

Carbon Trading 101: The Basics

“Everything you need to know about carbon trading to help get you started...”

2010 American English Edition

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Introduction

Overview

We have written this document to help individuals, businesses, and organizations to understand the basics of carbon trading and the emerging carbon market in a simple, concise, and informative document.

It is in layman's terms and designed specifically for those who are new to it all. It should therefore only be used as a general overview of the industry, and you need to do further research if you are interested in a specific part of the industry.

All the information included in this document is freely available on the web, at industry events, and through the various players in the market - if you have the time and patience to look for it. However, like all emerging markets, particularly such high-growth ones as carbon, the information is often fragmented, incomplete, and represented several different ways and carbon-specific languages.

Carbon Trading 101: The Basics will give you all the basic information and knowledge you need to get started in the industry, find out if the carbon market and carbon trading are right for you, or both. It will also help you save months of confusing research trying to figure it all out on your own.

After reading this document you will be confident talking about the basics of carbon trading with anyone in the industry. It will also help you to decide about what you should and can do next. You'll be in a better position to make your own informed decisions about the marketplace and to work out for yourself if carbon trading is right for you.

So hang on tight, enjoy the ride, and welcome to the ever-changing world of carbon.

Section 1. The Basic Questions

What is carbon trading?

Carbon trading, also called emissions trading, is a popular term used to describe the action of buying, selling, and trading carbon credits, offsets, and permits within various carbon markets.

What is a carbon market?

The term carbon market can either refer to the entire worldwide carbon industry as a whole or a specific geographical region within it, such as Europe, depending on the context.

Commercially, the term carbon market can also be used to describe the various dealings, activities, and interactions - usually business-to-business - within the carbon industry itself. These interactions may also include those involving the various carbon exchanges and registries that are emerging in each of the major regions.

Such participants within each of the various carbon markets around the world as governments, businesses, and individuals can buy, sell, option, and trade units of greenhouse gas emissions (GHG) or their equivalents by utilizing such mechanisms and agreements as the Kyoto Protocol. Currently they can do this by using carbon credits, offsets, and permits. Once again, this depends on the specific carbon market in which they are operating.

Carbon traders currently undertake the majority of these transactions for regulatory purposes, such as in Europe, where it is compulsory for some industries. However, a voluntary market is emerging in places such as the US.

What do all the new acronyms, such as CDM, JI, CERs, and VERs, actually mean?

As you delve further into the details of what is behind carbon trading, you'll come across many acronyms that the carbon market has created to distinguish its various mechanisms. This can be confusing at the start, with such terms as CDM, JI, CERs, VERs, AAUs, EAUs, and VCS. For the moment, don't let these confuse you. Instead, just think of them as different types of products and standards within the industry. You can worry about exactly what they mean and discover the details later. We have included a list at the end of this report that may help you to remember some of the basic ones when you're ready.

Another quick word of caution for beginners: the carbon industry is still developing, and therefore the carbon-centric language it uses changes all the time. New terms, phrases, and concepts are emerging all the time, which makes it nearly impossible to keep up-to-date with all the terms. Don't stress out about this or feel stupid, just deal with them one at a time. Once again, if you learn the ones listed at the back of this report you'll know all the basics, which is enough to keep you out of trouble.

What is a carbon credit?

A carbon credit is something that people can use to assign a commercial dollar value to one metric ton of greenhouse gas emissions or its equivalent, so that they can measure, buy, sell, and trade it.

When someone purchases a carbon credit from a third party, they are essentially paying someone else to offset, or reduce, one ton of carbon emissions from the atmosphere in another location on their behalf. Effectively, they are paying someone else to do what they either can't do or don't want to do themselves.

While using carbon credits does not reduce someone's own physical carbon footprint, when used correctly they do have a positive net effect on the global environment. If people buy the right type of certified carbon credits from a trusted source, most of the money they spend will go towards funding new projects and green technologies, which is good for the environment in the long term.

What is the difference between credits, offsets, and permits?

The difference between carbon credits, offsets, and permits can be confusing for newcomers to the industry. Fundamentally, carbon credits and offsets are the same thing, both being equal to one metric ton of GHG emissions. Some people argue differently, however. Most of the differences in their interpretation relate to the various scenarios in which the words are used, and for what purpose the credits or offsets are used. The carbon language everyone is using at the moment is still extremely new, and therefore changes regularly. We hope that for everyone's sake it will develop over time and become clearer.

The simplest way to explain the differences is that a permit means that its holder has the right to pollute up to a certain level, whereas a carbon credit or offset is a certificate stating that someone else has made a commitment to reduce carbon emissions on behalf of the owner of the credit or offset. People, governments, and businesses can buy, sell and trade carbon credits, offsets, and permits in the various carbon markets. However, only credits and offsets actually help to reduce the effects of GHGs on the environment.

What is a carbon footprint?

A carbon footprint is a representation - or a momentary snapshot - of the total greenhouse gas emissions that a business, organization, or person is emitting into the atmosphere. Carbon footprints are usually measured annually, and are often expressed in terms of carbon dioxide equivalents (CO₂e). Carbon credits are an example of a CO₂e.

Carbon footprints can vary greatly, depending on the type of activities someone does and how often they choose to do them. Individual people can reduce their carbon footprints by making simple choices every day. Many consumer websites offer good suggestions about how to do this.

Businesses, however, need to take a more structured approach. The first step is to get an audit done to assess their existing carbon footprint. The next step is usually to put new carbon-saving strategies in place to reduce their existing emissions, starting with simple things and working up to more complex and difficult ones. They can then use carbon credits to offset the remaining emissions if they want either to meet their industry regulations or become carbon-neutral voluntarily. Obviously, the larger and more complex the business the more expensive this process is likely to be. A large number of carbon consultants are in the business of helping guide businesses through this process. You can find an enormous number of carbon consultants on the internet if you're interested.

How do these terms relate to the issue of climate change?

While trading carbon credits is not a magic wand or the only way to address climate change, it does allow us to put a trading mechanism in place that puts a commercial value on the carbon emissions that we, as a society, create.

Why it is important for us to put a value on our carbon emissions?

Placing a price on carbon emissions produces a financial disincentive for businesses and other organizations that don't reduce their carbon footprints and choose to continue polluting. It also provides a financial incentive for businesses and other organizations that choose become part of the solution to create projects and carbon reductions that either reduce or remove carbon dioxide from the atmosphere.

Carbon trading, therefore, is simply one mechanism that people have put in place to try to help the commercial world deal with the issue of climate change. Carbon credits themselves are simply a tool, providing a new form of currency in the carbon market. The reality is that it is up to the world's businesses, other organizations, and individual people to utilize the emerging carbon market through their activities, both good and bad.

How will a carbon-constrained future affect me?

Like it or not, a carbon-constrained future is going to affect every one of us at some point. Unfortunately, it isn't something that is going to happen in the future, or an event for which we need to start planning someday. The reality of climate change has already begun.

How will it affect governments?

Governments that choose to ignore the issue of climate change and a carbon-constrained future may eventually find themselves out of office or in serious political trouble. The same governments may also find that by delaying facing up to the issue they've actually created a bigger financial problem for themselves and their countries for the future, as their countries' products and services may become devalued when trading with countries with carbon-trading laws and regulations in place, thereby affecting their overall export revenues.

How will it affect businesses and other organizations?

Larger businesses and other organizations will need to start accounting for their carbon footprints and the emissions that they produce each year. This will require regular auditing, independent testing, and - potentially - offsetting through the use of carbon credits.

Larger public companies may also see sharp falls in their share prices if they don't have appropriate carbon strategies in place. Sophisticated investors have already started migrating their investments away from carbon-intensive companies to more carbon-friendly companies in preparation for the new, carbon-constrained future.

Even small-to-medium-size businesses must be ready to face a carbon-constrained future, as they're typically involved in the supply chains of larger businesses, which will at some future point expect their suppliers to comply with the realities of a carbon-constrained business environment.

How will it affect individual people?

Unfortunately, we as individual human beings are at the end of the supply chain. The ultimate costs of a carbon-constrained future will eventually be passed all the way down the line to us as consumers of the various products and services that are creating the problem. As a result, we can expect to see an increase in the cost of most of the goods and services that we currently buy and use daily. Whether we like it or not, this is the price that we as citizens of the developed world need to pay for the lifestyles we choose to live.

How can I get involved in carbon trading, the carbon market, or both?

You have several ways to become involved with carbon trading and the wider carbon market at the moment - if you're interested. The good news is that the carbon market is growing rapidly and opportunities are presenting themselves in every direction at the moment if you want to go looking for them. As usual, your choices will only be limited by the amount of time, cash, and resources to which you have access.

Due to the broad nature of the issue of climate change and the newness of it all, the carbon market is going to need a wide variety of products, services, systems, and expertise to deal with it. The carbon market already seems as if it will be the next dot.com, but, we hope, this time without any big bubble that bursts along the way. It will probably be at least three to five years before the market really fires up with some serious momentum, and within 10 to 15 years it is likely to become one of the biggest commodity markets in the world - if not the biggest.

The following table lists just some of the opportunities and types of jobs that will be required over the coming years as the carbon market grows and evolves.

Jobs	Opportunities
Accountants	Auditing Services
Auditors	Brokerage & Trading Services
Brokers	Carbon Exchanges
Consultants	Carbon Registers
Engineers	Equipment Supply
Entrepreneurs	Information Providers
Management	Market Infrastructure
Marketing	Origination Services
Sales	Project Developers
Scientists	Specialized Software
Traders	Technology

A number of new specialty courses and universities around the world have started to offer carbon-specific and environmental pathways. An alternative to these is simply to get involved at the ground level with the part of the industry that interests you now and work your way up over the coming years.

The last option is to take a more entrepreneurial approach and jump in the deep end now and create your own business, place in the market, or both while there is still time. Plenty of opportunities are still out there if you have the time and the desire to put in the effort now for the future.

Section 2. Understanding Carbon Credits

Why buy carbon credits?

Businesses and other organizations typically buy carbon credits for one of three reasons. These are:

- to comply with a regulated carbon market, such as the existing European ETS,
- for speculative purposes, such as by buying them now with the intention of trading them later for a profit, or
- to offset a carbon footprint voluntarily, such as due to a desire to become carbon neutral.

It should be noted that if you intend to use the carbon credits yourself to help offset your own carbon footprint you'll also need to retire them after you've purchased them. To make this official you should do it on an independent register within your particular carbon market. The purpose of retiring a credit is to show that it has been used or spent. Up until that point it is still a fully tradable carbon credit that no one has used. Retirement is therefore an important step towards becoming carbon neutral.

How much do carbon credits cost?

This really is the million-dollar question in regard to carbon credits. Unfortunately, it has no simple answer, as the variables in pricing carbon are complex. Carbon credits come in all shapes and sizes and can vary greatly due to several factors. From the end users' point of view, such compliance credits (CERs) as spot CERs have typically ranged from €8 to €22 in the past, while the voluntary credits (VERs) have traded between US\$5 and US\$15 although it is still possible to find cheaper VERs around. Generally speaking, and as with any other emerging market, the better the product, in this case credits, the more they tend to cost, subject to supply and demand.

While all carbon credits are theoretically equal in value to one metric ton of GHG emissions, they can have totally different outcomes on the environment, so their prices vary depending on the type and quality of credit, particularly in the voluntary market. For example, prices in the voluntary market can vary depending on a) the type of credit - such as wind, solar, hydro, or forestry, b) the standard to which they've been certified - such as Kyoto vs. the Voluntary Carbon Standard or some other, c) the country of origin - as some countries have better reputations than others, d) the auditor who certified the original carbon project - and that auditor's credentials, and e) the story attached to them - such as whether the project generating them has additional social and community benefits.

In contrast to this, prices within the compliance market are somewhat more consistent and can be found on the various exchanges around the world, typically within 10% of each other. They do still fluctuate within the various carbon markets, though, depending on what's happening at the time and general market conditions. Pricing in relation to compliance credits relates more to supply and demand and the risk of fines that may be payable if a liable business fails to comply with a particular carbon-trading scheme.

Carbon credit prices may also vary with from whom someone buys them or through. The carbon market essentially consists of the three main sectors being the project developers and originators - or the creators of the credits, the brokers and traders - or the middlemen, and the retailers and resellers - or those who actually need or sell them.

Obviously, if buyers go directly to the originators and project developers they're usually likely to receive a cheaper price, but they would also need to buy in much larger quantities - such as 100,000 or more tons - and also have to know who to contact. This is likely to become harder to do as the market becomes more regulated and structured over the coming years and the originators become increasingly likely to prefer to deal through brokers and traders, who will then in turn deal with the retail market.

Those buying carbon credits should take care and, preferably, seek independent advice when doing so commercially, especially in an unregulated or voluntary market, as they need to make sure that they're comparing apples with apples.

What is the difference between compliance and voluntary carbon credits?

At present the two main types of credits that are available in the market, compliance credits (such as CERs) and voluntary credits (such as VERs). Within these two main types are nearly a dozen different carbon standards, which are all currently competing for dominance in the market. The main difference between them is that compliance credits have usually gone through a much stricter or more controlled certification process, which should mean that they're better, as such compliance credits usually cost more than voluntary credits.

Commercially, it is important to understand the different markets and mechanisms before investing heavily in carbon credits. When doing this, buyers should pay careful attention to the particular carbon market's region and requirements.

Are all carbon credits the same?

No, they aren't. As noted earlier, they can have totally different outcomes on the environment. Since they come in all different shapes and sizes it's important to compare some basic fundamentals when deciding on which ones to buy. The following should be used as a starting point:

- **Verification:** Check that an independent third party has certified them, and make sure that they're recognized by an approved carbon standard relative to the market in which or for which you intend to use them.
- **Additionality:** Check to make sure that they're actually helping to fight climate change by either reducing or removing GHG emissions from the environment, and understand how they were created. The market is also currently confronting some issues involving the double counting of carbon credits that you may need to consider later.

- **Permanence:** Check to make sure that the actual reduction or removal of GHGs is permanent, and make sure it can't be undone in the future. For example, find out if the reduction has already happened and whether it can be reversed.
- **Traceability:** Check to make sure that the credits either have individual serial numbers for them, that they come with identification numbers so they can be tracked and accounted for on a register, or do both. This will also help with the issue of double counting.
- **Receipts:** Check to make sure that you'll receive a tax invoice or proof of purchase after the transaction is complete. This may also help with proof of ownership later on if that becomes necessary.

Carbon credits that cannot meet all of these fundamental tests should be purchased only with enormous caution.

How do I know which are the right carbon credits to buy?

If you're new to the carbon market, the safest way is to seek independent advice from a carbon broker, retailer, or independent third party. When seeking advice from an independent third party, always check to make sure that the party providing the advice has no conflict of interest in regard to the credits about which they are advising you. For example, check to make sure they don't sell their own credits alongside another company's credits or receive a higher commission on one sale than another.

Since the carbon industry is still extremely new in most markets, few industry-specific associations have been established so far to regulate best practices. You unfortunately simply have to look around at the various options on the market and decide which one is right for you. If you still feel that you don't know enough to make a commercial decision on your own, you'd be wise to use an independent third party to help you choose. You'll be likely to cover any additional fees that they charge with savings with either better buying power, time, or the assurance that you have made the right decision and paid the right price.

How do I create a carbon credit?

Carbon credits can be created from a number of different activities that help either to reduce or remove GHG emissions from the atmosphere. These include, but are not limited to, solar power, wind power, hydro power, fuel switching and forestry.

Understanding what types of projects actually qualify for carbon credits can be a particularly complex issue. You should seek specialist advice from a project's developer or originator before investing too much time and money in the early stages. Projects must pass several tests to be suitable for carbon credits, the most important of which is *additionality*. If you're unfamiliar with this term or the other tests, you should research them further in order to be prepared before contacting one of these companies. A good place to start for compliance credits, although it can

be devilishly confusing for beginners, is on the UNFCCC website (see the Kyoto Protocol section) or alternatively one of the new emerging registries in the United States.

You should treat the production of carbon credits like any other commercial venture and give it the same amount of due diligence and importance, as it typically takes several years before a viable return becomes apparent. For more information on how to create carbon credits please read the section in this report titled “Project Development and Carbon Origination.”

How do I trade carbon credits?

Buying and selling carbon credits is a relatively straightforward process and can be compared to buying and selling shares in a stock market, as it's paper-based. No physical asset normally changes hands, and if you have access to the right amount of money and the right person to help you such transactions are relatively uncomplicated.

The tricky part for newcomers to the industry is finding the right company with which to buy or sell them through, and then deciding at what price to buy or sell them. It's also important to be aware of the different types of credits that are available on the market and how they compare with each other, as detailed earlier.

If you go to Google and do a search for 'carbon credits' you'll find a large number of companies already selling carbon credits online. If you're a company and looking to buy a commercial quantity of more than 1,000 tons you should consider using the services of a specialized carbon broker. To find this type of service online you should key in 'carbon broker' on Google. Alternatively if you looking for large parcels of credits (100,000+ tons) you'll need to go direct to someone in the primary carbon market who creates them and deal directly.

A carbon broker can help you buy and sell credits at the best market rate, typically charging a set fee or percentage commission based on the size of the transaction. Their fees usually range between 3% and 5% for quantities between 1000t and 100,000t and then the fees will come down as the volume goes up. In return you'll have the piece of mind that you've fully surveyed the market and received independent advice. Brokers also handle the whole transaction for you. A carbon broker can be particularly helpful in the voluntary market, which is less than fully transparent and involves many other issues to consider when buying or selling such credits.

Can I buy and sell carbon credits internationally?

Yes. In most cases carbon credits can still be bought and sold internationally, and minimal restrictions are currently in place. The point about which you need to be careful when buying and selling carbon credits internationally is whether the specific market in which you're buying or selling them will actually recognize them, as its requirements may differ. For example, Europe currently has some regulations in place that prohibit the retirement of certain types of carbon credits in its market. You need to be careful in making your selection when buying or selling different types of credits internationally.

How and why does someone retire carbon credits?

If you've purchased carbon credits to help offset your carbon footprint it's important to retire them so that you can make your claim in regard to carbon neutrality.

Carbon credits that are going to be retired should first be listed or registered on a recognized carbon register so that they can be traced. Once they've been registered they can then also be retired so that you can then make your claim.

Completing the process of retirement effectively renders them as used. This means they'll no longer have any commercial value, as you've spent them, and you therefore can't use them again or resell them to someone else. This is an important step that also addresses the issue of double counting in the industry.

Most reputable registries will be able to do the actual retiring of your carbon credits for you for a small fee, or if you bought them from a carbon broker or third party they should also be able to arrange this service for you.

Section 3. International Carbon Markets

Overview

The world now has several different carbon markets in various regions. They're all currently working towards a regulation or compliance-based mechanism of some sort, such as a cap-and-trade model. The European Union has by far the largest and most established compliance-based market in the world, having traded over US\$100 billion in 2009.

At the other side of the world, Australia is also trying to develop a new cap-and-trade model. Under the current proposal, it has the potential to be the most inclusive compliance-based market to date, and is expected to capture from 70% to 80% of the industry from day one assuming they can get enough political support for it.

Under the new Obama administration, the US has become the latest entrant into the market, recently announcing its intent to place a price on carbon in the future. If and when the US market comes online it will be the largest carbon market in the world, and many people are already mobilizing towards the US in anticipation of this.

It's also a common belief within the industry that once the US is officially on board, such other slower-moving carbon markets as Canada and New Zealand will quickly rally to launch their own mechanisms.

Many hope that in the future the various carbon markets will be linked in some way, either directly or indirectly, but this remains uncertain. At this stage and until an international agreement is reached it appears that the various carbon markets may develop in isolation to each other. If this becomes the case you will probably find that there will be a number of 'linkages' between them most probably based on existing international trade agreements. Below is a brief summary of the major carbon markets that are currently established or emerging.

European Union Emissions Trading Scheme - EU ETS

The European Union Emissions Trading Scheme (EU ETS) was the first multinational and multi-sector compliance-based emission trading system in the world. It has been in operation since 2005 and is now in its second trading period, which ends in 2012.

In 2009 this scheme facilitated more than US\$100 billion worth of carbon-related trades, with more than 3 billion carbon spot, future, and option contracts. In 2008 and 2009, however, the prevailing global economic crisis caused the EU ETS to be extremely volatile, with market prices dropping some 75% from previous years to between €8 to €15 per credit.

Talks are currently underway evaluating the scheme's current performance and assessing what changes should be made in the third trading period, which is due to start on 1 January 2013. Various stakeholders have both criticized and applauded the EU ETS for its success in the past. However, it should be noted that it was the first trading scheme of its type in the world and was initially somewhat experimental.

United States

Several regional trading schemes are currently in operation in the US. We've summarized them below for your information. One of the challenges the US will face moving forward is how to accommodate and try to combine these into one national trading scheme in the future.

Regional Greenhouse Gas Initiative - RGGI

The Regional Greenhouse Gas Initiative (RGGI) was the first mandatory carbon market in the US to start reducing greenhouse gas emissions. Ten Northeastern and Mid-Atlantic states have agreed to cap and then reduce CO₂ emissions from the power sector by approximately 10% by 2018.

Under RGGI, emission allowances are sold at regular auctions, the proceeds being invested in such programs that benefit consumers as energy efficiency, renewable energy, and other clean technologies. The RGGI carbon market was worth approximately US\$246 million in 2008.

Chicago Climate Exchange - CCX

Members of the Chicago Climate Exchange (CCX) have made a voluntary commitment to reduce their GHG emissions some 6% by 2010 from what they were in the period between 1998 and 2001. The CCX uses a mechanism called a Carbon Financial Instrument (CCX-CFI). The CCX saw strong growth in the VER market in 2008, as it dominated volumes in the second half.

The CCX carbon market was worth approximately US\$309 million in 2008, with about 69 million tons of CO₂ being traded through it. At this stage the expectation is that the new federal scheme will recognize the CCX's instruments.

California's Global Warming Solutions Act

California's Global Warming Solutions Act aims to reduce GHG emissions by at least 25% from 1990 levels by 2020. Their cap-and-trade model, which is still under design, intends to cover some 85% of the GHG emissions in California. Under the current W-M Bill, allowances issued under this act before 2012 could potentially be exchanged for the new federal carbon allowances.

California Climate Action Reserve - CCAR

The California Climate Action Reserve, also known as just the Climate Action Reserve, is a recognized domestic offset market that started in California. It is well-known for its transparency in the market and has a highly regulated system with strong standards and procedures.

Traders exchange something called Climate Reserve Tons (CRTs) under this mechanism. Pre-compliance buyers have already been looking at it in preparation for the new Western Climate Initiative and pending US federal scheme.

Western Climate Initiative - WCI

The Western Climate Initiative (WCI) covers the seven US states of Arizona, California, Montana, New Mexico, Oregon, Utah, and Washington and the four Canadian provinces of British Columbia, Manitoba, Ontario, and Quebec. It aims for an aggregate reduction in emissions of 15% from the 2005 level by 2020.

Australia

Australia is trying to introduce a Carbon Pollution Reduction Scheme (CPRS) as a compliance based market. It was initially scheduled to start in 2010, but has now been delayed for a year for both political and economic reasons and its start date is not yet known.

As it now stands it has the potential to be the most inclusive compliance-based market to date, and once underway it should cover some 70% to 80% of Australian emissions. The current model is based on a new cap-and-trade model that has the ability to change with the international carbon market over the coming years, thanks to such unique design features as goal posts that move over time with the changing market.

Its current design aims for Australia to reduce its emission levels by 5% from those in 1990 by 2020, but the government is prepared to increase this up to 15% if such other major industrialized countries as the US and EU commit to a fair international agreement.

It should also be noted that the Australian state of New South Wales (NSW) has an existing trading scheme in place called the NSW Greenhouse Gas Abatement Scheme (NSW GGAS). In 2008 this market was worth some US\$183 million. At this stage it is expected that the GGAS will roll into the new CPRS when and if it starts.

Japan

Japan launched a voluntary carbon market in 2008 based on an opt-in model, in which larger businesses and companies pledge to reduce their emissions voluntarily. Its designers initially hoped that thousands of companies would sign up, but that has yet to happen, probably due to the current global financial crisis.

It's currently running as a trial to gauge interest from industry, with most of its transactions being over-the-counter and spot trades. While it doesn't force Japanese businesses to make changes and falls short of their Kyoto targets, it is likely to be rolled into a more inclusive mandatory cap-and-trade system when Japan implements one.

Section 4. Standards, Mechanisms, and Registries

Overview

One of the most difficult areas to work out for those who are new to carbon trading, other than the ever-changing industry jargon, is how all the different standards, mechanisms, and compliance markets work and interact. Other than perhaps the Kyoto Protocol, their designers have all developed them in isolation within their markets, and then have usually adapted them to suit the constantly changing situations affecting the industry. Most of them are okay in principle and work well, but in order to progress the industry needs more uniformity to help create some certainty for the people who have the capital to invest.

More than a dozen different carbon standards are currently in place globally, all of them competing to become the dominant one. Depending on the standard, they can be in force in both the compliance and voluntary markets, and in some cases can even overlap.

Then, just to confuse things even further, the different carbon markets pick and choose which standards they do and don't recognize, depending on the particular market mechanism they have in place, their compliance requirements, or both. For example, compliance-based markets generally require better, or higher-quality, carbon credits than voluntary markets, and their prices usually reflect this. The different markets therefore use and permit trading in different credits, depending on their local standards, mechanisms, and compliance rules.

Compliance and Voluntary Markets

The difference between the compliance and voluntary markets is essentially that buyers in the compliance-based markets are there due to legal requirements to reduce their emissions, whereas in the voluntary markets they do this on their own accord.

Compliance markets tend to be regulated by governments and involve mostly industries within a defined area, such as the EU or a specific country, with companies and corporations within those industries being subject to mandatory participation. The industries involved are normally designated by their sector or the amount of emissions that they create. Failure to comply with such regulations typically results in heavy fines, criminal prosecution, or both.

The businesses, corporations, and individual people involved in voluntary markets choose to participate in some form of voluntary action without a mandatory carbon policy being in place. Their very nature makes most voluntary markets slippery things to define. The primary motivation for participation in these markets is various corporations' strategies for gaining greater market share or keeping market segments onside through green marketing activities. Another source of motivation is that a growing number of companies are genuinely trying to be socially responsible and do their part to combat climate change.

The Kyoto Protocol

The Kyoto Protocol, sometimes just called Kyoto, is a legally binding international agreement to reduce GHG emissions globally. It expires in 2012, and numerous governments are currently trying to negotiate a new agreement to replace it going forward. It came into force on 16 February 2005, after originally being signed in 1990. More than 180 countries have already ratified it, with Australia being one of the most recent to do so in 2007. The only major country that has not become a member of it at the time of this writing is the US.

The secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) administers and regulates Kyoto. Most of the countries within the UNFCCC ratified its treaty and Kyoto more than a decade ago. Once a country has done this it has committed itself to reducing its GHG emissions. Kyoto offers its members three different mechanisms to help meet their targets. These are emissions trading, the Clean Development Mechanism (CMD), and joint implementation (JI).

Emissions trading allows industrialised countries to express their allowed emissions or assigned amounts within the treaty as assigned amount units (AAUs). Countries that have units to spare or unused allowances can then trade these with other countries that have surpassed their own allowances and require additional units. Since carbon dioxide is the principle GHG, most people now refer to it as trading carbon within a carbon market.

The CDM allows industrialised countries to meet their emission targets or levels through investment, co-operation, or both in emission-reduction projects in non-industrialised or developing countries. This provides industrialised countries with greater flexibility in how they can meet their overall targets.

JI allows an industrialised country to earn emission reduction units (ERUs) from a project in another industrialised country. An example of this may be the sharing of new technology, foreign investment, or both in an emissions-reduction project.

Carbon Standards

Outside of the Kyoto mechanisms just described above, other standards also exist, mostly in voluntary markets. The following table details some of the main ones.

Carbon Standard	Description
Voluntary Carbon Standard (VCS)	The VCS is currently the main international standard for voluntary offset projects. The environmental benefits of offsets certified by VCS have already happened and are additional, measurable, permanent, and independently verified.
The Gold Standard (GS)	The Gold Standard is a best-practice methodology and premium-quality carbon credit label for both Kyoto and voluntary carbon markets. It is run by a non-profit organization based in Switzerland.
REDD Carbon Credits	REDD stands for 'reducing emissions from deforestation and degradation.' Although REDD is technically not yet a standard, it's a new term that has been created to help reduce emissions from deforestation and forest degradation in developing countries. The US carbon market is likely to recognise REDD

	formally in the future.
Climate, Community, and Biodiversity (CCB)	The CCB is a best-practice standard that evaluates land-based carbon mitigation projects in the early stages of development.
Greenhouse Friendly (GF)	Greenhouse Friendly is an Australian government initiative allowing businesses to market carbon-neutral products and services as such. Applications for new certification are currently on hold, with Australia's pending CPRS due in 2011.

Carbon Registries

Sitting alongside the various standards in the marketplace are many registries, which are all competing for the top market position. The following table details some of the main ones.

Carbon Registries	Description
American Carbon Registry (ACR)	The American Carbon Registry tracks and registers carbon offsets that are real, additional, permanent, verifiable, and based on ISO 14064 standards.
Blue Registry	Established by the TÜV SÜD company, the Blue Registry is based on a simplified procedure for tracking and registering carbon credits outside of the Kyoto Protocol.
CDM/JI	Under Kyoto, the UNFCCC operates a registry for CDM/JI projects that is fully accessible to the public and provides important data on all carbon projects within it.
Chicago Climate Exchange (CCX)	The CCX operates a registry that allows entities and individual people within the agricultural, forestry, waste management, and renewable energy sectors to register their offsets.
Gold Standard	The Gold Standard operates its own registry to track Gold Standard-approved carbon credits in both compliance and voluntary markets.
NSW GGAS	The New South Wales Greenhouse Gas Abatement Scheme (GGAS) maintains the GGAS register, which provides details of accredited abatement-certificate providers and the ownership of their abatement certificates, as with the carbon-credit equivalents for the scheme.
The Reserve (CAR)	The CAR in the US tracks and registers voluntary projects that reduce emissions of GHGs through a publicly accessible database.
MER VCS Registry	Markit Environmental operates one of the four authorized VCS registries and is authorized to issue, transfer, retire, inquire, and report on voluntary carbon units (VCUs).
APX	APX also operates one of the four authorized VCS registries and is the leading infrastructure provider for environmental and energy markets in renewable energy and greenhouse gases including carbon commodities in the US.

Section 5. Project Development and Carbon Origination

What is the difference between a project developer and a carbon originator?

Although project developers and carbon originators may at first glance appear to perform the same role, they are different in that project developers usually use other people's money and carbon originators use their own.

Project developers typically form working relationships with third parties that have either the money or the potential carbon assets and then help them to leverage this into a project intended to produce carbon credits. Carbon development has no certainties, but good project developers know how to reduce a project's risks along the way and to look after everyone's interests - including their own.

Depending on the project developer and the potential strength of the project, they either offer to work for free upfront or simply charge for their time and services along the way, similarly to how consultants work. In most cases paying along the way works out far cheaper for their clients in the long run if they can cash flow it, as most project developers tend to add an additional margin if they have to wait for payment and take on some of their client's risk.

Carbon originators, however, usually finance, manage, and develop their own projects in-house or even contract other people's assets directly. Although the actual finance for the project may come from elsewhere, as with any other commercial enterprise, they are essentially in the business of carbon creation and development. They look strategically for carbon opportunities and assets that they can leverage into carbon credits and sell for a profit.

Those looking for a project developer in the industry with whom to work often find that they're also carbon originators. This is not necessarily a bad thing, but it's important to understand that they perform both roles, and as such their potential clients or partners should adjust their due diligence questions to suit.

Why is it important to use a reputable project developer?

Carbon-credit creation, development, or both should be considered a business venture regardless of whether you are doing it yourself or with the help of project developers. As such you should give it the same due diligence as any other commercial venture into which you are planning to invest time, money, or both.

Although it's technically possible to develop your own projects yourself without the help of a project developer, doing so takes much more time and effort to get to the same end result. If you are only planning to do one or two carbon projects we highly recommend the use of a project developer. The risk of getting it wrong, making a critical mistake, or both is too high. However, if you intend to make this a full-time business you should consider getting the expertise in-house as soon as possible so you don't have to pay for it repeatedly.

Either way, a reputable project developer is highly likely to help save you time and money in the long run. Assuming that you've chosen the right one at the start, and that he, she, or they have

developed a similar type of project before, the developer should know what to look for, from where the problems may come, and how to deal with those problems that may arise along the way. Another important thing is that a good project developer usually has existing relationships in the industry who can also help to get your project up and running as quickly as possible. Being able to get a project up and running in 12 months instead of 18 means that you can start getting cash flowing back in the door some six months earlier.

How do I know which project developer to choose?

In order to choose the right project developer, you should first of all make sure that you feel comfortable working with the potential company, consultant, or both, as you may be working together for the next 12 to 18 months. You also need to consider at least the following nine questions:

- a) Does the developer have a good track record in the industry?
- b) Is the developer a specialist in this type of project?
- c) Has the developer done projects similar to your proposed one in the past?
- d) Can you talk with the developer's other customers who've already been through the same experience?
- e) Does the developer have local representation in the area where you plan to locate the project?
- f) With whom will you actually be dealing day-to-day - a sales rep or a scientist?
- g) Can you stage the payments in order to de-risk the project if you're paying upfront?
- h) For how long are you locked in or under contract if payment is delayed?
- i) Who owns the right to sell the carbon credits at the end of the project?

You should discuss or find the answers to all of these questions before selecting your project developer. If you contact four or more project developers it shouldn't take you long to work out which ones are interested in your business - and how professional they are.

How do I create my own carbon credits?

Whether you plan to use a project developer or decide to go with the do-it-yourself option, the same fundamental process still applies for creating and selling carbon credits.

- a) Select the type of carbon project you would like to start.
- b) Choose the carbon standard against which you plan to certify the project.
- c) Conduct an initial assessment, or audit, to discover whether the project is viable.
- d) Start and register the project with the relevant standard or authority.
- e) Work towards full certification and the final assessment, or audit.

- f) Ensure that you have all the required certificates and documentation in place.
- g) Select a carbon broker or sales channel for your credits and sell them.

Once you choose one, the project developer then usually offers to do an initial assessment of your project to determine its suitability. This can cost between US\$5,000 and \$10,000, so you need to ensure the project has enough scale to justify the initial costs and research. Once this initial assessment has been performed, and if your project stacks up on paper, the developer then conducts a further or full assessment and considers all aspects of the project. Once again, depending on your project's complexity this can become expensive, costing between US\$30,000 and \$70,000, and in some instances take up to 12 months.

Once a project has been fully completed and certified it should then be capable of producing a set amount of carbon credits each year, subject to annual compliance and ongoing audits. This means that each year, referred to as a vintage, your project should be able to produce a certain amount of credits that you can then sell, so you can keep selling new ones annually. The price you receive for them depends on the standard against which you registered them, the quality of the credits, and the market demand at the time.

Carbon-credit creation can be a complex science, and as mentioned earlier should receive the same respect and due diligence as any other commercial business venture. You should always seek out a specialist when you require specialist information. If your project is incapable of producing enough carbon credits within the first few years to justify the initial outlay for the audits, certification, and consultants, we highly recommend you consider either upscaling it or shelving it until the costs come down or the market changes.

What type of carbon projects can be developed?

Many different types of carbon projects can be developed if you're interested in starting one up yourself, and many new variations are popping up all the time. The main ones are wind power, hydro power, solar power, methane capture, afforestation, avoided deforestation, reforestation, biomass, biogas, geological sequestration, fuel switching and energy efficiency.

Essentially, any project that meets the criteria for registration, certification, or both and can prove additionality is likely to qualify as a carbon project and, potentially, produce carbon credits. Once again, this assumes that you have the time, money, and resources to develop it from concept to completion.

The most popular types of projects in terms of buyers in the market are renewable such as wind power, solar power, and methane capture. Hydro power is also popular, but many larger-scale hydro projects have received negative press due to the potentially negative effects that such large installations can have on the environment. When considering hydro projects it is important to look at run-of-river projects, as they're far friendlier toward the environment, being usually relatively small in scale. In the future and particularly in the US forestry will also be a big area.

I have a small tree plantation; can I earn carbon credits?

This is by far the most the most common question that people ask project developers and carbon originators. The simple answer is that if you find the thought of spending between US\$5,000 and \$10,000 to find out and then a further US\$30,000 to \$70,000 to certify the project fully to be frightening, then carbon-credit development is probably not right for you at this stage. Although this may change over time as the industry develops, if you presently don't have the scale and size to justify the initial outlay your safest bet is to avoid carbon-credit creation right now.

About what things do I need to be careful when starting a carbon project?

In addition to the information detailed above, you should take a few other things into consideration in the early stages of carbon-credit creation.

First, you need to be careful to select the right carbon standard to certify against your credits. Choosing the wrong standard would cost you an unacceptable amount of time and money.

Next, you need to select carefully into which market you intend to sell your credits - a compliance market or a voluntary market. This will have an impact on your initial outlay and the certification process you'll need to undertake.

You'll also need to plan how you're going to cash flow the project. In some instances it can take up to two years before you start getting a return on your investment. Can you cash flow all the expenses in the meantime?

Finally, you need to decide who will own the rights to sell the carbon credits once the project's ready to go. This depends on the deal you negotiate with the project developer at the start and is something you should consider carefully before signing any agreements, as it may affect your profitability. If you would like more information on this subject, we recommend that you first discuss it with an independent carbon broker or third party, who will be able to talk you through the ins and outs of the sales process.

Section 6. Carbon Trading Exchanges

Overview

Many carbon trading platforms and exchanges are currently in operation servicing the needs of the various carbon markets around the world, many more are likely to come online as the market matures, and as is usually the case one or two should also become the dominant industry platforms in each region.

The creation and implementation of these platforms and exchanges are important steps towards creating greater transparency and liquidity in the emerging carbon market. Within the next 20 years carbon is going to become enormously big business and is likely to become the world's most traded commodity, so the stakes are high.

Depending on your location, you can currently trade various credits, permits, and allowances on the different exchanges through the use of options, futures, and spot trades. The table below lists exchanges and platforms you may want to research further, depending on your specific interests and region.

List of Carbon Exchanges

Name	Region	Description
ACX-change	Asia	Asia Carbon Exchange
ACX	Australia	Australia Carbon Exchange
ACE	Brazil	Amazon Climate Exchange
CCX	US	Chicago Climate Exchange
Climex	Europe	Climex
World Green Exchange	Europe	World Green Exchange
TCE*	Asia	Tianjin Climate Exchange
Bluenext	France	Bluenext
Eurex	Germany	Eurex
ECX	UK	European Climate Exchange
EEX	UK	European Energy Exchange
MCX	Canada	Montreal Climate Exchange

*. Not yet launched, coming soon.

To find more specific information about any of the exchanges listed above, simply key its name into Google and go to the relevant website. You may find some of the exchanges don't let you deal with them directly, so you would have to contact one of the registered carbon brokers, traders, or broker-traders certified for that market.

Section 7. Conferences, Exhibitions, and Trade Shows

Overview

As with all emerging industries, a growing number of carbon conferences, exhibitions, and trade shows take place around the world annually. We've listed some of the main ones below by month and country. For specific dates and further information on each one, please review the individual websites as required.

List of Conference, Exhibitions, and Trade Shows

Month	Name	Location	Description
April	Carbon TradeEx	Washington, DC USA	USA's largest carbon conference & expo
May	Carbon Expo	Cologne, Germany	The leading carbon-industry conference and trade fair.
June	CO ₂ Energy Summit Carbon Capture, Storage, and Transport Summit	London, UK London, UK	Three-day summit for the energy sector. A senior-level forum tackling critical issues relating to the summit topics.
July	EU Emissions Trading	Brussels, Belgium	International conference on trading
August	Aus-NZ Climate Change and Business Conference	Melbourne, Australia	Australia-New Zealand climate change conference for businesses and policy makers.
September	Carbon 2009 Carbon Capture and Storage World Summit	London, UK Arlington, USA	International carbon management and trading expo. Sector-based conference on carbon capture and storage
October	Carbon World Carbono Carbon Market Expo Carbon Finance	Doha, Qatar Rio de J, Brazil Gold Coast, AUS London, UK	Emerging opportunities in the global carbon market; international players. Australia's premier trade fair. International conference in finance
November	Carbon Market Insights	NYC, New York	
December	International Carbon Credit Conference	New Delhi, India	Carbon-credit conference offering direct access to the Indian market.

One thing you'll note in regard to the list above is that little is happening early in the year.

Section 8. Carbon Terminology and Useful Website Links

The New Carbon Language

Carbon Term	Description
AAU	Assigned Amount Units
ACR	American Carbon Registry
ACX	Australian Climate Exchange
CAR	Climate Action Reserve
CCAR	California Climate Action Reserve
CCB	Climate, Community, and Biodiversity Standards
CCBA	Climate, Community, and Biodiversity Alliance
CCX	Chicago Climate Exchange
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO ₂	Carbon dioxide
CPRS	Carbon Pollution Reduction Scheme
CRT	Climate Reserve Ton
EAU	Emission Allowance Unit
ECX	European Climate Exchange
ERU	Emission Reduction Unit
ETS	Emissions Trading Scheme
EU ETS	European Union Emissions Trading Scheme
EUA	European Union Allowance
GF	Greenhouse Friendly
GHG	Greenhouse Gas
GS	Gold Standard
JI	Joint Implementation
J-VETS	Japan Voluntary Emissions Trading Scheme
Kyoto	Kyoto Protocol
NGAC	New South Wales Greenhouse Abatement Certificate
NSW GGAS	New South Wales Greenhouse Gas Abatement Scheme
pCERs	Primary CERs (sometimes known as project CERs)
pVERs	Primary VERs (sometimes known as project VERs)
REC	Renewable Energy Credit
REDD	Reducing Emissions from Deforestation and Degradation
RGGI	Regional Greenhouse Gas Initiative
sCERs	Secondary CERS
sVERs	Secondary VERs
UNFCCC	United National Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Units
VER	Verified (or Voluntary) Emission Reduction
WCI	Western Climate Initiative
W-M Bill	Waxman Markey Bill

Useful Website Links

The following is a list of websites and links that you may find helpful if you would like to do further research on a particular topic.

Name	Description	Website
Carbon Broker	Brokers Carbon is an independent carbon broker servicing most markets.	www.brokerscarbon.com/
Carbon Offset Guide	A list of Australian carbon offset providers.	www.carbonoffsetguide.com.au/
Carbon Finance	A monthly online newsletter covering all topics related to carbon finance.	www.carbon-financeonline.com/
The Kyoto Protocol	Detailed information on the Kyoto Protocol.	www.unfccc.int/kyoto_protocol/
Point Carbon	Carbon price forecasts and analysis of GHG emissions trading markets.	www.pointcarbon.com/
Report: State and Trends of the Carbon Market	Each year around May the World Bank releases a report on the state of the carbon market and its trends.	www.worldbank.org/
Report: State of the Voluntary Markets	Each year around May New Carbon Finance and Ecosystem Marketplace release a report on the state of the voluntary carbon market.	www.ecosystemmarketplace.com/

Section 9. The Future

Overview

Climate Change is potentially the biggest challenge we as humans have ever had to face, and the time has come for us to start doing something about it. Within the next 10 to 20 years carbon is likely to be the most traded commodity in the world, and the new carbon industry has already started mobilizing towards that eventuality.

Although the emerging industry still has long way to go and needs to hurdle many obstacles before it completely grows up, a light is glimmering at the end of the tunnel. The reality is that we already have the technology we need to address climate change; the various players in the industry are now just waiting for the policy makers and the political debate to catch up.

While carbon trading is not the solution to climate change, it *is* a mechanism that allows industry to mobilize its existing resources into greener and more environmentally friendly technologies. When done correctly and with the right policies, carbon-trading mechanisms reward those who do so, while those who don't pay the price.

The good news is that the market still offers plenty of opportunity to anyone who wants to become involved, and the big carbon boom, or dot.com equivalent, is still to come. The real action will probably start in the next three to five years, once new policies are in place after the global financial crisis of 2008-2009 settles down.

The new carbon-constrained economy will have winners and losers. The big question is - which one are you going to be?