

# Quantifying Exposure to Carbon-Intensive Industries in Private Equity Portfolios



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## KEY TAKEAWAYS

- To meet the goals of the Paris Agreement, countries need to move toward net-zero emissions by 2050 by decarbonizing their economies, which will create risks and opportunities for different sectors.
- By quantifying exposure to carbon-intensive industries, investors such as Adams Street can develop low-carbon strategies.

Climate change will be a defining global challenge of the 21st century, with associated impacts on ecological, economic, social, and political systems.

According to the latest reports from the United Nations' Intergovernmental Panel on Climate Change (IPCC), the foremost authority on climate science, every inhabited region of the globe is already experiencing the effects of climate change, contributing to currently observed and projected impacts and risks such as extreme temperatures, heavy precipitation, and agricultural and ecological drought.<sup>1</sup>

The best-case scenario, according to the IPCC, is that global emissions peak by 2030 and reduce to net-zero by around 2050, to limit global warming to 1.5 degree Celsius above pre-industrial levels.<sup>2</sup> Achieving this will require unprecedented investment in clean energy projects and other decarbonization measures.

The IPCC has indicated that average annual investment requirements for 2020-30 in scenarios that limit warming to 1.5-2 degrees Celsius are a factor of three to six greater than current levels, and that total investments in greenhouse gas (GHG) emissions reduction would need to increase across all sectors and regions.<sup>3</sup>

Many businesses, industries, and markets will likely gain from meeting the challenge, while others will probably suffer due to regulatory change and shifting market and societal preferences, all of which will directly impact the investment landscape.

The recognition that climate change presents both economic risks and opportunities is central to the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD).

Established by the G20 Financial Stability Board in May 2015 to improve disclosure on the potential impact of climate change on market participants, the TCFD encourages investors and their portfolio companies to analyze their exposure to climate-related risks and opportunities, and report accordingly.



**Average annual investment requirements for 2020-30 in scenarios that limit warming to 1.5-2 degrees Celsius are a factor of three to six greater than current levels**

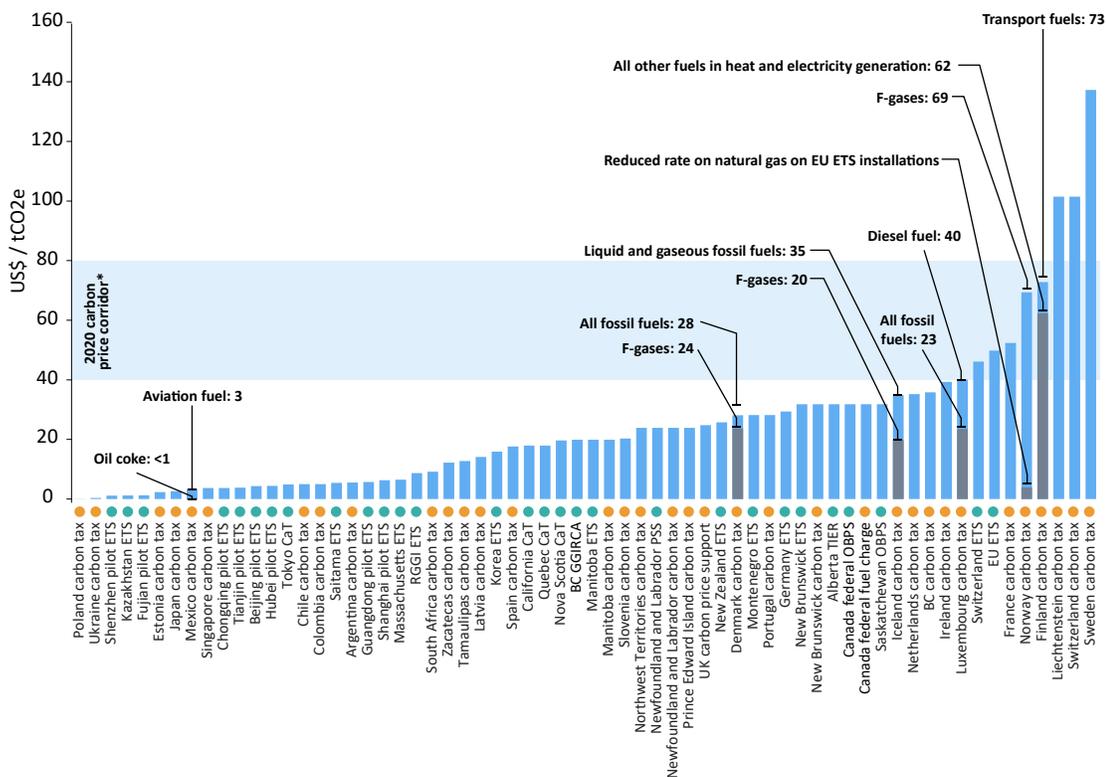
But beyond disclosure, a growing number of asset owners are making commitments to align their investments with “net-zero” goals<sup>4</sup> that mirror state-level commitments under the Paris Agreement. The intention is to add financial impetus to global policy efforts to avert the worst long-term consequences of climate change, while mitigating transition risk in investment portfolios from the anticipated ramp-up of regulatory measures to promote the low carbon economy, including the increasingly widespread use of carbon pricing mechanisms, as illustrated in Figure 1 below.<sup>5</sup>



**Figure 1: European Markets Lead the Way in Global Carbon Pricing**

Global Carbon Prices as of April 1, 2021<sup>6</sup>

● Carbon Tax ● Emissions Trading Scheme (ETS)



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According to the World Bank, 45 national jurisdictions and 34 subnational jurisdictions— including cities, states and provinces— implemented 65 carbon pricing initiatives as of April 1, 2021, representing 21.5% of global greenhouse gas emissions. Figure 1 illustrates the global disparities in costs to emit one tonne of CO2e, with Scandinavia, Switzerland, Liechtenstein, and France leading the way with the highest costs for producing greenhouse gases. (See Appendices for more detail on types of carbon pricing).

Note: Nominal prices on April 1, 2021

Prices are not necessarily comparable between carbon pricing initiatives because of differences in the number of sectors covered and allocation methods applied, specific exemptions, and different compensation methods. Due to the dynamic approach to continuously improve data quality and fluctuating exchange rates, data of different years may not always be comparable and could be amended following new information from official government sources. In addition, data for a limited number of initiatives may be incomplete as they are in the process of being validated and will be updated following confirmation from official government sources.

\*The 2020 carbon price corridor is the recommendation of the World Bank’s 2017 High-Level Commission on Carbon Prices Report.

## Adams Street’s Historical Exposure to Carbon-Intensive Industries

As a public supporter of the TCFD recommendations since March 2020, Adams Street is committed to greater transparency and reducing exposure to climate-related risks in our investments.

Adams Street is also a member of Initiative Climat International (iCI), a network of private equity investors committed to promoting climate action in private equity-backed companies, in line with the goals of the Paris Agreement.

To assess the relative exposure of Adams Street’s investments to carbon-intensive industries, we quantified the weighted average carbon intensity (WACI) of three broad-based portfolios (with vintage years of 2016, 2017 and 2018).<sup>7</sup> WACI is a commonly used measure of exposure to carbon-intensive industries within investment portfolios, recommended by the TCFD.

**Figure 2: Understanding Weighted Average Carbon Intensity (WACI)**

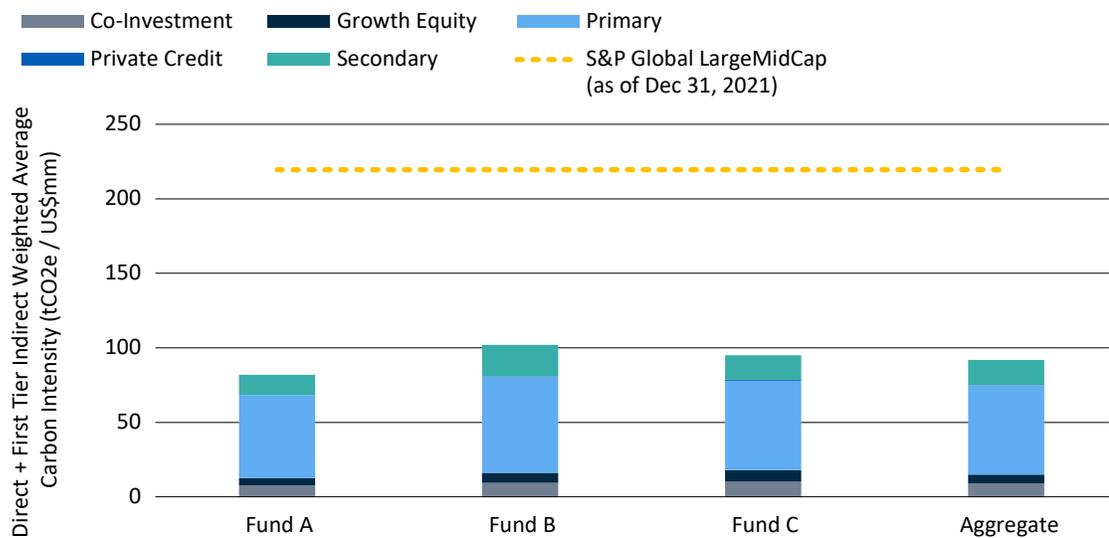
<b>Purpose of Metric</b>
To understand a portfolio’s exposure to carbon-intensive companies
<b>Description of Metric</b>
Portfolio’s exposure to carbon-intensive companies, expressed as tCO <sub>2</sub> e/US\$M company revenue
<b>Standard Formula</b>
$\sum_n^i \left( \frac{\text{current value of investment}_i}{\text{current portfolio value}} \times \frac{\text{company's in scope GHG emissions}_i}{\text{company's \$M revenue}_i} \right)$
Source: Global GHG Accounting and Reporting Standard for the Financial Industry (PCAF, 2020); Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD, 2021)

Our WACI analysis of the selected portfolios was based on estimates of the GHG emissions associated with each investment, using economic activity-based estimation factors rather than reported emissions data, due to the limited availability of such data for private equity portfolio companies. (See Appendix 2 for further information on Adams Street’s methodology for using economic activity-based estimation factors to calculate weighted average carbon intensity).

The analysis indicates that, for the three portfolios, the WACI, as measured in aggregate across each portfolio, was approximately 63%, 54%, and 57% lower respectively than the S&P Global Large MidCap Index,<sup>8</sup> as at December 31, 2021 (see Figure 3).<sup>9</sup>

**Figure 3: Illustrative Adams Street Exposure to Carbon-Intensive Industries for Recent Vintage Year Portfolios is Over 50% Lower than a Widely Used Public Market Index**

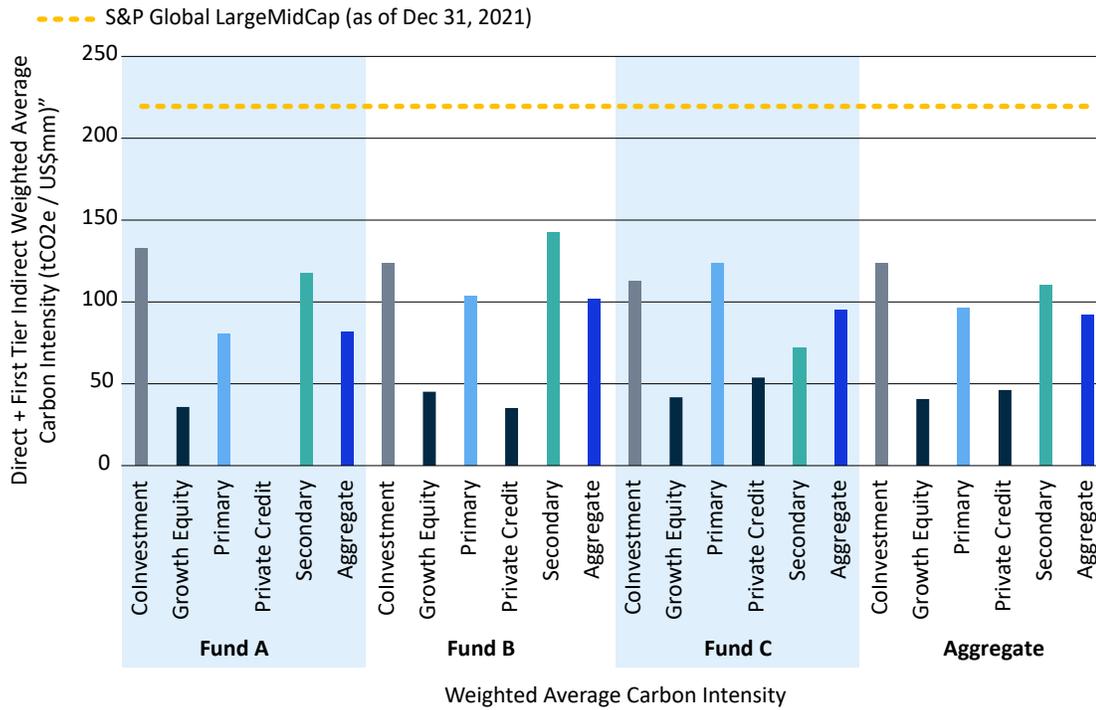
Weighted Average Carbon Intensity (WACI) of Recent Broad-Based Adams Street Portfolios Relative to Index



The low exposure to carbon-intensive industries was also consistent across the underlying investment strategies for each of the portfolio vintages analyzed (see Figure 4).

**Figure 4: The Portfolios' Low Carbon Exposure is Consistent Across Strategies**

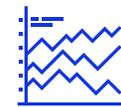
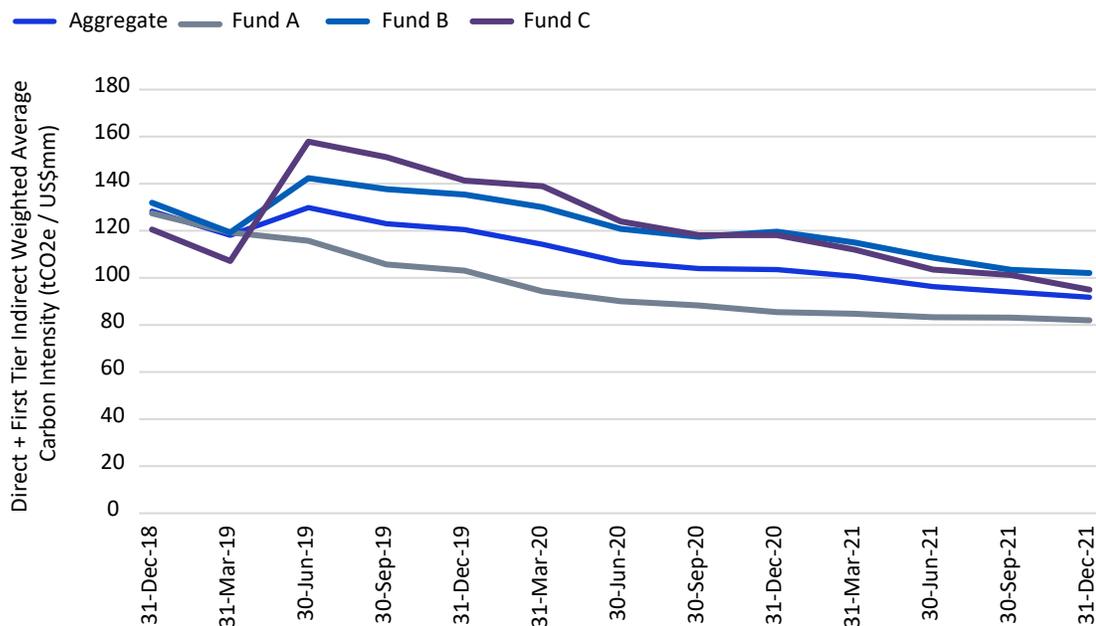
Weighted Average Carbon Intensity (WACI) of Underlying Strategies Relative to Benchmark



Additionally, the carbon exposure of the three selected portfolios has been consistently low over time (see Figure 5).

**Figure 5: Carbon Exposure is Consistently Low Over Time**

Evolution of Weighted Average Carbon Intensity over Time of Certain Recent Broad-Based Adams Street Portfolios



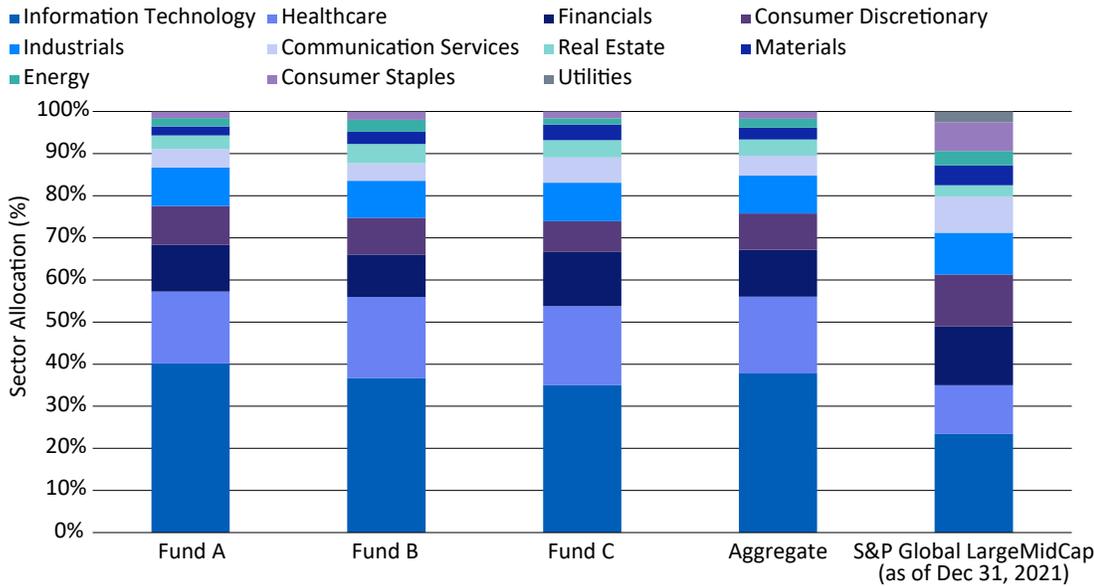
Low exposure to carbon-intensive industries was consistent across the underlying investment strategies for each of the portfolio vintages analyzed

The relatively low exposure to carbon-intensive industries of the selected portfolios is indicative of the sector allocations of each portfolio vis-à-vis the referenced index. Over 60% of the net asset value (NAV) of each portfolio is associated with the Information Technology, Healthcare and Financials sectors, with less than 20% linked to Industrials, Materials, Energy, Real Estate and Utilities holdings combined (see Figure 6).



### Figure 6: Information Technology, Healthcare, and Financials are Among the Portfolios' Highest Sector Allocations

Sector Allocation of Recent Global Private Equity Funds Relative to Benchmark

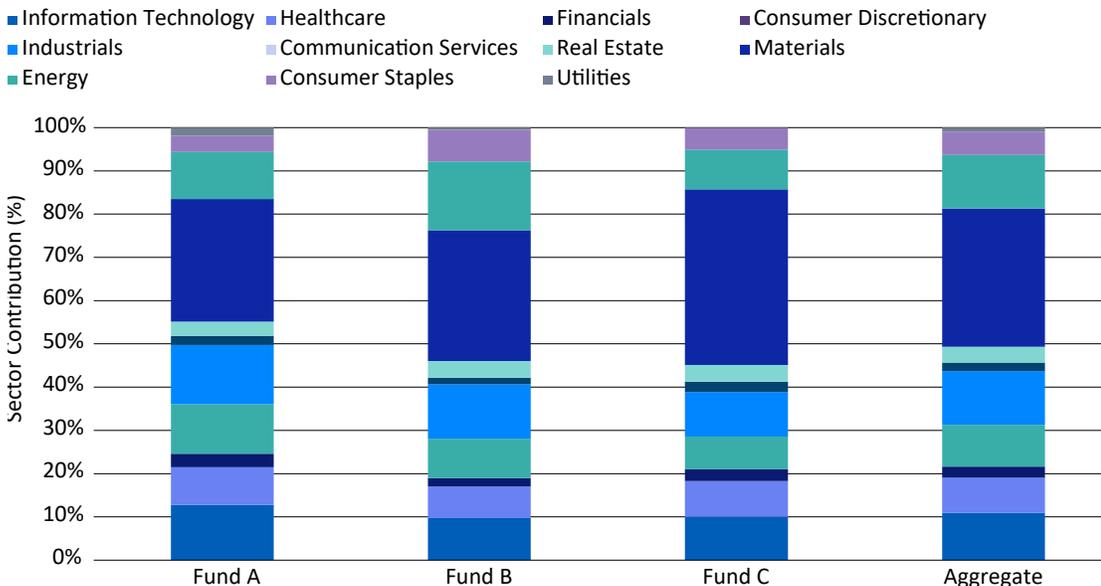


Over 60% of the net asset value of each portfolio is associated with the Information Technology, Healthcare and Financials sectors, which have relatively low carbon intensities. Industrials, Materials, Energy, and Real Estate holdings, though relatively small in net asset value terms, have a disproportionate impact on the overall carbon intensities of the three portfolios in our sample.

Industrials, Materials, Energy, and Real Estate holdings, though relatively small in terms of the overall value, have a disproportionate impact on the overall carbon intensities of the three Adams Street portfolios in our sample, contributing approximately 60% on aggregate to the WACI measurement of the portfolios (see Figure 7).

### Figure 7: The Portfolios' Most Carbon-Intensive Sectors Are Also the Lowest Sector Allocations But the Largest WACI Contributors

Breakdown of Weighted Average Carbon Intensity by Sector Contribution in Recent Global Private Equity Funds

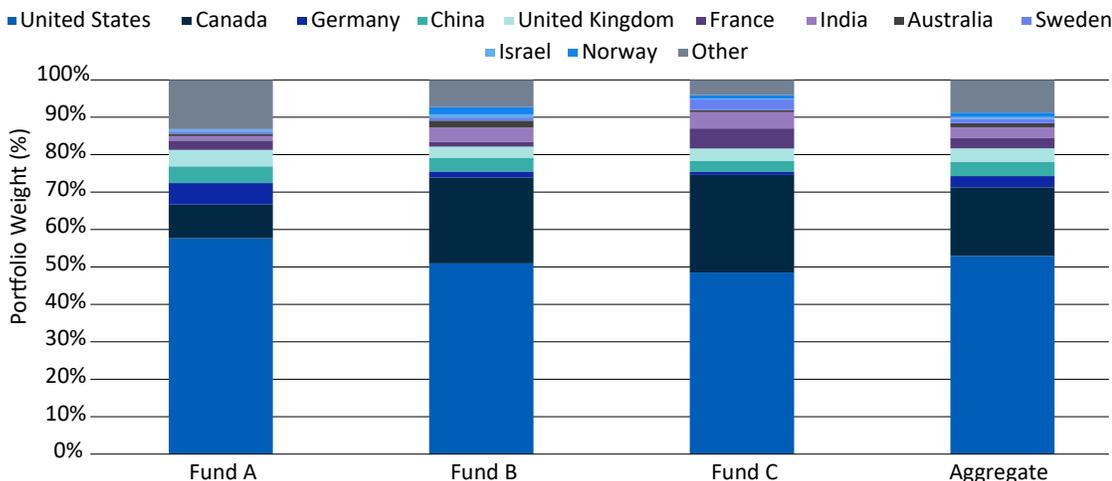


The analysis also highlighted that the majority of the three selected portfolios' holdings are headquartered in the US (see Figure 8), where carbon pricing is being introduced at the sub-national level (in states such as California, Hawaii, Massachusetts, Oregon, Pennsylvania, Virginia, and Washington) but still at a relatively low level, as indicated in Figure 1.<sup>10</sup>



**Figure 8: Most of the Portfolio's Carbon Exposure is Based in the United States and Canada**

Breakdown of Weighted Average Carbon Intensity by Country of Recent Global Private Equity Funds

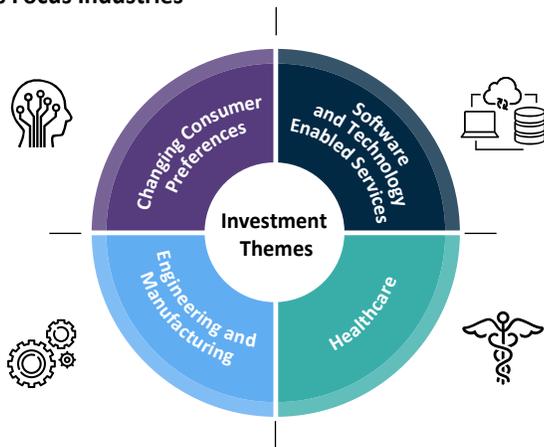


We remain committed to engaging with our general partners to gather more decision-useful insights on climate-related risks and opportunities for our investment teams, as well as providing greater transparency on these topics to our investors

**Adams Street's Forward-Looking Low-Carbon Strategy**

Adams Street believes that sectors going through fundamental structural change often benefit from tailwinds that help to spur growth, creating opportunities for companies to improve efficiency, grow into existing markets, and/or take share from less innovative competitors. The four major themes that Adams Street primarily invests in are software and technology enabled services, healthcare, engineering and manufacturing (including the re-industrialization occurring in the US), and changing consumer preferences.

**Figure 9: Adams Street's Focus Industries**



Our historical focus on these industries means that the exposure of our analyzed strategies to carbon-intensive industries has been relatively low.<sup>11</sup> However, we remain committed to engaging with our general partners on climate-related risks and opportunities to gather more decision-useful insights on climate-related risks and opportunities for our investment teams, as well as provide greater transparency on these topics to our investors, in line with TCFD recommendations.

Our track record on investing in low carbon-intensity industries supports the view that our capabilities are well-aligned to developing strategies that intentionally target low-carbon investment opportunities in markets that are at the start of their decarbonization journey. ■

## Appendix 1 – Types of Carbon Pricing

Carbon taxes (either on fossil fuel consumption or on GHG emissions) or a carbon emissions cap-and-trade system are the two most common approaches being used to achieve national or regional GHG reduction goals.

Under the polluter pays principle,<sup>12</sup> the most carbon-intensive industries are likely to face increased costs associated with climate-related regulatory action designed to decarbonize the global economy.

These internalized environmental costs will most likely drive early adoption of low-carbon solutions, where a technological solution exists, and the carbon price exceeds the abatement cost associated with that solution.

However, in difficult-to-mitigate industries, it is likely that the growing cost of carbon may lead to lower demand for those carbon-intensive goods and services, and/or the entrance of market disruptors with less carbon-intense alternatives.

### Cap and Trade Versus Carbon Tax

An ETS – sometimes referred to as a cap-and-trade system – caps the total level of greenhouse gas emissions and allows those industries with low emissions to sell their extra allowances to larger emitters. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions. The cap helps ensure that the required emission reductions will take place to keep the emitters (in aggregate) within their pre-allocated carbon budget.

A carbon tax directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined but the carbon price is.

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## Appendix 2 – Using Economic Activity-Based Estimation Factors to Calculate Weighted Average Carbon Intensity

Adams Street uses economic activity-based estimation factors, supplied by S&P Global Trucost, to calculate the weighted average carbon intensity (WACI) of our investment portfolios, as a measure of carbon exposure. These estimation factors are derived from Trucost’s environmental economic input output (EEL-O) model, which was developed to estimate the environmental impacts of over 464 different Trucost sectors, and subsequently adapted to the GICS Sub-industry level classification, which includes 158 global industries.

The GICS Sub-Industry level estimation factors for carbon intensity (in tCO<sub>2</sub>e/mUSD) were calculated using data from 15,000+ companies in the Trucost research universe,<sup>13</sup> in combination with the direct estimation factors for individual Trucost sectors from Trucost’s EEL-O Model. This was done by summing the share of emissions associated with each Trucost sector mapped to a given GICS Sub-Industry and normalizing by the share of revenues associated with each Trucost sector mapped to the same GICS Sub-Industry, to arrive at a weighted-average emissions intensity (tCO<sub>2</sub>e/mUSD) per GICS Sub-Industry.

The breakdown of revenue and emissions data was based on segmental revenue data collected for companies within the Trucost Universe (15,000+ companies). Emissions for each company were allocated to Trucost sectors based on sector revenue share (disclosed by the companies) and direct estimation factors derived from Trucost’s EEL-O Model. Trucost then used 2019 emissions and revenue data to align the modelled emissions with the company disclosed emissions data available at the time of the analysis.

Trucost split company disclosed emissions across the companies' different underlying sectors by way of using both sector revenue and direct estimation factors as follows:

1. Trucost calculated a company's modelled emissions per Trucost sector based on sector revenue breakdown and Trucost sector direct estimation factors from the EEI-O Model.
2. Trucost then determined the percentage split of the modelled emissions from each Trucost sector by dividing each sectors' modelled emissions by the total modelled emissions of that company.
3. Finally, Trucost applied the modelled emissions percentage split to total disclosed emissions of that company to allocate disclosed emissions back to each Trucost sector.

An illustrative example of Company A is given below, which can be applied to all scopes.

Trucost Sector	Direct Estimation Factor (tCO2e/mUSD revenue)	Revenue (mUSD)	Modelled Emissions (tCO2e)	Modelled Emissions Split	Disclosed Emissions (tCO2e)	Emissions Split Used in the Analysis (tCO2e)
Sector 1	1,000	100	100,000	64.52%		63,598.06
Sector 2	500	50	25,000	16.13%	98,577	15,899.52
Sector 3	200	150	30,000	19.35%		19,079.42

This emissions split then allowed for the summing of company emissions across all relevant Trucost sectors for a given GICS Sub-industry. The summed GICS Sub-Industry emissions were then divided by the sum of all company revenues across the same relevant Trucost sectors to derive the estimation factor for each GICS Sub-industry. This process was repeated across all relevant emissions scopes.

The emissions scopes of the WACI metrics referenced in this report relate to the direct (or operational) greenhouse gas (GHG) emissions and first-tier indirect (or first-tier supply chain) GHG emissions. They are calculated by applying the relevant Trucost estimation factors for each GICS Sub-industry (in tCO2e/mUSD revenue) to Adams Street's portfolio company investments (those held directly as well as those held indirectly through underlying private equity funds) based on their primary GICS Sub-industry classifications (across the 2016, 2017 and 2018 vintages of the selected portfolios, as at the end of Q4 2021).

The formula used for calculating WACI metrics in this way is represented as follows:

$$\sum_n^i \left( \frac{\text{current value of portfolio company}_i}{\text{current portfolio value}} \times \text{GICS Sub industry emissions intensity of portfolio company}_i \right)$$

No GHG data obtained directly from underlying general partners or portfolio companies was used in this analysis. GHG assessments involve an inherent element of estimation resulting in a level of uncertainty. Additionally, WACI estimates may vary for different vintage years and/or different measurement periods. The equivalent S&P Global LargeMidCap WACI and sector allocation data referenced above are as of December 31, 2021. For a more detailed explanation of how the S&P Global LargeMidCap WACI metric is calculated, please visit: [www.spglobal.com/spdji/en/esg-metrics](http://www.spglobal.com/spdji/en/esg-metrics).

1. IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Intergovernmental Panel on Climate Change. Retrieved from <https://www.ipcc.ch/report/ar6/wg2/>
2. IPCC. (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Retrieved from <https://www.ipcc.ch/sr15/>
3. IPCC. (2022). Climate Change 2022: Mitigation of Climate Change. Working Group III contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Intergovernmental Panel on Climate Change. Retrieved from <https://www.ipcc.ch/report/ar6/wg3/>
4. The Paris Aligned Investment Initiative, a collaborative group of investors representing \$34 trillion in assets, supported by four investor networks (AIGCC, Ceres, IGCC and IIGCC) developed the Net Zero Investment Framework to enable investors to align their portfolios and activities to the goals of the Paris Agreement. The framework puts forward metrics to assess investments and measure alignment, and requires investors to set clear, science-based targets at the portfolio and the asset class level. The Net-Zero Asset Owner Alliance, also convened in 2019 by the UN Environment Program (UNEP) Finance Initiative and the Principles for Responsible Investment (PRI), currently comprises institutional investors representing over \$7 trillion in assets under management and developed the 2025 Alliance Target Setting Protocol which sets out the Alliance’s approach to individual member and collective target setting and reporting for the period 2020–25.
5. The two main types of carbon pricing—emissions trading systems (ETS) and carbon taxes—have grown in popularity in recent decades. In 2021, 21.5% of global GHG emissions were covered by carbon pricing instruments in operation, representing a significant increase on 2020, when only 15.1% of global emissions were covered. This increase is largely due to the launch of China’s national ETS in March 2021, becoming the world’s largest carbon market (World Bank, 2021). Additional information on ETS and Carbon Tax Systems is available in Appendix 1.
6. World Bank. (2021). State and Trends of Carbon Pricing. Washington, DC: World Bank. Retrieved from <http://hdl.handle.net/10986/35620>
7. The selected portfolios are not part of an Impact/ESG mandate; rather, Adams Street’s consideration of ESG factors is part of its investment process, which also includes consideration of a range of other factors including those relevant to an investment’s risk/return profile. The portfolios selected for this analysis represent distinct investment vehicles of which Adams Street Partners is the general partner, manager, or investment adviser (as applicable). Such portfolios include investments across a variety of private market strategies, including investments in underlying Adams Street funds focused on primary, secondary, co-investment, growth equity and private credit strategies. There can be no guarantee that past, current, or future vehicles managed by Adams Street have or will display similar composition characteristics or similar ESG metrics, and the composition characteristics and ESG metrics for certain funds with a more directed focus, different vintage year or both may in fact be substantially different.
8. S&P Global LargeMidCap Index, as of December 31, 2021, ESG Carbon Characteristics. Retrieved from: <https://www.spglobal.com/spdji/en/indices/equity/sp-global-largemidcap/#overview>
9. Adams Street’s Weighted Average Carbon Intensity (WACI) for the three selected portfolios is estimated using operational and first tier supply chain GHG estimation factors at the GICS Sub-Industry Level. These estimation factors have been obtained from S&P Global Trucost, based on data from 15,000+ companies researched annually by Trucost, in combination with direct estimation factors from Trucost’s proprietary EEI-O Model. The effective date of assessment of the Adams Street portfolios is end of Q4, 2021. See Appendix 2 for further details.
10. World Bank. (2021). State and Trends of Carbon Pricing. Washington, DC: World Bank. Retrieved from <http://hdl.handle.net/10986/35620>
11. The selected portfolios are not part of an Impact/ESG mandate; rather, Adams Street’s consideration of ESG factors is part of its investment process, which also includes consideration of a range of other factors including those relevant to an investment’s risk/return profile.
12. The polluter pays principle was first mentioned in the recommendation of the OECD of May 26, 1972, laid down as Principle 16 of the 1992 UN Declaration on Environment and Development (known as the Rio Declaration). For a more detailed explainer, visit: <https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-polluter-pays-principle/>
13. Trucost analysts research on an annual basis the published environmental performance information of publicly traded companies based on their annual reports, sustainability reports, websites, and other public disclosures. Data on more than 450 environmental issues are collected each year, encompassing GHG and other environmental data. Trucost also incorporates environmental data provided to the CDP Disclosure Programs and engages annually with all companies in its research universe, either by email or letter, providing them with the opportunity to verify their environmental performance profiles and provide additional, as yet unreported, information.



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\*Firmwide AUM as of December 31, 2021 was \$49.3 billion.