

# CARBON EMISSIONS MARKET

## The Basics of Emissions Trading Mechanisms

A consensus has emerged among scientists and policymakers that an increase in Greenhouse Gas (GHG) emissions in the atmosphere is responsible for extreme weather patterns and climate change. As concerns about the potential impact of human-induced climate change has increased, policymakers around the world have looked for ways of reducing the carbon emissions associated with human activity. International efforts on combating climate change led to the negotiation of the Kyoto Protocol in 1997, an international treaty committing the global community to reduce Greenhouse Gas emissions by an average of 5.2% below 1990 levels in the period 2008 to 2012.<sup>1</sup>

To meet the binding emissions reductions agreed under the Kyoto Protocol, a number of nation states have turned to a market-based policy approach of an emissions trading mechanism (ETM).

An ETM is a cap & trade market which involves:

- The setting of a limit on the level of emissions allowed by entities (factories, power stations) included in the mechanism.
- An issuance by the government to the covered entities of carbon allowances in line with the cap that can be used for compliance.
- A penalty level that will apply to covered firms that do not submit sufficient credits to meet their emissions over the compliance period.
- Trading of the carbon allowances amongst the covered entities to foster compliance. Firms that emit less than the number of allowances that they have can sell their remaining allowances to those failing to meet those goals, offering an economic incentive for firms to reduce their greenhouse emissions.

The various ETMs set up to cover Greenhouse Gases (of which CO<sub>2</sub> is by far the largest), have seen rapid growth in recent years in terms of volume traded and in terms of value. The size of the carbon market in 2009 was put at approximately \$136 billion,<sup>2</sup> with some studies suggesting that the market will grow to \$1 trillion by 2020.<sup>3</sup>

Now investors can access this market with the iPath® Global Carbon Exchange Traded Note. This product tracks the Barclays Capital Global Carbon Index Total Return,<sup>TM</sup> which measures the performance of the most liquid carbon-related credit markets and is designed to be a global industry benchmark for carbon-related investing.

This paper takes a look at how the carbon markets function, describes the iPath® Global Carbon Exchange Traded Note and some of the features and advantages of Exchange Traded Notes (ETNs).

## BACKGROUND

The impetus for the growth of the carbon cap & trade market was the Kyoto Protocol, an international treaty for climate change drafted in 1997 intended to commit the global community to reduce Greenhouse Gas emissions. The treaty has been ratified by 175 countries which represent over 60% of emissions from industrialized nations defined by the UNFCCC.<sup>4</sup> The protocol calls for an average 5.2% reduction of emissions from 1990 levels by signatories in the period 2008-2012. The International framework for emissions reductions in the period after 2012 is currently being negotiated, with a series of annual meetings occurring that are setting out the carbon market agenda in that period.

The Kyoto Protocol agreement has led to the development and introduction of a number of ETMs by countries that are looking to meet their GHG reduction targets. The largest and most liquid market is the European Union Emission Trading Scheme (the EU ETS) that covers a number of large industrial sectors in 28 countries across Europe. In addition to the EU ETS, countries such as the U.S., Japan, Australia and New Zealand are all working toward developing ETS on either a national or sub-national level. Introducing an ETM that allows the trade of emissions allowances, such as the EU ETS, has a number of benefits including:

- Promotes emissions reductions amongst those firms with the lowest cost of abatement, meaning that the economy benefits from achieving its environmental goals at the lowest cost.

1. Kyoto Protocol to the United Nations Framework Convention on Climate Change, (United Nations, 1998).

2. Point Carbon, 2010.

3. New Carbon Finance, 2008.

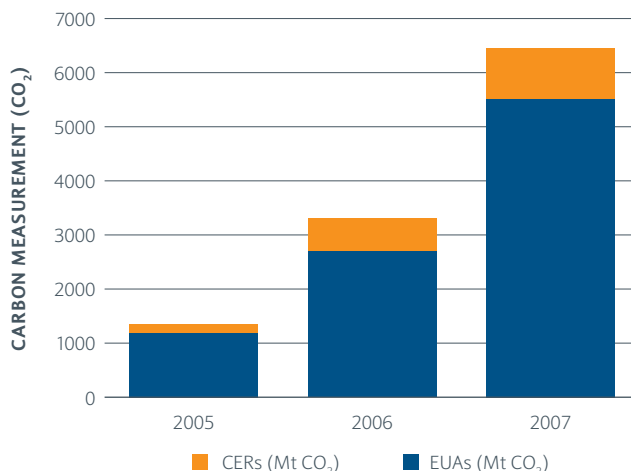
4. United Nations Framework Convention on Climate Change (UNFCCC) as of December 2007.

- By introducing tradable property rights, allows participants outside of those with compliance responsibilities under the scheme to participate. By opening up the market to financial investors such as brokers, hedge funds, and arbitrageurs, the market benefits from increased capital inflow, better liquidity and more efficient and transparent prices.

To date, trading in the carbon market has been dominated by two specific carbon commodities. The most highly traded are the allowances traded under the EU ETS — these are called EU Allowances (EUAs) and accounted for 80% of the value of the carbon market in 2009 (see Figure 1). The second carbon commodity is Certified Emission Reduction (CER) credits, which are offset credits that are earned under Greenhouse Gas reduction projects that have been registered by the body that administers the Kyoto Protocol — the United Nations Framework Convention on Climate Change (the UNFCCC). CERs are created under the Clean Development Mechanism (CDM), which allows investments in programs or technology to reduce or “offset” carbon emissions in developing countries, and these credits can then be traded.

These carbon commodities trade in units of one ton of CO<sub>2</sub>.

**FIGURE 1**  
Global carbon markets, volumes traded



*Note: Volumes of exchange traded and exchange cleared volumes.*

*Source: ECX, Barclays Capital.*

The price of the carbon credits under an ETM is driven by market supply and demand components. On the supply side, the regulatory authorities determine the number of allowances to be allocated to the market over the specified time frame. In addition, credits that are generated through approved offset projects (such as CERs) may also be allowed for compliance and this will add to overall supply.

Demand for credits ultimately comes from those entities that need to comply under the mechanism. Such demand will be influenced by the level of emissions of covered sectors and this is influenced by:

- The level of economic activity. An increase in economic activity that leads to an increase in emissions will increase the demand for carbon credits.
- More extreme weather (colder winters and hotter summers) increases the demand for space heating and cooling and this increases emissions.
- A change in relative fuel prices. For instance, an increase in natural gas prices in relation to coal prices will promote the use of the more carbon intensive fuel source.
- New innovation and technology that increases energy efficiency should reduce the level of emissions.

## FIGURE 2

The EU ETS — the market at a glance

	Description
Sectors covered	Power and heat, oil refineries, metals, pulp and paper, cement, lime and glass, and others = over 12,000 separate entities
Allocation mechanism	Mix of free allocation based on historic emissions and auctioning
Number of allowance allocated	2.1 GT CO <sub>2</sub> per year (2008-2012)
Other allowed credits	CERs and ERUs
Penalty level	100 €/t plus requirement to purchase credits on the market for short-fall

### Emissions Markets: An Example of Success

Many investors lack familiarity with emissions markets based on cap & trade principles. However, the approach itself has a successful track record.

In the early 1980s, the United States struggled with the issue of acid rain created by the emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) into the atmosphere by power plant emissions. Acid rain was damaging forests, corroding stone and metal structures, and causing health problems.

Congress recognized the need for action and required a 50% reduction in emissions of SO<sub>2</sub> and NO<sub>x</sub> by all U.S. power plants by 2012.<sup>5</sup> To meet these policy goals, an ETM based on cap & trade principles was introduced. The Acid Rain Program (ARP) placed industry-wide emissions limits and allocated credits to companies within this industry. Companies had incentive to reduce their emissions so that they could sell their excess to other plants for profit or retain their credits for future use.

The mechanism has been successful with SO<sub>2</sub> emissions having been reduced by 40% of the 1990's total power sector emissions limits<sup>6</sup> and acid rain no longer a significant policy issue.

SO<sub>2</sub> emissions are a regional problem (in this instance, the Northeastern U.S.) and the trading of emissions allowances was limited to companies covered by the mechanism on an OTC basis. With climate change being a global problem, the market for carbon emissions has already attracted much wider interest, with much more financial sector participation, better liquidity and more robust price formation and transparency.

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5. Environmental Protection Agency (EPA), 2005.

6. EPA, 2006.

### Investing in Cap & Trade with the iPath® Global Carbon ETN

Investors can now access the cap & trade market with the iPath® Global Carbon ETN, which tracks the Barclays Capital Global Carbon Index Total Return™ (BGCITR). The index currently tracks the most liquid and tradable carbon-related credit markets based upon the European program (EU ETS Phase II) from 2008-2012 as well as those from the Kyoto Clean Development Mechanism, both traded on the European Climate Exchange.

The iPath® Global Carbon ETN can be viewed as offering exposure to a new and growing market. In addition, as shown in Figure 3, the index offers relatively low correlation to broad-based equity and fixed income benchmarks.

In addition, the iPath® Global Carbon ETN can be used for short-term, tactical expressions of a view on the market, or as a hedge on industrial or energy prices (in that the emissions credits are an input cost to these producers and may be passed on in the form of output price increases). Overall, it provides convenient access to a rapidly changing and developing investable market.

#### CHALLENGES TO THE MARKET

As the carbon market is still developing, potential investors should be aware that there are several circumstances that could change the dynamics of the marketplace. Perhaps most important, the regulatory environment is the main driver of both supply and demand. If regulations change, increasing (or decreasing) supply, it will subsequently affect the market price of carbon credits. Moreover, while the cap & trade approach has broad support among policymakers and businesses, as well as environmental organizations, if that consensus changes, it could significantly impact the market.

**FIGURE 3**  
Correlations

	Barclays Capital Global Carbon Index Total Return™	MSCI EAFE Index	S&P 500®	Barclays Capital U.S. Aggregate Index	DJ-UBS Commodity Index Total Return <sup>SM</sup>
Barclays Capital Global Carbon Index Total Return™	1.00	–	–	–	–
MSCI EAFE Index	0.58	1.00	–	–	–
S&P 500®	0.54	0.92	1.00	–	–
Barclays Capital U.S. Aggregate Index	0.12	0.39	0.31	1.00	–
DJ-UBS Commodity Index Total Return <sup>SM</sup>	0.51	0.60	0.49	0.24	1.00

Source: Bloomberg, 11/06–12/09.

## What are iPath® Exchange Traded Notes?

iPath® Exchange Traded Notes (ETNs) are senior, unsecured, unsubordinated debt securities issued by Barclays Bank PLC. They are designed to provide investors with a new way to access the returns of market benchmarks or strategies. ETNs are not equities or index funds, but they do share several characteristics. For example, like equities, ETNs are traded on an exchange and can be shorted.<sup>7</sup> Like an index fund, they are linked to the return of a benchmark index.

iPath® ETNs provide investors with convenient access to the returns of market benchmarks, minus investor fees, with the ability to easily trade intraday on an exchange. The ETN structure allows investors to achieve cost-effective<sup>8</sup> investment in previously expensive or difficult-to-reach market sectors or strategies.

## Conclusion

Investing in carbon cap & trade markets is a new opportunity for investors. But it is one that only investors with a tolerance for risk and potentially high volatility should consider. However, the movement to reduce greenhouse gas emissions is gaining momentum across the globe. Over time, consistency and cross trading ability can improve liquidity in the markets, and ultimately as regional markets grow and converge, a global carbon market price (instead of regional) could emerge, leading to a growing and maturing carbon credit market.

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7. With short sales, you risk paying more for a security than you receive from its sale.

8. iPath ETNs typically have lower investor fees than currently existing mutual funds that invest in similar markets and are available to retail investors. Buying and selling iPath ETNs will result in brokerage commissions.

An investment in iPath ETNs involves risks, including possible loss of principal. For a description of the main risks see "Risk Factors" in the applicable prospectus.

Barclays Bank PLC has filed a registration statement (including a prospectus) with the SEC for the offering to which this communication relates. Before you invest, you should read the prospectus and other documents Barclays Bank PLC has filed with the SEC for more complete information about the issuer and this offering. You may get these documents for free by visiting [www.iPathETN.com](http://www.iPathETN.com) or EDGAR on the SEC website at [www.sec.gov](http://www.sec.gov). Alternatively, Barclays Bank PLC will arrange for Barclays Capital Inc. to send you the prospectus if you request it by calling toll-free 1-877-76-iPATH, or you may request a copy from any other dealer participating in the offering.

BlackRock Fund Distribution Company assists in the promotion of the Securities.

**iPath ETNs (the "Securities") are unsecured obligations of Barclays Bank PLC and are not secured debt. The Securities are riskier than ordinary unsecured debt securities and have no principal protection.** Risks of investing in the Securities include limited portfolio diversification, trade price fluctuations, uncertain principal repayment, and illiquidity. Investing in the Securities is not equivalent to direct investment in index or index components. The investor fee will reduce the amount of your return at maturity or on redemption, and as a result you may receive less than the principal amount of your investment at maturity or upon redemption of your Securities even if the value of the relevant index has increased. An investment in iPath ETNs may not be suitable for all investors.

The Securities may be sold throughout the day on the exchange through any brokerage account. There are restrictions on the minimum number of Securities you may redeem directly with the issuer as specified in the applicable prospectus. Commissions may apply and there are tax consequences in the event of sale, redemption or maturity of Securities. **Sales in the secondary market may result in significant losses.**

An investment in iPath ETNs linked to the performance of the Barclays Capital Global Carbon Index Total Return™ is subject to risks associated with fluctuations, particularly a decline, in the performance of the index caused by unpredictable volatility and movement in the prices of the index components. Trading in futures contracts on carbon emissions commodities, including trading in the index components, is speculative and can be extremely volatile. The commodity futures markets are subject to temporary distortions or other disruptions due to various factors, including the lack of liquidity in the markets, the participation of speculators and government regulation and intervention. Market prices of the index components may fluctuate rapidly based on numerous factors including but not limited to changes in supply and demand, domestic and foreign political or government actions and technological developments. These factors could adversely affect the value of the Index and, therefore, the value of your Securities.

Cap & Trade mechanisms have arisen primarily due to relative international consensus on the correlation between the rise in Greenhouse Gas emissions and the onset of Global Warming. Accordingly, changes in regulation and enforcement of Cap & Trade mechanisms as a result of changes in international consensus can adversely affect market behavior and the value of the Securities.

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