Carbon Credit Basics for Business

ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

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Net Zero and the Business Imperative

The global economy must reach net zero carbon dioxide emissions around 2050.

We must cut emissions in half within the next decade in order to be on track.

Why net zero?

In 2018, the IPCC Special Report relayed increasing threats that pointed to one dire message:

> **We are not moving nearly fast enough.**

To avoid the worst effects of climate change, aggressive emission reductions and removals of CO_2 from the atmosphere are necessary. Our collective inaction has underscored the urgency of this task.

How can companies participate in reaching these urgent goals?

Aim to **achieve net zero emissions by 2050** at the latest, including:

- Setting interim science-based decarbonization goals
- Developing robust net zero transition plans
- Reducing emissions across corporate operations and the full value chain
- Incorporating all greenhouse gases – not just CO_2 – into short- and long-term goals
- Act with urgency to **protect the world's current carbon stocks**, such as tropical forests
- **Invest in climate mitigation solutions** to maximize climate impact, such as high-quality carbon credits

What is a carbon stock?

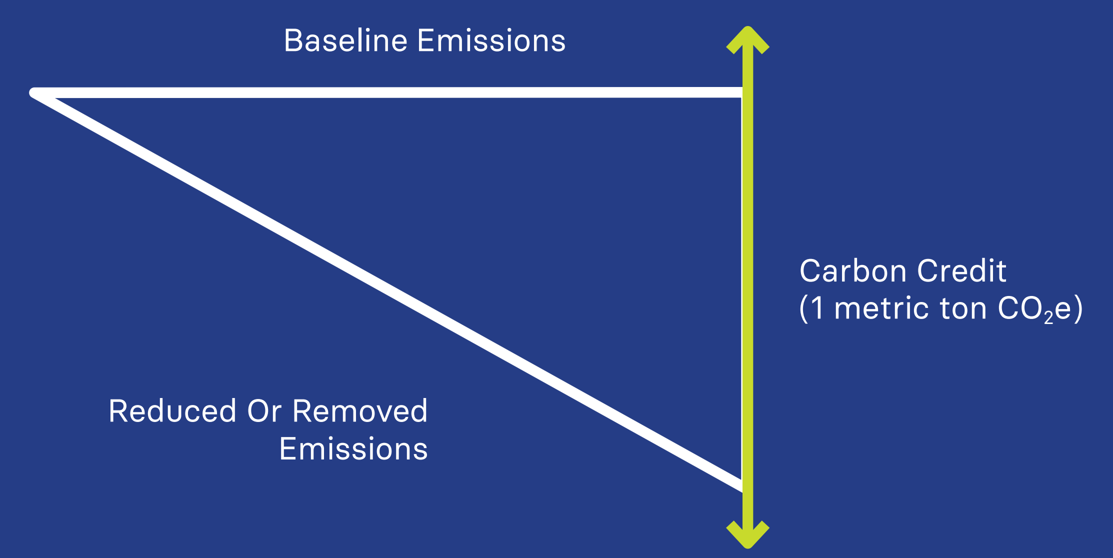
Many natural ecosystems absorb and store large amounts of carbon. This storage, known as a “carbon stock”, can be disrupted by activities like deforestation, releasing carbon back into the atmosphere. Research shows that keeping critical carbon stocks like tropical forests intact is critical to meeting Paris Agreement climate goals.

THE QUESTION IS:

What is the role of carbon credits to get there?

What is a carbon credit?

An emission unit issued by a carbon crediting program representing a reduction or removal of greenhouse gases.



Carbon credits are calculated from a baseline scenario in which the incentive provided by the credit price would not be present.

Credits can be used to compensate for emissions that have not yet been reduced or eliminated in a company's operations or value chain.

Credits are used in both regulatory and voluntary carbon markets. **This resource focuses on voluntary carbon markets.**

High-quality carbon credits

To **accelerate near- and medium-term mitigation** and **speed the low carbon transition**, carbon credits are **critical tools** if they meet specific criteria. **They must:**

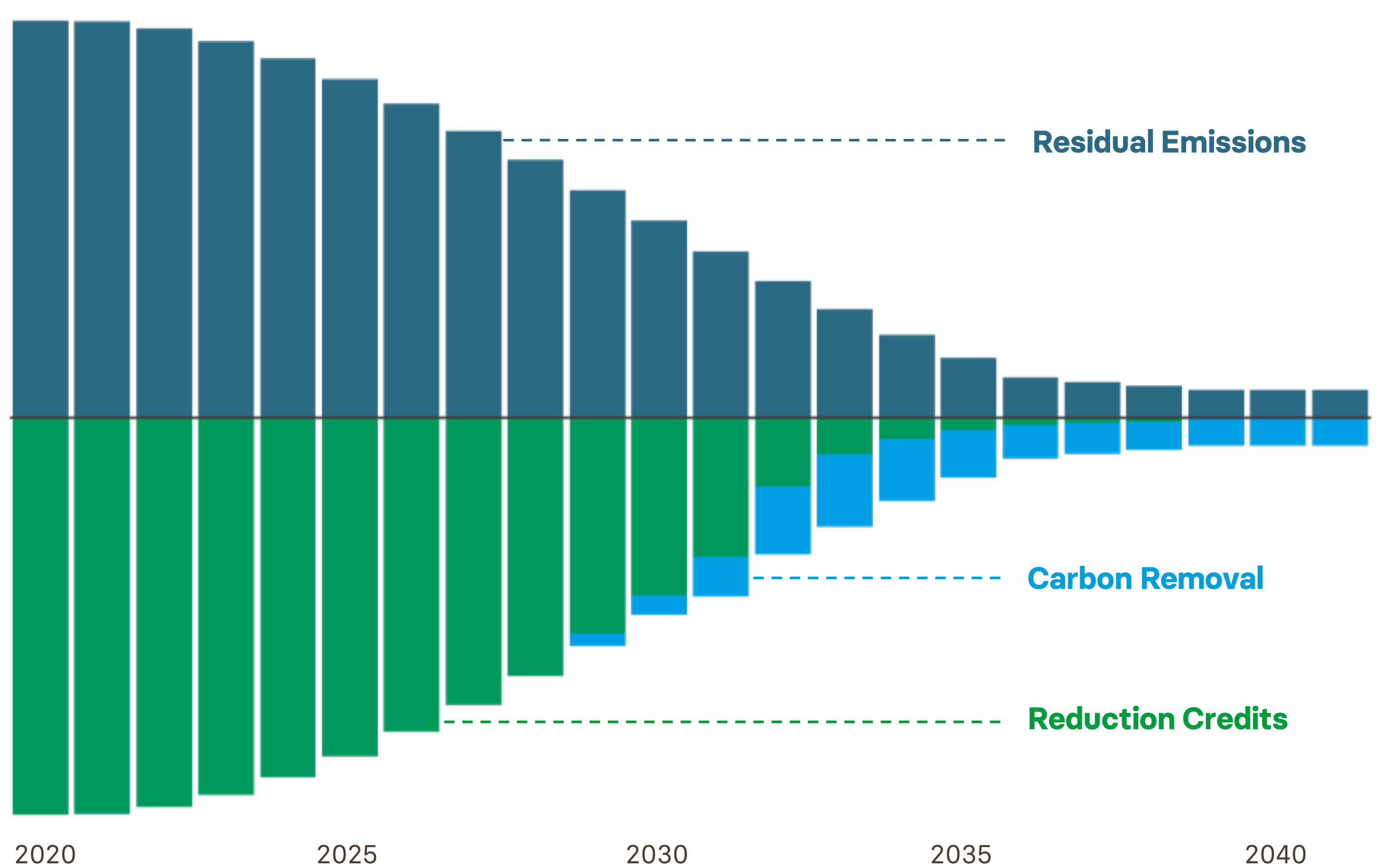
- ☑ **Have environmental and social integrity**
- ☑ Be transparently integrated in a company's pathway to decarbonization

Used accordingly, carbon markets can:

- ☑ Increase the level of **climate ambition**
- ☑ **Cut the cost** of doing so
- ☑ **Drive investment** to emission reduction and removal projects
- ☑ **Spur innovation** in mitigation technologies
- ☑ **Support sustainable development** and protect livelihoods

Carbon credits in a net zero pathway

Example Corporate Net Zero Pathway



Credits **cannot be a substitute** for a company's own emissions reductions. Investments in credits should complement a **net zero target and science-based decarbonization strategy** to maximize climate impact.

On their pathway to net zero, companies must:

1. Adopt interim science-based targets alongside a net zero goal
2. Implement ambitious near-term emission reductions to achieve science-based targets
3. Invest in carbon credits to compensate for ongoing emissions that cannot be abated
4. Implement and invest in carbon removals over time to balance remaining emissions or contribute to "climate positive" goals

Understanding Carbon Credits

How do carbon credit options vary?

Not all carbon credits are the same

Carbon credits can be generated from a range of activities or projects, and thus, can have different attributes.

1. Carbon credits can represent emissions **reductions** or **removals**
2. Carbon credits can be generated from **nature-based** or **technology-based** activities or projects
3. Carbon credits can differ in scale, by being representative of **project-based** or **jurisdictional** approaches

These categories are not exclusive.

For example, a credit can be a **nature-based** [2] emissions **reduction** [1] credit generated at a **jurisdictional scale** [3].

1

Credits can represent emissions **reductions** or removals

EXAMPLES

- Protection of tropical forests
- Methane capture and destruction

Emissions Reduction (or Avoided Emissions) Credits

These credits result from activities that **reduce emissions into the atmosphere or avoid them entirely**

- High-quality reduction credits are **readily available** in voluntary markets
- Reduction credits play a critical role **now** in cutting emissions and protecting existing carbon stocks

1

Credits can represent emissions reductions or **removals**

EXAMPLES
- Afforestation or reforestation
- Direct air carbon capture

Emissions Removal Credits

These credits result from activities that **remove and store emissions from the atmosphere**

- Removal credits will play an increasingly large role in "balancing" global emissions by mid-century
- Markets and technologies necessary for high quality removal credits will scale over time, but are currently limited

2

Credits can be **technology-based** or nature-based

EXAMPLES

- Methane capture and destruction
- Improved cookstove technology
- Renewable energy
- Direct air carbon capture

Technology-based solutions

These credits avoid, reduce, or remove emissions through technological approaches

- However, some project types may not be seen by stakeholders as impactful

  > For example, renewable energy is now cost-competitive with traditional energy sources in many areas, even without the financial incentives provided by carbon credits

- Most technological options for carbon removal approaches are new, and currently unavailable at scale

2

Credits can be technology-based or nature-based

EXAMPLES

- Methane capture and destruction
- Improved cookstove technology
- Renewable energy
- Direct air carbon capture

Technology-based solutions

These credits avoid, reduce, or remove emissions through technological approaches

- ✓ These credits can drive investment and innovation in early-stage technology, reducing costs and increasing availability
- ✓ They can also support action to tackle high-impact, short-lived climate pollutants such as methane

2

Credits can be technology-based or nature-based

EXAMPLES

- Tropical or temperate forest protection
- Conservation of blue carbon (e.g., mangrove, wetland, or ocean) ecosystems
- Retention of carbon stored in soils

Nature-based solutions

These credits avoid, reduce, or remove emissions through the protection and restoration of natural ecosystems

Benefits include contributing crucial funding to the **preservation of existing carbon stocks** while having strong co-benefits for biodiversity and communities

> Natural climate solutions can provide 20% of all the emissions reductions we need by 2050 to keep average global warming under 2°C

2

Credits can be technology-based or nature-based

EXAMPLES

- Ecosystem restoration
- Enhancement of carbon stored in soils

Nature-based solutions

These credits avoid, reduce, or remove emissions through the protection and restoration of natural ecosystems

- However, nature-based credits can sometimes be more vulnerable to reversals than technology-based approaches (e.g., through events like wildfires)
- Scientific challenges remain in measurement for activities like soil carbon sequestration

3

Nature-based credits can be generated at project or jurisdictional scale

EXAMPLES

- Avoided deforestation credits from conservation efforts on a single piece of private property

Project-Scale Approaches

These credits are generated within a limited and standalone project boundary

- Project-scale approaches can provide funding that enables important emissions avoidance or reduction activities for individuals or landholders
- Credits from individual projects are widely available in the voluntary carbon market

3

Nature-based credits can be generated at project or jurisdictional scale

EXAMPLES

- Credits from large-scale, jurisdictional forest protection transacted through initiatives like the LEAF Coalition

Jurisdictional-Scale Approaches

These credits are generated at the landscape level across entire jurisdictions or regions

- Jurisdictional approaches can generate emissions reductions or removals at scales not possible through individual projects
- This approach can incentivize governments to take actions and introduce policy necessary to achieve climate goals
- Large-scale approaches can **improve overall environmental integrity and resilience of climate benefits.**

Carbon Credit Quality

What is a high-quality carbon credit?

Why is it important?

Carbon Credit Quality

Quality is critical to ensure that carbon credits deliver genuine emissions reductions and climate benefits.

Companies should only invest in **high-quality** carbon credits that provide **positive environmental**, **economic, and social co-benefits.**

There are many dimensions of quality*, but here we focus on five key concepts.

*Consult resources from the Carbon Credit Quality Initiative, the Taskforce on Scaling Voluntary Carbon Markets (TSVCM) or the Integrity Council for Voluntary Carbon Markets (IC-VCM) for a full discussion of credit quality considerations. Quality criteria discussed here are based on a selection of TSVCM's draft Core Carbon Principles.

What defines quality in a carbon credit?

Key Dimensions of Credit Quality:

- Additional
- Permanent
- Monitored, reported and verified
- Leakage accounted for and minimized
- Does no net harm

+ Additional

- Credits must be **"additional beyond GHG emission reductions or removals that would otherwise occur without revenue from credits"***

  > In other words, the incentive from carbon credits must have led to the activity that generates reductions or removals
  >
  > If not, the carbon credit does not represent any **additional** benefits for the atmosphere beyond what would have otherwise happened

- Assessing additionality can be challenging – however, it is essential for ensuring credits represent actual emissions reductions

EXAMPLES

A landowner can choose to cut down forest on their property or keep it standing. If revenue from carbon credits results in the landowner preserving the forest, the credits are additional.

If the landowner was required by law to keep the forest standing, the credits did not provide an incentive and did not result in an additional climate benefit.

* Definition via TSVCM

Permanent

- Credits should represent carbon reductions or removals that are durable and protected over time
- Emissions reduced or removed can sometimes be emitted back into the atmosphere, resulting in climate benefits that are only temporary
- Permanence is addressed in different ways by different project types

> Some projects inherently store or reduce emissions permanently, while others must take steps to ensure reversal risks are managed

EXAMPLES

Events like a wildfire could damage a forest protected through the sale of carbon credits, emitting the carbon previously stored in that forest.

Carbon credit programs can plan for and address these risks. For example, setting aside an extra "buffer pool" of credits that is big enough to compensate for potential reversals can help mitigate risks of impermanence.

Monitored, Reported and Verified

- **Accurate, transparent, and credible accounting** is also critical for carbon credit quality
- Credits should be associated with a recognized and credible standard-setting body that has robust and transparent governance
- Credits should also be validated or verified by an accredited, third-party entity

Accounts for Leakage

- In some cases, activities that reduce or remove emissions can have other impacts, potentially increasing emissions elsewhere. This is known as **leakage**

  > For example, a forest protection project could inadvertently push illegal logging into other areas, resulting in emissions from deforestation in new locations

- Credit programs should rigorously monitor and mitigate potential leakage

Does No Net Harm

- Climate benefits provided by credits cannot come at the expense of negative environmental or social impacts
- Safeguards must exist to ensure credits enable conditions for a just and sustainable low carbon transition
- At minimum, credits should do **no net harm**, and include impact assessments, stakeholder consultations, and grievance mechanisms

EXAMPLES

A new forest protection program might be interested in selling carbon credits.

In order to do so, it would need to justify to crediting programs and future buyers that it undertook rigorous community impact assessments, obtained free, prior and informed consent, and has robust ongoing mechanisms for community feedback (among other required safeguards).

Current Challenges and Initiatives

Challenges and complexity remain for voluntary carbon credits

1. Company net zero goals are skyrocketing absent detailed plans for achieving them, contributing to uncertainty in markets.

2. Understanding quality when purchasing credits can be challenging and time-consuming.

3. Nature-based credits bring inherent challenges despite their importance.

4. Lack of clear guidance – and often conflicting available guidance – from standards organizations and regulators is a barrier for scaling action.

5. Science is complex and ever-changing, especially for nature-based credits (e.g. soil carbon and measuring forest carbon stocks).

Reduce your own emissions as much and as fast as possible in line with science

Don’t limit climate action to your own operational & supply chain emissions

Invest in projects that avoid, reduce or remove emissions via high quality carbon credits and other investment tools

Be transparent in your approach to decarbonization

There are initiatives working to solve issues of quality, claims and accounting to make sure real climate progress is being made.

VCMI Voluntary Carbon Markets Integrity Initiative

the integrity council for the voluntary carbon market

Business Alliance to Scale Climate Solutions

Natural Climate Solutions Alliance

The LEAF Coalition
Lowering Emissions by Accelerating Forest finance

Coalition for Negative Emissions

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Carbon Credit Quality Initiative

With their help, companies should act now - even given the complexity and lack of clarity.

Appendix

Appendix: Glossary of Common Terms

A carbon credit (or carbon offset) is an environmental commodity that represents the reduction, avoidance or removal of 1 metric ton of CO_2e compared to a projected baseline.

> **Carbon reduction or avoidance credits** are a subset of carbon credits that reduce or avoid emissions that would have happened in the absence of the activity.
>
> **Carbon removal credits** are a subset of carbon credits that remove CO_2 from the atmosphere and durably store it.

MRV – Monitoring, reporting and verification

VVB – Validation and verification of carbon credits is carried out by accredited 3rd-party Validation and Verification Bodies (VVBs).

Methodology sets out detailed procedures for quantifying the real greenhouse gas (GHG) benefits of a project, provides guidance to determine project boundaries, set baselines, assess additionality and quantify the GHG emissions that were reduced or removed.

Additionality is the concept that a project / activity leads to emission reductions that are additional to those that would have happened in the absence of the incentive generated by the crediting mechanism.

Baseline scenario is the most likely emissions scenario in the absence of the crediting mechanism. The baseline sets the level against which emission reductions or removals of a mitigation activity are determined.

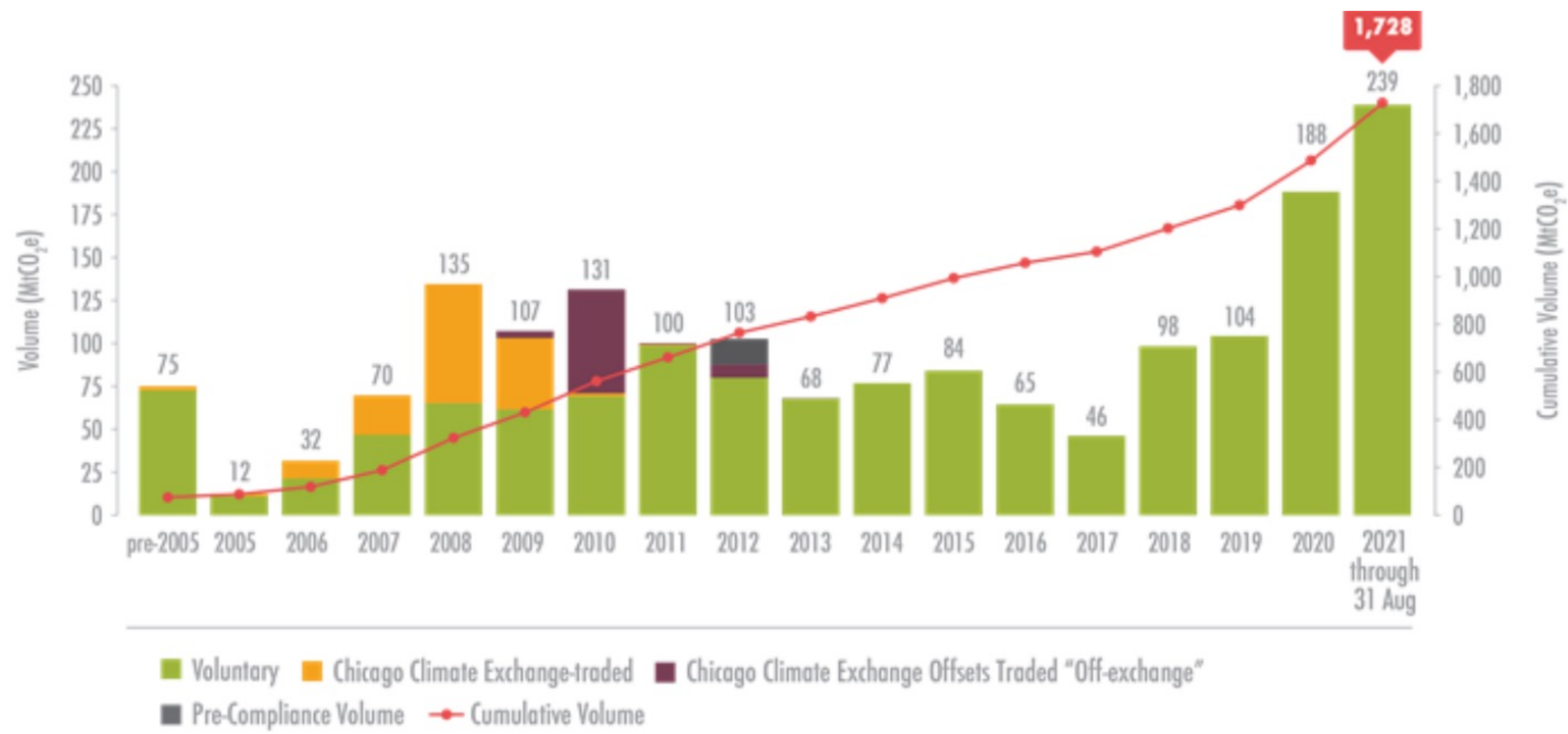
Leakage refers to increased emissions outside of project or program boundaries as a result of the activity within the boundary.

Permanence is the requirement that an activity has measures in place to manage situations in which emission reductions/removals are reversed (e.g., by natural disaster or mismanagement). If reversals are not managed the activity only results in a temporary greenhouse gas benefit for the atmosphere.

Appendix: Voluntary Carbon Market Trends

How big is the voluntary carbon market?

Market Size by Traded Volumes of Voluntary Carbon Offsets



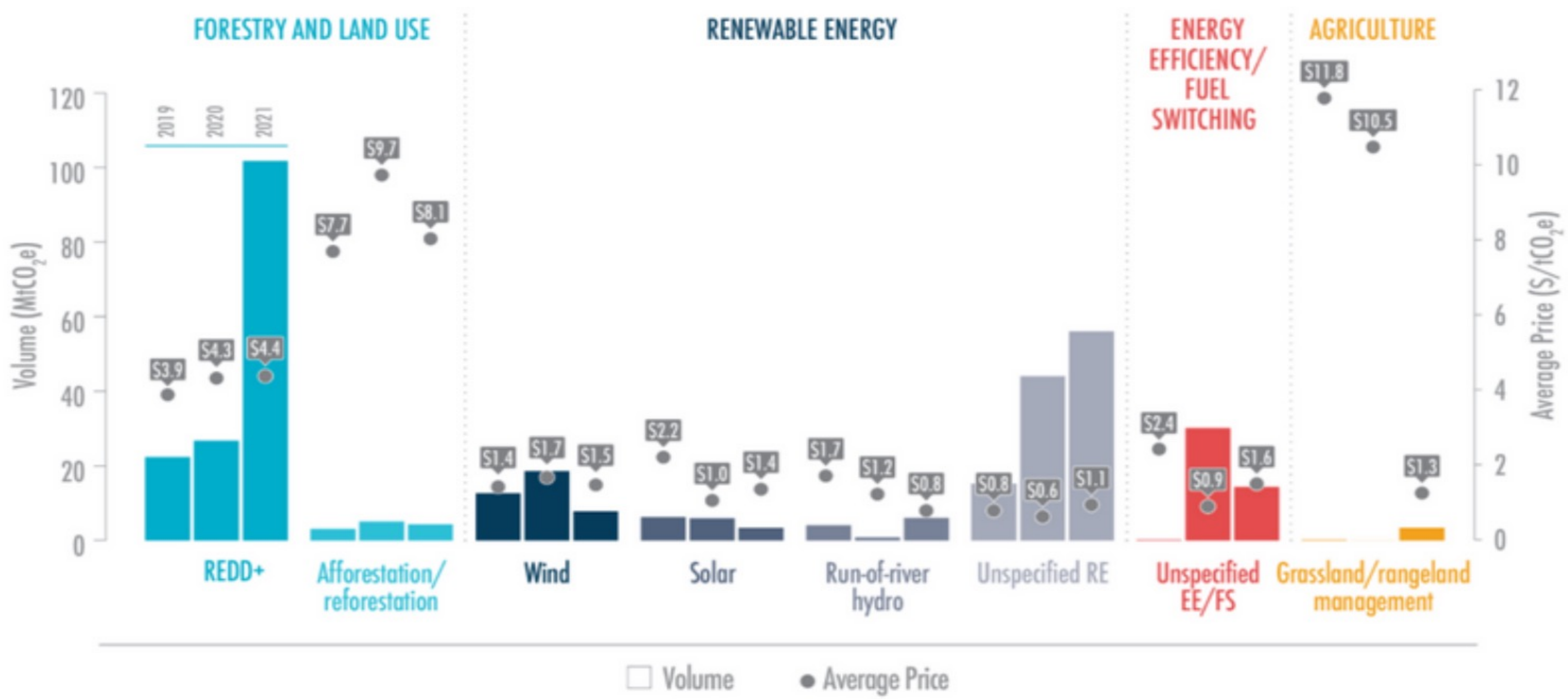
Via Forest Trends' Ecosystem Marketplace. 2021. 'Market in Motion', State of Voluntary Carbon Markets 2021, Installment 1. Washington DC: Forest Trends Association

Appendix: Voluntary Carbon Market Trends

What projects are companies investing in?

And at what prices?

Transacted Voluntary Carbon Market Sizes by Largest Project Types 2019 – 2021



Via Forest Trends' Ecosystem Marketplace. 2021. 'Market in Motion', State of Voluntary Carbon Markets 2021, Installment 1. Washington DC: Forest Trends Association

Appendix: Voluntary Carbon Market Trends

Where?

Transacted Voluntary Carbon Offset Volume and Average Price by Project Region

	2019		2020		2021 (through August)	
	Volume ($MtCO_2e$)	Price (USD)	Volume ($MtCO_2e$)	Price (USD)	Volume ($MtCO_2e$)	Price (USD)
Africa	16.1	$3.94	14.9	$4.24	23.9	$5.52
Asia	45.6	$1.80	63.0	$1.60	91.8	$3.34
Europe	1.1	$2.92	1.7	$9.47	0.8	$2.96
Latin America & Caribbean	15.3	$3.45	18.9	$4.17	36.6	$3.74
North America	15.5	$3.51	11.6	$6.31	10.0	$5.13
Oceania	0.5	$12.53	0.1	$20.57	0.1	$32.93

Via Forest Trends' Ecosystem Marketplace. 2021. 'Market in Motion', State of Voluntary Carbon Markets 2021, Installment 1. Washington DC: Forest Trends Association

Appendix: Resources for Credit Quality

Determining the quality of a carbon credit is essential, yet can be challenging and time-consuming

Companies can first look to existing credit quality guidance or tools from NGOs, academia, or other businesses

For example:

> [Carbon Credit Quality Initiative](#) from EDF, World Wildlife Fund and Oeko-Institute
>
> Credit quality resources from companies like **Microsoft** or **Google**
>
> Quality strategies in the **Carbon Offset Guide** from GHG Management Institute and Stockholm Environment Institute

Other new initiatives will further assist companies in evaluating quality:

the integrity council
for the voluntary carbon market

Integrity Council for the Voluntary Carbon Market (IC-VCM)

VCMI Voluntary Carbon Markets Integrity Initiative

Voluntary Carbon Markets Integrity Initiative (VCMI)

Business Alliance to Scale Climate Solutions

Business Alliance to Scale Climate Solutions (BASCS)

Appendix: Further Resources

Mobilizing Voluntary Carbon Markets (EDF)

> What Does the Science Tell Us?
>
> Trends in the Voluntary Carbon Markets: Where We Are and What's Next

Pathways to Net Zero: A Guide for Businesses (EDF)

Beyond Science-Based Targets: A Blueprint for Corporate Action on Climate and Nature (World Wildlife Fund)

Carbon Offset Guide (GHG Management Institute and Stockholm Environment Institute)

State of Voluntary Carbon Markets (Forest Trends)

Natural Climate Solutions for Corporates (Natural Climate Solutions Alliance)

Why Large-Scale Forest Protection Must Urgently Be Part of Corporate Climate Mitigation Strategies (Emergent)

Nature and Net Zero (World Economic Forum and McKinsey)

Carbon Dioxide Removal Primer (J Wilcox, B Kolosz, J Freeman)

Oxford Net Zero