Which companies will profit from the transition to a low-carbon economy?

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The transition to a low-carbon economy entails not only investment risks, but also opportunities. In order to identify these investment opportunities, it is crucial to measure carbon price exposure accurately. Only granular models of regulated carbon pricing schemes are able to do this. At SparkChange we have created such a model: CarbonAlpha. This paper explains how CarbonAlpha can help investors manage carbon price exposure and identify carbon-related investment opportunities.

Measuring carbon price exposure is key to identifying opportunities from the transition to a low-carbon economy

The transition to a low-carbon economy has become a major theme in financial markets, and rightly so. Yet, the key driver of this transition is often misunderstood and mispriced[1] – Carbon price exposure. Carbon price exposure results from governments implementing carbon pricing, such as a carbon tax or

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[1] SparkChange, Not All Emissions Are Created Equal

an Emission Trading System (ETS) in their jurisdictions, thereby putting a price on emitting CO_2.

For companies in emission intensive sectors – such as power, steel, metals, chemicals, transport, etc. – carbon price exposure is one of the key P&L drivers. For example, The Economist predicts that *"carbon pricing [...] could reduce the market capitalization of 1,400 of the world's biggest companies by 3%, or $1.6trn[2]."* Corporates themselves are also emphasising the potential magnitude of carbon price exposure. For example, Unilever reported in its 2021 annual report that, if unmitigated, 33% of their earnings are at risk due to carbon price exposure. [3]

As these figures highlight, the transition to a low-carbon economy entails obvious investment risks. However, it is hardly talked about that it also creates investment opportunities. In order to identify these investment opportunities, it is crucial to measure carbon price exposure accurately.

Carbon price exposure models: Stage 1 to 3

Various data models are available on the market aiming to measure carbon price exposure. These can be categorised by three stages:

Stage 1 models
- Use global emissions of a corporate and an artificial global carbon price to determine the corporate's exposure to carbon pricing – this tends to be the traditional ESG approach.
- All emissions are created equal and the corporates with the highest emissions face the highest exposure.

Stage 2 models
- Go one step further and incorporate local prices in the calculations.
- Not all emissions are equally priced but are priced depending on the location where they are emitted.

Stage 3 models
- Include specific policy aspects such as free allocation, i.e. emissions corporates do not have to pay for in a regulated carbon market.
- Stage 3 models also model the strategies corporates use to mitigate carbon price exposure, such as hedging behaviour and decarbonisation plans.

In contrast to stage 1 and 2 models, stage 3 models allow carbon price exposure to be accurately quantified. Further, they also represent the only model type that enables investors to identify companies that might benefit from regulated carbon markets; for example, through ambitious decarbonisation plans or active management of carbon price exposure.

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[2] The Economist (2020), Costs of carbon
[3] Unilever, Annual Report 2021

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|	STAGE 1 Multiply global carbon footprint with assumed global carbon price	STAGE 2 Fragment emissions regionally and apply local pricing	STAGE 3 Model each carbon market individually
Local prices	✕ No	✓ Yes	✓ Yes
Free allowances	✕ No	✕ No	✓ Yes
Mitigation strategies			
Decarbonization plans	✕ No	✕ No	✓ Yes – More ambitious firms can benefit
Hedging/banking	✕ No	✕ No	✓ Yes – Companies that actively manage their carbon price risk can benefit
Cost pass-through	✕ No	✕ No	✓ Yes – Companies can increase returns with rising carbon prices

Source: SparkChange

SparkChange CarbonAlpha is a stage 3 model based on the EU's compliance carbon market: the EU Emission Trading System.

CarbonAlpha models:

- the assumed emission pathways of corporates (direct and indirect emissions)
- where these emissions occur and how they are priced
- whether a company manages its carbon exposure actively (hedging) or passively, and
- the proportion of carbon costs that companies can likely pass-on to their customers.

CarbonAlpha can help identify investment opportunities

The following graphic illustrates how CarbonAlpha can support investors in identifying investment opportunities.
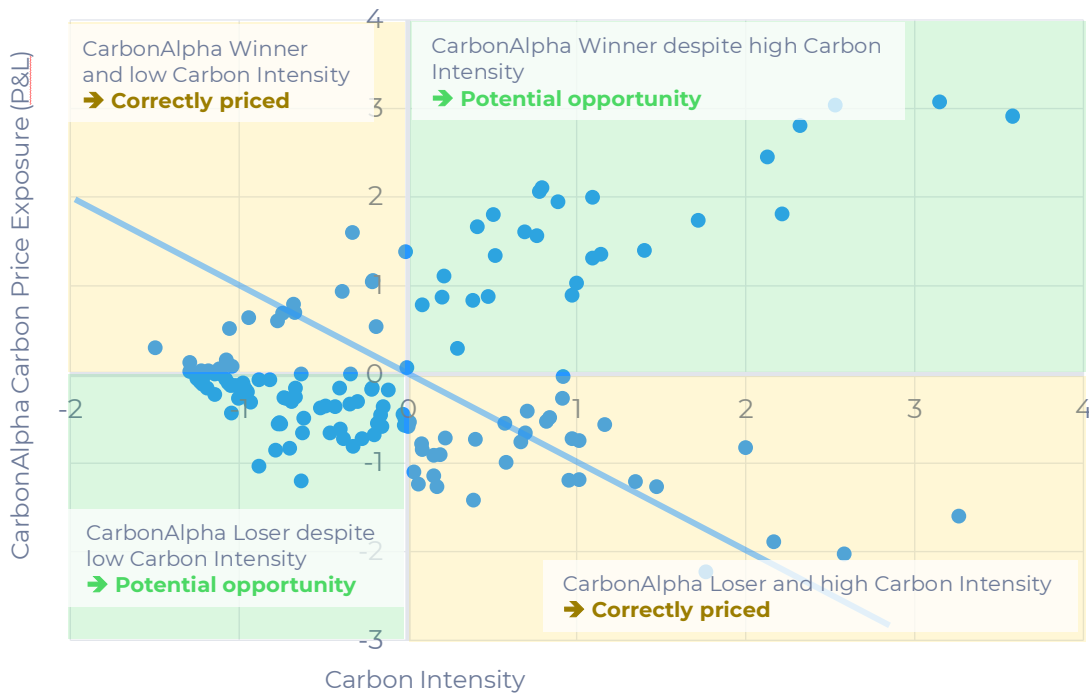
Source: SparkChange

The horizontal axis shows carbon intensity while the vertical axis shows CarbonAlpha Carbon Price Exposure. That is, the horizontal axis illustrates where corporations sit on the traditional ESG metric of carbon intensity: companies towards the right have a relatively high carbon intensity, and hence should be negatively affected by carbon pricing according to this metric; and vice-versa for companies towards the left of the horizontal axis. The vertical axis depicts the CarbonAlpha stage 3 model results. Positive numbers (towards the top) indicate where corporates face positive P&L effects[4] as a result of carbon pricing, while negative numbers (towards the bottom) indicate negative P&L effects.

The bottom-right quadrant includes companies that are negatively exposed to carbon pricing according to both the Carbon Intensity and CarbonAlpha metric. Put differently, for companies in this bucket the stage 1 and stage 3 models agree, and no potential investment opportunities exist. The same applies for the top-left quadrant which includes companies that are positively exposed to carbon pricing according to both models.

The bottom-left quadrant shows corporates who are CarbonAlpha losers despite having a low carbon intensity. Such corporates could represent an investment opportunity as they might be mispriced. However, no meaningful outliers exist (all dots tend to be close to the origin). This makes intuitive sense, as the P&L effects of carbon pricing on companies with relatively low emissions are, by definition, limited.

The top-right quadrant is crucial. Companies in this quadrant are those that have a high carbon intensity, but nevertheless, CarbonAlpha anticipates that they benefit from carbon pricing. Put differently, these companies are some of the biggest carbon emitters in Europe while also being one of the biggest winners of the EU ETS according to CarbonAlpha.

These companies could be considered significant investment opportunities as they are likely mispriced according to widely used ESG style approaches; i.e. stage 1 and 2 models.

The traditional ESG view tends to assume carbon intensive firms based in the EU have a high exposure to the EU ETS. Carbon intensive companies will have to purchase a large volume of allowances to cover their emissions. The traditional ESG view is therefore:

1. Carbon intensive companies face significant costs to cover their carbon emission obligation in the EU ETS.
2. Costs of carbon intensive companies increase if the carbon price rises.

In contrast, the CarbonAlpha view is much more nuanced. To measure the carbon price exposure of companies accurately, it's crucial to assess how they cover their carbon emission obligations.

In the EU ETS, companies receive a certain number of free allowances, known as "free allocation" each year. Companies only need to purchase allowances for the

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[4] P&L effects are defined as the difference between EU ETS related revenues and costs. A positive number indicates an increase in earnings everything else equal, and vice versa.

difference, or shortfall, between their emissions and free allocations. Some companies have received sufficient free allocation to cover their entire emission obligations. These companies have not had to purchase any additional allowances. And, hence, have not had any EU ETS related costs at all.

In fact, some companies have received excess free allocations, i.e. more allowances than required to cover their emission obligations. This has allowed these companies to build up a "historical stock" of free allowances, that can be used to cover future emission obligations. Again, these companies have not been required to purchase any additional allowances and have not had any EU ETS related costs at all.

Even companies that have had to buy allowances on the market to cover their emissions obligations have options to mitigate the associated costs. For example, some companies have actively hedged their future EU ETS obligations. And by doing so locked in a relatively low price to cover their future EU ETS exposures.

Not all companies have actively hedged their future EU ETS obligations. Even if they have, some companies have been able to lock in a lower price than their competitors. That is, the "achieved carbon price" differs from company to company: Each company pays a different price on average per tonne of carbon to cover its carbon emission obligation.

Further, assuming competitive markets, companies who have achieved a lower carbon price than their competitors will be able to boost their earnings as they can charge the same output price as their competitors. The more pronounced the increase in the carbon price, the more earnings these companies can generate through this channel.

Only a complete stage 3 model takes into account a regional carbon price, free allocation, and factors like hedging behaviour and cost pass-through. Hence, only stage 3 models can assess carbon price exposure accurately and identify potential carbon-related investment opportunities.

SparkChange CarbonAlpha is such a stage 3 model designed to help investors accurately assess carbon price exposure and to identify investment opportunities.

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About SparkChange

SparkChange is a specialist provider of carbon data, analytics, insight and financial products empowering financial institutions to capitalise on the opportunities — and manage the risks — arising from the transition to a low-carbon economy. Combining extensive industry experience across carbon markets, financial products and data analytics, our team shares a passion for SparkChange's mission: To link the financial world to carbon markets.

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