

# Benchmarking the Energy Transition: Insights from S&P DJI

## Executive Summary

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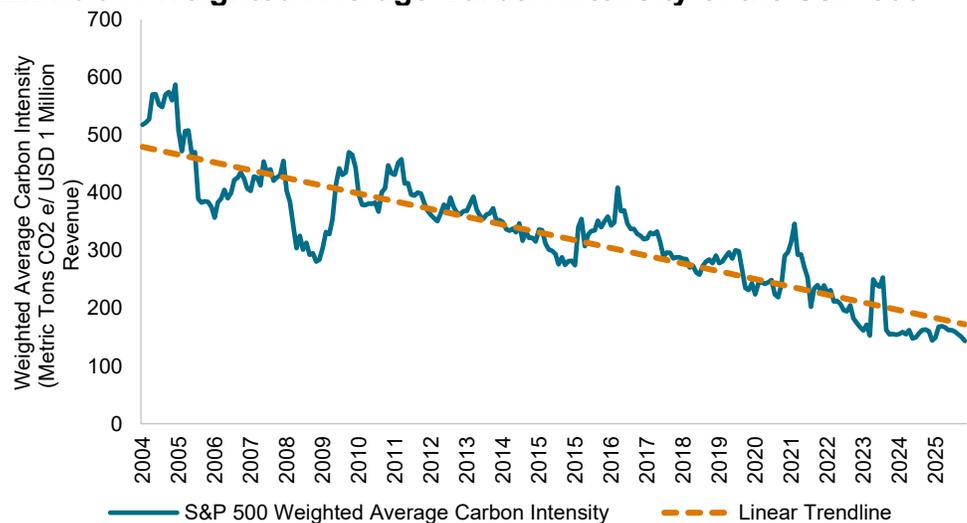
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The world is undergoing a shift, evidenced by the **S&P 500®'s 72.34% decarbonization** over nearly 21 years (see Exhibit 1). This shift is particularly pronounced in traditionally carbon-intensive sectors like Energy and Utilities, which experienced decarbonization rates of 76.97% and 67.52%, respectively (see Exhibit 2). As the energy transition unfolds, market participants face a landscape rich with both risks and opportunities. In this context, indices can serve as useful instruments, offering a wide array of tools across asset classes, including equities, fixed income and commodities. This research paper explores various indices, each highlighting unique aspects of the energy transition and offering insights for effectively navigating this transformative period in the indexing landscape.

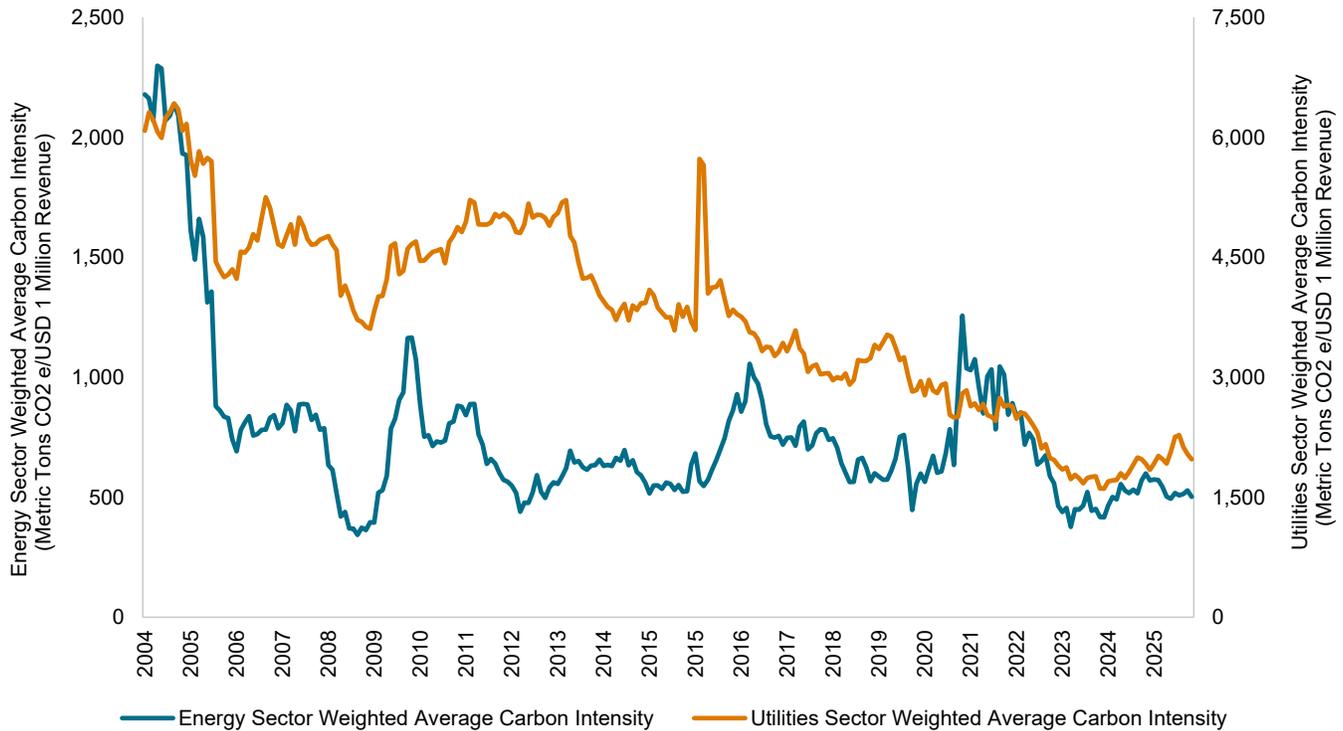
**Exhibit 1: Weighted Average Carbon Intensity of the S&P 500**



Source: S&P Dow Jones Indices LLC, S&P Global Energy Horizons. Analysis carried out using Portfolio Analytics on S&P Capital IQ Pro. Data from Dec. 31, 2004, to Oct. 31, 2025. Carbon emissions based on Scope 1 + Scope 2 + Scope 3 upstream emission. Chart is provided for illustrative purposes.

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### Exhibit 2: Weighted Average Carbon Intensity of the Energy and Utilities Sectors in the S&P 500



Source: S&P Dow Jones Indices LLC, S&P Global Energy Horizons. Analysis carried out using Portfolio Analytics on S&P Capital IQ Pro. Data from Dec. 31, 2004, to Oct. 31, 2025. Carbon emissions based on Scope 1 + Scope 2 + Scope 3 upstream emission. Chart is provided for illustrative purposes.

## The Technological Revolution and Market Forces Driving Energy Transition

The energy transition is enabled by a technological revolution that has brought remarkable efficiencies in the production and consumption of energy. Breakthroughs in renewable energy generation have dramatically decreased the cost of these energy sources, allowing them to compete more effectively with traditional fossil fuels. In particular, solar photovoltaics (PVs), which are the technology that directly converts sunlight into electricity using solar cells, experienced an 86% drop in costs between 2010 and 2023.<sup>1</sup> This decline was accompanied by significant reductions in the costs of both onshore and offshore wind energy.<sup>2</sup> Alongside cost reductions, innovations in energy storage technologies and smart grid advancements have fostered a more decentralized and resilient energy system.

<sup>1</sup> International Renewable Energy Agency (IRENA), [“Renewable Power Generation Costs in 2023,”](#) Sept. 24, 2024.

<sup>2</sup> IRENA, [“Key findings: Renewable Power Generation Costs in 2019,”](#) International Renewable Energy Agency, 2020.

This technological revolution is reinforced by fundamental market forces that continue to accelerate the low-carbon transition. The growing interest of market participants in opportunities related to sustainability—coupled with increasing consumer preference for clean energy—has resulted in a surging demand for renewable energy solutions.<sup>3</sup> Some market participants increasingly recognize the economic benefits tied to investing in renewable technologies, positioning these solutions not solely as ethical initiatives but as viable financial opportunities. Consequently, the renewable revolution appears to be more than just a passing trend; it seems to be evolving into a transformative force that could potentially reshape business models across various sectors.

## Indices as Strategic Tools for Market Participants

Indices can play a supportive role in facilitating the energy transition by providing market participants with diverse offerings across various asset classes. They serve as benchmarks to assess performance and mitigate risk, and they enable market participants to identify trends and navigate the complex energy transition landscape. By offering alignment with the associated risks and opportunities of the energy transition, indices can help market participants to assess the potential of this evolving ecosystem.

Several indices are available for market participants to consider, each highlighting different facets of the energy transition. Among these, the [S&P Global Clean Energy Transition Index](#), [S&P Global Essential Metals Producers Index](#), [S&P Global Carbon Credit Index](#), [Dow Jones Global Select ESG Tilted RESI](#), and [iBoxx® EUR Corporates Paris-Aligned Index](#) illustrate various index-based investment strategies that cater to diverse investment objectives and sustainability-related goals. In the following sections, we will take a deeper dive into some of these benchmarks.

## The S&P Global Clean Energy Transition Index

The S&P Global Clean Energy Transition Index measures the performance of companies in global clean energy-related businesses from both developed and emerging markets, with a target constituent count of 100. The index is composed of the most relevant publicly listed companies based on **revenue and power generation data**, while excluding high carbon emitters.<sup>4, 5</sup>

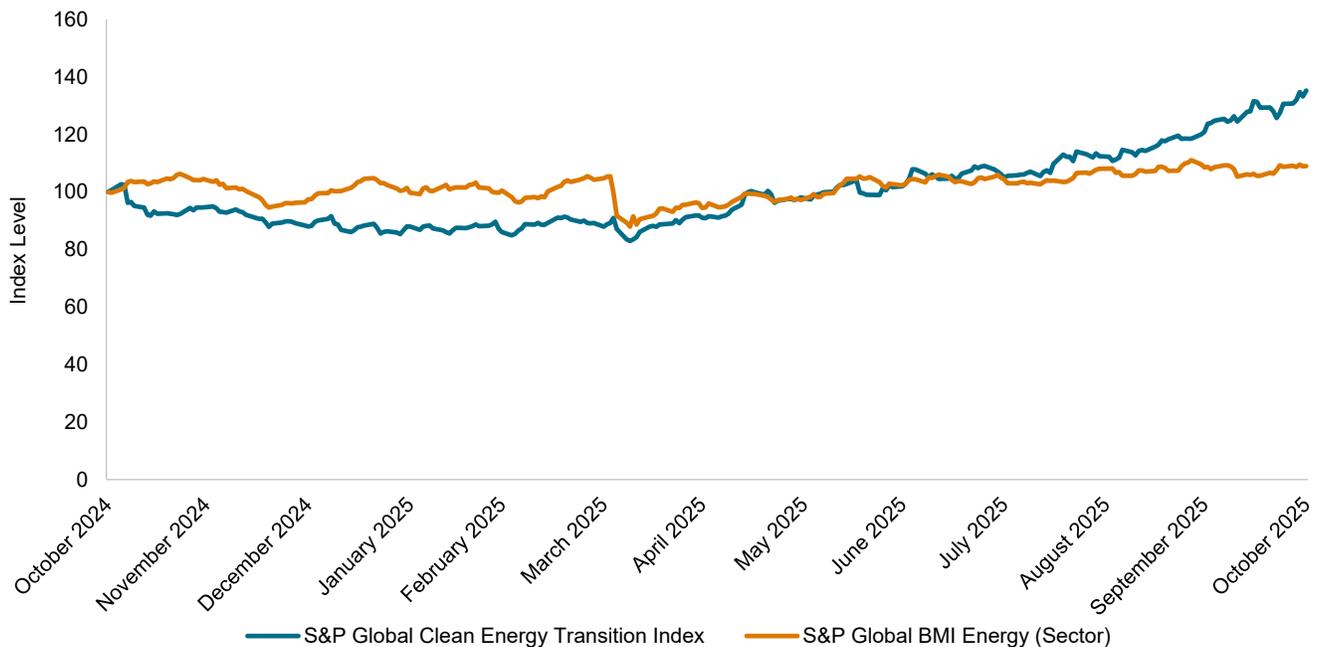
<sup>3</sup> For further insights, see S&P Global Energy' [Top Cleantech Trends for 2025](#).

<sup>4</sup> For more information, please see the [S&P Thematic Indices Methodology](#).

<sup>5</sup> Thematic purity for the index—measured by the index-weighted exposure score—has remained above 0.90 since 2022, above the 0.85 threshold at which stocks are removed until purity is restored as per the index rules. For more information on Exposure Score classification, please see the S&P Thematic Indices Methodology.

As illustrated in Exhibit 3, during the one-year period from Oct. 31, 2024, to Oct. 31, 2025, the index **outperformed** the S&P Global BMI Energy (Sector) by **26.13%**. This follows a difficult period for the clean energy index (and industry) after reaching an all-time high in 2021.

**Exhibit 3: Performance of the S&P Global Clean Energy Transition Index and the S&P Global BMI Energy (Sector)**



Source: S&P Dow Jones Indices LLC. Data from Oct. 31, 2024, to Oct. 31, 2025. Index performance based on total return in USD. Indices were rebased to 100 on Oct. 31, 2024. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

However, the clean energy sector continues to be buoyed by **record-breaking global investment** and accelerating adoption of low-carbon technologies.<sup>6</sup> Clean energy and low-emissions investment, including renewables, nuclear, grid, storage, efficiency and electrification, is projected to reach USD 2.2 trillion for 2025—double the level of fossil fuel spending—with solar PV attracting the lion’s share of both capital and capacity growth.<sup>7</sup>

Solar-related business activities—including wholesale solar power generation and PV manufacturing—accounted for 26.83% of the S&P Global Clean Energy Transition Index’s revenue mix by index weight as of Oct. 31, 2025 (see Exhibit 4).

Wind-energy companies have also benefited from this year’s turnaround in performance. This has been underpinned by record global wind-power growth—with installed global capacity surpassing 1.25 terawatts—alongside industry support, such as Ørsted’s confirmed sale of a

<sup>6</sup> For further insights on clean energy transition through an indexing lens, see Ye, Jason, and Zhang, Abbie, “[Navigating the Clean Energy Transition: Market Dynamics and Performance Insights](#),” S&P Dow Jones Indices LLC, Dec. 4, 2024.

<sup>7</sup> International Energy Agency (June 2025), World Energy Investment 2025. Available at: <https://www.iea.org/reports/world-energy-investment-2025>

50% stake in the Hornsea 3 offshore wind farm to Apollo.<sup>8, 9</sup> At the end of October 2025, 29 of the 100 constituents of the index reported revenues from wind power-related business activities.

Elsewhere, Google signed a landmark deal with Brookfield Renewable to secure up to 3,000 megawatts (MW) of long-term hydroelectric power, ensuring reliable, carbon-free energy for its expanding U.S. data centers.<sup>10</sup> Sixteen constituents of the index, including Brookfield Renewable Corporation, reported revenue from hydroelectric power-related activity as of Oct. 31, 2025.

Beyond power generation, the S&P Global Clean Energy Transition Index encompasses elements of the broader clean-energy ecosystem, from power utilities and infrastructure to energy equipment, components and materials.

In 2025, grid resilience and reliability have also emerged as critical priorities, as extreme weather events, surging electricity demand from AI data centers and aging infrastructure expose potential weaknesses across both developed and emerging markets. In the U.S., several states faced renewed grid stress during spring heatwaves, prompting regulators to accelerate support for distributed energy resources and battery storage.<sup>11</sup> In May, a major blackout affecting parts of Spain and Portugal underscored the fragility of interconnected power systems, reigniting debate around cross-border coordination and the need for real-time grid flexibility.

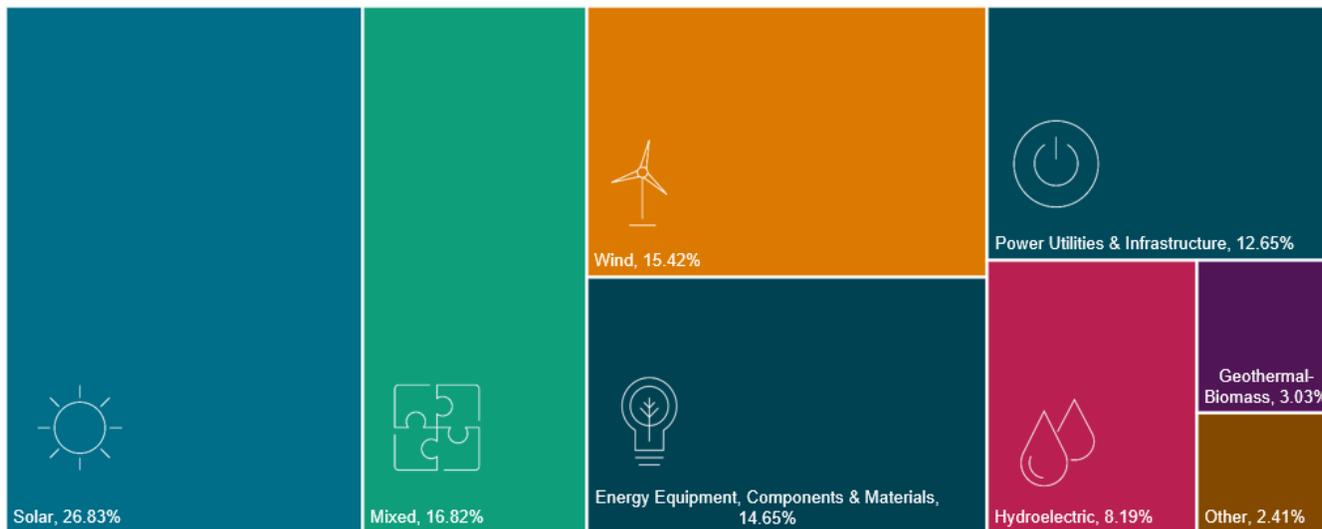
<sup>8</sup> World Wind Energy Association (2025), Half-Year Report 2025. Available at: <https://www.wwindea.org/HYR2025>

<sup>9</sup> Financial Times (2025), "Ørsted to sell half of world's largest offshore wind farm to Apollo in \$6.5bn deal." Available [here](#).

<sup>10</sup> Google LLC & Brookfield Asset Management (July 2025), Hydro Framework Agreement – Up to 3 GW Hydroelectric Power in the United States. Available [here](#).

<sup>11</sup> For indices related to the U.S. power and data infrastructure narrative, please see the [S&P U.S. Power Infrastructure Select Index](#) and the [S&P Data Center, Tower REIT and Communications Equipment Index](#).

### Exhibit 4: S&P Global Clean Energy Transition Index Business Activity-Level Revenue Breakdown



Source: S&P Dow Jones Indices LLC, FactSet. Data as of Oct. 31, 2025. “Mixed” category represents a combination of renewable and fossil fuel-based power sources. Business activity-level revenue figures reflect index-weighted averages. Chart is provided for illustrative purposes.

Policy tailwinds and shifting geopolitical dynamics have also played a role. In the U.S., Trump’s budget bill, signed into law on July 4, 2025, provided renewed support for areas such as storage and hydrogen, while tightening rules for solar, batteries and other supply-chain-sensitive technologies.<sup>12</sup>

The EU launched its Clean Industrial Deal in 2025 to support renewable deployment and improve the competitiveness of its clean tech sector. Mid-year projections from SolarPower Europe indicates a projected 1.4% year-over-year decline in new solar installations, marking the first annual drop since 2015 and reflecting headwinds in rooftop solar and delayed investment.<sup>13</sup> The U.K. government established Great British Energy (GBE), a publicly owned energy company, through legislation passed in May 2025, allocating GBP 8.3 billion for domestic clean energy investment, including funding for small modular nuclear reactors.<sup>14</sup>

Emerging markets also continue to make headlines. India remained true to its clean energy agenda with the country’s latest 2025 Union Budget prioritizing long-term energy security, including solar, wind, battery and green hydrogen manufacturing—and accelerated grid upgrading and energy storage deployment.<sup>15</sup> As of the end of October 2025, companies domiciled in India represented 6.30% of the S&P Global Clean Energy Transition Index weight.

<sup>12</sup> Thomson Reuters (August 2025), “The One Big Beautiful Bill Act: Changing the landscape for clean energy.” Available [here](#).

<sup>13</sup> SolarPower Europe (2025), “SolarPower Europe predicts negative annual growth of EU’s solar market.” Available [here](#).

<sup>14</sup> U.K. Government (2025), Great British Energy Act 2025: Factsheet. Available [here](#).

<sup>15</sup> Ember Energy (2025), “Union Budget 2025: Focusing on long-term energy security and domestic manufacturing.” Available [here](#).

Companies domiciled in China and Brazil represented an additional 13.10% and 8.61%, respectively.

Looking ahead, S&P Global Energy expects global investment in clean energy to accelerate through the 2030s despite ongoing geopolitical and policy challenges. This is set to be driven by China's manufacturing dominance, falling technology costs and advances in storage and grid management. Solar PV, batteries and electrification are expected to lead growth, with renewables supplying over 85% of new capacity in 2025 and about half of global power by 2040.<sup>16</sup>

For the first time, spending on clean technologies matches or surpasses upstream oil & gas, marking a critical inflection point in the energy transition.<sup>17</sup> The composition of the S&P Global Clean Energy Transition Index will continue to evolve in line with emerging industry developments as part of the global energy transformation story.

## The S&P Global Essential Metals Producers Index

The S&P Global Essential Metals Producers Index measures the performance of companies engaged in the mining or manufacturing of metals deemed essential to energy transition technologies. The index leverages **revenue and specialist mining production value data** to reflect the most relevant owners and operators.<sup>4</sup>

The index has rallied this year, increasing 62.53% on a total return USD basis through Oct. 31, 2025, reversing three straight years of decline. The turnaround reflects the increasing investor interest in metals essential to the energy transition—such as copper, lithium, nickel and rare earths—as well as their broader strategic importance in sectors such as technology, defense and advanced manufacturing.

The index **outperformed** the [S&P Global BMI Metals & Mining \(Industry\)](#) by **3.03%** during the one-year period ending Oct. 31, 2025.<sup>18</sup> In the underlying commodities market, cobalt was a standout performer, with the [S&P GSCI Cobalt Index](#) gaining **113.44%** during the same timeframe (see Exhibit 5). Prices climbed on tighter supply from the Democratic Republic of the Congo (DRC), a country that dominates global production, and steady demand from

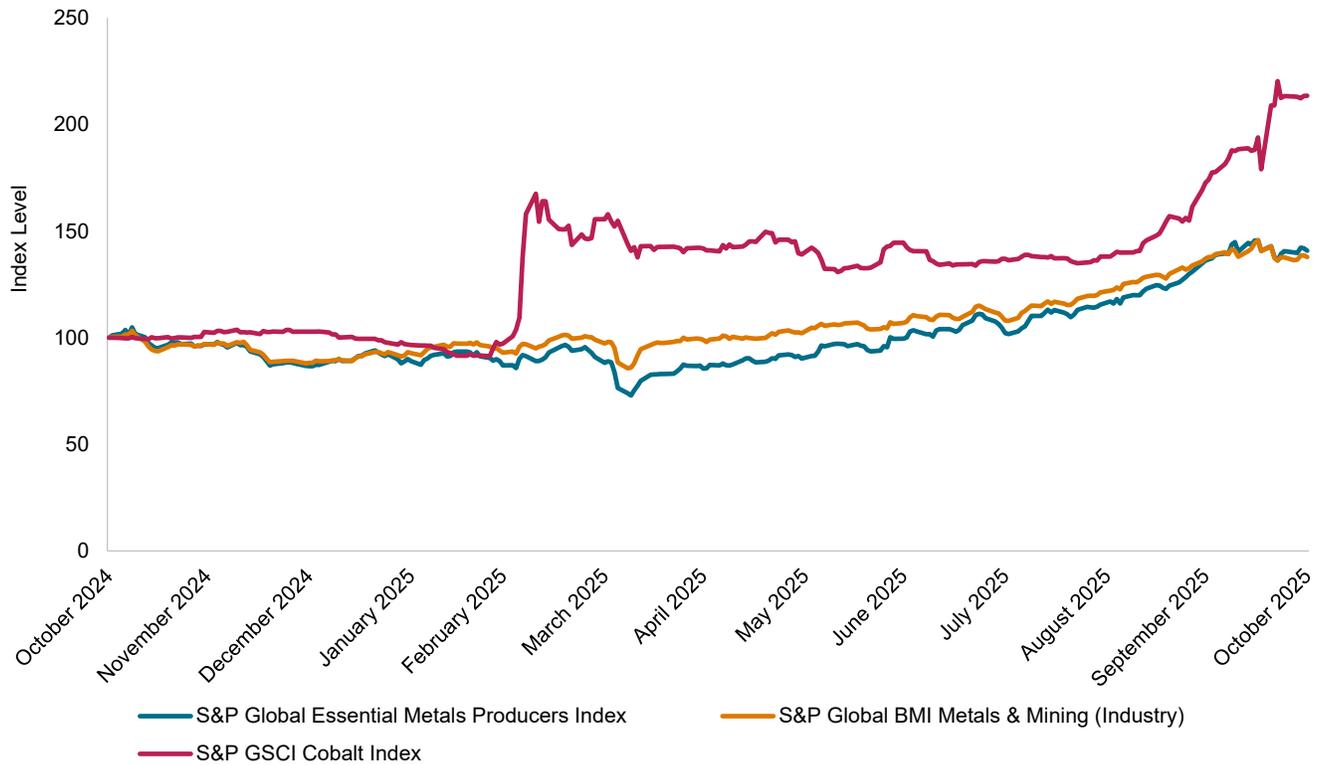
<sup>16</sup> S&P Global Energy (September 2025), "Beyond the Energy Transition: Re-imagined Scenarios for an Evolving World." Available at: <https://www.spglobal.com/commodity-insights/en/news-research/special-reports/energy-transition/scenarios-report-2025>

<sup>17</sup> S&P Global Energy (2025), "Top Cleantech Trends for 2025." Available at: <https://www.spglobal.com/commodity-insights/en/news-research/special-reports/energy-transition/top-cleantech-trends-for-2025>

<sup>18</sup> For additional insights on the S&P Global Essential Metals Producers Index, see Beyhan, Maya, "[Essential Metal Awakening](#)," S&P Dow Jones Indices LLC, Feb. 28, 2025.

battery manufacturers.<sup>19</sup> Cobalt is typically produced as a byproduct of copper and nickel mining.

**Exhibit 5: Performance of the S&P Global Essential Metals Producers Index, S&P GSCI Cobalt Index and S&P Global BMI Metals & Mining (Industry)**



Source: S&P Dow Jones Indices LLC. Data from Oct. 31, 2024, to Oct. 31, 2025. Index performance based on total return in USD. Indices were rebased to 100 on Oct. 31, 2024. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

U.S. copper prices briefly rallied early in the year on speculation of new tariffs on certain semi-finished products. The price surge was ultimately short-lived after the U.S. policies scaled back scope, but the episode underscored copper’s strategic importance amid tightening supply worries. According to S&P Global Energy, U.S. demand for refined copper is projected to rise by more than 30% by 2035, even as import dependence remains high at around 44% of consumption.<sup>20</sup> Copper-related mining represented a majority 31.38% of S&P Global Essential Metals Producers Index weighted revenue at the end of October 2025 (see Exhibit 6).

<sup>19</sup> Reuters (May 14, 2025), “Global cobalt market seen swinging to deficit from surplus in early 2030s.” Available [here](#).

<sup>20</sup> S&P Global Energy (July 31, 2025), Factbox: “US copper prices tumble in response to scaled-back tariffs.” Available [here](#).

### Exhibit 6: The Role of Essential Metals in the Energy Transition

Metal	Role in the Energy Transition	Weight
<b>Co</b> Cobalt 	Key component in lithium-ion battery cathodes, enabling energy storage for electric vehicles (EVs), portable devices, and grid-scale backup systems.	0.08%
<b>Cu</b> Copper 	Essential for electricity transmission and distribution; used extensively in wind turbines, solar panels, EV wiring, and charging infrastructure.	31.38%
<b>Li</b> Lithium 	Critical for rechargeable batteries in EVs, stationary energy storage systems, and portable electronics.	7.06%
<b>Ni</b> Nickel 	Enhances energy density in lithium-ion batteries, particularly for high-performance EVs and large-scale grid storage.	2.05%
<b>Pt-Pd</b> Platinum-Palladium 	Vital for hydrogen fuel cells, electrolysers, and catalytic converters supporting low-emission and hydrogen mobility.	6.88%
<b>RE</b> Rare Earth Elements 	Crucial for permanent magnets in wind turbines, EV traction motors, and other high-efficiency electric motors in clean technologies.	5.35%
<b>Other</b> 	Aluminum enables lightweight EV design and transmission; molybdenum strengthens solar and wind infrastructure; silver improves solar cell efficiency; zinc provides corrosion resistance and supports long-duration batteries.	20.08%

Source: S&P Dow Jones Indices LLC, FactSet. Data as of Oct. 31, 2025. Business activity-level revenue figures reflect index-weighted averages based on the S&P Global Essential Metals Producers Index. “Other” figure reflects combined revenue from aluminum, molybdenum, silver and zinc-related business activities. Table is provided for illustrative purposes.

Lithium grabbed headlines following Rio Tinto’s USD 6.7 billion acquisition of Arcadium Lithium in March 2025, marking a significant bet on expanding output across key markets.<sup>21</sup> S&P Global Energy projects lithium demand to grow 80% over the next five years, underpinned by robust EV adoption in China and Europe, government incentives and falling production costs.<sup>22</sup> As of Oct. 31, 2025, 16 of the S&P Global Essential Metals Producers Index’s 82 constituents derived **at least 50%** of their annual revenue from lithium ore mining or lithium compounds manufacturing.

Rare earth elements (REEs), long a focus of geopolitical debate, are dominated by China, which accounts for over 60% of global production and nearly 90% of processing.<sup>23</sup> MP Materials and Lynas—two of the largest rare earth miners outside China—sit alongside emerging projects in Australia, Canada, Europe, South Korea and Vietnam that are gradually

<sup>21</sup> Rio Tinto (March 6, 2025), “Rio Tinto completes acquisition of Arcadium Lithium.” Available at: <https://www.riotinto.com/en/news/releases/2025/rio-tinto-completes-acquisition-of-arcadium-lithium>

<sup>22</sup> S&P Global Energy (July 31, 2025), “Lithium price rebound could be short-lived: analysts.” Available [here](#).

<sup>23</sup> Center for Strategic and International Studies (Jan. 8, 2024), “What China’s Ban on Rare Earths Processing Technology Means.” Available [here](#).

expanding non-Chinese supply.<sup>24</sup> As of Oct. 31, 2025, REEs accounted for 5.16% of the index's revenue-weighted exposure, similar to lithium (6.59%) and the platinum-palladium duo (6.28%).

In a standout move, the spot price of gold rose 51.33% in the first 10 months of 2025, following a 27.47% gain in 2024, according to the [S&P GSCI Gold](#), driven by macroeconomic uncertainty and demand for safe-haven assets. Although gold is not explicitly featured in the index selection criteria, it plays a de facto role via multi-metal miners, representing 6.91% of the index weight on a reported revenue basis. Gold—including mining, streaming and royalties—is not typically included in energy transition-related metals indices, as it has no direct role in decarbonization technologies, instead serving traditionally as a portfolio ballast in volatile markets.

More broadly, responsible mining also continues to gain traction, with investors pressing companies on clean refining, upstream emissions transparency and circular economy practices. Battery recycling initiatives in the U.S. and Europe have accelerated as a strategic priority to secure future lithium, cobalt and nickel supply chains.<sup>25</sup>

Overall, the S&P Global Essential Metals Producers Index is notably more **geographically diverse** than typical broad market-cap benchmarks, with meaningful weight across Australia (16.09%), Canada (15.18%), the U.S. (13.85%), the U.K. (12.38%) and China (12.19%), reinforcing its global footprint and the strategic importance of essential metals worldwide.

As these dynamics evolve, the S&P Global Essential Metals Producers Index will continue to draw on S&P Global Energy's industry expertise to remain aligned with the evolving definition and supply and demand realities of critical metals.

## The S&P Global Carbon Credit Index

At the 29<sup>th</sup> UN Climate Change Conference, world leaders adopted crucial rules for carbon trading under Article 6 of the Paris Agreement, establishing mechanisms for decentralized and centralized carbon markets.<sup>26</sup> A recent analysis by the Organization for Economic Cooperation and Development (OECD) suggested that, on the supply side, carbon credit markets can create revenue for projects like clean energy technology deployment.<sup>5</sup> On the demand side, buyers can leverage the greenhouse gas mitigation impact of these credits for various purposes, such as meeting tax obligations or making voluntary claims regarding their climate

<sup>24</sup> Rare Earth Exchanges (May 26, 2025), "Rare Earth Magnet Production Outside China Recently – Investor Briefing." Available [here](#).

<sup>25</sup> "Overcoming Battery Supply Chain Challenges with Circularity." World Economic Forum (2025). Available at: [https://reports.weforum.org/docs/WEF\\_Powering\\_the\\_Future\\_2025.pdf](https://reports.weforum.org/docs/WEF_Powering_the_Future_2025.pdf)

<sup>26</sup> For a thorough overview of take aways from COP29 regarding global carbon markets, see Yin, Ivy, "[COP29 sets clear pathway for global carbon markets but challenges remain](#)," S&P Global Energy, Nov. 26, 2024.

performance.<sup>27</sup> This approach can support net-zero targets and offer cost-effective options for buyers, while financially incentivizing sellers.

The S&P Global Carbon Credit Index<sup>28</sup> reflects the most active segment of the tradable carbon credit futures markets. This includes futures contracts linked to EU Allowances, U.K. Allowances, California Carbon Allowances and the Regional Greenhouse Gas Initiative. The index utilizes pricing data sourced from ICE Futures Pricing, offering a comprehensive overview of carbon credit trading trends.

Illustrated in Exhibit 7 is a correlation matrix that analyzes the relationship between the S&P Global Carbon Credit Index and various other indices, including the [S&P Emerging BMI](#), [iBoxx \\$ Liquid High Yield Index](#), [iBoxx \\$ Liquid Investment Grade Index](#), [S&P Listed Private Equity Index](#), S&P 500 and [S&P United States REIT](#). The analysis utilizes five-day rolling returns from July 25, 2019, through Oct. 31, 2025. Findings from this analysis suggest a low correlation between the S&P Global Carbon Credit Index and these broad indices, with the **iBoxx \$ Liquid Investment Grade Index** and **iBoxx \$ Liquid High Yield Index** showing notably low correlation values of **0.11** and **0.27**, respectively.<sup>29</sup>

**Exhibit 7: Correlation Matrix – S&P Global Carbon Credit Index versus Broad Equities and Fixed Income Indices**

Index	#1	#2	#3	#4	#5	#6
#1: S&P Global Carbon Credit Index	1.00					
#2: S&P Emerging BMI	0.26	1.00				
#3: iBoxx \$ Liquid High Yield Index	0.27	0.54	1.00			
#4: iBoxx \$ Liquid Investment Grade Index	0.11	0.20	0.57	1.00		
#5: S&P Listed Private Equity Index	0.33	0.56	0.73	0.33	1.00	
#6: S&P 500	0.26	0.43	0.64	0.23	0.80	1.00
#7: S&P United States REIT	0.24	0.37	0.64	0.33	0.74	0.76

Source: S&P Dow Jones Indices LLC. Data from July 25, 2019, to Oct. 31, 2025. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Another possible advantage of carbon credit futures lies in the significant exposure equity investors have to carbon prices, driven by various climate-related options and risks. These encompass the potential impacts of different climate policy scenarios, such as 1.5°C, 2°C and 3°C of warming, with the financial sensitivity assessed by [S&P Global Trucost](#). Consequently,

<sup>27</sup> OECD, [“The Interplay Between Voluntary and Compliance Carbon Markets: Implications for Environmental Integrity,”](#) July 12, 2024.

<sup>28</sup> See the [S&P Global Carbon Credit Indices Methodology](#).

<sup>29</sup> For additional insights on the S&P Global Carbon Credit Index, see Kennedy, William, [“Carbon Credits: Playing the Diversification Game,”](#) S&P Dow Jones Indices LLC, Sept. 15, 2025.

market participants may consider leveraging carbon futures to shield themselves from adverse shifts in carbon prices,<sup>30</sup> particularly within high carbon-emitting sectors like Energy, Utilities and Materials.

## The Dow Jones Global Select ESG Tilted RESI

The buildings sector contributes approximately 37% of global energy-related CO<sub>2</sub> emissions and over 34% of energy demand.<sup>31</sup> Efficiency policies could potentially cut greenhouse gas emissions by up to 90% in developed countries and 80% in developing ones, alleviating energy poverty for 2.8 billion people.<sup>15</sup> However, with significant construction needed by 2050, the sector risks not meeting its mitigation goals. Today's building designs will influence energy use for decades; thus, future structures might be decarbonized and resilient to climate impacts. Investing in building efficiency could spur substantial economic gains, creating 9 to 30 jobs<sup>32</sup> for every USD1 million spent, and potentially reaching a value of USD 24.7 trillion in emerging markets by 2030.

The Dow Jones Global Select ESG Tilted RESI measures the performance of publicly traded Real Estate securities in its benchmark, the [Dow Jones Global Select RESI](#) that meet sustainability criteria.<sup>33</sup> The index attempts to improve the GRESB Total ESG Score weight with respect to the benchmark index by overweighting those companies with relatively high GRESB scores and underweighting those with lower scores or scores of zero. GRESB<sup>34</sup> is a global ESG benchmark for real assets, used by market participants to understand and measure the performance of funds and assets against the most important ESG metrics. The GRESB Score is an overall measure of ESG performance—represented as a percentage (100% maximum). An index constituent's GRESB Score gives quantitative insight into its ESG performance in absolute terms, over time and against its peers.

Exhibit 8 details the long-term performance and tracking error of the Dow Jones Global Select ESG Tilted RESI relative to the Dow Jones Global Select RESI.

<sup>30</sup> For further insights on carbon prices and markets, see S&P Global Energy's [Atlas of Energy Transition](#).

<sup>31</sup> United Nations Environment Programme, Sustainable Buildings: <https://www.unep.org/topics/cities/buildings-and-construction/sustainable-buildings>.

<sup>32</sup> United Nations Environment Programme, [Global Status Report for Buildings and Construction](#).

<sup>33</sup> See [Dow Jones ESG Real Estate Indices Methodology](#).

<sup>34</sup> For further insights, see: <https://www.gresb.com/nl-en/>

**Exhibit 8: Annualized Performance and Tracking Error of the Dow Jones Global Select ESG Tilted RESI versus Dow Jones Global Select RESI**

Dow Jones Global Select ESG Tilted RESI	YTD	1-Year	3-Year
Total Performance (Annualized, %)	8.25	4.04	8.77
Excess Performance versus Dow Jones Global Select RESI (Annualized, %)	0.76	0.77	0.46

Source: S&P Dow Jones Indices LLC. Data from Oct. 31, 2022, to Oct. 31, 2025. Index performance based on total return in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

The annualized excess performance achieved by the index was **0.77%** and **0.46%** for the one- and three-year periods, respectively (see Exhibit 8), with a cumulative outperformance of **1.65%** compared to the Dow Jones Global Select RESI over the three-year period.

A closer examination of the GICS® Real Estate sub-industries within this index provides interesting insights regarding their contributions to the relative performance of the Dow Jones Global Select ESG Tilted RESI for the three-year period ending on Oct. 31, 2025, along with their respective carbon intensity, as shown in Exhibit 9. The size of the bubbles indicates the level of carbon intensity, where larger bubbles signify a greater carbon footprint. Additionally, varying levels of carbon intensity are represented by a color gradient ranging from dark blue for the highest intensity to light blue for the lowest.

**Data Center REITs**—an increasingly important segment given accelerating AI-driven demand—were a modest drag on the Dow Jones Global Select ESG Tilted RESI’s relative performance (-0.71%). Their lower GRESB Scores, shaped in part by higher carbon intensity, led to underweights in an otherwise strongly performing sub-industry (albeit only represented by three constituents as of Oct. 31, 2025, with a combined index weight of 8.47%).

The data center theme bridges listed REIT companies and Big Tech hyperscale operators. Outside the REIT universe, operators such as AWS, Google Cloud, Microsoft Azure and Meta own some of the world’s largest data center facilities. According to S&P Global Market Intelligence’s 451 Research, U.S. data centers could consume nearly 800 TWh annually by 2030, more than double 2024 usage, with roughly 30% attributable to hyperscalers.<sup>35</sup>

The four largest hyperscalers are expected to spend more than USD 344 billion in 2025 alone, much of it on AI-ready capacity.<sup>36</sup> These operators are contracting nuclear, renewable natural gas and other low-carbon sources—like hydroelectric power—while deploying AI-driven workload management to improve efficiency.

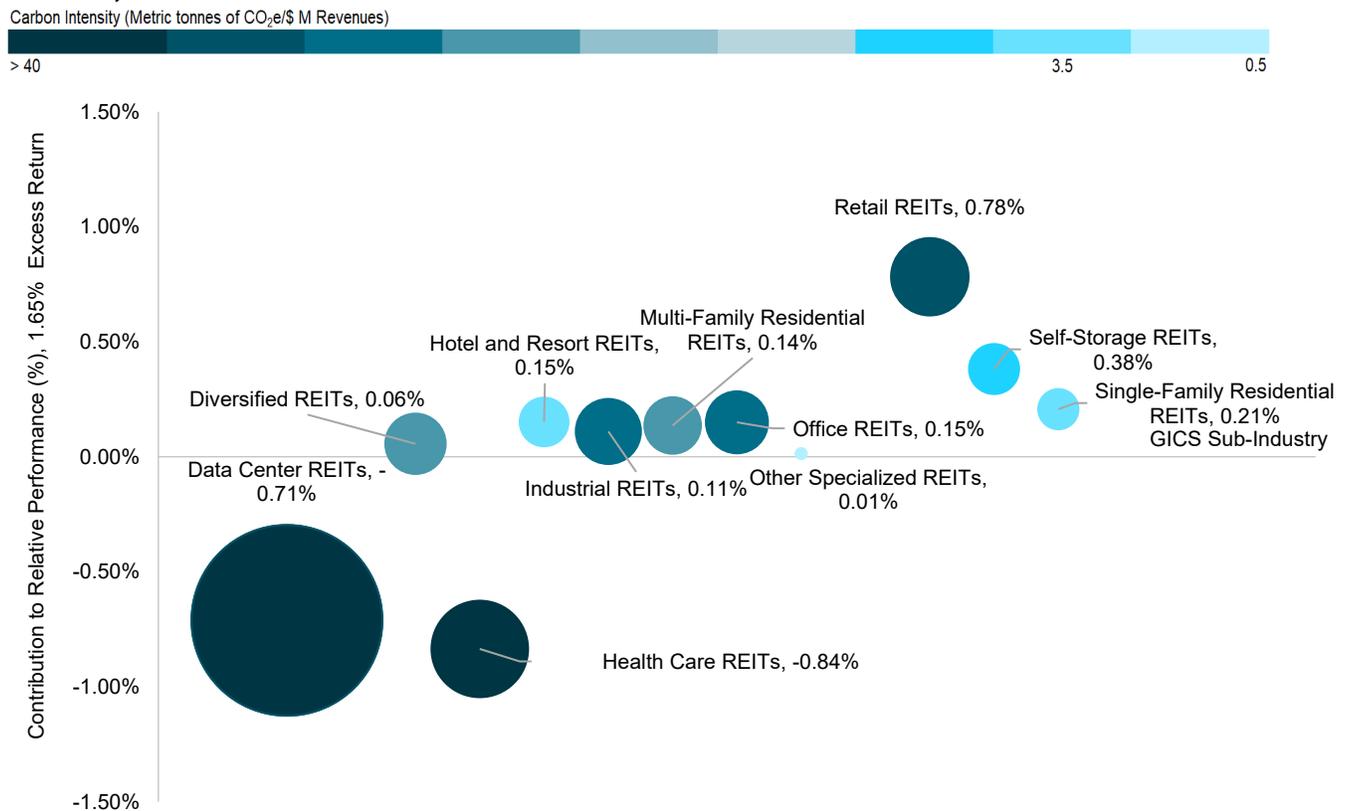
<sup>35</sup> S&P Global Market Intelligence (Feb. 27, 2025), “Datacenters balancing sustainability goals with accelerating AI demand.” Available [here](#).

<sup>36</sup> Bloomberg (Aug. 1, 2025), “The AI Race Has Big Tech Spending \$344 Billion This Year.” Available [here](#).

The sector is also facing growing scrutiny over water consumption and hardware turnover, reinforcing the need for stronger efficiency measures and more resilient design.<sup>37</sup>

In contrast, sub-industries with **lower carbon intensity**, such as **Self-Storage REITs** and **Single-Family Residential REITs**, provided the most significant contributions to the index’s relative performance, with contributions of **0.38%** and **0.21%**, respectively.

**Exhibit 9: Contribution to the Dow Jones Global Select ESG Tilted RESI’s Relative Performance versus Dow Jones Global Select RESI for the Three-Year Period Ending Oct. 31, 2025**



Source: S&P Dow Jones Indices LLC, S&P Global Energy Horizons. Data from Oct. 31, 2022, to Oct. 31, 2025. Index performance based on total return in USD. Carbon intensity is calculated as a weighted average, using the direct and first-tier indirect carbon emissions. Analysis carried out using the Portfolio Analytics of S&P Capital IQ Pro. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Retail REITs and Industrial REITs (18.45% and 16.01% of the index, respectively, as of Oct. 31, 2025) have been able to address climate challenges from trends such as energy-efficient upgrades and EV-charging expansion in retail properties alongside electrified logistics, advanced manufacturing and increased use of rooftop solar and on-site storage. Health Care REITs, which constituted 15.20% of the index as of Oct. 31, 2025, show wider performance

<sup>37</sup> GRESB (June 5, 2025), “Data center are under pressure—Here’s what needs to change.” Available at: <https://www.gresb.com/nl-en/data-centers-are-under-pressure-heres-what-needs-to-change/>

dispersion, but many are improving energy-intensive HVAC systems and retrofitting labs to reduce emissions.

Across all property types, the energy transition is reshaping operational priorities. Whether managing physical climate risks, lowering emissions, improving water efficiency or achieving higher building-certification standards, real estate owners are increasingly adapting their assets and frameworks.

The Dow Jones Global Select ESG Tilted RESI reflects this shift, as companies across the sector work to meet evolving regulation, adopt new technologies and address investor expectations for resilient, risk-minded portfolios.

## The iBoxx EUR Corporates Paris-Aligned Index

The iBoxx EUR Corporates Paris-Aligned Index aims to meet and exceed the standards for EU Paris-Aligned Benchmarks (EU PABs) under Regulation (EU) 2019/2089 amending Regulation (EU) 2016/1011.<sup>38</sup> The regulation proposes the definitions of minimum standards for the methodology of any “EU Paris-Aligned” benchmark indices that aim to be aligned with the objectives of the Paris Agreement.<sup>39</sup>

The index also incorporates factors that seek to manage transition risk and climate change opportunities in alignment with the recommendations of the Financial Stability Board’s Task Force on Climate related Financial Disclosures (TCFD) 2017 Final Report,<sup>40</sup> covering transition risk, climate change opportunities and stranded assets. The index measures the performance of eligible corporate bonds from the [iBoxx EUR Corporates](#). The corporate bonds are selected and weighted to be collectively compatible with a 1.5°C global warming climate scenario<sup>41</sup> at the index level.<sup>42</sup> The index applies exclusions based on company involvement in specific business activities, company violations against the principles of the United Nations Global Compact (UNGC) and involvement in relevant controversies, all outlined in the ESG criteria section of the index’s [factsheet](#). The index rules aim to efficiently track the EUR investment grade corporate bond universe, while upholding minimum standards of investability and liquidity.

<sup>38</sup> [“Commission Delegated Regulation \(EU\) 2020/1818,”](#) EU. July 2020.

<sup>39</sup> [“The Paris Agreement,”](#) United Nations Climate Change.

<sup>40</sup> [“Recommendations of the Task Force on Climate-related Financial Disclosures,”](#) Task Force on Climate-related Financial Disclosures. June 2017.

<sup>41</sup> [“Global Warming of 1.5 °C,”](#) Intergovernmental Panel on Climate Change (IPCC). 2018.

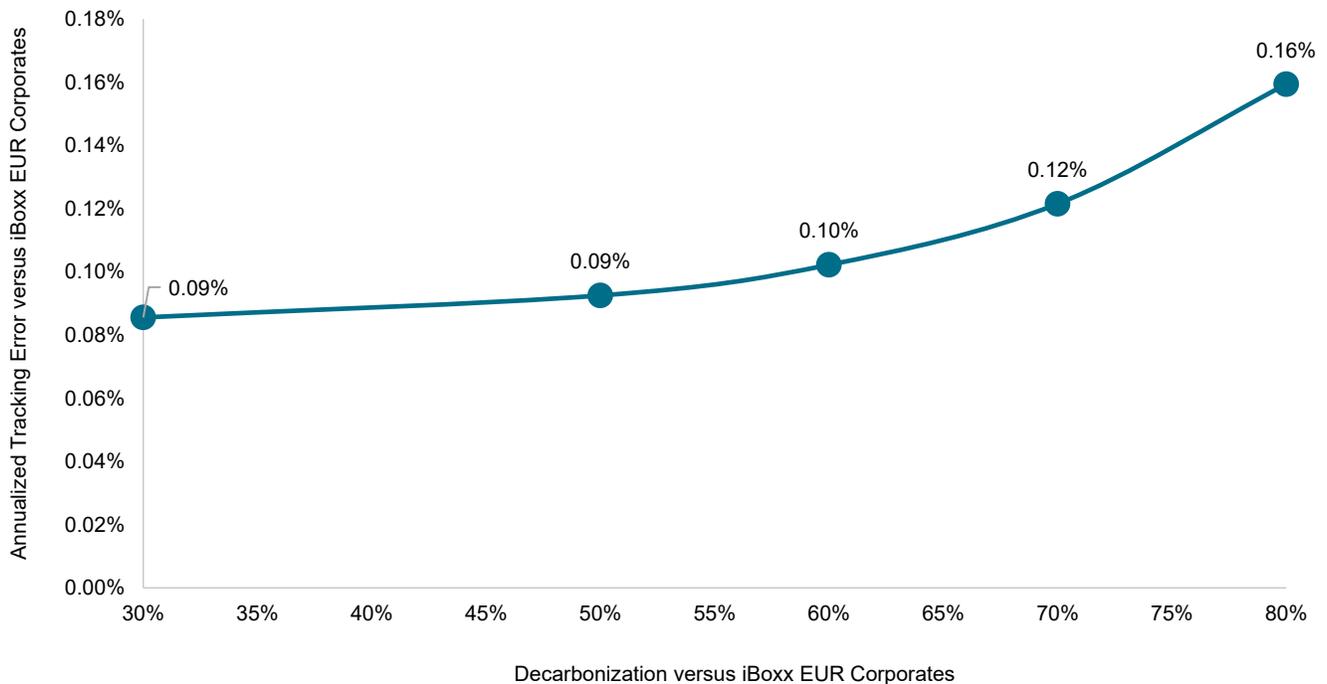
<sup>42</sup> See [iBoxx EUR Paris-Aligned & Climate Transition \(PACT\) Indices Methodology](#).

[S&P DJI’s Sustainability Index Dashboard](#) highlights that the index reduced **carbon footprint**<sup>42</sup> and **fossil fuel reserves** by **54.85%** and **100%**, respectively, when compared to the iBoxx EUR Corporates, as of Sept. 30, 2025. Notably, this was achieved with a minimal **tracking error** of only **0.18%**.

This accomplishment warrants emphasis, as it demonstrates that market participants can pursue significant improvements in sustainability metrics, such as carbon emissions, without sacrificing the risk and performance profiles of a broad fixed income benchmark like the iBoxx EUR Corporates. Both objectives can be met simultaneously.

Exhibit 10 illustrates this attribute, showing how the annualized tracking error varies in relation to the level of decarbonization achieved versus the iBoxx EUR Corporates. The **tracking error** remains relatively consistent at around **0.09%** until a **50% decarbonization** rate is reached, only rising to **0.16%** at an **80% decarbonization** rate.

**Exhibit 10: Change in Annualized Tracking Error in Response to Decarbonization – The iBoxx EUR Corporates Paris-Aligned Index versus iBoxx EUR Corporates**



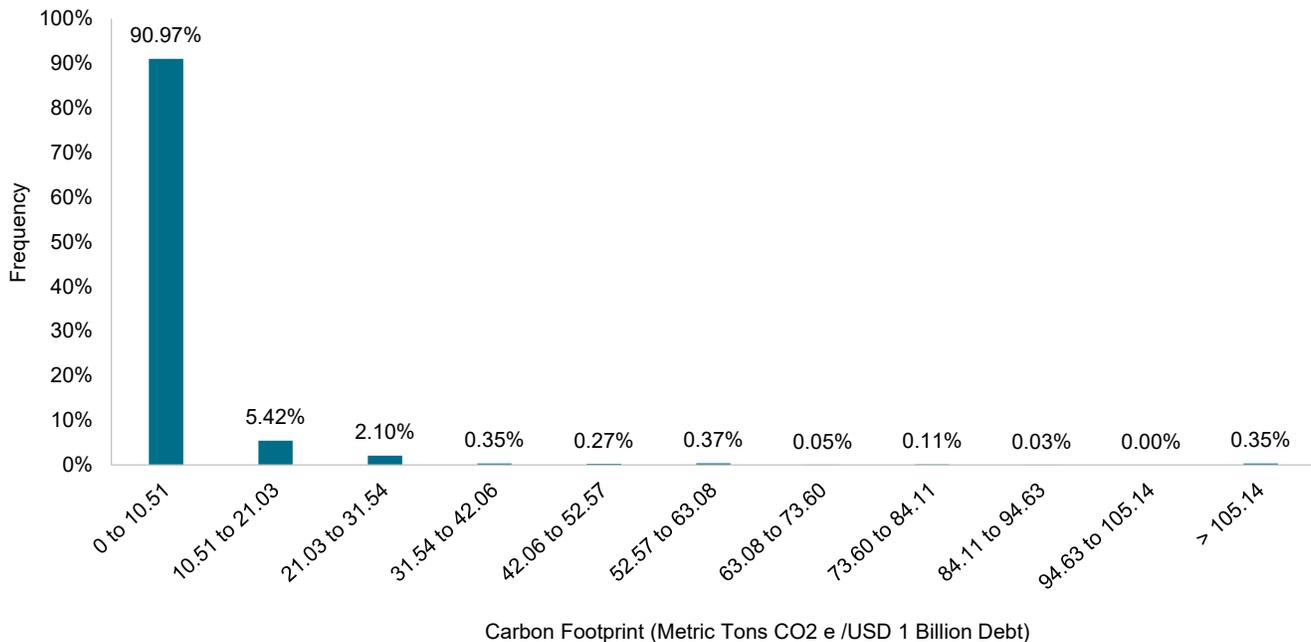
Source: S&P Dow Jones Indices LLC, S&P Global Energy Horizons. Data as of Dec. 31, 2024. Decarbonization based on Scope 1 + Scope 2 + Scope 3 upstream and downstream emissions. The iBoxx EUR Corporates Paris-Aligned Index was launched on May 15, 2025. All data prior to such date is back-tested hypothetical data. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

This quality of sustaining a low tracking error while simultaneously making substantial strides in carbon footprint can be attributed to two primary factors. The first factor relates to the adequately diverse distribution of carbon footprints among the iBoxx EUR Corporates, demonstrating a right skew. This can be utilized in the index construction to adjust the

weighting away from high emitters. This characteristic is illustrated in Exhibit 11, which shows the distribution of iBoxx EUR Corporates constituents across various carbon footprint levels, from high to low.

Only **0.35%** of the benchmark has a carbon footprint **greater than 105.14** metric tons of CO<sub>2</sub> equivalent per USD 1 billion of debt. By reducing weight in these high emitters, the index can achieve a substantial reduction in its carbon footprint compared to the benchmark, in line with its objectives, while ensuring a low tracking error.

**Exhibit 11: Carbon Footprint Distribution of the iBoxx EUR Corporates Investment Universe**



Source: S&P Dow Jones Indices LLC, S&P Global Energy Horizons. Data as of Dec. 31, 2024. Carbon Footprint based on Scope 1 + Scope 2 + Scope 3 upstream and downstream emissions. Chart is provided for illustrative purposes.

The second, and arguably the more crucial factor, is the inherent nature of the fixed income asset class: fixed income typically exhibits **far lower volatility** compared to equities. This lower volatility among the underlying securities is also reflected in the tracking error observed when an index like the [iBoxx EUR Corporates Paris-Aligned Index](#) undergoes decarbonization relative to the iBoxx EUR Corporates.

## Looking Forward

Indices can be essential instruments in facilitating the energy transition, offering a variety of options across different asset classes for market participants. They not only act as benchmarks to evaluate performance and manage risk but can also empower market participants to navigate the complexities of the evolving energy transition landscape. By aligning with the unique risks and opportunities that arise during the energy transition, indices

can provide a pathway for market participants to tap into the potential of this dynamic ecosystem.

Moreover, the availability of numerous indices—such as the S&P Global Clean Energy Transition Index, S&P Global Essential Metals Producers Index, S&P Global Carbon Credit Index, Dow Jones Global Select ESG Tilted RESI and iBoxx EUR Corporates Paris-Aligned Index—highlights the diverse strategies that cater to varying investment and sustainability-related objectives. These indices represent different facets of the energy transition, enabling market participants to choose those that best align with their investment objectives and goals. As the world increasingly embraces renewable energy solutions, with the backdrop of the surge in demand for artificial intelligence powered by data centers, leveraging these indices may be vital for market participants seeking to position themselves strategically within this evolving market landscape.

## Performance Disclosure/Back-Tested Data

The iBoxx EUR Corporates Paris-Aligned Index was launched on May 15, 2025. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance, and is based on the index methodology in effect on the index launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. Complete index methodology details are available at [www.spglobal.com/spdji](http://www.spglobal.com/spdji). Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the [FAQ](#). The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

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