ECOSTAR
NATURAL TALENTS

STATE OF EUROPEAN MARKETS 2017

Voluntary Carbon

Ecosystem Marketplace
A FOREST TRENDS INITIATIVE

UNIVERSITÀ DEGLI STUDI DI PADOVA

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ACRONYMS

ACR	American Carbon Registry
AFOLU	Agriculture, forestry and other land use
A/R	Afforestation/Reforestation
CAR	Climate Action Reserve
CDM	Clean Development Mechanism
CMG	Carbon Monitoring Group
CO_2	Carbon dioxide
COP	Conference of the Parties
EU	European Union
EU ETS	European Union Emissions Trading Scheme
IFCC	Italian Forest Carbon Code
IFM	Improved Forest Management
$KtCO_2e$	Thousand metric tonnes of carbon dioxide or equivalent reduced
LULUCF	Land-use, land use change and forestry
$MtCO_2e$	Million metric tonnes of carbon dioxide or equivalent reduced
NGO	Non-governmental organisation
PDD	Project Design Document
PIN	Project Idea Note
REDD+	Reducing Emissions from Deforestation and Forest Degradation (the "+" refers to the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in reducing emissions)
t	tonne of carbon dioxide or equivalent reduced
VOCAL	Voluntary Carbon Land Certification
VCS	Verified Carbon Standard
WCC	Woodland Carbon Code
UK	United Kingdom
UNI	Italian Normative Organisation

GLOSSARY

Afforestation/Reforestation project: Afforestation/reforestation (A/R) projects are a project type involving establishment of forests on areas without forest cover, in order to capture additional carbon in new tree

biomass and other carbon pools. Emissions reductions occur primarily through additional carbon sequestration.

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.

Buyers: Buyers purchase offsets either for their own internal use (called “end-users”) or for re-sale to another buyer (called “intermediaries”). Intermediaries, such as retailers, purchase offsets with the intention to resell. In contrast, end-users purchase offsets to count against their emissions and typically retire any purchased offsets to signal that those offsets are no longer available for sale.

Clean cookstoves project: Clean cookstoves projects are a project type involving the distribution of cleaner and/or more efficient stoves and/or fuels to households, thereby reducing emissions. Select clean cookstoves also reduce the amount of black carbon emitted, a pollutant not currently counted as a greenhouse gas but one that does affect climate change as well as human health. The Gold Standard developed a separate certification to measure black carbon in 2015.

Co-benefits: 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.

Compliance markets: 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.

End-buyers: 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. Also referred to in this report as “end-users.”

Energy efficiency project: Energy efficiency projects are a project type involving replacing current energy uses with new or more efficient technologies, processes, or practices.

European-headquartered organisation: European-headquartered organisations are based in Europe, but may conduct business both within and/or outside of Europe.

European-based projects: European-based projects are carbon projects developed in Europe. To date, all European-based projects tracked by Ecosystem Marketplace have been developed by European-headquartered organisations, though an organisation based outside of Europe could theoretically build a European-based project.

Fuel-switching project: Fuel-switching projects are a project type involving switching from traditional fossil fuels to renewable sources of fuel.

Forests and land-use: Forests and land-use is a term that refers to the forestry, land use and/or agricultural sectors.

Improved forest management (IFM) project: Improved forest management projects are a project type involving managing existing forest areas to increase carbon storage and/or to reduce carbon losses from harvesting or other silvicultural treatments. Emissions reductions may occur through additional sequestration and/or avoided emissions.

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.

Landfill methane project: Landfill methane projects are a project type involving capturing methane emitted at landfills, while also preventing the release of toxic organic compounds and odours.

Methodology: A methodology lays out requirements for carbon offset projects for calculating emissions reductions. Project developers can either use pre-existing methodologies or develop new ones. Voluntary offset standards each have a list of approved methodologies that they accept.

Offset: This term refers to 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.

Permanence: Permanence is the principle that carbon offsets must permanently remove the carbon dioxide or equivalent emission from the atmosphere or oceans. For forest carbon, a reversal of carbon storage can happen from human activity (e.g., logging) or unforeseen natural events (e.g., forest fires, pest outbreaks).

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. Carbon offset projects quantify their avoided or reduced emissions to produce tradable climate reduction certificates, called offsets.

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

Project Idea Note (PIN): The Project Idea Note is the first stage in project development. The Project Idea Note is a preparatory step before creating a carbon offset project that is often required by project methodologies. A Project Idea Note may include project plans; project feasibility, impact, and risk assessments; findings from stakeholder input sessions; and other early-stage preparations.

Project Design Document (PDD): The Project Design Document is the project stage that follows the Project Idea Note, once a methodology is selected. A Project Design Document details project design, anticipated emissions reductions, plans for quantifying and monitoring the delivery of climate and other social and environmental benefits, demonstrates that that the project activity exceeds “business-as-usual” reductions and avoids emissions leakage, and addresses other technical issues.

Reduced Emissions from Deforestation and forest Degradation (REDD+): REDD+ projects are project types developed 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.

> **Avoided Planned REDD+:** Avoided planned REDD+ projects protect forests that have been legally authorised to convert to non-forest land.

Avoided Unplanned REDD+: Avoided unplanned REDD+ projects protect forests from unclear or multiple threats, such as subsistence agriculture, livestock grazing, collection of fuelwood charcoal, illegal logging, and small-scale extractive activities.

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.

Reseller or Retailer: Resellers or 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. Resellers or 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 organisation 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.

Run-of-river hydropower project: Run-of-river hydropower projects are a project type using the natural flow of waterways to produce renewable energy.

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 organisations 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.

Supplier: A supplier is any organisation that sells carbon offsets, such as a project developer, retailer, or broker.

Transaction: A transaction occurs at the point that offsets are contracted by a buyer, 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.

Voluntary markets: Voluntary markets refer to the collective voluntary transactions tracked worldwide. There is no centralised 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).

Wetland restoration project: Wetland restoration projects are a project type using a variety of techniques, such as planting and hydrologic restoration, to restore wetlands.

Wind project: Wind projects are a project type involving the development of wind turbines to increase the use of sustainable energy and reduce reliance on energy from fossil fuels.

1. INTRODUCTION

In December 2015, as the 21st Conference of the Parties on climate change (COP) concluded, negotiators agreed on a historic climate deal to limit temperature rise from global emissions to below 2 degrees Celsius. The resulting Paris Agreement and its mandate for action marked a turning point after decades of political debate around climate change.

Yet before the first COP convened in 1995, a handful of conservationists had already recognised the problem of climate change and begun responding to it. The non-profit CARE's *Mi Cuenca* project, established in Guatemala in 1974, was one of the first carbon **offset projects**,[1] i.e., projects that measured their avoided or reduced emissions to produce tradable emissions reductions certificates. *Mi Cuenca* helped Guatemalan farmers save topsoil by planting trees.[2] The non-profit had initially struggled to keep the project operational, so they looked for a new source of funding.

At the time, power generation and distribution company AES had been exploring how to reduce its emissions. There was only so much AES could do to switch to cleaner energy, so the company came up with a novel concept: after trying to reduce internal emissions, it would pay to reduce emissions elsewhere. In 1988, the company decided to pay €2.2 million (M) for two million metric tonnes of carbon dioxide equivalent ($MtCO_2e$) of emissions reductions achieved by *Mi Cuenca,* which became one of the first-ever carbon offset sales.

Since then, many more companies have voluntarily purchased carbon offsets over the years, with Ecosystem Marketplace tracking a total of nearly one billion offsets transacted during 2005-2015. Others have purchased offsets in order to comply with country- or state-level regulations (called "**compliance markets**").

Voluntary carbon markets in Europe

European **buyers** have actively purchased both compliance and **voluntary** carbon offsets since the early days of the carbon markets. Compliance buyers are regulated under the European Union's emission trading scheme (EU ETS), which requires companies within targeted industries to reduce their emissions. Voluntary buyers come from a number of (typically unregulated) industries, including the energy, finance and food and beverage sectors.

Carbon offsets can be created by a broad array of project types, including **energy efficiency**, **landfill methane**, **run-of-river hydropower**, **clean cookstoves**, **wind**, **fuel-switching**, transportation projects, and forestry-based projects. The EU ETS, a compliance market, does not currently accept forestry-based carbon offsets, so these are only transacted by European buyers on the voluntary market.[3]

In 2015, Ecosystem Marketplace tracked European[4] voluntary buyers purchasing 16.1 $MtCO_2e$, typically from renewable energy and forestry projects.[5] Nearly all of the voluntary carbon offsets bought by European buyers originated from projects *outside* of Europe. Projects located in Europe produced relatively few carbon offsets for the voluntary market.

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[1] All terms in **bold blue** text are defined in the Glossary section of this report.

[2] Zwick, Steve. 2015. "REDD Dawn: The Birth of Forest Carbon," *Ecosystem Marketplace*, June 5. http://www.ecosystemmarketplace.com/articles/redd-dawn.

[3] Some compliance markets outside of Europe's EU ETS do recognize forestry-based carbon offsets, including California's and New Zealand's cap-and-trade programs.

[4] Hamrick, Kelley and Allie Goldstein. 2015. *Ahead of the Curve: State of the Voluntary Carbon Markets 2015*. Washington, DC: Forest Trends. In this report, "Europe" included all European countries (EU and non-EU), Turkey, and Russia.

[5] Hamrick, Kelley and Allie Goldstein. 2016. *Raising Ambition: State of the Voluntary Carbon Markets 2016*. Washington, DC: Forest Trends.

The purpose of this report is to examine the sale and purchase of voluntary carbon offsets in Europe. The report covers four areas:

1. First, the bulk of this report describes the *sale* of voluntary offsets by **European-headquartered organisations**[6]. This includes market data (volume, value, and price) that is further broken down in terms of offset location, project type and other attributes. Where available, we also provided this data for a smaller market segment regarding forestry offsets from **projects located in Europe** (Box 1).

2. Second, by drawing on Ecosystem Marketplace's larger, global dataset of offset sales, the report also shines a light on the *purchase* of offsets by European-headquartered organizations.

3. Third, to add additional context, the report includes information about the important role of European countries in providing results-based payments, outside of markets, to countries working to conserve their tropical forests.

4. Finally, country-level chapters provide additional detail on market activity and key policy developments in countries that are most active in the global voluntary carbon markets, including France, Germany, Italy, the Netherlands, Spain, Switzerland and the United Kingdom (UK).

Box 1: Forest Carbon: The Basics

Responsibly managed forests are critically important in slowing climate change while improving the quality of peoples' lives. Not only are forests home to more than 80% of all species living on land,[7] they are also crucial sources of food, medicine, drinking water, and immense recreational, aesthetic, and spiritual benefits for millions of people.

The **forests and land-use** sector is unique in that it can act as either a source or a sink for carbon. Deforestation is the second-largest source of annual carbon dioxide (CO_2) emissions after fossil fuel combustion,[8] yet when left standing, forests have the potential to sequester carbon through tree growth and thus reduce net carbon emissions.

Though forestry projects produced some of the first carbon offsets for voluntary buyers, these projects have historically been unable to sell offsets in compliance markets. The EU ETS–the first and still largest cap-and-trade program–does not allow regulated corporations to purchase forestry-based carbon offsets to meet their obligations, because trees that sequester carbon don't do so *permanently*.

Both compliance and voluntary **standards** have taken steps to address this **permanence** issue. The Clean Development Mechanism (CDM) for example allocates temporary Certified Emissions Reductions offsets to forest carbon offset projects, and these offsets are only valid for a given period. Voluntary standards devised a different approach, requiring a proportion of the credits to be held in a central buffer reserve. The reserve varies depending on the potential for future carbon loss and can be used in unplanned events like forest fires.[9] In such a case, offsets from these back-up forests, which are owned by the carbon offset seller, can replace carbon offsets "lost" from the destroyed forest.

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[6] For the purposes of this report, "Europe" includes all EU member states plus Norway and Switzerland. This differs from our definition of "Europe" in *State of the Voluntary Carbon Markets 2015* (Hamrick and Goldstein 2015), where Europe also included non-EU member countries Turkey and Russia.

[7] United Nations. 2017. "Goal 15 – Why It Matters," United Nations. Accessed March 10 2017. http://www.un.org/sustainabledevelopment/biodiversity/.

[8] Blanco G, Gerlagh R, Suh S, Barrett J, de Coninck HC, Morejon CFD, Mathur R, Nakicenovic N, et al. 2014. "Chapter 5 - Drivers, trends and mitigation." *In*: Climate Change 2014: Mitigation of Climate Change. IPCC Working Group III Contribution to AR5. Cambridge University Press.

[9] Ebeling, Johannes and Álvaro Vallejo. 2011. *AR Guidance: Technical Project Design*. Washington, DC: Forest Trends.

While **voluntary markets** have been instrumental in addressing such accounting concerns, voluntary offsets today comprise only a small subset of worldwide emissions reduction activity. According to a 2016 World Bank report on carbon pricing, compliance markets mitigated 12% of global emissions (about 7 gigatonnes of greenhouse gas emissions) in 2015[10]–over two orders of magnitude larger than offsetting activity in voluntary markets, which typically remains less than 0.01 gigatonnes per year. But voluntary markets have had an outsized impact in the creation of offset project blueprints, called **methodologies**. This is especially true for forest carbon methodologies; voluntary standards have created methodologies covering a range of activities, from offsets from small-scale agroforestry projects to accounting for forestry offsets at jurisdictional or state scales.

Recently, new compliance markets have worked with voluntary standards in transitioning select voluntary methodologies (both forestry and other) into new compliance regulations. Both California's and South Africa's compliance programs have partnered with leading voluntary standards. Most recently, California's cap-and-trade system began accepting offsets from rice-based projects, based on a rice protocol that was first developed by the American Carbon Registry (ACR).

In the future, forest carbon may play a bigger role in compliance markets around the world. In anticipation of the 2015 COP21, countries submitted their Intended Nationally Determined Contribution plans detailing how they will tackle emissions reductions in the future. Within this group, 97 countries mentioned specific plans to reduce emissions from deforestation or increase forest cover,[11] and 90 countries[12] (many overlapping with those above) expressed interest in meeting their reductions through the creation of domestic or global carbon markets. As of yet, countries' plans are too early stage to tell if there will be any overlap between the two plans: such as if any future carbon markets (country-specific or global) will allow regulated entities to trade forest carbon offsets.

Whether or not these potential markets will include forestry remains to be seen in upcoming climate change negotiations. In the meantime, countries have already taken action towards financing tropical forest emissions reductions through funding for **Reducing Emissions from forest Degradation and Deforestation (REDD+)**. Most funding thus far has focused on giving tropical countries the resources to account for forest emissions (called "REDD+ Readiness"), but payments for achieved forest carbon emissions reductions have started to increase in recent years. How (and if) REDD+ fits into any potential global carbon market (or markets) also remains to be seen in the negotiations–but individual countries will meanwhile continue to pledge and disburse financing towards making REDD+ operational.

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[10] World Bank. 2016. *State and Trends of Carbon Pricing 2016*. Washington, DC: World Bank, 2016.

[11] C2ES. 2015. "Comparison Table of Submitted INDCs". C2ES. March 12 2017. http://www.c2es.org/indc-comparison.

[12] Environmental Defense Fund and International Emissions Trading Association. 2016. *Carbon Pricing: The Paris Agreement's Key Ingredient.* Environmental Defense Fund and International Emissions Trading Association.

2. VOLUNTARY MARKETS: THE BASICS

Carbon offset projects reduce or avoid emissions by carrying out certain activities, such as installing more efficient light bulbs or planting trees, that result in quantifiable emissions reductions. These emissions reductions are called carbon offsets and are measured in (metric) tonnes of carbon dioxide emissions or equivalent reduced (tCO_2e).

Voluntary buyers purchase offsets to meet their own carbon neutrality or other environmental goals. They are not motivated by regulation and don't face any particular set of rules when purchasing offsets, though some develop internal criteria or guidelines.

Voluntary **suppliers** historically developed projects in an unregulated context. But today, most projects adhere to one of several voluntary standards that have designed credible methodologies. These standards require projects to submit to independent, third-party **verification** to ensure voluntary projects have achieved their stated emissions reductions.

Producing a voluntary offset

In order to verify that real emissions reductions have been achieved, **project developers** typically certify their offsets under a third-party standard–an often long, rigorous, and expensive process. Standards have a list of approved methodologies that detail the rules project developers must follow. Additionally, project developers must prove that they have made the emissions reductions they claim, by submitting their projects for review by third-party auditors that have been approved by the standards.

Standards differ by which project types they certify and the process for achieving certification. Some standards also include requirements that the project not only reduces emissions, but also includes employment or training for local populations, protects biodiversity, or addresses other non-carbon impacts. In this report, these non-carbon benefits are referred to as **co-benefits**.

Projects choose a standard based on a variety of factors, including which project methodologies a standard recognizes, the cost of using the standard, and the size of the project. The majority of projects around the world currently report using the Verified Carbon Standard (VCS), the Gold Standard, the ACR, or the Climate Action Reserve (CAR).[13]

Moving a project from conception to final **issuance** of offsets can take years, with forest carbon project developers reporting an average timeframe of two and a half years.[14] Figure 1 illustrates a typical project cycle from idea to implementation, followed by the offset generation cycle from issuance to **retirement**.

Selling a voluntary offset

Once a project developer is ready to market offsets, they must find a buyer. This can be a complicated process since there is no single marketplace for voluntary offsets. Some project developers develop their own marketing and advertising teams to identify and promote their project directly to **end buyers**. However, many project developers prefer to sell their offsets to a **broker** or a **reseller**, who takes responsibility for marketing those offsets to end buyers.

When an offset is sold, the **transaction** marks a transfer of ownership. Until an offset is **retired** it can be resold (which happens in the case of **retailers** who purchase offsets from project developers and resell them to end users).

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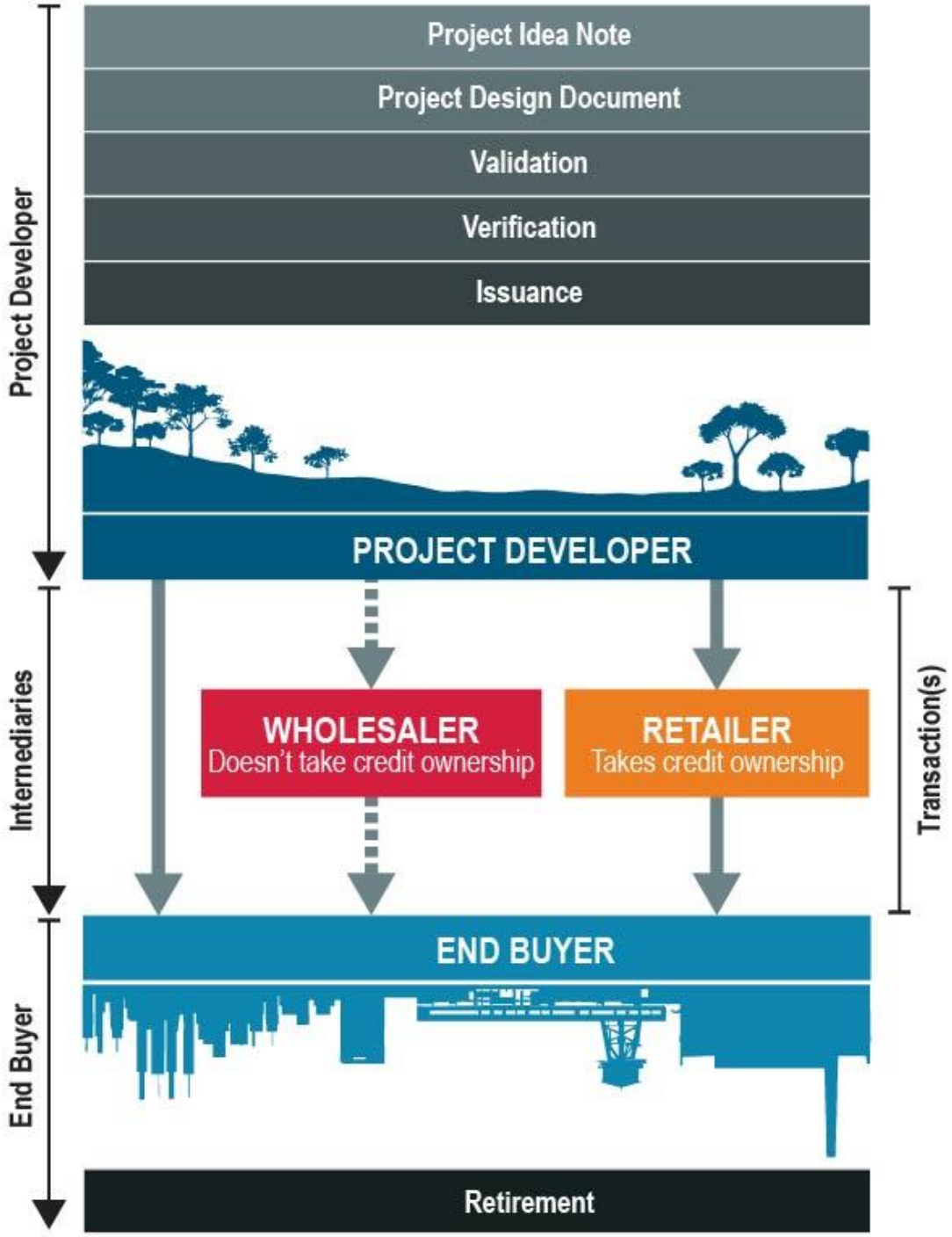
[13] Hamrick and Goldstein, 2015.

[14] Goldstein, Allie and Gloria Gonzalez. 2014. *Turning over a New Leaf: State of the Forest Carbon Markets 2014*. Washington, DC: Forest Trends.

An offset that has been permanently sold must be listed as retired on a **registry** that keeps track of offsets' issuance and retirement, in order to ensure that retired offsets are not sold again.

Figure 1: The Offset Cycle, from Project Development to Retirement



3. SCOPE AND METHODOLOGY

This report focuses on data collected as part of Ecosystem Marketplace's annual *State of the Voluntary Carbon Markets* and *State of the Forest Carbon Finance* reports. These reports are based on an annual survey of organizations that sell voluntary carbon offsets, for which Ecosystem Marketplace contacts over a thousand carbon market participants worldwide to gain an in-depth understanding of current market trends.

This report uses data collected about market activity in 2015. Respondents provided data on their annual sales, lending insights into the value, volume, and price of offset sales along with information on project type, project location, and standards. To ensure confidentiality of responses, we only present data if at least three organisations have reported on any single data point.

An important point to note is that we collect and track data on offset sales, called **transactions** in this report. We recognize a transaction at the point of contract between a buyer and a seller. That means a transaction between a project developer and a retailer is counted, and so is a transaction between the same retailer and an end buyer. In some cases, sales could represent the same offsets sold. Thus, the figures below relate to the market value impact of offset sales, *not* the accounted environmental impact of emissions reductions.

Additional forest carbon project data was gathered from our online Forest Carbon Portal and additional desk research.

For the purposes of this report, Europe includes all European Union (EU) member states, Norway, and Switzerland, unless otherwise noted.[15]

In addition to describing market activity by European-based organizations in the voluntary carbon markets, we also provide more specific information about transactions of forestry-based carbon offsets. Our results will be broken out into two sub-groups:

- data reported from European-based organisations that sold carbon offsets from any project type from projects located worldwide; and
- data reported from European-based organisations that sold carbon offsets from forestry-based projects located in Europe.

Because European forestry-based carbon projects are currently few and far between, it is important to understand the greater European voluntary carbon market activity.

Respondents Profile

A total of 59 European organisations reported transacting voluntary offsets in 2015 (Figure 2). Most of these organisations were for-profit (44) rather than not-for profit (15) (Table 1). The largest numbers of respondents were from the UK (16), Germany (12), and the Netherlands (6). Five organisations each responded from Italy, France and Switzerland, while three or fewer organisations each responded from Spain, Sweden, Hungary, Romania, Greece and Norway.

Out of the 59 organisations, eight organizations reported making sales of European forestry-based carbon offsets. Most of these organisations were based in Italy (3) and the UK (3). The remaining two were from Germany. These respondents consisted of four non-profit organisations and four for-profit organisations.

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[15] There is one exception to this scope, found in the "Projects Details and Co-Benefits" chapter on page 14, which discusses known forest carbon projects from non-EU eastern European countries.

Figure 2: Response Rate by European-Headquartered Organisations Selling Offsets Worldwide and from Europe

Table 1: European Organisations Transacting Voluntary Carbon Offsets by Profit Status and Organisation Type, 2015

	Projects Based Worldwide	Forestry Projects Based in Europe
Profit Status	44 For profit 15 Not-for-profit	4 For profit 4 Not-for-profit
Organisation Type (by Volume Transacted)	58% Retailer 25% Broker 13% Project developer 4% Investor	100% Project developer

4. SUPPLY: OFFSET VOLUME, PRICE, AND VALUE

European-headquartered organisations reported transacting 39.2 $MtCO_2e$ of voluntary carbon offsets in 2015 at an average price of €3.2/tCO_2e (t) (Table 2). Brokers, organisations that typically sell at the lowest possible prices, transacted offsets at an average price of €0.8/t. Excluding brokers, that average rises to €3.9/t for retailers and €4.1/t for project developers.

European-based forest carbon offsets comprised a much smaller subset of total transactions reported, with eight organisations reporting 285 $KtCO_2e$ offsets sold. The average price, €15.6/t, should be viewed with caution: While six organisations provided prices, the corresponding volume accounts for only 13% of the volume tracked. Thus the average price could be considered as reflecting only a subset of overall market transactions.

Table 2: Market Size and Average Price of Voluntary Carbon Offsets Sold by European Organizations, 2015

	Offsets from Projects Based Worldwide	Offsets from Forestry Projects Based in Europe
Volume	39.2 $MtCO_2e$	285 $KtCO_2e$
Value	€129.0M	€4.4M
Average Price	€3.2/t	€15.6/t

Notes: All prices and market values are volume-weighted to determine their significance.

Organizations based in the UK were the most active in transacting offsets from worldwide projects, transacting 19.8 $MtCO_2e$ with a market value of €48.8M (Table 3).

Table 3: European Organizations that Transacted Voluntary Carbon Offsets Worldwide, by Country Headquarters

Regions	Volume	Price	Value
United Kingdom	19.8 $MtCO_2e$	€2.5/t	€48.8M
Germany	5.9 $MtCO_2e$	€2.1/t	€12.2M
Switzerland	5.5 $MtCO_2e$	€7.0/t	€39.9M
Netherlands	4.4 $MtCO_2e$	€1.8/t	€7.9M
France	3.1 $MtCO_2e$	€4.1/t	€12.7M
Italy	170 $KtCO_2e$	€2.5/t	€0.5M
Spain	61 $KtCO_2e$	€16.0/t	€1.0M

5. PROJECT LOCATION

The bulk of offsets sold by European organisations in 2015 came from projects located in non-EU countries (Table 4). This is unsurprising, since offsets from countries without compliance carbon markets typically come from a broader range of project types. Many projects were located in developing countries in Asia, Latin America, or Africa, and offered multiple environmental or development benefits beyond carbon emissions reductions.

At a regional level, the majority (7.5 $MtCO_2e$) of offsets transacted by European organisations in 2015 originated in Asia (Table 4). India and China have historically been a source for offsets, and Indonesia has become a significant supplier as well in recent years. European organisations also transacted many offsets from Latin America and Africa, with Brazil and Kenya leading the way as individual country sources. However, at a country level, most offsets transacted by European organisations in 2015 came from Turkey and Indonesia (Table 5).

European forestry-based offsets mainly originated in the UK and Italy (Table 6). The UK has emerged as the main supplier of European forestry-based carbon offsets, thanks to its state-sanctioned Woodland Carbon Code (WCC), which provides national guidance and standards to develop domestic forest carbon projects. UK project developers transacted 259 KtCO2e of forest carbon offsets in 2015. In contrast, several Italian provinces and project developers have initiated projects in the absence of national guidance. Two projects in Germany and the Netherlands also reported transacting small volumes in 2015.

Table 4: All Offsets Sold from Worldwide, by Project Region in 2015

Regions	Volume	Average Price	Value
Asia	7.5 $MtCO_2e$	€2.6/t	€19.6M
Africa	3.5 $MtCO_2e$	€5.5/t	€18.9M
Europe*	2.1 $MtCO_2e$	€15.5/t***	€32.5M***
Latin America & Caribbean	3.1 $MtCO_2e$	€4.2/t	€13.0M
Non-EU Europe**	2.7 $MtCO_2e$	€1.2/t	€3.1M

Notes:

** In this report, Europe includes all EU countries, Switzerland, and Norway.*

*** Non-EU Europe includes Russia, Turkey, and Georgia.*

**** Of the 12 organisations reporting transactions of carbon offsets produced in Europe, nine provided price data. However, among the three organisations that did not provide price data was the organisation that reported the largest volume of European offset transactions. Consequently, the reported €15.5/tonne price reflects the average price of only 5% of the total volume. Thus market value, which is extrapolated from the average price and total volume, is likely an over-estimate.*

Table 5: All Offsets Sold from Worldwide, Top Countries of Origin in 2015	
Top Countries, Worldwide	**Volume**
Indonesia	2.6 $MtCO_2e$
Turkey	2.6 $MtCO_2e$
India	2.4 $MtCO_2e$
Brazil	1.8 $MtCO_2e$

Table 6: Forest Carbon Offsets Sold from Europe, Top Countries of Origin in 2015	
Top Countries, Europe	**Volume**
United Kingdom	259.0 $KtCO_2e$
Italy	20.1 $KtCO_2e$
Germany	-
The Netherlands	-

Notes: Ecosystem Marketplace only reports a data point if three or more organisations provide data, in order to protect confidentiality of our respondents.

6. PROJECT TYPES

European organisations reported transacting carbon offsets of a variety of project types in 2015. **Afforestation/reforestation** (A/R) offsets commanded the largest share of market value, transacting €14.0M in 2015, driven by relatively high prices (Table 7).

Other project types actually transacted higher volumes than A/R projects. REDD+ and wind offsets sold 5.8 $MtCO_2e$ and 5.4 $MtCO_2e$ respectively in 2015, compared to 1.9$MtCO_2e$ of A/R offsets transacted, but commanded lower prices. These two project types have historically been the top-selling offset types globally, due to a large supply of available offsets and competitive pricing.[16]

Yet even within these project types, average price varied depending on project details: for example, REDD+ offsets differed by the specific type of REDD+ project. **Avoided *unplanned* REDD+** offsets–whose projects try to address a variety of uncertain threats to forests–sold in lower quantities (1.5 $MtCO_2e$) but at higher prices (€4.2/t) than **avoided *planned* REDD+** offsets, with the former posting an overall market value of €6.2M. Avoided planned REDD+ offsets are generated by projects that protect forests that have been legally authorised to convert to non-forest land. These offsets sold in greater quantity (4.3 $MtCO_2e$) but at lower prices (€1.1/t) for an overall market value of €4.5M.

[16] Hamrick and Goldstein, 2015.

Table 7: Market Volume, Average Price and Value by Offset Project Types Based Worldwide, 2015			
Project Types	**Volume**	**Average Price**	**Value**
Afforestation/Reforestation	1.9 $MtCO_2e$	€7.4/t	€14.0M
Wind	5.4 $MtCO_2e$	€1.5/t	€8.3M
Clean cookstoves	1.8 $MtCO_2e$	€4.3/t	€7.8M
REDD+: Avoided unplanned	1.5 $MtCO_2e$	€4.2/t	€6.2M
REDD+: Avoided planned	4.3 $MtCO_2e$	€1.1/t	€4.5M
Energy efficiency	283 $KtCO_2e$	€11.0/t	€3.1M
Fuel switching	233 $KtCO_2e$	€11.9/t	€2.8M
Landfill methane	371 $KtCO_2e$	€2.6/t	€1.0M
Run-of-river hydro	790 $KtCO_2e$	€1.3/t	€1.0M

Notes: Definitions of all project types can be found in the Glossary.

A/R projects also made up the bulk of offsets transacted from projects based in Europe (Table 8). Respondents sold 285 $KtCO_2e$ last year from these projects at an average of €14.7/t. Besides A/R projects, respondents reported transactions from one **wetland restoration project** and from one **improved forest management** (IFM) project based in Europe. However, volumes and prices cannot be disclosed due to confidentiality restrictions.

Table 8: Market Volume, Average Price and Value by Forest Carbon Offset Project Types Based in Europe, 2015			
Project Types	**Volume**	**Average Price**	**Value**
Afforestation/Reforestation	285 $KtCO_2e$	€14.7/t	€4.2M

Notes: Definitions of all project types can be found in the Glossary.

7. PROJECT STANDARDS

European project developers and retailers overwhelmingly sold offsets developed under either VCS or the Gold Standard (Table 9). Offsets verified under VCS commanded the largest market share in 2015 (€31.1M) mainly because of the large volumes sold. This can be explained, in part, by the nature of offsets transacted: VCS was the first standards body to issue a REDD+ methodology in 2010; and most large-scale REDD+ projects use VCS methodologies.

European buyers also favoured offsets verified under the Gold Standard, purchasing €20.5M worth of offsets in 2015. Both Gold Standard and VCS have methodologies for verifying offsets from wind energy generation; the high demand for wind offsets (5.4 $MtCO_2e$) by buyers last year was reflected in the high volumes of offsets certified under both standards. The Gold Standard's higher average price of €3.9/t was partly because most clean

cookstoves projects are verified under the Gold Standard and these offsets attracted higher average prices (€4.3/t) from European buyers in 2015.

The Plan Vivo standard commanded a smaller market value, €3.0M, in part because the standard only verifies community forestry and land-use projects. These projects are limited to smaller-scale projects, so transaction values remain small though these offsets typically earned higher average prices (€7.5/t).

Table 9: Market Volume, Average Price and Value by Offset Standard Based Worldwide, 2015

Standards	Volume	Average Price	Value
Verified Carbon Standard (VCS)	12.2 $MtCO_2e$	€2.5/t	€31.1M
Gold Standard	5.4 $MtCO_2e$	€3.9/t	€20.5M
Plan Vivo	391 $KtCO_2e$	€7.5/t	€3.0M
Clean Development Mechanism (CDM)	383 $KtCO_2e$	€3.6/t	€1.3M
Other	114 $KtCO_2e$	€11.9/t	€1.3M
Did not use third-party standard	61 $KtCO_2e$	€17.8/t	€1.1M
Woodland Carbon Code (WCC)	259 $KtCO_2e$	-	-

Notes: Ecosystem Marketplace only reports a data point if three or more organisations provide data, in order to protect confidentiality of our respondents.

Despite their global prominence, none of these standards were used to verify transacted forest carbon offsets produced within Europe (Table 10). Instead, the WCC, the UK's domestic standard, comprised the bulk of transacted offsets with 259 $KtCO_2e$ in 2015. Non-UK European project developers reported that offsets used an internal/proprietary standard (displayed here as "Other"). Projects in Europe typically look to international offset standards for inspiration but use internal protocols. In a few cases, a certification body also verifies the projects. The lack of third-party independent certification is likely due to uncertainty over double counting[17] and the high transaction costs of carbon offset standards (as many European projects are smaller in scale and can't justify the financial expense).

[17] In the absence of national policies supporting local forest carbon projects, any forestry emissions reductions are likely included within country-level accounting. That means that any offsets sold from those forest carbon projects outside of the host country would represent double counting of emissions reductions. Voluntary carbon standards are loath to verify projects where there is a risk of double counting, contributing to the relatively low rate of independent third-party certification among European projects.

Table 10: Market Volume, Average Price and Value by Forest Carbon Offset Standard Based in Europe, 2015			
Project Types	**Volume**	**Average Price**	**Value**
Other	14 $KtCO_2e$	€18.8/t	€215.9K
Woodland Carbon Code (WCC)	259 $KtCO_2e$	-	-

Notes: Ecosystem Marketplace only reports a data point if three or more organisations provide data, in order to protect confidentiality of our respondents.

8. PROJECT STAGE AND VINTAGE

Most European respondents reported selling issued offsets (89%) or verified offsets (8%) in 2015 (Figure 3). In other words, they sold offsets that have already made emissions reductions (see the "Voluntary Markets: The Basics" chapter on page 4 for more information about an offset lifecycle). Indeed, one of the key limitations of voluntary carbon markets is that demand has historically not kept up with supply. Project developers and retailers often report having excess offsets at the end of each year, because they could not find a buyer or could not sell at their preferred price.

For example, in Ecosystem Marketplace's 2016 *State of Forest Carbon Finance* report, project developers worldwide reported an unsold 39.7 $MtCO_2e$–more than 1.6 times the amount they reported successfully transacting last year.[18] For nearly half of their unsold offsets (18.1 $MtCO_2e$), developers reported that they were waiting for market conditions, namely price, to improve. This is unsurprising, as project developers reported an ideal carbon price at €9/t–more than double the global average voluntary forest carbon price last year.

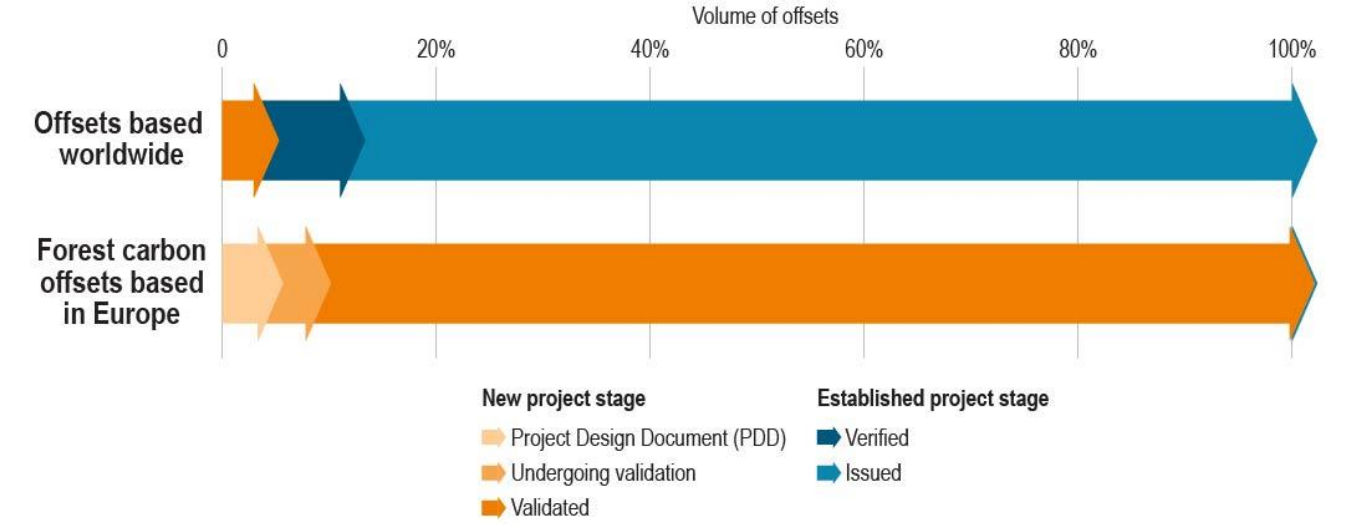
In contrast, none of the offsets sold from European forestry projects had been verified or issued yet at the point of sale. The bulk (92%) had achieved **validation**–meaning that a third-party auditor has examined the project's planning documents and proposed framework and approved its expected outcomes. An additional 4% of reported offsets were still undergoing validation at the time of their sale and a further 3% remained in the **project design document** (PDD) phase, wherein project developers describe anticipated emissions reductions and plans for achieving them.

There are a few reasons for this low rate of verification. Many projects developed under the UK's WCC are relatively young, since the standard only launched in 2011. Additionally, projects under an internal or other small regional standard may forego costs associated with verification and issuance, if they have already identified nearby buyers, or if the costs of verification are too high.

While the bulk (91%) of worldwide offsets sold by European-based organisations last year was issued before 2015, there were some buyers willing to pay higher prices to support early-stage projects. Across voluntary forest carbon offset sales tracked in 2015 worldwide, early-vintage buyers paid an average of €7.1/t compared to buyers purchasing older vintages at an average of €3.4/t.

[18] Goldstein, Allie and Franziska Ruef. 2016. *View from the Understory: State of Forest Carbon Finance 2016.* Washington, DC: Forest Trends.

Figure 3: Volume of Offsets Sold by Project Stage, 2015



Notes: For an overview of a typical offset project cycle, see Figure 1 on page 5 of this report.

9. PROJECT DETAILS AND CO-BENEFITS

Over the years, Ecosystem Marketplace has tracked more than 800 forest carbon projects from around the world. Over half of these projects have been driven by compliance markets that recognise forest carbon offsets (from California's carbon market and Australia's Carbon Farming Initiative), while the majority of *voluntary* forest carbon projects remain in Africa, Asia and Latin America. Fewer projects have taken root in Europe, as the region's compliance market does not allow for forest carbon offsets, and few policy signals have encouraged the growth of voluntary forest carbon projects until recently (such as in the UK).

In total, we identified 37 projects in Europe operating between 2000 and 2016. Of these, 12 are no longer active, 16 are actively transacting offsets, and the remaining nine are either in the pipeline or have an unknown status. All of these projects – both operational and not – may be roughly divided into three groups:

Traditional government-driven forest protection projects:

This group includes mostly eastern Europe A/R projects that are managed at a state level and usually involve large land areas. They are developed under the CDM, which was established under the Kyoto Protocol and which offers developed countries the possibility to offset some of their greenhouse gas emissions by funding development projects in developing countries. The only EU country included in here is Romania, which joined the EU in 2007. We identified:

- two projects in Moldova, conserving soil and restoring forests, covering more than 28,000 hectares (ha);
- one project in Albania, restoring degraded land and covering 6,300 ha; and
- one project in Romania, reforesting degrading land and covering 6,000 ha.

Projects influenced by new country-level policies:

This group of projects is a reaction to the gradual development of national policies for the establishment of voluntary markets and forestry-based carbon offset projects. Policy signals in favour of the establishment of forestry-based carbon projects have appeared only recently. The UK WCC was established in 2011, while the Italian Forest Carbon Code is still waiting for final approval by the Italian government as of 2017.

Independent project finance:

There are also a number of voluntary carbon projects in Europe, operating outside of country policies and managed by non-governmental organisations (NGOs) or private domestic companies. Ecosystem Marketplace tracked several afforestation and moor regeneration projects in Germany, the Netherlands, and Spain. Often, these projects use internally developed standards to certify emissions reductions. The protection of local flora and fauna is crucial to these projects, but they also generate other co-benefits such as jobs for local communities or increased resilience to climate change effects.

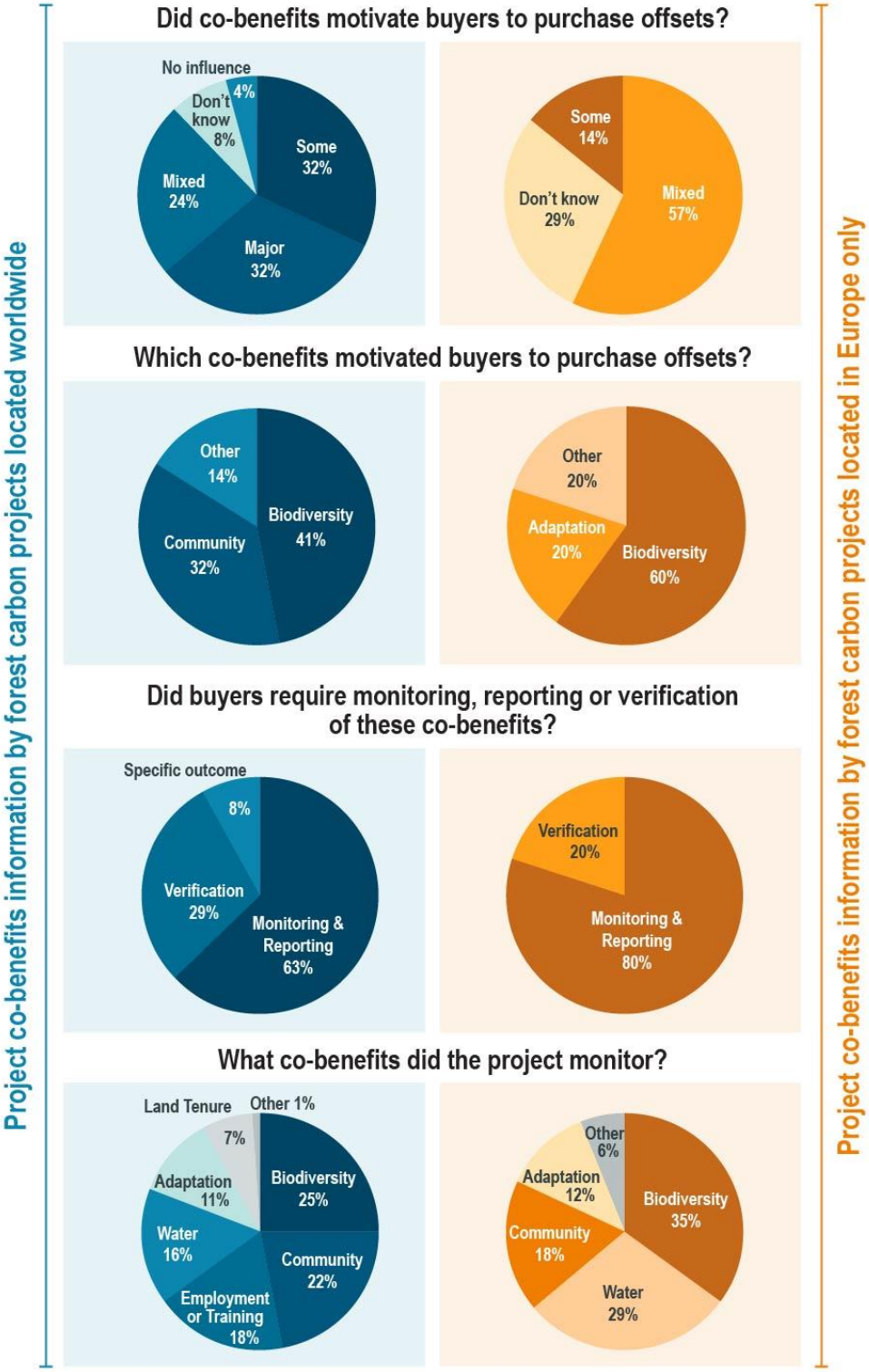
Overall, the majority of new projects stem from the UK's WCC and Italy's Carbomark. Many government-driven CDM projects remain operational, but falling prices in recent years for CDM credits mean that few new projects will likely be initiated in the near future.[19] Independently financed projects similarly face challenges including higher operational costs in Europe compared to forest projects in developing countries, and unclear demand sources in European countries without policy supports for voluntary offsets. Seven of the projects identified by Ecosystem Marketplace have been terminated, and two never became operational in the first place.

Though European forest carbon projects have been slow to multiply, forestry-based offsets worldwide remain popular with European buyers and resellers. This is, in part, because forest carbon offsets have numerous co-benefits that make them attractive to buyers pursuing multiple sustainable development goals.

For example, European organisations selling forest carbon offsets from around the world in 2015 reported that 88% of buyers were influenced, in part, by project co-benefits (Figure 4). In these cases, offset suppliers found co-benefits to be a key differentiator and marketing tool. Ecosystem Marketplace tracked additional information on co-benefits and other project details, also provided in Figure 4.

[19] World Bank, 2016.

Figure 4: What Motivated Buyer Demand and Monitoring of Co-Benefits Associated with Forest Carbon Offsets in 2015?



10. EUROPEAN FINANCE FOR REDUCING DEFORESTATION ABROAD

While REDD+ projects sold the most offsets of any project type in 2015, the €10.7M market value generated from those sales is a drop in the bucket compared to government financing for REDD+.

Governments have long recognised that forests can act as both a source and sink of emissions and have been working to establish national-level REDD+ programs. Before countries can create a program, however, they must be able to accurately monitor their emissions, consult stakeholders, and identify key threats from deforestation. As a result, many Annex I (e.g., "developed" or "Global North") countries have funnelled money towards capacity building in less developed countries. This finance, called "REDD+ Readiness," precedes payments for actual emissions reductions from avoiding deforestation.

Thus there are three different types of financing for REDD+:

National and sub-national level:

1. ***Readiness financing:*** Government financing for REDD+ helps build capacity for countries to produce REDD+ offsets in the future.

2. ***Non-market payments for performance:*** These are bilateral or multilateral government-to-government payments for emissions reductions. Financial payment depends on emissions reductions, but the resulting transaction does not produce tradable offsets that might be sold on a market.

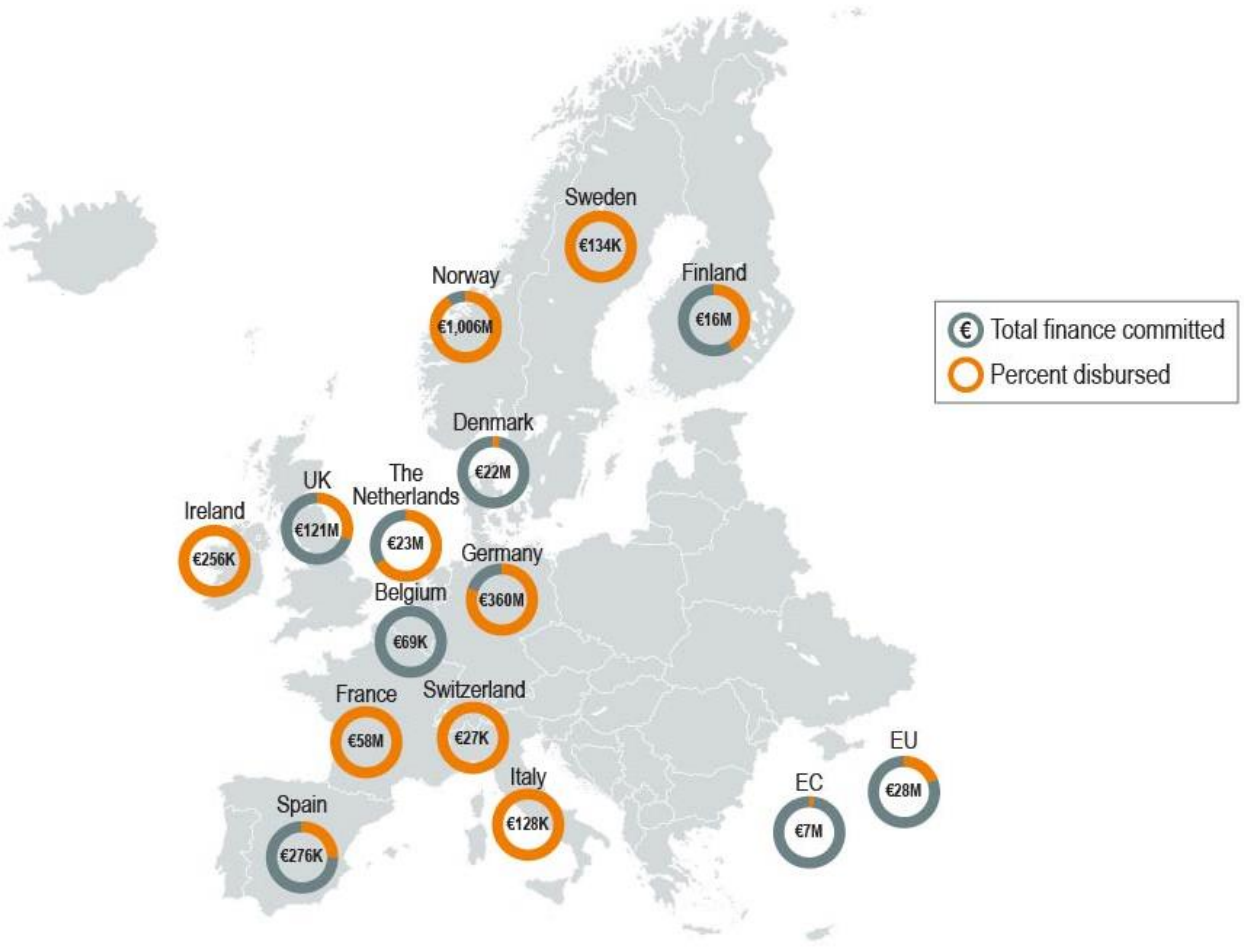
Project level, and national and sub-national level:

3. ***Market-based payments:*** Payments for emissions reductions from avoided deforestation involves buyers paying for offsets through a market, meaning the price can fluctuate depending on market forces. These offset transactions are the main focus of this report.

Readiness Financing

European governments have largely taken the global lead in financing both REDD+ Readiness and in paying for the subsequent emissions reductions. For example, since 2009, Norway, Germany, and the UK have committed over €1.5 billion (B) for REDD+ Readiness in 13 tropical countries with high deforestation rates. As shown in Map 1, disbursement rates vary by country, though the bulk of financing (mostly committed by Norway and Germany) has been disbursed.

Map 1: REDD+ Readiness Financing by European Countries, 2009-2014



Notes: This map displays the amount of REDD+ Readiness funding committed since 2009 to 2014 to 13 tropical countries with high deforestation rates, as tracked by Forest Trends' REDDX program which tracked REDD+ finance flows to Brazil, Colombia, the Democratic Republic of Congo, Ecuador, Ethiopia, Ghana, Indonesia, Liberia, Mexico, Papua New Guinea, Peru, Tanzania and Vietnam.

Non-Market Payments for Performance

European governments have already pledged €3.9B for results, e.g., funds to be disbursed if REDD+ countries can prove they have reduced emissions (Table 11). In terms of disbursement mechanisms, there are a number of multilateral funds dedicated to providing avoided deforestation payments for performance. For example, most European countries have made commitments to the Forest Carbon Partnership Facility. However, in terms of total amount committed, Norway has provided the bulk of financing through bilateral agreements with developing countries and through the multi-donor Amazon Fund.

The countries providing the most funds for non-market payments for performance mirrors those providing REDD+ Readiness money. Norway overwhelmingly supplies the most finance, followed by the UK and Germany. These three countries have also promised to nearly double the total amount committed for results by 2020.

Financing tracked in Table 11 shows committed funds only; disbursement depends on results actually being achieved. For example, Norway pledged €0.9B to both Brazil and Indonesia on the condition of those countries achieving their promised emissions reductions. Brazil reduced its deforestation rate by 80% under 2004 levels, and

has received Norway's full pledge and spurred a new commitment. In contrast, Indonesia has not met its requirements and has received no payments for emissions reductions.

Table 11: Pledged Results-Based Payments for REDD+ by European Countries, 2008-2015

	Amazon Fund	Forest Carbon Partnership Facility	BioCarbon	REDD+ Early Movers Programme	Bilateral Agreements	TOTAL
Norway	€899.5M	€270.1M	€103.8M	€83.5M	€1861.0M	**€3,217.9M**
Germany	€25.4M	€113.3M	€39.1M	€57.9M	-	**€235.7M**
UK	-	€184.2M	€152.3M	€43.1M	-	**€379.6M**
France	-	€4.5M	-	-	-	**€4.5M**
Switzerland	-	€9.7M	-	-	-	**€9.7M**
European Commission	-	€6.0M	-	-	-	**€6.0M**

Source: Goldstein and Ruef 2016.

Notes: All values presented here have been converted from US dollars at an exchange of 0.89775.

11. BUYERS

European buyers have traditionally demanded the largest volume of offsets of any region in the world.[20] By exploring what offset sellers from anywhere in the world reveal about their buyers, Ecosystem Marketplace documented that although North American buyers did purchase slightly higher volumes in 2015,[21] European buyers still transacted a reported 16.1 $MtCO_2e$ (Table 12).[22]

UK buyers purchased 29% of all voluntary offsets sold in 2015 to European buyers (Table 13), followed by French buyers at 23%. Forest offsets made up the bulk of sales (65% of total volume), indicating strong interest in that project type.

Projects selling forest carbon offsets from European projects attracted the greatest number of new buyers in Europe, most of whom were **end-users** and not retailers (Table 13). This interest from new buyers perhaps indicates an untapped market for European projects. Most European forest offset project buyers came from the transportation sector, whereas globally the energy sector leads in terms of voluntary demand for European forest offsets.

[20] It is important to note that there is some overlap between buyers and sellers in this report. Some buyers may be retailers who purchase offsets from a project developer; while those same retailers may then sell offsets to a European end buyer.

[21] Hamrick and Goldstein, 2016.

[22] This volume should be viewed as a minimum, as many suppliers remain hesitant to disclose any buyer information, considering it the most confidential.

Table 12: Offset Volume, Average Price, and Value Transacted to European Buyers, 2015

	Volume	Average Price	Value
Projects Based Worldwide	16.1 MtCO2e	€3.7/t	€58.6M
Forest Projects Based in Europe	336 KtCO2e	€8.8/t	€1.3M

Notes: Figures include suppliers not headquartered in Europe who have sold to European buyers.

Table 13: Worldwide and European Offset Transactions, by Location and Project Type of Offsets Sold to European Buyers, by Buyer Experience, Type, and Sector

	Worldwide Voluntary Carbon Offsets Sold to European Organisations	European Forest Carbon Offsets Sold to European Organisations
TOP BUYER LOCATIONS		
	United Kingdom: 29% **France:** 23% **Netherlands:** 22% **Germany:** 11% **Switzerland:** 6%	**United Kingdom:** 68% **Germany:** 30% **Italy:** 2%
TOP PROJECT TYPES		
	Forestry: 65% **Renewables:** 22%	**Forestry:** 100%
BUYER TYPE		
	Retailer: 76% **End-user:** 24%	**Retailer:** 10% **End-user:** 90%
BUYER EXPERIENCE		
	Returning: 91% **New:** 9%	**Returning:** 68% **New:** 32%
TOP BUYER SECTORS		
	Energy: 40% **Finance & Insurance:** 15% **Food & Beverage:** 14%	**Transportation:** 75% **Other:** 15% **Energy:** 5%

Notes: The total volumes sold to European buyers (16.1 $MtCO_2e$, Table 12) are less than those sold by European buyers (39.2 MtCO2e, Table 2) because some offsets may have been sold to non-European buyers. But the main difference is likely due to differences in reporting data; in Ecosystem Marketplace surveys, respondents are often more hesitant to share buyer data than any other type of data.

12. COUNTRY PROFILES

12.1 France

Table 14: Offsets Transactions by Organisations Headquartered in France, 2015		
	All Voluntary Projects, Located Worldwide	**Forestry Projects, Located Only in France**
Number of Respondents	6	*No forestry projects reported*
Volume	3.1 $MtCO_2e$	
Average Price	€4.1/t	
Value	€12.7M	
Project Type(s)	Clean cookstoves, Wind, A/R	
Standard(s)	VCS, Gold Standard	
Project Location(s)	Kenya, India, Guatemala, Cambodia, Uganda, Peru, France	

Notes: Not all respondents provided detailed information on offset location, standard, or project type. A total of 77% of offsets reported in this table included this additional detailed information. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

Section author: Julia Grimault, Territories and Climate Project Manager, I4CE

As of 2017, no certified carbon offset project located in France is delivering voluntary carbon credits. Partly because of double-counting issues (against national emissions commitments), voluntary standards are not present in France.

However, demand from French voluntary buyers for carbon offsets exists, and is currently met by credits from international projects, which to date have mainly consisted of renewable energy, forest and land-use and energy efficiency projects.[23] However, there is also a growing demand for local projects among French actors, who want to support projects closer to their own activities. Among the sectors identified for potential carbon projects development in France, forestry and agriculture play a major role.

Despite the current absence of voluntary certification schemes, local stakeholders including local Authorities and forestry institutions have been developing expertise and implementing carbon projects in different regions, often according to their own internal experimental standards. Different forest carbon "programmes" have emerged in France in the past 5 years. They do not all aim at carbon credits generation but at minimum quantify their additional carbon sequestration. The main programs are the following:

- GIP Massif Central program: A/R and IFM pilot projects for the creation of a national certification framework
- Sylv'Acctes in Auvergne-Rhône-Alpes: IFM projects without aiming at credit generation
- Duramen in Centre Val de Loire: IFM projects without aiming at credit generation
- Carbone Local in Occitanie: hedges plantation coupled with European credits cancellation

[23] I4CE, *Potentiel et déterminants de la demande volontaire en crédits carbone en France*. I4CE, 2017.

Policies and laws

For compliance purposes, France launched in 2006 the "domestic projects" scheme, a “domestic Joint Implementation mechanism” aimed at stimulating greenhouse gas emission reductions in sectors not covered by the EU ETS. Around 20 national projects have been approved (delivering more than 9M emissions reduction units), and 16 methodologies have been referenced. One methodology for afforestation projects was approved in 2016 but no forestry projects have been certified as of the time of this report’s writing. Indeed, the “domestic projects” initiative was operational from 2008 to 2012 but has been effectively frozen since that time. In the case of forestry, the decree for the approval of domestic afforestation activities was published late on 27 December 2012, and so did not permit the development of afforestation projects prior to 2012.

Based on the work of the Carbon Forest & Wood Club and Climate Agriculture Club,[24] and in order to allow for the development of certified voluntary projects in France, the initiative VOCAL (Voluntary Carbon Land Certification) was launched in 2015. Observing the absence of operational certification schemes, and a lack of opportunities linked to supply and demand for local projects, the project aims at developing a national certification framework in association with numerous public and private partners. It will certify greenhouse gas emissions reductions from agriculture and forestry projects in France, through a general framework and specific methodologies validated by the French Ministry for Environment.

This initiative is conducted by I4CE with the National Centre on Forest Ownership and the Public Interest Group of Massif Central. It is co-funded by the European Regional Development Fund and the French Environment and Energy Management Agency. It has a 2.5 years duration, from mid-2015 through 2017. Its first year was mostly dedicated to preliminary studies, aimed at better framing and designing the certification tools.

Box 2: The VOCAL Programme in France: Preliminary Studies

VOCAL’s first preliminary study[25] focused on demand and aimed at: 1) quantifying the demand from French stakeholders for local carbon offsets; 2) better understanding demand drivers; and 3) evaluating the interest for local projects in forestry and agriculture sectors. A second study assessed the willingness and capacity of French forest owners to get involved in carbon certification projects.[26]

In 2017, VOCAL aims to build the general framework for national certification and have it approved by the French Ministry for Environment. This document will establish the general principles for project certification and for methodology development, and specify the different criteria that projects would have to meet, for example additionality demonstration or non-permanence risk. This document should be adopted by June 2017. Three methodologies are expected to be developed in 2017 for the forestry sector: one for A&R, and two for IFM.

The certification scheme is developed in close collaboration with the French government, which participates actively in the steering committee of the project. The French Ministry for Environment will be in charge of validating the general guidelines and the methodologies and keeping the registry. The certification framework is actually a tool to contribute to national and European greenhouse gas reduction targets and implement the National Low-Carbon Strategy.

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[24] CFWC and CAC are bodies that aimed at sharing knowledge on climate economics in agriculture and forestry sectors. They are animated by I4CE's teams in collaboration with actors from these sectors. One of their mission is also to use or develop economic tools to promote mitigation actions in the LULUCF sector.

[25] I4CE, *Potentiel et déterminants de la demande volontaire en crédits carbone en France*. I4CE, 2017.

[26] CNPF, *Etude sur les attentes des propriétaires forestiers du Massif central vis-à-vis de VOCAL*. CNPF, 2017.

12.2 Germany

Table 15: Offsets Transactions by Organisations Headquartered in Germany, 2015		
	All Voluntary Projects, Located Worldwide	**Forestry Projects, Located Only in Germany**
Number of Respondents	12	*No forestry projects reported*
Volume	5.9 $MtCO_2e$	
Average Price	€2.1/t	
Value	€12.2M	
Project Type(s)	Coal mine methane, Wind, REDD+ planned/unplanned	
Standard(s)	VCS, Gold Standard	
Project Location(s)	Germany, India, Turkey, Brazil, China, Peru, Uganda, Nicaragua, Zambia, Nepal, Bolivia	

Notes: Not all respondents provided detailed information on offset location, standard, or project type. Only 81% of offsets reported in this table included additional detailed information. In order to protect the confidentiality of our respondents, Ecosystem Marketplace only reports a data point if three or more organisations provide data. As only two organisations provided data on forestry projects in Germany, we are unable to provide that information here. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

Section author: Stephan Wolters, adelphi

Project developments

The German market for voluntary carbon offsets has significantly grown in recent years. The first in-depth market analysis was carried out in 2010 by adelphi and sustainable on behalf of the German Emissions Trading Office of the Federal Environmental Agency. The subsequent report published in 2015 found a discrepancy between the preference among consumers for domestic projects and the actual availability of domestic offsets: while nearly 50 percent of the consumers name Germany as their first preference for the origin, only 10 percent of retired certificates are from German initiatives.[27]

Most German domestic offset activities take place in the land-use, land use change and forestry (LULUCF) sector and primarily focus on either peatlands or forests. MoorFutures is an initiative that issues emission reduction certificates from peatland rewetting in Brandenburg and Mecklenburg-Western Pomerania with significant local ecosystem co-benefits. To avoid double counting, issued credits are properly retired and recorded in the federal state registry. Around 10,000 credits had been sold as of mid-2014. Other relevant suppliers are PrimaKlima and Waldschutzfonds focusing on afforestation and forest conservation respectively. PrimaKlima focuses on afforestation and utilizes international standards to certify emission reductions. Most of its projects are situated abroad, but around 10 percent of reforested area is domestic (Schleswig-Holstein, Lower Saxony and Saxony).

[27] Wolters, Stephan, Katharina Nett, Dennis Tänzler, Kristian Wilkening, Markus Götz, Jan-Marten Krebs, and Dana Vogel. *Aktualisierte Analyse des deutschen Marktes zur freiwilligen Kompensation von Treibhausgasemissionen.* Umwelt Bundaamt: Dessau-Roßlau, 2015.

To reduce its own environmental footprint, the federal government in 2015 revived a travel offset scheme under which inevitable emissions caused by official travels are compensated. The Federal Environment Agency supported the purchase and in 2014 only, CDM-certified emission credits worth 138.038 tons of CO2e were retired.

Policies and laws

When it comes to actively sending positive market signals to advance the development of the voluntary domestic market, the German government is still cautious as commitments under the Kyoto Protocol and the European emissions framework limit the scope of engagement. For example, since 2013, peatland rewetting projects are also counted towards Kyoto targets in Germany's national greenhouse gas inventory with potential ramifications for double counting. But as Germany needs to reduce its greenhouse emissions by 80 to 95 percent by 2050, the government could in theory decide to leverage the potential of voluntary reductions by setting incentives for private initiatives.

The Federal Environmental Agency has therefore started a thorough assessment of policy options for creating an enabling environment without undermining environmental integrity. It has, for instance, investigated options to integrate greenhouse gas sensitive interventions in peatlands and forests in the emerging climate change architecture so as to tap into emission reduction potentials presented by carbon sinks (Joosten et al. 2016). Most recently, the Agency commissioned a systematic screening of regulatory challenges and opportunities for domestic offset projects – charting a pathway for how to address the various challenges and pitfalls of double counting and additionality (Nett and Wolters forthcoming).

Possible entry points for new policies identified are, among others, to commit not to sell surplus emission allowances and/or to cancel Assigned Amount Units for voluntary projects in order to reliably exclude double monetization; to assess and endorse existing voluntary carbon standards; and to redesign and create new incentives in the LULUCF/Agriculture forestry and other land use (AFOLU) sector in order to mitigate the risk of non-permanence. The German policy architecture might thus evolve in the future.

12.3 Italy

Table 16: Offsets Transactions by Organisations Headquartered in Italy, 2015

	All Voluntary Projects, Located Worldwide	Forestry Projects, Located Only in Italy
Number of Respondents	6 *(1 did not report transactions)*	3
Volume	169.6 $KtCO_2e$	20 $KtCO_2e$
Average Price	€2.5/t	€19.7/t
Value	€523.9K	€396.0K
Project Type(s)	A/R, Biomass/biochar, Energy efficiency	A/R, IFM
Standard(s)	Gold Standard, Verified Emissions Reductions +	Other, Verified Emissions Reductions +
Project Location(s)	Italy, Mozambique, Brazil, Uganda	Projects cover 87 hectares in Italy

Notes: Not all respondents provided detailed information on offset location, standard, or project type. Only 15% of offsets reported in this table included additional detailed information. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

Section author: Lucio Brotto, ETIFOR

Project developments

The first carbon compensation initiatives in Italy appeared in 2003 with the launch of private initiatives such as ImpattoZero and AzzeroCO2. The first (and only) attempt at a structured market dates to 2010 with the launch of CarboMark, a local voluntary carbon market for two regions in northeast Italy (Veneto and Friuli Venezia Giulia). Under CarboMark between 2010 and 2014 public forest owners sold offsets to private companies according to rigorous methodologies.

Today private organization are continuously introducing innovations in the field of carbon reduction and compensation, focusing on:

- better communication (e.g., blog, the "internet of things," user experience & engagement, radio, social networks, etc.);
- more diverse project frameworks that eschew traditional standards (e.g., micro-projects or projects that integrate water and carbon payments); and
- integrated energy and supply chain management systems focusing on a short value chain.

Major Italian players in term of forest carbon projects are LifeGate (about 18 forestry projects either in Italy or around the globe), AzzeroCO2 (with 16 reforestation projects in Italy), Treedom (using an online platform to monitor tree planting) and CarbonSink (with an ongoing partnership with Fair Trade).

Since 2009, the Carbon Monitoring Group (CMG) has been collecting data on voluntary forest carbon market initiatives in Italy. The CMG reported so far more than 70 forest carbon projects for a transacted value of approximately €5M.

Most Italian carbon project developers have been traditionally reluctant to use international third-party standards, either due to the very small size of projects or due to a lack of demand by buyers, who appear to be more interested in the reputation of suppliers rather than methodologies.

Policies and laws

In addition to the collection of market data, since 2011 the CMG has supported the bottom-up Italian Forest Carbon Code (IFCC) initiative (*Codice Forestale del Carbonio*). While it does not offer formal certification of forestry projects, the IFCC provides good-practice guidance on major issues project developers should take into consideration to enhance quality standards and harmonise the process of carbon crediting throughout Italy. The IFCC is currently used as a reference for project developers in Italy.

The framework Law 221/2015 ("Environmental Act for the promotion of the green economy and the containment of natural resources use") under Art.70 introduces a system for payment for ecosystem services for forest areas. The law intends to restructure the green economy sector in Italy. Implementation decrees are expected from 2017 onward.

On September 8th, 2016, the Italian Normative Organization (UNI) published the document UNI 11646:2016 "Green House Gases – Specifications for a National System of voluntary CO_2 credits derived from projects of reductions or removal of GHGs." UNI is a private organization representing the International Standards Organisation in Italy. The norm is voluntary and takes advantage of the experience of CarboMark.

12.4 United Kingdom

Table 20: Offsets Transactions by Organisations Headquartered in the United Kingdom, 2015		
	All Voluntary Projects, Located Worldwide	**Forestry Projects, Located Only in the United Kingdom**
Number of Respondents	17	3
Volume	19.8 $MtCO_2e$	259 $KtCO_2e$
Average Price	€2.5/t	-
Value	€48.8M	-
Project Type(s)	Wind, REDD+, A/R, Clean cookstoves, Hydro	A/R
Standard(s)	VCS, Gold Standard, WCC	WCC
Project Location(s)	Turkey, China, India, Brazil, UK, Uganda, Malawi	Projects cover 734 hectares in the United Kingdom

Notes: Not all respondents provided detailed information on offset location, standard, or project type. Only 69% of offsets reported in this table included additional detailed information. In order to protect the confidentiality of our respondents, Ecosystem Marketplace only reports a data point if three or more organisations provide data. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

Section author: Dr. Vicky West, Climate Change Analyst, UK Forestry Commission

Project developments

The UK's Woodland Carbon Code,[28] the voluntary government-backed standard for woodland creation projects, was launched in 2011. It allows the project developer to quantify and account for the carbon dioxide sequestered by the project, using the best scientific knowledge provided by Forest Research. A third-party validation and verification process ensures that projects are initiated and managed to high quality carbon standards as well as sustainable forest management as set out in the UK Forestry Standard. The UK Forestry Commission has also developed a framework for outlining the wider social and environmental benefits of projects. All projects use the publicly available UK Woodland Carbon Registry, provided by Markit, which shows project documentation as well as tracks the issuance, ownership, transfer and use of carbon credits, known as 'Woodland Carbon Units'. This provides transparency and clarity to the market and minimizes the possibility of double-selling.

By the end of 2016, 243 projects had registered with the Woodland Carbon Code. Altogether these projects are creating over 16,000 hectares of woodland and over their lifetime are predicted to sequester almost 6 $MtCO_2e$.[29] Of these projects, 138 were validated. Validated projects have created almost 5 thousand hectares of woodland and are predicted to sequester 2.3 $MtCO_2e$ over their lifetime. Projects have to be verified after year five and then every decade thereafter, so the first projects are just beginning to go through this process. So far, three of the

[28] UK Forestry Commission. UK Woodland Carbon Code. https://www.forestry.gov.uk/carboncode (Accessed 1 June 2017).

[29] UK Forestry Commission. Woodland Carbon Code Statistics. www.forestry.gov.uk/forestry/infd-93yjte (Accessed 1 June 2017).

projects have been verified at year five and now have started converting 'potential' to 'actual' sequestered carbon. These three projects cover 150 hectares and in five years have sequestered 730 tCO_2. The number of verified projects and units will increase steadily. In terms of numbers of players in the market, there are at least 14 project developers who have validated projects[30] and at least 70 different corporate buyers to date.[31]

Policies and laws

The UK Government has set emissions reduction targets through the UK Climate Change Act to reduce greenhouse gas emissions 80% by 2050 compared to 1990 levels. Across the UK there are also targets for woodland creation. Projects meeting the Woodland Carbon Code help to meet both of these targets. The UK government's Environmental Reporting Guidelines[32] set out how companies in the UK should report their gross and net emissions, and states that UK-generated Woodland Carbon Units can be used to compensate for gross emissions. The British Standards Institute's "PAS 2060: Carbon Neutrality"[33] sets out what companies need to do to claim 'carbon neutral' status. UK-generated Woodland Carbon Units can be used to compensate for unavoidable emissions in claims of carbon neutrality.

12.5 The Netherlands

Table 17: Offsets Transactions by Organisations Headquartered in the Netherlands, 2015

	All Voluntary Projects, Located Worldwide	Forestry Projects, Located Only in the Netherlands
Number of Respondents	7	*No forestry projects reported*
Volume	4.4 $MtCO_2e$	
Average Price	€1.8/t	
Value	€7.9M	
Project Type(s)	REDD+, Wind, A/R, Biogas	
Standard(s)	VCS, Gold Standard	
Project Location(s)	Indonesia, Turkey, Brazil, Uganda, Cambodia, India, South Africa, Ethiopia, Malaysia	

Notes: Not all respondents provided detailed information on offset location, standard, or project type. Only 82% of offsets reported in this table included additional detailed information. In order to protect the confidentiality of our respondents, Ecosystem Marketplace only reports a data point if three or more organisations provide data. As only one organisation provided data on forestry projects in the Netherlands, we are unable to provide that information here. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

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[30] UK Forestry Commission. Where to buy carbon from WCC projects. https://www.forestry.gov.uk/forestry/INFD-9N7FRU (Accessed 1 June 2017).

[31] UK Forestry Commission. What other companies say. http://www.forestry.gov.uk/forestry/INFD-9N7KV7 (Accessed 1 June 2017).

[32] Department for Environment, Food & Rural Affairs. *Environmental Reporting Guidelines: including mandatory greenhouse gas emissions reporting guidance*. UK Department for Environment, Food & Rural Affairs: London, 2013.

[33] BSI Group. PAS 2060 Carbon Neutrality. https://www.bsigroup.com/en-GB/PAS-2060-Carbon-Neutrality/ (Accessed 1 June 2017).

12.6 Spain

Table 18: Offsets Transactions by Organisations Headquartered in Spain, 2015		
	All Voluntary Projects, Located Worldwide	**Forestry Projects, Located Only in Spain**
Number of Respondents	3	*No forestry projects reported*
Volume	61.0 $KtCO_2e$	
Average Price	€16.1/t	
Value	€1.0M	
Project Type(s)	Wind, REDD+, A/R, Hydro	
Standard(s)	Gold Standard, No third-party standard, VCS	
Project Location(s)	India, Turkey, Spain, Brazil, Chile, Colombia, Kenya	

Notes: Not all respondents provided detailed information on offset location, standard, or project type in this section. In this case, 100% of offsets reported in this table had additional detailed information. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

12.7 Switzerland

Table 19: Offsets Transactions by Organisations Headquartered in Switzerland, 2015		
	All Voluntary Projects, Located Worldwide	**Forestry Projects, Located Only in Switzerland**
Number of Respondents	6	*No forestry projects reported*
Volume	5.5 $MtCO_2e$	
Average Price	€7.0/t	
Value	€39.9M	
Project Type(s)	REDD+, Energy efficiency, ozone-depleting substances, A/R, landfill methane	
Standard(s)	Gold Standard, VCS, Plan Vivo	
Project Location(s)	Brazil, Indonesia, Viet Nam, Nicaragua	

Notes: Not all respondents provided detailed information on offset location, standard, or project type. Only 8% of offsets reported in this table included additional detailed information. All project types, standards and project locations are listed in order of largest volume of offsets transacted to smallest.

13. OUTLOOK

Following the global climate agreement reached in Paris in late 2015, countries are now shifting from negotiation to implementation of climate policy. These decisions have also reinvigorated corporate and other voluntary actors to take action in the meantime. Here are some of the trends we are seeing in this space:

Broadening focus from carbon offsets to climate impacts: As the Paris Agreement became operational in October 2016, the fate of voluntary offsetting is uncertain. If every country has its own emissions reductions goals that means voluntary projects could represent a double counting of emissions (by both the host country and the end user buyer). While there still may be room for voluntary offsetting in specific sectors, or countries, some project developers are looking at selling confirmation of "climate impact" rather than actual offsets.

From project-based approaches to a landscape view: Voluntary forest carbon projects have another option to fit into countries' post-Paris goals. That is by "nesting" into larger landscape-level emissions reductions programs that are enacted by national or jurisdictional governments.

Integration of climate and forest certification standards: Voluntary forest certification schemes are increasingly integrating carbon accounting into their standards to provide additional income to certificate holders while lowering the transaction costs of carbon certification. For example, the Forest Stewardship Council in 2017 released its new ecosystem services verification procedure and tools for public consultation, with the ultimate goal of systematically including ecosystem services in auditing activities for its certificate holders.

Monetizing or attracting new demand from carbon projects' additional benefits: Many carbon projects provide a host of other ecosystem services around water, biodiversity and more. Both project developers, intermediaries and standards are looking at ways to quantify these additional benefits either for sale separately (as a new revenue source) or to attract new demand (but with the benefits remaining associated with the offsets). Many of these actors are looking at ways to align these co-benefits with the Sustainable Development Goals, seventeen targets that span environmental and social development, that have attracted private and public interest.

Sustainable and responsible investments (SRI): Investors have shown growing interest in addressing environmental, social and governance issues, and in backing conservation projects that can also generate a financial return. So far, most climate investments remain focused on energy or infrastructure improvements, but conservation-oriented investments have grown as well: in just two years, the total global private capital committed to conservation investments jumped by 62%, with total committed private capital from 2004 to 2015 estimated to be at least $8.2 billion.[34]

Supply chain sustainability and zero deforestation: When companies offset, they typically pay a separate organisation (either a project developer or intermediary) for emissions reductions certificates to cover emissions that the company can't reduce. Many of these emissions come from external processes or organizations associated with the business, such the transport of raw commodities from suppliers to an organization's manufacturing plant. However, some companies have begun to create offsetting-like projects within their supply chains. Separately, a growing number of companies have committed to eliminate or reduce deforestation from sourcing of commodities like palm oil or cattle that often cause deforestation. Both insetting and sustainable supply chain commitments point to growing engagement of companies to reduce carbon and/or save trees outside of a traditional offsetting approach**.**

Beyond offsetting: Europe hosts a significant number of carbon projects that do not generate verified offsets, such as corporate and individual tree planting efforts. These efforts likely deliver significant climate benefits but are not captured in carbon market benchmarks (including this report) and are not tracked in the aggregate. Often organisations engaged in such efforts do not seek accreditation under third-party standards due to high transaction costs or concerns about double-counting carbon mitigation in national climate targets. For the companies that fund

[34] Hamrick, K. State of Private Investment in Conservation 2016. Forest Trends: Washington DC, 2016.

these climate projects, marketing and visibility may be a bigger draw than accreditation under an accepted methodology.

Enabling policy: Some countries in Europe have recently established policies favouring the development of climate friendly interventions in the forestry sector (such as the United Kingdom's Woodland Carbon Code). New policies are emerging in other countries. For example, in Italy the 2015 *Environmental Act for the promotion of the green economy and the containment of natural resources use* (Law 221/2015, Art.70) introduces a system for payment for ecosystem service directed to forest areas.


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