MONTHLY RESEARCH DIGEST

An Executive Briefing on New & Notable Sustainability Research

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CHIEF SUSTAINABILITY OFFICERS

2026 Chief Sustainability Officer Report: Rooted in Business

By Weinreb Group

View the full report here

Notable Highlights

- The **number of CSOs declined by 10%** (from 216 in 2025 to 193 as of July 2026). This is the **first decline since tracking began** in 2010.
- CSOs say the **top three ways sustainability is creating business value** are risk mitigation (62%), cost savings (52%), and customer acquisition and retention (38%).
- **42%** of CSOs saw an **increase in sustainability-focused roles embedded within other departments,** while 28% reported an increase in the core sustainability team. This indicates a shift toward integrating sustainability into the core business strategy.
- **CSOs' top challenges** are market and economic uncertainty (62%), regulatory requirements (57%), and geopolitical volatility (55%).
- The **top three attributes that are essential to CSO success** are the ability to influence without authority (55%), attune to diverse stakeholders (49%), and operate at a big-picture and granular level (41%).
- **Customer pressure is the top external force** driving sustainability deeper within the business (62%), followed by regulatory pressure (57%), investor pressure and alignment with company values (41%), and profit (30%).

Objective

- To analyze the field of corporate sustainability and the evolving role of the chief sustainability officer (CSO).

Background

- The data in the report (last published in January 2025) is based on research and a survey of 69 CSOs from companies publicly traded on the NYSE or NASDAQ (methodology on pg. 6).

Report Findings

There are fewer CSOs, yet sustainability is more integrated within companies (pg. 1-2):

- **Women accounted for 66% of CSOs** in 2026, slightly higher than in 2025 and up from 28% in 2011.
- **80%** said their **sustainability budgets have increased** or remained the same since January 2025. The other 20% had their budget decrease.
- **55% said their headcount increased** from 2025, while 28% reported a decrease. On average, sustainability teams have a headcount of 20.

Fewer CSOs report to the CEO, though other drivers are maintaining sustainability momentum (pg. 1, 3):

- **Just 14% of CSOs report to the CEO** (vs. 33% in 2024), **while more CSOs are reporting to legal** (23% vs. 17% in 2024). This may be because the sustainability function is maturing, with CEOs involved in establishing it but then moving it where it adds the most value (e.g., to legal for regulatory compliance).
- **87%** reported that sustainability **governance structures are firmly in place**.
- 88% said board engagement increased or remained the same from 2025.

CSOs are feeling external pressures yet remain resilient (pg. 1, 4):

- **AI has been a key disruption:** Nearly three-quarters of CSOs reported that AI is having a moderate impact on their work, supporting efficiency. **18% said AI is having a significant impact,** including helping the team focus on more strategic work.
- Despite increasing external pressures, **CSOs are meeting the moment and feeling satisfied in their roles,** particularly because of the dynamic nature of the work and the ability to contribute to the well-being of society and the planet.

ENERGY

2026 Levelized Cost of Energy+

By Lazard, with support from Roland Berger and Teneo

View the full report here

Notable Highlights

- **Unsubsidized renewable energy remains the most cost-competitive form of new-build generation** on an LCOE basis, though costs increased across the board.
- **Existing generation is more competitive,** given that new-build costs have increased across all technologies and there are execution challenges, including inflation and permitting uncertainty.
- **Even after accounting for the additional cost of firming** intermittent renewables, **renewables remain broadly cost-competitive** with combined-cycle gas turbines.
- **Rising power demand and reliability concerns are compounding the pressures** from pipeline capacity constraints and inflation. **Investment in new infrastructure, faster permitting and approval processes, and diverse generation are critical** to meeting demand and enhancing overall system reliability and security.
- **Costs for utility-scale storage configurations increased** due to tariffs on lithium-ion imports that curtailed access to low-cost Chinese cells.

Objective

- To analyze the levelized cost of energy generation, the cost of firming intermittency in the U.S., and the levelized cost of standalone battery energy storage systems.

Background

- The annual report combines Lazard's Levelized Cost of Energy (LCOE) analysis, Cost of Firming Intermittency analysis, and Levelized Cost of Storage (LCOS) analysis.
- The LCOE compares the cost of generating electricity from renewables (onshore and offshore wind, utility-scale solar, geothermal, and hybrid projects) vs. conventional technologies (gas peaking, gas combined cycle, coal, and US nuclear) across the lifetime of the project and various sensitivities (methodology on pg. 6, 25-31).
- The Cost of Firming Intermittency analysis evaluates the project/resource-level costs associated with supplementing intermittent renewable energy on the grid with firm

capacity to ensure reliable electricity delivery during periods of peak system-reliability risk. This levelized firming cost is based on each grid operator's own capacity accreditation and resource adequacy framework (pg. 16).

- The LCOS compares the levelized cost of utility-scale standalone battery energy storage systems over their lifetimes, evaluated on a per-megawatt-hour and per-kilowatt-of-capacity-per-year basis across 2-hour and 4-hour durations (pg. 20-21).

Report Findings

Levelized Cost of Energy (LCOE) (pg. 4, 7-14):

- Pages 8-12 compare the **LCOE of energy technologies across various sensitivities** (**US federal tax subsidies,** fuel prices, **carbon pricing,** and the **cost of capital).**
- **The LCOE of renewables:** utility-scale solar PV ($40-98/MWh), onshore wind ($37-99/MWh), offshore wind ($105-167/MWh), geothermal ($67-111/MWh)
    - **Wind and solar LCOEs continued to rise** due to higher capital costs, interest rates, tariff pass-through, and supply chain repricing.
    - Wind, solar, and battery storage are expected to account for most near-term US capacity additions given their relatively short deployment timeline.
- **The LCOE of conventional technologies:** gas peaking ($144-276/MWh), gas combined cycle ($51-129/MWh), coal ($72-177/MWh), and US nuclear ($175-255/MWh)
    - **Announced new-build gas generation surged** due to increasing demand projections, despite a 15-year-high LCOE and long development lead times.
    - The report includes nuclear restart costs to reflect **increased market interest in leveraging existing nuclear sites** to restore baseload capacity, with potentially lower capital intensity and shorter timelines than greenfield development.
- A **carbon price range** of $20-60/ton of carbon would increase the LCOE of coal to $91-252/MWh, gas peaking to $156-315/MWh, and gas combined cycle to $59-152/MWh.

Levelized Firming Cost (pg. 4, 21-22):

- Pages 17-18 break down the **costs to firm solar, wind, and hybrid renewable resources** across various grid operators.

Levelized Cost of Storage (LCOS) (pg. 4, 17-18, 33-34):

- While the OBBBA **preserved the storage investment tax credit through 2033**, new Foreign Entity of Concern **restrictions have accelerated supply chain diversification** toward Southeast Asian manufacturing capacity and domestic suppliers.

SUSTAINABILITY REPORTING

State of Play Report: Implementation of European Sustainability Reporting Standards

By European Financial Reporting Advisory Group (EFRAG)

View the full report here

Notable Highlights

- **82% of companies updated their Double Materiality Assessment,** with changes ranging from minor refinements to full re-runs due to scope changes. The **most material areas** were **E1 Climate Change** (99%, up 1% from 2024), **S1 Own Workforce** (99%, no change), and **G1 Business Conduct** (95%, up by 2%).
- **69% of companies disclosed having a climate transition plan** (up from 55% in FY24), and **57%** disclosed having near- and long-term **decarbonization targets compatible with a 1.5°C** warming pathway.
- There is a **gap between declared materiality and strategic commitment**: While companies identified an average of 6.4 material topics out of 10, they **only had measurable targets for half of those topics**, and **only 63% of companies embed sustainability in executive incentive schemes.**
- **89% of companies** for which S2 Workers in the Value Chain and/or S3 Affected Communities are material (68% and 31%) **disclose formal human rights policies covering those topics.**
- **81% of companies** for whom supplier selection was material (54%) **referenced ESG criteria in supplier selection.** Codes of conduct are the most common mechanism, while operational mechanisms like corrective action plans remain minority practices.

Objective

- To examine how companies approached their second year of reporting under the Corporate Sustainability Reporting Directive (CSRD).

Background

- The data in this second annual report is based on 905 companies' sustainability statements from FY2025 subject to third-party assurance, with input from the EFRAG Sustainability Reporting Board and Technical Expert Group (methodology on pg. 6-8).

- This year's report includes a section on ESRS G1 Business Conduct (governance).
- “Cross-cutting standards” refer to Double Materiality Assessments, the distribution of material topics, the allocation of Impacts, Risks, and Opportunities (IROs) across the sustainability statement, and the extent to which material topics are supported by measurable targets and embedded into incentive schemes.
- ESRS standards referenced:
    - Environmental: E1 Climate Change, E2 Pollution, E3 Water and Marine Resources, E4 Biodiversity, E5 Resource Use and Circular Economy
    - Social: S1 Own Workforce, S2 Workers in the Value Chain, S3 Affected Communities, S4 Consumers and End Users
    - Governance: G1 Business Conduct

Report Findings

Cross-cutting standards (pg. 4, 8-17):

- **The five most widely disclosed sub-topics are the same as in FY2024:** Climate Change Mitigation (99% in 2025 vs. 97% in 2024), Energy (84% vs. 87%), Own Workforce Working Conditions (97% vs. 93%), Equal Treatment (96% vs. 94%), and Corruption and Bribery (84% vs. 83%).
- **98% and 82%** of companies, respectively, **disclosed at least one measurable target for E1 Climate Change and S1 Own Workforce**.
- **Companies disclosed an average of 30 Impacts, Risks, and Opportunities (IROs),** with E1 Climate Change, S1 Own Workforce, and G1 Business Conduct together accounting for nearly 60% of all IROs identified.

Environmental standards (pg. 4-5, 17-21):

- **Non-climate environmental topics became slightly more material.** Metric disclosure increased across E2 Pollution (from 38% to 42%), E3 Water and Marine Resources (to 35%), E4 Biodiversity (to 41%), and E5 Resource Use and Circular Economy (to 67%).
- Under E2 through E5 (where they are material), **over two-thirds of companies report exclusively at the global, company-wide level,** fewer than 10% report at the regional level, and 25% report at the site level for E2 Pollution, E3 Water, and E4 Biodiversity.

Social standards (pg. 5, 21-26):

- **Social topic materiality changed slightly** across S1 Own Workforce (99%, no change), S2 Workers in the Value Chain (from 63% to 68%), S3 Affected Communities (from 30% to 31%), and S4 Consumers and End Users (from 68% to 64%).
- **93% disclosed human rights incidents,** and 85% disclosed discrimination incidents.
- **Companies reported an average unadjusted gender pay gap of 14.3%** in favor of men, with the widest gaps concentrated in the financial sector.

What Sustainability Disclosures Disclose

By University of Chicago Law School

View the full report here / View the Executive Summary here

Notable Highlights

- **On average, corporate sustainability reports have become less specific, less quantitative, and "fluffier"** as reporting mainstreamed.
- **Most companies use multiple voluntary frameworks at once,** and once a framework is adopted, **companies tend to keep using it** (several have retention rates above 90%).
- When comparing firms by reporting tenure, **companies that have reported for longer tend to produce more specific and quantitative reports** with less fluff and more negative news.
- **Voluntary frameworks show measurable but mixed associations** with disclosure content, including TCFD (less fluff, more negative news), SASB (less fluff, lower quantitative density), and GRI (lower quantitative density).

Objective

- To examine the quality and comparability of corporate sustainability disclosures.

Background

- This report data is based on an analysis of over 15,000 sustainability disclosures from over 2,100 Russell 3000 companies from 1998 to 2023 (methodology on pg. 2, 27-36).
- It evaluates the use of five voluntary frameworks (TCFD, SASB, GRI, CDP, and SBTi) and provides relative measures of disclosure content across five dimensions: specificity, quantitative evidence, promotional language ("fluff"), the disclosure of negative company-related news, and data tables and figures.

Report Findings

Corporate sustainability reporting has mainstreamed (pg. 36):

- Corporate sustainability **reporting and the adoption of external assurance and voluntary frameworks surged after 2015,** driven by a wave of first-time reporters. Reports also grew substantially longer over time, along with reporting tenure and voluntary framework adoption.

Overlap in voluntary framework adoption (pg. 37-39):

- **Most companies use multiple voluntary frameworks at once**. Among firms that began reporting after 2018 (once **TCFD**, **SASB**, and **GRI** existed), 58% adopted two or more frameworks, and 19% adopted all three within their first two reporting years.
- In 2022, SBTi and CDP reporters were the **most likely to adopt external assurance**.

Disclosure composition (over time, reporting tenure, voluntary frameworks) (pg. 39-49):

- **Reports have become less specific, less quantitative, and "fluffier" as reporting mainstreamed**.
    - For specificity and quantitative content, this reflects both a **wave of thinner reports** from first-time reporters post-2015 and **declines within continuing reporters.**
    - Reports contain **twice as much fluff** (~27%) **as quantitative sentences** (~13%) and nearly four times as much fluff as negative news (~7%).
- When isolating within-firm change and calendar year trends, **three measures improve with reporting tenure** (by year three): specificity (~8% increase), fluff (~9% decrease), and tables (~39% increase).

AGRICULTURE

Decarbonising the Phosphate and Potash Fertiliser Industry

By ERM, Systemiq

View the full report here

Notable Highlights

- **Under business as usual, GHG emissions in the fertilizer industry are projected to reach 550 million tons per year by 2050** (440 for phosphate and 115 for potash), **a 25% increase** from the 2024 baseline.
- **An 89% reduction in emissions** from phosphate and potash fertilizer production **is technically feasible by 2050** under a net-zero scenario.
- **Reaching net-zero** fertilizer production emissions by 2050 **will require $235-320 billion in global investment** ($160-220 billion for phosphate production assets and $75-100 billion for potash assets)**,** not including investment in enabling infrastructure.
- There are **four key strategies for decarbonizing the fertilizer industry: (1)** basing the system on **low-carbon energy,** including renewable electricity and low-carbon heat; **(2) electrification and carbon capture and storage,** particularly in phosphoric acid production; **(3) nutrient use efficiency** as the primary downstream lever; and **(4) non-sulfur production** pathways as a long-term strategic option, especially as demand for sulfur grows in the battery sector.
- **Investing in decarbonizing P&K production can** protect industry **competitiveness** (e.g., against carbon pricing), **reduce exposure** to price shocks and supply constraints, avoid stranded assets, and improve **access to capital**.
- **Coordination is needed** across industry, finance, and government and the whole value chain. The following Report Findings include **actions to help companies and financiers decarbonize the fertilizer industry.**

Objective

- To provide a roadmap for the global fertilizer industry to cut value chain GHG emissions in line with the Paris Agreement while preserving food security, supply resilience, and affordability.

Background

- The report focuses on decarbonizing phosphate and potash (mined potassium-bearing mineral products) fertilizer production ("P&K fertilizer").
- The report is based on an ERM analysis of public data and literature, data from the IEA Ammonia Technology Roadmap, and Systemiq's Reducing Emissions From Fertilizer Use report (methodology on pg. 4-5, 21, 30-31, 36-37, 57, 59, 63).
- The EBRD, Systemiq, and the IFA provided strategic guidance; an advisory group (including the WBCSD and the ICMM) provided technical expertise; and various agriculture producers, trade associations, and technology and engineering firms provided additional insights.

Report Findings

The phosphorus and potassium industry (pg. 19-39):

- Around **95% of phosphorus** (as phosphate fertilizer) **and 85-95% of potassium** (as potash fertilizer) **consumption is used in agriculture** for crop nutrients. Changes in their availability, cost, or environmental performance have **system-wide implications for global food security and affordability.**
- In 2024, **the phosphate industry** emitted about **360 million tons of CO2e,** and the **potash industry** emitted about **89 million tons**.
- The combination of **climate impacts and insufficient decarbonization progress could amplify existing challenges** in the P&K industry, including:
    - Rising **costs and declining competitiveness** as producers remain exposed to volatile energy prices, water constraints, and carbon pricing mechanisms.
    - **Policy and regulatory exposure** as fertilizer production is incorporated within national decarbonization strategies and low-carbon product standards.
    - **Physical risks** related to water intensity and stress on infrastructure and resources (pages 86-87 include a map of physical risks through 2050).
- **Decarbonizing** phosphate and potash products and fertilizers **must be addressed as part of a broader transition** across fertilizer supply chains, energy systems, and food production, rather than as a production-only challenge.

Sector decarbonization pathways (pg. 40-61):

- **Two main long-term production decarbonization pathways (pg. 42-49):**
  - **Grid-supplied electricity:** Depending on the region, emission reductions could be achieved by procuring low-carbon electricity.
  - **Decarbonization of on-site generation** could be achieved through optimizing existing self-generation capacity (via heat recovery) and investing in on-site renewable capacity, CCS, or alternative fuels. These technologies depend on the regulatory landscape, geographic factors, and regional supply chains/economics.
- **Near-term production decarbonization pathways (pg. 50-54):**
  - Achieving long-term decarbonization depends on early action across the value chain through 2030.
  - Near-term actions can help moderate emissions growth while also supporting the maturation of early TRL technologies.
  - Pages 51-53 include several **near-term actions**, broken down by their technology maturity, cost of action, and GHG reduction potential.
- **Non-sulfur production pathways (pg. 55-56):** While incremental decarbonization of existing wet-process assets is essential in the near term, continued reliance on sulfur-based routes may constrain decarbonization in some regions due to price exposure. Non-sulfur process routes may become increasingly important for long-term optionality.
- **Ammonia decarbonization pathways (pg. 57):** Ammonia is a critical input for phosphate fertilizers. Nutrient use and material efficiency, fossil-derived ammonia with carbon capture, and electrolytic hydrogen can reduce ammonia production emissions.
- **Nutrient use efficiency and fertilizer use pathways (pg. 58-61):**
  - Improving **nutrient use efficiency can cut emissions without reducing yields,** lower input costs, reduce nutrient losses to water and air, and support more resilient soil and crop management over time.
  - Structural changes such as improved agricultural productivity and reduced land-use pressure can lower the demand for mineral nitrogen fertilizer and associated emissions.

Decarbonization economics and investment requirements (pg. 62-69):

- Pages 64-66 present global marginal abatement **cost curves that compare technology and system investment options.**
    - **Operational optimization, electrification** (where cheap, low-carbon power is accessible), **energy efficiency, and heat recovery are the cheapest levers today,** with the latter two measures even delivering a positive investment return.
    - **Full electrification, alternative process routes, and carbon capture deliver deeper decarbonization but cost much more** and depend on technology and supply-chain readiness, policy mechanisms, and clear demand signals.
    - Long-term capital mobilization hinges as much on risk reduction and coordination as on technology cost.
    - From a cost-per-ton-abated perspective, improving nitrogen use efficiency is the cheapest of the three fertilizer-use levers assessed. Optimized application and fertilizer-as-a-service models can deliver net cost savings while improving yields.
- **Decarbonization investment priorities include:**
    - **Production assets,** including retrofits, efficiency initiatives, electrification, and upgrades to existing plants using lower-carbon processing technologies.
    - **Industrial and energy infrastructure,** notably grid reinforcement, access to low-carbon electricity, and alternative fuel logistics.
    - **Enabling systems,** including innovation, demonstrations, digital tools, and industry coordination mechanisms (e.g., hubs that reduce cost and risks).

Decarbonization constraints and enablers (pg. 70-81):

- **Sector decarbonization is shaped** not only by site technologies but also **by system-level conditions**, including the availability of affordable, low-carbon electricity, infrastructure constraints, sulfur and ammonia market dynamics, adaptation to physical climate risks, and demand signals for low-carbon fertilizer.
- **Financing and policy mechanisms:**
    - **Policy support can help reduce the risks** financiers face when investing in sector decarbonization, including high upfront capital costs, uncertainty in long-term revenues and regulatory direction, and a lack of bankable offtake.
    - The appropriate mix of funding sources varies by technology type, project phase, and level of system integration (details on pg. 74).

- Pages 73 and 76-78 include **examples of financing mechanisms** and case studies on policy mechanisms.

Actions for decarbonizing the fertilizer industry (pg. 82-89):

- Pages 84-85 include a **visual roadmap of technology, finance, policy, and enabling actions** for each decade through 2050.
- **Actions for food and agriculture companies:**
  - **Drive consistent demand signals** through procurement practices, sustainability requirements, Scope 3 targets, and low-carbon or premium-crop product strategies.
  - **Participate in demonstration and pilot programs** to validate crop performance and enable retailers and farmer groups to adopt 4R practices, improve nutrient use efficiency, and adopt innovative products.
  - **Improve data sharing, field-level insight, and collaboration across the value chain** to target interventions effectively and scale adoption.
  - **Communicate** product sustainability attributes **transparently** to consumers.
  - Enhance sustainability while **avoiding adverse impacts** on food prices or access.
- **Actions for financiers:**
  - Deploy **risk-sharing instruments** and blended finance to support early-stage and first-of-a-kind projects.
  - **Co-finance** industrial demonstration projects with producers and public institutions.
  - Support **long-term contracts** and credit-enhancement mechanisms that improve bankability.
  - Build sector-specific expertise to **replicate successful financing models** across regions and archetypes.