes.

These methodologies could follow internationally relevant practices on environmental integrity to ensure the development of a high-integrity market. Moreover, these methodologies could boost their international relevance if recognised with quality labels such as 'CCP-approved' or 'CORSIA-eligible'.

For example, Cercabono, a certification standard in Colombia, started with the aim of supplying credits for Colombia's carbon tax scheme, but now certifies projects internationally. Within ASEAN, Thailand is currently applying for CORSIA eligibility for its T-VER Premium methodology.

## Regional compatibility

Given its experience developing national methodologies, Thailand might provide support at the ASEAN level to other members looking to develop a domestic standard. This might be through sharing experience and knowledge or by adapting methodologies to be appropriate for other Member States. Alternately, Member States may want to utilise each other's standards and build a regional set of methodologies. Under this scenario they could be integrated across compliance schemes and begin to form regional interlinkages.

The ASEAN Common Carbon Framework developed under the Malaysian Carbon Market Association has presented a similar approach to develop high-quality local methodologies, with mutual recognition of these across ASEAN.

# Carbon credit demand

## Consideration 4

**Develop robust domestic compliance schemes to create new and reliable demand for carbon projects**

Across many ASEAN Member States there is no price connected to emitting greenhouse gases and, in some countries, fossil fuels are still subsidised. The lack of carbon pricing schemes limit the incentives for entities to reduce their emissions.

By implementing compliance schemes, such as an ETS or carbon tax, governments can put a cost on emitting companies' balance sheets, incentivising decarbonisation. Moreover, by creating interlinkages between these schemes and carbon projects by allowing the use of carbon credits to meet compliance, governments can drive demand towards carbon projects that reduce or remove emissions in their jurisdictions.

Governments must ensure that the price level of the compliance instrument is sufficient to incentivise action on emissions. Further, if allowing flexibility to use credits as part of compliance, they must strategically select eligible project types that will help them meet their sectoral NDC targets and encourage funding to flow into these mitigation activities. The sooner the details of these emerge, including project types, methodologies and quantity of credits, the greater signal this sends to the market, allowing investment to flow.



## Market linkages and cooperation

Longer-term, countries might look to link their markets to support the achievement of their targets. In particular, given the varying economic circumstances of countries across ASEAN, this will help those with larger emissions profiles and higher marginal costs of abatement to meet climate targets. Countries can form agreements under Article 6.2 to facilitate bilateral carbon trading which has eligibility for the buyer under compliance schemes while ensuring no double counting on national ledgers.

Within the region, Singapore already allows international credits under Article 6 for companies to use towards the domestic carbon tax and to meet Singapore's NDC. ASEAN Member States might look to additional agreements from within the region to supply Singapore or facilitate other Member States achieving their respective NDCs.

Over time, ASEAN might explore moving from bilateral agreements with the region and create a multilateral agreement under Article 6.2, defining a common ASEAN framework for eligible credits. This would facilitate the formulation of an internal market and allow regional trading to supply and meet compliance needs. This would also enable the creation of a standardised and tradable contract of eligible credits, which would simplify market navigation on the buy side and encourage liquidity.

The development of a regional market would build on the ASEAN Strategy for Carbon Neutrality, which has as one of its key strategic pillars the harmonisation of regional monitoring, reporting and verification and the facilitation of interoperable carbon markets.

### Case study – Colombia

Colombia implemented its carbon tax in 2016 at around \$5 per tonne of CO<sub>2</sub> emitted.

The tax is part of Colombia's NDC target to reduce national emissions by 51% by 2030 compared to business-as-usual, and applies to both producers and importers of fossil fuels. This represents [about 27%](#) of the total emissions from the country, or around 51 million tonnes of CO<sub>2</sub> equivalent.

Colombia's carbon tax scheme initially allowed for the use of carbon credits from domestic projects to cover up to 100% of companies' taxed emissions, although this was reduced to 50% in 2022. Carbon projects from a variety of international and domestic carbon standards are eligible for the scheme.

Colombia's Ministry of Environment and Sustainable Development reported \$168mn spent on compliant credits from the scheme's inception in 2016 to the end of 2021.

## Consideration 5

### Endorse and raise public awareness of voluntary carbon activity

ASEAN leaders should endorse carbon markets and find methods to build public awareness of their potential to establish the region as a global leader.

An ASEAN-wide endorsement of high-integrity voluntary carbon markets from country leaders would provide powerful advocacy for their use in the region. In particular, this endorsement should focus on empowering and working with local communities within projects.

## Government-led endorsement of high integrity markets

The US made a similar endorsement in May 2024, signed by senior members of President Biden's staff.

Endorsement on a senior level would:

- ▲ Act as an indicator of market legitimacy in the region
- ▲ Build trust amongst stakeholders
- ▲ Indicate a long-term strategy to develop high-integrity carbon markets.

This could include endorsement of industry-level initiatives such as the IC-VCM's Core Carbon Principles and VCM's Claims Code of Practice, which would provide best practice guidance to stakeholders on both the supply and demand side within the region.

## Fostering regional demand

Part of this work can also build public engagement for regional demand. Demand has historically been dependent on international and volatile voluntary demand for carbon credits. To counter this, ASEAN could introduce rewards for regional voluntary purchases of ASEAN credits. A public registry could be built where climate pledges, including the use of regional credits by ASEAN corporations, are listed.

Further to this, a public recognition scheme could be developed for buyers of regional credits whereby corporates are awarded positive claims labels that relate to their actions. This might lean on the tiered system the VCM has built, but recognising and encouraging the use of regional credits. This would allow corporate buyers to benefit from the reputational benefit of positive environmental activities.

ASEAN could also explore the option to form a 'buyers club' of corporates committed to the purchase of regional credits that meet certain ASEAN eligibility criteria. Projects would be incentivised to supply these credits, and by creating a high-integrity standard this would help drive the quality benchmark of credits up to this standard.

## Connections and recognising achievements

Moreover, ASEAN hosted its inaugural [Carbon Forum](#) in 2023. Now moving into its 2024 edition, the Carbon Forum could explore the discussion of the topics in the report and be expanded into a larger conference with a rotational host. This would draw in and connect carbon market developers, investors and buyers, providing a platform to elevate ASEAN stakeholders and carbon market ecosystems. In recent years carbon-focused conferences have gathered a global audience of market stakeholders, allowing connections to be built across public and private sectors and positioning regional openness to business.

Relevant policymakers and secretariat could seize the forum to reflect on the importance of the industry to the region. There might also be an annual awards ceremony, to announce those receiving public claims labels for buyers mentioned above, and also present awards to projects and developers. Awards around the impact of co-benefits, such as local community engagement or biodiversity protection, which tell the full story of the projects, are also important to build awareness of the importance of co-benefits in carbon projects.

This presents an opportunity to further develop a virtuous circle whereby ASEAN corporates are incentivised to purchase regional high-quality projects to continue to build the ASEAN market. This can draw inward investment from around the world into the region, whilst also building a robust regional market ecosystem and positioning ASEAN as a global carbon market leader.





## Consideration 6

### Formulate Article 6 processes to open new avenues for international demand

## Expand Article 6.2 opportunities

International cooperation under Article 6.2 enables cross-border investment and carbon trading toward targets under the Paris Agreement.

An increasing number of countries, including Singapore, have launched bilateral cooperation under Article 6.2. However, despite the mitigation potential in the region and the opportunities to support each other in achieving NDCs, there are no bilateral agreements in place between ASEAN countries.

Singapore holds Article 6 agreements to trade correspondingly adjusted credits with countries around the world. The government-to-government arrangements are developing a new market as Singapore's obligated entities look to purchase the eligible credits. Based on this demand, investment is starting to flow into projects and trading services in countries that are Singapore's counterparty.

For these agreements to progress, an important component has been the development of Article 6 frameworks with designated government bodies who defined and agreed on the eligibility of sectors, the activities and crediting standards to follow, the establishment of processes for project approval, authorisation and registration, and the definition of equivalent monitoring and reporting processes. Existing guidance for Article 6.2, as decided at COP26, has been used as a reference. With recent decisions at COP29, ASEAN Member States now have an up-to-date guidance for operationalisation of country-to-country cooperation under Article 6.2.

ASEAN members could engage in discussing the elements needed for intra-region cooperation as a way to position ASEAN as an important hub of Article 6 activity. In addition, an area to explore is the possibility of multilateral arrangements, bringing more than two countries together.

Once this has been developed and agreed upon, ASEAN could facilitate discussions with other buyer countries to strike Article 6.2 agreements. ASEAN could become an attractive region to buyer countries that would be able to maximise supply access while only having to engage with the formalities of a single type of agreement – a template shareable by all ASEAN members. For Member States, ASEAN would assume the technical work of negotiating and formalising agreements, and it would be up to individual members to participate. A regional multilateral agreement would be a landmark, placing ASEAN as a global carbon market leader and drawing investment to the region.

## Engage in the developing Article 6.4 Mechanism

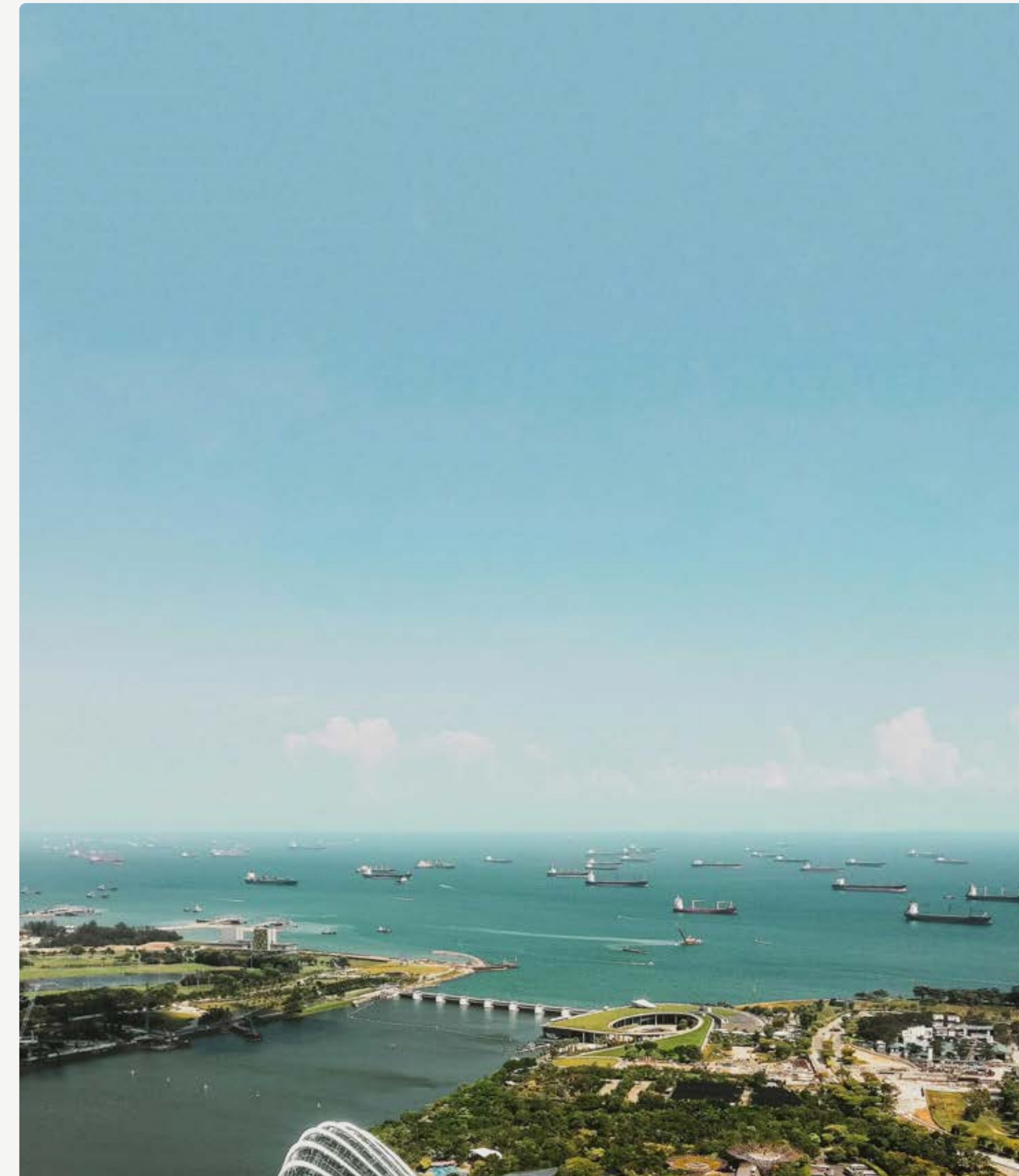
The Article 6.4 mechanism can provide a new avenue for carbon crediting and trading, based on internationally agreed methodologies currently being finalised under the United Nations Framework Convention on Climate Change.

As a nascent mechanism, market dynamics are as yet uncertain. However, host countries' Designated National Authorities (DNAs) should build knowledge and capacity early on and clearly articulate a strategy for engaging with the Article 6.4 mechanism. ASEAN countries can already define which projects or activity types can receive approvals for registration in the mechanism, and authorise on credits use for corresponding adjustments. Similarly, ASEAN members could already define which other projects may be approved under the Article 6.4 mechanism to issue Mitigation Contribution Units (MCUs), which remain in the host country's NDC targets. The better-prepared countries are for the Article 6.4 mechanism, the better positioned they will be to access a first-mover advantage from it as demand develops.

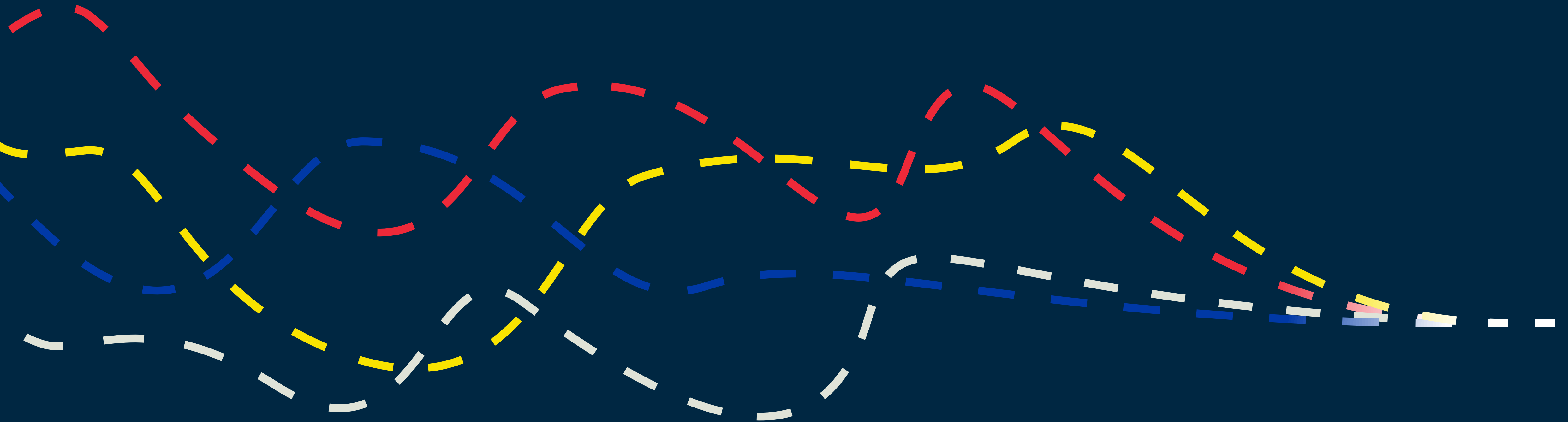
## CORSIA supply

Finally, by authorising credits for use towards CORSIA, ASEAN can become an important supply source to its airlines for CORSIA. Under the CORSIA offsetting scheme, designated airlines must purchase CORSIA-eligible credits that are authorised by host countries, correspondingly adjusted to ensure proper accounting and avoid double counting. The lack of homologated procedures to request and issue Letters of Authorisation for CORSIA purposes and the apply corresponding adjustments would deter the aviation sector from sourcing eligible credits from the region.

If their domestic governments cannot offer them, then ASEAN-based airlines will have to source credits from outside the region. By facilitating supply from within the region, ASEAN can retain revenues and simplify the procurement processes for its airlines. In addition, it could also become a global supplier of credits to airlines to satisfy the projected demand of [121-244 million credits](#) by the end of CORSIA's first phase in 2026.



# Summary and conclusions



## Summary and conclusions

The economic prize for the effective development of carbon markets in ASEAN is significant, with the potential to generate up to \$3tn in cumulative revenue by 2050 through the reduction or removal of 1.1 gigatonnes of CO<sub>2</sub> per year.

By implementing the policy considerations in this report, ASEAN can drive inward investment into the region and create more reliable sources of demand for projects. This will bring both economic and environmental benefits – helping establish domestic, regional and international markets and enabling countries to develop projects for which they have the natural endowments to supply. These recommendations present a pathway for which ASEAN can position itself as a global leader within carbon markets, complementing [ASEAN's Taxonomy for Sustainable Finance](#).



We've presented six policy considerations for ASEAN Member States, based on discussions with carbon market stakeholders from across the value chain in the ASEAN region. They are:

**Consideration 1**  
Develop carbon market regulation to provide policy clarity and create an attractive investment landscape

**Consideration 2**  
Ensure the requisite institutional and technical capacity to create a robust carbon market

**Consideration 3**  
Align standards around established best practice and allow for international standards to enable greater market access

**Consideration 4**  
Develop robust domestic compliance schemes to create new and reliable demand for carbon projects

**Consideration 5**  
Endorse and raise public awareness of voluntary carbon activity

**Consideration 6**  
Formulate Article 6 processes to open new avenues for international demand

These considerations can unpick some of the challenges currently limiting the potential of carbon markets in ASEAN. At present, uncertainty presents risks and limits the scaling of these nascent markets. Clarity is the element many stakeholders are searching for. Following these considerations will go some way to providing this clarity, building a robust and regionally harmonious set of markets for the benefit of the region and the planet.


To date, regional carbon market interlinkages and cooperation have not yet been well explored in ASEAN, and the moment to begin this is now. This will require effective coordination and political alignment, which ASEAN is well positioned to lead – and which Malaysia has shown intention to drive forward when chairing ASEAN in 2025.

If the region can implement these solutions quickly, this would not only be beneficial in the fight against climate change, it would allow ASEAN to gain a competitive advantage and unlock the vast economic and environmental opportunities carbon markets can offer.



# List of interviewees and thanks

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Report authored by **Greg Lydka Morris, Juan Carlos Arredondo Brun, Valentina Hernandez Gomez** and **Holly Nicholson**, edited by **Marc Height** and designed by **Alex Bird** from Abatable. 

This report reflects the opinions and views of the report partners and not necessarily those of the contributors.

## About Abatable

Abatable is a leading provider of end-to-end carbon market solutions. It develops the tools organisations need to confidently navigate carbon markets and find the right partners, understand market risk and amplify their planetary impact. Its solutions are enabled by technology, and powered by people, making it a trusted guide for organisations looking to take action within the complex and evolving carbon markets.

Find out more about Abatable's carbon credit sourcing and market intelligence solutions at [www.abatable.com](http://www.abatable.com)

## About the ASEAN Alliance on Carbon Markets

ASEAN Alliance on Carbon Markets (AACM) aims to scale the growth of voluntary carbon markets across ASEAN (the Association of Southeast Asian Nations) and support the implementation of compliance markets. AACM is the first private sector-led body to advocate for cross-border efforts in the areas of carbon market development. The alliance fosters a regional ecosystem and acts as a focal point for international partnerships, with activities including capacity building and technical assistance.

[www.aseancarbonalliance.com](http://www.aseancarbonalliance.com)

## About Equatorise

Equatorise is an international consulting firm supporting Indonesian corporates and institutions to seize opportunities in the UK and the EU, as well as supporting British and European institutions to unlock values in Indonesia, the rising socio-economic powerhouse in the Indo-Pacific region. We help our clients to shape opportunities from the twin transformation of the decade – stemming from digital transformation and sustainable transition into a net-zero post-pandemic future.

[www.equatorise.com](http://www.equatorise.com)











# Appendix

## 1 Abatable country policy profiles information for ASEAN

Abatable's voluntary carbon market country policy profiles provide in-depth risk and opportunity analyses based on a proprietary policy framework to assess countries' national carbon policies. The profiles are part of Abatable's market intelligence product suite, designed to improve the data infrastructure for stakeholders in carbon markets.

Our summary scores for ASEAN nations can be found in **Table 3** (scores range from 0–100).

[Click here](#) to learn more about Abatable's carbon market policy profiles.

Country	Current score	Forecasted score
 Brunei Darussalam	53.8	53.8
 Cambodia	52.5	60
 Indonesia	35	37.5
 Lao PDR	56.3	67.5
 Malaysia	72.5	87.5
 Myanmar	28.8	28.8
 Philippines	46.3	61.3
 Singapore	77.5	77.5
 Thailand	61.3	78.8
 Viet Nam	53.8	73.8

**Table 3.** Abatable policy profile assessment scores for ASEAN Member States as of 14 November 2024

## 2 ASEAN carbon market opportunity methodology

The carbon market opportunity figures presented in this report were estimated for three project types Abatable believes offer large climate mitigation potential to ASEAN: REDD+, blue carbon and biochar. The final figures are based on both the projected issuance of carbon credits for these project types in the region based on their mitigation potential and the projected future prices of carbon credits.

We forecasted:

- ▲ The potential total issuance of credits from these three project types in the ASEAN region in 2030 and 2050
- ▲ A range of potential revenue generated from these project types, based on the forecasted prices of credits and the aggregated value of these revenues in 2030 and 2050
- ▲ The cumulative revenue generated under these scenarios between 2025 and 2050
- ▲ Potential job creation within the region

Our detailed methodology follows.

### Total ASEAN annual credit issuance potential

Potential annual carbon credit issuance figures were forecast for three project types that represent significant climate mitigation potential in the ASEAN region. These activity types are: REDD+, blue carbon and biochar.

The mitigation potential for the three project types comes from a combination of academic peer-reviewed papers and data from [Naturebase](#), a publicly accessible global nature climate solutions (NCS) data source managed by [The Nature Conservancy](#) in collaboration with academic institutions and non-governmental organisations working on NCS.

### REDD+

REDD+ potential issuance data comes from Koh et al.'s peer-reviewed study, [Carbon prospecting in tropical forests for climate change mitigation](#), *Nature Communications*, 2021. The data reflects the modelled potential certifiable carbon credits from tropical forest carbon stocks (above-ground carbon, below-ground carbon and soil carbon).

The research applies criteria from the [Verified Carbon Standard](#) (including an additionality test, a 20% buffer for non-permanence and exclusion of recent deforestation and human settlements) to understand the potential creditable volume of carbon stock from forest conservation projects. It uses projected deforestation rates to estimate the volume of forest carbon that would be lost without protection and thus could be certified as emissions reductions. It applies these calculations across tropical forest areas at a one-kilometre resolution to map investible forest carbon in the tropics. The data provides minimum and maximum potential issuance volumes for specific countries, which we have taken for ASEAN Member States.



## Blue Carbon

ASEAN's blue carbon sequestration potential forecast was obtained from Naturebase. The data used reflects the carbon sequestration potential for different wetlands-related activities in ASEAN which include the following:












- ▲ Peatlands restoration
- ▲ Avoided peatland conversion
- ▲ Improved peatland management
- ▲ Avoided coastal conversion
- ▲ Coastal wetland restoration

The global NCS opportunity dataset is [developed](#) from analyses of satellite data, land systems modelling, machine learning and additional qualitative research.

## Biochar

Biochar carbon sequestration data comes from Lefebvre et al.'s peer-reviewed study, [From Waste to Carbon Removal: Quantifying the Global Impact of Biochar](#), Springer Nature, 2023. The forecast reflects CO2 removal potential from biochar activities in each ASEAN Member State using biomass residue data from crop residue, animal manure, forestry wood residues and wastewater biosolids. It calculates biochar yield and carbon content from countries' residue data, and assesses permanence based on average soil carbon temperature in each country.

To estimate net carbon sequestration we took country-level emissions from biochar production and application. We do not consider discounts for crediting for buffer pools.

REDD+ potential			Blue carbon potential		Biochar potential
Country	Annual mitigation potential (tCO <sub>2</sub> e)	Minimum annual mitigation potential (tCO <sub>2</sub> e annually)	Maximum annual mitigation potential (tCO <sub>2</sub> e annually)	Annual mitigation potential (tCO <sub>2</sub> e)	Annual mitigation potential (tCO <sub>2</sub> e)
 Indonesia	230,478,000	130,732,000	330,224,000	417,700,000	78,785,726
 Malaysia	53,632,000	32,265,000	74,999,000	55,700,000	10,739,873
 Thailand	39,054,000	12,396,000	65,712,000	1,400,000	29,196,731
 Myanmar	35,182,000	13,702,000	56,662,000	12,300,000	14,976,014
 Cambodia	28,307,000	11,128,000	45,486,000	800,000	6,050,073
 Viet Nam	24,031,000	9,556,000	38,506,000	1,900,000	24,541,630
 Lao PDR	22,123,000	11,957,000	32,289,000	200,000	2,988,305
 Philippines	10,133,000	4,977,000	15,289,000	2,400,000	20,185,983
 Brunei Darussalam	1,101,000	669,000	1,533,000	200,000	0
 Singapore	1,000	0	2,000	200,000	0
 Total ASEAN	<b>444,042,000</b>	<b>227,382,000</b>	<b>660,702,000</b>	<b>492,800,000</b>	<b>187,464,335</b>

**Table 4.** Aggregated annual ASEAN climate mitigation potential across REDD+, blue carbon and biochar

REDD+ annual mitigation potential is taken as the investable carbon figures presented by Koh et al. The minimum and maximum mitigation potential represents the standard deviation presented in Koh et al.'s analysis.

### Potential monetary value

To calculate the potential monetary value of the credit issuance forecasts we used two data sources:

- ▲ Pricing information from [Abatable's forward pricing curves](#), which are based on offer and transaction data submitted by carbon market participants
- ▲ Publicly available data from [Bloomberg NEF's \(BNEF\) Long Term Carbon Offsets Outlook 2024](#), which models carbon credit prices forward to 2050 based on three scenarios (a removal scenario, a high-quality scenario, and a voluntary market scenario).

We used ranges in our pricing forecasts to reflect the uncertainty of carbon credit prices into the future.

#### *2030 monetary values*

To calculate the total potential value range in 2030 we made two calculations: we aggregated the lower values of each of the three forecasted project types to get a potential total lower value, and aggregated the upper values of each project type to get a potential total higher value.

To calculate the potential credit value of ASEAN **REDD+** activities in 2030, we took the minimum (227,382,000) and maximum (660,702,000) volumes outlined in **Table 4**. These were then multiplied by the 2030 median price of REDD+ credits in Abatable's forward pricing curves (\$11.98/credit), which provided our lower and upper price ranges.

To calculate the potential credit value of ASEAN **blue carbon** activities in 2030 we took the forecast volumes outlined in **Table 4** (492,800,000) and multiplied these by the 2030 minimum and maximum prices of blue carbon in Abatable's forward pricing curves (min \$13.96/credit; maximum \$41.48/credit). This provided a lower and upper price range.

To calculate the potential credit value of ASEAN **biochar** activities in 2030 we took the forecast volumes outlined in **Table 4** (187,464,335) and multiplied these by the 2030 minimum and upper quartile prices of biochar in Abatable's forward pricing curves (min \$110.0/credit; upper quartile \$200.0/credit). This provided a lower and upper price range. We used the upper quartile in this instance as our maximum price is a statistically significant outlier (\$340.0/credit) and we wanted forecasts to remain conservative.

### 2050 monetary values

To calculate the total potential value range in 2050 we used the same framework as for 2030.

To calculate the lower potential credit value of ASEAN REDD+ activities in 2050 we took the annual potential mitigation forecast volume outlined in **Table 4** (444,042,000) and multiplied this by prices modelled in Abatable's forward pricing curves (\$16.73/credit). This price was calculated by taking the price of Abatable's REDD+ forward curve to 2030 (\$11.98/credit) and modelled forward to 2050, using the annual percentage growth in price between 2025 and 2030 (1.69%).

To calculate the lower potential credit value of ASEAN blue carbon activities in 2050 we took the forecast volumes outlined in **Table 4** (492,800,000) and multiplied this by prices modelled in Abatable's forward pricing curves. Prices were collected from Abatable's blue carbon forward curve out to credit vintage 2040, the last data point. We then took the average price growth between vintage 2025 and vintage 2040 (3.2%) and assumed this would represent the year-on-year growth between vintage 2040 and vintage 2050. This gave a value of \$51.95/credit in 2050.

To calculate the lower potential credit value for ASEAN biochar activities in 2050 we took the forecast volumes outlined in **Table 4** (187,464,335) and multiplied this by prices modelled in Abatable's forward pricing curves (\$205.0/credit). Prices were collected from Abatable's biochar forward curve out to credit vintage 2040, then to estimate prices out to vintage 2050 we took the average price growth between vintage 2025 and vintage 2040 (1.28%), and assumed this would represent the year-on-year growth between vintage 2040 and vintage 2050. This gave a value of \$205/credit in 2050.

To calculate the higher potential values for each project type, we used BNEF's 'high-quality' pricing scenario, which models potential credit prices in 2050 at \$238/credit. We multiplied the forecast total issuance in 2050 (1,124,306,335) by BNEF's 2050 high-quality scenario price. We then divided this value by the 2050 lower potential value to work out the factor increase from low to high 2050 total value (3.75), and multiplied the 2050 lower values of each project type by this factor. We did this as BNEF provides prices based on a single carbon value, and this calculation allowed us to bring some proportionality to the final values based on likely project-type prices.

### Cumulative value

To calculate a cumulative range of ASEAN's carbon market value up to 2050 we aggregated the annual lower and upper values from 2025 to 2050.

To calculate a current market price, we used the [estimated market value](#) in 2022 according to Ecosystem Marketplace (\$1.9bn). We assumed that, of the \$1.9bn market value, 7.38% (the ASEAN region's share of global issuances) could be attributed to the ASEAN region, suggesting the region had a market value of \$140.22mn.

For the low-range cumulative value, we calculated five years of the current market value (\$140.22mn/year), ten years of the 2030 low-range potential market value (methodology above – \$30.1bn/year), and nine years of the 2050 low-range potential market value (methodology above – \$71.4bn/year). This takes the value up to 2050 and provides a cumulative value of \$946bn.

For the high-range cumulative value, we calculated five years of the current market value as described above (\$140.22mn/year), ten years of the 2030 high-range potential market value (methodology above – \$65.7 bn/year), and nine years of the 2050 high-range potential market value (methodology above – \$267.7 bn/year). This takes the value up to 2050 and provides a cumulative value of \$3.0tn.

### Potential job creation

To forecast the number of jobs created we took direct job data reported in ASEAN project monitoring reports. While not all projects in the ASEAN region have this data, we can take an average of direct jobs created by each project type and multiply it by the total number of ASEAN projects of each type.

We decided to base job estimates on the number of projects, rather than the number of credit issuances, as projects report the total number of jobs created in a project lifetime, and there is no direct relationship between number of issuances and jobs created. In total, we found 31 projects that reported number of direct jobs created. Six projects also disclosed the number of indirect jobs created, but this value was considered too low to provide accurate estimates of jobs per project.

The following criteria were then used to select projects to estimate the average number of jobs created per project:

- ▲ The project has been validated and verified
- ▲ The project has issued credits prior to July 2024
- ▲ The project has a monitoring report from 2020 to 2023 that includes the number of direct jobs created

Some project types did not have data, so we chose to use the average for the closest project type with available data (e.g. the IFM value for forestry and land projects). We found that carbon projects have currently created 27,000 jobs across ASEAN.

To ensure that the number of potential direct jobs correlates with the potential market size, we divided the number of estimated jobs by the [estimated market value](#) in 2022 according to Ecosystem Marketplace (\$1.9bn). We assumed that, of the \$1.9bn market value, 7.38% (the ASEAN region's share of global issuances) could be attributed to the ASEAN region, suggesting the region had a market value of \$140.22mn in 2022.

By dividing \$140.22mn by 27,000, we can estimate that for every \$5,193 of market value, one job is created. To calculate the total potential job creation we took the lower range value of the forecasted total potential market value in 2030 (\$30.1bn) and 2050 (\$71.4bn) and divided this by \$5,913, the additional market revenue per job. This gave values of 5,796,264 jobs created in 2030, and 13,749,278 jobs created in 2050.

The final numbers in the main body of this report are conservatively rounded down for legibility.

All monetary figures in this report are in US dollars. The report is listing value in today's prices.





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