

Finding Sustainable Return Sources with Carbon Emissions?

Risk premia, alpha and carbon reduction

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– MICHAEL AZLEN

Azlen also became curious about the properties of carbon as a liquid investment asset class. In 2018, regulated carbon markets were trading about \$10 billion per month and yet he found no research on this liquid alternative asset class. Azlen hired Glen Gostlow, a PhD student from the LSE, and together they collected data on multiple carbon markets and produced the first comprehensive research paper on carbon as an asset class, “The Carbon Risk Premium”, published in the Journal of Alternative Investments in 2022. The proprietary data set in the paper provides the foundation for the investment strategy that culminated with the launch of the World Carbon Fund (WCF) in 2020. After completing the research, Azlen then hired a world class team with experience in climate policy, carbon pricing, power sector analysis, quantitative trading and portfolio management. The Fund was launched in February 2020 and now has almost 4 years of track record and has reached \$300 million in size with a total net return to investors of +106% since inception to October 2023, annualizing at over 22%.

Fund objectives: consistent absolute returns and a direct impact on climate change

In this context, an “all weather” performance objective could be an unfortunate pun, so it is better to say that it has an objective to generate positive returns over all rolling 12-month periods, regardless of the performance in the carbon market.

Its resilience was demonstrated in 2022, when the four main carbon markets dropped by an average of -3.3%, while the Fund was up +9.2%, and again in 2023 to October when the four main carbon markets declined an average of -6.1%, while the Fund was up +11.5%.

The return profile exhibits a very low correlation to commodities, equities and hedge funds. The strategy may also offer more subtle diversification benefits: portfolios of equities and credit, as well as some emerging market sovereign debt, may contain hidden carbon price risk in the form of implicit short carbon exposure that could become an increasingly expensive liability. In this context, long exposure to carbon via the WCF could potentially mitigate some of these risks.

Regulated carbon markets vs voluntary carbon markets

The WCF strategy only holds exchange traded carbon futures, options, physical carbon certificates and cash, and is only focused on the regulated compliance markets. Its universe has grown from 3 to 5 carbon markets and may soon add new markets as they launch. CCM believes that additional

Why climate change matters

Michael Azlen’s career started in proprietary trading before building two asset management businesses, one of which was sold to a Swiss public company. He has become passionate about climate change and has been teaching as a guest lecturer on the graduate degree program at London Business School for the past 18 years.

“I am an empiricist, and my views are based on data and high-quality peer reviewed academic research. The data and research has convinced me that climate change is actually worse than many people are aware of and that it is anthropogenic – caused by humans – and specifically caused by burning fossil fuels. This burning increases the atmospheric concentration of carbon dioxide causing an increase in global surface temperatures,” says Azlen. This view matches the IPCC Sixth Assessment Report of August 2023.

“Carbon dioxide in the atmosphere is like a duvet wrapping around our planet, blocking infrared radiation from being released and thereby trapping heat around the planet. The last 8 years have been the hottest ever on record and 2023 was the hottest year on record,” points out Azlen. The Paris Agreement on carbon emissions was struck in 2015 but global emissions have reached new records every year since, except for 2020, when they dropped 7% as the world economy shut down due to Covid. New temperature records were broken in 2021 and 2022 and were surpassed again in 2023.

“In terms of economic costs alone, it is cheaper to reduce emissions than to deal with their impacts and in terms of human costs, the least developed and poorest countries will be the hardest hit by the changing climate and yet have the least resources and resilience to deal with climate consequences,” he explains. This means that much of the equatorial region of the planet will become unsuitable for human habitation as it will become too hot and too dry in the coming decades affecting crop yields and increasing water scarcity. The UN has said that it is possible for this to create up to 500 million “climate refugees” who will flee these areas causing increased levels of global immigration that could trigger political instability,” explains Azlen.

The research behind carbon cap

After reviewing more than 200 peer-reviewed papers on climate change, Azlen enrolled in the “Economics and Governance of Climate Change” program at the London School of Economics (LSE), where he learned about “cap and trade” carbon markets as a policy tool designed to cap and lower emissions. Emissions Trading Systems (ETS) such as the EU ETS have been one of the most successful environmental policies: the EU ETS launched in 2005 and has reduced the annual run-rate of emissions in Europe by 1 billion tonnes/year. In a world with total global emissions of 36 billion tonnes, this is impressive and has spurred other countries including China, India, Brazil, Japan and multiple others to launch their own ETS.

markets will add to the fund capacity and provide excellent alpha generation opportunities.

The fund is not involved in the voluntary markets and Azlen argues that “Voluntary carbon markets have little to no regulation, potentially unlimited supply, a disparate range of standards and methodologies, are illiquid and due to the lack of regulatory oversight they are vulnerable to moral hazard since most of the participants are paid for the quantity of tonnes issued in each project. Unfortunately, there have been several cases of significant over-crediting resulting in financial losses and scandals. The voluntary market is also very small and illiquid with only about USD 1 billion traded in 2022 against approximately USD 1 trillion traded across the compliance capital markets”.

Compliance markets in contrast are highly regulated, large, liquid, transparent and crucially, they have a cap on the amount of carbon permits issued which declines each year. The largest emitters (usually above 25,000 tonnes a year) must participate in the market and they are audited on their emissions annually by the government. This strict regulation via monitoring, reporting and verification (MRV), as well as penalties, means that these markets normally achieve 99+% compliance amongst their participants. For instance, in 2022, in the EU ETS, approximately 1.4 billion permits were supplied to the market. At the end of the year the emissions of the entities were audited, and these entities must submit to the government the number of permits equal to their emissions. The government confirms that the companies have complied and then cancels all those permits. In the following year, a lower number of permits is issued and this supply reduction along with the auditing and cancellation occurs year on year.

In 2023, 2024 and beyond, the quantity of permits issued will continue to decline at a rate of 4.3% per year to ensure that CO₂ emissions within Europe must also decline. This creates scarcity value rather like bitcoin, only the formula is determined by politics rather than mathematics.

Internalising costs and incentivizing reductions

The government controls the supply of permits (quantity of emissions) while allowing the free market to determine the price. In the EU ETS, the carbon market trades a value of approximately Euro 2 billion daily, so it is a very liquid market. The objective is for the compliance entities to internalize the carbon price to incentivize companies with the lowest abatement costs, to reduce their emissions. “Company boards look at market prices and internalize the costs in a process of liquidity and price discovery that compares the external and internal prices. The companies with internal costs of abatement below the carbon price will have an incentive to reduce emissions. If carbon prices exceed internal abatement costs, they have an incentive to cut carbon emissions by investing in energy efficiency and low carbon solutions,” explains Azlen. The driver of the decision to cut internal

emissions by these companies is simply the profit objective since they will only choose to cut their emissions if their internal cost is less than the price of the carbon permit.

This market-based system has delivered concrete results. The EU ETS, launched in 2005, where the annual run-rate of emissions in Europe has declined from 4.2 billion tonnes/year in 2004 to 3.2 billion tonnes in 2022¹. This reduction of 1 billion tonnes/per year is significant in the context of global emissions at 37 Gt/year and refers to total European emissions, but emissions from the entities actually covered by the ETS have declined by 775 million tonnes/year which is a 37% reduction.² While there are many factors that can affect emissions, academic research has confirmed that the EU ETS was the principal driver of the emissions reductions while at the same time having no impact on economic growth.³

Marginal abatement costs vary between industries such as steel, cement, power generation and transport, and they also vary within those industries according to the types of behavioural or technological change required, such as shifts from road to rail or carbon capture and storage (CCS), which is currently a relatively high-cost solution.

Policy risk premium

Unlike other commodities, Azlen’s research paper makes the case for carbon having a policy risk premium. There are different opinions about what level of carbon price is consistent with The Paris Agreement, ranging from USD 75/tonne to USD 150/tonne by 2030. The average target price using a range of estimates is USD 120 per tonne by 2030 to align with The Paris Agreement goals. If carbon prices rose to this level by the year 2030, this would create a “buy and hold” annual risk premium of approximately 7% per year. “This is attractive but can only be captured if you hold the physical carbon permits since the futures market, while very liquid, is in a state of contango meaning that you would lose a significant amount of return through the roll premium by holding the futures. Holding physical carbon can only be done by registering with the governments and this can be expensive and time consuming. The fund has physical carbon accounts with all the 5 governments that it trades in,” explains Azlen.

Reasons for a carbon risk premium

The premium is partly to cover policy and regulatory risk, though this may be reduced through reforms. CCM judges that a recurrence of the 2008 EU ETS carbon price collapse – of about 70% peak to trough – is unlikely, due to a much stronger focus by politicians on addressing climate change combined with new policy features: the EU Market Stability Reserve which reduces supply, strict limits on fungibility of offsets, and regulations forcing the largest emitters, power generators, to buy allowances at auction.

Carbon markets are a pro-cyclical asset class and therefore have some GDP sensitivity, as seen when the

market dipped in March 2020, but not nearly as much as in 2008, and it recovered by year end 2020.

Another reason for the risk premium is technology: “A breakthrough in cheaper ways to remove carbon emissions could be tremendous for humanity and the planet, but would not be good for carbon markets,” acknowledges Azlen, and CCM is planning to launch a separate strategy which would be exposed to carbon removal technologies.

Long exposure and tactical rebalancing between carbon markets

Since being long carbon is seen as aligning with policy makers who also want a higher price to stimulate lower levels of emissions, the WCF has committed to always have at least a 10% net long exposure.

The core strategy generates returns from a mix of the aforementioned risk premiums, and tactically varying asset allocation between the growing range of carbon markets traded including going both long and short at the single market level.

“The tactical asset allocation is determined by a multi-factor model that incorporates technical signals, fundamental analysis of supply and demand and market policy and sentiment outlook. Two thirds of the model are very systematic and quantitative and based on statistical significance for factors that are proven drivers of carbon prices. One third is more qualitative, based on sentiment, macro and upcoming legislation,” explains Azlen.

2022 witnessed WCF’s adroit tactical trading: “Upon Russia’s invasion of Ukraine, WCF immediately held an investment committee meeting, cut exposure across all five carbon markets, and purchased put option protection in the EUA carbon market. The market then dropped 25% in 7 days and the WCF was insulated against much of this decline. The war brought a huge spike in energy prices and the spike in gas prices meant that coal burn by power companies was more profitable resulting in more emissions. This resulted in a bullish outlook, the WCF bought back into the market and the EUA carbon price rallied 18% by the end of the month,” says Azlen.

Alpha and hedgers

If risk premia differentiate carbon from other commodities, hedging behavior can open up opportunities for alpha generation in common with other commodities. The majority of EU ETS trading volume of EUR 1-3 billion per day, or EUR 40 billion per month, is estimated to be end users, who are mainly hedgers. “Utility hedgers are some of the biggest end users, trading very volatile hedge books. WCF aims to profit from this, but we expect that less knowledgeable traders would struggle trading the highly volatile market which has long run volatility of 50%,” says Azlen.

This hedging activity feeds into WCF’s shorter term arbitrage strategies, which extract alpha from

arbitrage and relative value trades. These include intraday liquidity provision and mean reversion strategies with a multi-hour timeframe, as well as relative value trades within or between markets over multi-day periods, and multi-week carry trades based on contango in the term structure.

cancelling carbon and SFDR 9

WCF devotes 20% of its performance fee to purchasing and cancelling carbon allowances, which helps it to meet the criteria for classification as an article 9 fund of the EU Sustainable Finance Disclosure Regime (SFDR).

“We do this in a meaningful and impactful way, contributing a significant portion of our gross revenue to create a real impact on reducing emissions.” Paying USD 80 per tonne to buy and cancel compliance carbon credits has much more veracity than paying as little as USD 5 per tonne for some voluntary schemes,” says Azlen. “This impact has not always been an important driver for some investors, but it was very important for a recent Swiss institutional investor who has taken USD 100 million of capacity in the Fund and was very focused on the quality of its impact,” he adds.

The fund has crystalized performance fees for three years and used EU compliance carbon markets for cancellation in the first two years and the UK market for the third year.

Incidentally, this concept is attracting interest from other institutional investors, who have asked CCM to guide them through the process of registering and cancelling permits themselves as several of them are concerned about the reputational risk of participating in the voluntary carbon markets.

Capacity and new markets

In 2023 WCF assets have more than doubled to USD 300 million in an Irish QIAIF, and the strategy may soft close at USD 500-600 million. “The EU is currently by far the most liquid market, and we therefore need to be cognizant of the reduced liquidity in the other four carbon markets when thinking about capacity,” says Azlen.

Capacity is however a moving target as new carbon markets are launching around the world, which could expand capacity. However, not all of them are suitable; the sixth market that WCF considered adding was the State of Washington, but there is not currently enough liquidity, so CCM is monitoring it and will only look to add this market when liquidity is sufficient.

Already 13 ETS are in force globally, with 6 more scheduled and 12 under consideration.

“China, the world’s biggest emitter, has launched an emissions market that is already three times larger than Europe’s, even though it is currently only based on the power sector, emitting 4.5 billion tonnes of

emissions versus 1.4 billion in Europe. China’s market will grow as steel, cement and chemicals are added to the scheme,” says Azlen.

China and the South Korean carbon market have not yet opened to international investors. Brazil, India and Japan, all big emitters, will soon be launching their own compliance markets and these will be sizeable. In contrast, the California market and US RGGI markets, capped at 300 million and 100 million tonnes respectively, are much smaller than Europe at 1.4 billion.

“Having already grown from USD 10 billion to USD 70 billion per month, values traded could reach USD 200-300 billion per month within 3-5 years and overtake oil as the most liquid global commodity within 5-10 years,” predicts Azlen.

New markets do not only increase strategy capacity but also provide portfolio diversification since correlations between different carbon markets are low. In addition, CCM have found that new markets are often solid sources of alpha across its range of trading strategies.

Some carbon markets may, however, merge. Switzerland has linked its market to the adjacent European market and Quebec has joined forces with California, which is 5,000 kilometres away and not contiguous. Washington State now wants to link up with the California/Quebec market. Azlen expects to see more regional linking of markets over the next 5-7 years, and eventually perhaps one global price within 15-20 years.

New carbon removal fund seeks cornerstone

To complement the WCF strategy, CCM plans to launch a new carbon removal fund, supporting technologies that aim to remove billions of tonnes of emissions. CCM is already tracking 1,000 companies that are removing carbon in various ways, including direct air capture and biochar. Some of the strategies liquify the carbon and inject it deep underground for permanent long-term storage. “The plan is to build a portfolio of 15-20 companies, and to profit from dynamic arbitrage. Carbon removal costs, currently USD 500 per tonne, are descending a steep curve. As they converge towards compliance carbon prices, there will be potential to hedge and to do relative value trades. It is possible to buy these credits at a significant discount if you are willing to prepay now and take delivery risk. CCM believes that the EU ETS will accept carbon removal credits as being fungible within 3-5 years,” says Azlen.

Profiting from lower carbon removal costs could also act as a sort of hedge for one of the risk premia underlying the long biased WCF carbon strategy, so the two strategies may turn out to be complementary.

A cornerstone investor is being sought for the new strategy and interested parties should get in touch with CCM. **THFJ**

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FOOTNOTES

1. EU Emissions Data Viewer: <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>
2. EU ETS Data Viewer: <https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1>
3. The joint impact of the European Union emissions trading system on carbon emissions and economic performance: <https://www.sciencedirect.com/science/article/pii/S0095069622001115>