



# Not all emissions are created equal

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How to assess carbon  
price risk correctly

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In collaboration with



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## The increasing importance of assessing carbon price risk

Governments around the globe have made commitments to limit global warming and reach net zero carbon emissions in order to deliver against the targets of the Paris Agreement. Regulated carbon markets have been a key tool of choice to achieve these ambitious goals.

The EU Emissions Trading System (EU ETS) – the most liquid regulated carbon market globally – operates in all EU countries as well as EFTA states and covers around 40% of the EU's greenhouse gas emissions.

As well as regulatory coverage, carbon prices themselves are on the rise and are set to rise further. The price of emission allowances (EUAs<sup>1</sup>) traded on the EU ETS has risen from 9 EUR/ton in January 2018 to around 70 EUR/ton now (October, 2022), peaking at just under 100 EUR/ton in August this year<sup>2</sup>.

Against this backdrop of increased regulatory coverage of carbon emissions and rising carbon prices it has become crucial for investors to assess carbon price risk, i.e., how individual companies' finances are exposed to changes in carbon prices.

However, the way in which investors typically assess carbon price risk tends to be incomplete. Even large EUA price movements have a limited impact on the equity prices of high emitting companies, at least in the short-term. Further, investors tend to rely on incomplete metrics, leading them to misprice carbon price risk for some companies.

### How do individual stocks perform in times of high EUA price volatility?

*An analysis by Solactive AG*

To visualize how individual stock returns are affected during times of heightened EUA price volatility, we estimated the average performance of large and mid-cap EU ETS participants during the top- and bottom-5 months of EUA returns between 2018 and 2022. We then proceeded to analyze how this performance relates to the companies' carbon footprint to sales ratio.

Based on this methodology, we aimed to see whether higher carbon prices negatively impact companies with a higher normalized carbon footprint – as these companies could be the ones expected to be most affected by higher carbon compliance costs in response to a rise in EUA prices – and vice versa.

However, we failed to find a strong relationship between average equity performance during volatile periods in the EU ETS market and companies' normalized carbon footprint throughout our study period (both in times of extreme increases and decreases in EUA prices). These results did not change materially by broadening our equity universe to include non-EU ETS participating companies of the Solactive Europe 600 index, normalizing individual stock

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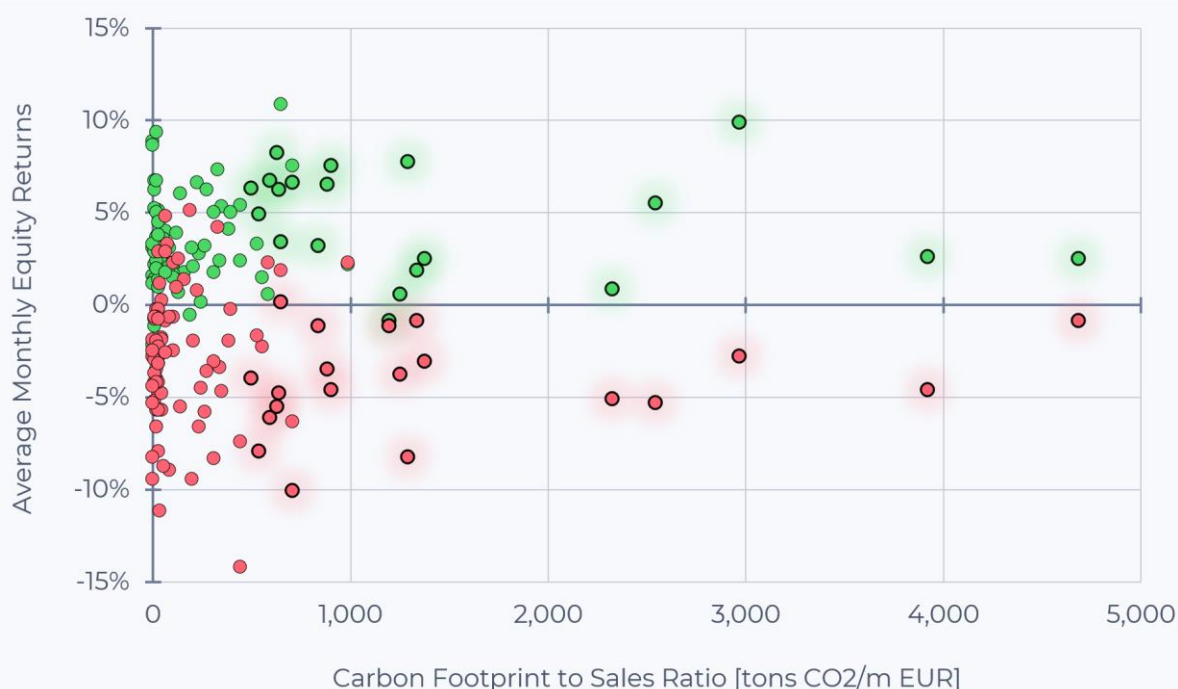
<sup>1</sup> European Union Allowance

<sup>2</sup> All prices are taken from Intercontinental Exchange (ICE)

performance with their overall sector’s performance, or by applying different carbon footprint to sales ratio filters and sector filters.

Nevertheless, we observed that since 2018 equity returns of high emitting companies tended to be positive during times of high carbon price increases, and negative during times of high carbon price decreases. Even though this finding may seem counterintuitive, it might be partially attributable to common factors that affect both carbon and stock prices – such as economic activity expectations, risk sentiment, etc.

*Figure 1: Loser Basket Stock Performance During Carbon Market Upswings (green) and Downswings (red) vs. Carbon Footprint to Sales Ratio; highlighted dots refer to companies included in the Loser Basket*



Source: Solactive

### Investors tend to focus on metrics that treat all emissions as equal

Just because there doesn't seem to be a negative relationship between large EUA price movements and the equity prices of large emitters doesn't mean investors haven't started to consider their portfolios' carbon price risk. Specifically, due to the lack of maturity in the market, investors tend to focus on high-level, easy to calculate metrics, such as carbon footprint or intensity.

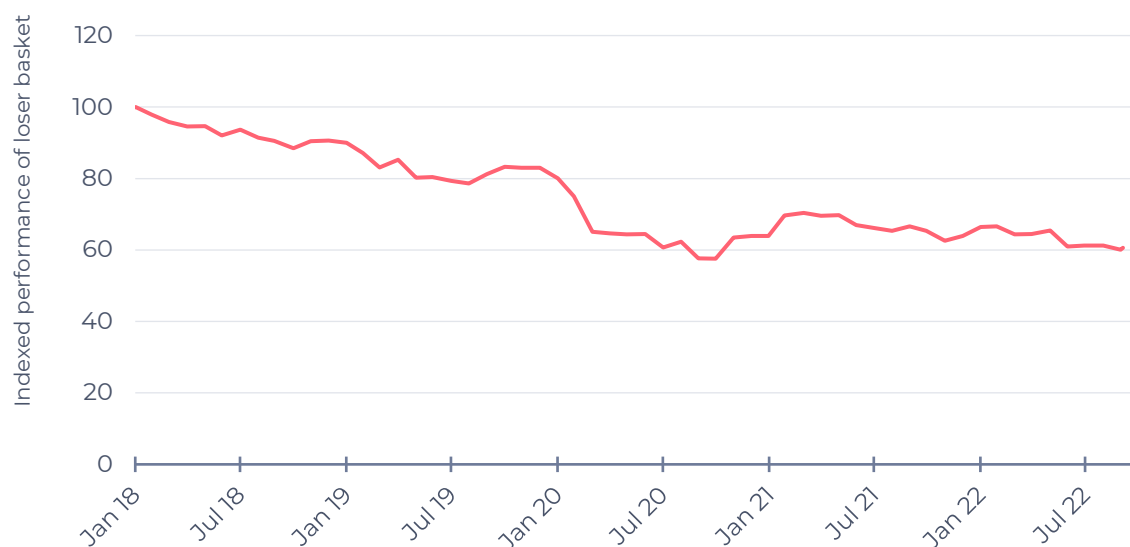
To illustrate this, we construct an equally weighted 'Loser Basket' that consists of the twenty corporates in the Solactive Europe 600 index with the greatest carbon intensity, defined as emissions divided by revenue.

This Loser Basket has considerably underperformed its benchmark – an equally weighted index with the same sectorial composition, based on the same equity

universe – by around 40% since European carbon prices, i.e., the price of EUAs, started rising in 2018.

Adjusting the Loser basket by an otherwise comparable benchmark allows us to isolate the effect of perceived carbon price exposure, suggesting it is a key driver of the underperformance.

**Figure 2: Performance of Loser Basket**



Source: SparkChange

## The market is currently mispricing companies' carbon price risk

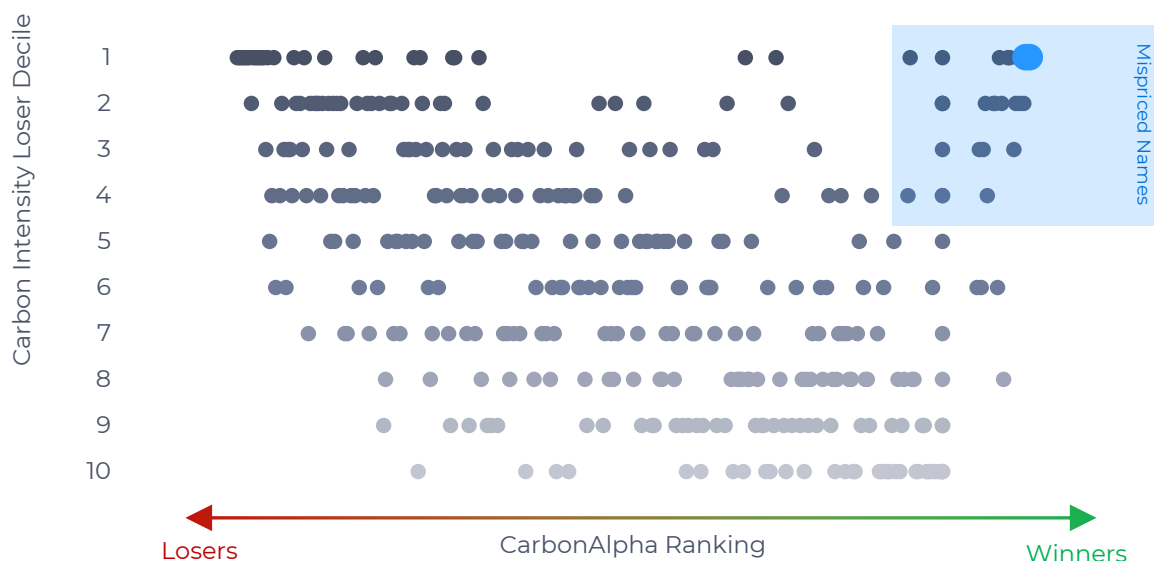
In reality, carbon footprint, intensity and similar top-down metrics are incomplete. They treat every emission equal, no matter whether it is priced or not. They also ignore individual market specifications such as free allocations, exclusions or hedging strategies of corporates. Even as companies' carbon footprints might not be changing over time, their exposure to carbon price risk might. By using such incomplete metrics, investors might be mispricing companies' carbon price risk.

CarbonAlpha, a proprietary dataset created by SparkChange, solves this problem by providing granular, bottom-up analysis per market for 6,500 corporates.

Indeed, the mispricing risk inherent in an 'all emissions equal' methodology is clearly visible when we contrast carbon intensity and CarbonAlpha rankings for a European stock universe. Some names in the Loser Basket are rather forecasted to benefit from regulated carbon markets like the EU ETS.

The following chart plots CarbonAlpha's carbon price risk results against those implied by carbon intensity. Dots in the top-left (losers) and bottom-right (winners) corners represent companies for which the ranking of both approaches concur. In contrast, dots in the bottom-left and top-right corners represent companies for which CarbonAlpha results differ, i.e., securities that might be mispriced. For our analysis, we focus on companies that have a high carbon intensity, but nevertheless, might be benefiting from regulated carbon markets (dots in the top-right corner).

Figure 3: Carbon Intensity vs CarbonAlpha ranking



Source: SparkChange

## Case Studies

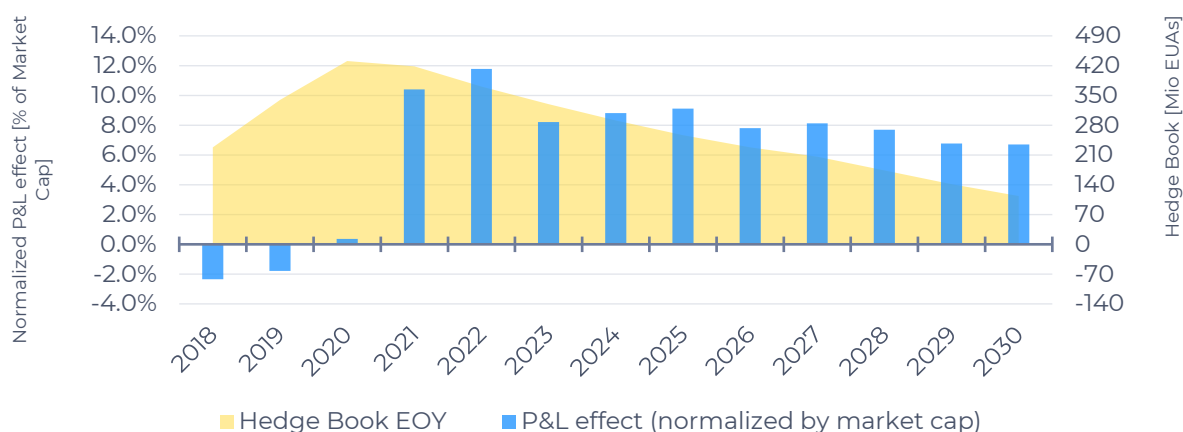
### RWE

Being the biggest polluter in the EU ETS, RWE is always receiving special attention from investors and the market regarding carbon price risk. RWE had roughly 71m tons of emissions in 2021 covered by the EU ETS and receives around 1m freely allocated EUAs for heat production. Their emission numbers are expected to increase in 2022 due to additional coal and lignite fired power generation driven by high gas prices. With a shortfall of over 80m EUAs in 2022, RWE faces a bill of roughly 6.5bn EUR in 2022 with an assumed average carbon price of 82 EUR/ton.

Traditionally, power producers do not buy their allowances when they emit their CO<sub>2</sub>, rather they hedge their carbon obligation alongside the power they sell in the future and forward markets. This means that any given year's compliance costs are determined by the EUA prices that RWE locked in when hedging in previous years. On top of their regular hedging strategy, RWE anticipated increasing prices in the EU ETS already in 2017 and started to acquire additional EUAs. As they publicly announced in 2019, RWE financially hedged their carbon position until the end of 2030. This means that RWE hedged their carbon-intensive portfolio to be not adversely affected if carbon prices were increasing.

CarbonAlpha takes exactly such developments and strategies into consideration, and consequently finds that instead of being negatively exposed to carbon price risk, RWE's pro-active hedging approach results in positive P&L effects until 2030. This is due to the fact that RWE hedged its carbon obligations at relatively low costs and is now able to pass-through some of the costs derived from currently high carbon prices to their customers.

Figure 4: Key CarbonAlpha results for RWE



Source: SparkChange

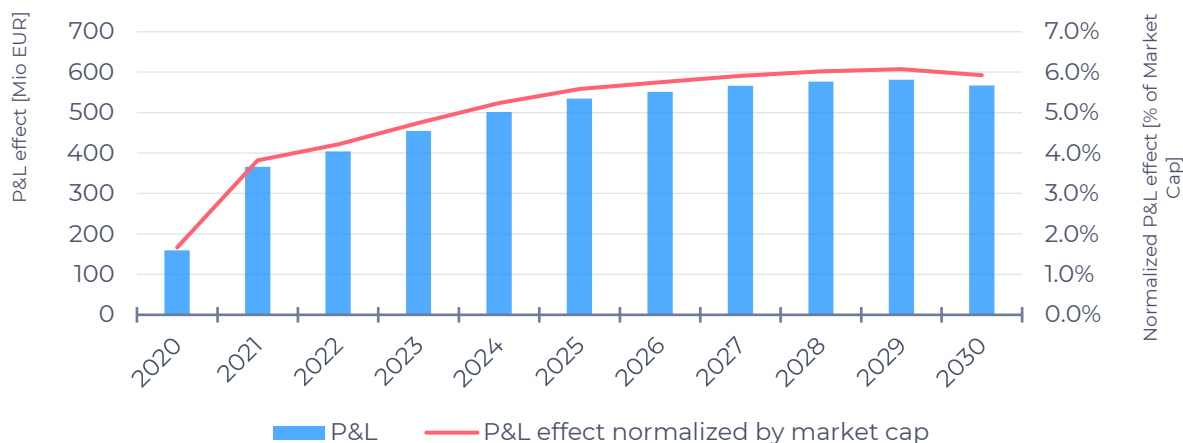
### Yara International

As a fertilizer producer, Yara receives free allocation of allowances to safeguard them from international competitors that do not have to pay for emissions. According to CarbonAlpha analysis, Yara will receive more free allowances than emissions until 2030. This means that Yara would not face any EUA-related costs over the next eight years. Even if their number of freely allocated allowances would be lower than Yara's emissions, CarbonAlpha estimates that Yara sits on a comfortable stockpile of EUAs, which was built up by an over-allocation of allowances historically.

On top of their generous free allocations, we nevertheless expect Yara to pass through its theoretical carbon costs. As their competitors will have to increase prices due to higher carbon costs, we expect Yara to try and secure windfall profits and increase product costs to reflect their theoretical carbon costs.

In total, this means that we expect Yara's profitability to be positively correlated to carbon prices, meaning that if carbon prices were to increase, Yara would profit from this development.

Figure 5: Key CarbonAlpha results for Yara International

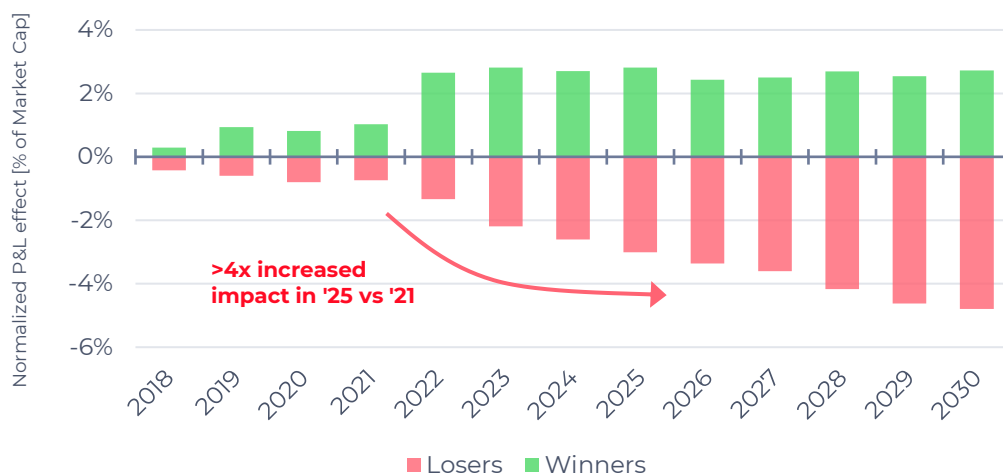


Source: SparkChange

## CarbonAlpha can help investors by accurately identifying winners and losers

So far, the impact of carbon price changes on companies' balance sheets has been relatively muted. Going forward, this will change, triggered by a combination of a reduction in the number of allowances allocated for free, the hedging reservoirs of companies running dry, and likely EUA price increases. In 2025 CarbonAlpha predicts that the most exposed names to carbon price risk could see combined losses of more than EUR 10bn. This equates to carbon price losers suffering median costs of >3% their market capitalization, a 4-fold increase from 2021 levels.

Figure 6: Total CarbonAlpha Effect normalized by Market Cap



Source: SparkChange

Investors who consider incomplete risk metrics may be increasingly disadvantaged as earnings will ultimately reflect true carbon price risk. In contrast, investors who go beyond carbon intensity and footprint measures can benefit by accurately identifying winners and losers.



## Contact Us

Combining extensive industry experience across carbon markets, financial products and data analytics, our 25+ team shares a passion for our company's mission: To link the financial world to carbon markets.



**Florian Baier**  
SENIOR RESEARCH ANALYST  
SparkChange  
Email: [fb@sparkchange.io](mailto:fb@sparkchange.io)



**Ben Bowring**  
DATA SCIENTIST  
SparkChange  
Email: [bb@sparkchange.io](mailto:bb@sparkchange.io)



**Konrad Sippel**  
HEAD OF RESEARCH  
Solactive AG  
Email: [konrad.sippel@solactive.com](mailto:konrad.sippel@solactive.com)



**Javier Almeida**  
ESG RESEARCH  
Solactive AG  
Email: [javier.almeida@solactive.com](mailto:javier.almeida@solactive.com)



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