



Voluntary Carbon Markets Insights: 2018 Outlook and First-Quarter Trends

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Acknowledgments

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Foreword

In the 13 years since Forest Trends' Ecosystem Marketplace first started reporting on the voluntary markets for carbon offsets, we have never seen greater change on the horizon.

Countries have begun to enact their emissions reduction goals under the Paris Agreement, many of which plan to implement domestic carbon pricing schemes and/or trade emissions reductions across borders—if they have not done so already. Yet, the Paris Agreement contains few hard-and-fast rules about international carbon trading, so negotiators are working hard to develop this structure and guidelines before 2020 (see page 13). On top of that, the international aviation industry is preparing to launch what may become the largest cap-and-trade program in the world (see page 17).

How these compliance markets affect existing *voluntary* carbon projects depends on how they are rolled out. Will they allow offsets from voluntary projects? If so, will there be restrictions on the type of project or when offsets are produced? With government and industry representatives around the world making these critical decisions in the remaining half of 2018 or 2019, now is a crucial time to track these market developments.

In the meantime, voluntary carbon market actors are continuing to explore and innovate. They are finding new ways of generating and selling emissions reductions, integrating their projects' activities with broader sustainable development goals, and collaborating with policymakers and industry groups about how to ensure compliance markets incorporate the best practices from voluntary carbon markets. Overall, these activities have resulted in over 430 million tonnes of emissions reductions generated since 2005 – this is equivalent to more than all of Australia's energy-related emissions in 2016.

To keep pace with this rapidly changing carbon markets landscape, we are deviating from our typical annual report format this year and are piloting a new mini-report, *Voluntary Carbon Markets: Outlooks and Trends*, that covers a shorter, more recent time period and examines the key trends that have emerged in the first quarter (Q1) of 2018. We provide an overview of the voluntary carbon markets – what they are and how they work – along with the latest first-quarter data on offset issuances, transactions, and retirements to bring our readers up to date. We also provide an in-depth outlook of the voluntary carbon markets, examining some of the major upcoming policy decisions that might radically change the voluntary carbon markets—or not.

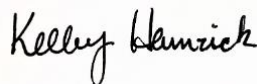
Our full *State of the Voluntary Carbon Markets* report will return in 2019, but before then, we believe the above developments are significant enough to track as they happen. We welcome your feedback and input, even more so in these evolving times.



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What Are Carbon Offsets?

The health of our planet depends on every government, company, and citizen to minimize their greenhouse gas emissions. Many are making major strides by transitioning to cleaner energy, reducing waste, and finding other creative solutions to cut their emissions. But these activities aren't enough to eliminate a carbon footprint completely. When reducing one's own emissions becomes physically impossible or financially unfeasible, many emitters turn to **carbon offsets** – measurable, quantifiable, and trackable units of **greenhouse gas (GHG)** emissions reductions.

Carbon offsets are produced by **projects** that carry out on-the-ground emissions reduction activities, and are typically measured in metric tonnes of carbon dioxide equivalents, or tCO₂e.¹ They can either be traded on the **voluntary markets**, where buyers and sellers trade on their own volition, or as part of a **compliance market**, where government regulations require emitters to either reduce their emissions or purchase offsets.

The vast majority of projects on the voluntary market follow rules and procedures set out by a voluntary carbon **standard**. If a project meets these criteria, the standard will **issue** carbon offsets equivalent to the emissions reductions. **Project developers** can then **transact** these offsets directly to **end buyers**, who can claim the emissions reductions as their own if they **retire** and remove the offsets from circulation. In other cases, project developers sell to **retailers** or **brokers**, who then resell or charge a fee for finding end buyers.

Box 1. Voluntary Carbon Market Standards

During the early stages of the voluntary carbon markets, many project developers used internal methodologies to calculate their project's emissions reductions. Today, most projects adhere to methodologies set out by one of several voluntary standards. These standards require projects to submit to third-party validation and verification to ensure projects have achieved their stated emissions reductions. Standards can differ by which project activities and types are allowed, where projects may be located, and what regulations projects must adhere to.

However, all voluntary standards require that offsets be:

- **Real:** there will be evidence that the project actually removes or prevents emissions;
- **Additional:** the emissions reductions would not occur without those project activities;
- **Measurable:** the volume of emissions reductions can be accurately measured; and
- **Verifiable:** a neutral, third-party auditor has verified the emissions reductions.

¹ Throughout this report, we measure offsets in thousand (KtCO₂e) or million (MtCO₂e) metric tonnes of carbon dioxide

How Are Voluntary Carbon Offsets Produced?

Project developers can employ a variety of activities to produce offsets, from installing renewable energy infrastructure like wind turbines or solar panels, to planting trees that remove and store carbon from the atmosphere.² The different methods for producing offsets are what distinguishes the various **project types**. Forest Trends' Ecosystem Marketplace groups project types into eight **categories**, listed below.

Table 1. Categories of Voluntary Carbon Projects, 2008-2018³

Project Categories	Projects with Issued Offsets	Volume of Offsets Issued in MtCO ₂ e (2005 - Present) ⁴	New Projects ⁵
Agriculture – modifying agricultural practices to reduce emissions by switching to no-till farming, reducing chemical fertilizer use, etc.	87	6.7	1
Chemical Processes and Industrial Manufacturing – modifying industrial processes to emit fewer greenhouse gases.	72	63.5	0
Energy Efficiency and Fuel Switching – improving energy efficiency or switching to cleaner fuel sources.	633	127.9	8
Forestry and Land Use – managing forests, soil, grasslands, and other land types to avoid releasing carbon and/or increasing the amount of carbon the land absorbs.	170	95.3	3
Household Devices – distributing cleaner-burning stoves or water purification devices to reduce or eliminate the need to burn wood (or other inefficient types of energy).	161	23.4	0
Renewable Energy – installing solar, wind, and other forms of renewable energy production.	611	61.9	2
Transportation – increasing access to public and/or alternative transportation (like bicycling) and reducing emissions from private transportation like cars and trucks.	43	1.1	0
Waste Disposal – reducing methane emissions from landfills or wastewater, often by collecting converting it to usable fuel.	238	57.5	0

² [Click here](#) for a more detailed explanation of how carbon offsets are produced and sold.

³ [Click here](#) to see which project types are in each category.

⁴ All data in this table are based on information from five standards: the American Carbon Registry (ACR), the Climate Action Reserve, the Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard (VCS).

⁵ Here we are defining "new projects" as projects that issued their first offsets in Q1 of 2018.

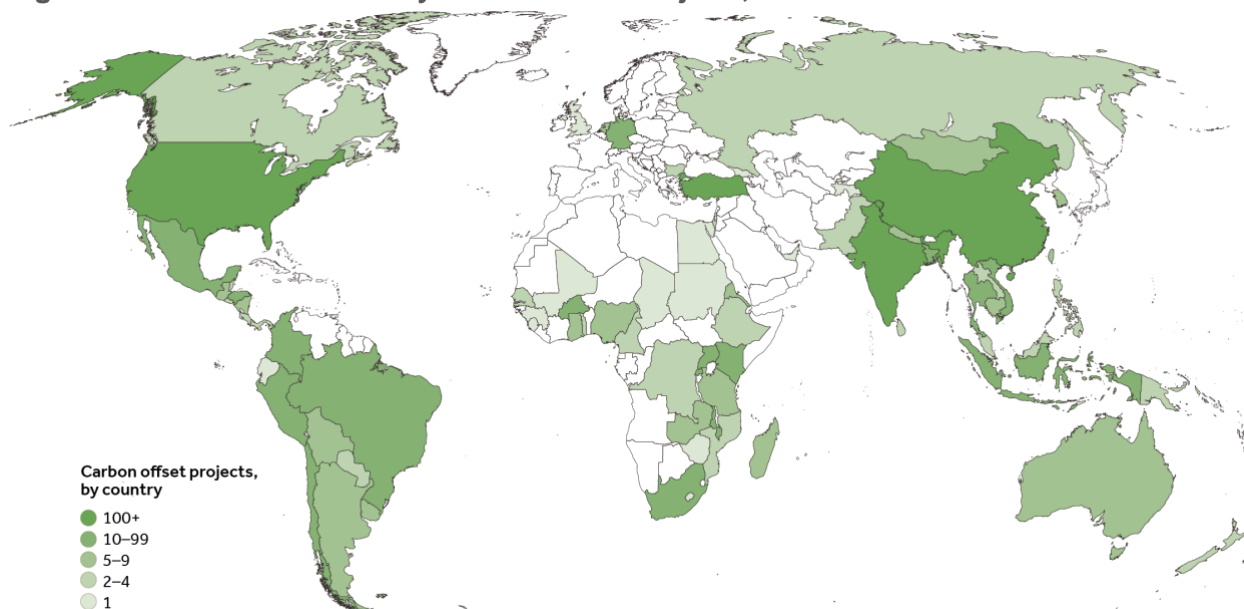
Where Are Voluntary Carbon Offsets Produced?

Voluntary carbon projects exist in 83 countries around the world, and, for the most part, can be traded freely between buyers and sellers in the same or across different countries. Some countries, like the United Kingdom and South Korea, have government-operated domestic markets that encourage businesses and individuals to buy locally-produced offsets.

Figure 1 shows how many projects in each country have issued offsets using voluntary carbon standards since 2005.⁶ A total of 2,008 projects have issued offsets during this time, mainly in Asia (51%) and North America (18%).⁷ Another 11% of projects have been based in Latin America and the Caribbean, 11% in Europe,⁸ and 11% in Africa. Oceania has been home to the fewest projects, with only 14 projects (1%) having issued offsets.

Projects in Asia and North America have also generated the largest share of the 435.7 MtCO₂e of offsets issued to date (39% and 26%, respectively), followed by Africa (13%), Latin America and the Caribbean (12%), Europe (9%), and Oceania (1%). Almost three quarters (72%) of all voluntary carbon projects are located in the top five project-hosting countries: India (442), China (426), the United States (351), Turkey (124), and Brazil (97).

Figure 1. Locations of Voluntary Carbon Offset Projects, 2008-2018



Notes: The map shows only projects that have issued offsets through the following voluntary carbon standards from 2008 to Q1 2018: American Carbon Registry (ACR), Climate Action Reserve (CAR), Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard (VCS) as of April 2018. Although projects were issued by voluntary standards, some projects' offsets may eventually be sold on compliance markets, such as California's Cap and Trade or Colombia's Fuel Tax. Based on data from 2,008 projects in 82 countries.

⁶ It is important to note that not all offsets issued by voluntary standards are ultimately used on the voluntary market. Some may be used for compliance purposes.

⁷ "North America" here refers to the United States and Canada only. Voluntary carbon projects and offsets from Mexico are included in our "Latin America and the Caribbean" region.

⁸ "Europe" here refers to all European countries, whether or not they are within the European Union (EU), as well as Turkey. There are few voluntary carbon projects within the EU because, historically, many EU member states have already committed to emissions reductions under the Kyoto Protocol. Thus, there are few instances where voluntary carbon projects could make additional emissions reductions beyond those included in the state emissions reductions accounting.

What Are the Climate Benefits of Voluntary Carbon Projects?

The volumes of offsets issued, transacted, and retired are important metrics for determining market size, but none of them are comprehensive indicators of the overall emissions reductions and climate benefits achieved by projects in the voluntary market.

Issuances reflect the volume of emissions reductions verified under a standard. Because verification and issuance of offsets costs money, some project developers only issue offsets when they have identified a buyer. Still, not all issued offsets are sold, and some offsets are resold multiple times. Hence, **transactions** and **retirement** volumes are also not a comprehensive indicator for a project's total emissions reductions.

In order to track the exact volume of greenhouse gas emissions avoided or absorbed because of voluntary carbon markets, we would need to look at the volume of offsets **generated**. That volume undoubtedly *exceeds* the volume of offsets issued, transacted, or retired.⁹

In the absence of this information, voluntary offset issuances are the closest proxy to the voluntary markets' environmental impact. **Since 2005, projects have helped to reduce, sequester, or avoid over 435.7 MtCO₂e. That is more than all of Australia's energy-related emissions in 2016.¹⁰ Last year alone, projects issued 62.9 MtCO₂e: a record high for the market.** That is the equivalent of *not* consuming almost 150 million barrels of oil.¹¹

Box 2: Sustainable Development and Carbon Offset Projects

While offsets are traded based on their climate benefits, many projects also have a host of additional impacts, known as "**co-benefits**." These co-benefits are often in line with other aspects of sustainable development, such as supporting the local economy through job training and creation, preserving watershed areas that supply clean water, or safeguarding biodiversity. In many cases, co-benefits are integral to the project and often one of the main reasons that suppliers and many buyers are engaged in voluntary carbon markets.

Several standards either incorporate co-benefits in their requirements or offer add-on certifications to measure co-benefits. Recently, many project developers and standards have begun aligning their co-benefits metrics with the United Nations' Sustainable Development Goals¹², which include everything from ending hunger to providing access to energy, to conserving marine life.

While there currently is no set of universally used metrics to measure many of these co-benefits, it is fair to say that many of the 435.7 MtCO₂e of offsets issued since 2005 have provided additional benefits to the communities and ecosystems in which they operate.

⁹ This information is typically found within Project Design Documents, Validation and/or Verification reports. Since the data might be located in different pages or documents, we do not currently have the aggregated emissions reductions generated numbers for voluntary carbon projects.

¹⁰ "National Greenhouse Gas Inventory," Australian Government Department of Environment and Energy, accessed May 2018, <http://ageis.climatechange.gov.au/>.

¹¹ "Greenhouse Gas Equivalencies Calculator," United States Environmental Protection Agency, last updated September 2017, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

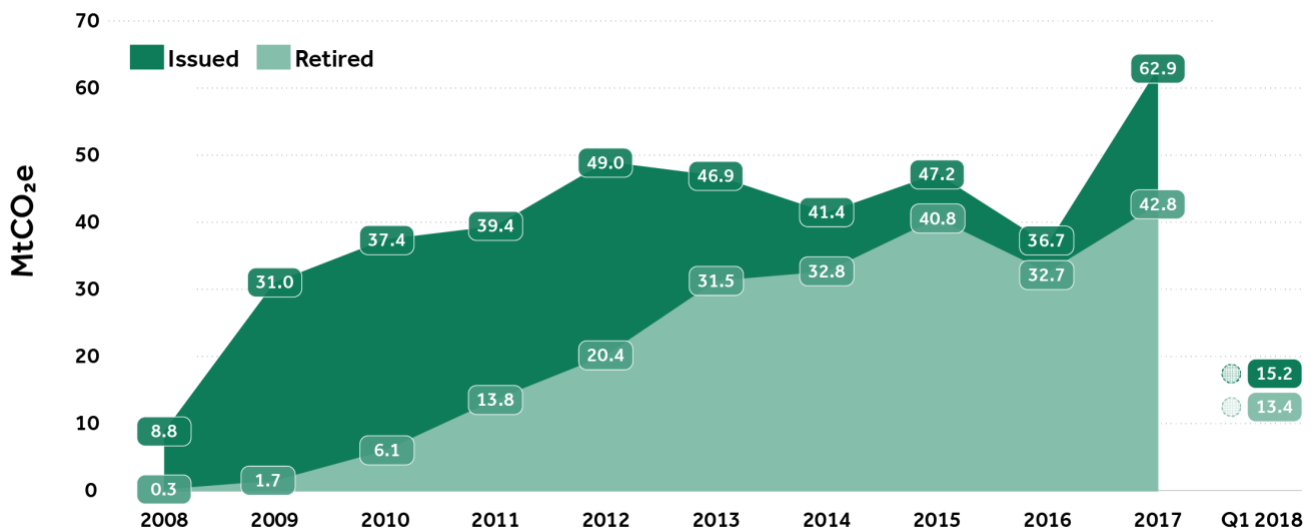
¹² "Sustainable Development Goals," United Nations, accessed July 2018, <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>.

What Is the Total Supply and Demand of Voluntary Offsets?

Issuance and retirements volumes are useful measures of supply and demand in the voluntary market, since issuances represent offsets available for sale, and retirements represent offsets that can no longer be resold. Issuances typically exceed retirements, in part because historically supply has outstripped demand, but also because of time lag between supply and demand; while perceived demand for offsets drives the creation and continuation of projects on the voluntary carbon markets, it might take years before a project produces a single offset.

Overall, since the voluntary carbon markets picked up in the late 2000's, offset issuances and retirements have both increased dramatically. In 2017, issuances (62.9 MtCO₂e) and retirements (42.8 MtCO₂e) reached record-highs.

Figure 2. Historical Voluntary Carbon Offset Issuances and Retirements



Notes: An error was found and this figure was updated April 16, 2019. Data is based on project registries from the following carbon standards: American Carbon Registry (ACR), Climate Action Reserve (CAR), Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard (VCS) as of April 2018. Based on 400.7 MtCO₂e offsets issued and 222.8 MtCO₂e offsets retired between 2008 and 2017. Although there was some pre-2008 market activity, it is not included in this figure due to a lack of consistent, publicly-available information.

While many factors contribute to the volume of offsets issued and retired in a given year, one reason for this uptick in 2017 may have been the **Paris Agreement**,¹³ as more awareness of climate change may have led businesses to make new commitments to reduce emissions. Likewise, the US government's decision to pull out of the Paris Agreement may have also sparked an uptick in demand, as more businesses and individuals were motivated to take climate action into their own hands.

Another factor in the historic year-over-year variation is compliance market activity. For example, many companies regulated under California's compliance market decided to purchase voluntary offsets in 2012—in preparation for the program's launch in 2013. After 2013, some project developers and standards that previously operated in the voluntary markets shifted their focus towards California's compliance market. In this way, new or expanding compliance markets may reduce activity in voluntary markets.

¹³ For more information, see the "Outlook" section starting on page 12.

Q1 Trends: Issuances

Standards will issue offsets to a project only if the following criteria are met: the project has implemented its emissions reductions activities and demonstrated that it has achieved quantifiable emissions reductions by undergoing third-party **validation** (to approve project activities and plans prior to project commencement) and **verification** (to ensure the project's activities have been implemented).

When an offset is issued, it is assigned a unique serial number and listed on a **registry** that traces the offset from issuance through transaction(s) to retirement. This is a critical step in providing transparency around offset ownership and to prevent double-claiming.

As discussed previously, a project's total volume of offsets issued does not always equate to the project's total volume of emissions reduced. Because project developers must pay for both third-party verification and the issuance of offsets, some project developers will only pay for these services if they have a committed buyer. Hence, issuance volumes represent a *minimum* amount of emissions reductions and available offset supply (see page 4 for more information about the environmental impact of offsetting).

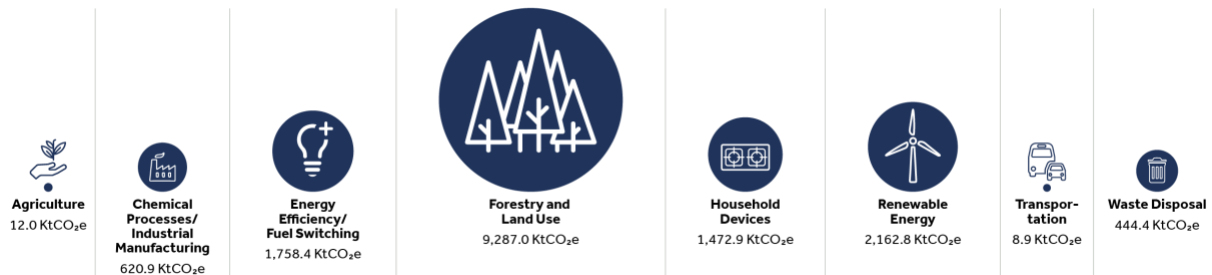


A class from Southern Oregon University on a sustainability and energy tour looking at a new solar installation. Photo credit: BP Target Neutral, Green Campus energy project

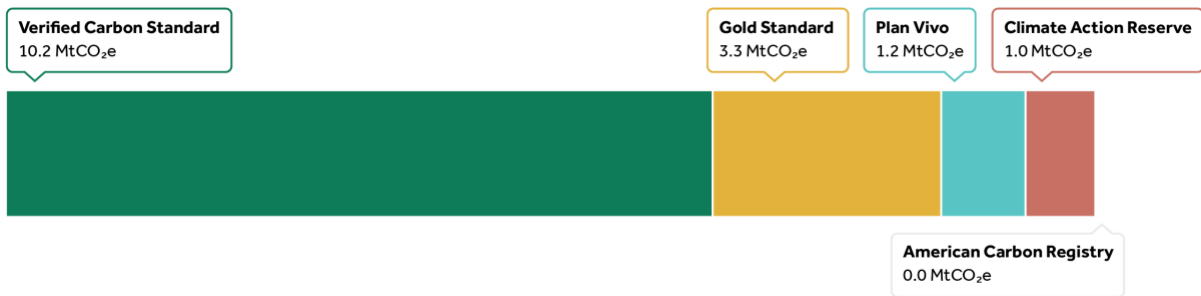
Figure 3. Q1 Issuances by Project Category, Standard and Country

160 projects issued 15.8 MtCO₂e offsets January-March 2018.
 7.0 MtCO₂e in January | 5.2 MtCO₂e in February | 3.5 MtCO₂e in March

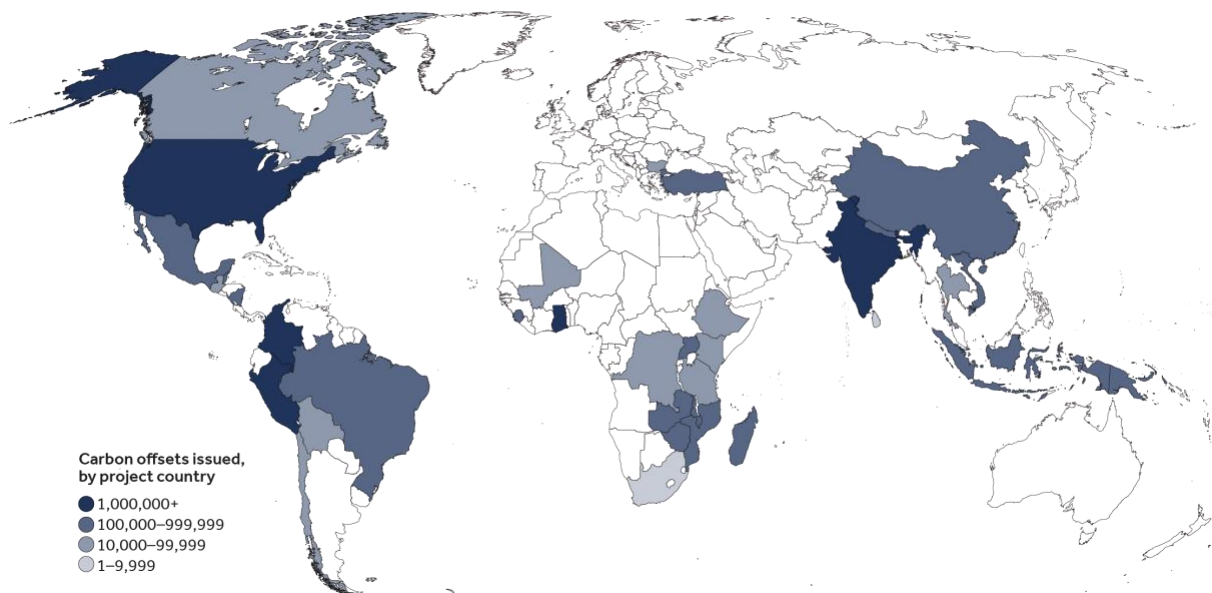
By Project Category



By Standard



By Country



Notes: The data is based on project registries from the following carbon standards: American Carbon Registry (ACR), Climate Action Reserve (CAR), Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard (VCS) as of April 2018. Based on 15.8 MtCO₂e offsets issued. Some category totals do not add up to 15.8 MtCO₂e due to rounding conventions.

Q1 Trends: Transactions

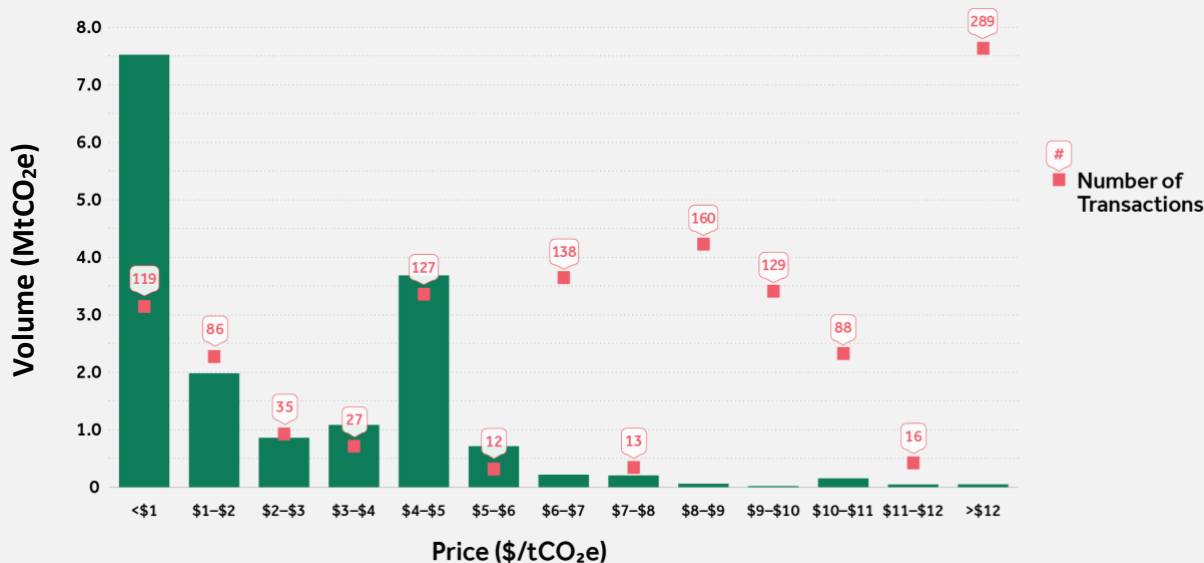
After offsets are listed in a secure registry account, project developers may sell to intermediaries like a retailer, broker, or exchange (who can resell to an end buyer) or directly to an end buyer.¹⁴ While an offset can only be issued and retired once, it may be transacted an unlimited amount of times before retirement. Because of this, there are a few critical differences between the transaction data presented here than the issuance and retirement data presented elsewhere in the report.¹⁵

First, we include the volume of offsets recorded for each transaction – even if the same offset was transacted multiple times (for example, from project developer to retailer to end buyer). Second, because there is no public source of transaction data, Ecosystem Marketplace conducted a survey¹⁶ to gather data directly from market participants: because we only report on survey respondents' data, the transaction data presented here should be viewed as conservative. Third, while issuances and retirements information is based on project registries from the five most common standards, this transactions information also includes offsets certified by other standards.

Box 3: What's in a Price?

In contrast to compliance markets, where offsets typically sell at a relatively consistent price, offset prices on voluntary carbon markets can range dramatically. While Ecosystem Marketplace has tracked average prices ranging between \$3-\$6/tCO₂e, actual prices range from under \$0.1/tCO₂e to just over \$70/tCO₂e. Figure 4 below depicts the volume and number of transactions by price reported in Q1 of 2018.¹⁷

Figure 4. Volume of Offsets Sold and Number of Transactions by Price, January – March 2018



Notes: The data is based on results from Ecosystem Marketplace's survey of project developers, retailers, and brokers conducted in Spring 2018. Based on 1239 transactions totaling 16.6 MtCO₂e offsets reported between January – March 2018. See Annex I: Methodology for more information.

This range in prices may be attributed to several factors, including: project costs (which can differ based on the project's location and type of activity); buyer's preferences (e.g., specific location, project type, co-benefits, or other buyer criteria), and the type of the transaction (typically, offsets bought in bulk tend to sell at lower prices than offsets bought in smaller quantities).

¹⁴ In some cases, a buyer or intermediary may choose not to sell immediately and instead wait for more favorable market conditions.

¹⁵ While most of the market activity data in this report comes directly from five voluntary standards (ACR, CAR, the Gold Standard, Plan Vivo, and VCS), transaction data comes from an Ecosystem Marketplace survey conducted to carbon project developers, retailers, and brokers. See the methodology section for more information.

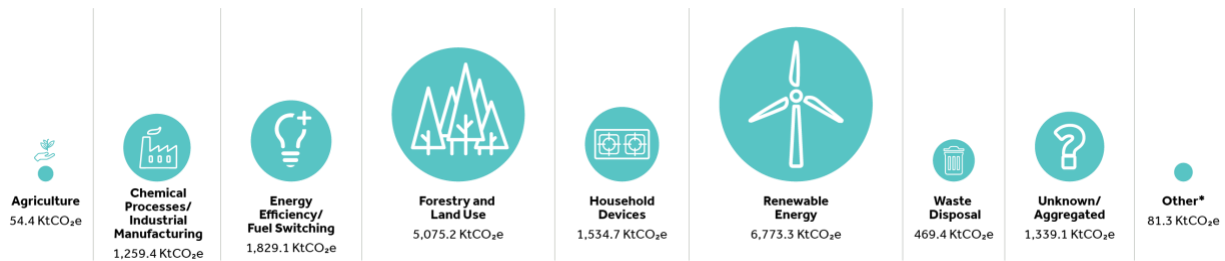
¹⁶ Our latest survey builds on our experience collecting voluntary carbon market data over the last twelve years.

¹⁷ Transaction data could be presented in aggregate or individual transactions. As a result, the number of transactions in this figure is underestimated.

Figure 5. Q1 Transactions by Project Category, Standard and Country

18.7 MtCO₂e offsets transacted January-March 2018 at an average price of \$2.4/tCO₂e.

By Project Category



By Standard

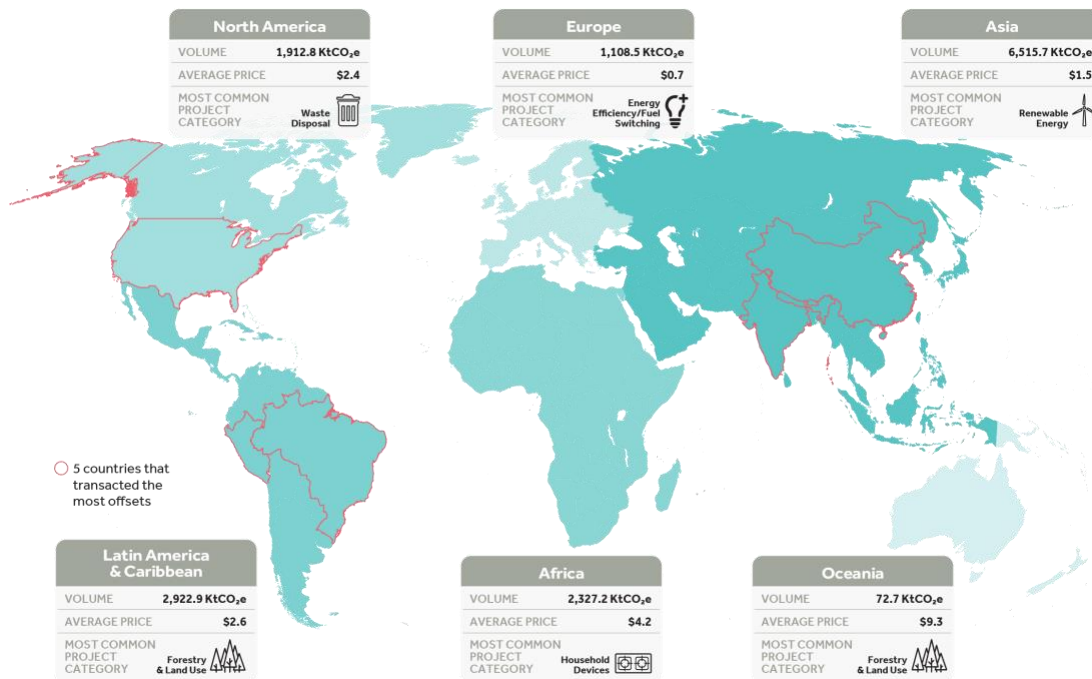
Volume



Value

Verified Carbon Standard 12,287.1 KtCO ₂ e \$22,565.3 K	Gold Standard 3,728.5 KtCO ₂ e \$11,667.8 K	Multi/Aggregated 1,284.3 KtCO ₂ e \$4,142.4 K	Climate Action Reserve 600.7 KtCO ₂ e \$869.9 K
Clean Development Mechanism 313.0 KtCO ₂ e \$319.9 K	American Carbon Registry 292.9 KtCO ₂ e \$1,425.8 K	Plan Vivo 98.4 KtCO ₂ e \$787.7 K	Other/None 23.6 KtCO ₂ e \$228.2 K

By Region



* Other includes transportation and other project types.

Notes: Data is based on results from Ecosystem Marketplace's survey of project developers, retailers, and brokers conducted in Spring 2018. See the methodology for more information. Based on 18.7 MtCO₂e offsets transacted. Some category totals do not add up to 18.7 MtCO₂e due to rounding conventions and/or incomplete offset attribute information.

Q1 Trends: Retirements

Retirement is the final stage of an offset's lifecycle, after which offsets are no longer able to be traded. At this point, the end buyer may claim the emissions reductions represented by that offset against their own emissions. In order to ensure the offset cannot be resold, the registry tracking that offset permanently removes the offset's unique serial number from circulation.

While it is best practice to retire an offset *before* claiming it against emissions, sometimes end buyers claim the emissions reduction before retiring the offset. Hence, the retirement volumes noted throughout this report represent a minimum amount of end-buyer demand for offsets.

Box 4. Who Buys Offsets?

Many kinds of people, companies, organizations, and governments voluntarily offset their emissions. A traveler might offset their air travel emissions. A major company may choose to offset a portion of their emissions as part of their sustainability strategy. Earlier this year, the rock band Pearl Jam offset the emissions associated with their tour in Brazil.¹⁸

In the surveys for our *State of the Voluntary Carbon Markets* reports, Ecosystem Marketplace asks market participants (project developers, retailers, brokers, and exchanges) about who purchases their offsets. [Last year's report](#) supported trends we have seen over the last decade, namely that:

- The bulk of voluntary offset purchases by volume are made by multi-national, private, for-profit companies.
- Returning buyers tend to purchase higher volumes, while new buyers, perhaps dipping their toes in the market, often purchase fewer offsets.
- There are many different reasons an end buyer may choose to purchase offsets, but often offsetting is generally part of a corporation's broader environmental sustainability strategy or an individual's specific goal to reduce emissions.
- When choosing which offsets to buy, end buyers who are looking for "charismatic" offsets that emphasize co-benefits like economic growth or biodiversity preservation, and they are often willing to pay higher prices for them.

¹⁸ "Pearl Jam invests in Amazonian reforestation to offset emissions from current Brazil tour," Mongabay, published March 20, 2018, <https://news.mongabay.com/2018/03/pearl-jam-invests-in-amazonian-reforestation-to-offset-emissions-from-current-brazil-tour/>.

Figure 6. Q1 Retirements by Project Category, Standard and Country

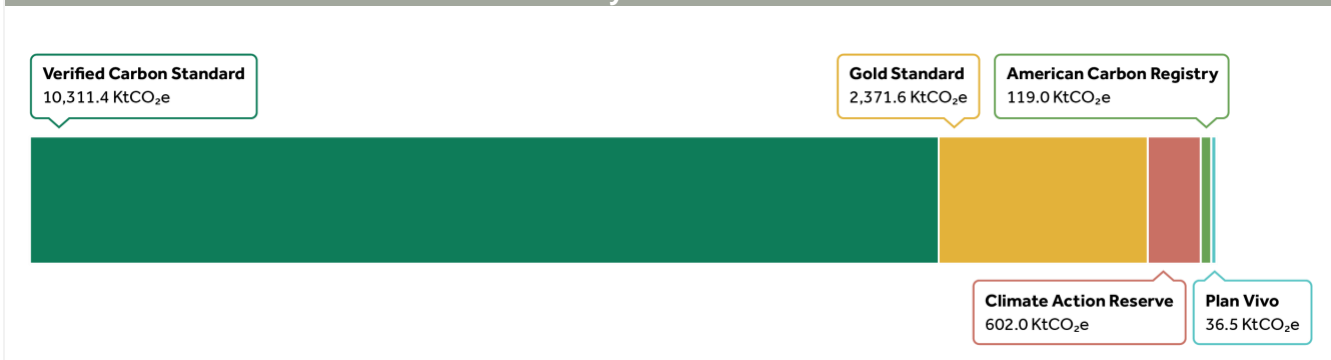
213 projects retired 13.7 MtCO₂e offsets, January-March 2018.

5.2 MtCO₂e in January | 5.1 MtCO₂e in February | 3.3 MtCO₂e in March

By Project Category



By Standard



By Country



Notes: An error was found and this figure was updated April 16, 2019. The data is based on project registries from the following carbon standards: American Carbon Registry (ACR), Climate Action Reserve (CAR), Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard (VCS) as of April 2018. Based on 13.7 MtCO₂e offsets retired in 58 countries. Some category totals do not add up to 13.6 MtCO₂e due to rounding conventions.

On the Horizon

The previous sections of this report focused on past developments in the voluntary market for carbon offsets – how they have evolved, how they work, and recent market activity. With more countries designing and rolling out carbon pricing schemes that create domestic compliance markets, as well as international markets developed by the UNFCCC’s climate negotiators and the airline industry, there are key future decisions and policies that could completely transform supply and demand for voluntary carbon markets.

This section examines some of the factors that have the potential to reshape the voluntary carbon market in the coming years and decades. “What to Watch” pages provide a summary of how compliance and voluntary markets may evolve. “From the Experts” includes input from active voluntary carbon market participants that we surveyed in early 2018. Finally, we take a closer look at one of the biggest developments on the horizon for the voluntary carbon market: the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).



A mother and child using a SmartSaver wood cookstove in Lagos, Nigeria. Photo credit: Envirofit.

What to Watch: Regulated Markets

Under the 2015 Paris Agreement, all 195 signatory countries made a commitment to reduce greenhouse gas emissions.¹⁹ This is great news for the planet, but what will it mean for the voluntary carbon markets?

As countries determine how to meet their carbon reduction commitments under the Paris Agreement, more and more plan to implement domestic carbon pricing schemes and/or trade emissions reductions across their borders. This will undoubtedly impact the voluntary carbon markets. *How* voluntary markets are affected depends on which regulations are enacted, and how they are implemented. There are several ways planned compliance systems could integrate voluntary carbon markets:

- ***Allow voluntary offsets to transition into a domestic compliance markets:*** Some governments already allow regulated emitters to use offsets certified by voluntary standards to comply with emissions regulations. Colombia's carbon fuel tax, for example, allows regulated businesses to purchase offsets developed by voluntary standards instead of paying the tax. Similarly, California allowed eligible voluntary carbon projects to transfer into the state's cap-and-trade program via its "Early Action" initiative in order to ensure there was a tradable supply available at the program's start. In addition, many of California's cap-and-trade program's offsets protocols were adapted from existing voluntary standards.
- ***Allow voluntary offsets to transition into an international, decentralized compliance market (Paris Agreement, Article 6.2):***²⁰ Article 6 of the Paris Agreement lays out a few options for encouraging offset trading. In Article 6.2, countries agreed to establish a unit of emissions reductions (called Internationally Transferable Mitigation Outcomes, ITMOs) that could be traded between countries. The criteria for ITMOs are still being debated: they might represent allowances, offsets, or some new unit of measurement. In May 2018, negotiators met in Bonn, Germany to discuss and propose eligibility rules. These negotiations culminated with 54 pages of notes that recorded many contradictory views; negotiators plan to meet again in Bangkok, Thailand before the upcoming United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties in December to finalize their positions.
- ***Allow voluntary offsets to transition into an international, centralized compliance market (Paris Agreement, Article 6.4):***²¹ Article 6.4 proposes the creation of a centralized, global mechanism to trade ITMOs. Such a mechanism would be supervised by an international governing organization, like the Clean Development Mechanism (CDM). Countries currently participating in the Kyoto Protocol can trade the globally-recognized CDM-approved offsets. A new Article 6.4 mechanism might transfer all CDM offsets, duplicate parts of the CDM, or create an entirely new mechanism. Alternatively, countries may choose to forgo a centralized market, and instead favor multi- or bi-lateral trading through similar policies or markets.
- ***Allow voluntary offsets to transition into the CORSIA market:*** International aviation is not covered by countries' national Paris Agreement commitments. Instead, the International Civil Aviation Organization (ICAO) plans to launch the first-ever sector-wide cap-and-trade program, CORSIA. CORSIA could rely heavily on carbon offsetting to meet the industry's emissions reductions targets. Representatives to ICAO are in the process of negotiating the program specifics, including offset eligibility rules. Decisions about which project types and vintages are accepted will have major implications across the voluntary carbon markets (see page 17).

¹⁹ While the United States signed and adopted the Paris Agreement, it plans to withdraw from the Agreement by 2020.

²⁰ "Paris Agreement". United Nations Treaty Collection, accessed July 16, 2008, https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=en.

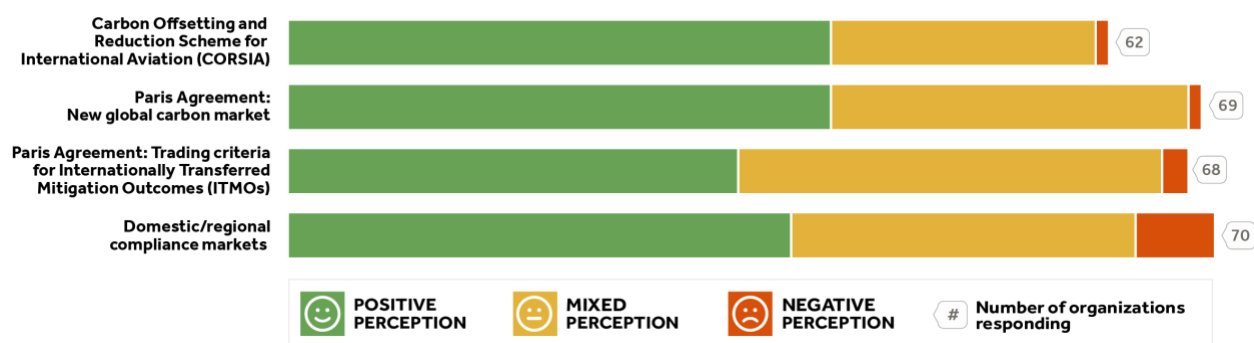
²¹ *Ibid.*

From the Experts: Regulated Markets

These different pathways represent a snapshot of the many changes that are afoot in the world of carbon markets. While predicting the future is challenging, we conducted a survey to ask current market participants and experts about how these changes may affect the voluntary carbon markets. More specifically, we asked what they view as the markets' biggest challenges and opportunities, and how they expect the aforementioned potential compliance markets to impact their work.

Most respondents viewed the upcoming CORSIA, Paris Agreement, or domestic markets as positive new opportunities (see Figure 7). These markets may result in both a new source of demand for projects that transition to selling offsets in compliance markets, as well as a reduction in the supply of voluntary offsets. Regardless of whether or not upcoming compliance markets allow for voluntary offsets, many agreed that raising overall awareness of offsetting is a good thing for the voluntary carbon markets.

Figure 7. How Voluntary Market Actors Perceive Potential Upcoming Compliance Markets



Notes: Data is based on results from Ecosystem Marketplace's survey of project developers, retailers, and brokers conducted in Spring 2018. See the methodology for more information.

Despite this generally favorable outlook, nearly all respondents reiterated the same word when describing the future of voluntary carbon markets: uncertainty. This was especially true for the Paris Agreement's Article 6.2 decisions around allowing voluntary offsets to transition into an international, decentralized compliance market. We explore this further in the next section, "On the Horizon: Voluntary Markets."

While few respondents expected to be negatively impacted by a new international market, several were wary of the effect domestic programs might have on their projects. A number of respondents commented that they had gotten frustrated when interacting with country officials and feel that their governments don't understand or incentivize private action on climate change. This skepticism is particularly felt with regards to **Reducing Emissions from Deforestation and Forest Degradation (REDD+)** national programs and policies, where many REDD+ project developers struggle to get their governments to learn from their experiences and consider including them in future jurisdictional, sub-national and/or nation-wide programs for addressing deforestation.

What to Watch: Voluntary Markets

Given that many potential paths for future voluntary offset activity involve transitioning segments of the voluntary market into compliance programs, what does that mean for the existing voluntary market?

The International Carbon Reduction and Offset Alliance (ICROA) has been convening expert roundtables to discuss ways voluntary offsetting can fit into this new and uncertain future. In November 2017, ICROA released guidance²² for voluntary offsets in a post-2020 world, which identified potential ways that voluntary carbon projects could co-exist with countries' climate commitments. These solutions, along with other potential solutions collected from Ecosystem Marketplace's survey of market experts are presented below:

- **Countries create domestic voluntary markets:** Many voluntary offset suppliers have historically sold to international end buyers.²³ However, a growing number of countries and regions are creating government-run domestic voluntary markets to boost demand for local offsets. Many of these programs are quite small and operate alongside an active compliance market. They include: France's Voluntary Carbon Land Certification initiative, the United Kingdom's Woodland Carbon Code, Colombia's Voluntary Carbon Market, and Korea's Forest Carbon Offset Scheme.
- **Countries agree to subtract voluntary offsets from their reporting:** Voluntary offsets may continue to be generated in sectors covered by the host country's climate goal, as long as that country is willing to remove those emissions reductions from their reporting to the UNFCCC. Whether any countries would be willing to give up claims to these emissions reductions remains to be seen.
- **Voluntary carbon projects exist outside of regulated sectors:** The Paris Agreement provides flexibility for countries to decide how to regulate and reduce carbon emissions, including which sectors of the economy are responsible for achieving emissions reductions. As a result, there may be room for voluntary offsets generated from non-covered sectors within those countries. If the host country does not calculate emissions from that sector, the offsets might be sellable to international buyers; if the emissions are counted but unregulated, the offsets might be sellable to domestic buyers.
- **Voluntary carbon projects sell non-carbon certificates to buyers:** Instead of purchasing emissions reductions, voluntary end buyers could receive recognition for their financial contribution to a voluntary carbon project. The offsets, however, would be claimed by the host country's government.
- **Voluntary offsets can sell to voluntary buyers through Article 6.4:** If the Paris Agreement's Article 6.4 allows voluntary offsets into its proposed global mechanism, the mechanism may allow non-state participants like companies or individuals to purchase and retire offsets. This would, in effect, ensure that emissions reductions occur above and beyond what countries have promised.
- **Voluntary carbon markets remain as-is in the United States:** Since the United States is currently planning to withdraw from the Paris Agreement by 2020, most of what has been discussed above does not apply to the US voluntary offset market. With no nationwide compliance market either, US-based voluntary carbon projects can continue to operate and sell offsets without the risk of double claiming.

²² International Carbon Reduction and Offset Alliance. *Guidance Report: Pathways to increased voluntary action by non-state actors* (International Carbon Reduction and Offset Alliance, 2017), https://icroa.org/resources/Documents/ICROA_Pathways%20to%20increased%20voluntary%20action.pdf.

²³ With a notable exception being the US, where most US-based projects sell offsets to US-based end buyers.

From the Experts: Voluntary Markets

A number of challenges – some new, some old – exist for active voluntary market participants. Many respondents to the Ecosystem Marketplace survey reiterated their frustration from previous years about low pricing and lack of demand. Meanwhile, depending on how new markets like CORSIA and the Paris Agreement are designed, market participants could see a rapid rise in demand for voluntary offsets. Therefore, the market is seen as high-risk for new project investment and (due to associated costs) they are also less inclined to invest in verification and issuance of new offsets from existing projects.

Encouragingly, other respondents said voluntary demand has never been better, citing more corporates making serious commitments to fight climate change or increasing the ambition of existing emissions reduction goals (especially by reducing emissions outside of their direct activities).

Despite these new and ambitious goals, many companies are not recognized nor rewarded for their offsetting investments and activities. One of the primary reasons is that the most commonly-used standard for quantifying corporate GHG emissions, the Greenhouse Gas Protocol, does not allow offsets as a means to reduce net emissions. In addition, while a plethora of new initiatives seek to encourage climate-smart corporate behaviors, including CDP's Climate Change Program (which is structured in alignment with the GHG Protocol), the Science Based Targets Initiative, and the RE100 Initiative, they offer little or no acknowledgement to corporations that go beyond internal emissions reductions activities to fund external emissions reductions through offsetting.



Seedlings being grown at a community tree nursery for a smallholder reforestation program in San Juan de Limay, Nicaragua. Photo credit: Taking Root, CommuniTree Project

Up in the Air: CORSIA's Potential Impact on Voluntary Offsets

The signing of the 2015 Paris Agreement was a landmark moment in the global effort to address the drivers of climate change. Nearly every country in the world agreed to limit its national greenhouse gas emissions; however, these domestic goals do not cover emissions occurring across borders, namely from international aviation and shipping.

Instead, countries agreed to collaborate on reducing these emissions through two United Nations (UN) sector-specific agencies: International Civil Aviation Organization (ICAO) and International Maritime Organization (IMO). While negotiations for industry-wide regulations to reduce emissions from international shipping are ongoing, the 192-member states of ICAO already set an aspirational emissions reduction goal back in 2013: to achieve carbon neutral growth beginning in 2020.

There are several potential pathways to achieve this goal: improving aircraft fuel efficiency, transitioning to cleaner-burning fuels (e.g. biofuels), and implementing market-based mechanisms for emissions reductions (e.g. offsetting). With international aviation expected to grow rapidly in the coming years, improving fuel efficiency and using cleaner fuels will likely be insufficient to achieve this goal. That's why, in 2016, ICAO adopted the first sector-wide carbon offsetting scheme: CORSIA. CORSIA will be implemented in phases:

1. The pilot phase (2021-2023), where countries can participate on a voluntary basis.²⁴
2. The first phase (2024-2026), where countries can participate on a voluntary basis.²⁵
3. The second phase (2027-2035), where all countries must participate.²⁶

Depending on the growth in international aviation and the development of other emissions reductions activities (namely fuel efficiency and cleaner-burning fuels), CORSIA could generate demand of 1.6-3.7 billion tonnes for emissions reductions²⁷ during its three phases of implementation (from 2021-2035).²⁸ This would dwarf any other operational or planned market, including the European Union's Emissions Trading Scheme and China's cap-and-trade program.

Table 2. Key Timelines of CORSIA Decisions and Activities

Date	Parties	Outcome
2018, June	ICAO	Standards and Recommended Practices (SARPs) adopted by the ICAO Council.
2019, January	All Countries	Countries must start monitoring, reporting and verifying airlines' international emissions.
2021-2023	Countries participating on voluntary basis	Pilot phase begins
2022	ICAO	Review of CORSIA
2023-2026	Countries participating on voluntary basis	First phase begins
2025	ICAO	Review of CORSIA
2027-2035	All countries (except exempted countries)	Second phase begins
2028	ICAO	Review of CORSIA

²⁴ As of 1 July 2018, 72 States, representing 76% of international aviation activity (2014 RTK data), intend to voluntarily participate in CORSIA from its outset.

²⁵ The difference between the pilot and first phases is the baseline from which airlines will calculate their emissions reduction requirements; in the pilot phase, airlines will have the option to choose 2020 or the current year, whereas beginning in the first phase airlines must use the current year.

²⁶ Exceptions include countries that have very few international flights (determined by ICAO analysis of international revenue tonne-kilometers), and countries categorized as least developed countries, small island developing states, and landlocked developing countries. Any of these countries may still decide to voluntarily participate.

²⁷ Sean Healy, CORSIA: Quantification of the Offset Demand (Öko-institut e.V., June 2017), https://www.carbon-mechanisms.de/fileadmin/media/dokumente/sonstige_downloads/CTI_Workshop_2017/5_Healy_170623_CORSIA_CTI_Presentation.pdf.

²⁸ CORSIA's baseline emissions are determined as the average emissions of 2019 and 2020. ICAO is now hard at work to develop Standards and Recommended Practices (SARPs) as well as guidance for countries to monitor, report and verify emissions as well as how to comply with offsetting requirements.

The potential demand from CORSIA would have major implications for the voluntary markets, however, who benefits will be largely determined by ICAO's decisions about how the market is structured and which offsets are eligible. Here are a few of the big decisions at play:

- **Standards:** The ICAO Council, consisting of 36 ICAO Member States, adopted Standards and Recommended Practices (SARPs) in late June 2018. These SARPs will be added to the legally binding Chicago Convention on International Civil Aviation and lay out the criteria for essential design elements of CORSIA. Decisions around offset eligibility will occur in a separate process led by the ICAO Council and a Technical Advisory Body.
- **Emissions Units:** A Technical Advisory Body will screen and recommend eligible standards and offsets for approval by the ICAO Council. These standards might include voluntary standards, compliance standards, and/or REDD+ programs. They might also include specify that certain methodologies or project types with a standard or program are eligible. At the moment, few details are known about which standards, project types, or other criteria might be allowed for use in CORSIA. Until a final decision in this regard is taken by the ICAO Council, voluntary carbon project developers still won't have a clear idea of whether they are eligible to provide emissions units to be used in CORSIA.²⁹
- **Vintage:** Another key question is how new offsets must be (an offset's age is called "**vintage**"). Countries home to many historical carbon offset projects typically prefer to keep vintages unrestricted, as this could help funnel more finance into their existing offset projects. Yet a number of other countries, especially those in the European Union, prefer stricter restrictions on offset age. Vintage restrictions are also under consideration for CORSIA.³⁰

The ICAO Council and Governing Body are currently negotiating these aspects of CORSIA, but decisions might not happen until after first compliance cycle begins in 2021. Furthermore, CORSIA is subject to a periodic review every three years beginning in 2022, and many of these decisions may change in the future. ICAO will take into account the decisions made by the UNFCCC regarding Article 6 of the Paris Agreement and promote compatibility with those decisions.³¹ Given that these negotiations are still ongoing, the eligibility of standards, project types, and emissions units under CORSIA may change in the future.

Current Airlines that Offset

While many airlines will offset for the first time under CORSIA, others have already been offsetting for voluntary or compliance purposes. Also, Figure 8 shows which countries already measure and reduce emissions from domestic flights; all flights within the European Union, for example, already have to meet the EU's emissions reduction goals for the sector and usually do so by purchasing compliance offsets.

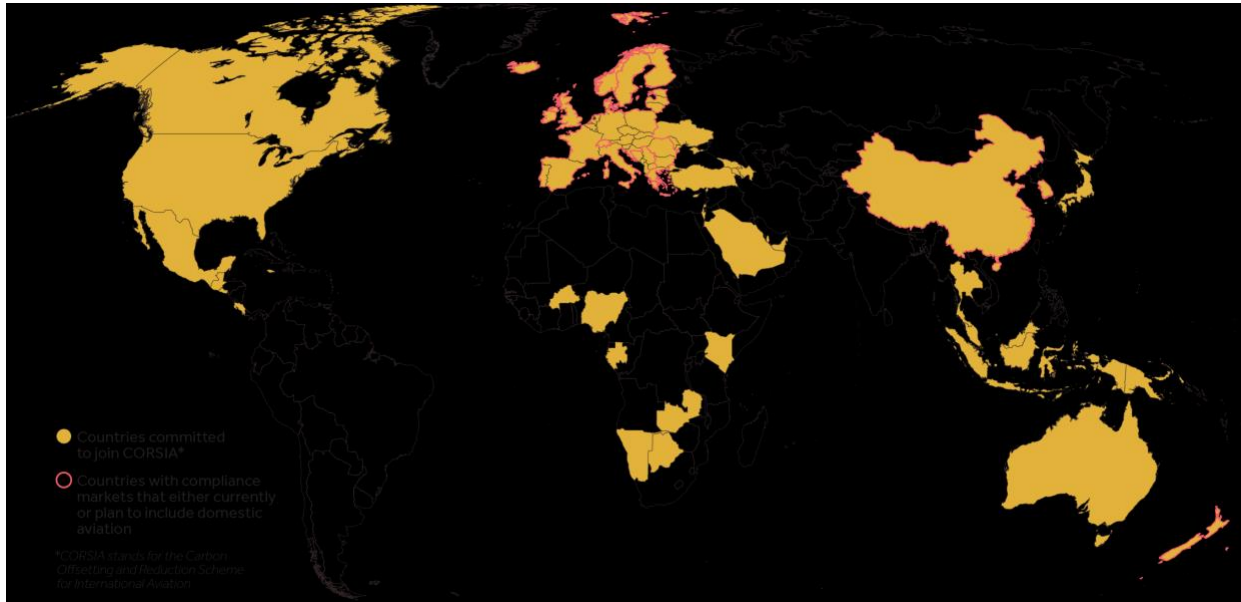
Many airlines also voluntarily offset some of their domestic and international emissions and/or offer the opportunity for customers to offset their flights. We analyzed 129 of the largest airlines around the world and recorded if they voluntarily offset or offered customers the option to voluntarily offset the emissions associated with their flight.

²⁹ According to Assembly Resolution A39-3, paragraph 20 d), the ICAO Council will establish a standing technical advisory body to make recommendations to the Council on the eligible emissions units for use by CORSIA.

³⁰ Outside of ICAO negotiations, countries have proposed a variety of vintage restrictions. These proposed dates align with a date of key decisions within ICAO: such as when ICAO agreed to consider market-based measures to meet their 2020 carbon neutrality goal (2013), set up CORSIA (2016) or launch CORSIA (2019).

³¹ According to Assembly Resolution A39-3, paragraph 20 e)

Figure 8. Countries Participating in the Voluntary Phase of CORSIA* and Countries with Aviation Included in a Compliance Market



Notes: The most recent data about countries participating in the voluntary pilot phase of CORSIA can be found on the ICAO website: <https://www.icao.int/environmental-protection/Pages/market-based-measures.aspx>. Countries may voluntarily join CORSIA at the beginning of any given year, provided they notified ICAO of their decision to join by June 30 of the preceding year. The data about countries with aviation emissions reductions come from: ICAP, Emissions Trading Worldwide: Status Report 2018 (Berlin: ICAP, 2018). These programs only cover domestic (or in the case of the EU, intra-regional) aviation, not international. Voluntary offsetting activity by airlines collected directly by Evan Yoshimoto, contributing researcher to this report.

A total of 29 airlines offer offsetting to their customers, while 15 airlines voluntarily offset their own emissions in some capacity (11 of these airlines offset their own emissions and offered offsetting to their customers). In general, airlines headquartered in Oceania (38%) were most likely to have carbon offsetting programs for customers, followed by airlines based in North America (29%) and Asia (29%).

Airlines aren't the only actors in the aviation sector concerned about the climate. The Airport Carbon Accreditation program encourages airports around the world to measure their footprint, reduce their own emissions, reduce third-party emissions at the airport, and finally offset remaining emissions. Currently, 237 airports participate in the program and 39 (primarily European airports) have reached the fourth level of accreditation to become carbon neutral by offsetting.

Table 3. Airlines Offering Voluntary Offsetting to Passengers, by Airline Headquarter Region

Regions	# of Airline Headquarters	# of Airlines Offering Voluntary Offsetting
Asia	31	9
Europe	34	7
Africa	10	2
Oceania	8	3
Latin America & Caribbean	21	3
North America	14	4
Non-EU Europe	11	1

Notes: Voluntary offsetting activity by airlines collected directly by Evan Yoshimoto, contributing researcher to this report.

Conclusion

Since trading of voluntary carbon offsets first took off in the late 2000's, voluntary carbon projects have helped to reduce, sequester, or avoid over 435.7 MtCO₂e. But this is still just a drop in the bucket compared to the total action needed on a global scale. Even with countries' new pledges under the Paris Agreement, scientists estimate that *at least* an 11,000 MtCO₂e emissions reduction gap remains to keep the world from warming above two degrees Celsius.³²

It would be easy to dismiss the climate impact of the voluntary carbon markets as insignificant, but that ignores a few critical facts. First, voluntary markets are growing fast. In the last decade, demand for voluntary carbon offsets has grown by over 140-fold, from just 0.3 MtCO₂e in 2008 to 42.8 MtCO₂e in 2018. Major brands, like Disney, Microsoft, and most recently Lyft, are using offsetting as part of their emissions reduction strategies.

Perhaps even more significant, though, are the voluntary markets' technical advancements. Voluntary markets have a unique ability to innovate and incubate new ideas – they have developed science-based methodologies for quantifying emissions reductions, enforced requirements to ensure that emissions reductions are real, and built market infrastructure to track emissions reductions and prevent double claiming. Upcoming compliance markets now have the opportunity to capitalize on the extensive groundwork laid by voluntary carbon markets.



Photo credit: Shutterstock

³² United Nations Environment Programme. *Emissions Gap Report 2017*. Accessed July 16, 2018, https://wedocs.unep.org/bitstream/handle/20.500.11822/22104/EGR_2017_ch_3.pdf?sequence=1&isAllowed=y.

Annex I: Methodology

Where Did the Data Come From?

We obtained issuance and retirement data in April of 2018 from five voluntary standards: American Carbon Registry, Climate Action Reserve, Gold Standard, Plan Vivo, and Verra's Verified Carbon Standard. Where up-to-date public information was available, we downloaded records from standards' websites. Where it was not, we obtained records through email correspondence.

There is no comprehensive online data available for voluntary transactions of carbon offsets. In order to obtain information about the volume, price, project type, and standards for offsets traded in the voluntary market, Ecosystem Marketplace conducted a survey of carbon project developers, retailers and brokers. In March and April 2018, we sent 607 requests for data. We received 131 responses in total, 37 of whom did not conduct transactions in Q1, and 63 of whom had conducted transactions and shared that information confidentially for this report.

How Do You Protect the Confidentiality of Survey Responses?

This report presents only aggregated data. All supplier-specific information is treated as confidential. Any supplier-specific transaction data mentioned in the text is already public information or approved by the supplier. Additionally, we do not identify prices or volumes from any country, project type, standard, or vintage for which we have fewer than three data points.

What Is Not Included in Our Findings and Figures?

While we have done our best to ensure that the data in this report is as complete as possible, due to limited time and data availability, there are some elements of the market that are not included. As such, all findings and figures should be regarded as conservative.

Our issuance and retirements data is based on data from 5 major voluntary standards (listed above), but does not include offsets used voluntarily from the United Nations Framework Convention on Climate Change's Clean Development Mechanism, or offsets issued under voluntary government-mediated programs with their own standards, like the United Kingdom's Woodland Carbon Code.

Our data on carbon offset transactions is based on a survey of project developers, retailers and brokers. Not all companies and organizations active in this space responded to our request for data, and we did not send requests to every active company and organization. The carbon offset industry is an ever-evolving world. While we do our utmost to ensure that we reach out to any carbon project developers, retailers, and brokers actively involved in the market, inevitably there are some we miss. If you are in the carbon space and would like to be included in future surveys, please email info@ecosystemmarketplace.com.

Annex II: Acronyms and Glossary

Acronyms:

ACR – American Carbon Registry
CAR – Climate Action Reserve
CDM – Clean Development Mechanism
CORSIA - Carbon Offsetting and Reduction Scheme for International Aviation
EU – European Union
GHG – Greenhouse Gas
ICAO – International Civil Aviation Organization
ICROA – International Carbon Reduction and Offset Alliance
ITMO – Internationally Transferable Mitigation Outcomes
Q1 – First quarter of 2018 (January – March)
REDD+ – Reducing Emissions from Deforestation and Forest Degradation
SARPs – Standards and Recommended Practices
tCO_{2e} – Metric tonnes of carbon dioxide or equivalent (typically measured in millions, M, or thousands, K)
UN – United Nations
UNFCCC - United Nations Framework Convention on Climate Change
US – United States
VCS – Verified Carbon Standard

Glossary of Terms and Concepts:

Broker: Brokers are intermediaries who do not take ownership of offsets, but facilitate transactions for a fee between project developers and end users, between project developers and retailers, and/or between retailers. When given the opportunity, some retailers will also perform this role, but generally not at significant volumes.

Carbon Market: Carbon markets are where carbon offsets are bought and sold. They may be either voluntary or compliance.

Voluntary markets refer to the collective voluntary transactions tracked worldwide. There is no centralized single marketplace for voluntary transactions but rather many discrete transactions and, in some cases, country or program-related markets (such as the United Kingdom’s Woodland Carbon Code).

Compliance markets are the result of government regulation to reduce greenhouse gas emissions, and allow regulated entities to obtain and surrender emissions permits (allowances) or offsets in order to meet predetermined regulatory targets.

Carbon Offset: Also referred to as “offsets”. A carbon offset is a quantified environmental benefit that is designed to compensate for impacts to habitat, environmental functions, or ecosystem services. Offsets may be regulatory or voluntary. Within carbon and greenhouse gas markets, offsets specifically refer to one metric tonne of carbon dioxide equivalent reduced, avoided or sequestered by an entity to compensate for emitting that tonne elsewhere.

Co-Benefit: Co-benefits are additional environmental, social, or other benefits arising from a carbon project that are quantified based on metrics or indicators defined by the project developer, a co-benefits certification program, or third-party carbon project standard that accounts for both climate and co-benefits.

Some registries and standards enable co-benefits certification to be “tagged” onto issued carbon offsets, if quantification and verification of co-benefits are not already embedded in a carbon project standard.

End Buyer: End-buyers are buyers who purchase offsets with the intention to retire them. Offsets will no longer be sold after transferring to an end-buyer. This is in contrast to retailers, who purchase offsets with the intention to resell them. End buyers are also referred to in this report as “end-users.”

Greenhouse Gas (GHG): A gas that contributes to the climate change by absorbing the sun’s infrared radiation when in the earth’s atmosphere.

GHG Emitting Entities: Any entity, e.g. corporation, that produces greenhouse gas emissions. GHG Emitting Entities are considered to be sources of GHG emissions, and their emissions are calculated either at the entity-wide or facility level.

Issuance: Issuance is the final project stage which occurs after third-party auditors have guaranteed a project has avoided or sequestered carbon dioxide or its equivalent. Once a project has met all requirements by its voluntary standard, the developer can apply to a standards body to issue eligible offsets. Any offsets issued to the project owner come with a unique serial number and are listed in a registry that monitors any ownership transfers or offset retirement. Issuance takes place once a carbon offset project has been validated, verified, and undergone other required processes.

Paris Agreement: The Paris Agreement was a landmark decision negotiated by 196 countries participating at the United Nations Framework on Climate Change’s Conference of the Parties in December 2015. The Agreement states that countries should set national emissions reductions goals in order to keep the global average temperature rise below 2 degrees Celsius, and attempt to keep temperature rise below 1.5 degrees Celsius. As of June 2018, 195 countries signed the agreement and 178 countries are party to the agreement. The United States, while party to the agreement, has announced its intention to withdraw; the earliest this withdrawal can happen is November 2020.

Project: Also referred to as “carbon projects” and “carbon offset projects”. A project is a site, or suite of sites, where restoration, sequestration, or other activities are implemented for the purposes of marketing the resulting ecosystem service assets or outcomes to buyers. Projects quantify their avoided or reduced emissions to produce tradable climate reduction certificates, called offsets. We often refer to projects as either voluntary or compliance projects, based on which the intended market for the projects’ offsets.

Project Category: Project categories represent similar groups of project types of carbon offset projects.

Project Developer: A project developer is a catch-all phrase to describe organizations that create carbon offset projects, beginning with the initial Project Design Document all the way to offset issuance. Project developers include organizations that are the project owner, partner organizations involved in project implementation, project financiers/investors, or others.

Project Type: Project developers may implement a variety of activities to reduce, sequester, or avoid emissions of greenhouse gases and produce offsets. Project type refers to the type of activities used to produce offsets.

Reduced Emissions from Deforestation and Forest Degradation (REDD+): REDD+ projects are project types in areas where existing forests are at risk of land-use change or reduced carbon storage. The projects focus on conserving these forests before they are degraded or deforested, resulting in the avoidance of a business-as-usual scenario that would have produced higher emissions. Emissions reductions occur primarily through avoided emissions.

Registry: A registry issues, holds, and transfers carbon offsets, which are given unique serial numbers to track them throughout their lifetime. Registries can also retire offsets. In compliance markets, each market has its own designated registry. In the voluntary market, independent registries exist.

Retailer: Retailers do not traditionally manage project development and documentation. Instead, they contract with project developers to take ownership of a portfolio of offsets that they then offer to end-buyers. Retailers typically offer other corporate carbon management services to end-buyers, such as advising on internal emissions reductions strategies.

Retirement: The final project development stage, retirement is the point at which an organization permanently sets aside a carbon offset in a designated registry, effectively taking the carbon offset's unique serial number out of circulation. Retiring offsets through a registry ensures that they cannot be resold. This is of particular importance if the buyer's intent is to claim the offset's emissions reductions against a carbon reduction or neutrality target.

Standard: A standard is a set of project design, monitoring, and reporting criteria against which carbon offsetting activities and/or projects' environmental and social co-benefits can be certified or verified. In the voluntary markets, a number of competing standard organizations have emerged with the intent to increase credibility in the marketplace. More recently, national and sub-national regulated markets have also designed standards specific to regional needs for voluntary use.

Transaction: The point at which a buyer signs a contract to purchase offsets, regardless of whether suppliers agree to deliver offsets immediately or in the future.

Validation: The project development stage that follows the Project Design Document. Validation is the approval of carbon offset projects during planning stages. To achieve validation, projects must submit information on project design for third-party approval. Project design information generally includes baseline scenarios, monitoring plans, and methodologies for calculating emissions reductions.

Verification: The project development stage that follows validation. Verification may take place up to several years after validation. It refers to the process of verifying emissions reductions generated by an offset project to a particular standard, which quantifies actual emissions reductions to ensure that the appropriate number of offsets are issued to the project.

Vintage: The year in which emissions reductions occur. The vintage of the offsets may not necessarily match the year in which the offsets are transacted—and the vintage year may be in the future.

About Forest Trends

Ecosystem Marketplace, an initiative of the non-profit organization Forest Trends, is a leading global source of information on environmental finance, markets, and payments for ecosystem services. We believe that transparency is a hallmark of robust markets and that by providing accessible and trustworthy information on prices, regulation, science, and other market-relevant issues, we can contribute to market growth, catalyze new thinking, and spur the development of new markets, and the policies and infrastructure needed to support them.

Forest Trends works to conserve forests and other ecosystems through the creation and wide adoption of a broad range of environmental finance, markets and other payment and incentive mechanisms. Forest Trends does so by 1) providing transparent information on ecosystem values, finance, and markets through knowledge acquisition, analysis, and dissemination; 2) convening diverse coalitions, partners, and communities of practice to promote environmental values and advance development of new markets and payment mechanisms; and 3) demonstrating successful tools, standards, and models of innovative finance for conservation. For up-to-date information on environmental markets, sign up for our newsletters here: <https://www.forest-trends.org/ecosystem-marketplace/>

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3Degrees exists for one simple reason – to make it possible for businesses and their customers to take urgent action on climate change. As a certified B Corporation, we provide renewable energy and emission reduction solutions to global Fortune 500 companies, utilities and other organizations that want to join the fight against climate change. The 3Degrees team has deep expertise in sustainability consulting, environmental markets, renewable energy and carbon project development, and utility renewable energy programs. Together with our customers, 3Degrees helps develop and implement creative solutions that ensure environmental integrity and make good business sense.

3Degrees was founded in 2002 as a division of 3Phases Energy Services and spun off in 2007. Since our founding, we have worked with over 400 clients in 60 countries and have been widely recognized for our industry leadership and award-winning programs for clients. The company is headquartered in San Francisco, with offices in Portland, Oregon, Seattle, Washington and Richmond, Virginia. Learn more at 3degreesinc.com.



BP Target Neutral develops carbon neutral products and services for BP's customers and partners. The programme is not managed for profit and has offset 3 million tonnes of carbon on behalf of customers since 2006 - that's equivalent to taking around 1.3 million cars off UK roads for one year. The programme uses the best practice of reduce, replace and neutralize to drive efficiencies, source lower carbon feedstocks, and then offset any unavoidable emissions. Underpinning their carbon neutral offers, BP Target Neutral uses carbon credits sourced from a portfolio of high quality offset projects around the world. The selection of carbon offset projects is overseen by an independent Project Selection Forum, comprised of environmental NGOs with a distinguished history in improving how corporations and individuals can minimize their impact on the environment. More information is available at www.bptargetneutral.com.



Cool Effect is a San Francisco Bay Area 501(c)(3) non-profit that allows individuals and businesses to direct funding to carefully vetted, high-quality carbon reducing projects around the world. Carbon credits are a measurable way to take immediate action to fight climate change.

Cool Effect verifies the science and the business practices of each project on its platform and provides the highest level of transparency and education for buyers of carbon credits. Over 90% of each donation goes directly to the project to help each grow and reduce even more carbon pollution. Since the launch of the platform in 2017, over 300,000 people have reduced over 600,000 metric tonnes of greenhouse gas emissions. To learn more about our mission, please visit cooleffect.org or follow Cool Effect on [Facebook](#), [Instagram](#), [Twitter](#), and [YouTube](#).



Pioneering Finance for Conservation

Biodiversity Initiative

Promoting development of sound, science-based, and economically sustainable mitigation and no net loss of biodiversity impacts

Coastal and Marine Initiative

Demonstrating the value of coastal and marine ecosystem services

Communities Initiative

Strengthening local communities' capacity to secure their rights, manage and conserve their forests, and improve their livelihoods

Ecosystem Marketplace

A global platform for transparent information on environmental finance and markets, and payments for ecosystem services

Forest Policy, Trade, and Finance Initiative

Supporting the transformation toward legal and sustainable markets for timber and agricultural commodities

Public-Private Finance Initiative

Creating mechanisms that increase the amount of public and private capital for practices that reduce emissions from forests, agriculture, and other land uses

Supply Change

Tracking corporate commitments, implementation policies, and progress on reducing deforestation in commodity supply chains

Water Initiative

Promoting the use of incentives and market-based instruments to protect and sustainably manage watershed services

Learn more about our programs at www.forest-trends.org