

Investing in Carbon Prices

Harnessing a new asset class to invest in the green transition and hedge carbon risk

Michael Craig,
Managing Director and
Head of Asset Allocation
and Derivatives, TDAM

Hussein Allidina,
Managing Director and
Head of Commodities,
TDAM

Christian Medeiros,
Portfolio Research
Manager, TDAM

Zahra Ahanchian,
Senior Portfolio
Research Analyst,
TDAM

At a glance

- Historically there has been no explicit cost levied on companies emitting carbon as a by-product into the atmosphere and carbon emissions have grown through time, resulting in the challenges presented by climate change.
- The carbon credit market seeks to solve our generation's greatest problem, climate change, by harnessing the power of market forces to price emissions and incentivize a green transition.
- TD Asset Management Inc. (TDAM) has launched a new ETF – TD Global Carbon Credit Index ETF (TCBN) – that provides exposure to carbon markets, initially focused on the European Union Emissions Trading System.

In a previously published article titled [Carbon Pricing, why should investors care](#), TDAM defined carbon credits, why they may be instrumental in reducing carbon emissions and why investors should care. In this paper, we take a deeper dive and outline the investment case for carbon credits, how they can be used in a multi-asset portfolio and discuss a new solution from TDAM that can provide investors with exposure.

Why Price Carbon?

The tragedy of the commons is an economic term that describes how humans acting out of self-interest tend to result in the consumption of free communal resources to depletion. For example, over-hunting, de-forestation and dumping waste were all checked only through policies that put a price on these actions (taxes, fines,

etc.). Carbon emissions function in a similar manner: with no explicit cost or charge associated with emitting carbon, emissions grow unchecked. Putting a price on carbon incentivizes emitters to temper their emissions by changing the way they operate (i.e., reducing carbon per unit of output).

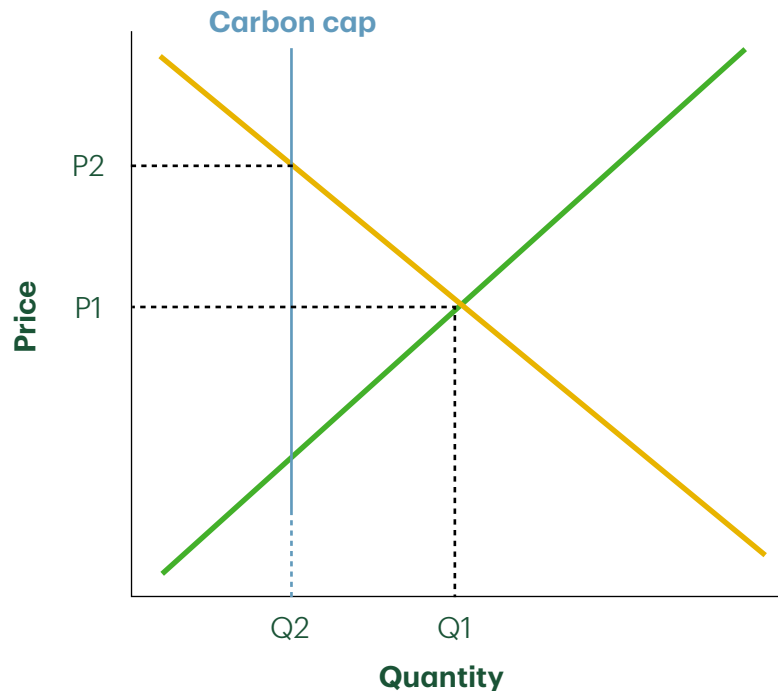
How to Price Carbon?

Many experts agree that putting a price on carbon is an effective way to help facilitate the green transition. There are two primary ways that carbon can be priced – through a carbon tax or through a cap-and-trade program. In the case of a carbon tax, a government or central entity will set a carbon price that must be paid by covered entities on emissions they are responsible for. Under a cap-and-trade system, the regulator will set a cap on the total amount of emissions that can be produced, and companies that exceed this cap will need to buy credits from those that produced under their cap and have excess credits.

In other words, for a cap-and-trade framework, the regulator sets a quantity and the market determines what price is required to reduce emissions to that level. In a carbon tax regime, the regulator sets a price and emitters determine the quantity of emissions they are comfortable emitting. This requires a correctly calibrated price for emissions to be reduced.

Through setting the quantity of carbon (**Figure 1**), we turn it into a scarce and quantifiable resource that can be priced. This allows powerful market forces to set a price for carbon, which leads to lower emissions over time and the adoption of green technology.

Figure 1: The Economics of Carbon Pricing



Source: TDAM. An Illustrative Supply and Demand chart showing how implementing a cap on carbon emissions (red line) lowers the quantity of emissions (Q2) while increasing the carbon price (P2). This is compared to no carbon cap with Q1 and P1.

The European Union Emissions Trading System

The European Union Emissions Trading System (EU ETS), is the largest and most liquid compliance carbon market in the world. The program currently covers nearly half of the EU's total greenhouse gas emissions and most of the utilities, power generation entities and heavy industries.

All covered industries must legally report their emissions and surrender the necessary carbon credits or face strict penalties. Over time the system is managed to target lower emissions by lowering the cap, adding new covered industries, and decreasing the number of freely allocated credits.

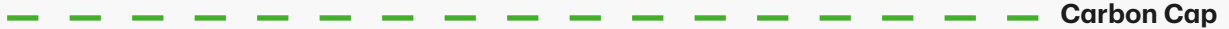
European Commission grants or auctions carbon allowance to covered industries



Industries can emit carbon until a cap



Excess Emissions



Carbon Cap

Allowable Emissions



Planned reductions in allowances and the carbon cap result in lower emissions over time

Industries that over produce carbon need to buy allowances from others to meet compliance



A futures market provides liquidity for hedging and speculating on the price of carbon

European Commission rules ensure the market remains in balance by adding or removing carbon credits if the market becomes over or under supplied

A Case for Investing in Carbon Prices

Carbon Pricing, why should investors care made a strong case that cap-and-trade markets are effective in reducing emissions and pushing companies to engage in

more sustainable practices. In this article, we will outline the three primary reasons why we believe carbon is worthy of an investment allocation.

Three key reasons:

1 Hedge Portfolio Carbon Exposure

2 Attractive Expected Returns

3 Portfolio Construction and Diversification

1 Carbon Hedge

Society at large is now beginning to price carbon emissions. This cost may be paid through carbon prices, more regulation, and consumer preferences. Companies will now have to bear the cost of emitting carbon into the atmosphere.

This will have an impact on corporate earnings and equity valuations for high emitters, and over time will impact investor returns. While holding carbon futures cannot offset any emissions, holding carbon futures in a portfolio may help mitigate losses to the portfolio from the rising cost of emissions.

2 Expected Return

Broad support across society to reduce climate change requires a higher price of carbon to transition to a more sustainable economy. The EU ETS is structured in a manner where the supply of carbon credits and the allowable emissions cap will both decline through time.

In the short run, prices are driven by industry specific, policy, and macroeconomic forces. In the long run, prices are driven by the cost to transition away from fossil fuels. We believe the supply and demand dynamics could support potential price appreciation and favourable expected returns for carbon credits over time.

Drivers of Risk and Return:

Long-term Drivers:

- **Supply and Demand Dynamics:** The EU ETS is designed to lower the supply of emissions over time, via a shrinking emissions cap and through fewer free allowances each year. Demand will grow as more participants enter the market from expanding industry coverage, internationalization, and financial market participation.

- **Marginal Cost of Abatement:** Higher prices are required to achieve climate objectives. The marginal cost of abatement describes the carbon price where emitters are incentivized to switch to or invest in more efficient technology. Over time, the price of carbon should rise to higher marginal costs, which make green technology cost-competitive.

Short-term and Medium-term Drivers:

- **Macroeconomic Forces:** This can include recessions or expansions. A shrinking economy will result in fewer emissions and therefore less demand for carbon credits by covered industries.
- **Industry Specific Forces:** Industry forces that change total emissions can result in carbon price fluctuations. For example, the power and utilities industries currently produce the most emissions; their choice of fuel source (gas, coal, nuclear, etc.) will vary, as will their demand for carbon credits.
- **Policy:** EU policy makers regularly update the rules for the emissions trading scheme; rules that accelerate the reduction of emissions will result in higher prices, while policy uncertainty could create volatility in the market.

3 Diversification

The EU ETS represents a new and unique asset class that may provide diversification benefits for a traditional balanced portfolio. These diversification benefits can be harnessed through:

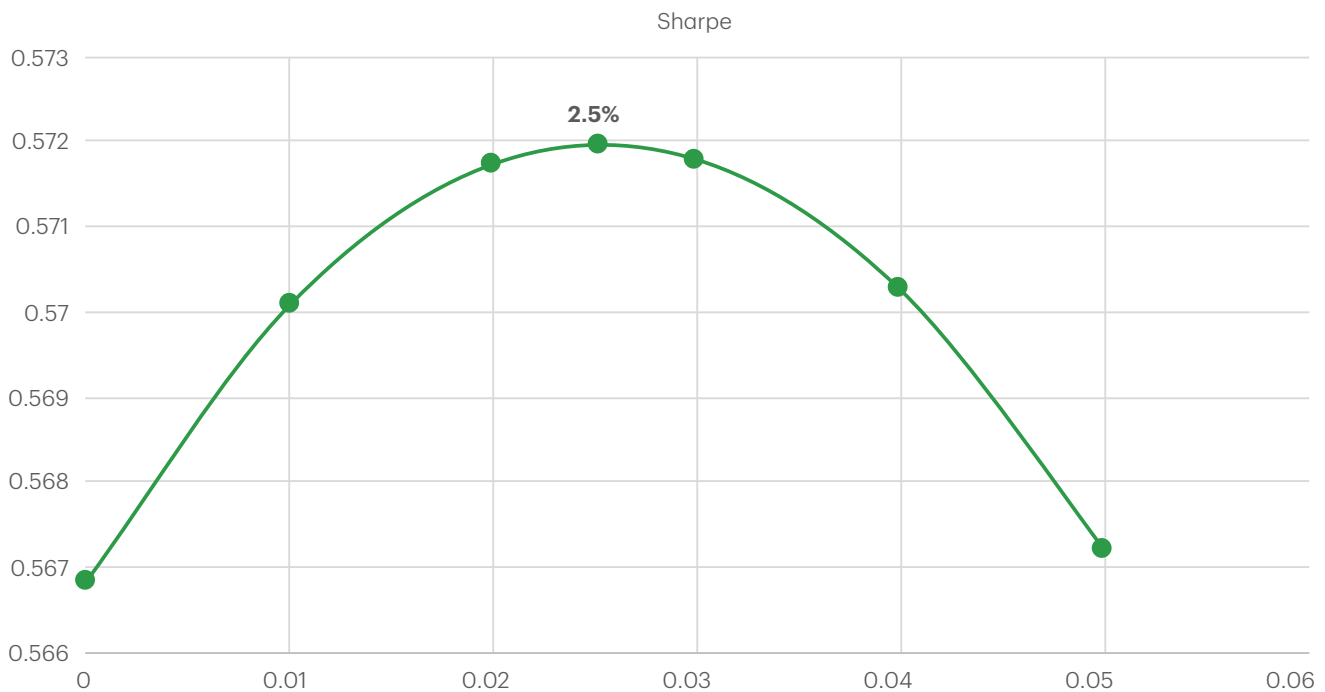
- **Low Correlation** — Historically, carbon credits have had a low correlation to U.S. and global equities, and a negative correlation to fixed income securities.

	US equities	Global Equities	U.S Bonds	Global Bond	Canadian Fixed Income	EU ETS
US Equities	1					
Global Equities	0.98	1				
US Bonds	0.13	0.12	1			
Global Bond	0.39	0.35	0.77	1		
Canadian FI	0.10	0.10	0.83	0.58	1	
EU ETS	0.23	0.25	0.03	0.07	-0.02	1

Source: Bloomberg Finance L.P. Data from December 2008 until June 30, 2022. U.S. Equities is represented by the S&P 500 Index, Global Equities by the MSCI World Index, Canadian Fixed Income by the FTSE TMX Universe, Global Fixed Income by Bloomberg Global Aggregate Bonds and Carbon Credits by EU ETS. Correlation is calculated based on monthly data from December 2008 efficient frontier.

- Attractive Expected Return** – The TDAM Asset Allocation Team’s capital market assumptions expect carbon credit returns to surpass those of fixed income and potentially those of equity securities over a ten-year period. This higher expected return supports inclusion in investment portfolios.
- Volatility** – As a nascent asset market, carbon credits carry much higher volatility than both equity and fixed income securities. Volatility may be expected to moderate somewhat as the asset class expands and grows, but in the meantime, investors should use prudence when allocating funds into a volatile asset class.

Maximum Sharpe Ratio Including EU ETS



Source: Bloomberg Finance L.P. Data from December 2008 to June 30, 2022. This chart demonstrates the evolution of the risk and return of a balanced portfolio as we incrementally increase the allocation to EU ETS at the expense of global equities. The portfolio includes global equities as measured by the MSCI World Index, Canadian fixed income as measured by the FTSE TMX Universe Bond Index and carbon credits as measured by the EU ETS. The weighting of the balanced portfolio is 60% global equities and 40% Canadian bonds. As shown, increasing the exposure to carbon credits can enhance the risk-adjusted return of the portfolio. In this exercise, the maximum Sharpe ratio can be achieved by reducing global equities by 3.4% and allocating the same amount to the carbon credit market. As a proxy for expected returns and risks, we used historical annualized return and standard deviation based on monthly data from December 2008 to July 2022. The Sharpe ratio is used to help investors understand the return of an investment compared to its risk.

Introducing the TD Global Carbon Credit Index ETF

Capitalism and market forces have driven the massive standard of living improvements we have experienced as a society since the industrial revolution, but they have also come with unpriced externalities we haven't witnessed before. The carbon credit market seeks to solve one of our generation's greatest problems, climate change, by harnessing the power of market forces to price emissions and incentivize a green transition. This opens up a unique and novel asset class that can allow investors to participate in this historic transition.

Against this backdrop, TDAM has launched a new ETF – TD Global Carbon Credit Index ETF (TCBN). The ETF will

seek to maintain a constant exposure to the EU carbon market by investing directly in futures and/or swap agreements, or some combination thereof, that provide exposure to carbon emission allowances.

This could further improve diversification benefits and growth prospects through exposure to new markets. In addition, TCBN offers one of the lowest cost ETFs in Canada that provide exposure to global carbon credit markets. At TDAM, we believe that not all ETFs are created equal. That means taking a more focused approach and building products that seek to solve investor needs. ■

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