

The Best Bang for Your Climate-Aware Buck

(Or Pound, Euro, Yen – You Name It)

Melissa R. Brown, CFA, Global Head of Applied Research, Qontigo



So your goal is carbon reduction—potentially getting to net-zero emissions by 2050. But you do not want to wait until then to measure the impact your investments might make. You want to invest in a *broad* climate-reduction equity benchmark because, after all, you do not want to take on too much extra-market risk. You can invest anywhere in the world. In this paper we attempt to answer the following questions: in which region can you make the most impact, and how much active risk is required to achieve your climate goals?

Enter the Paris-Aligned Benchmarks: US vs. Europe

We used two regional STOXX Paris-Aligned benchmarks (PABs) to try to answer these questions: one based on the STOXX Europe 600 index and the other with the STOXX USA 500 as the underlying index. The PABs start with a goal of 60% reduction in the greenhouse gas emissions relative to the underlying. With the most recent rebalance, each index was additionally required to achieve a 7% reduction in greenhouse gas emissions¹ from the PAB level of the prior year, which was already well below that of the underlying cap-weighted index. Of course, because the emissions-reduction goals are relative to both the cap-weighted index and the prior year's PAB, even with that reduction the PAB index with the higher starting points would still have higher emissions.

Our initial expectation was predicated on the fact that carbon reduction has been a focus of European regulators, companies and investors for quite some time, whereas US-based investors have been concerned about the potential give-up in returns. At the same time US regulators were at best indifferent and at worst actively advocating against such portfolios, unless managers could prove returns would be higher or risk would be lower. Given this, we expected the initial starting point (the underlying capitalization-weighted benchmark) would already be more climate-friendly in Europe. In addition, we thought the 7% reduction requirement might result in moving the US Paris-Aligned benchmark farther away from its cap-weighted counterpart, compared with those in Europe, thereby producing a higher level of active risk.

Alas, our expectation was wrong! The principal reason was that Energy and Utilities—the biggest emissions sinners—are more heavily weighted in Europe, whereas Information Technology, one of the two lowest greenhouse gas intensity sectors, is far more dominant in the US. In addition, the Materials sector is not only a bigger part of the European benchmark but is also far more carbon-intensive in Europe.

To be sure, this outcome was a little misleading, and reflected the disconnect between the US stock market and its economy. According to OECD, US GDP is actually 70% more carbon intensive than Europe's. The weights of sectors in the market index are far different from their GDP weights. If we broaden our market definition in the US to the STOXX USA 900 (more of a large-mid cap index than just large cap like the USA 500) and analyze just the 400 stocks in the USA 900 that are not in the USA 500, we get a somewhat different story. But first, our comparison between the USA 500 and the Europe 600.

¹ The 7% reduction is calculated using the ratio of emissions to enterprise value including cash (EVIC).

Active risk was relatively low, but its distribution was very different in Europe vs. US

Before detailing the climate-related metrics for our two Paris-Aligned benchmarks versus their underlying cap-weighted parents, we started with a standard analysis of portfolio risk.

As of March 23, 2021², the STOXX USA 500 (henceforth “US”) and the STOXX Europe 600 (“Europe”) Paris-Aligned Benchmarks both had a little more than 2% tracking error versus their cap-weighted counterparts. Total risk levels were similar for all four indices, although the gap between the PAB and the underlying was slightly bigger for Europe, with the PAB less volatile. More of Europe’s active risk comes from factors, which we will detail below, whereas the US PAB has more stock-specific active risk (Exhibit 1). Overall, however, the top-line risks of the two PABs were similar.

There is one interesting point of departure between the two families—in both cases, the underweights (including stocks not held along with those that were in the portfolio but held at less than their underlying benchmark weight) accounted for a lot more risk than the overweights. However, in the US, about 60% of the active risk came from the names *not* held in the PAB, and about 88% came from all the underweights. The rest, of course, came from the overweight bets.

In contrast, in Europe the overweight bets were quite diversifying, as the sum of the risk contribution of stocks not held was around 130%, and the sum for underweights was over 180%. So, particularly in Europe, it was the riskier and bigger names that failed to meet the strict climate criteria—many in the Energy and Materials sectors—that drove the active risk. And the sources of risk can have an important impact on return going forward.

Lower Beta, Volatility, Value and Dividend Yield drove active risk, but the US had more specific risk

The breakdown in active risk between factors and stock-specific (risk that can theoretically be diversified away) also varied (Exhibit 2). In Europe, where 75% of the active risk was factor risk, the main style driver was the negative exposure to Market Sensitivity—in other words, the PAB contains lower-beta names, compared with the underlying index. This exposure accounted for fully one third of the total factor risk. The slightly negative Value and Volatility³ bets each also contributed more than 2% of the total active risk, and the negative Dividend Yield tilt, no doubt from the elimination of Energy names, contributed almost 2%. The negative Momentum exposure was a diversifying bet, with a contribution of -3%, but while we would expect the tilts on the other style factors mentioned to remain in the same direction through time, Momentum is likely to jump around between negative and positive, depending on which stocks are faring better or worse.

Active style bets in the US portfolio were more diversified, with positive bets on Growth and Size, and tilts toward lower Dividend Yield, Leverage, Market Sensitivity and Value each contributing more than 2% of the total active risk, and Momentum once again diversifying the risk. Overall, almost 22% of the risk in the US was style-based, much less than in Europe.

² The indices were rebalanced a few days earlier in March.

³ Meaning that the PAB has slightly more expensive, but less volatile stocks relative to the cap-weighted benchmark.

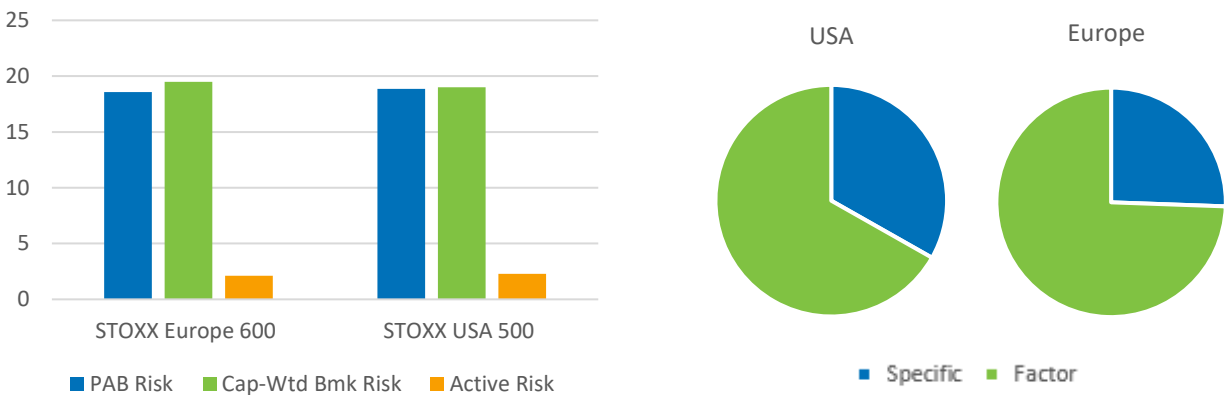
Zero-weight Energy was the single biggest risk contributor

Industry risk in the US, however, was higher than in Europe, accounting for just less than half of the total risk. The underweight (actually zero weight) in Oil, Gas and Consumable Fuels was the biggest contributor, far ahead of the risk coming from all other industry bets. In Europe, where industry risk was just over 37%, Oil, Gas and Consumable Fuels was also the biggest contributor with its absence from the PAB, but risk from the overweights in Pharmaceuticals and Household and Personal Products was not far behind.

Although the Europe PAB had some significant country weights (most notably an active weight of -3.5% in the UK), individual country risk contributions were small, and overall, the country bets diversified away a bit of the active risk. All the indices were based in USD for this analysis, and the underweight in GBP contributed more than 5% of the active risk. Of course, as a single country, the USA PAB had no country or currency risk (assuming you are a USD-based investor).

Overall, we found the active risk of both PABs to be relatively low—certainly no higher than many actively managed portfolios, and with the possible exception of the underweights in Oil, Gas and Consumable Fuels, no individual element stood out as a driver of risk that might be concerning. *The goal of investing in a broadly diversified benchmark that meets the Paris standards can easily be achieved.*

Exhibit 1. Total and Active Risk, and Percent of Active Risk



Source: Qontigo

Exhibit 2. Style Exposures and Risk Contributions

	<u>STOXX Europe 600 PAB</u>		<u>STOXX USA 500 PAB</u>	
	Active Exposure	Percent of Risk	Active Exposure	Percent of Risk
Style		32.8		21.7
Dividend Yield	-0.09	1.9	-0.07	3.1
Earnings Yield	0.06	-0.6	0.05	-1.8
Exchange Rate Sensitivity	-0.02	0.6	0.05	0.2
Growth	0.03	0.2	0.11	5.2
Leverage	-0.08	0.9	-0.07	2.2
Liquidity	-0.02	0.5	-0.01	0.0
Market Sensitivity	-0.12	25.2	-0.02	4.2
Medium-Term Momentum	-0.05	-3.0	-0.02	-3.1
Profitability	0.06	0.6	0.07	1.0
Size	0.05	1.4	0.04	4.9
Value	-0.07	2.9	-0.04	3.9
Volatility	-0.02	2.2	-0.02	1.9

Source: Qontigo

Exhibit 3. Industry and Country Weights and Risk Contributions

STOXX Europe 600 PAB			STOXX USA 500 PAB		
	Active Exposure	Percent of Risk		Active Exposure	Percent of Risk
Industry Top and Bottom 5		37.3			45.1
Pharmaceuticals	5.3%	7.7	Health Care Prov & Svcs	3.3%	1.4
Household & Pers Prod	3.7%	8.4	IT Services	2.2%	0.9
Insurance	2.9%	-2.5	Communications Equip	2.0%	2.8
Electrical Equipment	2.8%	1.4	Biotechnology	1.6%	2.8
Textiles, App & Lux Gds	2.0%	0.1	Pharmaceuticals	1.5%	1.2
Food Products	-1.4%	-1.5	Industrial Conglom	-1.1%	2.8
Aerospace & Defense	-1.6%	4.3	Road & Rail	-1.2%	1.8
Gas, Water & Multi-Utils	-1.7%	-2.5	Hotels, Rest & Leisure	-1.2%	2.7
Metals & Mining	-2.2%	2.8	Aerospace & Defense	-1.6%	3.4
Oil, Gas & Cons Fuels	-3.7%	10.9	Oil, Gas & Cons Fuels	-2.3%	13.4
Country (Top and Bottom 5)		-0.9			
France	2.7%	-1.5			
Denmark	1.9%	1.5			
Netherlands	1.9%	-0.2			
Switzerland	1.0%	-0.1			
Spain	0.5%	-0.1			
Belgium	-0.4%	0.0			
Sweden	-0.6%	-0.4			
Italy	-1.1%	-0.7			
Germany	-1.5%	0.4			
United Kingdom	-3.5%	0.6			
Currency (Top 4)		5.2			
DKK	1.9%	-0.9			
EUR	1.8%	-0.8			
CHF	1.0%	0.1			
GBP	-3.5%	5.4			

Benchmark risk characteristics as of March 23, 2021.

Results are based on the Axioma Medium-Horizon Fundamental Models, Europe (EU4) for the European PAB and US (US4) for the US PAB.

Source: Qontigo

Climate metrics: GHG Intensity is concentrated in a few sectors

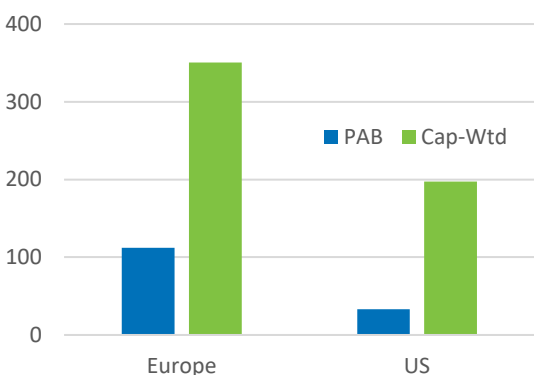
We have shown that the PAB indices are equally or less volatile than their underlying cap-weight counterparts, and their active risk is relatively low and well-distributed. But how do they stack up on climate metrics? Does one geography give you a bigger “bang for your buck” (or pound, euro, yen or any other currency)? And what is the major source of the improvement?

The main goal of the Paris-Aligned benchmarks is to promote a substantial reduction in greenhouse gas (GHG) emissions. Carbon intensity for the PAB indices should be less than 50% of the underlying benchmark value (Qontigo indices goes beyond regulatory requirements with an initial reduction of 60%)—clearly a substantial difference. And as we noted earlier, starting in 2021 there was a requirement for emissions to be reduced by an *additional* 7% per year. Therefore, by definition, both the US and Europe PAB indices see substantial reductions in their emissions, compared with their underlying cap-weighted parent benchmark (Exhibit 4). Interestingly, and unexpectedly given our original thesis, the US started with much lower total emissions than did Europe (per the weighted average GHG intensity ratio for the cap-weighted index). This merited a deeper dive...

The Energy sector, with its extremely high level of emissions, contributes by far the highest proportion of GHG intensity to both underlying indices (about 40% in Europe and more than 50% in the US, Exhibit 5). Although the sector’s contribution (sum of company weights x GHG emissions ratio) is higher in Europe, aggregate emissions for the STOXX USA 500 are so much lower that Energy’s overall contribution to the total ends up being higher in the US. Energy is followed by Utilities (contributing 14% and 16% of overall emissions in Europe and the US, respectively). The major difference between the US and Europe is in the materials sector, which has a much higher total contribution in Europe, along with a higher sector weight. Therefore, Materials accounts for more than 30% of the GHG intensity level of the STOXX Europe 600, whereas in the US, the Materials sector accounts for less than 10%.

On the flip side, Information Technology, which accounts for more than one-third of the market value of the STOXX USA 500, has very low GHG emissions intensity. This had a substantial dampening impact to the total GHG Intensity of the index. While the Technology GHG intensity was also low in Europe, the sector’s weight was much lower, which pushed weight into other, higher-intensity sectors.

Exhibit 4. Greenhouse Gas Intensity



Source: Qontigo and ISS ESG - Climate

Exhibit 5. Sector Total and Contribution to Cap-Weighted Benchmark Greenhouse Gas Intensity



Note: GHG Intensity Contribution = asset weight x asset GHG intensity summed by sector.

Sector weight = asset weight x market value summed by sector and divided by the benchmark total.

Percent of total emissions = GHG intensity contribution/total index GHG intensity.

Source: Qontigo and ISS ESG – Climate

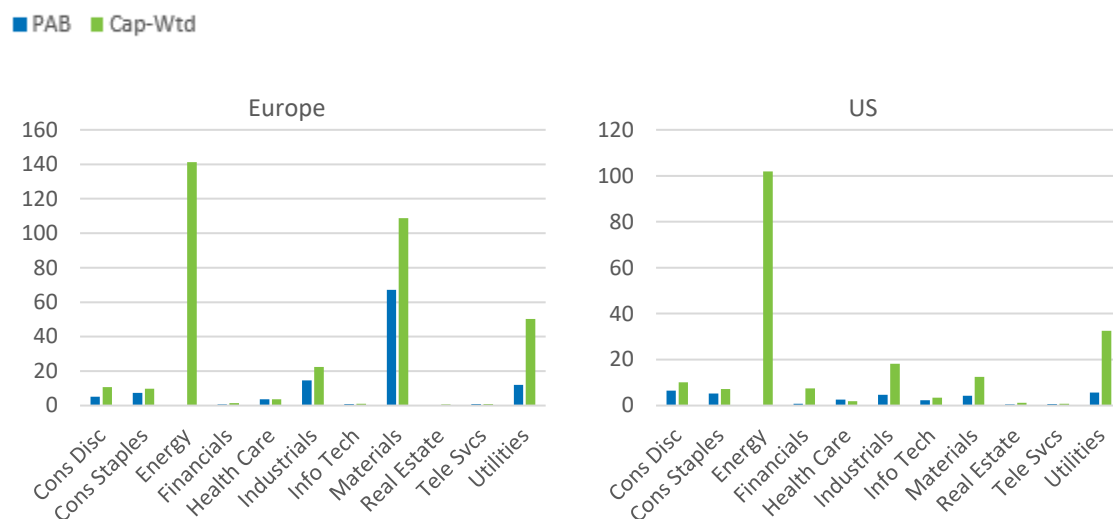
Going from parent to PAB

When we compare the final results after all of the PAB screening⁴ was applied and the new index was created, we see that Energy accounted for the lion’s share of emission reduction in both Europe and the US (Exhibit 6). In both cases the sector dropped out of the PAB completely. The reduction in contribution from Utilities was also apparent in both regions. The sector that stood out with the biggest difference was Materials, which now has the highest contribution to the total PAB emissions in Europe. In contrast, sector contributions to the US PAB were much more evenly distributed and all at very low levels, including Materials.

⁴ There are other screens applied when creating the Paris-Aligned Benchmarks, but we have limited the analysis to the major one—greenhouse gas emissions—for simplicity.

An important point to note is about further reductions in GHG emissions to meet the 7% per year goal. Starting from a much lower base in the US suggests that the goal will become increasingly more difficult to meet⁵.

Exhibit 6. Sector Contribution to Total Emissions, PAB versus Underlying



Source: Qontigo and ISS ESG - Climate

Broadening the US “market”

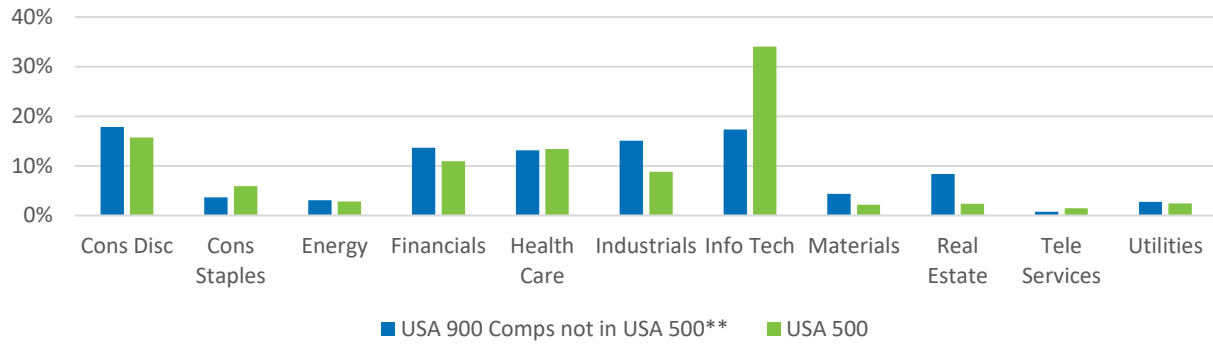
As noted, the results for large-cap US stocks reflect the dominance of Technology to the detriment of other sectors (in terms of weighting). To reduce that impact in our analysis, we calculated some of the same statistics as above for the USA 900, as well as for the 400 stocks in the USA 900 that are not in the USA 500—in other words, the mid-cap names that are less dominated by the ultra-mega-cap well-known names in the Technology sector.

There was clearly a much more even distribution of weights (Exhibit 7), although obviously the total market capitalization of any sector was small (the 400 names together comprise about 8.7% of the USA 900). But it was clear that the dominance of Technology was far less. The total GHG Intensity of those stocks was also higher than the same-sector stocks in the USA 500.

The end result was that the smaller names in the USA 900 had more emissions—roughly equivalent to those in Europe—and the Paris-Aligned benchmark had a smaller overall reduction from them, compared with the larger, more tech-dominated names. This was closer to what we would expect, knowing that the US has higher emissions as a percent of GDP than does Europe, but it does not erase the apparent discrepancy.

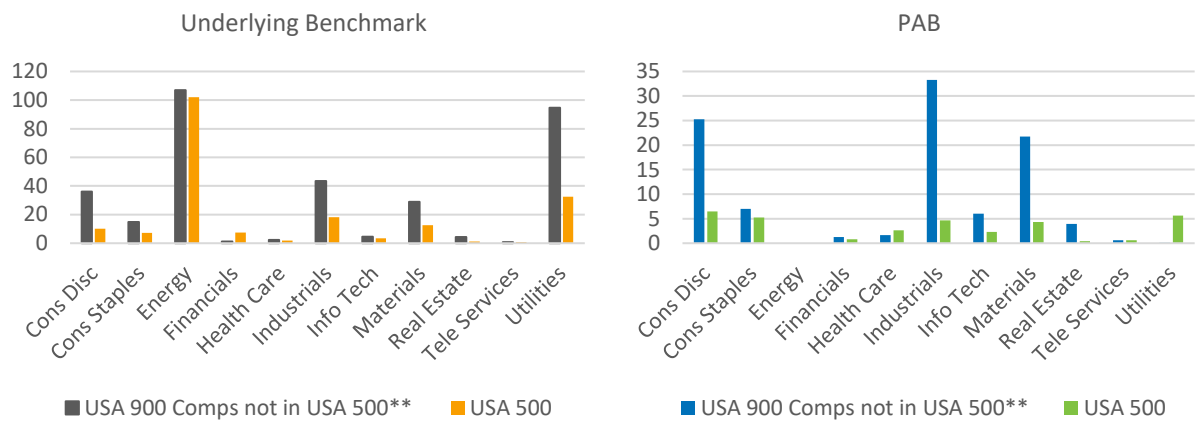
⁵ The GHG ratio (emissions/enterprise value including cash, or EVIC) could theoretically be reduced by increasing EVIC, thereby violating the spirit of the PAB. Because of that, a rule has been built into the benchmark design that puts EVIC growth (an inflation factor) back into the numerator for the aggregate index. The 7% reduction can therefore only be achieved by actual emissions reduction.

Exhibit 7. Sector Weights, USA 900 Companies Not in USA 500 vs. USA 500



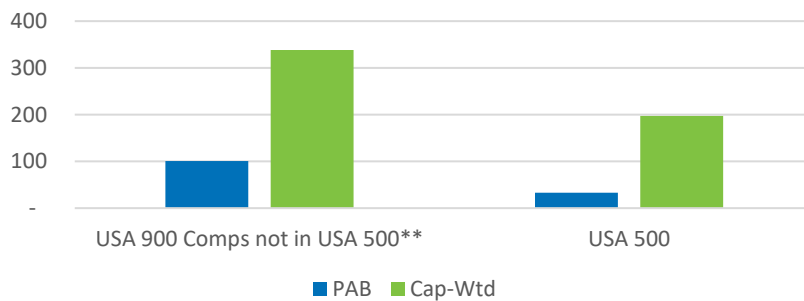
Source: Qontigo

Exhibit 8. Contribution to Total Emissions



Source: Qontigo and ISS ESG – Climate. Note that the scales for the underlying benchmark vs. the PABs are different.

Exhibit 9. GHG Intensity, 400 Stocks Not in the USA 500 vs. USA 500



Source: Qontigo and ISS ESG - Climate

Conclusion

We were surprised by the gap between the total emissions of the STOXX Europe 600 and the STOXX USA 500, as we initially expected the US to be higher (as it is when emissions are compared with GDP). The makeup of the two *markets* drove the initial parent-benchmark differences, with (1) an extremely high concentration in Information Technology in the US dampening down the weights of other more carbon-intensive sectors, (2) much higher weight along with higher intensity in European Materials and (3) a lower weight and lower-intensity profile of Energy stocks in the US (which nonetheless were the biggest contributors to overall GHG intensity). Then, after applying the PAB-required 60% lower emissions versus the benchmark, plus an additional 7% reduction from the prior year's PAB (along with other elements of constructing the PAB portfolio), the US market as it stands now is closer than Europe to that ultimate goal of zero emissions. When we limit the US universe to the mid-sized names, we get results that are roughly equivalent to those in Europe.

What could change? If energy prices continue to rise and the weight of the Energy sector in the US increases, but companies in the sector do not work to reduce emissions, the required 7% reduction in emissions from the prior year will be more difficult to achieve. This is especially true if the increase in Energy weight comes at the expense of a decrease in the lower emissions sectors, such as Information Technology. Higher Energy weight in the parent index would also mean higher tracking error for the PAB.

Still, we remain firmly convinced that the Paris-Aligned Benchmark methodology offers companies substantial incentives to reduce emissions and be included in the benchmark. As more and more investors shift their investments into these kinds of strategies, this will be a win-win—not only for the environment, of course, but also for investors who will be able to invest in a well-diversified, broad-market benchmark.

Contacts & Information

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[Qontigo.com](https://www.qontigo.com)

Europe

Frankfurt

Mergenthalerallee 61
65760 Eschborn, Germany
+49 69 2 11 0

Geneva

Rue du Rhone 69, 2nd Floor
1207 Geneva, Switzerland
+41 22 700 83 00

London

No. 1 Poultry
London EC2R 8EJ, United Kingdom
+44 20 7856 2424

11 Westferry Circus

London E14 4HE, United Kingdom
+44 20 7862 7680

Paris

19 Boulevard Malesherbes
75008, Paris, France
+33 1 55 27 38 38

7 Rue LéoDelibes
75116, Paris, France
+33 1 55 27 67 76

Prague

Futurama Business Park Building F
Sokolovska 662/136b
186 00 Prague 8, Czech Republic

Zug

Theilerstrasse 1A
6300 Zug, Switzerland
+41 43 430 71 60

Americas

Atlanta

400 Northridge Road, Suite 550
Atlanta, GA 30350
+1 678 672 5400

Buenos Aires

Corrientes Avenue 800, 33rd Floor
Office 101
Buenos Aires C1043AAU, Argentina
+54 11 5983 0320

Chicago

1 South Wacker Drive, Suite 200
Chicago, IL 60606
+1 224 324 4279

New York

17 State Street, Suite 2700
New York, NY 10004 USA
+1 212 991 4500

San Francisco

201 Mission Street, Suite #2150
San Francisco, CA 94105
+1 415 614 4170

Asia Pacific

Hong Kong

28/F LHT Tower
31 Queen's Road Central
Hong Kong
+852 8203 2790

Singapore

80 Robinson Road, #02-00
Singapore 068898, Singapore
+852 8203 2790

Sydney

9 Castlereagh Street, Level 17
Sydney, NSW 2000, Australia
+61 2 8074 3104

Tokyo

27F Marunouchi Kitaguchi Building,
1-6-5 Marunouchi Chiyoda-ku
Tokyo 100-0005, Japan
+81 3 4578 6688



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