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When AI Meets ESG Disclosure: A Strategic Evaluation for What Machines Can and Cannot Do

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Project Background:

This project is developed under an effort to strengthen industry collaboration at the Research Centre for ESG (CESG), HSUHK. In Mar 2026, CESG engaged Hauman Yeung and his team to explore the research topic on how AI may affect the job duties for preparation of ESG reports for Hong Kong listed firms. Pauline Wong and Louis Cheng from HSUHK worked with Hauman Yeung and Jason Chow to come up with the initial draft for the purpose of releasing the research work findings at the IIDS Conference “Bridging Theory and Industry Practice: Advancing ESG Excellence in Hong Kong and Beyond” in September 2026. We aim to further enhance the initial draft and release a final report to the public in due course.

Disclaimer:

This report is prepared by the research team at The Research Centre for ESG (CESG) at the Hang Seng University of Hong Kong. This report and the results should be used only as a reference for understanding the subject matters. CESG and the research team accept no responsibility or liability for the accuracy and completeness of such information in the report.

Acknowledgement

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Executive Summary

1. AI is moving into everyday ESG reporting, but its usefulness varies significantly by task.
 2. ESG reporting and analysis can be divided into three tiers:
 - Tier A: AI can largely handle the task with light human checking.
 - Tier B: Requires genuine human–AI collaboration.
 - Tier C: Should remain mainly human-led for structural reasons beyond model quality.
 3. The framework focuses on two main users:
 - Corporate report preparers: how to use AI while maintaining compliant and defensible disclosure.
 - Asset managers: how to analyse large volumes of ESG reports without being misled by AI-polished language or data complexity.
 4. The evidence covers LLM benchmarks, agentic AI systems, NLP-based Scope 3 estimation, AI-driven greenwashing experiments, and ESG rating divergence research.
 5. AI is currently most reliable in compliance checking, data integration, standard mapping, completeness checks, and cross-report extraction, with some rule-based tasks reaching 85–95% accuracy.
 6. Tasks such as materiality assessment, first-draft writing, Scope 3 estimation, and greenwashing detection are better suited to human–AI collaboration, while strategy, stakeholder communication, ethics, and third-party assurance should remain human-led.
 7. The analysis reflects the mid-2026 regulatory and technological environment, including ISSB expansion, EU ESRS simplification, and Hong Kong’s move toward mandatory climate disclosure for large-cap issuers.
 8. The overall aim is to identify where AI can improve efficiency and where human judgment and accountability must remain central.
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1. 人工智能正迅速由概念驗證階段走向日常 ESG 報告應用，但不同工作的適用程度差異很大。
 2. ESG 報告及分析工作可分為三個層次：
 - A 級（Tier A）：AI 可大致完成，只需人員作簡單抽查。
 - B 級（Tier B）：需要真正的人機協作。
 - C 級（Tier C）：基於責任、判斷及信任等結構性原因，應主要由人員處理。
 3. 相關框架主要針對兩類使用者：
 - 企業 ESG 報告編製者：如何在維持合規及可辯護披露的前提下運用 AI。
 - 資產管理機構：如何利用 AI 分析大量 ESG 報告，同時避免受 AI 修飾語言及龐大數據量影響判斷。
 4. 研究證據涵蓋大型語言模型（LLM）基準測試、代理型人工智能（agentic AI）系統、自然語言處理（NLP）在範疇三（Scope 3）估算的應用、AI 造成漂綠風險的實驗，以及 ESG 評級分歧研究。
 5. AI 目前最可靠的應用包括合規檢查、數據整合、準則映射、完整性核查及跨報告資訊擷取；部分規則明確的工作準確率已達約 85%–95%。
 6. 重要性評估（materiality assessment）、報告初稿、範疇三估算及漂綠識別較適合人機協作；而策略決策、持份者溝通、道德判斷及第三方鑒證則應繼續由人員主導。
 7. 分析以 2026 年年中的監管及技術環境為背景，包括 ISSB 的持續擴展、歐盟 ESRS 簡化，以及香港大型上市公司逐步實施強制氣候披露。
 8. 整體目標是界定 AI 可在哪些範疇提升效率，以及哪些工作仍必須保留人員的專業判斷與問責責任。

1. Why the Research Topic is Important

The research is significant because two major developments are occurring simultaneously: ESG reporting is becoming increasingly regulated, while AI is becoming increasingly capable of supporting reporting and analysis. ESG disclosure has shifted from a largely voluntary corporate practice toward formal requirements under frameworks such as IFRS S1/S2, the EU sustainability reporting regime and HKEX requirements. In Hong Kong, climate disclosure requirements have also strengthened, including mandatory Scope 3 reporting for Hang Seng Composite LargeCap issuers from financial years beginning on or after 1 January 2026.

At the same time, large language models and other AI systems can process large volumes of financial, operational, supply-chain and ESG information much faster than traditional manual approaches. However, the paper argues that the key question is not simply what AI can do, but which tasks should be delegated to AI and which should remain under human responsibility.

This distinction has important practical consequences. AI already performs strongly in structured activities such as compliance checking, standard mapping, data consistency verification and information extraction. More judgment-intensive activities—including materiality assessment, Scope 3 estimation and report drafting—require human–AI collaboration. Strategic decisions, stakeholder communication, ethical judgments and assurance should remain predominantly human because they involve accountability, trust and professional responsibility rather than technical capability alone.

The project therefore provides a practical framework for corporations and asset managers to use AI efficiently without allowing automation to replace necessary human judgment and accountability.

2. Task Division Between AI and Humans

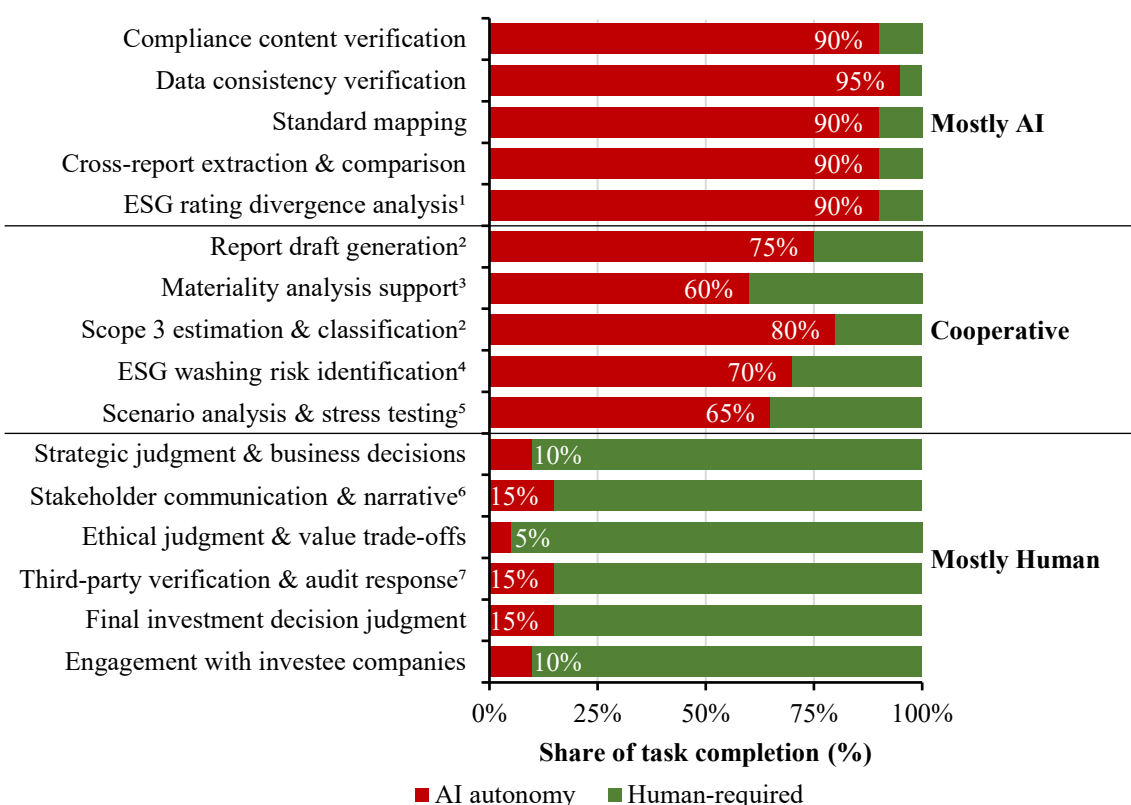
Figure 1 shows a clear relationship between task structure and AI autonomy. AI performs best when there is an external and objectively checkable reference, such as a reporting standard, numerical dataset or existing disclosure. These “Mostly AI” tasks can therefore be automated with relatively limited human verification. The middle group combines structured processing with judgment: AI can substantially accelerate drafting, materiality analysis, Scope 3 estimation and ESG-washing screening, but humans must interpret the results and make final decisions. In contrast, strategic decisions, ethics, stakeholder communication, audit response and investment judgment remain predominantly human because they involve accountability, context and professional responsibility.

Figure 2 shows the same pattern specifically for IFRS S2 climate reporting. Highly standardized calculation and compliance tasks reach around 90–95% AI autonomy because they largely involve mapping, arithmetic and verification. Scope 3 estimation, climate narrative drafting, target setting and transition-plan screening remain collaborative because they combine quantitative processing with assumptions and contextual judgment.

The main exception is quantitative climate scenario modeling, which is only 25% AI-autonomous. The paper explains that general-purpose LLMs are currently weak at reasoning through the physical and economic mechanics of uncertain climate pathways; purpose-built climate models may therefore be more appropriate. Board-level governance and final transition-plan or investment judgments remain principally human because responsibility for those decisions cannot be transferred to AI.

Together, Figures 1 and 2 suggest that the appropriate model is not maximum automation, but structured human–AI division of labour: AI should handle structured, repetitive and verifiable work, while humans retain control over judgment, accountability and final decisions.

Figure 1. AI Autonomy vs. Human-Required Share, by Task



Note: Each bar's red segment reflects the AI-completable share of the task and the green segment the human-required share, split at the single percentage reported for that task. Tier C tasks are not zero by definition; they reflect the low end of the same scale (see Section 5.3). The percentages and reasoning behind them come from Ascent Partners Group Ltd's own ESG reporting practice: Ascent Partners has prepared ESG reports for HKEX-listed companies since 2016, and arrived at each task's figure by running the same prompts across six AI models (Claude, DeepSeek, Gemini, Manus, Perplexity, and Poe) multiple times, then determining the completion share through professional judgment and comparison against past reports prepared entirely manually (Ascent Partners, 2026). These figures should be read as a snapshot of current practice rather than a fixed, permanent estimate.

¹Berg, F., Koelbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315–1344. <https://doi.org/10.1093/rof/rfac033>; Tian, G. G. (2026). ESG measurement and ratings divergence: A cross-jurisdictional review of institutional, stakeholder, and digital accountability perspectives. *Business Strategy and the Environment*, 35, 1–17. <https://doi.org/10.1002/bse.71005>

²Boston Consulting Group. (2026, April). AI-enabled ESG reporting: From regulatory complexity to strategic advantage [White paper]. Center for Sustainability Policy & Regulation. <https://www.bcg.com/assets/2026/white-paper-ai-enabled-esg-reporting.pdf>

³Boston Consulting Group. (2026, April); Rajgopal, S. (2025, October 13). Integrated reporting 2.0 with AI. *Forbes*. <https://www.forbes.com/sites/shivaramrajgopal/2025/10/13/integrated-reporting-20-with-ai/>

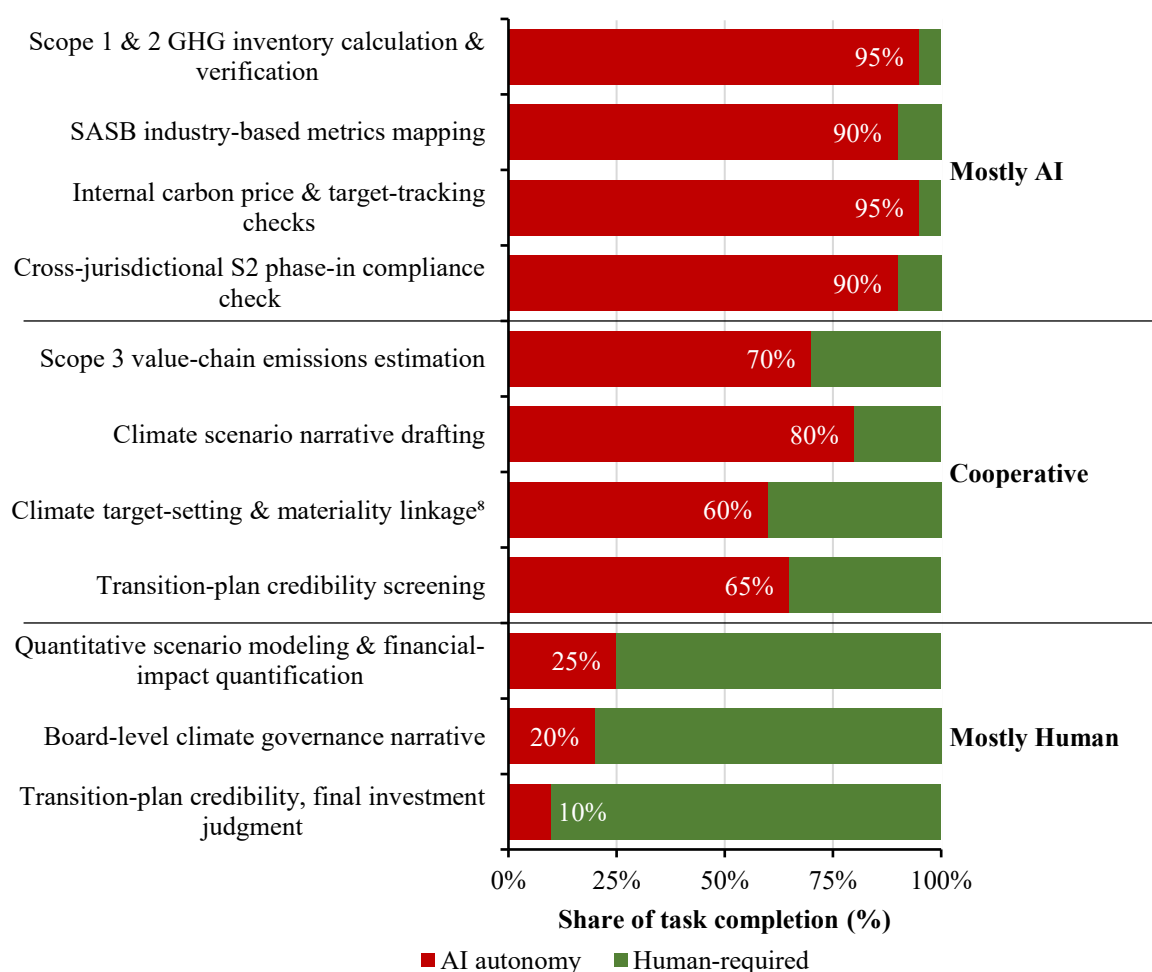
⁴Tian, G. G. (2026); Dimes, R., de Villiers, C., Denny, P., & Leinonen, J. (2026). The impact of generative AI on the perpetuation and detection of greenwashing in sustainability reports: Insights from an experiment. *Business Strategy and the Environment*, 35, 1–16. <https://doi.org/10.1002/bse.70983>

⁵IFRS Foundation. (2023). IFRS S2 Climate-related Disclosures. International Sustainability Standards Board. <https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/ifrs-s2-climate-related-disclosures/>

⁶Dimes, R., de Villiers, C., Denny, P., & Leinonen, J. (2026)

⁷Tian, G. G. (2026)

Figure 2. AI Autonomy vs. Human-Required Share, IFRS S2 Tasks



Note: Each bar's red segment reflects the AI-completable share of the task and the green segment the human-required share, split at the single percentage reported for that task. Tier C tasks are not zero by definition; they reflect the low end of the same scale. The percentages come from the same Ascent Partners Group Ltd testing methodology described in the note below Table 2, applied to the IFRS S2 tasks in Table 3, and should be read as a snapshot of current practice rather than a fixed, permanent estimate (Ascent Partners, 2026).

⁸Rajgopal, S. (2025, October 13)

3. Implication 1: AI Enhancement for ESG Reporting for Corporations

Corporate ESG reporting teams increasingly need to integrate sustainability requirements into existing financial and operational systems, quantify climate-related financial impacts, collect and estimate difficult Scope 3 emissions data, and meet overlapping requirements under frameworks such as GRI, ISSB and HKEX. These activities create substantial data-processing, coordination and compliance burdens, making ESG reporting a natural area for carefully designed AI support.

AI is most effective in structured and verifiable reporting tasks. Compliance content verification, data consistency checks and standard mapping can largely be automated because AI is checking information against established requirements rather than making strategic judgments. More complex activities require human–AI collaboration. AI can generate standardized first drafts, identify potential material ESG issues and support Scope 3 estimation by classifying transactions and matching them with appropriate emission factors. For Scope 3 estimation, around 80% of the processing may be AI-completed once suitable data and emission factors are available, while humans remain responsible for interpreting incomplete supplier information, resolving ambiguous classifications and validating assumptions.

Strategic decisions, stakeholder-facing narratives, ethical trade-offs and audit responses should remain predominantly human because they involve accountability, business context and professional judgment.

In practice, corporations can use AI throughout the reporting workflow to extract information from PDFs and scanned documents, categorize activity data, detect anomalies, check emission-factor currency and conduct KPI-level compliance reviews. AI can also prepare structural drafts and first-pass bilingual translations, but these outputs require professional review before publication. The most effective model is therefore to use AI as a data integrator and compliance assistant, while maintaining clear human review, final sign-off and strong underlying data infrastructure.

4. Implication 2: AI Enhancement for ESG Integration for Asset Managers

Asset managers face the challenge of extracting useful ESG information from hundreds of heterogeneous reports, identifying potential ESG washing, comparing companies across different reporting frameworks and incorporating sustainability information into valuation and portfolio decisions. AI can substantially increase the speed and scale of this analysis, but its outputs need to be interpreted within the relevant investment and industry context.

AI is particularly effective in cross-report information extraction and ESG rating-divergence analysis. It can rapidly collect comparable indicators such as emissions intensity, water efficiency and board diversity, and identify how differences in indicator selection, weighting or controversy treatment contribute to divergent ESG ratings. These structured analytical tasks can reach around 90% reliability, although analysts still need to examine unusual data and determine whether rating criteria are appropriate to a company's actual circumstances.

More judgment-intensive applications require collaboration. AI can flag patterns associated with possible greenwashing and conduct portfolio-level climate scenario simulations, but humans must determine what those signals mean. Around 70% of greenwashing pattern identification and about 65% of scenario-analysis computational work may be AI-assisted; interpretation, scenario design and portfolio implications remain the responsibility of investment professionals.

Final investment decisions and engagement with investee companies should remain human-led. AI can provide evidence and surface industry-specific factors, but it cannot assume fiduciary responsibility or replace the negotiation, experience and relationships required for effective

stewardship. Accordingly, asset managers should use AI primarily as a screening and analytical support tool, triangulate its outputs against independent evidence, and retain explicit human ownership of investment decisions.

5. Future Outlook

AI's role in ESG reporting is expected to expand substantially over the remainder of this decade, particularly in structured and semi-structured tasks. Purpose-built and benchmarked AI systems are steadily progressing from research prototypes toward production-grade applications. Improvements in hallucination control, retrieval accuracy and agentic workflows are likely to increase the reliability of activities such as data extraction, verification, compliance checking, drafting support and other collaborative reporting tasks.

At the same time, regulatory attention to AI-assisted ESG reporting is likely to increase. Major sustainability reporting standards currently provide little specific guidance on how AI-assisted disclosures should be treated for assurance purposes. As AI becomes embedded more deeply into reporting processes, future regulatory and governance frameworks are likely to place greater emphasis on model transparency, data provenance and independent verification of the AI-enabled analytical process, rather than examining only the final disclosure.

However, some boundaries are expected to remain durable even as technology improves. Responsibilities involving legal accountability, stakeholder and reputational consequences, ethical judgment and assurance-grade auditability cannot simply be transferred to AI through better model performance. ESG reporting ultimately serves as an accountable communication between an organization and the stakeholders who rely on its information.

The future of AI in ESG reporting should therefore focus on improving human–AI workflows rather than pursuing full automation. Organizations and investors should continuously reassess AI capabilities as evidence develops, while maintaining clear human responsibility wherever trust, judgment and accountability are essential.



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