

The State of the Carbon Developer Ecosystem

Exploring the future of voluntary carbon markets through a developer lens



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Carbon developer ecosystem: a highly fragmented market that is evolving quickly

2022 saw a real appreciation for the work of carbon project developers from the perspective of the investor community, resulting in what we believe will be a record year for the number of funding announcements into the space. Despite the strong growth signals in carbon credit generation, 2022 has also been a year of wavering demand for the Voluntary Carbon Market (VCM).

Corporate buyers continue to be on the sidelines, seemingly waiting for clearer guidance on quality and claims and less policy uncertainty. Despite the turbulence, the message from developers and investors is clear: If projected demand for voluntary carbon offsets is to be met, the time to accelerate funding for carbon credit generation is now.

Abatable estimates that 2022 recorded **over \$10bn worth of investments (across more than 65 announced deals)** into carbon credit generation unlocking the market's potential to scale the supply of credits. Such a significant increase in carbon credit generation may require rethinking the long-term implications for pricing, demand, and supply dynamics in the VCM.

\$10bn+ worth of transaction into upstream investments (carbon credit generation) in 2022

Stepping into 2023, we are excited to be publishing our second edition of the Carbon Project Developer Ecosystem Report after our successful 2021 report. This year's report highlights how the developer ecosystem is fundamentally changing. Whilst remaining a **highly fragmented market dominated by local players**, the broader availability of financing options has allowed experienced developers to upsize their ambitions and execute expansion plans into new project types and adjacent regions. Other key trends in 2022 included **a wider movement of players from country-specific into global operators and the very first signs of market consolidation** with the percentage of historical issuances in the Top 15 developers (across all project types) increasing slightly from 2021 to 2022. Throughout 2022, significant M&A activity was announced. Notable transactions include South Pole acquiring three companies (including Italian-based carbon developer, Carbonsink), the acquisition by Mitsui of global forestry developer and investor New Forests, and the acquisition of Radicle by

Canadian bank BMO. Other notable announcements were made by private equity firm TPG on the creation of Anew Climate from the merger of US-based developers Bluesource and Element Markets, and the launch of Rubicon Carbon, a new carbon platform.

This fast-evolving landscape is starting to see a **higher level of competition for access to developers**, with a greater risk appetite from corporates and investors for projects at the earlier stages of development in exchange for larger discounts on carbon credit prices secured by multi-year partnerships. As highlighted in one of our recent articles, [the carbon finance model is changing alongside the Carbon Project Development Curve](#). As larger corporate and carbon funds are **participating in the earlier stages of project development**, we expect this could result in a diminishing role for standardisation, carbon pooling, or traditional financial intermediation in this market.

First signs of M&A led market consolidation as % of issuances in top 15 developers increased compared to 2021

Carbon developer ecosystem: a highly fragmented market that's evolving quickly (cont.)

Many new players have entered the market this year, encompassing **more than 180 new developers** across the four established carbon registries, contributing **500 new projects that are expected to result in an estimated 100 million new carbon credits in annual issuances**.

180 new developers contributing 500 new projects for over 100MtCO₂e of annual volume

Through a close collaboration with developers and meticulous analysis of the market, Abatable has come to appreciate the multifaceted roles that developer's play. A developer is often understood as a project implementer who implements, verifies, and issues carbon credits. However, that model has evolved over time to include carbon consultancy firms who support implementation partners with carbon asset development - in some cases, helping those with access to finance and facilitate carbon credit sales to corporate buyers. In 2022, the expansion of our research **identified a new category: "aggregators"**, or firms who use digital solutions to develop diversified carbon portfolios and work as incubators by supporting the development of projects through

financing and geospatial Monitoring, Reporting and Verification (MRV) solutions. Such new players include companies who may have started as nature-based MRV providers (e.g. Boomitra, Pachama, and Revalue Nature) but have since taken a greater role in carbon project development. We are also pleased to see more **Carbon Dioxide Removal (CDR) technology companies now list projects under established carbon registries** in an effort to increase their corporate buyers' access outside of self-verified credit sales.

Looking ahead, we are excited to see what 2023 has in store for the carbon developer ecosystem. While market forces suggest an economic slowdown, it remains to be seen how short-term dynamics may play out at the intersection between supply and demand in the VCM. We expect a slowdown in financing activity in 2023 whilst investors are seeking more clarity on the ability of the market to sustain price premiums relative to maturing VCM benchmarks. Such clarity can also be found in climate legislative frameworks and policies shaping up over the course of the year, allowing the market to overcome the existential threats that it is currently facing.

About the authors



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Maria is a co-founder of Abatable. Prior to Abatable, she worked as a Vice President at Goldman Sachs and advised large corporates and institutional investors on nature-based carbon removal and impact investment portfolios, most recently focused on work around carbon procurement.



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About this report

This report analyses aggregate data across project developers which report to the four major registries – Verra’s Verified Carbon Standard (VCS), Gold Standard (GS), Climate Action Reserve (CAR) and American Carbon Registry (ACR).

We lay out key developer-level observations and discuss possible implications for the voluntary carbon markets (VCM).

Unlike other research reports, we have looked at the voluntary carbon market (VCM) through the lens of the carbon project developer, putting aside any project- or registry-specific profiling.

Data sources include the Berkeley Carbon Trading Project and Abatable's proprietary data. Key observations are based on conversations with a network of project developers over the last year.



Photo by [Annie Spratt](#) on [Unsplash](#)

The State of the Carbon Developer Ecosystem in 2022

The carbon developer ecosystem continues to expand due to strong investment activity

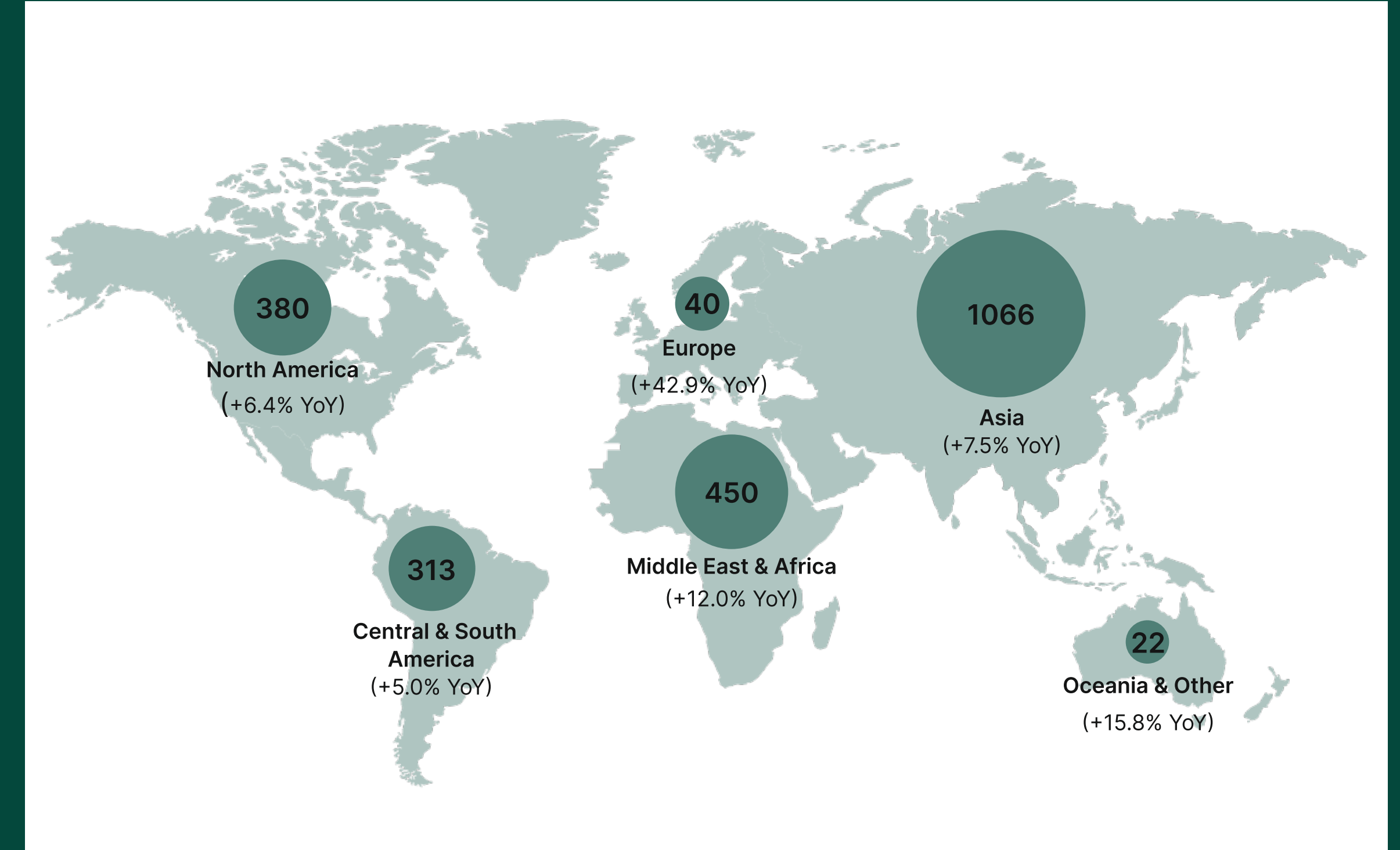
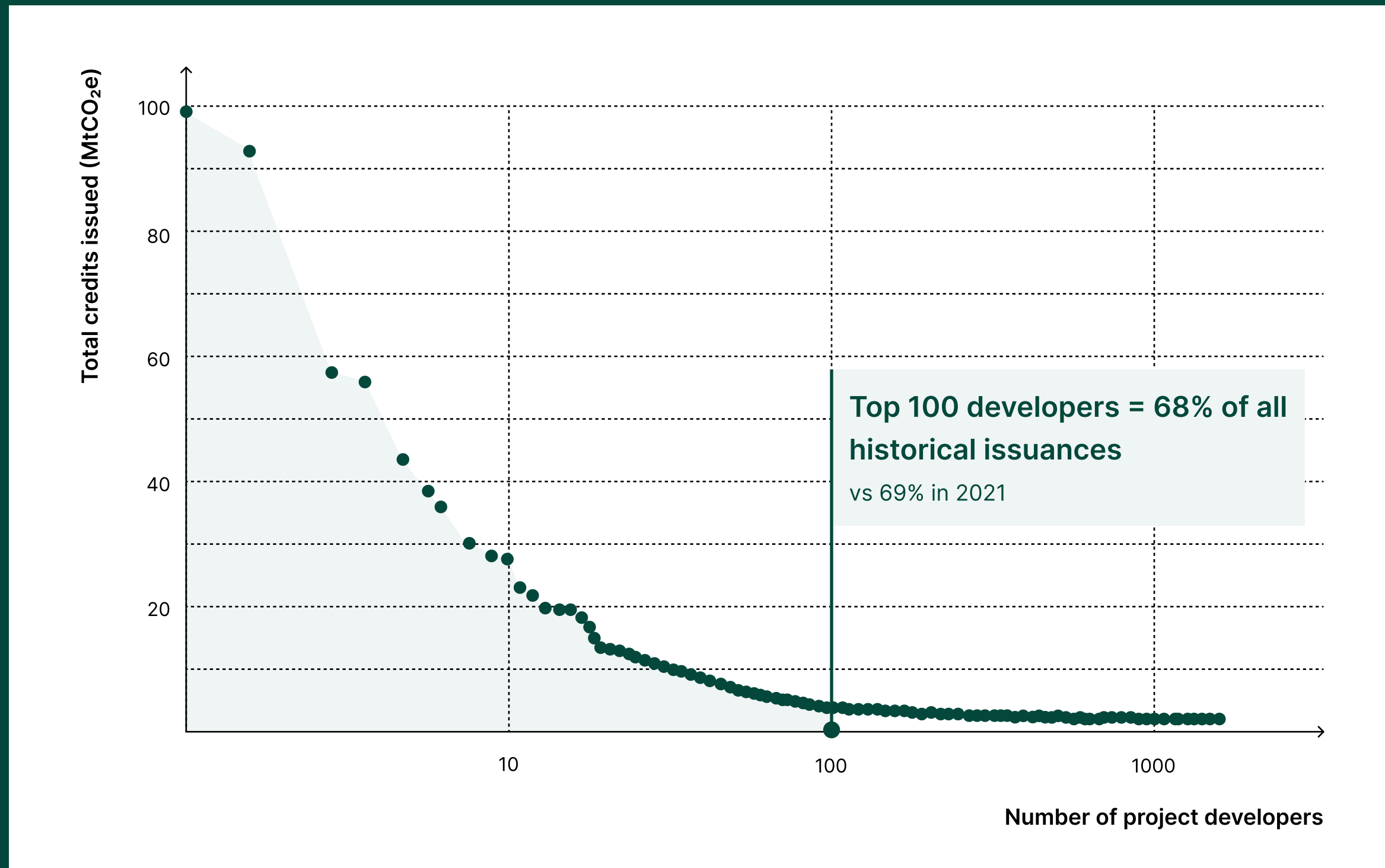
~2120
Total developers tracked

+180
New developers added in 2022

\$10 B+
Worth of investments announced

The carbon developer ecosystem remains highly fragmented

Largest carbon developer ecosystems are in Asia, Africa and the Americas



Source: Abatable analysis, total number of developers includes only data across four carbon registries (ACR, CAR, VCS, GS) as of November 2022. Data does not include data from regional registries, which may increase the number of project developers by region. For illustrative purposes only. Our chart intends to show directionally the level of the maturity of the developer ecosystem by region based on the existing dataset. Note that several developers may have a track record of projects being developed in multiple regions and may appear several times in the count by region. Year on Year (YoY) growth data is compared against December 2021.

Key observations on the State of the Carbon Developer Ecosystem in 2022

1

First signs of developer ecosystem consolidation

The developer ecosystem remains highly fragmented between a few large players and a long list of small, regional players. Despite this, for the first time, the ecosystem started showing signs of market consolidation in 2022, with the percentage of historical issuances in the Top 15 developers (across all project types) increasing by one percentage point, from 34% in 2021 to 35% in 2022. Notable transactions include acquisitions of North American developers such as Radicle and New Forests, South Pole's acquisitions of three companies, and the merger of Blue Source and Element Markets by private equity firm TPG.

2

Development portfolio expansion and diversification

In 2022 alone, Abatable estimates that approximately 180 new developers listed projects on the four primary registries, with only a minority due to the conversion of old CDM projects. Each developer contributed an average of 2.8 new projects during 2022. This trend highlights an accelerated supply build-up and a broader diversification of developers' portfolios from single project owners and hyper-localized players into globally diversified development portfolios. Developers who have gone to market with a portfolio approach, have also secured more funding.

3

Dominance of new agriculture and cookstove projects

Sustainable agriculture project developers contributed the most projects and total historical issuances with triple-digit YoY growth compared to 2021.

Clean household device developers saw the most considerable contribution by number of new projects added to the registries in 2022, with over 50% YoY growth to 2021 levels. We observed an expansion of cookstove developers' portfolios in Africa and India. Notable developers seeing an expansion of their projects include C-Quest, UpEnergy, and Burn Manufacturing, all of which secured extensive funding in 2022 to accelerate growth.

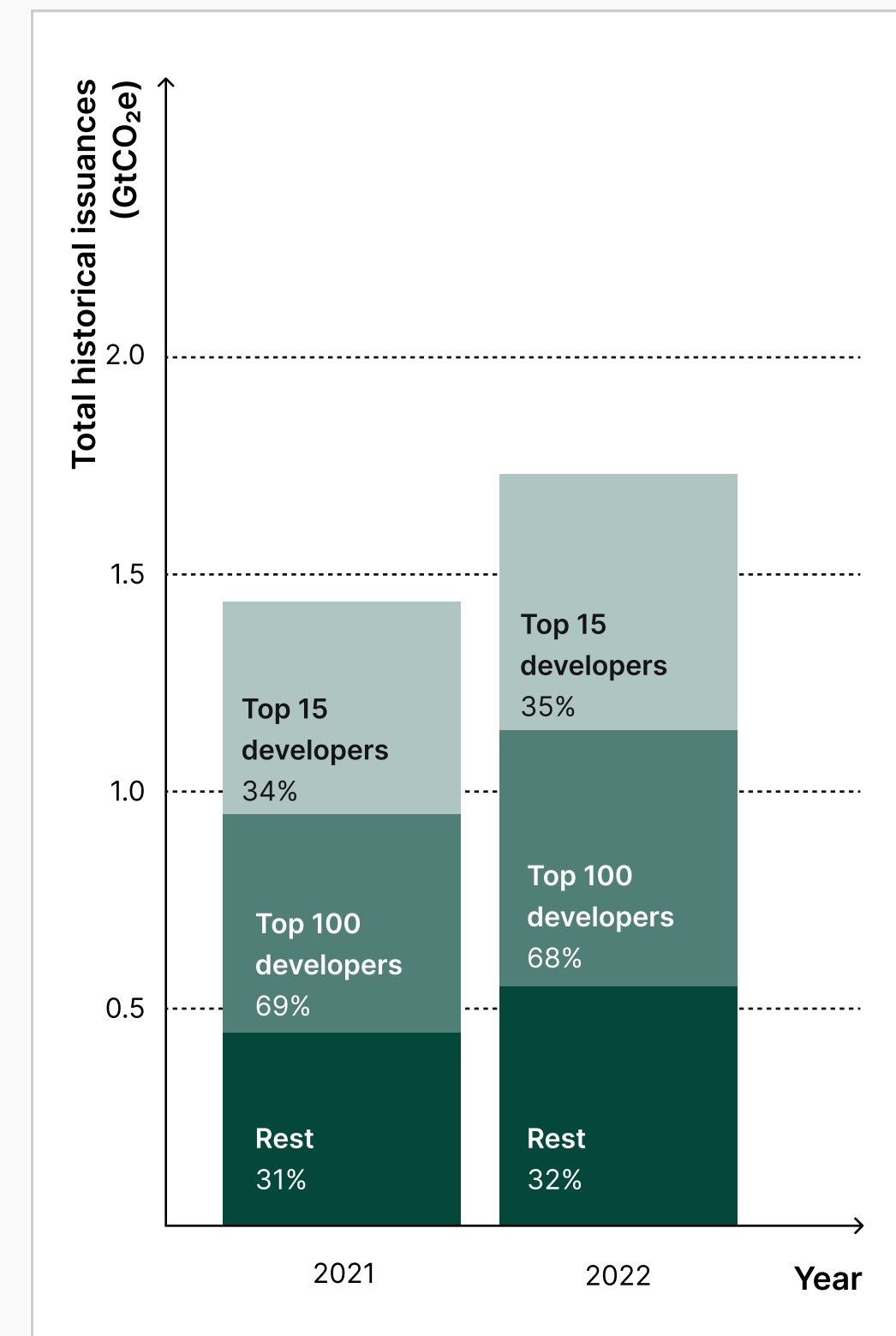
1 | First signs of developer ecosystem consolidation¹

The project developer ecosystem remains highly concentrated with a few developers contributing the most to historical carbon credit issuances - the **top 100 developers (out of a total of over 2,000 tracked by Abatable) equal 68% of historical issuances**. The ecosystem has a long-tail of small developers.

For the first time, the ecosystem started to experience early signs of market consolidation in 2022, with the percentage of **historical issuances from the top 15 developers (across all project types) increasing by one percentage**, from 34% at the end of 2021, to 35% in 2022.

Over the course of 2022, significant M&A activity was announced: **South Pole** acquiring three companies (including Italian based developer, Carbonsink), the acquisition by Mitsui of global forestry developer and investor **New Forests**, as well as the announcement by private equity firm TPG of the creation of **Anew Environmental** from the merger of US-based developers Bluesource and Element Markets. Please see “Landmark Deals in 2022” for a full overview of announced investment activity in the VCM.

Market concentration



Top 15 developers by historical issuances as of 2022

| Rank 2022 vs 2021 ² | Developer name | Issued credits (MtCO ₂ e) / YoY growth | No. of projects / YoY growth |
|--------------------------------|--------------------------------|---|------------------------------|
| +1 | Wildlife Works Carbon LLC | 98.8 / +55% | 14 / +0% |
| -1 | Finite Carbon | 92.0 / +0% | 68 / +6% |
| +0 | South Pole Holding Ag | 54.6 / +20% | 232 / +50% |
| +0 | Anew Environmental, LLC | 53.9 / +9% | 119 / +17% |
| +1 | Permian Global | 43.6 / +30% | 2 / +0% |
| -1 | InfiniteEARTH | 37.5 / +12% | 1 / +0% |
| +2 | EnKing International | 34.2 / +39% | 198 / +80% |
| +0 | ACATISEMA | 29.9 / +19% | 1 / +0% |
| -2 | CIMA, Cordillera Azul | 28.0 / +11% | 1 / +0% |
| +0 | Jaiprakash Power Ventures | 27.8 / +18% | 2 / +0% |
| +2 | Terra Global Capital | 22.5 / +25% | 12 / +9% |
| -1 | New Forests | 21.6 / +0% | 23 / +10% |
| +1 | Himachal Baspa Power Company | 20.1 / +32% | 1 / +0% |
| +7 | Bosques Amazonicos | 19.5 / +90% | 4 / +100% |
| -2 | Ecosystem Services LLC | 19.5 / +14% | 2 / +0% |

¹ Source: Abatable analysis, total issued credits includes the sum across four carbon registries (ACR, CAR, VCS, GS) as of November 2022. Year on Year (YoY) growth data is compared against December 2021; ² Rank 2022: Rankings based on total issuances

2 | Development portfolio expansion & diversification

In 2022 alone, Abatable estimates that approximately 180 new developers listed projects on the four main registries, with only a minority being a result of the conversion of old CDM projects into established carbon standards. Over 500 new projects were added by the new developers, with an average portfolio size of approximately 2.8 projects, suggesting that there is a trend for new entrants to list a portfolio of projects.

This trend is in contrast with the historical nature of the developer ecosystem, which has been dominated by developers who often have 1 to 2 projects. In 2022, the percentage of developers with only 1 project in their portfolio decreased from 74% to 71%, with developers with portfolios between 2 and 15 projects seeing the largest percentage point increase over the year. This trend has been supported by an increasing availability of financing options for developers wishing to expand their portfolio regionally or globally.

Whilst the ecosystem continues to be hyper localised, a higher percentage of developers started to own globally diversified development portfolios during the course of 2022.

New Entrants

180+

Developers added in 2022
(2129 total no. of developers)



500

New projects added
by new developers

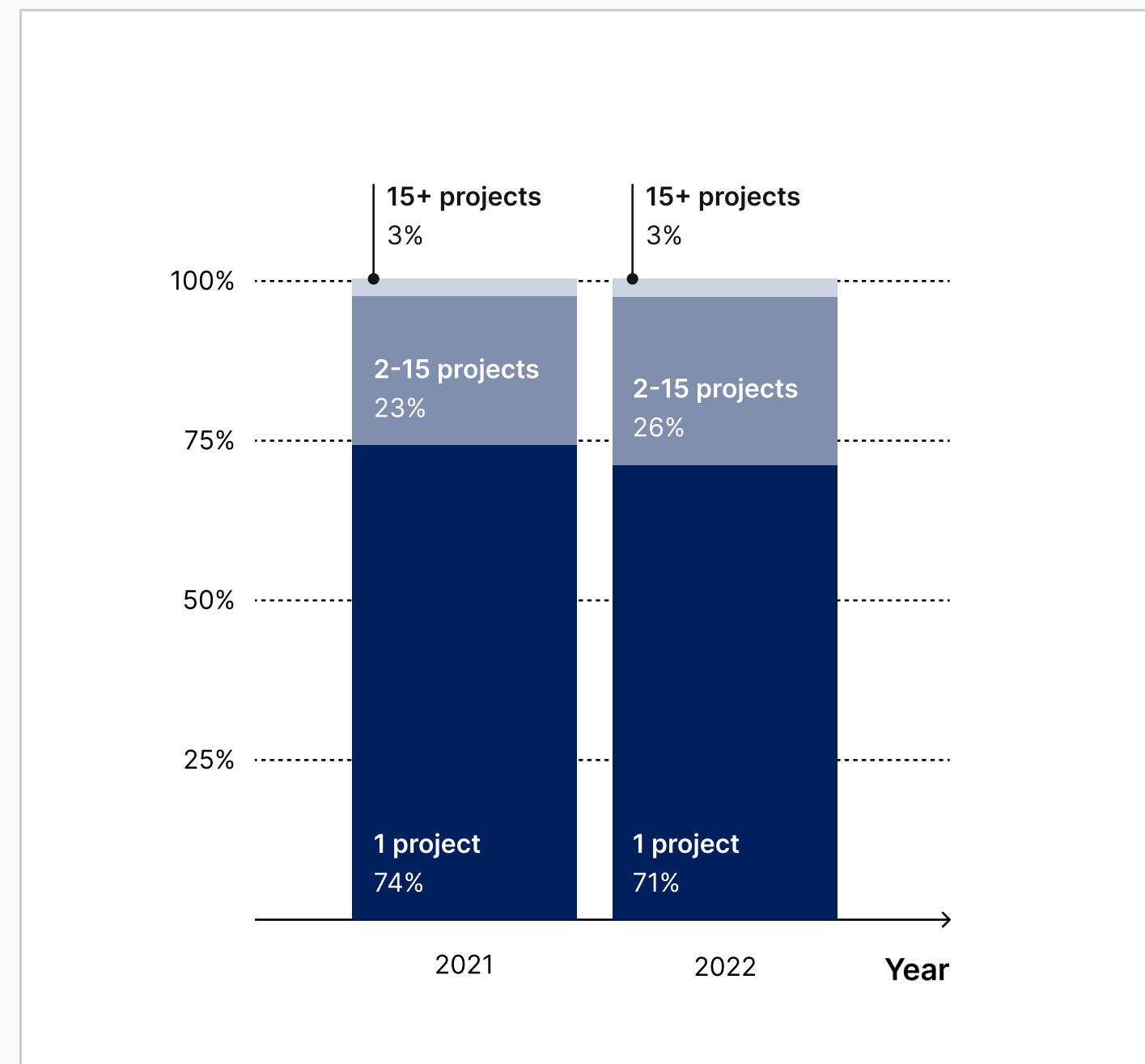
2.8

Average no. of projects
per new developer

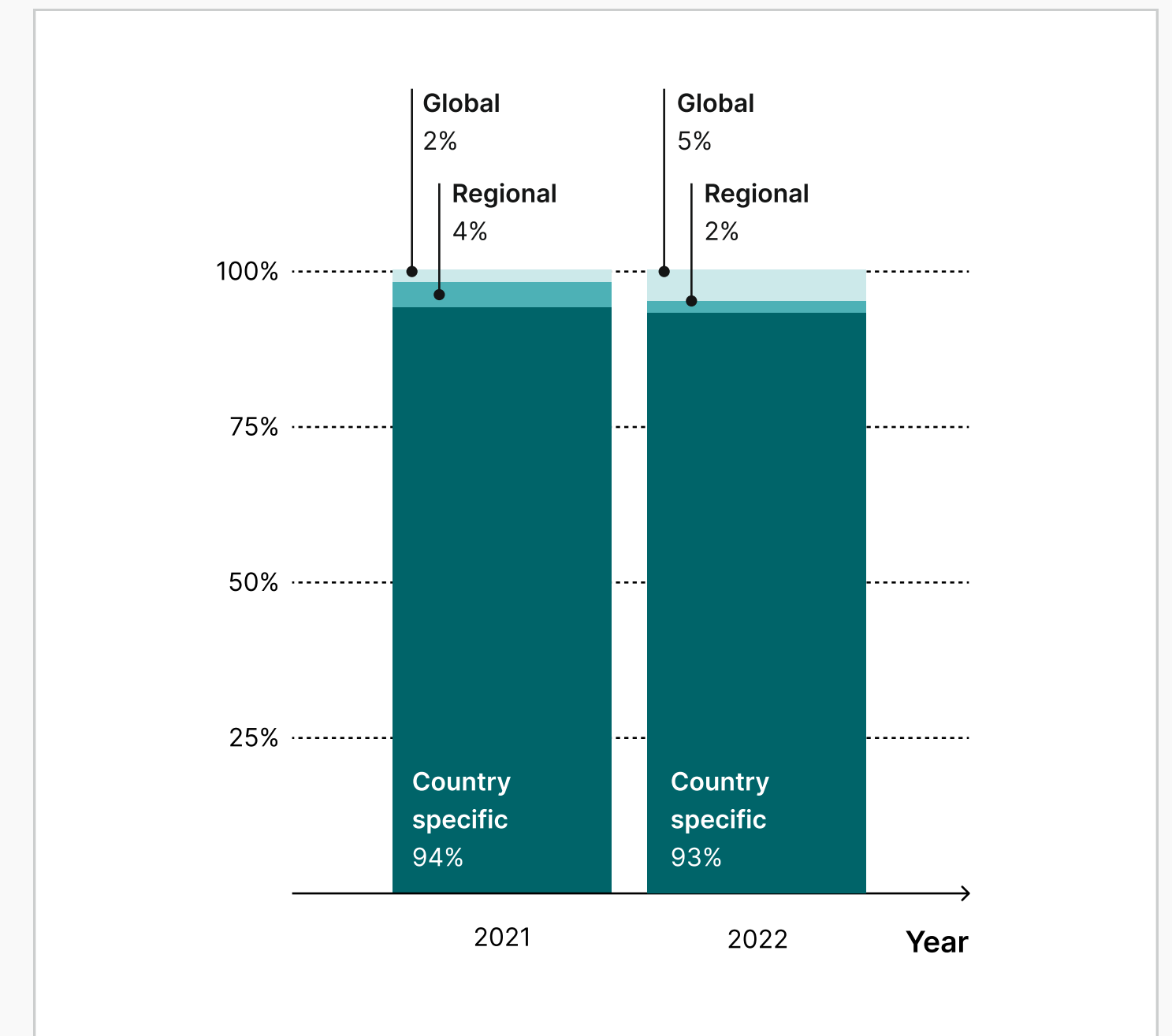
100 Mt

Annual expected credits
by new developers

Developer breakdown by portfolio size



Developer breakdown by portfolio location



Source: Abatable analysis, total developers include only developers reporting across four carbon registries (ACR, CAR, VCS, GS). 2022 and 2021 data is as of November 2022 and December 2021, respectively

3 | Dominance of new agriculture and cookstove projects¹

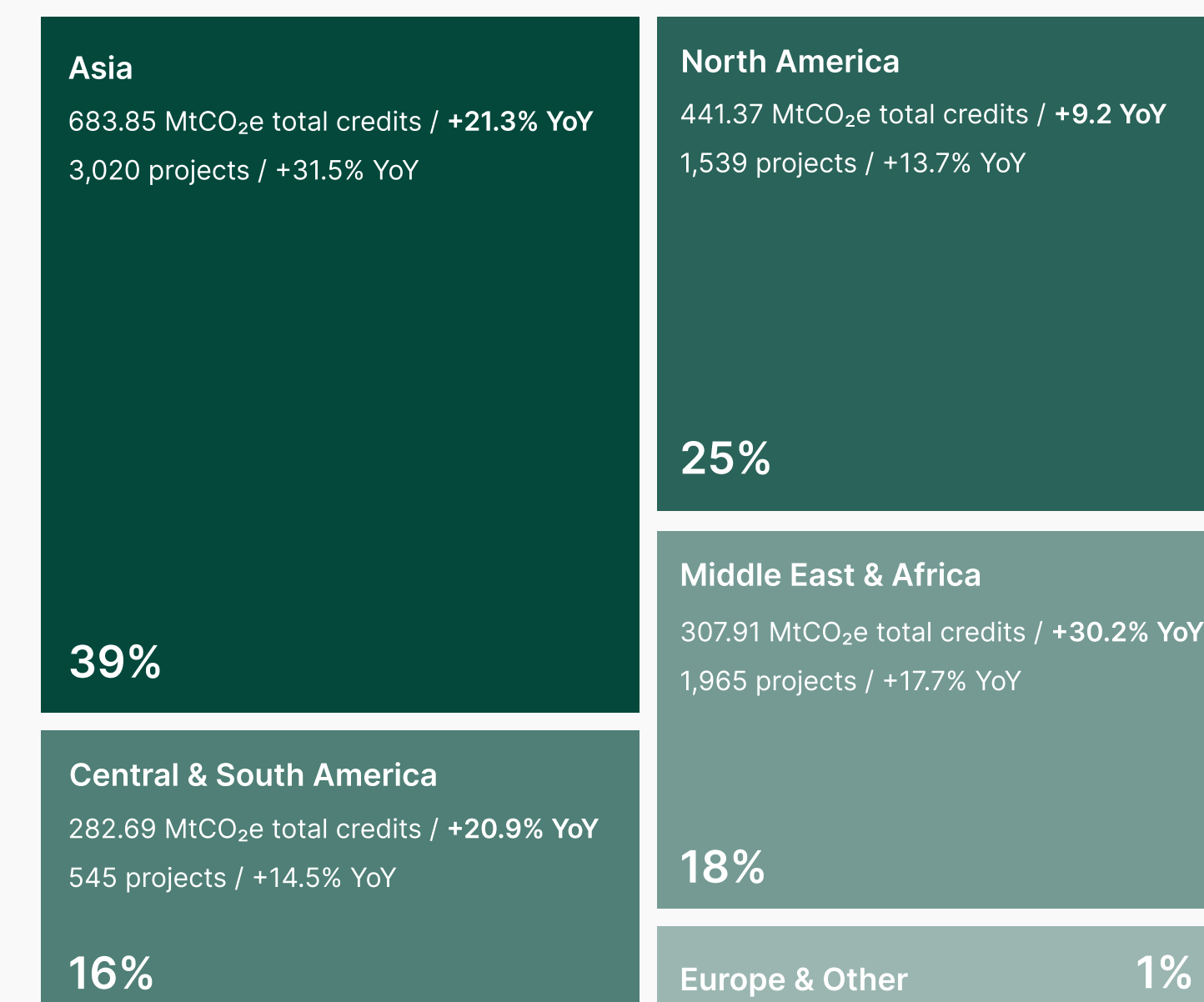
Sustainable agriculture project developers saw the largest increase relative to 2021 levels compared to other project type categories by both number of projects and total historical issuances. This was contributed to by a number of new project developers developing rice emission management projects in China. Clean household devices developers, such as the ones developing efficient and cleaner cookstoves projects, saw the largest contribution if considering the number of new projects added to the registries in 2022, with over 50% YoY growth. We observed an expansion of cookstove developers' portfolio in Africa and India.

Project categories like wetland restoration as well as carbon capture and storage saw a number of new players enter the markets, though both number of projects and issuances still remains relatively small. Limited growth has been observed for more mature and established project categories like renewable energy carbon offsets. Within North America, the United States dominates by volumes, however 2022 saw the increase of Mexican IFM developers.

YoY project type growth by issuances and number of projects

| Project type ² | Issued credits (MtCO ₂ e) / YoY growth | No. of projects / YoY growth |
|---------------------------------|---|------------------------------|
| Renewable energy | 553.2 / +18% | 2,238 / +6% |
| REDD+ | 476.1 / +28% | 222 / +25% |
| Industrial efficiency | 270.2 / +16% | 1,484 / +15% |
| IFM | 230.1 / +7% | 563 / +29% |
| Cookstoves | 62.9 / +23% | 992 / +51% |
| Afforestation and reforestation | 61.1 / +27% | 319 / +48% |
| Other | 47.6 / +13% | 1,011 / +8% |
| Carbon capture and storage | 21.8 / +0% | 11 / +120% |
| Sustainable agriculture | 10.2 / +175% | 319 / +525% |
| Wetland restoration | 1.5 / +12% | 26 / +86% |
| Total | 1,734.6 / +19% | 7,185 / +22% |

Regional credit issuance breakdown³



¹ Source: Abatable analysis, total issued credits includes the sum across four carbon registries (ACR, CAR, VCS, GS) as of November 2022. Year on Year (YoY) growth data is compared against December 2021. ² Project types definitions: REDD+ (forest conservation), IFM (Improved forest management), Ren. Energy (renewable energy, includes hydropower); ³ Issuance breakdown: Note that the sum of percentage breakdown does not total 100% due to rounding.

Key themes to watch in 2023

1

Continued entry of new developers

2022 saw several developers convert old Clean Development Mechanism (CDM) projects into established carbon programs, a trend we expect to continue in 2023. We expect to see 1) players developing carbon dioxide removal projects seeking certifications under established carbon standards, 2) a larger ecosystem of players developing Climate Action Reserve (CAR) projects in Mexico, as well as 3) continued roles for “aggregators” (e.g. MRV players now doing development) and incumbents (e.g. large forestry groups and large energy groups start in-house carbon focused developments).

2

Slowdown in financing activity outside of nature based solutions

2022 was a record year for financing rounds into carbon project developers, particularly in nature-based solutions and cookstoves developers. We expect a slowdown in funding towards cookstove projects due to the anticipated supply build-up within this project category. We foresee a refocus of funding into large-scale nature-based solutions (predominantly REDD+ and blue carbon projects) that can deliver attractive investment entry points despite volatile, short-term VCM prices. Nature based solutions could benefit from a nice tailwind from the recent adoption of a global biodiversity framework adopted at COP15 in Montreal.

3

Increased developer participation in Article 6 programs

Given the expected convergence between voluntary and compliance markets due to Article 6 programs, we expect players to explore diversifying their development portfolios to include jurisdictionally “nested” projects as a way to build optionality and eligibility under Article 6 bilateral deals. These projects require a level of government-level authorisations for international carbon trading, and we expect closer cooperation between developers and authorities at the national and sub-national levels to push for greater clarity on the host country’s carbon regulations and approval processes.

League tables

Explore the top 25 developers who are scaling VCM markets



Top 25 | Global nature based solutions developers¹

| Rank 2022 vs 2021 ² | Developer name | Portfolio focus ³ | Project type focus ⁴ | Issued credits (MtCO ₂ e) / YoY growth | No. of projects / YoY growth |
|--------------------------------|---|------------------------------|---------------------------------|---|------------------------------|
| 1 +1 | Wildlife Works Carbon LLC | Global | REDD+ | 98.8 / +55% | 14 / +0% |
| 2 -1 | Finite Carbon | Country-specific | IFM | 92.0 / +0% | 68 / +6% |
| 3 +1 | Permian Global | Regional | REDD+ | 43.6 / +30% | 2 / +0% |
| 4 -1 | InfiniteEARTH | Country-specific | REDD+ | 37.5 / +11% | 1 / +0% |
| 5 +0 | South Pole Holding Ag | Global | REDD+, ARR, Sustainable Ag. | 36.4 / +23% | 28 / +47% |
| 6 +2 | ACATISEMA | Country-specific | REDD+ | 29.9 / +19% | 1 / +0% |
| 7 -1 | Anew Environmental, LLC | Global | IFM | 29.4 / +14% | 78 / +8% |
| 8 -1 | CIMA | Country-specific | REDD+ | 28.0 / +11% | 1 / +0% |
| 9 +1 | Terra Global Capital | Global | REDD+, Sustainable Ag. | 22.5 / +25% | 12 / +9% |
| 10 -1 | New Forests | Global | IFM | 21.6 / +0% | 23 / +10% |
| 11 +4 | Bosques Amazónicos | Country-specific | REDD+ | 19.5 / +90% | 4 / +100% |
| 12 -1 | Ecosystem Services LLC | Country-specific | REDD+ | 19.5 / +14% | 2 / +0% |
| 13 -1 | CarbonCo | Country-specific | REDD+ | 18.2 / +35% | 4 / +0% |
| 14 +0 | Greenoxx NGO | Country-specific | REDD+ | 11.8 / +11% | 2 / +0% |
| 15 -2 | White Mountain Apache Tribe | Country-specific | IFM | 11.4 / +0% | 5 / +0% |
| 16 +0 | Oromia Coffee Farmers Cooperative Union | Country-specific | REDD+ | 10.5 / +14% | 1 / +0% |
| 17 +0 | The Nature Conservancy | Global | REDD+, IFM, ARR, Blue Carbon | 9.7 / +8% | 26 / +8% |
| 18 +1 | Florestal Santa Maria | Country-specific | REDD+ | 9.3 / +13% | 1 / +0% |
| 19 -1 | Guanaré SA | Country-specific | ARR | 9.1 / +9% | 1 / +0% |
| 20 +0 | BioCarbon Partners | Country-specific | REDD+ | 9.0 / +15% | 2 / +0% |
| 21 +2 | AIDER | Country-specific | REDD+ | 9.0 / +24% | 6 / +20% |
| 22 +0 | Conservation International Foundation | Global | REDD+, Blue Carbon | 8.4 / +10% | 3 / +0% |
| 23 +1 | Green Assets, Inc. | Country-specific | REDD+ | 7.9 / +18% | 7 / +17% |
| 24 -3 | The Conservation Fund | Country-specific | IFM | 7.9 / +3% | 10 / +0% |
| 25 +0 | Brazil AgFor LLC | Country-specific | REDD+ | 7.1 / +13% | 1 / +0% |

¹ **Source:** Abatable analysis, total issued credits includes the sum across four carbon registries (ACR, CAR, VCS, GS) as of November 2022. Year on Year (YoY) growth data is compared against December 2021; ² **Rank:** Rankings based on total issuances; ³ **Portfolio focus:** Global as Portfolio Focus indicates developers who develop projects across two continents or more. Country-specific are developers who only develop projects in one country; Regional indicates developers who develop within the same continent; ⁴ **Project types definitions:** REDD+ (forest conservation), IFM (Improved forest management), ARR (afforestation, reforestation, revegetation) and Sustainable Ag. (sustainable agriculture, incl. rice emissions management), Blue carbon (incl. wetland & peatland restoration).

Top 25 | Household devices & cookstove developers¹

| Rank 2022 vs 2021 ² | Developer name | Portfolio focus ³ | Issued credits (MtCO ₂ e) / YoY growth | No. of projects / YoY growth | Expected annual issuances ⁴ (MtCO ₂ e) / New projects |
|--------------------------------|--|------------------------------|---|------------------------------|---|
| 1 +0 | Impact Carbon | Global | 8.4 / +5% | 3 / +0% | - |
| 2 +1 | Relief International | Country-specific | 5.2 / +18% | 1 / +0% | - |
| 3 -1 | Vestergaard Frandsen Group SA | Country-specific | 4.5 / +0% | 1 / +0% | - |
| 4 +0 | myclimate Foundation | Global | 4.1 / +14% | 11 / +22% | 0.1 / +2 |
| 5 +0 | Toyola Energy Services Limited | Country-specific | 3.0 / +22% | 1 / +0% | - |
| 6 +0 | Sirreon Technology & Development (Beijing) | Country-specific | 2.7 / +20% | 11 / +0% | - |
| 7 +1 | Proyecto Mirador | Regional | 2.4 / +14% | 5 / +0% | - |
| 8 -1 | MICROSOL SAS | Global | 2.1 / +0% | 10 / +0% | - |
| 9 +8 | ClimateCare Limited | Global | 2.1 / +83% | 10 / +43% | 0.2 / +3 |
| 10 -1 | GERES | Global | 2.0 / +1% | 3 / +0% | - |
| 11 +7 | C-Quest Capital | Global | 2.0 / +98% | 43 / +79% | 33.3 / +22 |
| 12 -2 | CO2balance UK ltd | Global | 1.9 / +0% | 48 / +9% | 0.6 / +4 |
| 13 -2 | Envirofit International, Ltd | Global | 1.8 / +7% | 31 / +41% | 0.4 / +9 |
| 14 -1 | South Pole Holding Ag | Global | 1.7 / +20% | 53 / +179% | 0.1 / +1 |
| 15 +0 | Man and Man Enterprise | Country-specific | 1.6 / +32% | 5 / +150% | 0.3 / +3 |
| 16 -2 | atmosfair gGmbH | Global | 1.6 / +13% | 32 / +3% | 0.0 / +1 |
| 17 -1 | Livelihoods Fund - Climate Pal Ltd | Country-specific | 1.6 / +28% | 2 / +0% | - |
| 18 -6 | E+Carbon, Inc | Global | 1.5 / +0% | 1 / +0% | - |
| 19 +0 | Hestian Innovation | Regional | 1.2 / +47% | 11 / +0% | - |
| 20 +0 | Clean Air Trade, Inc. | Country-specific | 1.1 / +81% | 3 / +0% | - |
| 21 +1 | UpEnergy Group | Global | 1.1 / +109% | 62 / +77% | 10.8 / +27 |
| 22 -1 | Bangladesh Bondhu Foundation | Country-specific | 1.1 / +102% | 47 / +2% | 0.1 / +1 |
| 23 n/a | Burn Manufacturing Co. | Regional | 1.1 / n/a | 25 / +1150% | 2.3 / +23 |
| 24 n/a | AERA Group | Global | 0.6 / n/a | 5 / +25% | 0.5 / +2 |
| 25 -2 | Value Network Venture Advisory Services | Global | 0.5 / +29% | 25 / +150% | 8.7 / +15 |

¹ Source: Abatable analysis, total issued credits includes the sum across four carbon registries (ACR, CAR, VCS, GS) as of November 2022. Year on Year (YoY) growth data is compared against December 2021. Includes only developers developing household devices and clean cookstoves projects; ² Rank: Rankings based on total issuances; ³ Portfolio focus: Global as Portfolio Focus indicates developers who develop projects across two continents. Country-specific are developers who only develop projects in one country; Regional indicates developers who develop within the same continent; ⁴ Annual expected issuances based on numbers disclosed by developers to registries. Shows only issuances from new projects added in 2022.



Landmark Deals in 2022

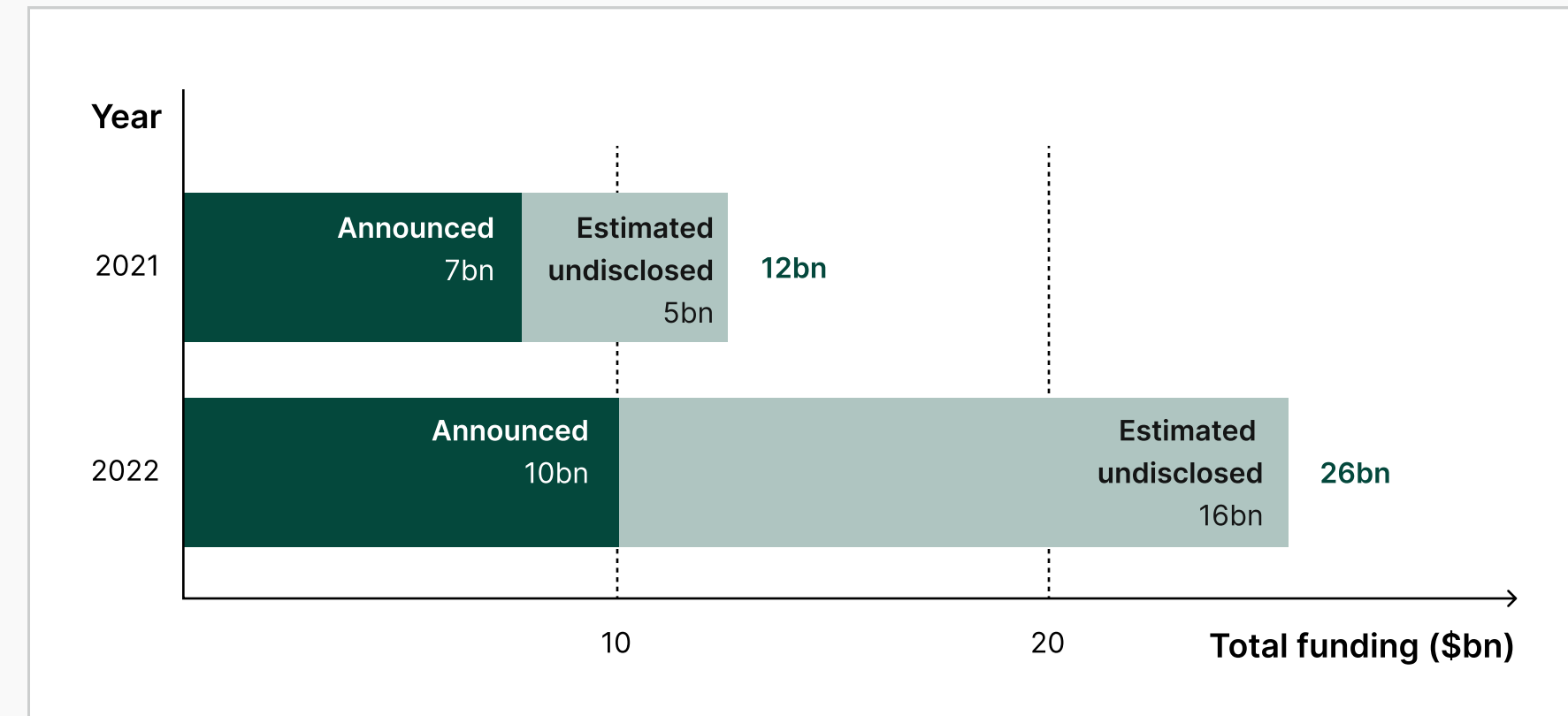
Key investment transactions announced contributing to carbon credit generation

Funding and deal overview by year and project type

At Abatable, we track funding rounds and the total number of deals involving carbon investor and project developers.¹ We estimate that total funding increased from \$7bn to \$10bn from 2021 to 2022, approximately a 40% YoY increase based on disclosed investments. Only a portion of deals disclosed investment amounts. Based on Abatable's estimates, total funding (including undisclosed deals) may total up to \$12bn in 2021 and up to \$26bn in 2022, with 2022 being a record year.² In total, we tracked 40 deals in 2021 and 68 in 2022, a 70% YoY increase. Deals tracked include only deals which saw the involvement of a carbon investor or project developer and include: (a) equity funding rounds, M&A and acquisitions (b) project financings and ERPAs; (c) carbon fund investment; (d) corporate procurement deals. They do not include procurements done via exchange platforms.

From a project-type perspective, nature-based projects continue to represent the largest project type by number of deals. In 2022, we saw an increase in the number of deals within Household Devices & Cookstoves as investors continue to diversify their portfolios away from nature-based projects and benefit from attractive investment entry points.

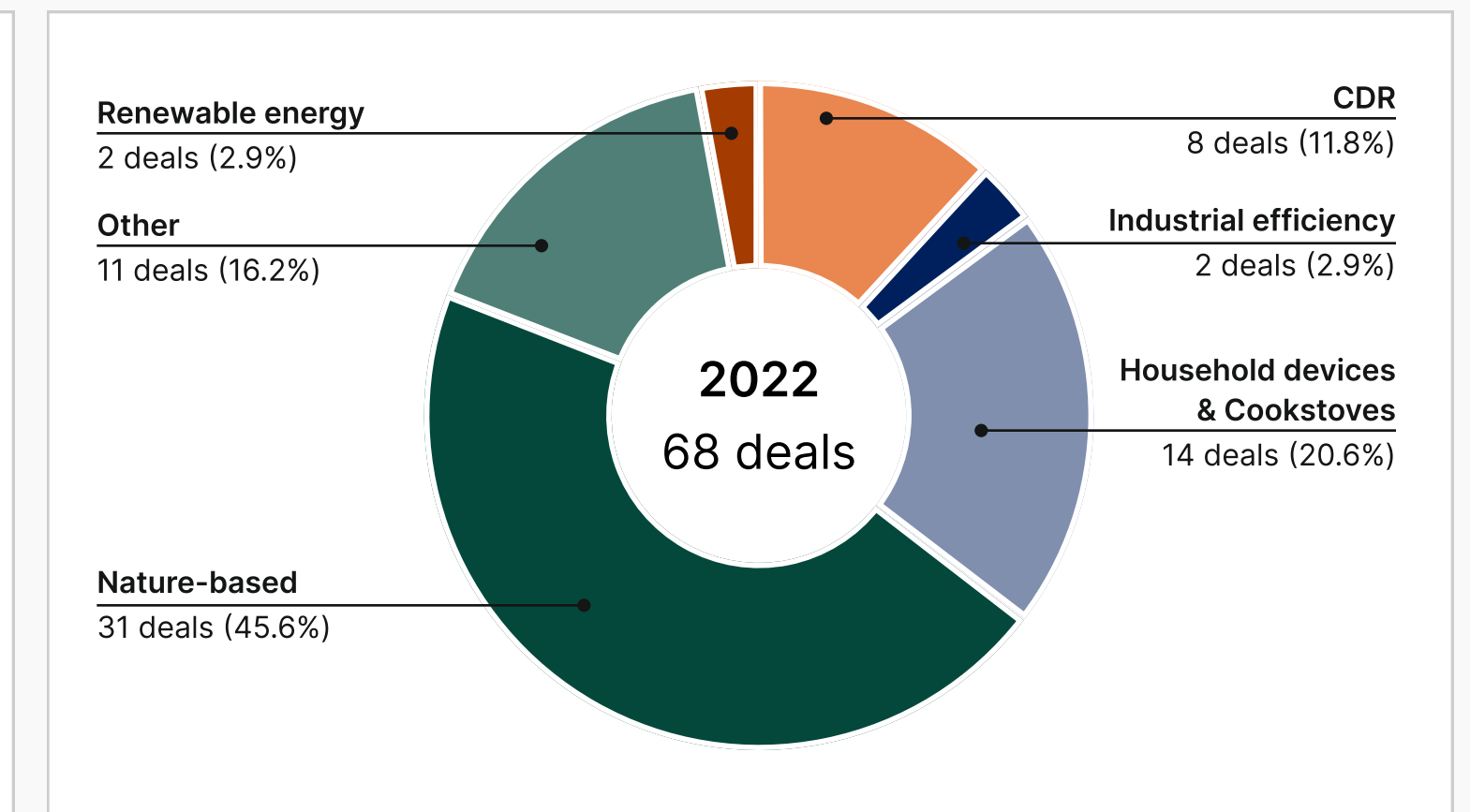
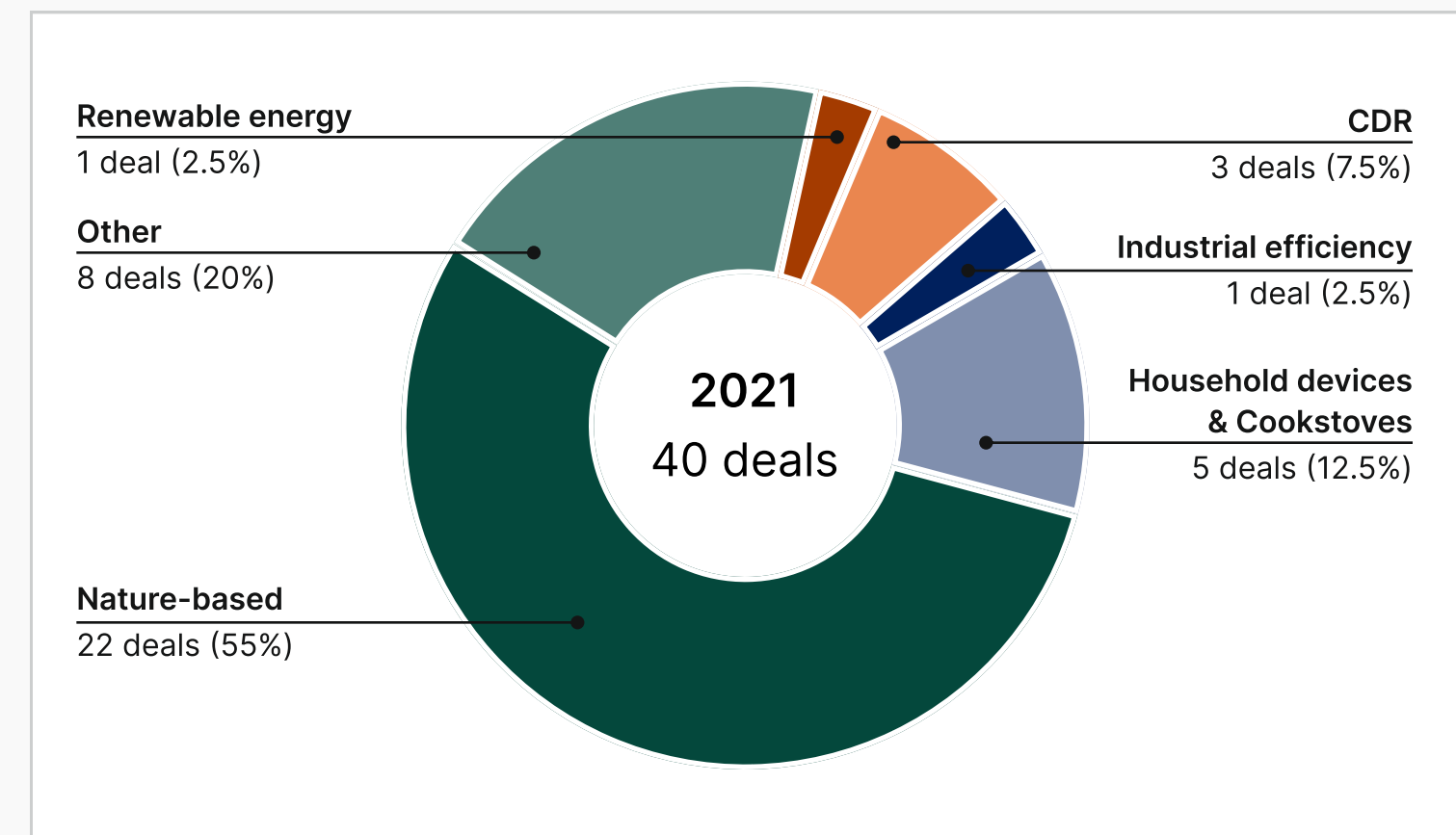
Total funding announced & estimated (\$bn)



Total funding going into carbon credit generation and developers in 2022 is at least 7x larger than the primary voluntary carbon market size³

Primary voluntary carbon size in 2021 was \$1bn and \$1.3bn in 2022

Total number of deals by project type



¹ **Source:** Abatable analysis. Abatable tracked over 65 deals announced over the course of 2022 based on what Abatable believes to be an exhaustive list of deals announced on specialised news, press releases, and company news. Approximately \$10bn represents the sum of funding amount disclosed across 26 deals (representing approx. only 38% of deals announced), because of the large amount of undisclosed funding rounds, Abatable expects the total aggregated funding into carbon credit generation to be substantially higher than \$10bn. ² **Our estimates:** We estimated the total funding size by looking at the total funding disclosed over the % of deals for which a funding round was announced. These figures are estimates, and are intended to discuss a trend. ³ **Source:** Based on the estimated VCM market size from Trove research, which estimates the size to be approximately \$1.3 billion in 2022 and \$1 billion in 2021

Landmark Deals in 2022

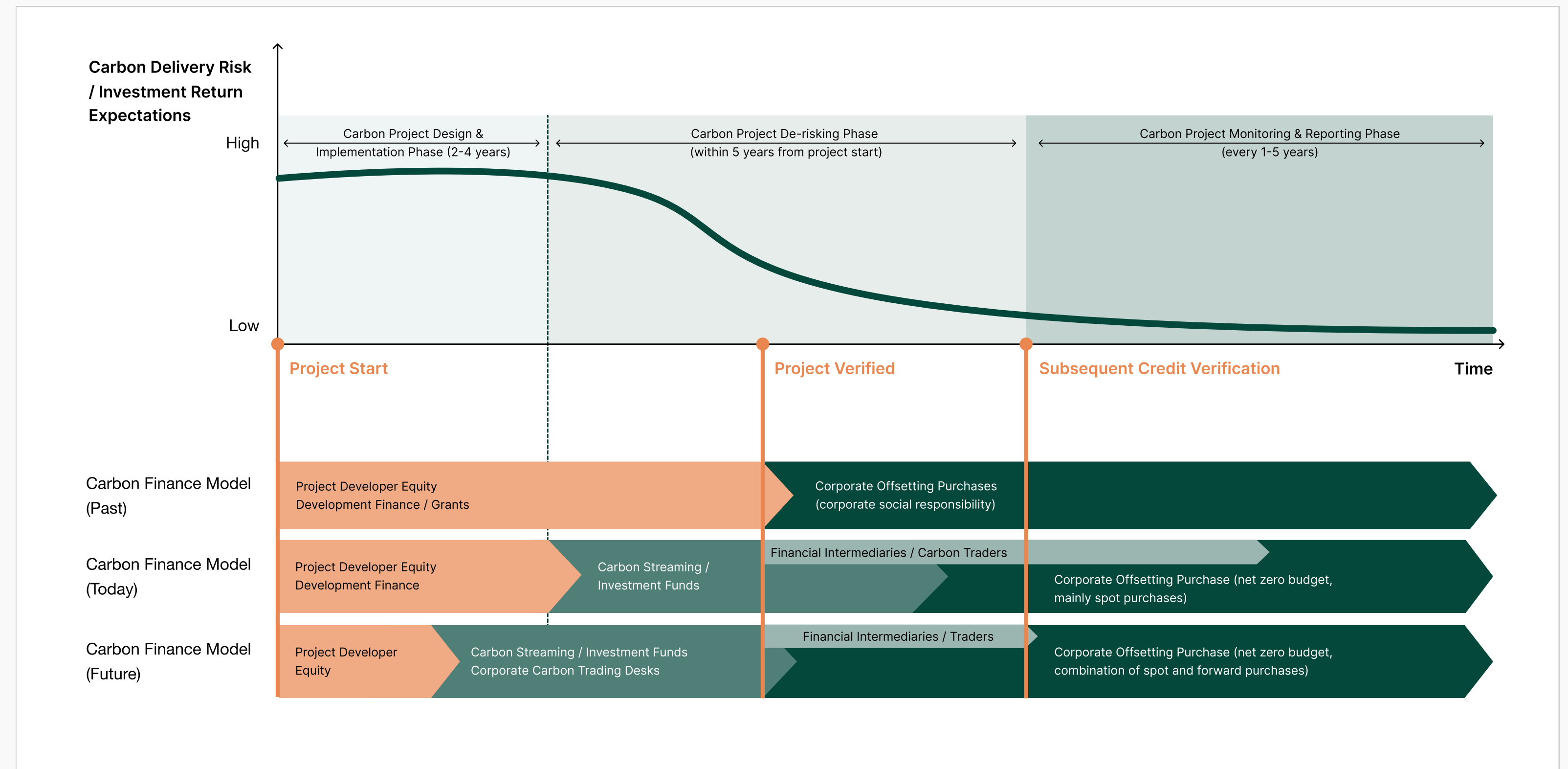
Abatable estimates that 2022 recorded over \$10bn worth of transactions (across more than 65 announced deals) into upstream investments (carbon credit generation)¹ which could result in a step-change ability for this market to scale supply.

Such a large uptake in carbon credit generation may require a rethinking of the long-term implications for pricing and demand-supply dynamics in the VCM.

This fast-evolving landscape is starting to see a higher level of competition for access to developers, with a greater risk appetite from corporates and investors for projects at the earlier stages of development in exchange for larger discounts on carbon credit prices secured by multi-year partnerships.

As highlighted in [one of our recent articles](#), the carbon finance model is changing alongside the Carbon Project Development Curve. As larger corporate and carbon funds are participating in the earlier stages of development, we expect this to result in a smaller role for financial intermediation.

Carbon Project Development Curve - Evolution of the Carbon Finance Model



¹ **Source:** Abatable analysis. Abatable tracked over 65 deals announced over the course of 2022 based on what Abatable believes to be an exhaustive list of deals announced on specialised news, press releases, and company news. Approximately \$10bn represents the sum of funding amount disclosed across 26 deals (representing approx. only 38% of deals announced), because of the large amount of undisclosed funding rounds, Abatable expects the total aggregating funding into carbon credit generation to be substantially higher than \$10bn.

Q1 | Landmark Deals in 2022

Source: Abatable analysis. The list of deals included is not designed to be exhaustive. Abatable tracked over 65 deals announced over the course of 2022 and included only a sub-set which it considered to be notable as a result of the size of the deal announced, or based on relevance of counterparties involved. For illustrative purposes only.

Acquisition

Amount not disclosed

Carbonsink Acquired by South Pole

South Pole, a globally integrated carbon services company, expands its development capabilities in Africa through Carbonsink, with the announcement coming after a string of European partnerships and acquisitions from South Pole (i.e. GoClimate, Co2Ok).

Investment

\$500 M

The Shared Wood Company Investment by AXA, Engie

Parisian carbon offset developer and agroforestry company, The Shared Wood Company (SWC), closes minority equity investment from AXA IM and utility Engie. The developer aims to develop 40 Mt of mitigation over the next two decades, targeting \$500m over the next six years in nature-based projects.

Investment

\$13 M

Worldview International Foundation Investment by Carbon Neutral Royalty

Canadian alternative impact investor, Carbon Neutral Royalty (CNR), announced a streaming agreement with mangrove restoration developer Worldview International Foundation (WIF) that could generate over 70 Mt carbon credits.

Investment

Acquisition

\$200 M

Chesnut Carbon & Forest Carbon Works Investment by Kimmeridge

Kimmeridge, a New York-based alternative asset manager, announced a new carbon credit platform for nature-based credits, Chestnut Carbon and also acquired a US forestry project developer specializing in family-owned forestry lands, Forest Carbon Works.

JANUARY

FEBRUARY

MARCH

Merger

Amount not disclosed

Climate Neutral Group Merged with Anthesis

London-based net zero sustainability consultancy Anthesis has agreed to merge with Dutch-based offset project developer Climate Neutral Group (CNG) after receiving investment from private equity firm Palantine in 2021.

Merger

Investment

Amount not disclosed

Element Markets & Bluesource Merger with investment by TPG Rise

North American offset project developer Bluesource and environmental commodities company Element Markets announced a merger and combined entity, Anew Climate. The merger created the largest marketer and originator of carbon and environmental credits under majority ownership by private equity impact investment vehicle, TPG Rise.

Investment

Amount not disclosed

C-Quest Investment by Shell & Macquarie

US-based developer C-Quest Capital (CQC) secured investments from an oil major and global bank to scale up a cookstove project portfolio in Sub-Saharan Africa expected to generate over 200 Mt carbon credits over the next decade. The latest deal is the third in a series of 3 investments by both Shell and Macquarie with CQC that have been announced in the previous 12 months. Funding came after a \$14m funding received by CQC from Singapore's sovereign wealth fund Temasek and energy traders Pavillion Energy to expand CQC's portfolio in Southeast Asia, targeting 48 Mt credits over 10 years.

Q2 | Landmark Deals in 2022

Source: Abatable analysis. The list of deals included is not designed to be exhaustive. Abatable tracked over 65 deals announced over the course of 2022 and included only a sub-set which it considered to be notable as a result of the size of the deal announced, or based on relevance of counterparties involved. For illustrative purposes only.

Investment

\$13 M

ClimeCo

Investment by Warburg Pincus & The Heritage Group

ClimeCo, a US-based environmental commodities developer and consultancy, announced a funding round of over \$50 million led by Warburg Pincus, a leading global growth investor, and The Heritage Group. Funding secured finances for ClimeCo's expansion into CCUS and other emerging decarbonization asset classes.

Investment

\$30 M

CarbonCure

Investment by Invert

Canadian investor and carbon streaming firm, Invert, signed the first sizeable carbon credit purchase agreement providing upfront capital in exchange for hundreds of thousands of CarbonCure's carbon credits, delivering permanent CO2 mineralization.

Acquisition

Amount not disclosed

New Forests

Acquired by Mitsui & Nomura

Japan's Mitsui and Nomura acquire New Forests, one of the largest forestry asset managers and developers of carbon credits with projects across Australia, New Zealand, and Southeast Asia. The announcement came just after Mitsui took a 33.7% stake in Australian offset developer Climate Friendly.

Investment

Amount not disclosed

C-Quest

Investment by BP

Oil major BP has signed an agreement with US-based offset developer C-Quest Capital to make a sizeable investment in CQC's operations in India, including financing of a rollout of a new LED lighting programme.

APRIL

Investment

Amount not disclosed

KOKO Networks

Investment by Microsoft Climate Innovation Fund

Africa-based carbon credit developer and bioethanol technology company, KOKO Networks, secured an equity investment by US tech giant Microsoft's climate innovation fund, a \$1bn corporate venture capital fund.

Investment

\$20.6 M

Anew & LocusAG

Investment by Green Star Royalties

North American carbon credit, Bluesource (now Anew) and precious metals and royalty and streaming investment company Star Royalties announced up to \$20.6m to finance the expansion of a US farmers' soil carbon program through agtech Locus AG's CarbonNow program

MAY

AMC Facility

\$925 M

Frontier Climate

New corporate facility

Five global companies - Stripe, McKinsey, Shopify, Alphabet and Meta - announce plans to spend \$925m on engineered carbon removal credits through 2030, aiming to help scale nascent technologies through an Advanced Market Commitment (AMC) facility

JUNE

Investment

\$3,600 M

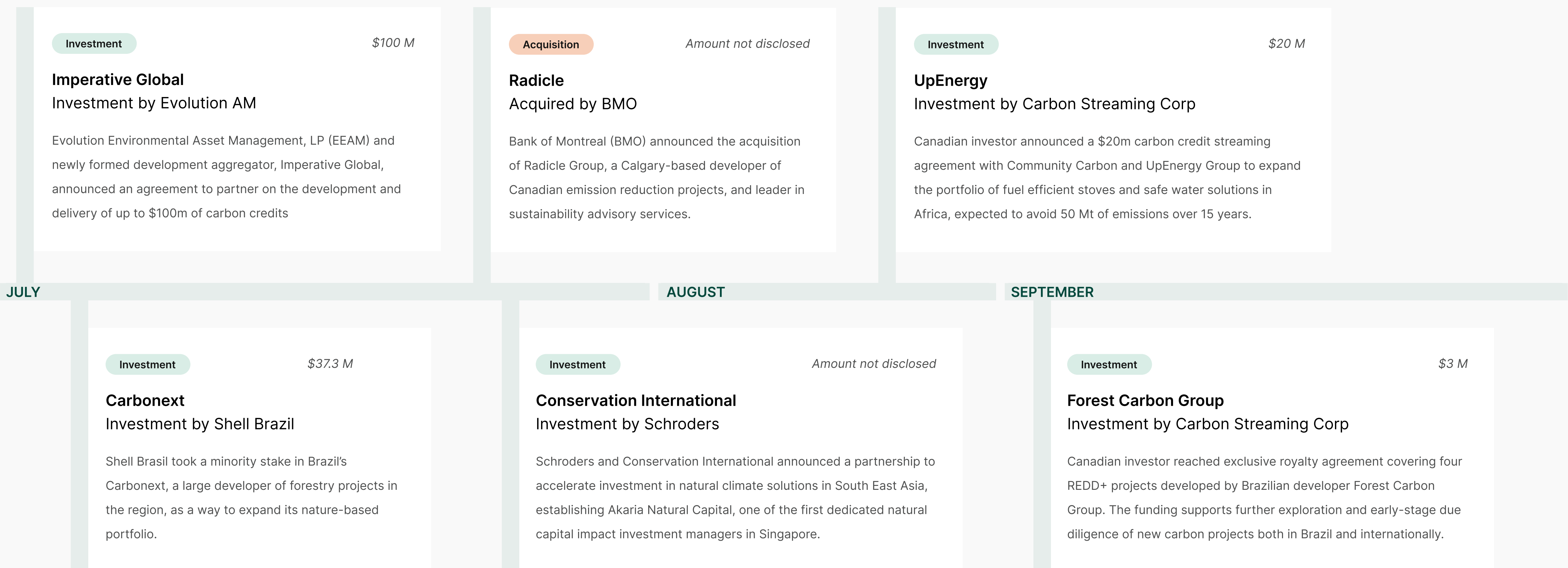
GenZero

New platform launched by Temasek

Singapore's Temasek launched an investment platform company GenZero, that will invest an initial S\$5bn (\$3.6bn) to accelerate the low carbon transition of Temasek's portfolio's net emissions by 2030 and work towards a net zero portfolio by 2050.

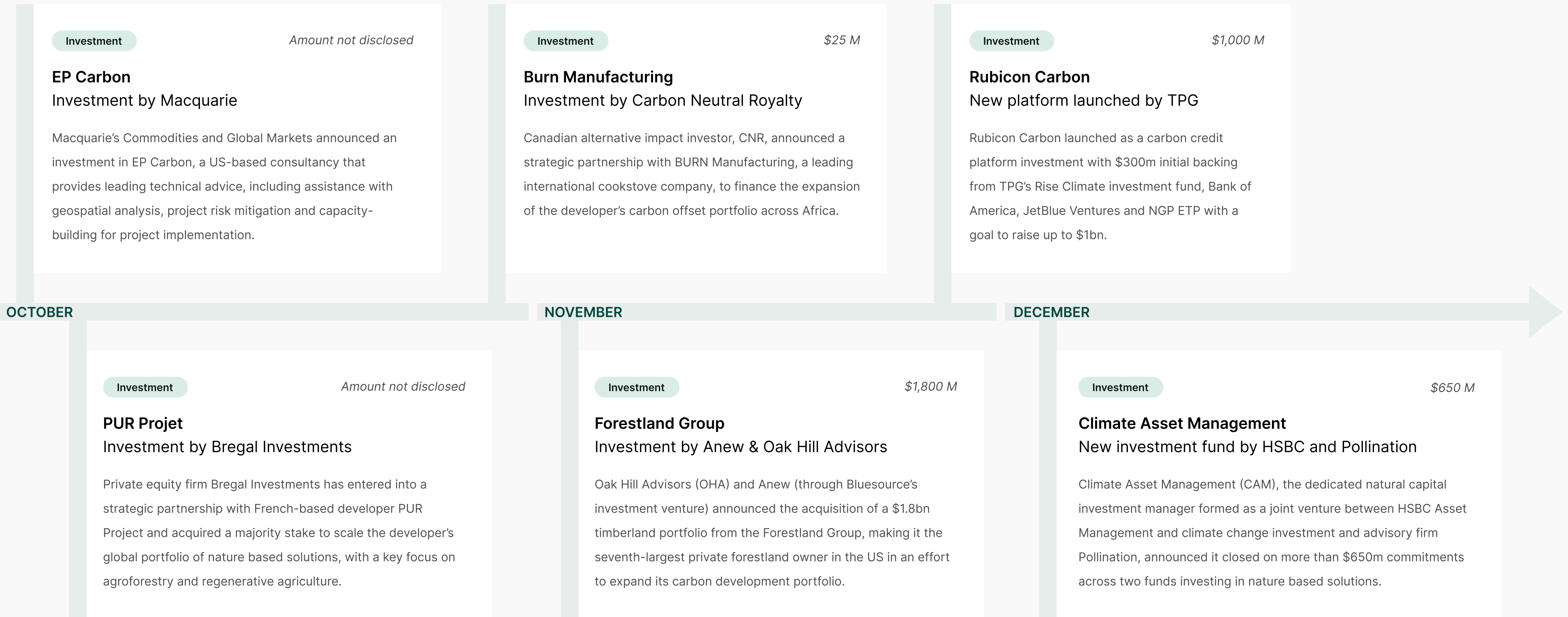
Q3 | Landmark Deals in 2022

Source: Abatable analysis. The list of deals included is not designed to be exhaustive. Abatable tracked over 65 deals announced over the course of 2022 and included only a sub-set which it considered to be notable as a result of the size of the deal announced, or based on relevance of counterparties involved. For illustrative purposes only.



Q4 | Landmark Deals in 2022

Source: Abatable analysis. The list of deals included is not designed to be exhaustive. Abatable tracked over 65 deals announced over the course of 2022 and included only a sub-set which it considered to be notable as a result of the size of the deal announced, or based on relevance of counterparties involved. For illustrative purposes only.





About Abatable

Find out how we are enabling climate action for the hard to abate emissions

About Abatable

We offer intelligence and carbon procurement services in the VCM

We provide procurement and transaction infrastructure for buyers, sellers, advisors, and financiers in the voluntary carbon market.

Our mission is to enable climate action for the hard to abate emissions by building the infrastructure for corporates and investors to navigate, access, and support credible climate solutions delivering long-lasting positive environmental and social impact.

As operators in the voluntary carbon market, we have developed an understanding of the carbon project developer ecosystem, with key observations summarised in this yearly report.

If you have any questions about this report or have any feedback for us on how to improve it, please [get in touch](#).



For carbon project developers

Stay updated on corporate procurement cycles

Access a platform enabling carbon offsetting procurement for corporate buyers and advisors seeking to retire credits from projects delivering real and tangible impact to local communities and their ecosystem.

- Choose from various contract structures - from spot to multi-year purchases
- Manage documents in one place and respond to Request for Proposals (RFPs) faster
- Receive support in screening corporate buyers based on ESG criteria

Many developers have already chosen us as a go-to-market distribution channel for their carbon credits

- ✓ Over 80 developers onboarded
- ✓ Over 140 million tCO₂e available for sale in the next 12-18 months accessible through the Abatable platform

The screenshot displays the Abatable platform interface. At the top, there are navigation links for 'My procurement', 'Developer database', and 'Resources', along with a 'Sign out' button. Below this, a 'Back' link is visible. The main content area features a profile for 'Carbon Development X LLC' with an 'Abatable network' tag. The profile includes details such as 'HQ location: United States', 'Website: www.developer-website.com', 'Company type: Privately held company', and 'Year founded: 1998'. It also lists 'Areas of expertise' as 'Improved forest management', 'Industrial efficiency and Waste management', and 'Sustainable agriculture'. A summary bar shows '48 projects' (No. of projects developed), 'Global' (Geographical focus), '13' (Project countries), and 'Medium' (Portfolio size). Below this, a section titled 'Carbon projects aligned with your criteria (3 out of 48)' contains a table with columns for Project title, Project type, Country, Registry, and Carbon profile. The table lists three projects: Project A (Sustainable agriculture, United States, VCS), Project B (Biochar, United Kingdom, Puro.Earth), and Project C (Improved forest management, China, VCS). Each project has 'Avoidance' and 'Removal' options. A link for 'Other projects (45)' is also present. To the right, a separate window shows an 'RFP: Pear Inc.' with tabs for 'Requirements' and 'RFP response'. The 'Requirements' section includes 'Procurement requirements' such as 'Total volume: 400,000 tCO₂e', 'Delivery period: Jan 2023 - Dec 2025', 'Project types: Sustainable agriculture, Improved forest management', 'Carbon profile: Avoidance, Removal', and 'Registries: Verra, Gold Standard'. The 'About the buyer' section lists 'Buyer legal name: Pear Inc.', 'Industry: Food and beverage industry', 'HQ location: United States', and 'Intended use of credits: Retirement'. A 'Downloads' section is also visible at the bottom.

Sign up to our project developer database

- 1** Register your interest to get updates on corporate procurement cycles and RFPs
- 2** Get access to a platform to manage projects and proposals, all in one place
- 3** Get actionable quality insights and market intelligence on your projects to inform future development pipeline

For corporate buyers and advisors

Access the most comprehensive carbon procurement platform

Our platform enables efficient management of carbon procurement cycles, with a focus on quality and speed of procurement.

- Access the largest database of carbon project developers and shortlist relevant suppliers for procurement
- Fully-automated and standardised Requests for Proposal (RFP) to simplify and streamline data collection from suppliers
- Independent, user-friendly scoring system to assess the quality of the of project developer and the carbon project level criteria

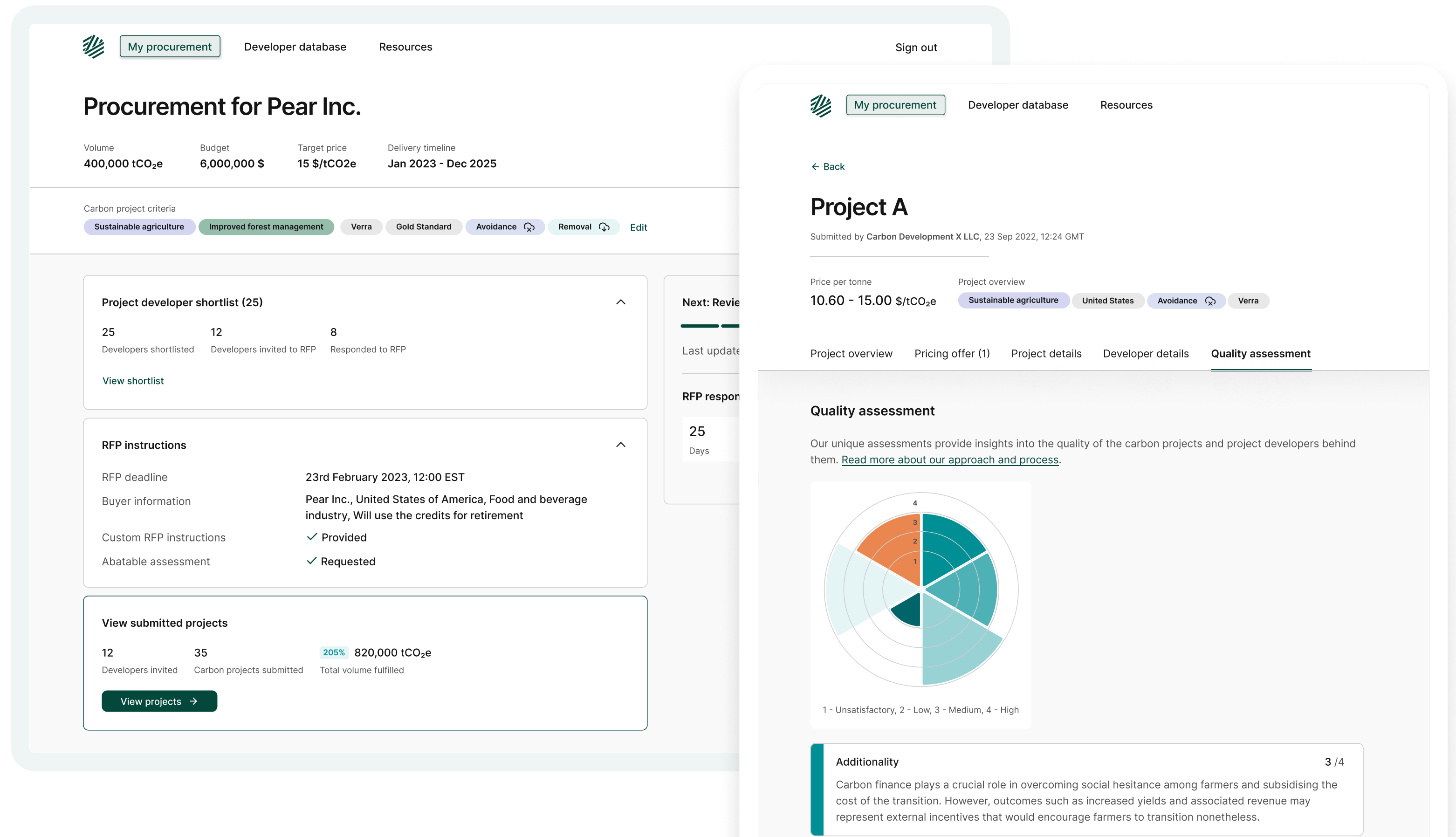
Project types we support

Nature-based solutions

- Afforestation & reforestation
- Soil carbon
- Improved forest management
- Avoided deforestation
- Blue carbon

Engineered solutions

- Improved cookstoves
- Industrial efficiency
- Direct air capture
- CO₂ mineralisation
- Biochar



Request access to our procurement platform

1

[Schedule a call](#) to discuss your needs

2

Submit your RFP to our developer network

3

Review received proposals and quality criteria to create your carbon portfolio

Unprecedented policy risks exist in the VCM due to uncertain Article 6 implementation

In 2022, policy risks have been front of mind for investors and corporates looking to financially support carbon offsetting projects in the voluntary carbon market. Following COP26 in Glasgow, countries have started to develop their plans to leverage Article 6 of the Paris Agreement to voluntarily cooperate or trade emissions to achieve emission reduction targets set out in their Nationally Determined Contributions (NDCs). As such, some countries are actively looking to regulate and leverage in-country carbon sinks as a new valuable national asset.

The number of NDCs intending to leverage Article 6 increased from 99 to 120 over the past few years¹, yet only a handful of countries shared how they intend to leverage the mechanisms.

¹ Source: WRI, "[The State of Nationally Determined Contributions: 2022](#)"

In the absence of sound national infrastructure and legislation clarity, countries are aware that national carbon assets could be exported without the right governments' approval or share or proceeds and risk not being captured in their national NDC goals.

To avoid that, governments are now developing and implementing the appropriate legislation and infrastructural set up to govern this new asset, with some also seeing carbon as a geopolitical opportunity. Countries like Indonesia, the Democratic Republic of Congo and Brazil, which own some of the world's valuable forest carbon sinks, are now organising to form what's been referred to as an "OPEC of forests". With such development, market players within the VCM are exposed to an **unprecedented level of policy uncertainty, potentially impacting the value and/or claims associated with the carbon credits they develop, invest or purchase.**

From speaking with investors and corporates, we identified three policy risks that are top of mind for investors and corporate buyers in 2022 and coming into 2023:

1 | Revocation or dispute over carbon rights

Risks exist for governments to expropriate or dispute the ownership of carbon rights previously understood by developers or implementation partners as tied to land or other private property

titles. Governments may also require a portion of the credits to be restricted to domestic buyers or used within a national carbon tax regime. Governments decisions to revoke carbon rights may also be retroactively applied.

2 | Temporary or permanent export ban of carbon credits

Governments may decide to temporarily halt the issuance and/or transfer of carbon credits from all projects developed in the country, in anticipation of an established national infrastructure and accounting system. Delaying carbon credit monetisation for developers may negatively impact financial viability of projects.

3 | Ban of claims associated with carbon credits

Governments may not authorize the transfer of carbon credits from projects developed in-country for international trading purposes, hence impeding the use of those carbon claims for an international private company's "net zero target". Non-authorized carbon credits can still be supported financially by international private and blended finance actors, but would only be considered as "climate contribution" towards the country's NDC.

Latest Policy Insights from our Blog (cont.)

Mitigation solutions emerge to tackle policy risks specific to the VCM

As Abatable has researched solutions to mitigate policy risks and not discourage investors and corporate buyers to play an active role in the VCM, we have come across a number of insurance providers interested in adapting their policy insurance solutions to cover the risks that are specific to the voluntary carbon markets.

“Innovation in insurance solutions can help mitigate some of the key risks, such as carbon project nationalization, regulatory changes leading to carbon credit export bans, etc., By bolstering confidence in the integrity of carbon offset transactions, the insurance industry can ultimately enable greater capital flows to areas where investment is most critical, such as underserved emerging markets.”

John Minor

National Practice Leader, Political Risk, Aon



Outside of the innovation we observed in the insurance space, alternative mitigation activities can also be implemented by developers as they seek to access capital and scale in-country climate action. Those include but are not limited to: conducting active policy advocacy and education initiatives with governments on the topic of voluntary carbon markets, piloting newly established authorisation processes for international trading purposes, as well as strategically leveraging the use of public-private funding schemes. We discuss these mitigation options along with explaining the key policy risks in our upcoming white paper.

[Subscribe to our newsletter](#) to get notified when the white paper is published and to receive regular updates and insights into the voluntary carbon market.



Pauline Blanc

Strategy and Policy Lead

Key mitigation initiatives



Policy insurance cover against expropriation or revocation of carbon rights



Policy advocacy and educational initiatives with government



Piloting new authorization processes under new Article 6 rules



Strategic use of private-public cooperative blended finance

Glossary

Voluntary Carbon Market

The segment of the carbon market for carbon offset transactions outside of government-related regulatory schemes i.e. carbon credits purchased by organisations wishing to offset their carbon voluntarily.

Verified Carbon Standard (VCS)



The Verified Carbon Standard (VCS) developed by Verra is the world's most widely-used voluntary greenhouse gas reduction programme, with over a thousand projects. They have collectively reduced or removed more than 400 million metric tons of carbon and other GHG emissions from the atmosphere.

Climate Action Reserve (CAR)



The Climate Action Reserve (CAR) establishes high-quality standards for North American carbon offset projects, oversees independent third-party verification bodies, issues carbon credits generated from such projects and tracks the transaction of credits over time in their publicly-accessible registry system.

Clean Development Mechanism (CDM)



The CDM was the first global, environmental investment and credit scheme of its kind, providing a standardised emissions offset instrument, the Certified Emissions Reduction or CER. Developed by the UNFCC under the Kyoto Protocol so that emission-reduction projects in developing countries could earn certified emission reduction credits, each equivalent to one tonne of CO₂. The CDM is no longer issuing credits and is being replaced by Article 6.4 of the Paris Agreement.

Gold Standard (GS)



Established by WWF, The Gold Standard is endorsed by more than 80 NGOs. UN agencies use the Gold Standard for the development of their carbon mitigation and sustainable development projects. Gold Standard is now also certifying Sustainable Development Goals (SDGs).

American Carbon Registry (ACR)



The American Carbon Registry (ACR), a nonprofit enterprise of Winrock International, has 18 years of experience in the development of rigorous, science-based carbon offset standards and methodologies as well as operational experience in carbon offset project registration, verification, oversight and offset issuance.

Berkeley Carbon Trading Project



The Berkeley Carbon Trading Project at the Center for Environmental Public Policy (CEPP) is a research and outreach program dedicated to studying the effectiveness of carbon trading and offset programs to inform program design. Barbara Haya, Ivy So, Micah Elias. (2021, September). Voluntary Registry Offsets Database, Berkeley Carbon Trading Project, University of California, Berkeley. Retrieved from [the BCTP website](#).

Glossary

Project Type

Each project is characterised by definitions as stated.

Afforestation and Reforestation

Planting trees and reducing barriers to natural regeneration in non-urban areas.

REDD+ / Avoided Forest Conversion

Preserving forests and grassland and preventing conversion to other land uses like agriculture or development. REDD refers to reducing deforestation and forest degradation in the global south. Many REDD+ projects bundle several activities that together reduce deforestation and forest degradation, expand forests, and increase stocks in existing forests, including improved forest management, afforestation/ reforestation, re-vegetation, alternative livelihood programs, and clean cookstoves. The “+” in REDD+ refers to the countries’ efforts to foster conservation, sustainable management of forests, and enhancement of forest carbon stocks.

Improved Forest Management

Applying practices that increase above and below ground carbon stocks including reducing timber harvest levels, extending timber harvest rotations, designating reserves, fuel load treatments, enrichment planting, and stand irrigation or fertilisation. Many IFM projects account for avoided emissions relative to regional baseline carbon stocks, which drive most of the issuance volumes.

Clean Cooking Stoves & Energy Efficiency

Increasing energy efficiency in a variety of industrial processes. Clean cookstoves refer to improved cookstoves which replace or minimise the use of dung or firewood for cooking. Carbon benefits are realised in the form of reduced emissions from burning biomass as well as reducing deforestation.

Carbon Capture and Storage

Capturing carbon out of the atmosphere or capturing CO2 released in high concentrations from industrial processes for permanent storage underground or in manufactured products.

Renewable Energy

Increased renewable energy deployment across a variety of solutions, including biomass, geothermal, hydropower, solar, and wind energy sources.

Wetland Restoration

Restoring deltaic and coastal wetlands, including mangrove ecosystems. Restoration can include switching from row crops to rice cultivation designed in deltaic areas, as well as tidal wetland creation.

Glossary

Project Type

Each project is characterised by definitions as stated.

Industrial Efficiency & Waste Management

Projects include industrial energy efficiency improvements, fuel substitution, manufacturing process improvement, as well as waste recovery, management and refrigerant related sectors.

Sustainable Agriculture

Increasing above and below ground carbon in agricultural areas, through a variety of practices including manure application, returning compost residuals to fields, covering crops and introducing trees to landscapes. This also includes projects for which a change in agricultural practices to more sustainable ones can result in emission reductions.

Other

Includes other avoided emissions projects in transport, household & residential sectors.