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THE INSTITUTE OF
COST ACCOUNTANTS OF INDIA
भारतीय लागत लेखाकार संस्थान
Statutory Body under an Act of Parliament
(Under the jurisdiction of Ministry of Corporate Affairs)

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॥ सुखिनोभवंतु ॥

A Monthly Newsletter Of
Sustainability Standards Board

Volume XXXIV May, 2026

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17 SDGs:

1. No Poverty
2. Zero Hunger
3. Good Health
4. Quality Education
5. Gender Equality
6. Clean Water
7. Clean Energy
8. Decent Work
9. Industry & Innovation
10. Reduced Inequality
11. Sustainable Cities
12. Responsible Consumption
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace & Justice
17. Partnerships

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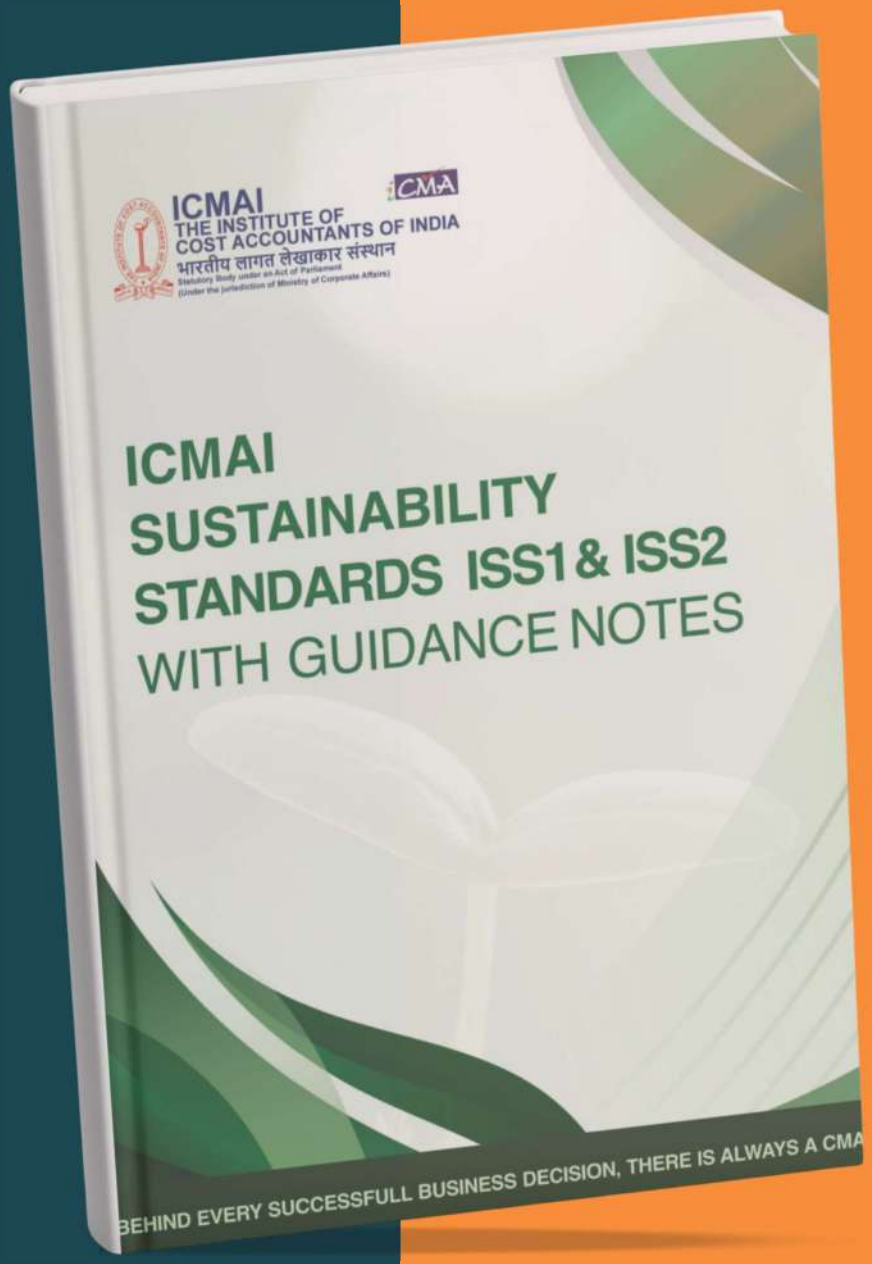

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Message from the Chairman

"A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people." - Franklin D. Roosevelt

Dear Professional Colleagues,

Wars and geopolitical conflicts across the world have historically triggered sharp increases in crude oil prices, disrupted global supply chains and intensified inflationary pressures, leading to slower economic growth and financial instability. For India, which imports a major portion of its crude oil requirements, oil shocks significantly increase import bills, widen fiscal and current account deficits and raise the cost of transportation, power, food and essential commodities, thereby directly affecting households and industries alike. At the same time, excessive dependence on fossil fuels and accelerated extraction of natural resources during periods of global conflict adversely impact the ecology by increasing carbon emissions, environmental degradation and climate-related vulnerabilities. These challenges reinforce the urgent need for energy diversification, renewable energy adoption, sustainable consumption patterns and resilient economic policies to ensure long-term ecological balance and economic stability.

Across the globe, businesses are increasingly aligning their operational and reporting frameworks with environmental, social and governance (ESG) expectations, thereby contributing towards a responsible and inclusive economic future.

The Sustainability Standards Board of ICMAI continues its committed journey towards building awareness, capability and professional excellence in sustainability reporting, assurance and strategic ESG integration. We also have various webinars for capacity-building initiatives and stakeholder engagements aligned with global sustainability developments.

I am pleased to note the encouraging response received for the ICMAI Sustainability Standards – ISS 1 and ISS 2 along with the Guidance Notes issued by the Board. These standards are designed to support organisations and professionals in enhancing transparency, accountability and comparability in sustainability disclosures, while also strengthening the role of Cost and Management Accountants in the evolving sustainability ecosystem. The Board has been actively promoting knowledge dissemination through technical publications, and we are happy to state the ICMAI Sustainability Standards ISS1 and ISS2 with Guidance Note are now available for sale. We have also distributed to the sustainability department of India Inc. for their adoption for proper disclosures.

The Board is also proud to advance the initiative of the ICMAI Green Awards, which seek to recognise and honour organisations demonstrating excellence in Business Responsibility and Sustainability Reporting (BRSR), climate responsiveness and sustainable business practices. The Awards aim to encourage corporates to align with global sustainability benchmarks and the United Nations Sustainable Development Goals (SDGs), thereby creating a culture of responsible growth and transparent disclosures. We have also closing the ICMAI Green Awards 2024-25 and urge the organization to apply within May 31, 2026.

We also urge the members, students and others to take the opportunity in enrolling in the 7th batch of the Certificate Course on ESG. The details are available in the SSB portal.

Sustainability today is intrinsically connected with risk management, operational efficiency, stakeholder trust and access to capital. Cost and Management Accountants possess unique competencies in measurement, resource optimisation, performance evaluation and integrated reporting, positioning the profession as a strategic partner in India's sustainability transformation journey.

As we move forward, I urge all members, students, corporates and institutions to actively participate in sustainability initiatives and contribute towards building a greener, more resilient and equitable future. Let us collectively embrace innovation, ethical governance and responsible business practices in the spirit of "*Vasudhaiva Kutumbakam*" — the world is one family.

I convey my sincere appreciation to all members of the Board, industry experts, regulators, academic institutions and stakeholders for their continuous support and valuable contributions to the sustainability movement. We also extend our heartfelt greetings and best wishes to everyone on the auspicious occasions of *Ganga Dussehra, Id-Ud-Zoha, Padmini Ekadashi, Vat Savitri Vrat, Skanda Sashti* and various other festivals celebrated across our diverse cultural traditions. May these sacred occasions inspire peace, harmony, compassion and collective prosperity, while strengthening the spirit of unity, sustainability and social well-being in our society. Together, let us continue to strengthen the profession's leadership in sustainability and nation building.

With warm regards,

CMA (Dr.) Ashish Prakash Thatte
Chairman
Sustainability Standards Board
May 25, 2026

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A Salute to the Month of May

Remembering Nobel Laureate Rabindranath Tagore and Sustainability on 9th May

The month of May brings warmth, colour, and new hope. It reminds us of nature, fresh beginnings, and the beauty of life. Among the important days of this month, 9th May holds a special place as we remember the great poet, thinker and Nobel Laureate Rabindranath Tagore. His life and work continue to inspire people across the world.

Tagore was not only a poet. He was also a philosopher, teacher, musician and social reformer. He loved nature deeply and believed that human life and nature must live together in harmony. Long before the world started talking about sustainability and environmental protection, Tagore spoke about respecting the earth and living a balanced life.

Many of his poems and songs describe rivers, trees, rain, flowers and changing seasons. Through his writings, he taught people to feel connected with nature. One of his beautiful lines says:

"The same stream of life that runs through my veins runs through the world."–Gitanjali-69

These simple words show that all living things are connected. This idea is the heart of sustainability. If nature suffers, human life also suffers.

Tagore founded Visva-Bharati University with a different idea of education. Students learned in the open air, under trees, close to nature. He believed education should not only give knowledge but also teach respect, creativity, humanity and care for the environment.

Today the world is facing many environmental problems like pollution, climate change, cutting of forests and shortage of natural resources. Countries are now trying to adopt sustainable development, renewable energy, recycling and green technology. But Tagore had already shown the importance of simple living and balance between progress and nature many years ago.

He also worked for village development and self-reliance. He encouraged agriculture, rural industries, education and community participation. These ideas are now seen as important parts of sustainable growth.

Another meaningful line by Tagore says:

"Trees are the earth's endless effort to speak to the listening heaven."-Fireflies

This line reminds us that nature is alive and valuable. Trees, rivers and land are not only resources; they are part of our existence. We must protect them for future generations.

Today industries, institutions and governments are focusing more on ESG and sustainability practices. But true sustainability is not only about technology or business policies. It is also about values, responsibility and humanity. Tagore believed that development without compassion and moral values cannot bring real happiness.

The youth of today have a big role to play. Small actions like saving water, reducing waste, planting trees and respecting nature can create a better future. Sustainability starts from daily habits and responsible thinking.

As we remember Rabindranath Tagore on 9th May, let us take inspiration from his thoughts and teachings. He showed the world that culture, humanity and nature are deeply connected.

May this month of May inspire us to build a greener, kinder and more sustainable world where progress and nature walk together in harmony.

Sustainability -Global Context

MONTHLY NEWS

1. Germany warned it may miss its 2030 climate targets

On 18 May 2026, an independent climate advisory body in Germany stated that the country is likely to miss its legally binding 2030 emissions-reduction targets. The report challenged the federal government's own projections and highlighted concerns over emissions from energy, construction, and land-use sectors. The development has intensified debate around Europe's transition policies and climate accountability mechanisms.

READ MORE

2. European Union considering expansion of aviation carbon market

The European Commission is reviewing whether the EU Emissions Trading System (EU ETS) should apply to long-haul international flights departing Europe. The proposal would significantly expand aviation-sector carbon pricing and could affect global airline operations and international climate negotiations.

READ MORE

3. Germany replaces controversial green heating law

On 13 May 2026, the cabinet of Germany approved legislation replacing the country's earlier mandatory renewable-heating framework. The new "building modernization law" removes compulsory renewable-energy installation requirements while maintaining long-term climate-neutrality goals for 2045. Environmental groups described the move as a dilution of climate ambition.

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4.Taiwan strengthens legislative push toward net-zero transition

Taiwan continued advancing sustainability legislation linked to its 2050 Net Zero Pathway. Government-backed reforms focus on decarbonization across energy, industrial production, and social infrastructure while reinforcing climate-governance frameworks and environmental compliance systems.

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5. EU, Brazil, and China launch global carbon-market coalition

On 7 May 2026, the European Union, Brazil, and China officially launched the Open Coalition on Compliance Carbon Markets in Florence, Italy. The initiative aims to create interoperable standards for international carbon-credit systems and strengthen global carbon-market governance.

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6.United Kingdom introduces new sustainability-linked energy reforms

The government of United Kingdom introduced reforms targeting long-term energy security, water sustainability, and infrastructure resilience. The measures are part of broader climate-transition and energy-independence efforts amid rising geopolitical instability and energy-market pressures.

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7.Scientists warn of record global wildfire activity linked to climate change

Climate scientists reported that global wildfire outbreaks between January and April 2026 reached

the highest levels on record, driven by extreme heat conditions and an emerging El Niño cycle. Governments across Africa, Asia, and the Americas are now under pressure to strengthen climate-adaptation and disaster-risk governance frameworks.

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8.UN climate leadership says geopolitical conflict is accelerating renewable transition

According to statements highlighted in Reuters' sustainability coverage, ongoing geopolitical tensions and disruptions in oil and gas supply chains are accelerating investment in renewable energy across multiple regions. United Nations climate leadership indicated that energy-security concerns are increasingly reinforcing sustainability transitions globally.

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9. SEC Tells Court it Plans to Scrap Climate Reporting Rules

SEC said that it plans to reconsider the rules through a "notice-and-comment rulemaking" process, which the Commission had initially attempted to avoid by requesting that the court issue a ruling on the legality of the rules, after it had also withdrawn its defense of the rules against legal challenges. The court denied the SEC's request in September 2025, ordering the Commission to either reconsider the regulation through ordinary rulemaking procedures, or to renew its defense of the rules in court.

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10. UN Forest Funding Crisis Strains Global Sustainable Forest Management Efforts

The United Nations warned that a deepening UN forest funding crisis could weaken global deforestation and forest governance efforts after voluntary contributions dropped 53 percent in 2025. Delegates at the 21st session of the United Nations Forum on Forests said shrinking financial support was threatening implementation of the UN Strategic Plan for Forests 2017-2030 and broader sustainable forest management goals, according to the International Institute for Sustainable Development's Earth Negotiations Bulletin.

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Sustainability -Indian Context

MONTHLY NEWS

1. India ready to provide technical guidance, support in maternal, child healthcare

India is a leader in delivering healthcare interventions with fairness. Union Health Minister highlighted this at the World Health Assembly. India prioritizes women, children, and adolescents in its health programs. The country is ready to share its successful models and technical guidance with other nations. India's commitment to global health for women, children, and adolescents remains strong.

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2. FAO confers Agricola Medal on PM Modi

Prime Minister Narendra Modi received the prestigious FAO Agricola Medal. The Food and Agriculture Organization of the United Nations honored him for his work in sustainable agriculture, food security, and rural development. This recognition highlights India's dedication to strengthening its agricultural sector. The award was presented during his visit to Rome.

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3. Centre betting big on Brahmaputra as economic lifeline

The Indian government is developing the Brahmaputra river into a major economic corridor. This initiative focuses on transport, trade, and tourism. Significant investments are planned for infrastructure like jetties and cargo vessels. Advanced technologies will be used for better river management. This aims to boost connectivity and economic growth across the Northeast region.

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4. India, Nordic nations agree to elevate ties to Green Technology and Innovation Strategic Partnership

India and Nordic nations have forged a Green Technology and Innovation Strategic Partnership. This collaboration aims to boost clean energy, trade, and the blue economy. Prime Minister Modi met with Nordic leaders to strengthen ties. Both sides are committed to a rules-based global order and resolving conflicts. Discussions also covered sustainability and emerging technologies for a peaceful future.

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5. Operation Sindoor reflected 'smart power' in its most complete expression

Indian forces executed Operation Sindoor with military precision, dismantling terror infrastructure and demonstrating strategic resolve. Army Chief Gen Upendra Dwivedi described this as 'smart power' in its complete expression. He outlined a 'SMART' framework for India's future strategy, focusing on statecraft, manufacturing depth, innovation, resilience, and technology primacy to navigate a complex global landscape.

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6. Centre plans Guwahati Water Metro in Phase I of nationwide rollout

India is set to launch Water Metro services in 18 cities, with Guwahati leading Phase I. This initiative aims to transform waterways into efficient public transport corridors. The project prioritizes green technologies and aims to reduce urban congestion. Feasibility studies are underway, with several cities already having their reports accepted. The government is committed to sustainable and inclusive mobility solutions.

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7. BRICS can help nations facing challenges of energy supplies, food, fertiliser and health security

External Affairs Minister stated BRICS can assist nations with energy, food, fertilizer, and health security issues. The group meets amid global flux, with ongoing conflicts and economic uncertainties. Emerging markets expect BRICS to play a stabilizing role. Discussions will focus on development, economic resilience, climate change, technology, and security. Cooperation against terrorism is a shared interest.

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8. Indian Army facilitates women led cafe at 13,000 ft to boost tourism and livelihoods in East Sikkim

A new cafe run by local women has opened near the Baba Harbhajan Singh Shrine in East Sikkim. Located at 13,000 feet, this initiative provides employment and boosts the local economy. The project, supported by Trishakti Corps, aims to promote tourism in border areas. It showcases the region's heritage and strategic importance. This effort highlights military-civil collaboration and inclusive growth.

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9. How this 'smart' Maharashtra woman is turning orange peels into cash

Nagpur is seeing a surge in sustainable innovation. Young minds are turning discarded orange peels into useful eco-friendly products. This includes sustainable fashion, natural cleaning solutions, and scientific research. These initiatives are reducing waste, creating jobs, and promoting a greener future for the city.

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10. India's office fit-outs could cut embodied carbon emissions by up to 55%

Corporates are increasingly adopting green office interiors and recycled materials to achieve carbon neutrality. With India's office leasing booming, fit-outs are a significant, yet overlooked, source of waste and emissions. Circular approaches can reduce lifecycle costs, waste, and carbon emissions by 25-55%, offering a strategic advantage for long-term value and resilience.

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Continent-Wise Corporate Sustainability Reporting Frameworks: Mapping SDGs and Evaluating Diversities with Western and Northern Europe focus

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Abstract

Western and Northern Europe represent the most advanced and mature sustainability reporting ecosystems globally, characterized by comprehensive regulatory structures, institutional accountability, and integration of sustainability into financial and corporate governance systems. The region has transformed sustainability reporting from a voluntary disclosure exercise into a mandatory and assurance-oriented governance mechanism through frameworks such as the Corporate Sustainability Reporting Directive (CSRD), European Sustainability Reporting Standards (ESRS), Sustainable Finance Disclosure Regulation (SFDR), EU Taxonomy, TCFD-aligned disclosures, and ISSB-oriented reporting systems in the United Kingdom. Nordic countries further demonstrate integrated and stakeholder-centric sustainability approaches rooted in ethical governance and long-term value creation. This article examines the sustainability reporting architecture of Western and Northern Europe, maps the alignment of these frameworks with the Sustainable Development Goals (SDGs), evaluates institutional maturity and reporting practices, and analyses the evolving role of Cost and Management Accountants in sustainability measurement, reporting, assurance, and strategic decision-making.

Context and Orientation

Western and Northern Europe constitute the most institutionally developed sustainability reporting region in the world. Sustainability disclosures in this region are no longer limited to voluntary corporate social responsibility initiatives; instead, they have become embedded within corporate governance, financial regulation, climate policy, and investment decision-making. Governments, regulators, investors, and corporations collectively recognize sustainability reporting as an essential mechanism for economic resilience, environmental accountability, and long-term value creation.

The region's sustainability orientation is strongly influenced by the European Green Deal, climate neutrality targets, responsible finance initiatives, and stakeholder-oriented governance traditions. Countries across the European Union, the United Kingdom, and the Nordic region have adopted regulatory systems that require companies to disclose environmental, social, and governance (ESG) information in a standardized and verifiable manner. Sustainability reporting is increasingly linked with risk management, enterprise strategy, supply chain accountability, and sustainable finance.

A defining characteristic of the Western and Northern European model is the transition from voluntary sustainability communication to mandatory sustainability accountability. Companies are expected not only to disclose financial impacts arising from sustainability risks but also to explain how their operations affect society, climate, biodiversity, and broader development outcomes. This has established the region as a global benchmark for sustainability governance and disclosure practices.

Sustainability Reporting Frameworks and Institutional Architecture

1. European Union: CSRD, ESRS, SFDR, and EU Taxonomy

The European Union has established one of the world's most comprehensive sustainability reporting systems through the Corporate Sustainability Reporting Directive (CSRD), the European Sustainability Reporting Standards (ESRS), the

Source: *Conceptualised & designed by the author using AI tools*

Sustainable Finance Disclosure Regulation (SFDR), and the EU Taxonomy Regulation. These frameworks collectively create a harmonized sustainability disclosure ecosystem linking corporate reporting, sustainable finance, and climate governance.

The CSRD significantly expands the scope of sustainability reporting by requiring a larger number of companies to disclose ESG-related information using standardized reporting principles under the ESRS. One of the most significant features of the European framework is the concept of "double materiality," under which organizations must disclose not only how sustainability issues affect corporate performance but also how corporate activities impact society and the environment. This represents a broader stakeholder-oriented perspective compared to traditional investor-centric reporting models.

The ESRS framework covers environmental, social, and governance dimensions comprehensively, including climate change mitigation, biodiversity protection, workforce practices, human rights, business conduct, and governance structures. The reporting standards also introduce digital tagging and assurance requirements, thereby improving comparability, reliability, and transparency across jurisdictions.

The EU Taxonomy complements the disclosure framework by establishing criteria for environmentally sustainable economic activities. It enables investors, regulators, and stakeholders to determine whether business activities contribute substantially to environmental objectives such as climate mitigation, circular economy transition, pollution prevention, and ecosystem protection. Simultaneously, the SFDR requires financial institutions and investment managers to disclose sustainability risks and sustainability-related impacts in investment products and financial decision-making processes.

Institutionally, the sustainability reporting architecture is supported by the European Commission, EFRAG, ESMA, national regulators, audit institutions, and assurance providers. This multi-layered institutional structure ensures strong regulatory oversight and coordinated implementation across the European Union.

2. United Kingdom: TCFD, SECR, SDR, and UK Sustainability Reporting Standards

The United Kingdom has developed a sustainability reporting ecosystem that is independent from, yet broadly aligned with, international sustainability disclosure developments. Following Brexit, the UK adopted an investor-focused sustainability reporting orientation while maintaining strong alignment with

the International Sustainability Standards Board (ISSB) framework.

The UK was among the earliest jurisdictions to mandate climate-related disclosures aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD framework requires organizations to disclose information relating to governance structures, climate-related risks, business strategy, risk management systems, and climate-related performance metrics and targets. This framework significantly strengthened climate risk transparency within corporate reporting practices.

The Streamlined Energy and Carbon Reporting (SECR) framework further enhanced accountability by requiring companies to disclose energy consumption, greenhouse gas emissions, and energy efficiency measures. In addition, the Sustainability Disclosure Requirements (SDR) framework seeks to address sustainable investment transparency, ESG product labeling, and anti-greenwashing obligations within financial markets.

The UK Sustainability Reporting Standards (UK SRS) are gradually moving toward alignment with the ISSB standards issued by the IFRS Foundation, particularly IFRS S1 and IFRS S2. Consequently, the UK model emphasizes financially material sustainability information relevant to investors and capital markets while maintaining comparability with emerging international reporting systems.

3. Nordic Countries: Integrated Sustainability Approaches

The Nordic countries, including Sweden, Denmark, Finland, Norway, and Iceland, have developed highly integrated sustainability governance systems rooted in social trust, ethical business conduct, and long-term economic planning. Sustainability reporting in these countries is often embedded within broader corporate governance and strategic management processes rather than being treated merely as a compliance requirement.

Nordic corporations are globally recognized for adopting integrated reporting approaches that combine financial performance, environmental stewardship, and social responsibility into a unified reporting framework. These countries demonstrate advanced practices in renewable energy transition, circular economy implementation, biodiversity reporting, green financing, and responsible supply chain management.

A distinguishing feature of the Nordic sustainability model is the emphasis on stakeholder capitalism and societal value creation. Sustainability disclosures often focus on long-term resilience, employee welfare, community engagement, and climate responsibility alongside financial outcomes. Strong public institutions, transparent governance systems, and digitally advanced administrative structures further support the effectiveness of sustainability reporting in the Nordic region.

As a result, the Nordic approach reflects a culture-driven sustainability orientation in which reporting is viewed as an instrument for ethical governance, transparency, and sustainable economic transformation.

SDG Mapping and Development Priorities

The sustainability reporting frameworks of Western and Northern Europe exhibit strong alignment with the United Nations Sustainable Development Goals (SDGs). The region's sustainability regulations, climate policies, and corporate governance systems collectively contribute toward the achievement of global development priorities.

SDG	Reporting Linkages
SDG 7 – Affordable and Clean Energy	Renewable energy transition, energy disclosures, SECR
SDG 8 – Decent Work and Economic Growth	Workforce standards, labor disclosures, social governance
SDG 9 – Industry, Innovation and Infrastructure	Green industrial transformation and sustainable innovation
SDG 12 – Responsible Consumption and Production	Circular economy, waste reduction, value-chain disclosures
SDG 13 – Climate Action	TCFD, ESRS E1, net-zero transition plans
SDG 14 & 15 – Life Below Water and Life on Land	Biodiversity reporting and natural capital accounting
SDG 16 – Peace, Justice and Strong Institutions	Governance disclosures, anti-corruption measures
SDG 17 – Partnerships for the Goals	Sustainable finance ecosystems and multi-stakeholder collaboration

Climate action constitutes one of the most prominent reporting priorities within European sustainability frameworks, directly supporting SDG 13. Corporate disclosures increasingly emphasize net-zero transition planning, greenhouse gas reduction strategies, climate risk management, and renewable energy adoption. Similarly, the focus on circular economy practices, waste reduction, and sustainable production systems aligns closely with SDG 12 on responsible consumption and production.

European sustainability disclosures also demonstrate strong linkages with SDG 7 through renewable energy transitions and energy efficiency reporting, particularly under frameworks such as SECR and the EU Taxonomy. Social reporting dimensions relating to workforce practices, diversity, labor rights, and human capital management contribute to SDG 8 concerning decent work and economic growth.

The region's growing emphasis on biodiversity conservation, ecosystem protection, and natural capital accounting reflects alignment with SDGs 14 and 15. Governance-related disclosures involving anti-corruption mechanisms, ethical conduct, regulatory compliance, and institutional

accountability further support SDG 16 concerning peace, justice, and strong institutions.

In broader terms, Western and Northern Europe have adopted sustainability reporting not merely as a disclosure exercise but as a strategic mechanism for advancing sustainable development priorities through financial systems, industrial policy, and corporate governance reforms.

Institutional Maturity and Corporate Reporting Practices

Western and Northern Europe demonstrate the highest levels of institutional maturity in sustainability reporting due to the existence of mandatory regulations, assurance mechanisms, advanced governance systems, and strong investor participation. Sustainability reporting practices in the region are characterized by standardization, comparability, and integration with financial reporting systems.

A significant feature of the region is the mandatory nature of sustainability disclosures. Unlike many developing regions where ESG reporting remains largely voluntary, European organizations are increasingly required by law to disclose sustainability information according to prescribed standards and reporting formats. This has significantly improved consistency and reliability across corporate disclosures.

Another defining characteristic is the integration of assurance and audit processes within sustainability reporting systems. Sustainability information is increasingly subjected to external verification procedures, thereby enhancing stakeholder confidence and reducing the risks of greenwashing and misleading disclosures. Companies are also adopting digital sustainability reporting systems, including XBRL tagging, ESG data platforms, and real-time reporting dashboards to improve data transparency and comparability.

Institutional investors, banks, pension funds, and financial regulators play an influential role in shaping sustainability reporting practices within the region. Investor demand for ESG-related information has encouraged companies to integrate sustainability considerations into enterprise risk management, capital allocation, and long-term corporate strategy.

Furthermore, European reporting practices increasingly extend beyond organizational boundaries to include value-chain and supply-chain sustainability impacts. This reflects a broader transition toward ecosystem-based sustainability governance rather than isolated organizational reporting.

Role of Cost and Management Accountants

Cost and Management Accountants (CMAs) occupy a strategically important position within the sustainability reporting ecosystem of Western and Northern Europe. Their role has evolved substantially from traditional cost management functions toward integrated sustainability measurement, environmental accounting, and strategic ESG decision support.

One of the key responsibilities of management accountants is the development and monitoring of sustainability-related performance metrics.

Organizations increasingly require accurate measurement of carbon emissions, environmental costs, energy efficiency, resource utilization, and social performance indicators. CMAs contribute by designing reliable data collection systems, internal controls, and sustainability measurement frameworks that support regulatory compliance and assurance readiness.

Environmental and carbon accounting have also become major functional areas for management accountants. Under frameworks such as CSRD and climate-related disclosure standards, companies require lifecycle costing, carbon costing, circular economy assessments, and environmental management accounting practices. CMAs assist organizations in quantifying sustainability-related costs and integrating them into operational and strategic decision-making.

In addition, management accountants contribute significantly to sustainability budgeting, ESG-linked investment analysis, and transition planning. They support green capital allocation decisions, sustainability performance evaluation, and long-term scenario analysis relating to climate and regulatory risks. Their expertise enables organizations to align sustainability objectives with financial performance and enterprise value creation.

CMAs also play a crucial role in integrated reporting processes by connecting sustainability performance with financial reporting, risk management, governance systems, and strategic objectives. As sustainability assurance requirements expand across Europe, management accountants are increasingly involved in compliance monitoring, internal audit coordination, documentation processes, and sustainability assurance preparation.

Consequently, the profession is emerging as a critical institutional partner in advancing transparent, measurable, and decision-oriented sustainability governance systems.

Conclusion

Western and Northern Europe have established the most advanced and comprehensive sustainability reporting landscape globally. Through frameworks such as CSRD, ESRS, SFDR, EU Taxonomy, TCFD, SDR, and ISSB-aligned reporting systems, the region has transformed sustainability reporting into a mandatory, assurance-oriented, and strategically integrated governance mechanism.

The region's sustainability architecture reflects a strong commitment to climate action, sustainable finance, stakeholder accountability, and long-term economic resilience. Corporate sustainability disclosures are increasingly integrated with enterprise strategy, financial reporting, investor decision-making, and SDG implementation. Nordic countries further demonstrate how sustainability can be embedded within ethical governance and societal value creation models. The maturity of the Western and Northern European reporting ecosystem is evident in its institutional coordination, regulatory enforcement, digital reporting systems, and emphasis on value-chain accountability. Sustainability reporting is no longer viewed solely as a communication exercise but as a central instrument of economic governance and sustainable transformation.

Within this evolving framework, Cost and Management Accountants play a vital role in enabling credible sustainability measurement, environmental costing, integrated reporting, ESG assurance, and strategic sustainability management. Their contribution is becoming increasingly indispensable in ensuring that sustainability reporting supports both organizational accountability and long-term sustainable development objectives. SB

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A Peek at the Sustainable Finance Regulatory Framework in the EU

Part IV

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Abstract

Continuing our thread of thought from the previous edition on SEBI's regulatory framework on green bonds, in this edition, we attempt to understand the regulatory environment in sustainable finance in the European Union (EU), a leader in the GSS+ issuances ecosystem. We explore the European Green Deal, Action Plan, the EU taxonomy, and the recent EuGB framework. As the world's sustainable debt market continues its impressive growth, nearing USD 7 trillion in cumulative aligned GSS+ (green, social, sustainability, sustainability-linked) bond issuances according to Climate Bonds Initiative data,[1] the EU stands out as the global leader accounting for about 45% of the GSS+ issuances.,[2] [3] Now let us attempt to the sustainable finance regulatory ecosystem looks pean Union (EU).

The European Green Deal

The EU's sustainable finance regulatory framework has been evolving and has received significant impetus since the European Green Deal, a roadmap adopted in 2019 by the European Commission. This is an ambitious roadmap that aims to transform EU into a climate-neutral economy by 2050, while ensuring that the transition is fair to the people and the planet, and is economically sound.[4] It looks at investments in innovation and green technology. And in this, understandably, sustainable finance plays a pivotal part.

Action Plan on Financing Sustainable Growth

What arrived even before the Green Deal, was the Action Plan on Financing Sustainable Growth launched in 2018. The Action Plan was the result of a high-level expert group constituted to arrive at a set of reforms in the sustainable finance sector. The objectives of the plan were to reorient capital flows towards sustainable investment, managing sustainability-related financial risks, and to enhance transparency in the ecosystem.[5]

An integrated package of measures was rolled out under this action plan, which includes the following:

1. Establishing a EU Taxonomy – to create a common language in the sustainable finance ecosystem in order that all stakeholders understand sustainability-related terms in the same way
2. Strengthening sustainability disclosures
3. Creating standards and labels for the sustainable finance ecosystem in order to guide investors.

It was in this broad context that the EU came up with the Sustainable Finance Disclosure Regulation (EU) 2019/2088 (SFDR),[6] the Corporate Sustainability Reporting Directive (EU) 2022/2464 (CSRD),[7] the EU Taxonomy Regulation (EU) 2020/852[8] and the EU Green Bond Regulation (Regulation (EU) 2023/2631.

The Disclosure Regime under SFDR and CSRD

The SFDR aims to standardise sustainability-related disclosures in the financial services sector. The primary aim is to galvanize private sector investments in sustainability projects. It lays down requirements for disclosures of sustainability-related information by the financial market participants, including how sustainability risks are addressed in their investment decisions, remuneration policies in relation to ntegration of sustainability risks, and so on.[9]

[1] https://www.climatebonds.net/data-insights/publications/sustainable-debt-global-state-market-2025
[2] https://www.climatebonds.net/news-events/press-room/press-releases/sustainable-debt-market-nears-usd7-trillion-aligned-issuance-demonstrating-strong-global-momentum
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[9] https://eur-lex.europa.eu/EN/legal-content/summary/assessing-environmentally-sustainable-investments.html

The CSRD requires listed entities and larger unlisted entities to publish sustainability reports based on the double materiality principle – that is the dual aspect of sustainability – both how they identify and address the environmental and social risks they face, and how their operations impact the environment and the society. The first set of disclosures was mandated for the reports published in 2025. The companies preparing disclosures under CSRD are required to follow the European Sustainability Reporting Standards.[10] CSRD mandates detailed sustainability reporting – not just in quantitative terms but in a manner that force corporates to mull on, develop and disclose the integration between the organisation's business strategy and sustainability; the disclosures would also be subject to audit requirements. These disclosures are expected to enable informed investment decision-making by investors, lenders and other financial sector participants.

The EU Taxonomy

The EU Taxonomy Regulation aims at standardising the terminologies used in the sustainable finance ecosystem and create uniformity on which economic activities can be considered as 'sustainable'.[11] It establishes a set of six 'environmental objectives' – climate change mitigation, adaptation, sustainable use of resources, circular economy transition, pollution control, biodiversity protection. It sets out four conditions that an activity has to satisfy to qualify as 'environmentally sustainable' – contributing significantly to one or more environmental objectives, does not significantly harm any of the objectives, carried out in compliance with the minimum safeguards laid down, and complies with the technical screening criteria. This framework mandates that the issuers must utilise the proceeds before the maturity of the bonds in 'sustainable economic activities' as per the EU Taxonomy. The regulation also provides for some transparency measures, among others.[12] An important aspect of the taxonomy is the no-harm-to-any-objective criterion, which ensures that activities that further an objective but damage one or more other objectives are not considered 'sustainable'. A parallel to this can be found in SEBI's Dos and Don'ts guidance that was mentioned in the previous edition of the series.

EuGBs, mandatory reviews and regulatory oversight of reviewers

Among the more recent measures, the European Commission (EC) has issued the voluntary European Green Bond Standards that are to be followed by the issuers who wish to use the "European Green Bond" (EuGB) label. This has been issued under the EU Green Bond Regulation (Regulation (EU) 2023/2631). The Standard, most importantly, provides for supervision of the reviewers (appointed for pre-and post-issuance reviews of green bonds) by the European Securities and Markets Authority. The Standards also include disclosure templates – factsheet, allocation reports, and environmental impact reports. The economic activities proposed to be funded must satisfy the technical screening criteria as laid down in the delegated acts.

Challenges and the road ahead

No regulatory framework is or can be perfect; after all regulation can only anticipate some developments and can only remain responsive to the reality. The EU regulatory framework also has faced challenges and criticism on the extent of disclosures and data collection exercises needed to implement the disclosure frameworks, the potential compliance and regulatory overload, among others. Geopolitical shifts, especially those concerning energy security, also pose challenges.

Nevertheless, the path has been set: that is, sustainable finance is moving from voluntary nice-to-have principles to mandatory must-have standards. The EuGB label is poised to become a global reference point on green bond regulations, but the implementation and adoption unfold needs to be closely followed.

Conclusion

The developments in EU, being a mature ESG market, offer guidance on expectations for the future course of regulations that could come up in other parts of the world, including India. However, it must also be recognised that the EU benefits from advanced public and industrial infrastructure, deeper markets and all the hallmarks of a developed economy, India, being a developing country, that has suffered through two centuries of colonial rule and rose up as a sovereign nation only decades back, needs to give flexibility to its market participants and cannot impose a regime that mimics the EU in every way.

India is surely is carving its own path to regulating sustainable finance and green bonds in its own way that best suits the aspirations and mindset of its own business sector. Further, the recent changes like mandating independent third-party reviews in both pre-and post-issue stages, show that India is gearing up to meet global standards, and offer a robust platform for both issuers and stakeholders. In the future editions of this column, we may explore other forms of sustainable finance and happenings in India and the world. SB

Reproduced with suitable modifications from the personal writings and posts of Ms. Usha Ganapathy Subramanian.

[10] https://finance.ec.europa.eu/financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en
[11] https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en
[12] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32020R0852

ANNOUNCEMENT

Over the past eleven editions, we have explored a diverse range of topics highlighting scientific achievements that have significantly contributed to advancing ESG principles and sustainability in our daily lives. Each topic has aimed to demonstrate how innovation and scientific progress are shaping a more responsible and sustainable future.

In this series, the current edition—"Artificial Intelligence as a Catalyst for ESG and Sustainability Transformation"—marks the epilogue of the series. Artificial Intelligence stands as a powerful enabler, driving efficiency, transparency, and data-driven decision-making across ESG dimensions, thereby accelerating sustainable development at both organisational and societal levels.

With the conclusion of this insightful journey, we are excited to introduce a new series starting next month, featuring a fresh theme and a different perspective. We look forward to continuing this knowledge-sharing initiative with renewed energy and engaging content.

Thank you for your continued support and readership.

CMA Arunabha Saha
Editor

Artificial Intelligence as a Catalyst for ESG and Sustainability Transformation

Insight – XII

CMA Arunabha Saha
Practicing Cost Acountant
Thane

Abstract

Artificial Intelligence (AI) is playing a major role in helping organisations achieve Environmental, Social, and Governance (ESG) goals. AI supports sustainability by improving energy efficiency, reducing carbon emissions, minimizing waste, enhancing worker safety, ensuring transparency and strengthening governance practices. Companies such as Microsoft, Google, Tata Steel, Infosys and Unilever are already using AI for sustainable and responsible business operations. The article also highlights the important role of Cost and Management Accountants (CMAs) in sustainability measurement and decision-making. Although challenges like data quality, cost, and regulatory changes exist, AI-driven ESG practices are expected to shape the future of sustainable business growth.

Introduction: A New Way of Thinking

Today, businesses are not judged only by profit. People also look at how companies treat the environment, how they treat people, and how they run their operations. This is called ESG – Environmental, Social, and Governance.

At the same time, we are living in a digital age where Artificial Intelligence (AI) is changing the way decisions are made. AI can study large amounts of data quickly, find patterns, and suggest better ways of doing things.

When ESG and AI come together, something powerful happens. Companies are able to make smarter, faster, and more responsible decisions. Sustainability is no longer just a goal—it becomes measurable and manageable.

AI in Environmental Sustainability (E)

1. Managing Carbon Emissions

Reducing carbon emissions is one of the biggest challenges in the world today. AI helps by tracking emissions in real time and predicting future trends.

Case Study – Microsoft (Global)

Microsoft has committed to becoming carbon negative. To achieve this, it uses AI tools to measure emissions across its operations and supply chain.

- AI helps track emissions from data centres.
- It predicts future energy needs and reduces unnecessary usage.
- It also supports carbon removal projects using data models.

Because of AI, Microsoft is not just reducing emissions but also planning long-term sustainability.

2. Energy Efficiency

AI helps industries reduce energy consumption by studying usage patterns.

Case Study – Google (Global)

Google uses AI in its data centres to reduce cooling costs.

- AI studies temperature, workload, and energy usage.
- It automatically adjusts cooling systems.
- This has reduced energy consumption significantly.

This shows that even small efficiency improvements can create a large environmental impact.

3. Waste Reduction and Circular Economy

AI helps companies reduce waste and reuse materials.

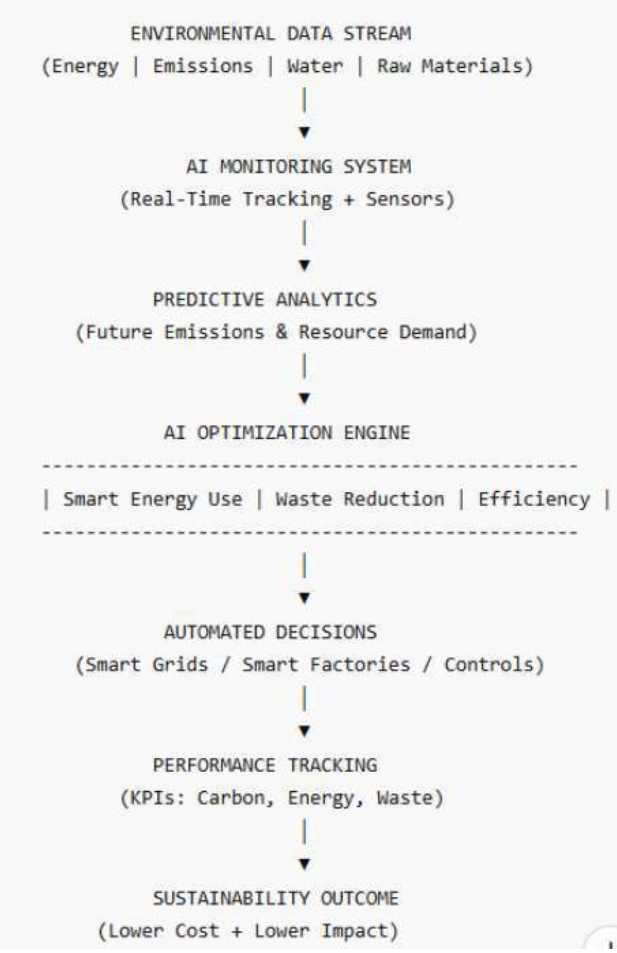
Case Study – Tata Steel (India)

Tata Steel uses AI to optimize raw material usage and reduce waste in production.

- AI predicts the exact quantity of raw materials required.
- It reduces excess usage and scrap generation.
- Waste materials are reused wherever possible.

This improves both cost efficiency and environmental performance.

Environmental (E) Flowchart – AI for Sustainability



Source: *Conceptualised & designed by the author using AI tools*

AI in Social Responsibility (S)

1. Worker Safety

AI is improving safety in factories, construction sites, and mines.

Case Study – Larsen & Toubro (India)

Larsen & Toubro uses AI-based monitoring systems at construction sites.

- Cameras and sensors track worker movement.
- AI identifies unsafe behaviour (like missing safety gear).
- Alerts are generated in real time.

This reduces accidents and protects workers.

2. Fair Hiring and Diversity

AI can help companies become fairer in hiring.

Case Study – Unilever (Global)

Unilever uses AI in its hiring process.

- AI screens candidates without bias.
- Video interviews are analysed based on skills, not background.
- It helps select candidates based on merit.

This improves diversity and fairness in recruitment.

3. Community and Social Impact

AI helps companies understand the needs of society better.

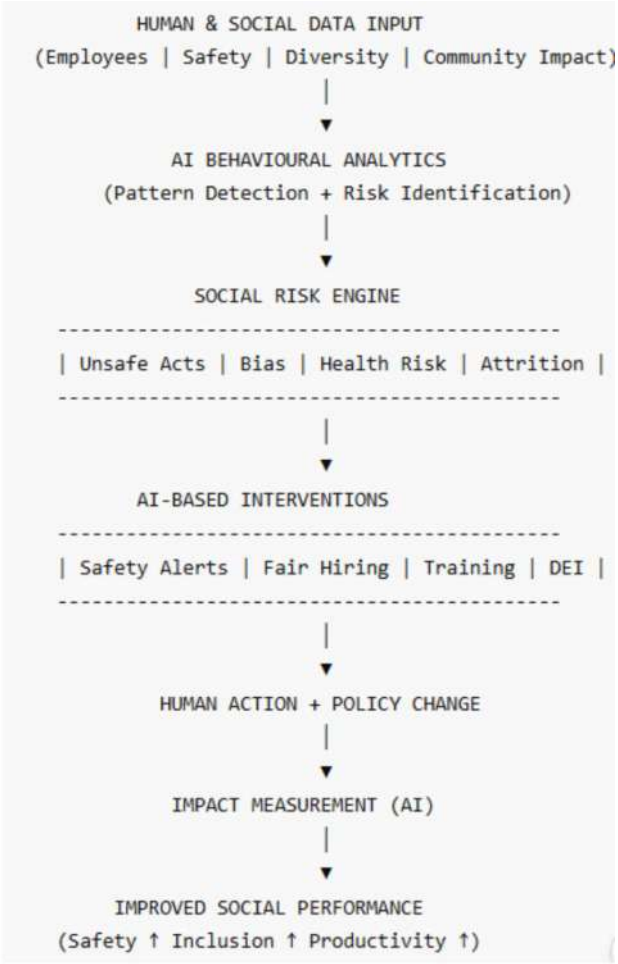
Case Study – Reliance Industries (India)

Reliance uses data analytics and AI for rural development programs.

- AI identifies areas needing healthcare and education support.
- It tracks the success of social programs.
- Resources are allocated more effectively.

This ensures that CSR activities create real impact.

Social (S) Flowchart – AI for Human Impact



Source: *Conceptualised & designed by the author using AI tools*

AI in Governance (G)

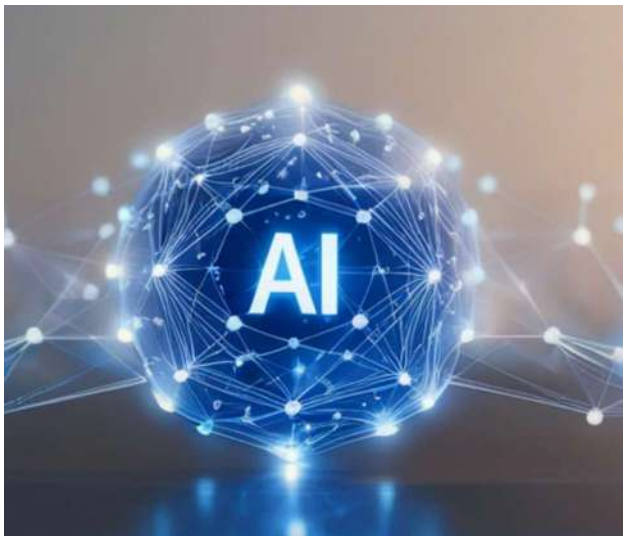
1. Better Reporting and Transparency

Companies must now report ESG performance regularly. AI makes this easier.

Case Study – Infosys (India)

Infosys uses AI tools to prepare sustainability reports.

- Data is collected automatically from different departments.
- AI ensures accuracy and consistency.
- Reports are generated faster and with fewer errors.
- This improves trust among stakeholders.



2. Risk Management and Fraud Detection

AI can detect risks before they become serious problems.

Case Study – JPMorgan Chase (Global)

JPMorgan uses AI to monitor transactions and detect fraud.

- AI identifies unusual patterns in transactions.
- It alerts management instantly.
- This prevents financial fraud and ensures compliance.

Such systems strengthen governance.

3. Ethical Decision-Making

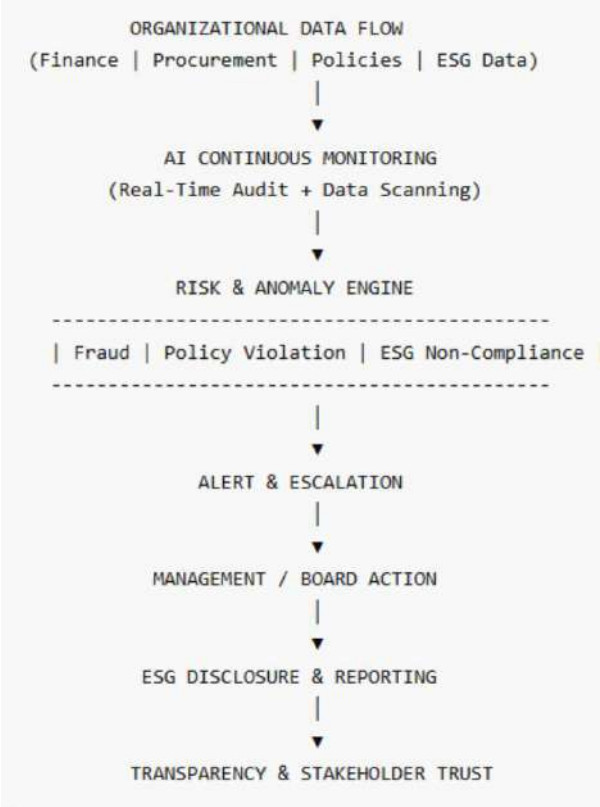
AI supports better decision-making at the top level.

Case Study – IBM (Global)

IBM has developed AI tools for ethical decision-making.

- AI analyses the long-term impact of decisions.
- It considers environmental and social risks.
- It helps management choose responsible strategies.

Governance (G) Flowchart – AI for Control & Compliance



Source: *Conceptualised & designed by the author using AI tools*

Role of AI in ESG Measurement and Data Management

One of the biggest problems in ESG is handling data. AI solves this problem.

- It collects data from machines, sensors, and systems.
- It converts raw data into useful information.
- It provides real-time dashboards.

Case Study – Mahindra & Mahindra (India)

Mahindra uses AI to track sustainability performance.

- AI monitors energy use and emissions.
- It helps set reduction targets.
- It tracks progress regularly.

This makes ESG measurable and actionable.

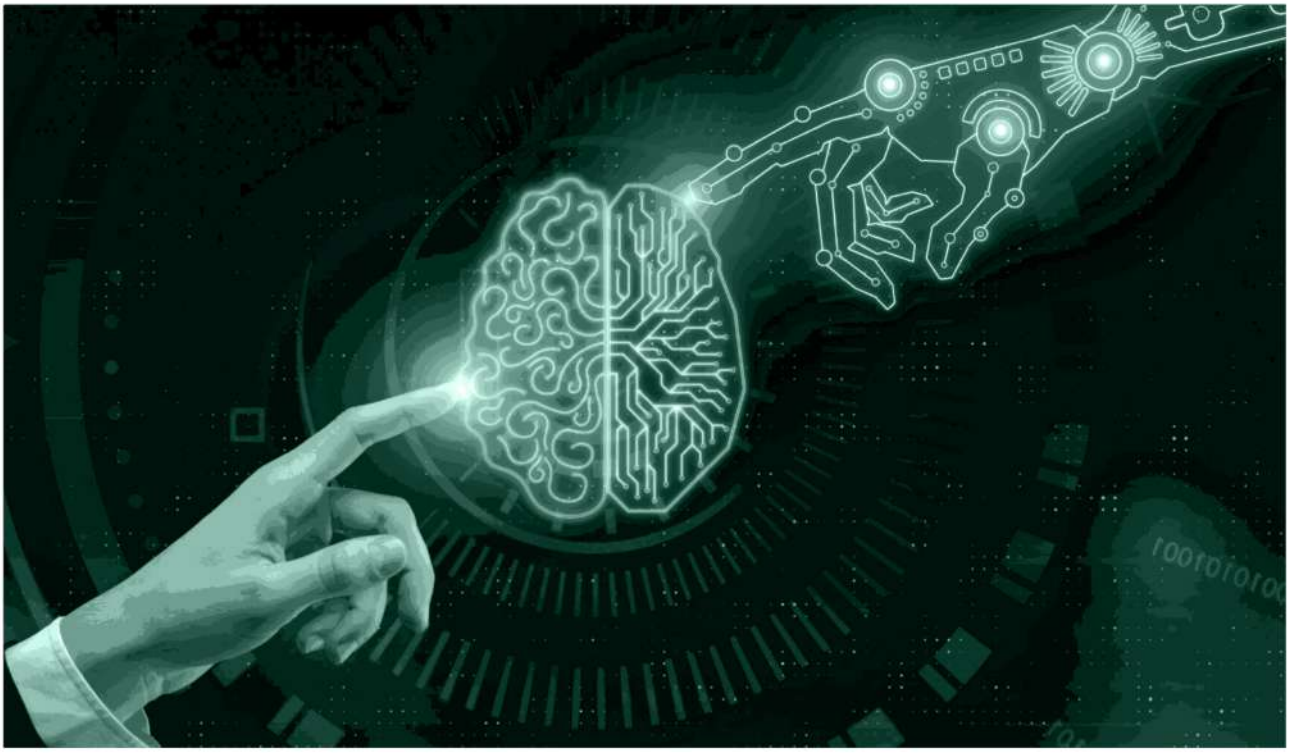
Role of Cost and Management Accountants (CMAs)

AI does not replace professionals—it changes their role.

CMAs can use AI for:

1. Measuring Sustainability Costs

- Cost of carbon emissions



- Waste management cost
- Energy consumption cost

2. Better Decision Making

- Compare sustainable vs traditional methods
- Analyse long-term benefits
- Support green investments

3. Data Validation and Control

- Ensure AI data is correct
- Maintain transparency
- Strengthen internal controls

In simple words, CMAs become strategic partners in sustainability.

Challenges in Using AI for ESG

Even though AI is useful, there are some challenges:

1. Data Issues

If data is wrong, AI results will also be wrong.

2. High Cost

Small companies may find AI expensive.

3. Bias in AI

AI can sometimes give unfair results if not properly designed.

4. Changing Regulations

ESG rules are still evolving.

Companies must be careful and responsible while using AI.

Future of AI in Sustainability

The future looks very promising.

- AI will track ESG in real time
- Smart factories will reduce waste automatically
- Supply chains will become fully transparent
- Climate risks will be predicted in advance

In coming years, companies without AI may struggle to meet ESG expectations.

Conclusion

Artificial Intelligence is changing how companies' approach ESG and sustainability. It helps in reducing pollution, improving social impact, and strengthening governance.

Real-world examples from companies like Microsoft, Tata Steel, Infosys, and Unilever show that AI is not just a theory—it is already working.

For professionals like CMAs, this is a big opportunity. By combining financial knowledge with AI tools, they can guide companies toward sustainable growth.

Sustainability is no longer a choice. And AI is making it achievable.

Final Thought

AI gives speed to decisions, but ESG gives direction. When both work together, businesses not only grow—but grow responsibly. SB

Corporate Sustainability Metrics: Key Insights on Nature Risks, Tech Recycling, and ESG Compliance in India

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Abstract

Imagine a world where a single storm wipes out billions in agricultural output, or where e-waste mountains choke urban landfills, or supply chains grind to a halt due to regulatory green walls. This isn't dystopian fiction—it's the stark reality of corporate sustainability risks unfolding today. For Indian businesses, from bustling tech parks in Bengaluru to logistics hubs in Mumbai, mastering ESG metrics isn't optional; it's survival. This article dives deep into game-changing sustainability benchmarks—nature-related financial exposures, tech giants' recycling feats, logistics innovations, and India's green finance surge—offering actionable insights for Cost & Management Accountants (CMAs), CFOs, and ESG leaders aiming to future-proof their operations. Drawing from cutting-edge data, we'll explore not just the numbers, but the strategies that turn compliance into competitive edge.[1][2] In India, where SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework is reshaping boardrooms and RBI's green bonds are reshaping finance, these metrics illuminate a path forward. With corporate India eyeing $5 trillion GDP ambitions, sustainability isn't greenwashing—it's the engine of resilient growth. Let's unpack the urgency, benchmarks, and blueprints.

ARTICLE-I

The $44 Trillion Nature Risk Tsunami: Why Companies Can't Afford to Ignore It

Picture this: a coffee giant loses access to shade-grown beans as deforestation accelerates, or a mining firm faces shutdowns from biodiversity loss. Globally, $44 trillion in economic value—half of global GDP—is tied to nature, heightening financial risk exposure for companies that fail to align land-sector standards with GHG Protocol guidelines. This isn't hyperbole; it's from rigorous analyses by bodies like the World Economic Forum and NGFS, spotlighting how nature degradation translates to stranded assets, supply disruptions, and litigation tsunamis.[1]

In India, the stakes skyrocket. Our economy relies heavily on nature-dependent sectors: agriculture (18% of GDP), forestry, and mining contribute over 10% directly, but ripple effects touch manufacturing and exports. Consider the 2025 floods in Assam—nature loss amplified losses to $2 billion, stranding insurer portfolios and farmer credit lines. Companies ignoring the new GHG Protocol Land Sector and Removals Standard risk Scope 3 emissions blind spots, where land-use changes account for 25-30% of corporate footprints. Non-alignment means BRSR penalties, investor flight (think BlackRock's nature screens), and TNFD-mandated disclosures that could slash valuations by 15-20%.[3]

Why the urgency? Nature risks are materializing faster than climate ones. A PwC report flags $9-11 trillion in immediate portfolio exposures for banks alone, with India's lenders holding nature-tied loans in agri-SMEs and infra. For CMAs, this demands revolutionizing cost audits: integrate natural capital accounting via tools like the ENCORE platform, quantify biodiversity credits, and model scenario risks under stress tests. Forward-thinking firms like Tata Steel are piloting regenerative agriculture, offsetting land risks while boosting yields 20%. The lesson? Act now—align with GHG standards to turn nature from liability to asset, safeguarding stakeholder value in an era of "planetary boundaries."

Real-world playbook: Adani Ports' mangrove restoration offsets 1 million tons CO2e annually, blending compliance with carbon markets. Indian firms must scale this, embedding nature metrics into ESG roadmaps to attract FDI and sovereign green funds.

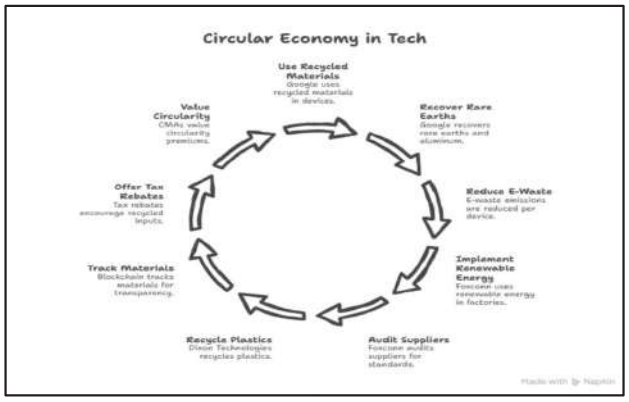
Google's Recycling Revolution: 50% Recycled Materials and What It Means for India's Tech Ecosystem

Fast-forward to 2025: Google proudly reports up to 50% recycled material use in select devices, hitting 48% recycled plastic across its hardware production. This isn't PR spin—it's verifiable progress from Pixel and Nest lines, slashing virgin plastic needs and diverting tons from landfills. Google's closed-loop approach—recovering rare earths and aluminum—embodies circular economy mastery, cutting e-waste emissions by 20-30% per device lifecycle.[4][5]

For India, home to 1.4 billion consumers and exploding smartphone demand (900 million units by 2026), this is a blueprint. Our e-waste crisis hits 10 million tons yearly, with only 22% recycled formally per CPCB. Tech majors like Foxconn, assembling iPhones in Chennai, amplify the call: their roadmap targets 75% renewable energy by 2030, plus rigorous supplier audits and labor standards upgrades. Imagine Foxconn's solar-powered factories powering 80% of output—emissions drop 40%, costs stabilize via RE100 alliances.[6][7]

Engaging challenge: Can Indian OEMs like Lava or Micromax hit 30% recycled content by 2028? MeitY's Extended Producer Responsibility (EPR) mandates it, but execution lags. Success stories emerge: Dixon Technologies recycles 15% plastics, partnering with recyclers for certified loops. Barriers? Supply chain opacity and cheap virgin imports. Solutions: Blockchain-tracked materials (IBM Food Trust style), tax rebates on recycled inputs, and CMA-led valuations pricing circularity premiums.

Impact metrics paint the picture: Google's shift saves $1 billion in materials yearly; scaled to India, it could recycle 2 million tons e-waste, create 50,000 green jobs, and boost ESG ratings for IPOs. For professionals, audit recycled content via life-cycle assessments (LCA), benchmark against PAS 2060, and advise on green certifications like TCO Edge. The tech recycling wave isn't coming—it's here, demanding Indian firms surf or sink.



Source: *Conceptualised & designed by the author using AI tools*

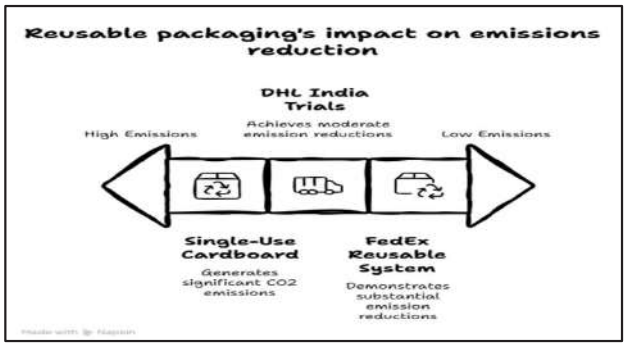
FedEx's Reusable Packaging Leap: Slashing Emissions in Closed-Loop Logistics

Logistics, the artery of global trade, pulses with emissions—8% of world CO2. Enter FedEx: their B2B reusable packaging system targets lower emissions across closed-loop networks, with pilots showing 64-88% reductions versus single-use cardboard. Powered by Returnity partnerships, boxes circulate 10-20 times, cutting waste and costs 30% while enabling real-time RFID tracking.[8][9]

India's logistics sector, valued at $215 billion and targeting $330 billion by 2025 under National Logistics Policy, hungers for this. E-commerce giants like Flipkart ship 2 billion parcels yearly, spewing 5 million tons CO2. Reusables could halve that, aligning with BRSR's resource efficiency KPIs. FedEx's model thrives on scale: closed loops minimize virgin pulp (1 ton cardboard = 17 trees), and data analytics optimize routes.

Case in point: DHL India's reusable trials for pharma cut emissions 45%, preserving cold chains. Challenges for us? Fragmented trucking (90% unorganized), poor reverse logistics (return rates 25%). Game-changers: PLI schemes funding reusable infrastructure, GST tweaks favoring loops, and CMA optimizations via ABC analysis for packaging costs.

Broader ripple: Lower emissions unlock EU CBAM exemptions, saving exporters $500 million duties. For CMAs, integrate into throughput costing, forecast ROI (payback <18 months), and champion supplier scorecards. FedEx proves reusables aren't niche—they're the future of resilient, low-carbon supply chains.



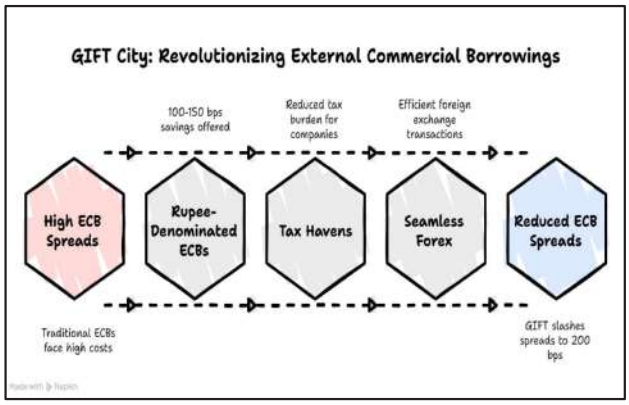
Source: *Conceptualised & designed by the author using AI tools*

GIFT City's ECB Surge: 70% Routing Signals India's Green Finance Pivot

In a quiet revolution, nearly **70% of India's External Commercial Borrowings (ECBs)** now route through GIFT City, per FY26 IFSCA data. This IFSC hub channels $18 billion sustainably-linked loans, prioritizing low-carbon infra and ESG projects under RBI's ECB framework.[2][10]

Why magnetic? GIFT offers rupee-denominated ECBs at 100-150 bps savings, tax havens, and seamless forex. Corporates like Reliance raise $2 billion green ECBs for solar farms, blending cost savings with BRSR disclosures. This shift supercharges ESG: 40% ECBs tie to sustainability KPIs like emissions cuts.

For Indian firms, it's transformative. Traditional ECBs via London/Singapore faced 300 bps spreads; GIFT slashes to 200 bps, freeing capital for net-zero transitions. CMAs must decode: structure masala bonds with ESG riders, audit green usage via assurance standards (ISAE 3000), and model forex hedges.



Source: *Conceptualised & designed by the author using AI tools*

Table of Impact:

Metric	Benchmark	Indian Opportunity
Nature Risks	$44T global exposure [1]	Agri/mining risk audits under BRSR
Recycled Tech Materials	50% Google, 48% plastic [4]	EPR compliance for 30% target
Renewables Target	Foxconn 75% by 2030 [5]	RE100 for export competitiveness
Emissions Reduction	FedEx 64-88% via reusables [8]	Logistics PLI for closed loops
ECB Green Routing	70% via GIFT City [2]	$20B sustainable financing unlock

Comparative Global vs. Indian Benchmarks: A Roadmap for Action

Zooming out, these metrics form a constellation:

Company/Trend	Key Metric	Reduction/Target	Indian Parallel
Nature Risks	$44T tied to nature [3]	Heightened financial risk	Adani mangroves (1M tCO2e offset)
Google Recycling	50% materials, 48% plastic [4][5]	E-waste diversion	Dixon 15% recycled plastics
FedEx Packaging	Lower emissions closed-loop [8][9]	64-88% CO2 cut	DHL pharma reusables (45% cut)
Foxconn Roadmap	75% renewables [6][7]	Supplier/labor upgrades	Tata Power RE100 push
GIFT City ECBs	70% routing [2][10]	Green loan surge	Reliance $2B solar ECBs

India lags globals but accelerates: BRSR Phase II mandates assurance, SEBI's ESG funds hit ₹50,000 crore. Globally, EU's CSRD demands double materiality; India mirrors with integrated reporting.

CMA's Strategic Playbook: From Metrics to Mastery

CMAs, you're the ESG vanguard. Steps:

1. Quantify Risks: Use IPAT models for nature impacts; $Impact = P \times A \times T$ where T=technology efficiency.[1]
2. Audit Circularity: LCA for recycling ROI; target 20% cost savings.
3. Optimize Logistics: Network models minimizing emissions: $min \sum c_{ij}x_{ij} + e_{ij}y_{ij}$.
4. Leverage GIFT: Structure ECBs with sustainability premiums (50 bps).
5. Report Boldly: BRSR+TNFD convergence for investor trust.

Case study: ITC's ESG overhaul—₹10,000 crore value unlocked via water-positive status. Scale nationally: $1 trillion green GDP add by 2030.

The Imperative Horizon: Sustainability as India's Superpower

As March 2026 unfolds, these metrics scream action. $44 trillion risks demand nature alignment; 50% recycling calls for circular tech; FedEx innovations green logistics; 70% ECB routing fuels finance. For Indian corporates, it's a trillion-dollar opportunity—mitigate, innovate, thrive.

CMAs: Lead with data-driven audits, turning metrics into mandates. Stakeholders: Demand transparency. Together, architect a sustainable India, where growth hugs the planet. Submit your ESG stories to *Sukhinobhavantu*—shape the narrative. SB

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ARTICLE-I

Circular Economy in Urban Local Bodies: *Lessons and Road Map from Pune Municipal Corporation*

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Deputy Chief Accounts & Finance Officer
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Abstract

India's urban local bodies are increasingly at the crossroads of rapid urbanisation, resource depletion, and climate imperatives. The circular economy (CE) presents a transformative paradigm that moves beyond the conventional linear 'take-make-dispose' model toward a regenerative system where waste becomes a resource. Pune Municipal Corporation (PMC), managing a city of over 7.2 million people with an annual budget exceeding ₹12,000 crores, has positioned itself at the frontier of this transition. This article examines PMC's multi-dimensional initiatives across solid waste management, water recycling, construction debris reuse, and green procurement — analysing both achievements and persistent gaps. Drawing on municipal finance frameworks, ESG principles, SDG alignment, and global best practices, it outlines a credible road map for embedding circular economy principles into urban governance at scale. The article argues that circular economy integration in ULBs is not merely an environmental imperative but a compelling fiscal strategy that can reduce operational costs, unlock new revenue streams, and strengthen the long-term financial sustainability of India's cities.

ARTICLE-II

Introduction: The Urban Resource Paradox

India's cities consume approximately 75% of the nation's total energy and generate nearly 62 million tonnes of municipal solid waste annually, of which only 20% is processed scientifically (MoHUA, 2023). This structural inefficiency represents not just an environmental liability but a colossal financial haemorrhage for urban local bodies (ULBs). The linear economy model — extract, produce, consume, discard — is fundamentally incompatible with the realities of 21st century urban governance.

The circular economy (CE) offers a systemic response. Defined by the Ellen MacArthur Foundation, the CE is a 'restorative and regenerative' model by design that keeps materials, products, and resources in use for as long as possible. For a municipal corporation like PMC, this translates into tangible opportunities: converting waste streams into revenue, reducing procurement expenditure through material reuse, lowering carbon footprints, and future-proofing city infrastructure against resource price volatility.

Pune, as Maharashtra's second-largest city, presents a compelling laboratory for circular economy experimentation. With a formally adopted Pune City Climate Action Plan (PCCAP), a robust civic budget, and an engaged citizenry, PMC has the institutional infrastructure necessary to pilot and scale circular economy frameworks. This article analyses the current state of PMC's circular economy journey, identifies structural barriers, and presents a multi-layered road map aligned with national policy goals, SDGs, and ESG best practices.

Understanding Circular Economy In The Municipal Context

1. Core Principles

The circular economy rests on three foundational principles: (i) designing out waste and pollution, (ii) keeping products and materials in use at their highest utility, and (iii) regenerating natural systems. For ULBs, these principles manifest across solid waste management, water systems, construction materials, energy, and urban agriculture.

2. Fiscal Relevance for ULBs

Municipal corporations are simultaneously the largest consumers and largest waste generators within their jurisdictions. A circular economy lens

repositions waste from a cost centre to a potential revenue centre. Biogas from organic waste can offset energy bills; recycled construction material can reduce capital project costs; treated wastewater can substitute freshwater in industrial and horticultural applications. For PMC, which manages infrastructure assets worth several thousand crores, even marginal improvements in material efficiency can yield significant fiscal dividends.

Moreover, circular economy principles align directly with ESG frameworks increasingly demanded by capital markets. As PMC pursues green municipal bonds and potential InvIT structures for infrastructure monetisation, demonstrable ESG performance — including circular economy metrics — will be a critical factor in investor due diligence and credit rating assessments.

PMC's Circular Economy Initiatives: An Assessment

1. Solid Waste Management — From Disposal to Resource Recovery

PMC generates approximately 2,100 metric tonnes per day (MTD) of municipal solid waste. Under the Swachh Bharat Mission and the Solid Waste Management Rules 2016, PMC has made substantial strides in waste segregation and processing. The decentralised composting programme — operational across 200+ housing societies — converts organic waste into compost that is sold back to residents and civic departments, creating a closed-loop urban agriculture cycle.

PMC's partnership with SWaCH (Solid Waste Collection and Handling), a pioneering waste-picker cooperative, exemplifies inclusive circular economy design. By formalising the role of informal waste-pickers in the recycling value chain, PMC has simultaneously enhanced recycling rates, created dignified livelihoods, and reduced tipping fees at landfill sites. As of 2023-24, SWaCH processes over 500 tonnes of dry recyclables monthly, diverting significant quantities of paper, plastic, glass, and metal from landfill.

However, persistent challenges remain. Segregation compliance among commercial establishments is erratic. The Uruli Devachi and Phursungi landfill sites continue to receive mixed waste, generating methane emissions and leachate contamination. Transition from a disposal-centric model to a full resource-recovery model requires significant capital investment in material recovery facilities (MRFs) and biomethanation plants.

2. Construction and Demolition Waste — A Circular Opportunity

Pune's booming real estate sector generates an estimated 3,000-4,000 tonnes per day of construction and demolition (C&D) waste — a largely underutilised resource stream. PMC established a C&D waste processing facility at Mhalunge, capable of processing 500 tonnes per day. Crushed aggregate produced at this facility has been used in road sub-base construction and paver block manufacturing, demonstrating the viability of a circular materials loop in urban construction.

Yet, illegal dumping of C&D waste remains rampant. The full potential of this facility remains constrained by inadequate collection infrastructure, weak enforcement of C&D waste rules, and limited demand aggregation for recycled material from PMC's own capital works. A mandatory recycled content policy in PMC tenders — requiring a minimum percentage of recycled aggregate in qualifying infrastructure projects — could significantly stimulate demand and close the loop.

3. Wastewater and Water Recycling

PMC operates multiple Sewage Treatment Plants (STPs) with a combined installed capacity of over 500 MLD. Treated water from these STPs is increasingly being channelled for non-potable applications including road-washing, horticulture, and industrial use. The Bhairoba STP is a landmark example, supplying treated water to industrial estates in Hadapsar, reducing freshwater drawdown and generating a modest but meaningful revenue stream for PMC.

Expansion of the treated wastewater reuse programme holds enormous circular economy potential. Pune faces water stress projections under multiple climate scenarios, and treated water represents a reliable, low-carbon second source. However, legal clarity on treated water pricing, infrastructure for tertiary treatment and distribution, and regulatory frameworks for industrial reuse still require attention.

4. Green Procurement and Circular Supply Chains

PMC's procurement function — spanning stationery, IT equipment, vehicles, street furniture, and construction materials — represents a significant lever for circular economy mainstreaming. Green public procurement (GPP) policies that prioritise products with recycled content, extended producer responsibility compliance, and end-of-life take-back provisions can signal market demand and nudge suppliers toward circular product design.

PMC has begun incorporating sustainability criteria in select procurement categories. Scaling this to a comprehensive GPP policy — aligned with BIS standards, Bureau of Energy Efficiency guidelines, and international best practices — requires capacity building in procurement teams, revised tender documentation standards, and clear life-cycle cost assessment frameworks.

Financial Architecture For Circular Economy Investment

Circular economy transitions require upfront capital investment in infrastructure (MRFs, biogas plants, advanced STPs, C&D processing units) and enabling systems (digital waste tracking, smart metering, GIS-based asset management). Several financing instruments are available to PMC:

- Green Municipal Bonds: PMC was India's first ULB to issue a municipal bond in 2017 and the first to issue a green bond in 2019, raising ₹200 crores for water infrastructure. Circular economy projects — with clearly defined use-of-proceeds, measurable environmental impact indicators, and third-party verification — are highly bankable under green bond frameworks.
- AMRUT 2.0 and Smart Cities Mission: National programme funding can be strategically directed toward circular economy infrastructure, particularly in water recycling, solid waste processing, and green public spaces.
- Viability Gap Funding (VGF): For circular economy PPP projects with long gestation periods, VGF support from the state government or national agencies can bridge the financial gap and attract private operators.
- Carbon Credits and Environmental Markets: Biogas plants and composting facilities generate measurable greenhouse gas emission reductions that can be monetised as carbon credits under the proposed Carbon Credit Trading Scheme (CCTS) of India, providing an additional revenue stream.

The key financial principle is to demonstrate circular economy projects as bankable assets — with predictable cash flows from resource sales, tipping fee revenues, and environmental service payments — rather than as public subsidies. This repositioning is fundamental to unlocking private capital at scale.

Road Map: Embedding Circular Economy In PMC's Governance

1. Short-Term (1–2 Years)

PMC should adopt a formal Circular Economy Policy with measurable targets, designate a Circular Economy Cell within its administration, and integrate CE metrics into its Annual Performance Report and sustainability disclosures. Immediate priorities include completing waste segregation enforcement, operationalising the C&D waste facility at full capacity, and launching a pilot green procurement policy for at least five major procurement categories.

2. Medium-Term (3–5 Years)

Scale the treated wastewater reuse programme to supply 20% of Pune's non-potable industrial demand. Establish two additional decentralised biomethanation plants in high-density residential zones. Develop a PMC-specific ESG reporting framework aligned with GRI Standards and SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework, leveraging the existing SAP ERP infrastructure for real-time data capture and reporting.

3. Long-Term (5–10 Years)

Position PMC as a net-zero waste city by 2035, with all waste streams either composted, recycled, converted to energy, or reused as secondary raw material. Issue a second green bond — or potentially a Social and Sustainability Bond — specifically for circular economy infrastructure, targeting institutional ESG investors and green climate funds. Explore InvIT structures for operating circular economy assets (STP clusters, MRF networks) to unlock balance-sheet liquidity and attract infrastructure-grade capital.

Governance And Regulatory Enablers

Circular economy mainstreaming in ULBs requires not just financial capital but regulatory innovation. Several governance reforms are needed at the PMC level and in collaboration with the state government:

First, PMC's municipal bylaws need to be updated to mandate extended producer responsibility (EPR) compliance reporting by bulk waste generators operating within city limits. Second, a city-level resource exchange platform — connecting waste generators with recyclers and secondary material users — can be developed leveraging digital public infrastructure. Third, PMC's internal audit and compliance function should expand its ESG audit mandate to include circular economy performance indicators, ensuring accountability alongside financial compliance.

Capacity building for PMC engineers, procurement officers, and budget-planning teams on circular economy principles, life-cycle costing, and ESG metrics is non-negotiable. IIM Calcutta's Executive Programme in Public Policy and Management and similar institutions offer structured learning pathways that can bridge the knowledge gap between administrative practitioners and sustainability frameworks.

Esg Alignment And SDG Linkages

The circular economy agenda at PMC aligns powerfully with multiple ESG dimensions. On the Environmental axis, it directly addresses SDG 11 (Sustainable Cities), SDG 12 (Responsible Consumption and Production), SDG 6 (Clean Water), and SDG 13 (Climate Action). On the Social axis, the formalisation of waste-pickers through SWaCH and the creation of green jobs addresses SDG 8 (Decent Work) and SDG 1 (Poverty Reduction). On the Governance axis, transparent reporting, third-party verification of environmental claims, and compliance with central regulations strengthens institutional credibility and investor confidence.

For PMC as a bond issuer and prospective capital market participant, robust ESG performance linked to circular economy outcomes will directly influence credit ratings, cost of borrowing, and access to global green finance pools. The International Finance Corporation, Asian Development Bank, and European Investment Bank all have dedicated green city financing windows that reward demonstrated circular economy progress.

Conclusion

The circular economy is not a utopian concept — it is an operational strategy whose time has arrived for India's major municipal corporations. Pune Municipal Corporation, with its institutional depth, existing initiatives, and capital market credibility, is uniquely positioned to lead this transformation. Transitioning from the linear to the circular model is simultaneously an environmental imperative, a fiscal strategy, and a governance reform agenda.

The road ahead demands visionary leadership, cross-departmental collaboration, financial innovation, and an unwavering commitment to data-driven performance management. For India's urban future to be sustainable and equitable, circular economy integration in ULBs must move from pilot to policy, from project to programme, and from aspiration to accountability.

"Sustainability is not a choice — it is a responsibility." — *Sukhino Bhavantu*

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Vasudhaiva Kutumbakam

VK Webinar Series of the Sustainability Standards Board

57th Webinar

Capital Market & Sustainability in Kenya

Friday | May 8, 2026 | 4pm- 5:15pm (India), 1:30pm - 2:45pm (Kenya)

Mr. Edwin Ongera

CMA (Dr.) Aditi Dasgupta

The Sustainability Standards Board (SSB), ICMAI organized the 57th edition of the *Vasudhaiva Kutumbakam* Series on May 8, 2026, from 4:00 p.m. to 5:15 p.m., on the theme "Capital Market and Sustainability in Kenya". The distinguished speaker for the session was Mr. Edwin Ongera, Assistant Director, Issuer Governance and Sustainability, Capital Markets Authority ,Kenya. CMA (Dr.) Aditi Dasgupta, Joint Director, ICMAI introduced the speaker and provided the theme and the objective for hosting the webinar.

The speaker commenced his presentation by emphasizing the growing importance of sustainability in shaping corporate strategy and performance globally. He highlighted that international sustainability reporting standards have evolved from voluntary initiatives to mandatory compliance frameworks, reflecting a significant shift in corporate governance and accountability. He noted that countries worldwide are increasingly adopting sustainability standards in response to climate risks and environmental challenges. The speaker discussed the impact of extreme weather events on human life, biodiversity, and ecosystems, stressing the urgent need for climate adaptation and achievement of net-zero goals. He elaborated on the significance of the Paris Climate Agreement, the role of the Conference of Parties (COP), and the importance of global cooperation in climate adaptation, carbon credit systems, greenhouse gas emission reduction, and climate finance initiatives. The presentation also covered biodiversity conservation, climate finance architecture, and the evolution of global ESG reporting frameworks. The speaker explained the International Sustainability Standards Board (ISSB) standards, namely IFRS S1 and IFRS S2, relating to sustainability and climate-related financial disclosures. He stated that nearly 36 countries have adopted or are in the process of adopting these standards, marking a global transition from voluntary frameworks such as GRI to mandatory sustainability reporting practices. Further, the speaker discussed key European Union regulations including the Corporate Sustainability Reporting Directive (CSRD) and Sustainable Finance Disclosure Regulation (SFDR). He highlighted the rapid growth of sustainable finance through green bonds, social bonds, sovereign sustainability bonds, and other innovative financial products. Special emphasis was laid on Africa's emerging role in the global sustainability movement. Although Africa contributes only around 4% of global greenhouse gas emissions, it is positioning itself as a "Green Continent" through renewable energy initiatives, green hydrogen production, and the creation of green jobs. Kenya was cited as an example for its climate transition initiatives, including its commitment to achieving net-zero emissions by 2050, development of sustainability frameworks, climate taxonomies, and establishment of a National Carbon Registry. The speaker also deliberated on green finance, carbon market regulations, governance, accountability, integrated reporting, and Sustainability Assurance Frameworks. Strategic collaborations among Kenya, India, and European Union countries in sustainability and climate initiatives were highlighted as important drivers for global cooperation and knowledge sharing. Overall, the session provided valuable insights into the evolving global sustainability landscape, mandatory sustainability reporting standards, sustainable finance ecosystems, and international collaborative efforts towards climate resilience and sustainable development.

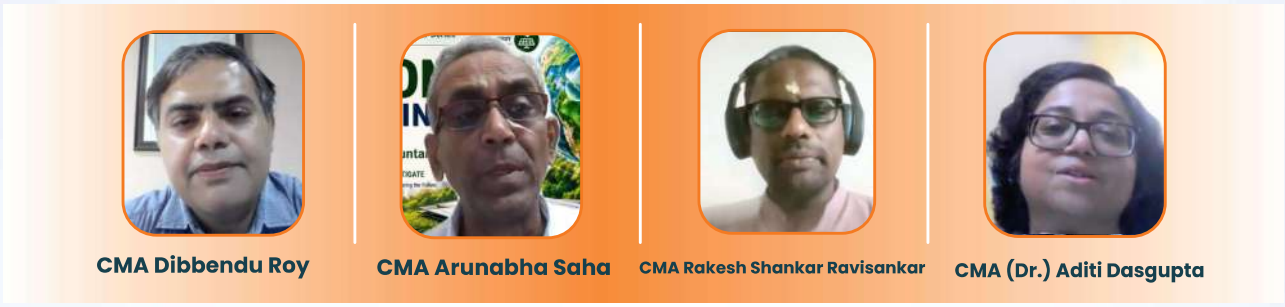
The session concluded with a question-and-answer segment, wherein participants gained valuable insights from the speaker's responses. The webinar concluded with a vote of thanks rendered by CMA (Dr.) Aditi Dasgupta, Joint Director.

Vasudhaiva Kutumbakam
VK Webinar Series of the Sustainability Standards Board

58th Webinar

Carbon Accounting -Role of CMA

Friday | May 22, 2026 | 4pm- 5:15pm



The Sustainability Standards Board (SSB), ICMAI organized the 58th edition of the *Vasudhaiva Kutumbakam* Series on May 22, 2026, from 4:00 p.m. to 5:15 p.m., on the theme "Carbon Accounting- Role of CMA". The distinguished speaker for the session was CMA Rakesh Shankar Ravisankar, Faculty of Commerce, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai. CMA Arunabha Saha, Coordinator introduced the topic and stated the various facets of carbon accounting and how CMAs are instrumental in the entire ecosystem. CMA (Dr.) Aditi Dasgupta, Joint Director, ICMAI introduced the speaker and set the tone of the webinar with her opening thoughts on the topic.

The session also explored the linkage between carbon accounting and carbon footprint measurement, along with various carbon reduction techniques and sustainable investing practices. The speaker elaborated on the major carbon accounting methodologies, namely the spend-based method, activity-based method, and hybrid method. He discussed Scope 1, Scope 2, and Scope 3 emissions and explained the relevance of the Task Force on Climate-related Financial Disclosures (TCFD) framework in sustainability reporting and management practices. Further, the speaker deliberated on green finance modules, financial carbon accounting modules, carbon assurance modules, and the quantification and management aspects of carbon accounting integrated with greenhouse gas emission modules. Through practical case studies, he demonstrated how organizations can adopt carbon accounting platforms and value maturity models to strengthen sustainability practices. He also elaborated on the five core capability areas of Carbon Accounting Principles and shared several best practices and practical applications relevant to professionals and organizations.

The session concluded with a question-and-answer session, wherein participants queries were replies by the speaker. The webinar concluded with the closing remarks of CMA Dibbendu Roy, Additional Director and vote of thanks offered by CMA (Dr.) Aditi Dasgupta, Joint Director.

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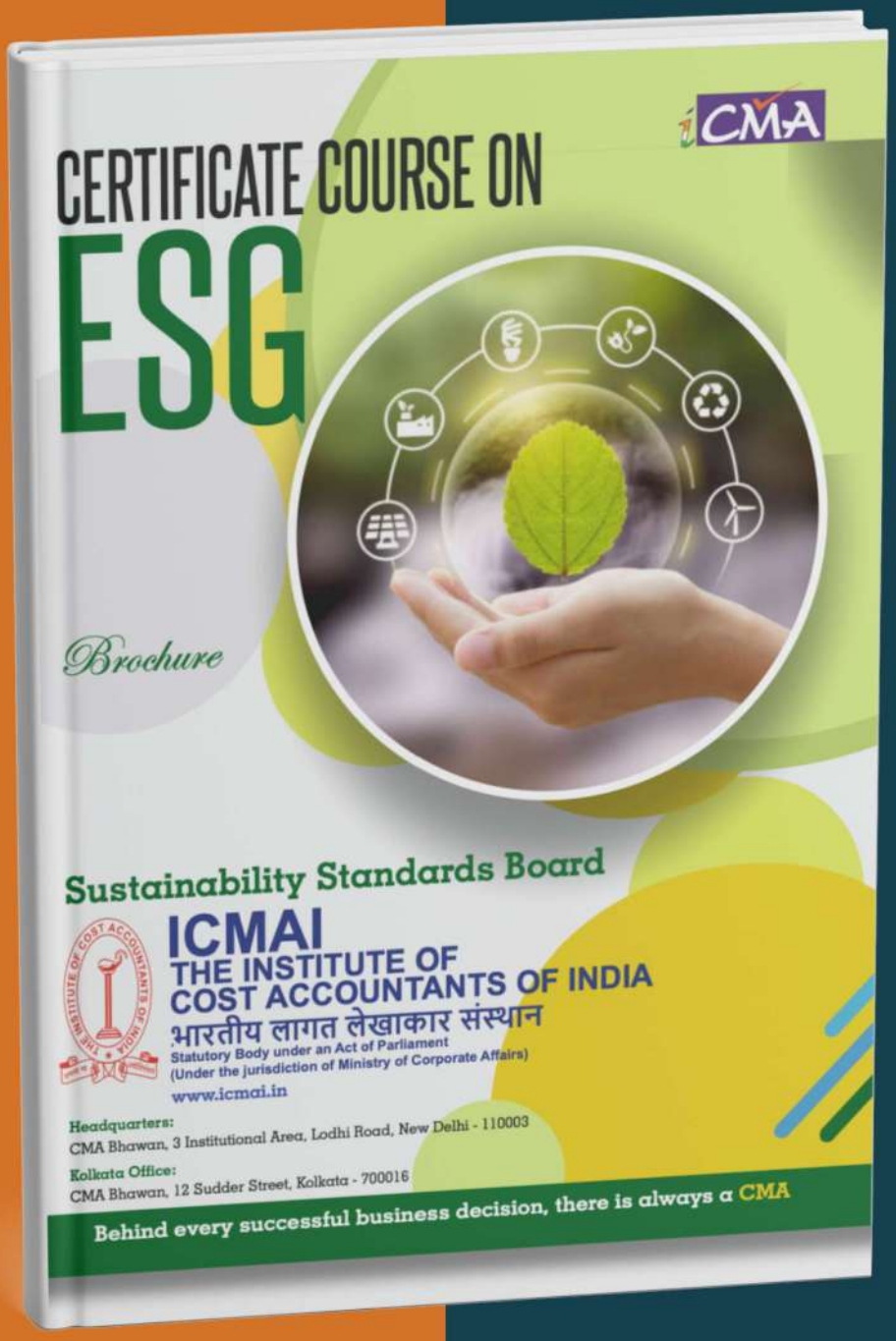

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Green Hydrogen: A Strategic Pathway to Sustainable Development and Energy Security in India

CMA (Dr.) Aditi Dasgupta
Joint Director
The Institute of Cost Accountants of India
Kolkata

Abstract

The global transition toward low-carbon energy systems has accelerated the search for sustainable alternatives to fossil fuels. Green hydrogen, produced through renewable-powered electrolysis, has emerged as a promising solution for decarbonizing hard-to-abate sectors while enhancing energy security. This paper examines the concept, environmental implications, applications, and policy framework of green hydrogen in India, with particular emphasis on the National Green Hydrogen Mission. It further explores the critical role of Cost and Management Accountants in ensuring the economic viability and strategic implementation of green hydrogen projects. The study concludes that while green hydrogen offers significant environmental and economic benefits, its success depends on cost optimization, infrastructure development, and robust policy support.

Introduction

Climate change and environmental degradation have compelled nations to rethink their energy strategies. Fossil fuel dependence has not only contributed to greenhouse gas emissions but has also created vulnerabilities in energy security. In this context, green hydrogen has emerged as a viable alternative capable of supporting deep decarbonisation across multiple sectors.

India, as one of the fastest-growing economies, faces the dual challenge of sustaining economic growth while reducing its carbon footprint. Recognizing this, the Government of India has launched the National Green Hydrogen Mission, aiming to position the country as a global hub for green hydrogen production and export. This initiative reflects a broader strategic vision of achieving energy independence alongside environmental sustainability.

Concept and Production of Green Hydrogen

Green hydrogen refers to hydrogen produced through the electrolysis of water using renewable energy sources such as solar and wind. Unlike conventional hydrogen production methods, which rely on fossil fuels, this process does not emit carbon dioxide, thereby making it environmentally sustainable.

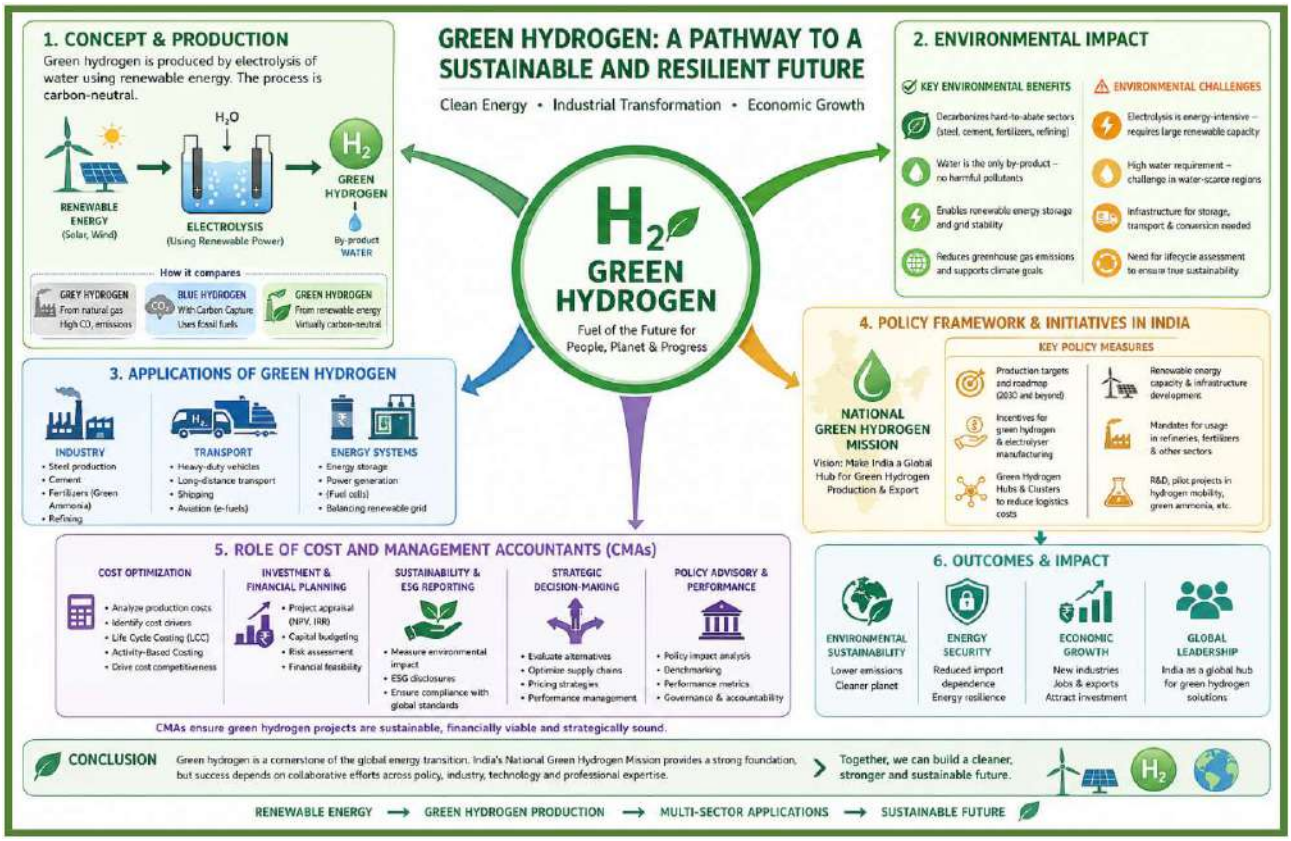
The distinction between green hydrogen and other forms is crucial. Grey hydrogen is produced from natural gas and is associated with high emissions, while blue hydrogen incorporates carbon capture technologies but still depends on fossil fuels. Green hydrogen, by contrast, is virtually carbon-neutral, positioning it as a cornerstone of future clean energy systems.

Environmental Impact of Green Hydrogen

The environmental significance of green hydrogen lies in its ability to decarbonize sectors that are otherwise difficult to electrify. Industries such as steel, cement, fertilizers, and refining can significantly reduce their emissions by substituting fossil fuels with green hydrogen. Additionally, the use of hydrogen as a fuel results in water as the only by-product, thereby eliminating harmful pollutants.

Another critical benefit is its role in supporting renewable energy systems. Green hydrogen can act as an energy storage medium, enabling the utilization of surplus renewable power and stabilizing energy grids. This enhances the overall efficiency and reliability of renewable energy deployment.

However, the environmental advantages are accompanied by certain challenges. The electrolysis process is energy-intensive and requires substantial



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renewable power capacity. Furthermore, the production process demands significant quantities of water, which may pose challenges in water-scarce regions. Infrastructure development for storage, transportation, and conversion also has environmental and economic implications. Therefore, a lifecycle perspective is essential to ensure that green hydrogen remains truly sustainable.

Applications of Green Hydrogen

Green hydrogen has diverse applications across industrial, transport, and energy sectors. In industrial processes, it can replace carbon-intensive inputs in steel production and serve as a feedstock in fertilizer manufacturing through green ammonia. In the transport sector, hydrogen-based fuels offer a viable solution for long-distance and heavy-duty transportation, where battery-electric alternatives may not be practical.

In addition, green hydrogen contributes to energy systems by enabling large-scale storage of renewable energy and facilitating its use in electricity generation through fuel cells. Its versatility as both an energy carrier and industrial input underscores its strategic importance in the global energy transition.

Policy Framework and Government Initiatives in India

India's policy framework for green hydrogen is anchored in the National Green Hydrogen Mission, which outlines an ambitious roadmap for production, utilization, and export. The mission targets substantial annual production by 2030, along with significant investments in renewable energy capacity and infrastructure.

Supporting this mission are several policy measures, including incentive schemes for hydrogen production and electrolyser manufacturing, initiatives to promote domestic manufacturing, and mandates for green hydrogen usage in key industries such as refineries and fertilizers. The development of green hydrogen hubs and clusters is also envisaged to reduce logistics costs and enhance efficiency.

Furthermore, the government is actively promoting research, development, and pilot projects in areas such as hydrogen mobility and green ammonia. These efforts reflect a comprehensive approach to building a robust hydrogen ecosystem in India.

Role of Cost and Management Accountants

The transition to green hydrogen involves substantial capital investment and complex cost structures, making the role of Cost and Management Accountants (CMAs) particularly significant. As emphasized by the Institute of Cost Accountants of India, CMAs contribute to multiple dimensions of green hydrogen development.

They play a vital role in cost optimization by analyzing production costs, identifying key cost drivers, and applying advanced costing techniques such as life cycle costing and activity-based costing. Their expertise is essential in reducing the cost of green hydrogen to competitive levels.

In addition, CMAs are instrumental in investment appraisal and financial planning. They evaluate large-scale projects using tools such as net present value and internal rate of return while assessing associated risks. Their role extends to sustainability and ESG reporting, where they measure environmental impact and ensure alignment with global reporting standards.

Strategic decision-making is another area where CMAs add value. They assist organizations in evaluating alternatives, optimizing supply chains, and developing competitive pricing strategies. Moreover, their involvement in policy advisory and performance measurement enhances the overall effectiveness and accountability of green hydrogen initiatives.

Conclusion

Green hydrogen represents a transformative opportunity to achieve environmental sustainability, energy security, and economic growth simultaneously. Its ability to decarbonize key sectors, coupled with its versatility as an energy carrier, makes it a critical component of the global energy transition.

In the Indian context, the National Green Hydrogen Mission provides a strong policy foundation for scaling up green hydrogen production and usage. However, challenges related to cost, infrastructure, and resource requirements must be addressed to realize its full potential.

The role of Cost and Management Accountants is central to this transition, as they ensure that green hydrogen projects are not only environmentally sustainable but also economically viable and strategically sound. With coordinated efforts across policy, industry, and professional domains, green hydrogen can pave the way for a cleaner and more resilient energy future. SB

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ESG as Risk Architecture: Climate, Social and Governance Risks

Part III

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Abstract

Environmental, Social and Governance (ESG) concerns have gradually evolved from voluntary ethical commitments into central components of institutional risk management. Climate volatility, governance failures, labour concerns, supply-chain disruptions and social instability increasingly influence financial resilience and long-term enterprise sustainability. This article examines ESG through the framework of Enterprise Risk Management (ERM), focusing on India's emerging climate-risk architecture through Business Responsibility and Sustainability Reporting (BRSR) Core, evolving climate disclosure expectations and the growing engagement of the Reserve Bank of India with climate-related financial risks. The article further compares India's evolving approach with international developments such as the Task Force on Climate-related Financial Disclosures framework, European Union climate stress testing models and the climate disclosure proposals of the U.S. Securities and Exchange Commission. It argues that ESG governance across jurisdictions is converging toward mandatory scenario analysis, measurable disclosures and sustainability-integrated institutional governance.

Conceptual Foundation

Traditional models of risk management largely concentrated on financial uncertainty, operational inefficiencies and regulatory compliance. However, the emergence of ESG has fundamentally altered the understanding of institutional risk by expanding it beyond conventional financial parameters. Climate change, social instability and governance failures are now recognised as material threats capable of affecting enterprise continuity, investor confidence and economic stability.

Environmental risks such as floods, heatwaves, water scarcity and carbon transition pressures increasingly influence operational performance and asset valuation. At the same time, social concerns relating to labour standards, diversity, data privacy and stakeholder trust affect institutional legitimacy and market reputation. Governance risks, including corruption, opaque disclosures and weak board oversight, continue to trigger systemic failures across organisations and economies.

Consequently, ESG has shifted from being a peripheral sustainability initiative to becoming an integral part of Enterprise Risk Management (ERM). Institutions are now expected not merely to disclose sustainability commitments, but to identify, measure and manage ESG-related risks in a structured and auditable manner. This transformation reflects a broader movement from symbolic sustainability toward measurable governance accountability.

Indian Regulatory & Institutional Context

India's ESG governance ecosystem is undergoing a significant transition as regulators increasingly integrate sustainability considerations into disclosure systems, financial supervision and corporate governance frameworks.

One of the most important developments in this regard is the Business Responsibility and Sustainability Reporting (BRSR) framework introduced by the Securities and Exchange Board of India. The BRSR framework marked a departure from purely narrative sustainability reporting by encouraging structured and measurable ESG disclosures. The subsequent introduction of BRSR Core further strengthened this approach by identifying key quantitative indicators relating to greenhouse gas emissions, energy usage, workforce diversity, occupational safety and supply-chain sustainability.

A notable feature of the Indian framework is its increasing emphasis on value-chain accountability. ESG obligations are no longer confined to the

Source: *Conceptualised & designed by the author using AI tools*

organisation alone but are gradually extending toward suppliers, vendors and operational ecosystems. This demonstrates the recognition that sustainability risks are interconnected and systemic rather than isolated organisational concerns.

Simultaneously, climate disclosure expectations in India are evolving in response to both domestic and international pressures. Investors, regulators and financial institutions increasingly view climate-related information as financially material. Climate exposure now influences capital allocation, credit decisions, insurance assessments and long-term investment strategy. As a result, organisations are expected to disclose not only sustainability initiatives but also the financial implications of climate-related risks and transition challenges.

The role of the Reserve Bank of India in this transition is particularly significant. Through discussion papers and policy observations, the RBI has acknowledged climate change as a potential source of macroeconomic and financial instability. It has highlighted the impact of physical climate risks on infrastructure and productive assets, as well as transition risks arising from shifts toward low-carbon economies. The RBI's evolving approach indicates that climate considerations may gradually become embedded within prudential supervision, stress testing and financial risk assessment frameworks.

This represents a major institutional shift in India's governance philosophy. Sustainability is no longer treated merely as corporate social responsibility; it is increasingly being integrated into the architecture of financial regulation and economic stability.

Global Comparative Perspective

India's evolving ESG risk framework must be understood within the broader context of global regulatory convergence toward climate-integrated governance.

A major international milestone in this direction was the emergence of the Task Force on Climate-related Financial Disclosures framework. TCFD fundamentally transformed sustainability reporting by structuring climate disclosure around four core pillars: governance, strategy, risk management, and metrics and targets. More importantly, it introduced the concept of climate scenario analysis, requiring organisations to assess how different climate pathways could affect their operations, financial resilience and long-term viability.

The significance of TCFD lies in its treatment of climate change as a financial and strategic risk rather than solely an environmental issue. This approach has influenced regulatory frameworks across multiple jurisdictions and has accelerated the movement toward mandatory climate-related disclosure systems.

The European Union has gone even further by integrating climate risk into financial supervision through climate stress testing mechanisms. Institutions such as the European Central Bank assess how banks and financial systems would respond under different climate scenarios involving extreme weather events, carbon taxation and rapid energy transition policies. These stress tests operationalise ESG risk within prudential governance and capital adequacy frameworks.

The European model is particularly important because it quantitatively embeds sustainability within banking supervision and financial resilience assessment. ESG is therefore treated not as a parallel reporting exercise but as a core determinant of institutional stability and systemic risk management.

In the United States, the U.S. Securities and Exchange Commission proposed extensive climate disclosure requirements aimed at standardising sustainability-related reporting for listed companies. The proposals focus on governance structures, material climate risks, emissions disclosures and the financial implications of climate-related events. Although regulatory debates continue regarding implementation and scope, the proposals reflect a broader international shift toward mandatory ESG disclosure and accountability.

Taken together, these global developments indicate that ESG governance is steadily moving toward a model based on measurable disclosures, scenario analysis and integrated risk supervision.

Implications for CMA Professionals

The integration of ESG into institutional risk architecture significantly expands the professional responsibilities of Cost and Management Accounting practitioners.

Traditionally, CMAs have been associated with budgeting, cost analysis, performance evaluation and financial control. However, the emergence of sustainability-linked governance requires professionals capable of connecting environmental and social variables with economic decision-making. This creates a strategic role for CMAs in sustainability accounting, climate-risk measurement, ESG data assurance and integrated reporting systems.

As organisations move toward mandatory sustainability disclosures, the credibility and auditability of ESG information become increasingly important. CMAs are therefore positioned to contribute to the design of internal controls, measurement frameworks and assurance mechanisms capable of supporting reliable ESG reporting.

Furthermore, ESG integration requires translating sustainability risks into measurable financial implications. Carbon pricing affects product costing, resource scarcity influences operational planning and governance failures directly impact enterprise valuation. Such developments require accounting professionals to move beyond traditional financial analysis toward multidimensional risk assessment and long-term strategic evaluation.

The profession is consequently evolving from financial stewardship toward sustainability stewardship, where CMAs become central participants in building resilient and accountable institutions.

Way Forward

The future of ESG governance lies in institutional integration rather than fragmented compliance. Sustainability can no longer be treated as a separate reporting exercise or a reputational initiative disconnected from enterprise strategy. Environmental, social and governance risks increasingly influence financial resilience, investor confidence, capital access and long-term organisational survival.

India presently stands at an important transitional stage in this evolution. While its ESG framework remains comparatively less prescriptive than some advanced jurisdictions, regulatory developments clearly indicate movement toward greater standardisation, quantitative disclosures, assurance-based reporting and climate-risk integration. Over time, India is likely to adopt more sophisticated approaches involving climate stress testing, transition-risk assessment and scenario-based governance systems.

For CMA professionals, this transformation presents both a challenge and an opportunity. The future demands professionals capable of integrating sustainability, governance, economics and risk analytics into a unified institutional framework. ESG therefore represents not merely a reporting requirement but a deeper restructuring of governance philosophy itself.

Ultimately, the movement from inner governance to institutional governance reflects a broader civilisational transition — one in which accountability, resilience and long-term sustainability become central principles of economic and institutional life. SB

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Board Diversity for Better Governance

Part IV

Usha Ganapathy Subramanian
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Abstract

As ownership is separated from management in companies, board composition becomes crucial. Board diversity ensures fairness in decision-making, and has the added benefit of enhancing the quality of decisions aimed at corporate success. Diversity must be multi-dimensional – including executive vs. non-executive balance, promoter vs. non-promoter balance, and variety in terms of experience, skill sets, gender, representation of stakeholder perspectives in order for the board decisions to be fair to all stakeholders.

In the previous editions of this column, we delved on the importance of governance, the journey conversations on sustainability in the corporate board rooms, and explored redefining corporate success in the light of sustainability outcomes. In this edition, we shall explore why board diversity matters and looking at diversity from a multi-dimensional viewpoint.

Need for board diversity

Stakeholder perspective

In a corporate setup, ownership is separated from management through the layer of governance. The governing body – the board of directors – is vested with the power and responsibility to oversee management, among other crucial functions. The owners – the shareholders – do not have inherent rights to manage the business, and are not privy to internal matters like board room discussions or books of account. While the shareholders are vested with the rights of voting on the matters requiring shareholder approval under the applicable laws, which, of course, includes appointment of directors, the other stakeholder groups do not have such rights either. Hence, the boards must act as the voice and conscience of all stakeholder groups, irrespective of whether such groups have inherent rights under the legal and regulatory framework. This necessitates that the board be comprised of persons who represent different stakeholder groups. However, it must be remembered that the directors owe fiduciary duty to the company as a whole and not to specific constituencies.

Strategic perspective

Going beyond stakeholder protection, even to ensure corporate survival and success in the long run, corporate strategy must be formulated by considering the inputs of a diverse set of thought processes. Decision-making, especially at the board-level, is seldom a mathematical or formulaic process; it involves exercise of foresight, prudence, judgment and courage in the face of uncertainty. It is a well-studied aspect of being human that human judgments often suffer from blind spots and inherent bias in decision-making. And we are well aware of the fact that people, in general, tend to be more aware of others' blind spots and weaknesses, than they are of their own.

Further, judgment is also defined by various factors like the life experiences of a person – both professional and personal, their area of expertise, the value systems they were surrounded with, and their own individual beliefs.

A simple example will be the difference in the approach to a problem like falling market share by a person with a marketing background and a person with finance background; the approach towards cyber security risks by a person with a human resource background and one with a technology background. This is surely not to say that one perspective matters more than the other. **The very point of the discussion is to highlight that both the perspectives matter, when it comes to decision-making that could decide the fate of an enterprise.**

Hence, there is a need to have a set of persons in the boards who will complement each other in terms of thought processes, skill sets, risk appetite, and so on.

Multi-dimensional board diversity

Now that we have established that board diversity matters, let us look into the various aspects of board diversity.

Executive-Non-executive Mix: As discussed in the preceding section on the need for board diversity, human beings have blind spots and weaknesses that would be apparent to others but not so much to themselves. The executive directors – for this purpose, the managing directors, the whole-time directors – are those involved in the actual running of the company. They bring the necessary depth to the discussions and help establish the locus of the discussions in the company. Without them, the board discussions would almost entirely lack context. However, as they are too close to the very things being discussed, it is necessary that the voice of the executive directors is balanced with the perspective of others who are not involved in the day-to-day running of the business of the organisation. And that is why many regulatory frameworks, including that of SEBI's listing regulations, mandate an optimum combination of executive and non-executive directors, which is usually that at least half the board should be non-executive.

Promoter-nominee-independent director mix: Promoters are persons who are defined by the control they have on the company – usually those who founded the company but not always, but who have their skin in the game. Nominee directors represent other providers of capital – like lenders or strategic investors or funders. Besides these persons representing specific ownership or financial interests, persons who are completely separate from the promoters, nominees and other directors is necessary. They must have thought processes that are independent from these groups. To be completely independent, they should surely not be an employee or hold executive positions in the company or have any other significant relationship with the company. Such persons are needed to bring in the outside perspective – especially the perspective of the unrepresented or under-represented stakeholder groups, including the minority shareholders, employees, suppliers, customers, consumers in general, environment, society, regulators, and others. No matter the prescriptions in the regulatory frameworks on what makes a director "independent", the tenacity and mindset of the director play a huge role in how actually independent they are.

Skill-set diversity: It is necessary that any given problem is approached with a 360-degree perspective. Hence, persons with differing expertise, educational backgrounds, experience, and skillsets are needed. Ideally, persons with expertise in different functional domains are necessary both from the executive director pool and the non-executive side. Given this, the induction of independent directors need not just be seen as a tick-box compliance. It also doubles up as an opportunity to include different perspectives to build a robust decision-making process. Independent directors can be inducted from different backgrounds and skill sets.

Demographic and geographic diversity: Given the demographic and geographic diversity in workforce, customers and other important stakeholder groups, it is ideal that the board consists of representatives from the key sets. For instance, as women form part of the employee and consumer stakeholder groups and given the unique challenges and aspirations of women, it is ideal that at least one woman is a part of the board. Today the legal and regulatory corporate governance provisions mandate women director appointment for listed companies and bigger public companies. Beyond the arguments in favour of and against such a legal mandate, it would make business sense to have women directors to ensure that workplaces that are historically designed around men function in a manner that facilitates productivity, prevents disputes and discomfort and supports the career aspirations of its women employees as well. At the same time, it should be ensured that gender disparity for either gender is prohibited as part of the organisational culture.

Similarly, if the younger generations are the target consumers for the products of the organisation, it makes sense to have a younger director on the board who also has other complementing skillsets. If the organisation has major operations in or serves multiple geographies, it makes sense to have representatives from the various continents/ countries.

While the above can be thought of as the general aspects of board diversity, based on the facts and circumstances of each business, the concept of board diversity may need to be redefined.

Board diversity as a means to an end

Finally, it must be remembered that 'board diversity' is not an end in itself and only a means to an end, which is good governance. Hence, any appointment to the board should not be a tick-box measure – not merely done to fulfil regulatory requirements or to tick the box of 'best practice'. It must be based on merit. And equally important if not more, is ensuring the right fit complementing the existing board skillsets and alignment with the board's risk appetite and organisational values.

In the future editions of this column, we may delve into other aspects of governance and ethical leadership like the role of independent directors, board processes, corporate policies and other aspects that go into ensuring a sustainable future. SB

Reproduced with suitable modifications from the personal writings and posts of Ms. Usha Ganapathy Subramanian.

Energy Crisis: A Wake-Up Call for Sustainable Future

CMA Arunabha Saha
Practicing Cost Acountant
Thane

FEATURE

The ongoing conflict in West Asia and the disruption in the Strait of Hormuz have once again exposed the world's heavy dependence on fossil fuels. The Strait of Hormuz is one of the most critical oil transit routes globally, carrying a significant share of crude oil and natural gas supplies to Asian economies. Any disruption in this region immediately impacts global oil prices, transportation costs, inflation and industrial production.

For India, the situation is particularly serious. As the world's third-largest consumer of crude oil, India imports nearly 90% of its petroleum requirements. A substantial portion of these imports traditionally passed through the Strait of Hormuz. Although India has managed to secure alternative oil supplies, the country is paying significantly higher prices, increasing pressure on foreign exchange reserves and overall economic stability.

Recognising the gravity of the crisis, Prime Minister Narendra Modi appealed for petroleum conservation and initiated austerity measures to reduce unnecessary fuel consumption. These actions reflect not only economic prudence but also the growing importance of sustainability and energy security in national planning.

At the same time, India has strengthened its global engagement on sustainability, clean energy and ESG-driven growth through Prime Minister Modi's recent five-nation diplomatic tour covering the United Arab Emirates, Netherlands, Sweden, Norway and Italy.

In the UAE, discussions focused on energy security and long-term Gulf partnerships during the ongoing regional instability. In the Netherlands, emphasis was placed on semiconductor manufacturing, green hydrogen, water management and innovation. Sweden discussions highlighted artificial intelligence, resilient supply chains and green industrial transition. Norway focused on clean energy, climate cooperation, maritime trade and the blue economy, while Italy concentrated on green industrial partnerships, clean energy and strategic economic cooperation.

These diplomatic initiatives clearly indicate that sustainability and ESG are now becoming central pillars of India's economic and strategic policy framework. Earlier, sustainability discussions were largely linked with environmental protection and climate change. However, the present global energy crisis has demonstrated that sustainability is equally important for economic resilience, national security and long-term development.

Another important concern emerging from the global energy crisis is the increasing dependence on coal. Due to rising oil and gas uncertainties, many countries, including India, are once again relying more heavily on coal-based power generation to maintain energy stability. While coal provides short-term energy security, increasing dependence on fossil fuels may create challenges in achieving the Net Zero targets that India has committed to for the future.

This situation is therefore a serious reminder that balancing economic growth, energy security and environmental sustainability will be one of the biggest challenges for policymakers in the coming years. If fossil fuel consumption continues to rise, climate goals and ESG commitments may face significant pressure.

The current crisis should therefore become a wake-up call for society as a whole. Reducing fossil fuel

consumption cannot remain only a government responsibility. Citizens, industries and institutions all need to contribute towards sustainable living practices. Greater use of mass public transport systems, electric mobility, energy-efficient infrastructure, carpooling, reduction in unnecessary fuel consumption and increased adoption of renewable energy at household and industrial levels can collectively make a significant difference.

The transition towards renewable energy has now become an urgent necessity rather than a future ambition. Solar power, wind energy, green hydrogen, biofuels and energy-efficient technologies are essential for reducing dependency on imported fossil fuels and building a self-reliant economy.

Industries must also adopt sustainable practices by integrating renewable energy, improving energy efficiency and building resilient supply chains. In this transition, the role of professionals and Cost Accountants is becoming increasingly important. They support ESG reporting, sustainability planning, green investment evaluation, energy cost management and long-term financial risk assessment.

The West Asia crisis is therefore more than an oil supply disruption. It is a global wake-up call highlighting the urgent need for sustainable development, ESG integration, energy conservation and energy independence. Countries that invest in clean energy and responsible consumption today will be better prepared for the uncertainties of tomorrow. SB

ANNOUNCEMENT

Hope this message finds you well.

Building on the momentum of the recently concluded series on Sustainability and Ancient Scriptures, we are pleased to introduce a new seven-part article series titled "Sustainability Numbers: From Metrics to Management" for publication.

The objective of this series is to bridge the growing gap between ESG measurement and practical decision-making. While sustainability discussions often remain conceptual, this series seeks to translate them into quantifiable, decision-useful insights that are particularly relevant for Cost and Management Accounting professionals.

The series will explore how sustainability metrics are evolving from narrative disclosures into measurable management tools capable of influencing governance, risk assessment, operational strategy, investment decisions, and long-term value creation. It will also examine the expanding role of CMAs in sustainability accounting, ESG analytics, integrated reporting, and strategic performance management.

Through a structured blend of conceptual discussion, practical illustrations, regulatory developments, and professional insights, the series aims to make ESG measurement more accessible, analytical, and actionable for readers navigating the changing landscape of sustainable governance.

We look forward to your readership and engagement as we begin this important journey from sustainability narratives to sustainability numbers.

CMA Arunabha Saha
Editor

The Language of Sustainability – Why Numbers Matter

Episode: 1

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Abstract

Sustainability is no longer a peripheral conversation driven solely by corporate values or stakeholder expectations. It has evolved into a measurable business discipline that directly influences investment decisions, operational efficiency, regulatory compliance, and long-term enterprise value. Yet, despite growing attention toward Environmental, Social, and Governance (ESG) initiatives, many organizations still rely heavily on narrative-based disclosures that lack consistency, comparability, and accountability. This article explores why sustainability must be translated into measurable metrics, how ESG indicators differ from traditional financial measures, and why professionals such as CMAs are increasingly critical in connecting sustainability performance with financial outcomes. In a world shaped by data-driven decisions, sustainability too must speak the language of numbers.

Introduction

For decades, organizations measured success through financial indicators such as revenue growth, profitability, return on investment, and shareholder value. While these metrics remain essential, they no longer provide a complete picture of business performance. Climate risks, resource scarcity, labor practices, and governance standards now significantly affect operational resilience and market reputation. Investors, regulators, consumers, and lenders increasingly demand evidence of sustainable business practices—not merely promises.

Traditional sustainability reporting often relied on broad narratives: commitments to reduce emissions, improve diversity, or support communities. While such statements helped communicate intent, they frequently lacked measurable outcomes. Without quantifiable indicators, stakeholders could neither compare organizations nor evaluate progress over time. As a result, sustainability reporting risked becoming symbolic rather than strategic.

The modern ESG landscape is changing this approach. Companies are now expected to measure carbon emissions, track water consumption, assess workplace safety, monitor diversity ratios, and evaluate supply chain ethics using structured and auditable data. Sustainability is becoming embedded into mainstream business analytics, and professionals capable of interpreting these metrics are increasingly valuable.

This transition reflects a simple managerial truth: what gets measured gets managed.

Concept in Brief

Sustainability metrics are structured indicators used to evaluate an organization's environmental, social, and governance performance. Much like financial accounting standardizes business performance through ratios and statements, ESG metrics attempt to standardize sustainability performance through measurable data.

Environmental indicators typically focus on emissions, energy efficiency, waste generation, and water consumption. Social metrics evaluate labor conditions, employee well-being, diversity, training hours, and community impact. Governance metrics assess ethical conduct, board independence, transparency, and compliance frameworks.

Unlike financial metrics, ESG indicators often involve externalities—impacts not immediately visible in financial statements but capable of influencing long-term value creation. For example, excessive carbon emissions may not directly reduce

quarterly profits today, but future carbon taxes, regulatory penalties, or reputational damage could materially affect future earnings.

Narrative reporting alone struggles to capture these risks effectively. Statements such as "we are committed to sustainability" offer little insight without measurable benchmarks. Quantitative reporting enables comparison, trend analysis, target-setting, and accountability.

This shift has also transformed the role of management accountants and CMAs. Sustainability data must now be integrated with budgeting, forecasting, cost management, investment appraisal, and strategic planning. CMAs are uniquely positioned to bridge operational sustainability initiatives with financial interpretation, helping organizations understand not just environmental impact, but business impact.

Numbers that Matter

The growing importance of ESG measurement can be understood through commonly used sustainability KPIs.

ESG Area	Key Metric	Why It Matters
Environmental	Carbon Emissions (tCO_2e)	Measures climate impact and regulatory exposure
Environmental	Energy Intensity	Indicates operational efficiency
Environmental	Water Consumption per Unit	Assesses resource dependency
Social	Employee Turnover Rate	Reflects workplace satisfaction and retention costs
Social	Lost-Time Injury Frequency Rate (LTIFR)	Indicates workplace safety performance
Social	Gender Diversity Ratio	Measures inclusivity and leadership representation
Governance	Board Independence Percentage	Reflects governance quality
Governance	Ethics & Compliance Incidents	Indicates control effectiveness

A practical distinction exists between financial and ESG metrics:

Financial Metrics	ESG Metrics
Profit Margin	Carbon Intensity
Return on Equity	Water Efficiency
EBITDA	Employee Safety Rate
Cash Flow	Diversity & Inclusion Ratio
Earnings Per Share	Supply Chain Compliance

Financial metrics traditionally capture short-term performance, while ESG metrics often reveal long-term sustainability and resilience. Increasingly, investors analyze both simultaneously.

For example, a manufacturing company with strong profits but high carbon intensity may face significant transition risks in a low-carbon economy. Conversely, firms investing early in energy efficiency may initially incur higher costs but achieve stronger long-term competitiveness.

In Practice

A strong example of measurable sustainability integration can be seen in global manufacturing and consumer goods companies that have embedded ESG metrics into operational strategy.

Unilever has long linked sustainability objectives with business performance indicators. By monitoring metrics such as greenhouse gas emissions, water usage, and sustainable sourcing percentages, the company transformed sustainability from a corporate communications exercise into an operational management system. Its reporting structure allows stakeholders to track progress against measurable targets rather than broad commitments alone.

Similarly, Microsoft introduced quantified climate goals including carbon negativity targets and annual emissions disclosures. The company measures Scope 1, 2, and 3 emissions while incorporating internal carbon pricing mechanisms into financial decision-making. This demonstrates how sustainability metrics increasingly influence capital allocation and strategic investment decisions.

In India, organizations across sectors are also aligning with Business Responsibility and Sustainability Reporting (BRSR) frameworks, which emphasize measurable disclosures related to energy usage, employee welfare, waste management, and governance practices. Indian listed companies are progressively shifting from descriptive sustainability narratives toward data-driven accountability.

A particularly important development is the integration of ESG metrics into executive compensation and performance management systems. Organizations now frequently tie leadership incentives to emission reductions, diversity goals, or safety performance, reinforcing the idea that sustainability outcomes are business outcomes.

CMA Insight

The rise of sustainability accounting is redefining the responsibilities of finance professionals. CMAs are no longer limited to traditional cost analysis and budgeting functions; they are becoming interpreters of non-financial value drivers.

One of the biggest challenges in ESG reporting is translating operational sustainability data into financially relevant insights. Carbon reduction initiatives, for instance, require cost-benefit evaluation, investment appraisal, scenario analysis, and risk forecasting—all areas where CMAs possess strategic expertise.

Source: *Conceptualised & designed by the author using AI tools*

CMAs can help organizations answer critical questions:

- What is the financial impact of reducing emissions?
- How do sustainability investments affect long-term profitability?
- Which ESG risks could materially influence enterprise value?
- How can sustainability KPIs be integrated into management dashboards?

By linking ESG performance with financial planning and strategic control systems, CMAs enable organizations to move beyond compliance toward sustainable value creation.

This integration also improves decision quality. Data-driven sustainability management supports resource optimization, operational efficiency, investor confidence, and regulatory preparedness. In essence, sustainability accounting is becoming an extension of strategic management accounting.

Conclusion

Sustainability cannot remain a language of intentions alone. In an era defined by accountability, resilience, and transparency, organizations must quantify their environmental and social impact with the same rigor applied to financial performance.

Numbers create comparability. Metrics create accountability. Measurement creates action.

As sustainability increasingly shapes investment flows, regulatory expectations, and competitive advantage, businesses that fail to measure ESG performance risk managing blindly in a rapidly changing economic landscape. The future belongs to organizations that can transform sustainability from narrative into measurable strategy—and professionals who can interpret those numbers meaningfully will play a defining role in that transformation.

What gets measured gets managed—and what gets managed creates lasting value. SB

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Hidden Bonds Between Volcanic Eruptions and Soil Fertility

Series: VI

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Abstract

Nature works through invisible connections where one environmental process influences another. Volcanic eruptions are generally seen as destructive natural events because they damage forests, agriculture, human settlements, and ecosystems. However, behind this destruction lies an important ecological contribution to the Earth. Volcanic ash and lava gradually become sources of mineral-rich soil that supports agriculture, biodiversity, and long-term ecological balance. This article explains the hidden relationship between volcanic eruptions and soil fertility within the broader concept of global ecological interdependence and sustainability. It highlights how natural systems recycle nutrients, restore ecological balance, and sustain life through interconnected processes. The article also discusses the importance of understanding these natural relationships for sustainable development and environmental protection.

EARTH'S HIDDEN CONNECTIONS SERIES

Introduction

The Earth is not a collection of separate systems. It is a connected network where land, water, air, plants, animals and geological activities influence each other continuously. Every natural activity, whether visible or invisible, contributes to maintaining balance within the environment. This connection between different elements of nature is known as ecological interdependence.

One of the most interesting examples of this interdependence can be observed in volcanic eruptions and soil fertility. At first glance, volcanoes appear only as symbols of destruction. They release hot lava, ash, smoke, and gases that can destroy villages, forests, crops, and human life. Yet, after years and sometimes centuries, the same volcanic materials transform into highly fertile soil capable of supporting dense vegetation and productive agriculture.

Many of the world's fertile agricultural regions are located near volcanic zones. This shows that nature often creates new opportunities from destruction. Understanding these hidden ecological bonds is essential for sustainability because it teaches humanity that environmental systems work in cycles of destruction, regeneration, and renewal.

Understanding Ecological Interdependence

Ecological interdependence means that all parts of nature depend upon one another for survival and stability. Soil depends on climate, plants depend on soil, animals depend on plants, and human beings depend on all these systems together.

Similarly, geological processes also contribute to ecological balance. Mountains influence rainfall patterns, rivers carry minerals to plains, oceans regulate temperature, and volcanic eruptions help recycle nutrients trapped deep inside the Earth.

Nature does not waste resources. What appears harmful in one situation may become beneficial in another over time. This principle can clearly be seen in the relationship between volcanoes and fertile land.

The concept of sustainability is closely connected with ecological interdependence. Sustainable development means using natural resources wisely without disturbing the long-term balance of ecosystems. It requires understanding that environmental systems are connected and that human survival depends on maintaining these connections.

Volcanic Eruptions and Their Ecological Role

Volcanic eruptions occur when molten rock, gases, and ash escape from beneath the Earth's crust. These eruptions may cause immediate destruction through lava flows, ash clouds, earthquakes, and toxic gases. Human settlements near volcanoes often face serious risks.

However, volcanic materials contain important minerals that become useful for soil formation. Volcanic ash includes elements such as potassium, magnesium, phosphorus, calcium, and iron. These minerals are necessary for plant growth and soil productivity.

Over time, volcanic rocks and ash break down through weathering processes caused by rain, wind, temperature changes, and microorganisms. Slowly, these materials mix with organic matter and form fertile soil layers.

This process may take years, but the result is extremely productive land suitable for farming and forest growth. Thus, volcanic eruptions contribute to the natural recycling system of the Earth.

Hidden Bonds Between Volcanoes and Soil Fertility

The connection between volcanic activity and soil fertility is one of nature's hidden relationships. Though eruptions initially damage ecosystems, they later support ecological renewal.

Mineral Enrichment of Soil

Volcanic ash supplies fresh minerals to the soil. These minerals improve plant nutrition and help crops grow better. Fertile volcanic soils support the cultivation of rice, coffee, tea, fruits, and vegetables in many countries.

Better Water Retention

Volcanic soil has a special structure that allows it to retain moisture for longer periods. This helps plants survive even during dry conditions and reduces water stress in agriculture.

Support for Biodiversity

Fertile volcanic regions often develop dense forests and rich ecosystems. Healthy vegetation supports insects, birds, animals, and microorganisms. This increases biodiversity and strengthens ecological balance.

Carbon Storage and Climate Support

Forests and vegetation growing on volcanic soil absorb carbon dioxide from the atmosphere. This contributes indirectly to climate regulation and environmental sustainability.

These hidden ecological bonds demonstrate that geological and biological systems are deeply connected.

Global Examples of Volcanic Fertility

Several regions around the world show how volcanic activity supports agriculture and human civilization.

In Indonesia, volcanic lands support rice cultivation and plantation crops because the soil remains rich in minerals. In Italy, areas surrounding Mount Vesuvius are famous for vineyards and fruit farming. Similarly, volcanic regions in Japan and parts of Africa support highly productive agricultural systems.

People continue to live near volcanoes despite the risks because fertile soil provides long-term economic and agricultural benefits. This reflects the complex relationship between humans and nature where danger and opportunity exist together.

Sustainability Lessons from Nature

The relationship between volcanic eruptions and fertile soil provides important lessons for sustainability.

Nature Works Through Cycles

Nature follows cycles of destruction and regeneration. Forest fires, floods, storms, and volcanic eruptions may damage ecosystems temporarily, but they also create conditions for future renewal.

Importance of Soil Conservation

Healthy soil is essential for food security and environmental stability. Excessive chemical use, deforestation, and soil erosion are major threats to sustainability. Volcanic ecosystems remind us of the importance of mineral-rich and biologically active soil.

Long-Term Environmental Thinking

Human society often focuses only on immediate impacts. Sustainability requires long-term thinking. Volcanic eruptions may appear destructive today, but their ecological benefits may continue for generations.

Balance Between Development and Nature

Scientific planning, environmental monitoring, and sustainable land use are necessary for regions near volcanoes. Human development should work with nature rather than against it.

Ecological Wisdom and Human Responsibility

The hidden relationship between volcanoes and soil fertility also carries a deeper environmental message. Nature teaches that destruction is not always the end. Sometimes it becomes the beginning of renewal and growth.

Modern society faces many environmental challenges such as climate change, soil degradation, pollution, and biodiversity loss. These problems are often caused by ignoring ecological balance and overexploiting natural resources.

Understanding ecological interdependence helps humanity realize that environmental protection is not separate from human welfare. Healthy ecosystems support agriculture, water resources, climate stability, and economic development.

Sustainability therefore requires responsibility, patience, and respect for natural systems.

Conclusion

The relationship between volcanic eruptions and soil fertility is a powerful example of global ecological interdependence. Volcanoes may cause short-term destruction, but over time they enrich the Earth with valuable minerals that support fertile soil, forests, agriculture, and biodiversity.

This hidden bond demonstrates how natural systems are interconnected through cycles of destruction, renewal, and regeneration. Understanding these ecological relationships is essential for achieving sustainability and protecting the environment for future generations.

Nature continuously reminds humanity that every process on Earth is connected. The ash released from a volcano may eventually nourish crops, forests, and human life itself. Such ecological wisdom highlights the importance of living in harmony with nature and respecting the delicate balance that sustains life on our planet. SB

Chitra Nakshatra

Purvi Dalal
Industrial Designer

VRUKSH SERIES

Rahasya Vedic Astrology describes a Chitra Nakshatra Personality as follows

"Tvastar or Vishvakarma (The Celestial Architect, Divine Engineer and Cosmic Craftsman of the Universe, The Designer of the Weapons, Celestial Chariots and Spacecrafts of the Warriors in Mythology, Master of Maya and Magic, He is Creative Sculptor and Designers of the Ornaments and Protective Armour of the Gods and Goddesses)"

So by default people belonging to this Nakshatra who Nakshatra Lord is Mars will have the qualities of Mars - that is aggression, action, passion and like an army general who is willing to risk his life to execute his plan. They are good strategists, planners, architects, engineers, weapon designers, car designers, creative fields like Fashion & Jewellery, Politician, lawyer etc. They may be intelligent, smart, artistic, ambitious, good bosses, executives, creative, independent, self reliant but they have certain weaknesses too. They need to convert their weakness of arrogance, ego, lack of emotional balance, jealousy, stubbornness into virtues to lead admirable lives.

What trees will help them in this journey?

The tree here is Bel, Bael or called Bilva or Bilvam. The Bel fruit is very nutritious and is called as the wood apple or the stone apple and the fruit grows in Summer.

Bel leaves are used as an offering to Lord Shiva. Each Bel leaf is always in a group of 3 and offered such in 11 or 21 numbers over the Shivlinga. This is an auspicious tree which purifies its surroundings and helps to calm these Mars personalities into becoming purer and pious.

People belonging to Chitra Nakshatra may be invaluable employees with great leadership qualities but also self-reliant. So do not hesitate to find out your nakshatra and plant a tree belonging to your nakshatra in your surroundings or gifting them to people living in and around you. SB

DO YOU KNOW?

Source: Conceptualised & designed by the author using AI tools

You might think paper needs cutting down any tree—but in reality, only a small, carefully selected group of fast-growing trees are used worldwide. These trees are grown like crops, harvested, and replanted in cycles as short as 6–10 years. Even more surprising, over 40% of global paper today comes from recycled fibers, reducing pressure on forests. In countries like India, paper is increasingly made from agricultural waste like bagasse and straw, not trees at all. This means your notebook could come from sugarcane leftovers rather than forests.

Modern paper production is shifting from deforestation to circular resource management.

Sustainably managed forests used for paper can actually absorb more carbon than unmanaged ones. So, paper isn't just a forest product—it's becoming a renewable, regenerative material system.

We are in pursuit of improvement and are keen to know your views. Please write to us at ssb.newsletters@icmai.in

5 Questions on Sustainability

1. The European Union's Carbon Border Adjustment Mechanism is commonly known as _____.
2. The concept of "Double Materiality" under ESG reporting considers both financial impact and _____ impact of business activities.
3. Under the Paris Agreement, countries communicate their climate action plans through documents known as _____.
4. The principle of "Polluter Pays" was formally recognized during the _____ Conference on Environment and Development.
5. The world's first large-scale mandatory carbon market was launched by the _____.

The names of first 5 participants giving correct responses will be declared in the ensuing newsletter. The responses may be sent to ssb.newsletters@icmai.in

CORRECT ANSWERS OF APRIL QUIZ

1	90 billion pounds
2	ESG reporting
3	ISO 14001: 2026
4	$9.4 billion
5	1.3%

LAST MONTH WINNER

CMA Arjya Priya Sinha

Call for articles

Sukhinobhavantu is inviting articles on the theme ESG/ Sustainability or related themes for publishing in June 2026 edition. The articles should be relevant and original. The article should clearly cover/depict the scope, opportunity and potential for cost accountants. It should not exceed 2200 words and references/ sources are to be given wherever required. It should reach us latest by June 14, 2026, by email to ssb.newsletters@icmai.in The right for selection of articles vests with SSB. Decision of SSB will be final and binding.

Your talent our pride!

GREAT NEWS FOR CHILDREN!

Your Drawing Can Be Featured in

Sukhinobhavantu

Hello Little Artists! We are happy to invite children aged 6 to 12 years to share their creativity for the Newsletter **Sukhinobhavantu.**

What Can You Draw?

Children may create drawings based on any of the following ideas:

- Nature
- Kindness
- Family
- Peace
- Love
- Harmony
- Patriotism
- Friendship
- Anything that makes the world a joyful place

Drawing Instructions (Very Important)

- ☑ Use an A4 size page
- ☑ Keep a 20 mm header & 20 mm footer
- ☑ Stay within the central area
- ☑ Do NOT draw in the header or footer

Review & Decision:

The artwork will be reviewed collectively, and the decision of the Reviewing Authority shall be final and binding.

Please feel free to contact

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Pick up your colours, pencils, and crayons, and Let your imagination bring joy to the world!

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