MIBG Sustainability Research

VCM - 2023 was not all that -ve!

Moving towards enhanced integrity & credibility

2023 was a tumultuous year for the voluntary carbon markets (VCM) marred by multiple controversies denting its credibility. This did not dent retirements (-5%) much but fresh issuances and prices fell by 25%/16% YoY. We believe the VCM market may have bottomed and could see pick-up from 2024 onwards, driven by: a) overdrive in regulatory changes to build enhanced integrity, assurance and credibility in offsets; b) bilateral agreements amongst countries under Article 6.2/6.4 of the Paris Agreement; c) inevitable need for emission reduction by 'hard-to-abate' sectors; d) need to offset Scope 3 emissions across sectors; and e) credits from CO_2 removal becoming a reality. We see large opportunity from NbS as ASEAN houses 15% of the world's tropical forests. We prefer exchanges (SGX SP and BURSA MK) and banks (DBS SP) which could benefit from being part of the larger VCM ecosystem. Risk is from prevailing geopolitical tensions, elections and high cost of capital affecting cross-border flows.

VCM marred by integrity issues since late 2022

Over 2022-23, the VCM saw a lot of bad press questioning its integrity. The prominent among these include: 1) an investigation by *The Guardian* publication concluding that 90% of carbon credits for land-based removal of CO_2 approved by Verra were "useless"; 2) South Pole, a Swiss-based carbon finance consultancy, facing allegations of exaggerating climate claims in one of its projects; 3) Delta Air Lines facing a lawsuit over its USD1b carbon-neutrality claim; and 4) exaggerated quantities of cookstoves driven carbon credit claims as per peer reviewed report of an American university. Although VCM volume and average prices declined sharply YoY, the silver lining is carbon-credit retirements are steady indicating companies continue to use carbon credit offsets and that VCM survived serious reputational damage.

Multiple new rules & regulations to plug quality gaps

Among the significant global regulatory overhaul to resurrect the credibility of VCM, The VCMI and the ICVCM issued rules including: a) buyers must prioritize rapid cuts in emissions before using VCM to offset residual emissions; b) buyers must set and publicly disclose science-aligned targets and publicly commit to net zero before 2050; c) net-zero targets should also cover Scope 3 emissions; d) clearly communicate the use of carbon credits; and e) must disclose information on claims and conduct independent validation and assurance. Recent initiatives at TNFD, SBTi FLAG standard and COP28 Food companies resolution should also help boost NbS/biodiversity credits through in-setting vs offsetting earlier.

ASEAN slow on net zero/ VCM but potential remains

Last year, the number of projects and volume in Malaysia, Singapore and Indonesia remained low despite established exchanges because of low supply of credits, especially in NbS and renewable energy (RE). There is a lack of credible local projects and financing to generate quality carbon credits. So far, only 97 ASEAN companies committed to SBTi-based net zero target (1.4% of total). The upside in volume would come if large scale local Nbs projects are taken up in ASEAN and also from development credits in energy efficiency, waste etc. On a competitive scale the investments in carbon capture and storage (CCS) is big in ASEAN and overshadows the VCM and might become the pivot to offset it if VCM fails to scale up.

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Company	Bbg code	Curr	CP	Rating	TP
Bursa Malaysia	BURSA MK	MYR	7.32	HOLD	6.55
Singapore Exch.	SGX SP	SGD	9.66	HOLD	10.24
DBS	DBS SP	SGD	32.10	BUY	37.81

Source: Bloomberg, Maybank IBG Research
Share price as on 26 Jan 2024

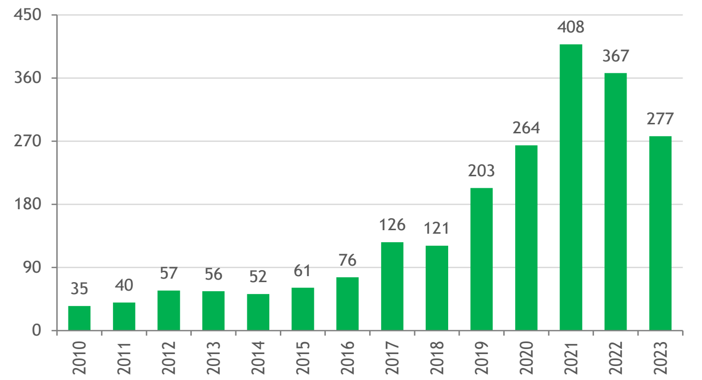
Abbreviations used in the report

VCM	Voluntary carbon markets
NbS	Nature-based solutions
VCMI	Voluntary Carbon Markets Initiative
ICVCM	Integrity Council for the Voluntary Carbon Market
TNFD	The Taskforce on Nature-related Financial Disclosures
SBTi	Science-based Targets initiative
FLAG	Forests Land and Agriculture
COP	Conference of the Parties
CDM	Clean Development Mechanism

1. VCM volumes and prices weak in 2023 but there are a few bright spots

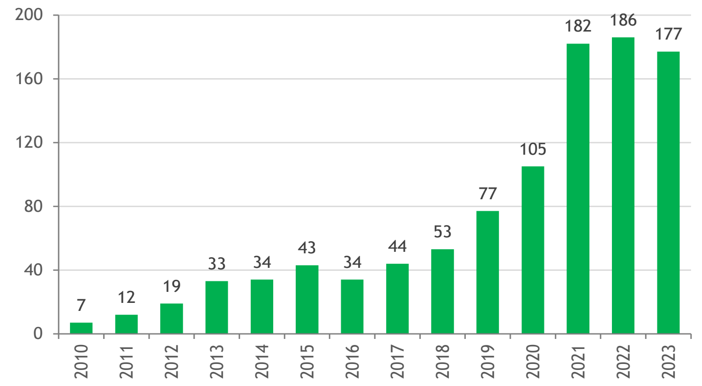
According to MSCI Carbon Markets data, carbon credit issuances in 2023 were 25% less than in 2022. VCM markets hit a high of 408m tCO2e in 2021, after which it reported decline in 2022 to 367m tCO2e and to 277m tCO2e in 2023. In value terms, the size of the VCM declined to USD1.1b from USD1.5b in 2022. However, the retirements of carbon credits have been steady over the past three years at about 177m tCO2e. The momentum on retirements, which picked up in Dec 2023, continues in Jan 2024 as well. This clearly suggests that the use of carbon credits as a means to offset excess emissions remains intact and if credible supply is offered, the volume could scale up further. Also, the vintage (age of carbon credit) issued is declining, which is good for VCM because the demand for low-vintage carbon credits is higher than legacy credits (primarily old CDM and RE projects). Finally, carbon credit surplus continues to increase, driven by NbS, which forms close to 50% of the inventory. The quality of carbon credits remains key for pick-up of VCM. In the overall global carbon credit projects (more than 5,000) only 150 are A rated with an assessment score of 2.9 to 3.1. Rating mapped to price data suggested that better rating resulted in better pricing (premium of at least USD2).

Fig 1: Carbon credit issuances on the VCM trending down



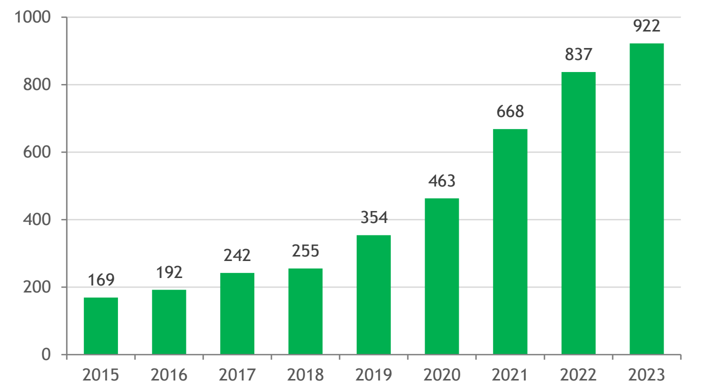
Source: Trove Research (MSCI Carbon Markets)

Fig 2: Carbon credit retirements remained steady in 2021-23



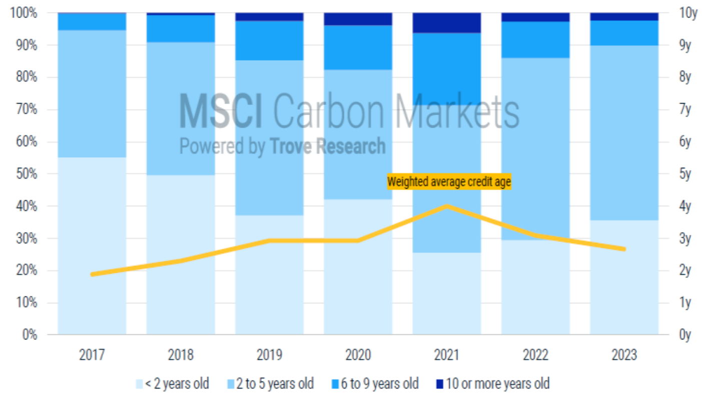
Source: Trove Research (MSCI Carbon Markets)

Fig 3: Carbon credit inventory trending higher, driven by NbS



Source: Trove Research (MSCI Carbon Markets)

Fig 4: Weighted average age of carbon credit issued declining



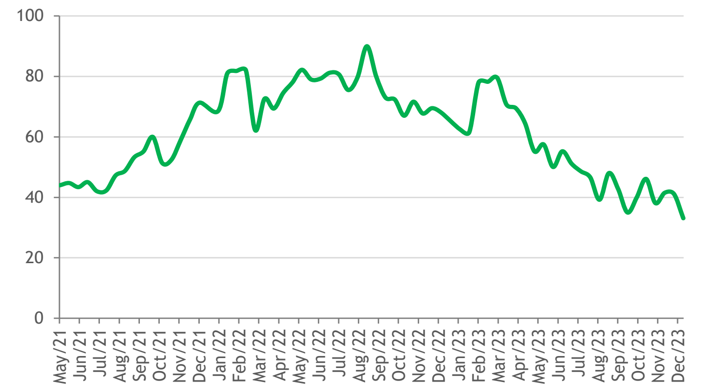
Source: Trove Research (MSCI Carbon Markets)

The prices of carbon credit have declined across both the compliance market as well as the VCM. The carbon allowance price is currently about EUR60-65/tCO2e after hitting a high of about EUR100/tCO2e in late 2022. Similar is the case with the UK compliance market allowance prices. The decline in compliance market pricing is because of global geopolitical disturbances and political backlash to measures tackling rapid climate change. The trend in compliance market pricing and reputational issues in the VCM dragged down the weighted average carbon credit price from USD6.8/tCO2e in the Dec'22 quarter to USD4.9 in the Dec'23 quarter, according to MSCI Carbon Markets. The one positive for VCM was the improvement in prices of nature-restoration projects despite the overall weakness. The sharpest fall was in the cookstove credit price and that of RE. RE credits are no longer being approved by Verra and Gold, the two primary validation agencies, because there is no additionality in it, especially in the developed markets and some developing markets.

Fig 5: European Union ETS: allowances prices declining

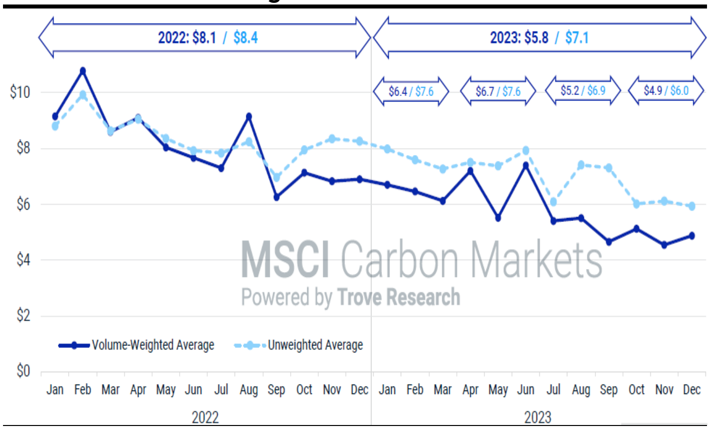
Source: Bloomberg

Fig 6: UK ETS Emission Auction - allowances prices lower



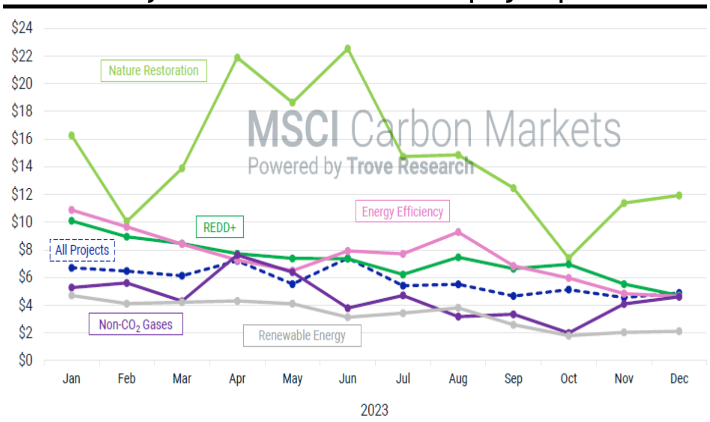
Source: Bloomberg

Fig 7: Carbon credit prices trending lower on annual basis, however decline slowing



Source: Trove Research (MSCI Carbon Markets)

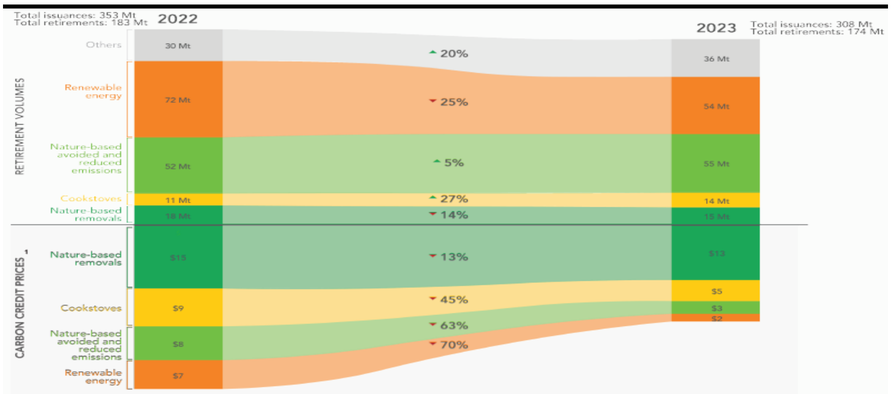
Fig 8: Carbon credit prices across all project types declining with recovery seen in nature restoration project prices



Source: Trove Research (MSCI Carbon Markets)

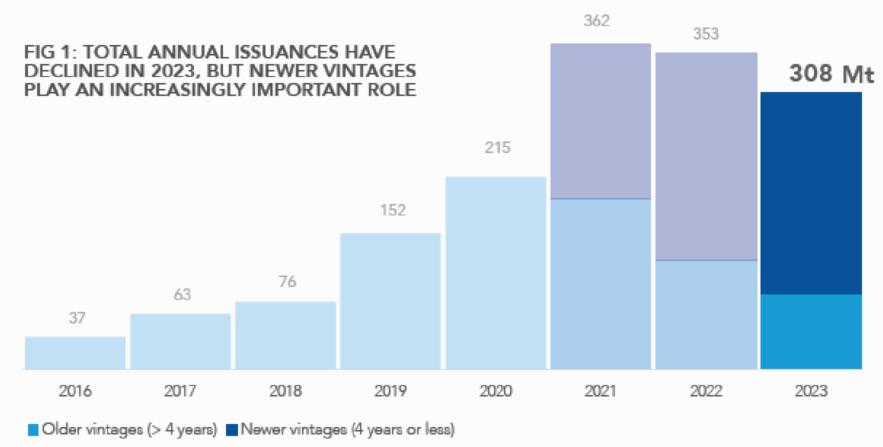
Climate Focus' study found a similar result in carbon credit issuances, retirements and prices. Also, the vintage of carbon credits is declining. NbS had the highest issuances across all project types in 2023. The importance of NbS for generating carbon credits continues to increase as buyers move away from RE type of projects. The VCM carbon credits pipeline is increasing with NbS share inching higher, which augurs well for countries in Latin America, South America, Africa and Southeast Asia, which are major suppliers of carbon credits to the world.

Fig 9: VCM volumes and prices lower in 2023 vs 2022



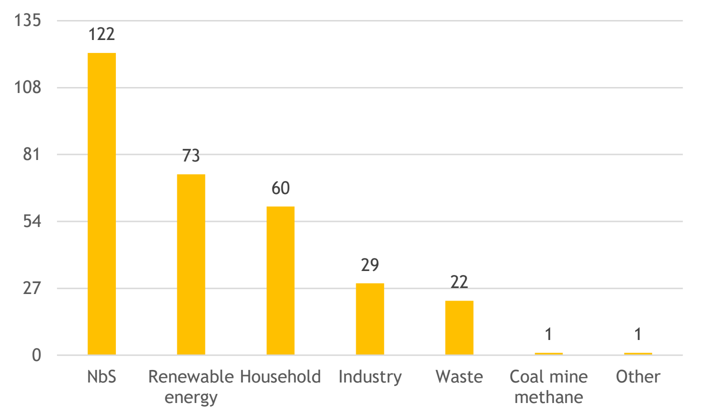
Source: Climate Focus Jan 2024

Fig 10: 2023 saw higher issuances of credits with vintage of 4 years and less



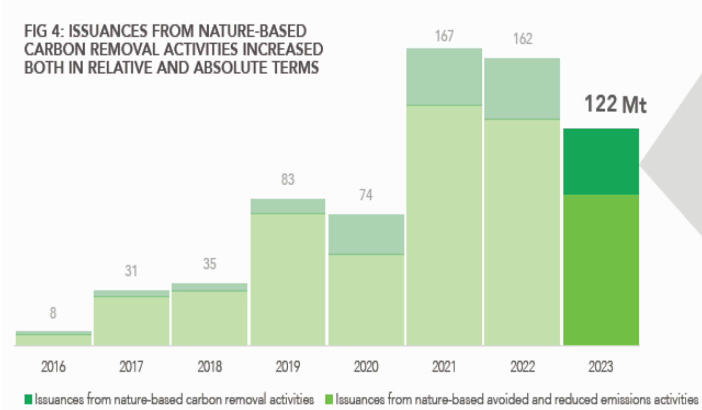
Source: Climate Focus Jan 2024

Fig 11: NbS leads the race in the highest number of credit issuances in 2023



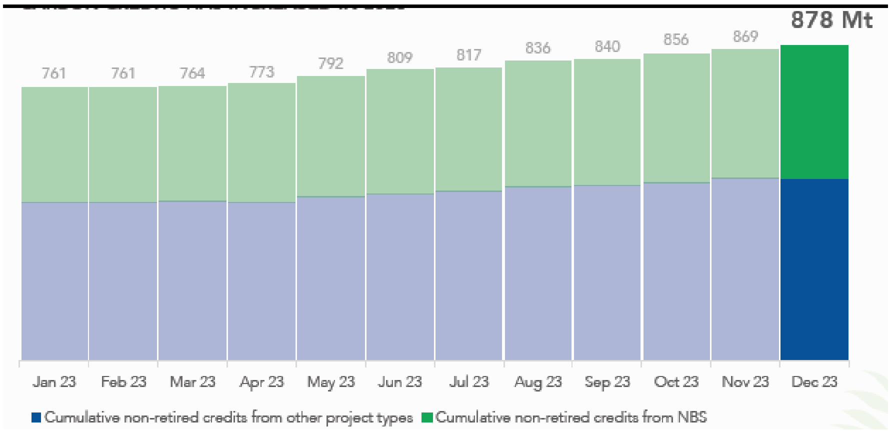
Source: Climate Focus Jan 2024

Fig 12: The importance of nature-based carbon removal activities increasing



Source: Climate Focus Jan 2024

Fig 13: VCM's stockpile at 878m tCO2e with NbS' share inching higher



Source: Climate Focus Jan 2024

2. VCM faced credibility issues since late 2022

VCM has had its fair share of bad press, which has also led to the fall in volumes and prices in the VCM. Many believe that carbon credits is a way to avoid making actual efforts/investing time and energy to reduce CO_2 emissions from the business. Others believe that the carbon credits are overstated. In early 2023, *The Guardian* newspaper, in collaboration with the German weekly *Die Zeit and SourceMaterial*, a non-profit investigative journalism organisation carried out a study that found 90% of the carbon credits for land-based removal of CO_2 approved by Verra, one of the leading global carbon-offset certifiers, were "useless". The analysis raised questions about the credits bought by a number of internationally renowned companies, some of which have labelled their products "carbon neutral", or have told their consumers they can fly, buy new clothes or eat certain foods without making the climate crisis worse.

The investigation found that:

- Only a handful of Verra's rainforest projects showed evidence of deforestation reductions, with further analysis indicating that 94% of the credits had no benefit to the climate.
- The threat to forests had been overstated by about 400% on average for Verra projects, according to analysis of a 2022 University of Cambridge study.
- Gucci, Salesforce, BHP, Shell, easyJet, Leon and the band Pearl Jam were among dozens of companies and organisations that have bought rainforest offsets approved by Verra for environmental claims.
- Human rights issues are a serious concern in at least one of the offsetting projects. *The Guardian* visited a rainforest offset project in Peru, and was shown videos of residents claiming their homes were cut down with chainsaws and ropes by park guards and police. They spoke of forced evictions and tensions with park authorities.

Delta Air Lines is facing a lawsuit over its USD1b carbon-neutrality claim, which plaintiffs say is "false and misleading" as it relies on offsets that do little to mitigate global warming.

South Pole is facing allegations of exaggerated climate claims. In November 2022, Elias Ayrey, the chief scientist at carbon ratings firm Renoster, estimated that the Kariba project (Zimbabwe) claimed 30 times more carbon credits than it should have. According to Sylvera and Calyx Global carbon credit ratings companies, claims are higher by the factor of 5-8 times.

In a peer-reviewed article published recently, researchers at the University of California Berkeley concluded that 9 in 10 of the 96m so-called cookstove credits certified by leading carbon registries do not avoid the emissions they claim. The researchers had analyzed 40% of all the credits issued in the market. The carbon credit registries such as Gold Standard and Verra have raised substantive concerns about the research. There were concerns raised about the selection of projects, as only large projects were selected which generated higher number of credits. It is very clear that skepticism continues on the authenticity and amount of carbon credits.

3. ‘Greenhushing’ is now the new normal due to regulation change and lack of data to justify claim

South Pole, through an independent research firm, surveyed about 1,400 companies in 12 countries and 14 sectors. One of the five key findings was “Greenhushing is now the new normal”. Corporate greenwashing has always been a challenge, but the pendulum has swung so far that now even the greenest companies are greenhushing. With all the backlash against companies taking active steps against climate change and claiming to sell eco-friendly products and buying carbon credits, companies are resorting to greenhushing.

Among the 58% of the companies surveyed who said they were decreasing their level of external communication, over half (57%) listed changing regulation and/or more demanding industry requirements on environmental reporting and communications as the main reason for doing so. This was followed closely by heightened scrutiny by customers (45%) and lack of sufficient data to support claims (43%). Increased media scrutiny was a key concern for 41% of the respondents, alongside the lack of clear industry guidance on communicating climate claims (41%). Investor pressure and scrutiny was ranked the least important reason on average, with 38% of companies surveyed listing it as a reason for decreasing their levels of external communications around climate efforts.

44% of the companies surveyed say external communication on climate targets has become more difficult in just the past year. 58% are decreasing communication as a result. 18% do not plan to publicize their science-based targets at all. 93% see the communication of their net-zero strategy as being the key to commercial success.

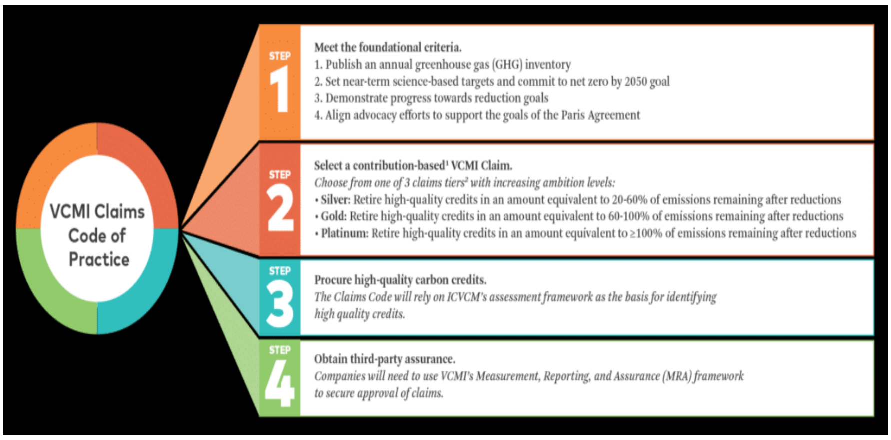
4. New rules and regulations to rebuild integrity and address credibility issues

In response to the allegations made by *The Guardian*, Verra updated its methodology for forest-related carbon credits. Under the new methodology, Verra will now lead and manage the baseline-setting process, using jurisdictional-level data that meet stringent requirements and a robust development process. This is an upgrade from the earlier methodology where the baseline data was restricted to the particular project. The programme will employ advanced remote-sensing technologies coupled with a thorough risk assessment to determine the expected deforestation for a project area, ensuring that the number of verified emission reductions from all projects in a jurisdiction is consistent with jurisdictional-scale accounting. Overall, the new approach ensures consistency, reduces the potential for conflict of interest and adds greater quality control while better aligning with and supporting government action.

The VCMI has launched the VCMI Claims Code of Practice to bring confidence and credibility back to the claims that involve use of carbon credits. The Claims Code will be useful for: a) buyers of goods and services seeking to make net-zero aligned purchases; b) investors to review the credibility of a company’s climate ambition and its actions; c) government and their agencies to encourage companies to use carbon credits credibly; and d) organization and industry association that are seeking to develop guidance/framework involving carbon credit use and disclosures.

VCMI put out a four-step process that aims to foster the use of high-quality carbon credit to offset residual CO_2 emissions.

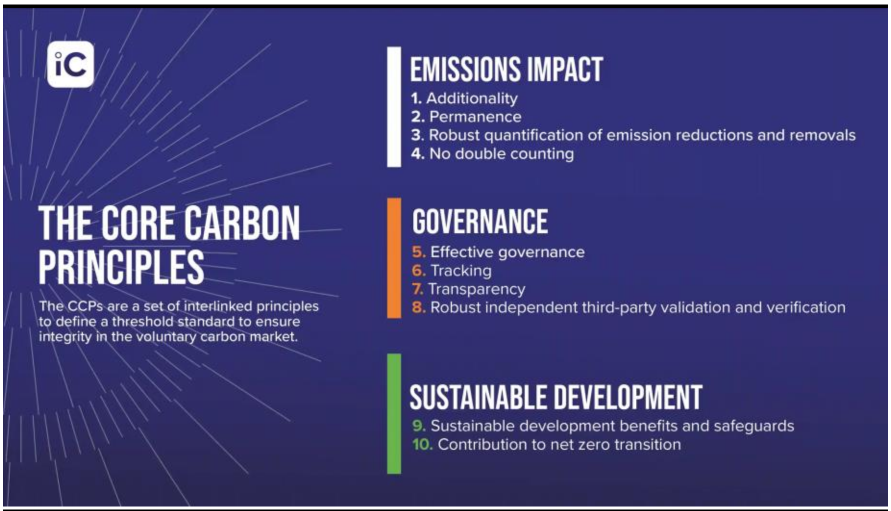
Fig 14: Four key steps that companies must take to make a VCMI Claim



Source: VCMI

The ICVCM has developed the core carbon principles and programme-level assessment framework and assessment procedure. ICVCM believes that The Core Carbon Principles (CCPs) will be a global benchmark for high-integrity carbon credits that set rigorous thresholds on disclosure and sustainable development. VCMI has also included CCPs as part of its evaluation process.

Fig 15: ICVCM's core carbon principles



Source: ICVCM

Fig 16: Summary of the new rules/regulations across leading VCM standards

	Standard	Claim name	Must reduce emissions?	Must commit to net zero?	Must cover Scope 3 emissions?	Must use certain quality of credit?	Must disclose credits used?	Must get third party verification?
'Existing' VCM standards	Certified Carbon Neutral	Carbon neutral	✓	✗	Recommended	✓	✓	Optional
	bsi.	Carbon neutral	✓	✗	✓	✓	✓	Optional
'New' VCM standards	VCMI	Silver, Gold, Platinum	✓	✓	✓	✓	✓	✓
	Gold Standard	Fairly Contributing to Global Net Zero	✓	✓	✓	✓	✓	✗
	VERRA Consultation to launch end of July	tbc	tbc	tbc	tbc	✓	✓	tbc
	south pole	Funding Climate Action	✓	✗	✓	✓	✓	✗
National / govt standards	ASA	Carbon neutral if evidence & context	✗	✗	✓ (product/service claims)	?	✓	Must disclose if verified or not
	Commission Proposal	Carbon neutral likely allowed if evidenced	?	✗	tbc	?	✓	✓
	Parliament Counter-Proposal	Carbon neutral banned if based on credits	n/a	✗	n/a	n/a	n/a	✓

Source: ICVCM

The key changes include:

1. buyers to prioritize rapid cut in emissions before using VCM to offset residual emissions;
2. buyers must set and publicly disclose science-aligned targets and publicly commit to net zero before 2050;
3. it should also cover Scope 3 emissions;
4. clearly communicate the use of carbon credits;
5. buyers must disclose information about claims and conduct independent validation and assurance.

Other than the above, there are multiple changes underway in the science-based and nature-based disclosures, biodiversity and regulatory changes. We have listed the key changes as below:

- Science based Target Initiative (SBTi) – Forest, Land and Agriculture sector guidance – includes accounting for removals from things like restoring natural ecosystems, improving forest management practices, deploying silvopasture, and enhancing soil carbon sequestration on pasture and farmland.
- SBTi – Beyond Value Chain Mitigation guidance discussion paper – clarity on the use of carbon credits to offset value-chain emissions.
- Taskforce on Nature-related Climate Disclosures - The recommendations and guidance will enable businesses and finance to integrate nature into their decision making. This will ultimately support a shift in global financial flows to encourage and enable businesses and finance to assess, report and act on their nature-related dependencies, impacts, risks and opportunities. Recently 320 global companies agreed to adopt TNFD by 2024/25, which would push up the demand for NbS (Refer annexure for list of ASEAN companies that signed TNFD).
- California Legislation – Voluntary Carbon Market Disclosure Act AB 1305 – applicable from 2024 requiring companies to make certain disclosures if they make claims in the state regarding greenhouse gas emissions or they market, sell, purchase or use voluntary carbon offsets to make certain disclosures.
- US Commodity Futures Trading Commission – Discussion paper on Listing of Voluntary Carbon Credit Derivative Contracts - helps to advance the standardization of voluntary carbon credit derivative contracts in a manner that fosters transparency and liquidity, accurate pricing, and market integrity.
- European Corporate Sustainability Reporting Directive– Applicable from 2024 makes it mandatory for all large companies operating in the EU to report their environmental impact
- United Nations Environment Programme – Global Biodiversity Framework - aims to halt and reverse biodiversity loss by 2030.
- International Organization of Securities Commissions– consultation paper to promote the integrity and orderly functioning of voluntary carbon markets.
- The Singapore government has stated that 5% of the carbon tax obligations could be met through high-quality carbon credits.

5. Investment in nature via VCM to increase over 2023-25

We are approaching 1.5°C temperature rise in the next 30 months and 2°C in the next 119 months. In 2022, global CO_2 emissions from fossil fuel combustion and cement production reached 36.1 GtCO2e. This is higher than the emissions in 2019, 2020 and 2021 by 2.0%/7.9%/1.5%. This increase will make the target to reduce emissions by 43% by 2030 and net zero by 2050 even harder. According to one recent analysis, we are only 30 months away from increase in global temperature by 1.5°C and 119 months from increase in temperature by 2°C which would unleash major impact on human life and agriculture.

In an ideal net zero scenario almost 70-90% of electricity generation by solar/wind, more than 90% of heavy industrial production is low-emissions, more than 90% of buildings are zero carbon ready, there is 520Mt low-carbon hydrogen usage. Even after this there would be a residual CO_2 emissions of 7.6Gt which would need to be offset using carbon credits/nature based solutions. We believe this will drive the investments in VCM, carbon capture and storage (CCS) and direct air capture (DAC). In reality, the residual emissions may be much more than 7.6Gt and the need for VCM, CCS and DAC may be much more to prevent us from the precarious increase in temperature by 1.5-2°C.

Investments in nature have gained traction in recent years and they are now a major part of the capital flow in the VCM. However, projects that generate carbon credits for this market have come under increasing scrutiny. These criticisms are often directed at older projects created under outdated standards or more relaxed approaches to verification. As new pledges mount in 2024 and beyond, investors looking for high-quality carbon credits will face the challenge of differentiating those projects that have integrity from those that do not.

As per MSCI, as of June 2023, there were over 850 active registered nature-based projects in the VCM. These are focusing on the protection and enhancement of natural carbon stocks in forests, farmlands and coastal ecosystems. Another 2,100 projects were already in development, creating a combined project area the equivalent size of Colombia. Most of the existing Nbs projects are in Latin America, South America and Africa. The share of Southeast Asia compared to its potential remains low.

We believe NbS will dominate the future carbon credit markets as credits generated from renewable projects are becoming by and large not valid as per Verra and Gold Standard in the developed markets and many developing markets.

As per MSCI, USD16b was invested in nature-based projects during 2012-2022. They project a further investment of USD9b by 2025 in projects currently in development. By 2022, the rate of investments has reached two and a half times the VCM size of USD1.5b. New capital raising and announcements cover an additional USD20b up to 2030, per MSCI. Most of these new commitments have come from asset owners or other institutional investors (42%), corporate investors (29%) and fund managers (17%).

Four elements are key for all nature-based projects: additionality, quantification, permanence and “co-benefits” (positive impacts beyond carbon).

- Additionality: A project is considered additional if there is evidence that it would not have been viable without the revenue from carbon credits.
- Quantification: accurate quantification of a project's emissions impact is complex but crucial for reducing the risk of over-crediting.
- Permanence: low permanence risk means that protection and enhancement of the natural carbon stocks will not easily be reversed.
- Co-benefits: deliver multiple co-benefits to match investor preferences, such as local community support or biodiversity conservation.

Fig 17: Investments in NbS projects increasing

Data has been obtained from three main sources: (1) a survey of market participants conducted during April and May 2023, (2) analysis of more than 400 public announcements of capital raises for low-carbon funds and (3) modeled investment for over 7,000 projects, both registered and in the development pipeline.

Source: MSCI

6. Technology and nature on equal footing for net zero

The South Pole Net Zero Report 2024 studies the key enablers to achieve net zero. The majority of companies surveyed are looking to technological solutions when working towards their net zero targets – either ones that reduce emissions from industrial processes (40%), such as carbon capture and storage (CCS) and carbon capture and utilization (CCU), or that neutralize emissions from those processes (32%), such as direct air capture (DAC). Alongside technological solutions, investments into NbS such as ecosystem protection, via voluntary carbon credits, were ranked overall as one of most important solutions when working towards net-zero targets (32%).

The use of RE (29%) and investments in energy and resource efficiency (28%) – both of which have been top choices for surveyed companies in the past – have dropped in the overall ranking of preferred solutions. The same applies to greening supply chains, which has consistently been listed as the third most important solution in the past three years. Only 27% of businesses surveyed said they were prioritizing reductions in scope 3 emissions on their way to net zero emissions, in joint fifth place together with new product or service delivery models (27%).

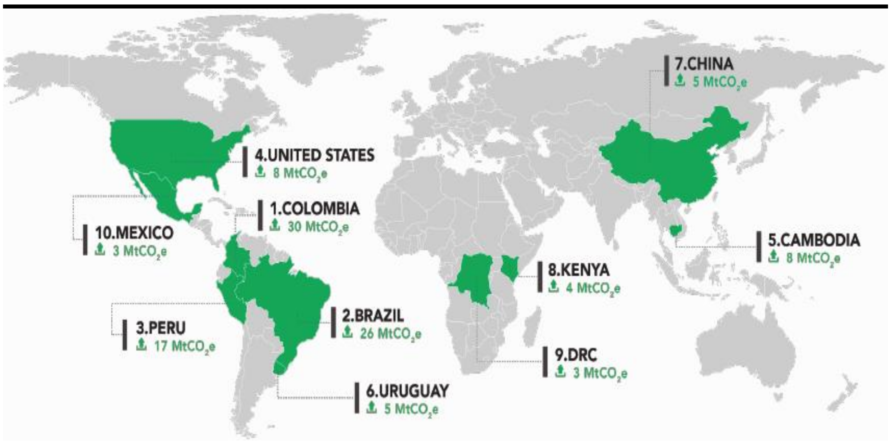
Fig 18: NbS at #2 and other VCM at #9 in ranking of net zero enablers

Source: South Pole Net Zero Report 2024

7. ASEAN taking its initial steps towards VCM

Amongst the six key markets of ASEAN, three markets, namely Singapore, Malaysia and Indonesia, have already set up VCM exchanges in 2023. The Philippines has not formed any plans whereas Vietnam plans to pilot a carbon credit market in 2025 and launch a carbon exchange in 2028, according to a draft carbon market project in Vietnam conducted by the Ministry of Natural Resources and Environment. Except for Singapore, which has multiple projects listed, the volumes in the other two exchanges are low (Refer Annexure II for details on VCM exchanges in ASEAN). We believe the main reason for this is the lack of a large volume of high-quality carbon credits. This is also visible from the fact that amongst ASEAN only Cambodia features in the top 10 countries which constitute more than 90% of the total supply of Nature based solutions in 2023.

Fig 19: Only 1 ASEAN country among Top 10 suppliers of NbS in 2023



Source: Climate Focus Jan 2024

Annexure I

ASEAN 6 markets Nationally Determined Contributions

ASEAN updated Nationally Determined Contributions

Country	Net Zero target year	Comments
Indonesia	2060	Submitted revised NDC in Sep'22. Targets: 1) Emission reduction of 31.89% (29% earlier) using domestic resources and 43.2% (41% earlier) using international support against 2030 business as usual scenario; b) peat lands restoration of 2m ha and rehabilitation of degraded land of 12m ha by 2030; c) Energy target: new and renewable energy at least 23% in 2025 and at least 31% in 2050, oil should be less than 25% in 2025 and less than 20% in 2050, coal should be minimum 30% in 2025 and minimum 25% in 2050, and gas should be minimum 22% in 2025 and minimum 24% in 2050
Malaysia	2050	Last submission in Jul'21. Targets to be achieved by 2030 vs base year 2005 are: 1) reduce carbon emission intensity 45% - using domestic resources; 2) develop a single platform for carbon credit transaction via Domestic Emissions Trading Scheme (DETS); and 3) retain at least 50% national forest coverage, encourage zero waste and recycling
Philippines	NA	Last submission in Apr'21. Target is reduction and avoidance of GHG emissions by 75% by 2030 from 2020 of which 2.71% is unconditional and 72.29% is conditional, ie, through international support
Singapore	2050	Submitted revised NDC in Nov'22. Targets: 1) to reduce emissions to around 60 $MtCO_2e$ in 2030 (vs 65 $MtCO_2e$ earlier) after peaking its emissions earlier; 2) aims to achieve at least 2 gigawatt-peak by 2030 (unchanged); and 3) carbon tax raised on progressive basis to SGD80/tCO_2e by 2030
Thailand	2065	Submitted revised NDC in Nov'22. Targets: 1) to reduce its emissions by 30% (vs 20% earlier) unconditionally and 40% (vs 25% earlier) conditionally, ie, through international resources vs business-as-usual by 2030; and 2) to increase forest cover of the country to achieve 55% of the total country area by 2037
Vietnam	2050	Submitted revised NDC in Nov'22. Targets are: 1) reduce GHG emissions by 15.8% (vs 9% earlier) with domestic resources and 43.5% (vs 27% earlier) with international support by 2030 vs 2014; 2) stop deforestation by 2030 and increase forest cover to 42% by 2030 and maintain a stable level to 2050; 3) phase out coal-fuelled power generation by 2040; 4) 43% renewable by 2050 (excluding hydro); 5) 30% reduction in methane emissions by 2030 under the Global Methane Pledge (new)

Source: UNFCCC, various sources, Maybank IBG Research

Annexure II

Out of the total of 320 companies globally that have signed up for adopting TNFD framework, only 11 companies are from the ASEAN region.

ASEAN companies signed up for adopting TNFD

Company	Bbg code	Curr	CP	Rating	TP
Malaysia					
Sunway Bhd	SWB MK	MYR	2.57	HOLD	2.02
Thailand					
Mae Fah Luang Foundation	NA	THB	NA	NA	NA
SCG Chemicals	NA	THB	NA	NA	NA
Philippines					
Manila Water	MWC PM	PHP	18.24	BUY	27.00
Metro Pacific Investments	MPI PM	PHP	5.18	BUY	6.80
PLDT	TEL PM	PHP	1,294	BUY	1,978
Singapore					
City Development Limited	CDL SP	SGD	6.20	NA	NA
Oceonomy	NA	SGD	NA	NA	NA
Olam Agri	NA	SGD	NA	NA	NA
Olam Food Ingredients	NA	SGD	NA	NA	NA
United Overseas Bank	UOB SP	SGD	28.50	HOLD	30.86

Source: Bloomberg, Maybank IBG Research

ASEAN companies (revenue >USD2b) that have emission-reduction targets

Company	Bbg code	Curr	CP	Rating	TP	Target
Malaysia						
Petronas Chemicals	PCGB MK	MYR	6.75	NA	NA	Net zero
Axiata Bhd	AXIATA MK	MYR	2.63	BUY	3.00	Net zero
Maybank	MAY MK	MYR	9.10	NA	NA	Net zero
Tenaga Nasional Bhd	TNB MK	MYR	10.52	HOLD	10.00	Net zero
CIMB Holdings Bhd	CIMB MK	MYR	6.12	BUY	6.70	Net zero
Hong Leong Financial	HLFG MK	MYR	16.26	BUY	21.70	Net zero
Genting Bhd	GENT MK	MYR	4.70	BUY	5.84	Carbon neutral(ity)
Philippines						
Ayala Land	ALI PM	PHP	34.15	BUY	43.00	Net zero
SM Investments	SM PM	PHP	904.00	BUY	1,310.00	Minimising emissions
JG Summit Holdings	JGS PM	PHP	38.05	BUY	58.00	Net zero
Singapore						
Olam International	OLAG SP	SGD	0.91	NA	NA	Net zero
SingTel	ST SP	SGD	2.40	BUY	3.10	Net zero
OCBC	OCBC SP	SGD	12.90	HOLD	13.83	Net zero
DBS Group	DBS SP	SGD	31.92	BUY	37.81	Net zero
United Overseas Bank	UOB SP	SGD	28.13	HOLD	30.86	Carbon neutral(ity)
Wilmar International	WIL SP	SGD	3.32	HOLD	3.99	Net zero
CapitaLand	CLI SP	SGD	2.92	BUY	3.30	Net zero
Singapore Airlines	SIA SP	SGD	6.64	NA	NA	Net zero
Keppel	KEPPEL SP	SGD	6.90	NA	NA	Net zero
Flex	FLEX US	USD	23.03	NA	NA	Emissions reduction target
Singapore Tech. Eng.	STE SP	SGD	3.86	BUY	4.20	Net zero
Thailand						
Charoen Pokphand Foods	CPF TB	THB	18.00	BUY	25.60	Net zero
CP All	CPALL TB	THB	53.25	BUY	79.00	Emissions reduction target
PTT Global Chemical	PTTGC TB	THB	34.50	SELL	28.00	Net zero
PTT Exploration & Prod.	PTTEP TB	THB	150.00	BUY	194.00	Net zero
Siam Cement	SCC TB	THB	267.00	HOLD	315.00	Net zero
Kasikornbank	KBANK TB	THB	122.50	HOLD	130.00	Net zero
Siam Commercial Bank	SCB TB	THB	105.00	BUY	120.00	Emissions reduction target
Bangkok Bank	BBL TB	THB	143.50	BUY	200.00	Emissions reduction in line with country target
Thai Beverage	THAIBEV SP	SGD	0.52	NA	NA	Science-based target
Krung Thai Bank	KTB TB	THB	16.30	BUY	22.00	Emissions reduction target
Advanced Info Service	ADVANC TB	THB	218.00	BUY	251.00	Emissions reduction target
Airports of Thailand	AOT TB	THB	59.25	NA	NA	Emissions reduction target
Indorama Ventures	IVL TB	THB	24.30	NA	NA	Carbon neutral(ity)

Source: Bloomberg, Maybank IBG Research, Net Zero Tracker

Annexure III

Details of VCM exchanges operational in ASEAN

Malaysia: Bursa Carbon Exchange
BCX carried out the nation's inaugural carbon credit auction on 16 March 2023. The auction, which was carried out electronically, saw participation from 15 buyers from various industries purchasing a total of 150,000 Verra-registered carbon credits. The credit contracts were oversubscribed with a price of MYR18.5/tCO2e.

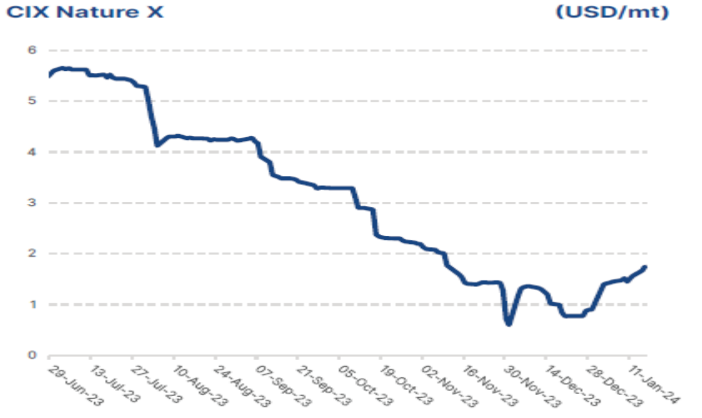
Currently, there are two projects listed:

Project I	Project II
Project Name: Linshu Biogas Recovery And Power Generation Project *Contract Type:* Global Technology-Based Contract (GTC) *Location:* Linshu Town, Shandong Province, China *Volume:* 50,000 Contracts *Reserve Price MYR/ Contract:* RM 18.50 *Project Type:* Waste Handling and Disposal (Wastewater Treatment) *Vintage:* 2019-2020 *Project ID:* 2402	*Project Name:* Southern Cardamom REDD+ Project *Contract Type:* Global Nature-Based Plus Carbon Contract (GNC+) *Location:* Koh Kong, Cambodia *Volume:* 100,000 Contracts *Reserve Price MYR/ Contract:* RM 68.00 *Project Type:* Agriculture Forestry and Other Land Use (AFOLU-REDD+) *Vintage:* 2021 *Project ID:* 1748 (on hold at the moment as per Verra website)

Singapore: Climate Impact X
The exchange was launched in June 2023. To date, around 3.5m tCO2e of carbon credits have been bid and offered on CIX Nature X, the company's first global standard contract series, equating to a daily average of 40,000 tonnes. The average widest bid-offer spread on the contract series during the daily pricing session stands was around USD0.30 per tonne, tightening to an average spread of around USD0.10 per tonne.

Ten projects are currently deliverable into the standard contract:
- Rimba Raya Biodiversity Reserve Project, Indonesia (VCS 674)
- The Mai Ndombe REDD+ Project, Democratic Republic of the Congo (VCS 924)
- Cordillera Azul National Park REDD Project, Peru (VCS 985)
- REDD in Tambopata National Reserve and Bahuaja-Sonene National Park, Brazil (VCS 1067)
- The Envira Amazonia Project – A Tropical Forest Conservation Project in Acre, Brazil (VCS 1382)
- Katingan Peatland Restoration and Conservation Project, Indonesia (VCS 1477)
- REDD+ Project for Caribbean Guatemala: The Conservation Coast, Guatemala (VCS 1622)
- Reduced Emissions from Deforestation and Degradation in Keo Seima Wildlife Sanctuary, Cambodia (VCS 1650)
- Rio-Anapu Pacaja REDD Project, Brazil (VCS 2252)
- Resguardo Unificado Selva de Mataven REDD+ Project, Colombia (VCS 1566)

Fig 13: Carbon credit prices traded on exchange



Source: Climate Impact X Daily Report

Fig 14: Carbon credit price differentials and retirement data

CNX Projects - Price Differentials and Retirement Data

Project	VCS ID	CNX Delivery Status	v20-23 Issued Credits	v20-23 Retired Credits	v20-23 Retirement Rate	Price Differential to CNX (vintage-aligned, USD/mt) Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
Rimba Raya	674	Deliverable	0	0	-	2.50	3.70	4.20	6.00	6.20	7.35
Katingan	1477	Deliverable	5,884,249	332,620	5.65%	2.25	3.10	3.20	3.40	3.80	4.20
Tambopata	1067	Deliverable	781,606	53,428	6.84%	2.50	4.00	4.30	4.45	5.00	5.55
Mataven	1566	Deliverable	0	0	-	-	-	-	-	-	-
Conservation Coast	1622	Deliverable	1,524,959	94,588	6.20%	1.25	1.75	1.25	1.40	1.60	1.65
Keo Seima	1650	Deliverable	4,306,110	39,859	0.93%	1.20	1.75	1.75	2.10	1.65	3.60
Cordillera Azul	985	Deliverable	4,739,179	0	0%	0.40	0.60	0.80	0.90	1.55	1.60
Rio-Anapu Pacaja	2252	Deliverable	570,104	125,694	22.05%	0.75	1.50	1.50	1.60	1.55	0.25
Envira Amazonia	1382	Deliverable	636,093	132,852	20.89%	0.25	0.40	0.55	0.60	0.80	0.70
Mai N'Dombe	934	Deliverable	6,984,597	25,009	0.36%	-0.05	0.20	0.20	0.00	0.00	0.00
Southern Cardamom	1748	Suspended	7,787,549	568,717	7.30%	0.25	0.10	0.00	0.25	0.10	-
Kasigau Phase 2	612	Suspended	3,256,709	68,640	2.11%	1.25	3.30	3.60	3.80	-	-

Source: CIX, Verra, 2 January 2024

Source: Climate Impact X Daily Report

Indonesia: Indonesia Carbon Exchange

IDXCarbon was launched in Sep 2023. In its first carbon trade, IDXCarbon recorded carbon trading of 459.953 tCO2e and there were 27 transactions. Currently two projects are listed with a few in the pipeline. Below is the trade report and projects listed.

Fig 15: IDXCarbon daily trading report

Source: IDXCarbon Daily Report

Fig 16: IDXCarbon listed projects

SPE-GRK Carbon Unit Grouping Series Standard

Show 10 entries   Search:

No.	Series	Name	Vintage
1.	IDNBS	Indonesia Nature Based Solution	2013 - 2023
2.	IDNBSI	Indonesia Nature Based Solution - International Verification	2013 - 2023
3.	IDTBS	Indonesia Technology Based Solution	2013 - 2023
4.	IDTBSI	Indonesia Technology Based Solution - International Verification	2013 - 2023

Showing 1 to 4 of 4 entries   Previous 1 Next

List of Series

Show 10 entries   Search:

No.	Series	Instrument/Project	Vintage
1.	SPE-10-PR-VI-2023-14464	Proyek Lahendong Unit 5 & Unit 6 PT Pertamina Geothermal Energy Tbk	2016 - 2020
2.	SPE-11-PR-V-2023-10867	Pembangunan Pembangkit Listrik Baru Berbahan Bakar Gas Bumi PLTGU Blok 3 PJB Muara Karang	2023

Showing 1 to 2 of 2 entries   Previous 1 Next

Source: IDXCarbon website

Thailand: Federation of Thai Industries Exchange (FTIX)

The Federation of Thai Industries announced on 16 Jan, 2023, the opening of registration for carbon credit trading on its Renewable Energy and Carbon Credit Exchange Platform. This new online platform supports the domestic carbon market and provides Thai exporters with the ability to purchase carbon credits, allowing them to address demands from importing nations to conform to carbon emission reduction regulations. The platform initially supports carbon credit trading through over-the-counter methods. In the near future, the FTIX will be developed to support 100% RE (i.e., RE100 energy) and RE certificate trading.

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