

Counterpoint Global Insights

Beyond Virtue Signaling

Financial Materiality of Carbon Emissions

CONVERGENCE | SUSTAINABILITY RESEARCH | MAY 2023

Financial statements were originally designed to reflect information about a company's financial performance and position. But there has been a growing gap in recent decades between what the statements show and economic reality. One reason for this is the shift from tangible investments to intangible assets. Intangible value is the total value of an organization as a going concern less the total value of its net tangible assets (such as product inventory, buildings, land, and equipment). Intangible value may represent patents, trademarks, goodwill, data, customer and user bases, and the like. Book value is understated for intangible-intensive businesses because those investments are expensed on the income statement and not capitalized on the balance sheet. Another reason for the gap is that accountants don't record negative externalities, costs unilaterally imposed on others, on the balance sheet. This overstates book value for companies that are the source of substantial negative externalities.

We believe that investors should take into account these negative externalities. Pollution from carbon emissions is a good example. In our view, the global economic and regulatory catalysts are on the way to help to make this cost much clearer, and this could have a wide potential impact on the value of companies.

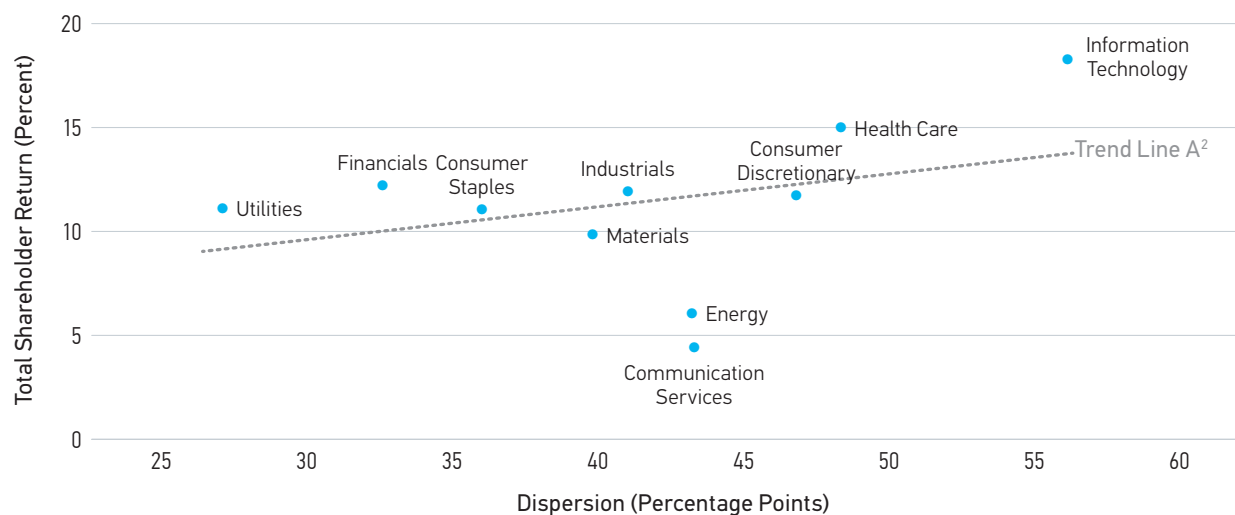
High dispersion¹ of stock prices in a sector presents an opportunity for skillful active managers to outperform their peers. For the decade ending in 2022, the sectors with the largest total shareholder returns (TSRs) also had among the widest dispersions (see exhibit).

¹ "Dispersion" measures the range of returns for a group of stocks, sectors or industries. Here, we are looking at sectors. In each year, we calculate the median return for the stocks within the sector. We then calculate the average total shareholder return (TSR) for the stocks in the top half, and the average return for the bottom half, and dispersion is the difference between the two.



Some of the top returning sectors, information technology, consumer discretionary, and healthcare, were the top three sectors based on dispersion. These sectors are intangible-asset intensive. Economies of scale and obsolescence tend to be more important for businesses that rely on intangible assets than those based on tangible assets. This means that investors who can separate the winners and losers stand to benefit accordingly.

Total Shareholder Returns vs. Dispersion by Sector



Source: Factset, data represents the last decade ending in 2022.

Note: Dispersion for Russell 1000 and TSRs for S&P 500. Past performance is no guarantee of future results.

² "Trend Line A" represents the correlative relationship between Dispersion and TSR in GICS sectors

Perhaps more surprising are the sectors, including basic material and energy, that had average dispersion but two of the lowest TSRs over the last decade. Shifts in demand and demographic trends might explain the poor stock price returns. An alternative potential explanation is that these high-dispersion, low-return sectors are associated with negative externalities that investors have recognized. Identifying and quantifying the cost of carbon-related externalities may allow investors to shift their portfolios accordingly.

Our Sustainability Research has produced a method to systematically measure the potential cost of carbon emissions as well as the financial impact of a carbon tax. Our framework allows us to translate these costs into estimates of stock returns. Companies with low-carbon-emissions intensity look attractive relative to those with high emissions. By integrating carbon into expectations for long-term profit margins and hence company valuations, we give companies the financial justification to decarbonize. Rather than justifying change solely for the purpose of greater environmental responsibility, we provide an economic basis for action. We also seek to help our clients benefit from the many opportunities that a low-emissions world could create.

Additive Integration at Counterpoint Global: Internalizing Carbon in Valuation

Companies create carbon emissions, both directly and indirectly, that cause harm to society. As of now, society, not the companies, is forced to reckon with these emissions. We believe that globally economic and regulatory policy changes are on the way which will aim to reduce green premiums (the additional cost of a clean technology alternative compared to traditional, higher emissions options) and thus increase the cost competitiveness of sustainable options. We anticipate that the burden and liability of emitting carbon will ultimately fall on companies, and that the fundamental analysis that investors do today needs to reflect a price on carbon.

We can estimate a carbon cost for a company by placing a price on direct and some of their indirect carbon emissions. **We currently assume a price to emit carbon of \$40 per metric tonne. We arrived at our estimate by analyzing the global prices of carbon credits, which represents an offset to a tonne of carbon emissions, and estimating what a reasonable price could be over time.** The cost of a carbon credit varies widely globally because of a lack of market interoperability and quality standards. Our current target of \$40 per tonne is significantly higher than the global average today³ because it corrects for the market being skewed artificially lower by lower quality credits trading in the market; lower quality because of issues such as permanence⁴ and additionality⁴. We also base our assumption on past proposals from the U.S. Climate Leadership Council⁵, current carbon credit prices being realized globally, such as prices in the EU Emissions Trading System⁶, and the price needed to force polluters to move up the carbon abatement cost curve. The price is also supported by the work of the MIT Joint Program on the Science and Policy of Global Change and their research on Climate Modeling⁷. We note there are scenarios where a carbon credit could significantly exceed \$40 per tonne. For instance, a short squeeze could occur where companies facing increasing regulatory mandates were forced to buy with limited supply.

Internalizing a carbon cost results in an unrecognized carbon expense for our portfolio companies as well as for those companies we monitor, which we can reflect in expectations for profit margins. We can look at two companies to see the magnitude and range of the potential impact. For calendar year 2021, Amazon's illustrative annual carbon cost is \$647 million, or less than 2% of Net Income. For ExxonMobil, the cost would be \$4.1 billion or 17.9% of Net Income for calendar year 2021 (see illustrative table on page 4 for more details).

³ Global Average - <https://data.ecosystemmarketplace.com/> (\$4.73 2H 2021)

⁴ See definitions for permanence and additionality as related to carbon offsets on Page 6

⁵ US Climate Leadership - <https://clcouncil.org/our-plan/> (as of September 2019)

⁶ EU ETS - <https://tradingeconomics.com/commodity/carbon> (101.95 euros as of 3/1/2023)

⁷ In producing this research, we collaborated with academic experts at MIT's Joint Program on the Science and Policy of Global Change – a note from the Deputy Director on the collaboration is located at the end of this piece.

Illustrative Carbon Cost

	SELF-REPORTED SCOPES 1-2 EMISSIONS ^{8,9} (tonnes CO ² equivalent)	ANNUAL ACCRUED CARBON EXPENSE ¹⁰ (\$40/tonne estimate)	PERCENTAGE OF REVENUE ¹¹ (Annual Accrued Carbon Expense Est. / FY Revs)	PERCENTAGE OF NET INCOME ¹² (Annual Accrued Carbon Expense Est. / FY NI)
Amazon (FY 2021) ⁸	16m metric tonnes	\$0.6b	0.14%	1.9%
ExxonMobil (FY 2021) ⁹	103m metric tonnes	\$4.1b	1.5%	17.9%

Source: MSIM. For illustrative purposes only and should not be construed as a recommendation to buy or sell the securities referenced. Amazon and ExxonMobil represent 0% and 0% of the MSIF Growth Portfolio (respectively) as of March 31, 2023. Carbon price estimate is as of March 2023, Holdings and price estimate are subject to change.

By estimating the carbon expense for each company, we can assess the materiality of potential carbon costs and their estimated impact on valuation and shareholder returns.

Moreover, portfolio analytics allow us to measure the impact a potential carbon tax would have on our portfolios relative to their benchmarks. We utilize our Barra¹³ risk tools to analyze our portfolios and to conduct statistical analysis on return performance under different scenarios. We tested the scenario of how our portfolio and the broader market would perform under various carbon taxes. Specifically, we used our carbon tax estimate, multiplying it by the amount of company emissions (Scope 1 and Scope 2¹⁴), and estimate the performance of each company's stock based on profitability change distributions for each industry¹³. Because our portfolios are significantly less carbon intensive than our benchmarks¹⁵, we can estimate the potential performance of the Counterpoint Global portfolios relative to their benchmarks under different scenarios for a carbon tax:

CG MSIF Growth vs. Benchmark Returns with Carbon Tax Estimates (as of March 31, 2023)

\$40 PER TONNE TAXATION SCENARIO

MSIF Growth	+4.1%
MSIF Growth Active Return	+1.7%
Russell 1000 Growth	+2.4%

Utilizing MSCI's Barra¹³ stress testing tool and risk model, we simulated the hypothetical "\$40 Per Tonne Taxation Scenario" calculating the estimated returns for the portfolio and indices. We tested this scenario on the MSIF Growth portfolio, its benchmark, the Russell 1000 Growth Index and the S&P 500 Index for comparison. Active return was calculated as the difference between the estimated MSIF Growth Portfolio returns and the estimated Russell 1000 Growth Index returns in the simulation.

Source: Morgan Stanley Institutional Fund (MSIF) Growth Portfolio Coverage: 97%, MSCI. As of March 31, 2023. Illustration is based on the emissions data within the underlying holdings latest company filings and MSCI data as of March 31, 2023 and factoring in a carbon tax estimate and does not represent the actual fund or index returns, nor returns a shareholder would have or will experience. This is provided for illustrative purposes only. Note: Russell 1000 Growth benchmark has lower emissions than other indexes like the S&P 500; using the same framework, the S&P 500 index would have a -0.8% return headwind with a \$40/tonne taxation scenario.

This approach may be less helpful for investment managers with high concentration portfolios because it focuses on systematic rather than idiosyncratic exposure. However, we find it useful to highlight the potential returns under various carbon tax scenarios.

⁸ Amazon Company Filings (10-K filing source for FY Revenue and Net Income figures, Sustainability Website: sustainability.aboutamazon.com/environment/carbon-footprint source for emissions data).

⁹ ExxonMobil Company Filings (10-K filing source for FY Revenue and Net Income figures, emissions data from ExxonMobil GHG supplement corporate.exxonmobil.com/-/media/global/files/advancing-climate-solutions-progress-report/2023/2023-acs-ghg-data-supplement.pdf).

¹⁰ Scope 1 and Scope 2 emissions data from filings mentioned in footnotes 5 & 6 multiplied by \$40.

¹¹ "Annual Accrued Carbon Expense" divided by the companies' total annual revenue from that year, as provided in their disclosed financials (footnotes 8 & 9).

¹² "Annual Accrued Carbon Expense" divided by the companies' total annual net income from that year, as provided in their disclosed financials (footnotes 8 & 9).

¹³ Barra is a set of applications provided by MSCI, which enable stress testing and risk modeling. This process has two key steps for generating hypothetical performance results: first, the user inputs market-change estimates into the tool. Second, the risk model then uses factor correlations to extrapolate said market-change estimates onto the securities within the portfolios/benchmarks. In the "\$40 Per Tonne Taxation Scenario" we multiply the estimated Scope 1+2 company emissions (sourced from a third-party data provider, MSCI as of March 31, 2023) by \$40, this incremental cost estimate reduces the estimated profitability of those companies. The Barra simulation estimates the flow of investment dollars from one industry into another given the industry profitability changes, which creates the market change estimates.

¹⁴ For definitions of Scopes 1, 2 and 3 emissions see definitions section on page 6

¹⁵ Per carbon emissions data provided by MSCI as of March 31, 2023 and chart available on page 5 for further explanation.

Carbon Intensity Estimate of Counterpoint Global Portfolios

	INCEPTION	DISCOVERY	GROWTH	INSIGHT	ADVANTAGE
Portfolio Carbon Intensity vs Benchmark (Gross tonnes emissions per \$mm revenue vs benchmark)	19% (31% Tonnes/Rev)	11% (14%Tonnes/Rev)	34% (30% Tonnes/Rev)	30% (28% Tonnes/Rev)	24% (31% Tonnes/Rev)

Source: MSCI, Factset, MSIM as of March 31, 2023. Information represents the teams MSIF Portfolios and provided for illustrative purposes only. Illustration is based on the emissions data within the Portfolios' and benchmarks' underlying holdings as of March 31, 2023. Carbon price estimate is as of March 2023. Holdings and carbon price estimate are subject to change.

Our portfolios are comprised of companies that create fewer emissions per revenue dollar than the companies in the benchmark (As described in the above table, where all 5 portfolios have estimated emissions below the respective benchmarks, as of March 31, 2023). For example, the carbon emissions per revenue dollar in the Growth Portfolio is less than half of the benchmark, while the carbon intensity estimate of the portfolio, the emissions per invested dollar is roughly one-third the index. Said differently, Counterpoint Global holdings tend to skew toward higher price/sales ratios than the population of investable companies. As a result, our clients tend to have significantly less exposure to carbon intensity per invested dollar than they would if they invested in the benchmark.

Our Sustainability Research seeks to quantify drivers of value that are not captured by traditional and widely-available metrics. We believe that measuring the cost of carbon emissions allows us to better understand the environmental risks for the companies in our portfolio as well as for those we do not own.

Unlocking Systemic Change

Our analysis of carbon emissions provides a signal to companies and clients that we are factoring in these costs as part of our analysis and valuation. We would like to see this measure of environmental stewardship move from an objective of the corporate social responsibility manager to a strategic and financially-material issue for the board of directors. Executives and boards who know that active managers are quantifying the risks of carbon emissions may have more of a financial incentive to allocate corporate resources to the innovations that we need to decarbonize as a society.

We believe that the next wave of sustainability investing is to partner with companies to unlock opportunities for favorable impact. We call this convergence: the alignment of long-term value creation and positive impact on society and the environment. We believe that direct engagement with managements on strategies to mitigate carbon intensity creates more value for our clients than the standard approach of reducing a portfolio's gross carbon emissions through screens that eliminate investment options. We hope to promote change through integration and partnership with companies.

One lesson from our research on carbon emissions is that the most common approach in the investment community is to focus on a relatively narrow group of industries and companies. For instance, there has been a lot of attention paid to the transportation industry even though it represents only 16% of global emissions.¹⁶ Reframing the sources of risk helped us appreciate a broader range of opportunities. Sustainability Research has expanded its scope to other end markets for carbon sequestration, such as fertilizer innovation and precision agriculture technologies. These are important because farming, broadly defined, produces 19% of global emissions.¹⁶

We also seek to invest long-term oriented capital into breakthrough technologies that have the potential to unlock multi-trillion dollar energy end markets. These breakthroughs could contribute to the decarbonization of power generation, which represents 27% of emissions,¹⁶ and could ultimately accelerate the electrification of manufacturing, which is 31% of emissions.¹⁶

The secular growth of decarbonization creates opportunities that are aligned with the investment culture at Counterpoint Global. With our framework described here on internalizing the potential costs from carbon emissions, we can estimate some of the financial risk associated with emissions. We can also capitalize on the decarbonization opportunity by identifying what we believe are high potential disruptors and highly durable incumbents as we invest across the range of market capitalizations as well as in both public and private markets.

¹⁶ Rhodium Group as of 2020, as referenced in How to Avoid a Climate Disaster, by Bill Gates. Published February 16, 2021.

MIT

Joint Program on the Science and Policy of Global Change

Climate change is likely to cause shifts in the political, technological, social and economic landscape; these changes will create both financial risks and opportunities to transition to a low-carbon economy. There is a self-reinforcing mechanism for action in motion: society is increasingly pressuring government and industry to decarbonize, which drives technological innovation creating a wider array of low-carbon options, in turn creating further societal pressure to implement those options.

The framework developed by Counterpoint Global provides a method to measure the potential cost of carbon emissions and to estimate the financial impact of a carbon tax. An advantage of this framework is it translates these impacts into estimates of stock returns. In quantifying these impacts, Counterpoint Global has shown that asset owners can integrate this analysis into their strategies and ultimately provide executives, boards and other decision makers with more incentives to allocate resources to decarbonizing.

The key for capital allocators and other strategic entities is to quantify the impacts, actively engage in risk assessment and management, and identify opportunities for value creation. Decision makers at different levels need more risk-assessment tools, like the one developed by Counterpoint Global, it will help them to find opportunities for sustainable growth.

SERGEY PALTSEV

Senior Research Scientist

Deputy Director, Joint Program on the Science and Policy of Global Change

Massachusetts Institute of Technology

DEFINITIONS:

Emissions Scopes:

- *Scope 1 emissions*: These are “direct” emissions - those that a company causes by operating the things that it owns or controls. These can be a result of running machinery to make products, driving vehicles, or just heating buildings and powering computers.
- *Scope 2 emissions*: These are “indirect” emissions created by the production of the energy that an organization buys.
- *Scope 3 emissions*: These are also indirect emissions - meaning those not produced by the company itself - but they differ from Scope 2 as they cover those produced by customers using the company’s products or those produced by suppliers making products that the company uses.
- Source: www.weforum.org/agenda/2022/09/scope-emissions-climate-greenhouse-business/

Additionality:

- A criterion for assessing whether a carbon removal project has resulted in greenhouse gas emission reductions or removals in addition to what would have occurred in its absence.
- Source: www.offsetguide.org/high-quality-offsets/additionality/

Permanence:

- A criterion for assessing whether a carbon removal project can guarantee that the removal and storage of greenhouse gas emissions would not be reversed (i.e., GHGs are subsequently emitted so that no net reduction occurs) indefinitely.
- Source: www.offsetguide.org/high-quality-offsets/permanence/

ADDITIONAL DEFINITIONS:

“**ESG**” investment: Environmental Social and Governance based investment is an investment approach which takes explicit account of the environmental, social and corporate governance aspects of all proposed investments. **Tangible investments** are those investments made in something that has physical substance, such as hard or real assets or personal property. **Intangible asset** is an asset that is not physical in nature. Goodwill, brand recognition and intellectual property, such as patents, trademarks, and copyrights, are all intangible assets.

Counterpoint Global

New York

INVESTORS	RESEARCH RESPONSIBILITIES	YEARS OF EXPERIENCE	YEARS WITH FIRM	YEARS WITH TEAM
DENNIS LYNCH	Lead Investor, Head of Counterpoint Global	29	25	25
SAM CHAINANI	Head of Counterpoint Global~ New York, Technology	27	27	23
JASON YEUNG	Health Care	26	21	19
ARMISTEAD NASH	Business Services, Software	23	21	19
DAVID COHEN	Consumer	35	30	24
ALEX NORTON	Consumer, Industrials, Technology (ex Software)	28	23	23
MANAS GAUTAM	Head of Global Endurance, Generalist	11	8	8
ANNE EDELSTEIN	Health Care	12	5	5
ABHIK KUMAR	Software, Media	14	4	4
JENNY LEEDS	Healthcare	7	4	4
JOSHUA JARRETT	Director of Research, Generalist	18	3	3
RUOBING CHANG	Internet	11	7	3
ALEKS SAMETS	Payments	3	3	3
BETH FIFER	Health Care	11	2	2
MUHAMMADRAZA PANJU	Internet	4	2	2
PETE STOVELL	Generalist	29	2	2
MICHAEL MORITZ	Generalist	5	1	1
CONSILIENT RESEARCH				
MICHAEL MAUBOUSSIN	Head of Consilient Research	36	3	3
DAN CALLAHAN	Consilient Research	18	3	3
DISRUPTIVE CHANGE RESEARCH				
STAN DELANEY	Big Ideas, Emerging Themes	22	22	19
SASHA COHEN	Big Ideas, Emerging Themes	6	6	6
JUSTIN AMEZQUITA	Big Ideas, Emerging Themes	3	3	3
VASILEIOS PRASSAS	Big Ideas, Emerging Themes	9	2	2
SUSTAINABILITY RESEARCH				
THOMAS KAMEI	Head of Sustainability Research, Internet	11	11	11
DERRICK MAYO	Sustainability Research	18	9	2
CLIENT RELATIONSHIP & BUSINESS MANAGEMENT				
MARK TODTFELD	Chief Operating Officer	28	18	4
KERRY ANN JAMES	Head of Client Relations, Portfolio Specialist	26	6	2
PRAJAKTA NADKARNI	Portfolio Specialist	19	16	12
MICK MORAN	Portfolio Specialist	9	9	1
MCKENZIE BURKHARDT	Portfolio Specialist	20	20	20
XAVIER SALAZAR	Portfolio Analyst	5	5	1
KATHRYNE DOWNS	Portfolio Specialist ~ Global Endurance	11	11	1
EARL PRYCE	Portfolio Administrator	23	23	16
CHAYSE MORGAN	Portfolio Administrator	3	3	3
ERICA CASARENO	Portfolio Administrator	1	1	1
AMBER YANG	Business Management	13	5	2

Asia

Global, International, Asia

KRISTIAN HEUGH Lead Investor, Head of Global Opportunity

- 13 Investors
- 6 Portfolio Specialists
- 1 Portfolio Operations Analyst

"Investor" refers to an analyst or portfolio manager of Counterpoint Global.

Team members may change without notice from time to time. Years of Experience listed above refers to Industry Experience.

Years of Experience, Years with Firm and Years with Team are as of June 2023.

Risk Considerations

There is no assurance that a Portfolio will achieve its investment objective. Portfolios are subject to **market risk**, which is the possibility that the market values of securities owned by the Portfolio will decline and that the value of Portfolio shares may therefore be less than what you paid for them. Market values can change daily due to economic and other events (e.g. natural disasters, health crises, terrorism, conflicts and social unrest) that affect markets, countries, companies or governments. It is difficult to predict the timing, duration, and potential adverse effects (e.g. portfolio liquidity) of events. Accordingly, you can lose money investing in this Portfolio. Please be aware that this Portfolio may be subject to certain additional risks. In general, **equities securities'** values also fluctuate in response to activities specific to a company. Investments in **foreign markets** entail special risks such as currency, political, economic, market and liquidity risks. The risks of investing in **emerging market countries** are greater than risks associated with investments in foreign developed countries. **Privately placed and restricted securities** may be subject to resale restrictions as well as a lack of publicly available information, which will increase their illiquidity and could adversely affect the ability to value and sell them (liquidity risk). **Derivative instruments** may disproportionately increase losses and have a significant impact on performance. They also may be subject to counterparty, liquidity, valuation, correlation and market risks. **Illiquid securities** may be more difficult to sell and value than public traded securities (liquidity risk).

ESG Strategies that incorporate impact investing and/or **Environmental, Social and Governance (ESG)** factors could result in relative investment performance deviating from other strategies or broad market benchmarks, depending on whether such sectors or investments are in or out of favor in the market. As a result, there is no assurance ESG strategies could result in more favorable investment performance.

INDEX DEFINITIONS

The **Russell 1000® Index** is an index that measures the performance of the 1,000 largest companies in the Russell 3000 Index. The **Russell 1000® Growth Index** measures the performance of the large-cap growth segment of the U.S. equity universe. It includes those Russell 1000® Index companies with higher price-to-book ratios and higher forecasted growth values. The Russell 1000® Index is an index of approximately 1,000 of the largest U.S. companies based on a combination of market capitalization and current index membership. The **S&P 500® Index** measures the performance of the large cap segment of the U.S. equities market, covering approximately 75% of the U.S. equities market. The Index includes 500 leading companies in leading industries of the U.S. economy. The indexes are unmanaged and do not include any expenses, fees or sales charges. It is not possible to invest directly in an index. Any index referred to herein is the intellectual property (including registered trademarks) of the applicable licensor. Any product based on an index is in no way sponsored, endorsed, sold or promoted by the applicable licensor and it shall not have any liability with respect thereto.

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