MONTHLY RESEARCH DIGEST

An Executive Briefing on New & Notable Sustainability Research

In This Issue – **June 2025**

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ENERGY

Efficiency Now: Overcoming Internal Barriers to Industrial Energy Efficiency

By Energy Efficiency Movement (EEM), in partnership with Accenture

View the full report here

Notable Highlights

- Over 50% of respondents say their **company has been working on energy efficiency for more than six years.**
- 68% perceive that their **energy efficiency budget is increasing** year on year.
- **Companies are focusing their energy efficiency initiatives on** manufacturing processes (76%), buildings (55%), IT infrastructure (48%), supply chain (47%), employee engagement (41%), and transportation (40%).
- **60% of companies invest in more than two energy efficiency measures:** 70% have installed energy efficiency **equipment** and infrastructure, 65% have **KPIs** to track energy efficiency progress, 58% have an **operational model** focused on energy efficiency, and 49% have **relevant certifications**.
- **72% have multiple departments responsible for energy efficiency**, with the top three including a dedicated energy management team (60%), the sustainability department (54%), and the operations/manufacturing department (50%).
- The following Report Findings break down the **five main internal barriers to corporate energy efficiency** (financing, adapting infrastructure, insufficient skills, lack of organizational strategy, and data and controls) **and a roadmap to overcome them.**

Objective

- To identify businesses' top internal barriers to enhancing energy efficiency and offer guidance on how to overcome them.

Background

The report data is based on a survey of 294 corporate executives across eight industries and five regions, as well as 10 interviews with respondents. Most respondents came from companies with over 1,000 employees (methodology on pg. 34-36).

- The roadmap was developed based on survey insights, expert interviews, and analysis by EEM and Accenture.

Report Findings

The five main internal barriers to corporate energy efficiency and a roadmap for companies to overcome them:

#1: Financing (43% ranked as the #1 barrier) (pg. 16-18):

- **51% believe that uncertainty about the return on investment for energy efficiency projects hinders decision-making.** Other limiting factors include energy price volatility (41%) and difficulty accessing external finance for efficiency improvements (26%).
- **84%** say their organization **doesn't allocate sufficient funding** for energy efficiency projects.
- Manufacturing processes offer the most significant opportunities for energy savings.
- ➢ **Roadmap for companies to overcome financial barriers (details on pg. 18):** Secure dedicated energy efficiency funding. Explore alternative financing. Take on strategic energy efficiency opportunities.

#2: Adapting infrastructure (19% ranked as the #1 barrier) (pg. 19-21):

- **47% believe that growing reliance on IT, data, and software complicates energy efficiency efforts** by causing delays and requiring more collaboration.
- 42% said their company struggles to **incorporate new, energy-efficient equipment** into legacy systems.
- 35% say uncertainty about a new **technology's reliability** and longevity is an obstacle.
- Many companies are **hesitant to replace functional equipment with energy-efficient equipment** due to the high upfront costs, uncertain payback periods, and risk of production downtime during retrofitting.
- ➢ **Roadmap for companies (details on pg. 21):** Validate and build trust in new technologies for energy efficiency. Optimize facility layout and operational processes.

#3: Insufficient skills (15% ranked as the #1 barrier) (pg. 22-24):

- 48% believe that a **shortage of skilled workers** hinders energy efficiency initiatives.
- 45% report that **training their workforce** for energy efficiency adoption **is challenging**, whether due to time, budget, or a lack of perceived importance.

- **Integrating modern technical solutions into a mature production environment** requires an understanding of existing machinery, the ability to bridge old and new technologies, and expertise in cross-functional collaboration.

➢ **Roadmap for companies (details on pg. 24):** Develop comprehensive energy efficiency training programs. Foster collaboration and knowledge sharing. Develop internal capacity on external energy management compliance standards.

#4: Lack of organizational strategy (12% ranked as the #1 barrier) (pg. 25-28):

- When **senior management fails to prioritize energy efficiency and effectively communicate** its importance, initiatives often lose momentum, become fragmented across departments, or fail to take off.
- 48% believe that the time and financial **demands for regulatory compliance limit efforts** for energy efficiency initiatives.
- **19% say that energy efficiency is not well integrated with KPIs** (e.g., overall equipment effectiveness and GHG emissions), suggesting a lack of strategic direction.
- Many companies **lack a formal energy policy or have one that misaligns with their business strategy**, resulting in ad hoc energy efficiency initiatives rather than a sustained, measurable commitment.

➢ **Roadmap for companies (details on pg. 27-28):** Integrate energy efficiency into business strategy. Establish clear leadership and governance for energy efficiency. Integrate energy management into core business processes.

#5: Data and control challenges (11% ranked as the #1 barrier) (pg. 29-31):

- **46% of respondents say their organization struggles to collect high-quality energy data, and 39% report that their energy data is not processed periodically**, which makes it challenging to assess the effectiveness of initiatives or build a business case for further investment.
- 40% said they need to address lengthy and time-consuming internal management approvals for energy efficiency initiatives.
- **Many companies underinvest in audits** due to financial concerns or a lack of internal expertise. This results in siloed reporting structures, with limited interoperability and data sharing, and **hinders the development of a cohesive energy management strategy.**

➢ **Roadmap for companies (details on pg. 31):** Implement comprehensive energy monitoring and quality data-collection infrastructure. Establish robust reporting. Implement advanced data analytics and monitoring solutions, including generative AI, for automated reports and real-time analytics.

IRON & STEEL DECARBONIZATION

Pedal to the Metal: Evaluating Progress Toward 2030 Iron and Steel Decarbonization Goals

By Global Energy Monitor

View the full report here

Notable Highlights

- **Global electric arc furnace (EAF) capacity has increased by 11% since 2020 and is projected to grow by an additional 24% by 2030.**
- The world **added more than twice as much coal-based steel capacity** compared to lower-emissions technology last year.
- **Many countries and companies have delayed or scaled back their plans** for transitioning to green steel due to **unfavorable market conditions, insufficient policy support, and competing priorities.**
- Even if all hydrogen development plans and transition plans are implemented, **the steel industry is off-track to meet 2030 ironmaking decarbonization goals.**
- **Technological innovations are needed** to overcome the limited availability of direct reduction-grade iron ore.
- **Policy changes**, such as the US tariffs on steel imports and countries' retaliatory measures, **will disrupt global supply chains critical for green steel production**, **drive up costs, and discourage cross-border investment in green steel technologies**.

Objective

- To evaluate the global steel industry's progress toward 2030 iron and steel decarbonization goals.

Background

- This annual report is based on data from the 2025 Global Iron and Steel Tracker (GIST) (formerly the Global Steel Plant Tracker and the Global Blast Furnace Tracker) and the 2024 Global Iron Ore Mines Tracker (methodology on pg. 2, 6).

- GIST data now includes plant-level details and information on all iron and steelmaking units at each plant.
- Acronyms: blast furnace (BF), basic oxygen furnace (BOF), direct reduced iron (DRI), and electric arc furnace (EAF).

Report Findings

Mid-2020s global steelmaking progress update (pg. 8-9):

- Global steel demand has rebounded strongly post-pandemic and is projected to reach 2.2-2.3 billion tons annually by 2030 and nearly 2.5 billion tons annually by 2050.
- The **share of EAF-based steelmaking** grew from 30% in 2020 to 32% today and is projected to reach 36% by 2030.

The state of operating iron and steel worldwide (pg. 10-16):

- The three countries with the **most operating steel capacity** are **China** (85% BOF, 15% EAF), **India** (65% BOF, 23% EAF, 16% Other technologies), and the **U.S.** (29% BOF, 71% EAF).
- China holds 48% of the global steelmaking capacity and 55% of the ironmaking capacity.
- EAF processes are distributed more evenly worldwide, though **China holds nearly 25% of EAF capacity, and the United States accounts for 11%.**
- China's steel production has plateaued and is projected to decline gradually after 2025, while India intends to double its steelmaking capacity by 2030 (pg. 4).

The global iron and steel development pipeline (pg. 17-24):

- **Steelmakers are doubling down on coal-based processes and investments.** Over the last five years, 259 blast furnace re-linings have been completed, extending 372 million tons per annum (MTPA) of blast furnace capacity. Additionally, another 57 re-linings have been announced, extending 112 MTPA of capacity.
- **Half of the steelmaking capacity under development utilizes EAF technology (up from one-third in 2022);** however, only about one-third of the developing capacity set to start in 2030 plans to use EAF technology.
- 58% of **iron in development** with a known production method is set to utilize coal-based blast furnace technology, and **42% will use direct reduced iron (DRI).**
- India accounts for over 40% of global steel capacity in development (compared to 16% for China).

- India leads the development of DRI capacity (33 MTPA), followed by Iran (30 MTPA), Australia (18 MTPA), and the U.S. (12 MTPA).
- Even if all hydrogen development plans and transition plans are implemented, **the steel industry is off-track to meet ironmaking decarbonization goals.**
    - The IEA Net Zero Scenario requires DRI to reach 17% of iron production by 2030, with 30% of the output using hydrogen as a reductant.
    - The industry is on track to achieve a 15% DRI in 2030, with 20% of facilities using hydrogen or planning to switch to it.

Challenges to the green steel transition (pg. 28-29):

- Green hydrogen and renewable energy are expensive, creating **uncertainty about the feasibility and success of large-scale hydrogen-based steelmaking projects.** The U.S. recently canceled several renewable hydrogen projects and reversed its federal policy on funding regional hydrogen hubs.
- **Scrap steel is a crucial resource in the sector transition, but supply and quality are uneven** due to varying stages of industrial development and recycling infrastructure across steelmaking economies.
    - Around one-quarter of global steel demand is met through scrap, but this is projected to increase to 44% by 2050**.**
    - China is restricting scrap steel exports. The EU is considering a similar policy, which would ensure domestic availability of scrap but disrupt global scrap trade.
    - **Global supply chains and production centers must be reorganized** to align with the availability of scrap steel, renewable energy sources, hydrogen infrastructure, and resource distribution.
- **Major iron ore producers**, such as Australia and Brazil, **have opportunities to lead in green primary steelmaking** by leveraging their iron ore reserves and renewable energy potential. The **Global Iron Ore Mines Tracker (GIOMT)** maps nearly 900 iron ore mines and analyzes existing, developing, and potential iron ore capacity (pg. 25-27).

United States steel profile (pg. 34-35):

*Pages 29-48 have **profiles on 10 countries**, including operating iron and steel capacity, updates on the green transition, key policies, and coal-based iron and steel production.*

- Among the top steel-producing countries, **the U.S. has maintained a relatively low average emissions intensity for steelmaking, primarily due to the high share of electric arc furnaces (71%).**

- The U.S. operates 33 MTPA of basic oxygen furnace (BOF) capacity and 80 MTPA of electric arc furnace (EAF) capacity.
- The U.S. has the world's oldest fleet of blast furnaces, with an average operating age of 74 years.
- **All developing steelmaking in the U.S. uses electric arc furnaces**, with no plans to retire coal-based capacity.
- **All new iron capacity is direct reduced iron (DRI).**
- The Trump administration has halted or attempted to roll back much of the funding that would support green steel development.

VOLUNTARY CARBON MARKET

2025 State of the Voluntary Carbon Market

By Ecosystem Marketplace

View the full report here

Notable Highlights

- **The volume and value of the voluntary carbon market (VCM) declined for the third consecutive year,** with a **25% decrease in the volume** of reported transactions (to 84 million metric tons CO2e transacted) and a **29% decrease in the total value** of reported transactions (to $535 million).
- Average **credit prices fell by 5.5%** to $6.34 per ton of CO2e, but prices remained more than double the 2020 average.
- **The ongoing decline in the VCM is gradually slowing.** 2024 saw the lowest transaction volume since 2018, but the market value is 1.9x higher than that in 2018.
- **Nature-based credits accounted for 45%** of total transaction volume in 2024 (up from 37% in 2023).
- On average, **carbon removal credits were 381% more expensive than carbon reduction credits in 2024,** up from a 245% premium in 2023.
- Eligibility for CORSIA remains an important driver of demand for certain credit types, but **integrity initiatives like the Core Carbon Principles are becoming a more relevant indicator of credit quality** for most credit buyers.

Objective

- To assess the state of the global voluntary carbon market (VCM) in 2024.

Background

- Ecosystem Marketplace is the world's largest repository of VCM transaction data.
- The data in this annual report is based on voluntary carbon credit transaction data from over 200 "EM Respondents" (listed on pg. 34), a survey of 66 EM Respondents (pg. 30-32), and data from carbon standard registries (methodology on pg. 34-35).
    - Only projects approved by the relevant registry were included in project registrations, regardless of whether credits were issued for those projects.

  - The volume of credits transacted in the VCM is likely higher than that listed.
- "Co-benefits" are social or environmental benefits a carbon credit project provides in addition to the GHG emission reductions/removals.
- "Vintage" refers to the year verified emission-reduction activities occurred.

Report Findings

VCM transaction volume, value, and price (by project category) (pg. 13-21):

- Page 13 compares **VCM transaction volumes, values, and prices by project category from 2023 to 2024. Notable category changes:**
  - Agriculture was the only category whose average price increased (by 18%), though transaction volume fell by 87%.
  - Within Forestry and Land Use, the REDD+ transaction volume decreased by 52%, while the Improved Forest Management transaction volumes increased by over 300%. The prices of Afforestation-Reforestation/Revegetation (ARR), Agroforestry, and blue carbon projects increased by an average of 20%.
  - Waste Disposal volume grew over 3x, driven by increased demand for credits from the ICVCM's CCP-approved Landfill Gas projects.
  - Renewable Energy credit volumes fell by 23%, and average prices fell by 31%.
  - Energy Efficiency/Fuel Switching credit transaction volume fell by 93% due to credits becoming more niche.
- Pages 15-18 break down **all project categories in detail.**
- Pages 19-20 break down VCM transaction volumes, values, and prices **by project standard.**

Project registrations, issuances, and retirements (pg. 9-12):

- **Project registrations declined by 11%** from 2023, with approximately 600-700 new projects registered with major carbon standards each year between 2022 and 2024.
- **Credit issuances fell** from 390 million in 2023 to 311 million in 2024.
- **Credit retirements from the 10 largest standards have plateaued since 2021,** with 182 million tons of credits retired in 2024 (down from 189 million in 2023).
  - **Forestry and Land Use became the most frequently retired credit type in 2024 due to declining retirements of Renewable Energy credits.**

- Credits from Household/Community Devices projects accounted for an increased share of retired offsets, reflecting sustained growth in project registrations and issuances in this category.

Carbon credit quality and buyer preferences (pg. 22-29):

- **Buyers continue to prioritize carbon removal credits over carbon reduction credits.**
  - The market share of removal credits grew from 4% of total credits traded in 2023 to 5% in 2024.
  - **ARR accounted for 99% of the removal credit transaction volume in 2024.** These credits are, on average, **10 times less expensive** than credits from novel engineered project types, such as biomass sequestration.
  - **Tech companies are a leading source of demand for removal credits** to offset GHG emissions from data center operations.
- **The ICVCM approved six standards as Core Carbon Principles (CCP)-eligible.**
  - Three credit project categories (Landfill Gas, Fugitive Emissions, and Ozone Depleting Substances) also received CCP approval, with their credits becoming widely available to buyers.
  - These developments have decreased the urgent need for separate credit certifications for environmental and social co-benefits.
  - **As credit-issuing standards update their methodologies for CCP compliance, there is a lag in validation for projects** using the updated methodologies, which can delay CCP-approved credits from reaching buyers and end users.
- The **price premium for credits with a vintage from the last five years increased from 53% to 217%** due to buyers avoiding outdated methodologies and preferring to align the vintage with the years of emissions being offset.
- Independent rating agencies that assess the quality of carbon credits (e.g., Sylvera) help buyers evaluate the quality of carbon projects. However, **inconsistency between agency project evaluation methodologies can confuse buyers and frustrate suppliers.**

FORESTS, LAND, AND AGRICULTURE (FLAG) EMISSIONS

The First 100+ FLAG Targets: Forest, Land and Agriculture under the Science Based Targets initiative

By WWF

View the full report here

Notable Highlights

- **149 companies have validated near-term FLAG targets**, 89 of which have also set net-zero FLAG targets.
- 64% of companies are working on **both demand- and supply-side** land sector mitigation measures.
- **85%** reported taking steps to **reduce agricultural emissions** (often through regenerative farming), **82%** reported addressing **food loss and waste** to reduce supply chain emissions, **75%** have begun addressing **land-use change** and deforestation, and **48%** are shifting toward more **plant-based product portfolios**.
- **16% have committed to maintaining no-deforestation**, and 125 have committed to achieving no-deforestation across their primary deforestation-linked commodities no later than December 31, 2025.
- Pages 12-21 include **examples of actions companies are taking across mitigation levers,** as well as tools and resources.

Objective

- To review companies' Forest, Land, and Agriculture (FLAG) targets validated under the SBTi and their plans for land sector mitigation.

Background

- This report assesses 149 companies' validated FLAG targets as of December 31, 2024. The analysis is based on a review of the SBTi target dashboard.
- 110 companies had publicly available reports in English, which were reviewed for information on intended actions for land sector mitigation (corporate sustainability reports, climate transition action plans, net-zero roadmaps, and annual reports) (methodology on pg. 4, 28).

- All FLAG targets are new, so corporate reporting may reflect pre-FLAG target mitigation plans and may not reflect new activities underway in their FLAG mitigation plans.
- Companies must set FLAG targets if they're in a required FLAG sector (food production, food and beverage processing, food and staples retailing, and tobacco) or if their FLAG emissions encompass 20% or more of their gross Scope 1, 2, and 3 emissions.

Report Findings

Emissions reductions and removals (pg. 6):

- Many companies are **taking action to enhance emission reductions and simultaneously increase land sector removals**.

Regions and sectors (pg. 7-8):

- **Europe has the largest share of validated FLAG targets** (74%), while North America and Asia have 13 each.
- **FLAG targets have been set across many sectors and throughout the value chain,** including 73 processors, 32 retailers, 18 producers, and two traders.
- Most companies with FLAG targets are in the Food and Beverage Processing industry (73), with all other sectors having fewer than 20.

Pathways to set FLAG targets (pg. 7):

- **96% of companies have absolute emission reduction targets** (set using a FLAG sector pathway)**, and two have intensity targets** (set using FLAG pathways covering 11 commodities)**. Four have a combination** of absolute and intensity targets.

No-deforestation commitments (pg. 9):

- Of the companies with FLAG targets, 27 appear on the Forest 500 list of large companies contributing the most to tropical deforestation.
- Some companies, including The Hershey Company, have cited setting **FLAG targets as the catalyst for moving up their no-deforestation target dates** from 2030 to 2025.

Supply- and demand-side mitigation measures (pg. 10):

- **64% of companies (95) mentioned demand-side measures** in their reporting (e.g., reducing food and agricultural waste and loss).
- **70% (105) mentioned supply-side measures** in their reporting (e.g., land-use and land-cover change, afforestation and reforestation).

Land sector mitigation actions companies are taking (pg. 11)

Mitigation Lever	Percentage Mentioned	# of Companies Mentioned	Description
Agricultural emissions reduction (all categories of mitigation)	85%	93	Reduce CH_4 and N_2O emissions from enteric fermentation, nutrient management, synthetic fertilizer production, and manure management; reduce CH_4 emissions by improving water and residue management of rice fields and manure management
Reduce food and agricultural waste and loss	82%	90	Reduce food waste: consumer campaigns, private sector policies, supply chain technology, improving food labeling, and converting waste into biogas; reduce food loss: improve handling and storage practices through training, investment, and technology
Land-use and land-cover change (deforestation, wetlands, and savannas)	75%	82	Pursue conservation policies: establishment of protected areas, law enforcement, improving land tenure, REDD+, sustainable commodity production, improving supply chain transparency, procurement policies, commodity certification, and cleaner cookstoves
Shift to plant-based diets	48%	53	Reduce production of GHG-intensive foods through public health policies, consumer campaigns, and the development of new foods
Soil carbon sequestration in croplands and grazing lands	39%	43	Implement erosion control, reduced tillage, and cover cropping and restoration; increase use of larger root plants
Reforestation or forest restoration	27%	30	Invest in forest restoration, reforestation, national and local policies, and payment for ecosystem services
Agroforestry	19%	21	Integrate agroforestry into agricultural and grazing lands
Peatland or coastal wetland restoration	9%	10	Invest in restoration, national and local policies, and payment for ecosystem services
Biochar application	7%	8	Apply biochar amendments to soils
Forest management	7%	8	Optimize rotation lengths and biomass stocks, reduced-impact logging, improved plantations, forest fire management, and certification
Increase the substitution of cement and steel with wood products	5%	5	Increase the substitution of cement and steel with wood and biobased products

Image taken from pg. 11

Aligning FLAG mitigation action with nature action (pg. 22):

- **85%** of companies (94) **mentioned biodiversity or nature in their reporting**, with 16 companies mentioning the Science Based Targets Network (SBTN).
- For many companies, conducting assessments of land emissions and impacts has **established a foundation** they can build on to assess biodiversity impacts and set targets.

Anticipated FLAG target growth (pg. 25):

- **An additional 645 companies** with SBTi-validated targets or target commitments **will be required to set FLAG targets**, as SBTi mandates FLAG targets for their sector.

GEN Z & MILLENNIAL TALENT & CONSUMERS

2025 Gen Z and Millennial Survey

By Deloitte

View the full report here

Notable Highlights

- Gen Z and millennial individuals will make up **74% of the global workforce** by 2030.
- 70% of Gen Zs and millennials **consider a company's environmental credentials or policies to be very/somewhat important** when evaluating a potential employer.
- 15% and 13% have **changed jobs due to concerns** about the company's environmental impact.
- 89% of Gen Zs and 92% of millennials believe **a sense of purpose is important** for their job satisfaction and well-being.
- **Employers that balance financial security, a sense of purpose**, **and well-being** (work-life balance, growth opportunities, and support for mental health) **can attract talent, reduce turnover, and increase employee engagement.**
- The following Report Findings include **takeaways for business leaders** to attract and retain Gen Z and Millennial employees and consumers.

Objective

- To examine the factors shaping Gen Z and Millennial worldviews (including environmental concerns and career purpose) and provide takeaways for business leaders to attract and retain them as talent and consumers.

Background

- The data in this 14th annual report is based on a 2024 survey of 23,482 Gen Zs (14,751) and millennials (8,731) across 44 countries (methodology on pg. 50).
- Gen Zs are defined as being born between January 1995 and December 2006. millennials are defined as being born between January 1983 and December 1994.

Report Findings

Environmental concerns influence Gen Z and Millennial behavior (pg. 46-49):

- 80% of Gen Zs and millennials **believe businesses should do more** to be sustainable.
- 48% of Gen Zs and 47% of millennials say they and their colleagues have **put pressure on their employers** to take action to protect the environment.
- 65% of Gen Zs and 63% of millennials are **willing to pay more for environmentally sustainable products or services.**
- **To reduce their environmental impact, Gen Zs and millennials have** purchased an electric vehicle (17%, 45%), made their home more sustainable (26%, 45%), adopted water conservation habits (43%, 30%), and researched companies' environmental impact/policies before buying their products or services (26%, 37%).
- **Takeaways for business leaders:**
    - To attract Gen Z and Millennial consumers, **meet the growing demand for more affordable, sustainable products and services.**
    - To attract and retain Gen Z and millennial employees, **clearly and transparently communicate sustainability commitments.**

Gen Zs and millennials increasingly feel financially insecure (pg. 29-32):

- **Cost of living topped Gen Z (39%) and millennial (42%) concerns for the fourth year in a row,** nearly or more than double their concerns for their mental health, unemployment, personal safety, protecting the environment, and political instability.
- Financial security **has a direct impact on their job satisfaction** and the likelihood that they'd recommend their employer to a friend.
- **Takeaways for business leaders:**
    - Offer **market-competitive salaries** and benefits.
    - Consider **personalizing benefits** to meet employees' needs, such as dependent care, healthcare, or commuting costs.
    - **Provide financial education** to help them understand how to manage their finances and prepare for their future.

Money, meaning, and well-being are key to Gen Z and millennial workplace happiness (pg. 24-27, 34-38):

- **44% of Gen Zs and 45% of millennials said they left a job because it lacked purpose.**
- **Financial security, a sense of purpose** (values aligned with their organization), **and well-being** (work-life balance, growth opportunities, and support for mental health) are the **top three factors** that cause Gen Zs and millennials to change employers.
- **Employers that balance all three can attract talent, reduce turnover, and increase employee engagement.**
- **<u>Takeaways for business leaders:</u>**
    - Clearly **define and communicate** the organization's purpose to attract aligned talent and help employees find meaning in their work.
    - Understand the **factors that motivate** Gen Z and millennials, and **tailor your approach to meet individual needs** to help improve performance, work quality, and business growth.

GREEN PRODUCTS & SERVICES

Investing in the Green Economy 2025: Navigating Volatility and Disruption

By LSEG

View the full report here

Notable Highlights

- **The global green economy was valued at $7.9 trillion in Q1 2025**. If considered a standalone sector, it **would account for 8.6% of listed equity markets** and be the fourth-largest sector by market capitalization.
- **Revenues from green products and services** within LSEG's equities coverage have **more than doubled** in the past decade and **surpassed $5.1 trillion** in 2024**.**
- **Green industries are prone to short-term volatility** due to geopolitical tensions, shifting trade policies, and rapid technological advancements, including AI. However, **long-term drivers** (including the energy transition) **underpin strong growth and long-term performance**.
- **The total value of all green bonds issued globally has reached $2.9 trillion, with a record $572 billion** of new issuance in 2024 (up by 10% from 2023).
- **Climate adaptation accounted for roughly a fifth of the 2024 global green economy,** with over 2,100 companies generating **over $1 trillion in revenue** from adaptation-related products and services.

Objective

- To examine the state of the global green economy and help investors navigate short-term volatility and identify long-term growth drivers.

Background

- This annual report is based on LSEG's Green Revenues data (which assesses over 20,000 listed companies worldwide and quantifies associated revenues across 133 green product and service categories), other LSEG datasets, and FTSE Russell index solutions (methodology on pg. 2, 4).

Report Findings

The state of the green economy (pg. 6-7):

- **Long-term drivers underpin strong growth and long-term performance of the green economy.**
    - The **market capitalization grew at a compound annual rate of 15%** from 2014 to 2024, second only to the Technology sector (18% CAGR).
    - **Green equities have delivered 59% of cumulative outperformance** since 2008, outperforming their benchmark (the FTSE Global All Cap Index) in 54% of all rolling 12-month periods and 70% of all five-year periods.

Investment characteristics of the green economy (pg. 9-16):

- The green economy was the second-best-performing industry among ICB Industries in the FTSE All-World Index over the past decade and the fourth-best performer in 2024.
- **Green equities may offer greater upside potential** but are likely to be more volatile compared to the broader market. They began to underperform their benchmark in 2024 but rebounded to close the year on par with the market.
- **Green bonds typically have less upside than green equities but are usually less volatile.**
    - **In 2024, corporations accounted for 64% of the issuance volume in the green bond market.**
    - The 10-year performance of green corporate bonds closely tracks that of the benchmark, with only a 1% underperformance as of Q1 2025.
    - **Green corporate bonds outperformed the benchmark by 2% in 2024,** primarily driven by their negative active duration, which proved advantageous amid rising interest rates and inflation.

Climate adaptation/resilience is emerging as a new growth vector for the green economy (pg. 18-24):

- **34%** of large and medium-sized companies in the FTSE All-World Index (over 4,000 public companies) **reference adaptation measures in their annual disclosures**.
- **Adaptation finance flows grew at a compound annual growth rate of 21%** from 2018 to 2022.

- **The green bond market could help companies finance climate adaptation.** Over a quarter of the eligible use-of-proceeds categories are linked to adaptation and resilience investments, with 53% going toward green Buildings and Properties.
- Green buildings are the largest green sector with exposure to adaptation solutions ($424 billion in revenue), followed by water infrastructure ($94 billion).
- The **LSEG Green Revenue Classification System (GRCS)** can help investors track companies with exposure to adaptation solutions.

Investment strategies incorporating the green economy (pg. 26-30):

- **Investors can focus on green equities through thematic funds or baskets, or incorporate green revenues alongside other sustainable investment data** (e.g., the FTSE TPI Climate Transition Index Series and the EU Climate Benchmark Index Series) to gain exposure to upside opportunities from the transition (details on pg. 29-30).
- **Green thematic funds focus on investing in companies in the alternative energy and water sectors.**
    - These funds experienced strong inflows in 2020 and 2021, **reaching $74 billion** in assets by the end of the first quarter of 2025.
    - Flows flattened and shifted to outflows in 2024 as the green economy underperformed compared to broader markets; however, cumulative outflows remain small compared to the 2020-21 inflows.
- **Some funds have adopted the U.K.'s Sustainability Disclosure Requirements (SDR) labels.** Out of nine SDR-labeled funds analyzed, "sustainability focus" funds (which aim to invest in environmentally and/or socially sustainable assets) have the highest percentage of green revenue in their portfolios, reaching up to 89%.

The composition of the green economy (pg. 32-55):

- **Four industries comprise nearly three-quarters (73%) of the green economy market capitalization:** Technology (30%), Industrial Goods and Services (18%), Automobiles and Parts (13%), and Utilities (12%).
- **Nearly one-third of industries have exposure to green products and services exceeding 10%,** with the highest levels in Automobiles and Parts, Utilities, Construction and Materials, and Real Estate.
    - **The Automobiles and Parts industry has the highest green exposure, reaching 53%** in Q1 2025 (up from 16% in 2019), due to supportive policy measures like stricter emissions standards and investments in EV charging infrastructure.

  - From 2020 to 2025, green exposure grew from 8% to 20% in Real Estate and from 14% to 23% in Construction and Materials, primarily driven by the expansion of green building activities.

- **LSEG's Green Revenues Classification System (GRCS) categorizes 133 types of green products and services in 10 sectors.**
  - **Energy Management and Efficiency accounts for nearly half of the green economy by market capitalization (46%)** and has grown at a five-year **CAGR of 10%,** reaching a market capitalization of over $3.6 trillion in Q1 2025.
  - **Transport Equipment is the second-largest sector (17%).** It was the fastest-growing long-term, with a 20% CAGR since 2016. However, growth has slowed significantly, primarily driven by Tesla's decline in 2025.
  - The following green sectors each account for **5-7% of the green economy**: Energy Generation, Energy Equipment, Transport Solutions, Waste and Pollution Control, Environmental Resources, Water Infrastructure and Technologies, Food and Agriculture, and Environmental Support Services.
- **The green economy is spread across 50 countries.**
  - **The Americas account for 64% of market capitalization**. Green exposure is 8.5%, tracking close to the global average.
  - Despite having a significantly lower market capitalization (22%), **Asia generates the most green revenue (44%)**, with one-third of this revenue coming from China.
  - **Europe's green market capitalization has remained stable over the past five years,** possibly due to greater diversification across regional markets. **However, its share of the global green economy** (13% market capitalization and 24% green revenue) **has gradually declined** since 2022.