AI & ESG

BY

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The field of Environmental, Social, and Governance (ESG) has undergone rapid expansion, followed by political backlash, yet continues to see steady utilization in recent years. Businesses are disclosing social and environmental information, prompting regulatory agencies to propose and set regulations and guidelines. Moreover, ESG is evolving as a tool for investment analysis, a risk management tool, and an approach to corporate social responsibility. Simultaneously, artificial intelligence (AI) is emerging as a possible tool for companies to collect and analyze ESG metrics, including environmental impacts and workplace safety. This Article proposes an approach that companies and their users can employ to leverage AI benefits and adequately minimize risks. This Article addresses (1) the environmental impacts of AI, (2) the numerous ways AI is being used in the ESG space, (3) the legal hurdles companies and their users may face when integrating AI in the ESG space, and (4) best practices to mitigate the risks and leverage the potential of AI in the ESG space. This Article concludes by revealing best practices for companies, which include utilizing blockchain to mitigate risks, implementing adequate procedures and policies, and ensuring adequate oversight over AI use.

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I. INTRODUCTION

The acronym "ESG" refers to "environmental, social, and governance" and is commonly used by companies to categorize related issues.[1] While ESG has gained significant traction in the corporate governance space, it has faced criticism for its broad and often ambiguous scope, which can make it susceptible to varying interpretations and potential misuse.[2] Over time, ESG has evolved into a multifaceted concept: it can serve as a factor for investment analysis, an approach to corporate social responsibility or sustainability, and even

[1] ESG suffered scrutiny by the CEO of one of the biggest asset managers in the world, Blackrock, when he used the term "Energy Pragmatism" instead of ESG. *See Larry Fink's 2024 Annual Chairman's Letter to Investors*, BLACKROCK, https://www.blackrock.com/corporate/investor-relations/larry-fink-annual-chairmans-letter [https://perma.cc/V64C-4H97] (last visited Mar. 26, 2025) (discussing the demand for energy infrastructure and need for investors to consider energy security); *see also* Ramsey Touchberry, *BlackRock's Larry Fink Ditches ESG for 'Energy Pragmatism*,*'* WASH. TIMES (Mar. 26, 2024), https://www.washingtontimes.com/news/2024/mar/26/blackrocks-larry-fink-ditches-esg-for-energy-pragm/ [https://perma.cc/638J-J8Z7] (describing Larry Fink's 2024 annual letter to investors and the replacement of terms).

[2] See Elizabeth Pollman, *The Making and Meaning of ESG*, 14 HARV. BUS. L. REV. 403, 404–06, 433 (2024), for a discussion of the varied uses of the term ESG and the meanings associated with it. *See also* Barbara Ballan & Jason J. Czarnezki, *Disclosure, Greenwashing, and the Future of ESG Litigation*, 81 WASH. & LEE L. REV. 545, 549–51 (2024) (describing the risks posed by greenwashing when businesses disclose ESG).

as an expression of ideological preference.[3] This Article focuses on the interactions between ESG and artificial intelligence (AI), defining ESG primarily as a disclosure and risk management tool, while acknowledging its broader applications.

ESG can be defined as a metric-driven approach to achieve corporate accountability.[4] ESG provides data that helps businesses operate more transparently and responsibly, and to promote environmental, social, and economic welfare.[5] From this perspective, issues surrounding ESG disclosure take center stage and raise questions about how corporations disclose a broad array of approaches to achieve sustainability.[6] Corporate governance frameworks encompass the rules and practices of a corporation, the duties of directors and officers, the management of disclosure requirements, and the determination of what information is considered "material" for disclosure, including which environmental, social, and governance criteria should be reported.[7] ESG is motivated by investors and consumers who use this information for their investment decisions and consumer choices.[8]

Additionally, ESG is used as a risk-management tool because ESG is a set of practices relevant to "proactive risk management."[9] Thus, ESG acts in response to consumer demand, to avoid financial risks, and to anticipate the benefits of a greener future economy, which incentivizes businesses to behave more sustainably.[10]

Businesses and investors worldwide are using AI technologies to help collect and analyze ESG metrics.[11] AI collects real-time data to help companies track their environmental impacts, analyze and improve workplace safety, and ensure transparency and traceability to strengthen corporate governance.[12] AI's role in the ESG space is

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[3] *See generally* Pollman, *supra* note 2, at 403, 424 ("ESG takes on dramatically different meanings varying from factors for integrating in investment analysis or risk management to a synonym for corporate social responsibility, sustainability, or even an ideological preference or political stance provoking backlash.").

[4] *See* Colin Myers & Jason J. Czarnezki, *Sustainable Business Law? The Key Role of Corporate Governance and Finance*, 51 ENV'T L. 991, 997 (2021) ("ESG has emerged as a metrics-based approach intended to increase corporate accountability.").

[5] *See id.*

[6] Ron Llewellyn et al., *ESG and the Supply Chain*, THOMSON REUTERS: PRAC. L. COM. TRANSACTIONS (Feb. 1, 2023).

[7] *See id.*

[8] *See* Ballan & Czarnezki, *supra* note 2, at 549 (discussing the fact that investors use ESG as performance indicators while environmentally conscious consumers use ESG to guide decision-making).

[9] Pollman, *supra* note 2, at 427.

[10] Myers & Czarnezki, *supra* note 4, at 995.

[11] *The Role of AI in ESG and Sustainability Reporting*, KEY ESG (July 3, 2024), https://www.keyesg.com/article/the-role-of-ai-in-esg-and-sustainability-reporting [https://perma.cc/23HZ-ZBBD] (MSCI, S&P Global, and other corporations have been successful in using AI to gather ESG reports and insights).

[12] Nitin Liladhar Rane et al., *Artificial Intelligence Driven Approaches to Strengthen Environmental, Social, and Governance (ESG) Criteria in Sustainable Business Practices:*

quantitative and qualitative.[13] For instance, AI can analyze weather patterns and past energy use to adjust energy use accordingly, while also gathering information from stakeholders and local communities to explain the challenges of high energy use.[14]

AI is a technological product, but also a field of study that combines various areas, such as cognitive science.[15] AI encompasses a range of systems such as machine learning technologies (ML), Natural Language Processing (NLP), and Large Language Models (LLMs).[16] For the purposes of this Article, AI encompasses all these terms.[17] The most recent (and revolutionary) advancement in AI is Generative AI, a deep learning technology tool that can create outputs based on users' requests or prompts.[18] Deep learning is a subset of ML and is used in most AI applications. Deep learning works by using multi-layered neural networks, which are programs that mimic human brain decision-making.[19] There are generally three operating phases of Generative AI: training, tuning, and evaluation (i.e., more tuning to improve accuracy).[20] Additionally, applying NLP and ML algorithms to ESG data analytics can improve the reliability and depth of sustainability reporting, helping businesses align their strategies with global sustainability goals.[21] Essentially, AI can analyze large datasets to identify trends, allowing companies to improve their ESG practices more efficiently.

This Article addresses the key opportunities and challenges from AI and ESG interactions. First, this Article describes environmental impacts that coincide with AI use, such as high energy use, carbon emissions, and excessive water consumption. But alongside these impacts, AI offers many positive uses for advancing ESG goals and related decision-making. AI presents a valuable tool for ESG data

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A Review (May 28, 2024), https://ssrn.com/abstract=4843215 [https://perma.cc/ZL7X-VWFA].

[13] *Id.*

[14] *Id.*

[15] Andrew W. Torrance & Bill Tomlinson, *Governance of the AI, by the AI, and for the AI*, 93 MISS. L. J. 107, 110–11 (2023); Cole Stryker & Eda Kavlakoglu, *What is Artificial Intelligence (AI)?*, IBM (Aug. 9, 2024), https://www.ibm.com/topics/artificial-intelligence [https://perma.cc/XEV5-S8WF].

[16] For the purposes of this paper, AI encompasses all the subsets listed above, as they may all be used in the ESG space. For instance, companies can feed data into ML platforms and then ask the machine to assess current ESG issues utilizing that data. *See* Stryker & Kavlakoglu, *supra* note 15 (explaining the technologies on which AI is built); *see also* Rane et al., *supra* note 12 (noting that trends in AI technologies, including NLP and ML, have been used to address ESG challenges).

[17] *See* Stryker & Kavlakoglu, *supra* note 15.

[18] *Id.*

[19] Jim Holdsworth & Mark Scapicchio, *What is Deep Learning?*, IBM (June 17, 2024), https://www.ibm.com/think/topics/deep-learning [https://perma.cc/M33P-NHJ8].

[20] Cole Stryker & Mark Scapicchio, *What is Generative AI?*, IBM (Mar. 22, 2024), https://www.ibm.com/think/topics/generative-ai [https://perma.cc/7NER-64ZJ].

[21] Rane et al., *supra* note 12.

analysis, ESG reporting, and risk management assessment. It can help corporate managers build models for risk management using environmental, social, and governance data, and propose investment plans and strategies.[22] AI can also be used for ESG screening, scoring, and portfolio optimization, and for ESG engagement and stakeholder communication.[23] Further, AI can help measure ESG initiatives and investments and handle due diligence.

Nevertheless, there are ethical and legal challenges to the implementation of AI in ESG. AI can raise issues because it can lack transparency, exhibit biases, and produce hallucinations. As to transparency, AI often operates in a "black box" that renders its processes opaque.[24] This lack of clarity, coupled with its insufficient regulatory oversight, can create several legal challenges, such as issues with data control and governance.[25]

Further, there are legal implications that can influence how AI interacts with ESG. AI language models rely on data pulled from the Internet, which can raise concerns about data veracity, acquisition, and privacy.[26] AI gathers information that may create a "transparency paradox" because, in risk management, data can be a source of liability.[27] For instance, the use of AI can raise privacy and security issues and infringe on intellectual property (IP) rights.[28]

Moreover, other issues that create legal risks are related to AI biases. Algorithms, which are designed to predict outcomes, often struggle to account for ethical considerations.[29] The use of AI requires clearly defined objectives. For-profit businesses tend to prioritize one overriding goal: maximizing profit. Thus, in the context of ESG disclosure and AI, algorithms may create a false or misleading narrative

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[22] Gerard Hertig, *Financial Supervision and AI*, THE CAMBRIDGE HANDBOOK OF PRIVATE LAW AND ARTIFICIAL INTELLIGENCE 431, 433 (Ernest Lim & Phillip Morgan, 2024).

[23] *Revolutionizing ESG Reporting with AI: Opportunities and Challenges*, ECOACTIVE TECH (Apr. 14, 2025), https://ecoactivetech.com/revolutionizing-esg-reporting-with-ai-opportunities-and-challenges/.

[24] *Id.*

[25] *Id.*

[26] *See* Tom Wheeler, *Connecting the Dots: AI Is Eating the Web That Enabled It*, BROOKINGS (June 24, 2024), https://www.brookings.edu/articles/connecting-the-dots-ai-is-eating-the-web-that-enabled-it/ [https://perma.cc/Z4Z2-BP23] (describing how different publishers are responding to AI); Katharine Miller, *Privacy in an AI Era: How Do We Protect Our Personal Information?*, STAN.: HUMAN-CENTERED A.I. (Mar. 18, 2024), https://hai.stanford.edu/news/privacy-ai-era-how-do-we-protect-our-personal-information [https://perma.cc/LV8B-XZTH] (explaining the potential risks the widespread use of AI systems may have on society).

[27] Andrew Burt, *The AI Transparency Paradox*, HARV. BUS. REV. (Dec. 13, 2019), https://hbr.org/2019/12/the-ai-transparency-paradox [https://perma.cc/8CAZ-H7XC].

[28] *Artificial Intelligence and Blockchain: The New Power Couple*, KPMG, https://kpmg.com/us/en/articles/2023/ai-blockchain-new-power-couple.html [https://perma.cc/YU9G-45J9] (last visited Sept. 25, 2025).

[29] Hertig, *supra* note 22, at 433.

that appears to align with "sustainability" objectives, but is manipulated to serve commercial interests. For instance, AI may work by disclosing environmental, social, and governance data that support this "successful" narrative.[30] This practice can create legal risks, including allegations of consumer and investor fraud, while also raising serious ethical concerns.[31]

Additionally, Generative AI tools can suffer hallucinations, whereby the AI perceives patterns or objects that do not exist, creating nonsensical or inaccurate results.[32] AI hallucinations can create risks for investors and the accuracy and reliability of information on the market.[33]

On a similar note, directors, executive officers, and lawyers may be exposed to liabilities for the risks that AI may pose to investors' returns. The board of directors owes fiduciary duties to the corporation, such as the duty of care and duty of loyalty, which carries a duty to monitor and oversight systems; the failure to implement AI systems properly can raise managerial oversight issues.[34] Furthermore, lawyers owe duties of due diligence and the duty to maintain client confidentiality, and must pay attention when relying on AI systems and offering their services.

The legal risks of AI implementation can be mitigated by employing best practices, implementing adequate procedures and policies, ensuring adequate oversight of AI use, and keeping up with the latest regulatory actions and laws governing the use of AI. This Article explores how companies and other stakeholders using AI in the ESG space can use best practices going forward.

AI risks can be further mitigated by an emerging technology—blockchain.[35] Blockchain is a "distributed digital ledger that stores data of any kind."[36] Essentially, blockchain has the ability to store data from

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[30] THE SOCIAL DILEMMA, Netflix, at 45:00–46:00 (Larissa Rhodes, Exposure Labs, Argent Pictures, The Space Program, Agent Pictures 2020).

[31] *See generally* Ballan & Czarnezki, *supra* note 2, at 551 (discussing two specific litigation paths: "(1) greenwashing claims arising from [AI-generated] environmental marketing claims that potentially run afoul of federal and state consumer protection laws, and (2) greenwashing securities litigation arising from potentially deceptive climate change and sustainability claims in violation of federal securities law.").

[32] *What are AI Hallucinations?*, IBM (Sept. 1, 2023), https://www.ibm.com/topics/ai-hallucinations [https://perma.cc/3YUV-WL3L].

[33] Bryan Reynolds, *Hidden Dangers of AI Hallucinations in Financial Services*, BAYTECH CONSULTING (Apr. 29, 2025), https://www.baytechconsulting.com/blog/hidden-dangers-of-ai-hallucinations-in-financial-services [https://perma.cc/6QRC-ZA49] (providing evidence of the impact of hallucinations).

[34] Hertig, *supra* note 22, at 433–35.

[35] *See Artificial Intelligence and Blockchain: The New Power Couple*, *supra* note 28 (explaining how blockchain can "protect against AI misuse"); s*ee also* discussion *infra* Part IV.

[36] David Rodeck, *Understanding Blockchain Technology*, FORBES ADVISOR (Mar. 4, 2025, 6:46 AM), https://www.forbes.com/advisor/investing/cryptocurrency/what-is-blockchain/ [https://perma.cc/XKW3-CLXX].

transactions without giving the user the ability to alter the data.[37] Thus, blockchain has the potential to transform ESG metrics, as it holds the missing piece to ensure transparent and reliable ESG recording within a company.

Another mitigation path is human-centered artificial intelligence (HCAI), an innovative proposal for the ethical, social, and environmental challenges posed by AI. HCAI is a new discipline that uses a "human-centric" approach to guide the necessary regulation, development, and implementation of AI systems to respect human rights.[38]

AI technologies may be considered "a double-edged sword" for environmental and social protection.[39] While having the capability to enhance sustainability, AI technologies also have a massive environmental impact.[40] These impacts include global, local, and regional environmental effects from data centers,[41] immense water consumption, energy consumption, and natural resource extraction.[42] Before introducing the ESG and AI landscape, it is essential to describe the existence of the numerous and growing environmental risks and impacts that coincide with increased AI use.

To fully comprehend AI's environmental risks, one must consider both the operational environmental risks and the carbon

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[37] *See Artificial Intelligence and Blockchain: The New Power Couple*, *supra* note 28.

[38] Ugo Pagallo, *Dismantling Four Myths in AI & EU Law Through Legal Information 'About' Reality*, *in* MULTIDISCIPLINARY PERSPECTIVES ON ARTIFICIAL INTELLIGENCE AND THE LAW 251, 256–58 (Henrique Sousa Antunes et al. eds., 2024), https://library.oapen.org/bitstream/20.500.12657/86900/1/978-3-031-41264-6.pdf [https://perma.cc/JH7S-U2FC].

[39] *Friend or Foe? The Problem with AI and Greenwashing*, 360 (Oct. 2, 2024), https://360info.org/friend-or-foe-the-problem-with-ai-and-greenwashing/ [https://perma.cc/89P2-YQU8].

[40] *See* Carole-Jean Wu et al., *Sustainable AI: Environmental Implications, Challenges and Opportunities*, ARXIV (Oct. 30, 2021), https://doi.org/10.48550/arXiv.2111.00364 [https://perma.cc/G9S7-TD5S] ("[T]he carbon footprint of training one large ML model . . . is equivalent to 242,231 miles driven by an average passenger vehicle."); Shaolei Ren & Adam Wierman, *The Uneven Distribution of AI's Environmental Impacts*, HARV. BUS. REV. (July 15, 2024), https://hbr.org/2024/07/the-uneven-distribution-of-ais-environmental-impacts [https://perma.cc/Y48L-6FZN]; Zodhya, *How Much Energy Does ChatGPT Consume?*, MEDIUM (May 19, 2023), https://medium.com/@zodhyatech/how-much-energy-does-chatgpt-consume-4cba1a7aef85 [https://perma.cc/YA4Y-3UF2].

[41] Thea de Gallier, *4 Innovative Ways to Harness Waste Data Centre Energy*, WORLD ECON. F. (Feb. 13, 2024), https://www.weforum.org/agenda/2024/02/harnessing-waste-energy-data-centres/ [https://perma.cc/E3SZ-NJTT] ("Data centres are the foundation on which the Internet operates. Every time we perform an action online, data is generated and these hubs are responsible for processing it."); *see also* Zach Williams, *NY Gov. Hochul Mulls Climate Goal Delay as AI Energy Use Grows*, BLOOMBERG L. (Oct. 29, 2024, 2:00 AM), https://news.bloomberglaw.com/bloomberg-government-news/ny-gov-hochul-signs-bill-restricting-state-government-ai-use [https://perma.cc/W6TT-9GBE] (highlighting the tension between economic goals to increase technological innovation and climate goals to transition to a renewable grid).

[42] *See* Ren & Wierman, *supra* note 40 (describing both the localized and generalized environmental impacts of AI).

footprint.[43] The hardware needed for AI machines, such as servers and data centers, requires significant use of resources.[44] Specifically, training AI models, such as an LLM, requires immense electricity as well as drastic carbon emissions.[45] In the United States alone, the demand for AI is set to increase data center consumption to "about 6% of the nation's total electricity usage in 2026."[46]

Additionally, AI's environmental impacts may disproportionately affect areas and communities that are already vulnerable to environmental harms, such as drought and air pollution.[47] For example, higher carbon emissions may lead to higher levels of ozone and particulate matter in regions already vulnerable to diminishing air quality.[48] Also, water consumption from AI use can exacerbate droughts in existing water-stressed regions.[49] Thus, the environmental impacts of AI may increase local environmental impacts as well as affect regions disproportionately,[50] and these impacts must be considered when adopting the technology.

AI also entails excessive water consumption.[51] Data centers may rely on water for cooling and powering operations.[52] If water

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[43] *See* Wu et al., *supra* note 40 (discussing research and data relating to the overall environmental impact of AI).

[44] *Id.*

[45] Ren & Wierman, *supra* note 40 ("[T]he training process for a single AI model, such as a large language model, can consume thousands of megawatt hours of electricity and emit hundreds of tons of carbon. This is roughly equivalent to the annual carbon emissions of hundreds of households in America.").

[46] *Id.*

[47] *Id.* ("In many cases, adverse environmental impacts of AI disproportionately burden communities and regions that are particularly vulnerable to the resulting environmental harms. For instance, in 2022, Google operated its data center in Finland on 97% carbon-free energy; that number drops to 4–18% for its data centers in Asia.").

[48] *Id.*

[49] *Id.* ("For instance, geographical load balancing that prioritizes the total energy costs or carbon footprint may inadvertently increase the water footprint of data centers in water-stressed regions, further straining local freshwater resources.").

[50] *See* Ren & Wierman, *supra* note 40.

[51] David Berreby, *As Use of A.I. Soars, So Does the Energy and Water It Requires*, YALE ENV'T 360 (Feb. 6, 2024), https://e360.yale.edu/features/artificial-intelligence-climate-energy-emissions [https://perma.cc/ZAK3-5K62] (noting how much water Google's data centers use); *see also* Jeff Young, *Why AI Is So Thirsty: Data Centers Use Massive Amounts of Water*, NEWSWEEK (Mar. 24, 2024, 6:35 AM), https://www.newsweek.com/why-ai-so-thirsty-data-centers-use-massive-amounts-water-1882374#:~:text=As%20data%20center%20operators%20power,challenge%20for%20some%20host%20communities [https://perma.cc/H7UV-YZNC] ("As [AI] data center operators power up the servers that keep the [I]nternet humming and make artificial intelligence possible, they also need large volumes of water to cool those servers down . . . ."); Ren & Wierman, *supra* note 40 ("[T]he strain on local freshwater resources imposed by the substantial water consumption associated with AI, both directly for onsite server cooling and indirectly for offsite electricity generation, can worsen prolonged droughts in water-stressed regions . . . .").

[52] Pengfei Li et al., *Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models*, ARXIV (Mar. 26, 2025), https://arxiv.org/pdf/2304.03271.pdf [https://perma.cc/G7CY-DZSX]; Matt O'Brien & Hannah Fingerhutt, *Artificial Intelligence*

consumption for data center cooling, data center heat rejection, and offsite energy generation is not included in a company's ESG report, they may open themselves up to a host of legal risks,[53] including litigation and regulatory actions.[54] The controversy surrounding water usage and environmental inequity highlights the danger of AI increasingly damaging high-risk areas and vulnerable communities.[55]

Hand in hand with excessive water consumption, AI use requires immense energy consumption. For example, ML systems may have a significant carbon footprint.[56] Moreover, GPU data centers[57] needed for AI will only increase with AI use, and companies must be wary of the consequences of increased AI and energy use from data centers.[58] However, existing research reveals data centers have the potential to essentially "recycle" and reuse their energy waste.[59] These

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technology behind ChatGPT was built in Iowa—with a lot of water, DES MOINES REGISTER (Sept. 10, 2023, 5:50 PM), https://www.desmoinesregister.com/story/money/business/2023/09/10/chatgpt-was-built-in-iowa-using-artificial-intelligence-microsoft-west-des-moines/70819093007/ [https://perma.cc/6BYY-YYEG] (explaining that companies like Google and Microsoft reported significant growth in water consumption from 2021 to 2022, largely attributed to AI use); *see also* Ren & Wierman, *supra* note 40 ("AI model training can lead to the evaporation of an astonishing amount of fresh water into the atmosphere for data center heat rejection, potentially exacerbating stress on our already limited freshwater resources.").

[53] *See* Rane et al., *supra* note 12 ("AI-powered contract management systems can automatically review and manage contractual obligations, ensuring compliance and reducing the risk of legal disputes.").

[54] *See* Christopher Flavelle, *Court Rulings Give States New Power to Protect Ground Water*, N.Y. TIMES (Mar. 4, 2024), https://www.nytimes.com/2024/02/29/climate/groundwater-aquifer-depletion-courts.html [https://perma.cc/WX4J-T7Y3] ("In Nevada, Idaho and Montana, a string of court decisions have strengthened states' ability to restrict overpumping of groundwater."). This may be a sign that States will start limiting groundwater consumption from AI data centers.

[55] *See* Ren & Wierman, *supra* note 40.

[56] Joel Castano et al., *Exploring the Carbon Footprint of Hugging Face's ML Models: A Repository Mining Study*, ARXIV (Nov. 29, 2023), https://arxiv.org/pdf/2305.11164 [https://perma.cc/U88P-8B7T].

[57] Graphics Processing Units (GPUs) are specialized circuits used in data centers to handle multiple tasks at the same time, positioning them at a significant advantage for tasks that require larger levels of parallel processing power. *The Role and Purpose of Data Center GPUs*, TRGDATACENTERS, https://www.trgdatacenters.com/resource/the-role-and-purpose-of-data-center-gpus/ (last visited Sept. 25, 2025) [https://perma.cc/C5N2-9SZL].

[58] *See* Gallier, *supra* note 41 ("U.S. data center demand is forecasted to grow by some 10 percent a year until 2030.").

[59] *Id.* (discussing four innovative "circular energy" projects, including a trout farm powered by renewable energy from data centers, and a swimming pool heated from energy generated by a small data center); Clare Naden, *AI for Sustainability*, IEC E-TECH (Dec 4, 2023), https://etech.iec.ch/issue/2023-06/ai-for-sustainability [https://perma.cc/S9AH-TKNN] (noting Google's data centers around the world powered by clean energy); *Powering a Pioneering Data Centre Project*, SYSTEMAIR, https://www.systemair.com/en/expertise/case-studies/boden-greenhouse-sweden [https://perma.cc/8GSR-5V2D] (last visited Sept. 25, 2025) (describing Systemair's pilot project utilizing data center generated heat to power a greenhouse to grow vegetables); Lennart Håkansson, *Agitira and Greenfood to Build Large–scale Greenhouses in Boden*, N. SWED. BUS. (Mar. 23, 2023, 20:06 PM), https://northswedenbusiness.com

solutions must be implemented if companies decide to use AI for ESG purposes, to develop sustainably, and to be coherent with its aspirations as an innovative tool.

Increased AI use also entails increased natural resource extraction. Natural resources, like rare earth elements and metals such as germanium and gallium, are needed for chips used for AI technologies.[60] AI data centers also use copper, which may bring a host of social and legal issues.[61]

Companies should consider how they will address certain environmental issues surrounding the increased use of AI and how they will disclose these issues in their ESG reports. This Article acknowledges the aforementioned environmental risks associated with AI use but also highlights how responsible and sustainable AI use can combat those risks and provide numerous environmental benefits, such as carbon footprint tracking and resource allocation.[62]

II. AI USE IN ESG-RELATED DECISION-MAKING

There are a wide variety of AI use cases in the ESG space, including uses for environmental impact analysis and reduction, social responsibility and employee well-being, governance and compliance, risk management, integration and reporting, stakeholder communication and education, and ESG investing. But it is also imperative to note where AI will not work. AI cannot substitute for human judgment because it lacks self-awareness and consciousness.[63] AI is based on algorithms and, like humans, only knows what it has been exposed to through these algorithms.[64]

Related to the "E" in ESG, AI can reduce a company's overall environmental impact by analyzing data for energy consumption, minimizing pollutant emissions from machines, and continuously

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[https://perma.cc/4GUF-25WD] (discussing a food tech company in Sweden that plans to build a greenhouse powered by the surplus energy generated by a blockchain server hall).

[60] *See Critical Minerals in AI and Digital Technologies*, SFA (OXFORD), https://www.sfa-oxford.com/knowledge-and-insights/critical-minerals-in-low-carbon-and-future-technologies/critical-minerals-in-artificial-intelligence/ [https://perma.cc/2W48-3BEY] (listing many "critical materials" used for AI technologies, including germanium and gallium).

[61] *See* Max Bearak, *A.I. Needs Copper. It Just Helped to Find Millions of Tons of It*, N.Y. TIMES (July 15, 2024), https://www.nytimes.com/2024/07/11/climate/kobold-zambia-copper-ai-mining.html [https://perma.cc/P7VY-6Z3A].

[62] *See Potential Opportunities and Risks AI Poses for ESG Performance*, BARNES & THORNBURG (Nov. 30, 2023), https://btlaw.com/en/insights/alerts/2023/potential-opportunities-and-risks-ai-poses-for-esg-performance [https://perma.cc/XSG9-HH49].

[63] Tom McClelland, *Will AI Ever Be Conscious?*, CLARE COLLEGE, https://stories.clare.cam.ac.uk/will-ai-ever-be-conscious/index.html [https://perma.cc/B4WS-MRDJ].

[64] *Id.* ("Perhaps the human mind's ability to generate subjective experiences is the one ability that a computer system can never emulate.").

monitoring carbon emissions to effectively track a company's carbon footprint.[65]

In an attempt to improve the "S" in ESG, AI can detect areas where diversity initiatives may be the most beneficial, potentially use blockchain technology to track a company's supply chain, and monitor labor conditions to improve ethical rights compliance.[66]

AI's use regarding the "G" in ESG includes risk management, integration and reporting, and stakeholder communication and education.[67] AI can monitor regulatory changes globally, evaluate board diversity, and streamline a company's internal auditing process. AI could also use data to assess risks, provide proxy voting advice, and gather information for company reporting measures.

A. Uses

AI is increasingly being used in ESG-related decision-making across various sectors and industries, as well as by investors.[68] Here are several ways AI is applied in the ESG context:

1. ESG Data Analysis: AI algorithms can analyze vast amounts of financial data to identify relevant ESG factors and trends, as well as non-financial data such as environmental impact reports, supply chain information, and employee diversity metrics.[69] For instance, AI can improve the use of raw materials, adding efficiency to the production process.[70] Improving supply chain production efficiency can decrease resource consumption, thus ensuring a more sustainable manufacturing process.[71] Additionally, AI can use recruiting tools to assess and eradicate bias in the workplace as well as increase workplace diversity.[72]

2. ESG Risk Assessment and Management: AI-powered risk assessment tools evaluate the ESG risks of investment portfolios, supply chains, and business operations by analyzing their exposure to climate change-related hazards, labor violations, or governance issues, enabling investors and businesses to proactively mitigate these risks.[73] Business

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[65] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[66] *See* Assunta Di Vaio et al., *Blockchain Technology and Gender Equality: A Systematic Literature Review*, 68 INT'L J. OF INFO. MGMT., Feb. 2023, at 1–2 (investigating "how corporate governance models can include blockchain technology to add value to gender equality and inclusion processes").

[67] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[68] *Id.*

[69] *Id.*; Rane et al., *supra* note 12.

[70] Rane et al., *supra* note 12.

[71] *Id.*

[72] *Id.*

[73] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62; Rane et al., *supra* note 12 ("In supply chain management, AI promotes social sustainability by ensuring ethical sourcing and labor practices. AI-powered systems can track and monitor supply chain activities to ensure suppliers adhere to ethical standards

operations include energy management. For instance, AI can integrate data from weather forecasts and historical use patterns to make needed alterations in energy use.[74] In relation to supply chains, AI can predict product demand using past data trends, which can better manage a company's inventory and mitigate supply chain inefficiencies.[75]

3. ESG Screening, Scoring, and Portfolio Optimization: AI algorithms automate the screening process of investments or companies based on ESG criteria; investors and asset managers then use these scores to guide investment decisions and integrate ESG considerations into their portfolios.[76]

4. ESG Engagement and Stakeholder Communication: AI-powered chatbots and virtual assistants interact with investors, customers, employees, and other stakeholders to answer questions, provide information, and gather feedback on ESG initiatives.[77] For example, AI-powered chatbots and assistants ensure stakeholders' needs are addressed through various questions.[78] NLP and ML systems can comprehend and respond to customer FAQs,[79] asking for stakeholders' opinions on engagement efforts, sustainability programs, or diversity initiatives.[80] Integrating AI tools to evaluate the impact of ESG initiatives and investments is a proactive way to ensure stakeholder collaboration and ensure the beneficial impact of the programs.

5. ESG Reporting and Disclosure: AI attempts to make ESG reporting and disclosure more efficient by automating data collection, analysis, and reporting tasks. AI software can extract information from unstructured data sources (e.g., AI can use NLP to clean data and then prepare the text data for generative AI model consumption. Then, transformers can process the data that was cleaned, remove pertinent information, and spot patterns.)[81] It can generate ESG reports, get real-time ESG data, ensure compliance with regulatory requirements, and compare ESG data against Key Performance Indicators (KPIs).[82] Also, AI platforms may assess ESG metrics and help companies and lawyers

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and labor laws. By analyzing data from various sources, AI can identify potential risks related to child labor, forced labor, and unsafe working conditions.").

[74] Rane et al., *supra* note 12.

[75] *Id.*

[76] Matti Minkkinen et al., *What About Investors? ESG Analyses as Tools for Ethics-based AI Auditing*, 39 AI & SOC'Y 329, 330 (Mar. 9, 2022); Bryant Rivera, *Green Bonds: Reforming ESG Regulation in the United States to Meet the Requisite Funding Demand for a Decarbonized Economy*, 28 HASTINGS ENV'T L. J. 191, 195–96 (2022).

[77] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[78] Rane et al., *supra* note 12.

[79] *Id.*

[80] *Id.*

[81] Jay Mishra, *How Generative AI is Transforming Text Data Extraction*, BUILT IN (July 18, 2024), https://builtin.com/articles/how-generative-ai-transforming-text-data-extraction [https://perma.cc/XCE4-QF6M].

[82] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

navigate different disclosure regimes and guidelines across jurisdictions. This is beneficial because there is not yet a standardization of ESG disclosure guidelines across the globe. AI can sort through data from a client's ESG reports under The Taskforce on Climate-related Financial Disclosures (TCFD) and then can make another set of reports that comply with different guidelines, such as the Sustainable Finance Disclosure Regulation (SFDR).[83]

6. ESG Impact Measurement: AI attempts to measure and evaluate the impact of ESG initiatives and investments such as sustainability programs, community engagement efforts, and diversity initiatives.[84] AI can aid businesses in accurately measuring and reporting their sustainability performances.[85] AI can automate data collection and provide a real-time look into the measurements of sustainability efforts.[86] More specifically, AI can pinpoint local environmental and social issues, helping companies assess the impact of their ongoing initiatives.[87]

7. ESG Due Diligence: Companies can disclose how they are handling certain ESG considerations, such as climate change risk.[88] AI can assist and conduct ESG due diligence, revealing ESG policies and risk factors to ensure investment decisions based on ESG goals. Due diligence necessarily involves disclosure.

Due Diligence and the "E" in ESG: Companies can use AI tools to conduct due diligence reviews that focus on climate change risk and mitigation, biodiversity and ecological impacts, and other environmental impacts.[89]

Due Diligence and the "S" in ESG: AI tools can aid in social due diligence for a company, such as analyzing the supply chain for human rights violations and ensuring there are adequate diversity, equity, and inclusion policies.[90]

Due Diligence and the "G" in ESG: AI tools can engage stakeholders to reveal misalignments between stakeholder values and company operations. AI tools can also assist a company in ESG due diligence by identifying applicable laws for board diversity.[91]

Lawyers' roles and due diligence: AI can complement lawyers' roles in conducting due diligence. A prominent legal AI tool, CoCounsel,

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[83] *How AI Is Blazing a Trail in ESG Reporting*, ICAEW INSIGHTS, (Mar. 8, 2024), https://www.icaew.com/insights/viewpoints-on-the-news/2024/mar-2024/how-ai-is-blazing-a-trail-in-esg-reporting [https://perma.cc/FMV7-SUWT].

[84] Rane et al., *supra* note 12.

[85] *Id.*

[86] *Id.*

[87] *Id.*

[88] Peter Gioelle & Tyler L. Burgess, *Due Diligence and ESG*, *in* ENVIRONMENTAL, SOCIAL, GOVERNANCE: THE PROFESSIONAL'S GUIDE TO THE LAW AND PRACTICE OF ESG 426, 426 (Brian Israel et al. eds., 2023) (eBook).

[89] *Id.*

[90] *Id.* at 427–28.

[91] *Id.* at 428–29.

used by law firms and legal professionals, can create summaries of legal issues and review reports and other documents.[92] CoCounsel and other AI tools can help lawyers review ESG disclosures, while analyzing and summarizing the material.[93] A key example of AI aiding lawyers in analyzing material is in the mergers and acquisitions (M&A) due diligence context, where AI can review documents and save lawyers time when conducting due diligence in a M&A deal.[94] This can translate to M&A deals where lawyers are focused on specific ESG issues in a target company, where AI can aid in document review and search for certain issues such as environmental litigation risks and risks involving employees or board diversity risks.[95]

B. AI Tools

Several companies offer AI tools and solutions tailored for ESG decision-making and due diligence, such as Datamaran, Sustainalytics, RepRisk, Truvalue Labs, Alva, and WorldFavor.

These companies are leveraging AI technologies to analyze large datasets and provide ESG data for proper ESG due diligence. Also, these companies provide ESG-related data to business leaders, ensuring they are disclosure-ready, have a clear audit trail, and have a clear understanding of ESG risks throughout their business. Companies using these AI platforms are reaping the benefits of AI and ESG integration.[96]

Datamaran: Datamaran is a specific AI-powered smart ESG platform. The platform provides AI-powered insights and summaries.[97]

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[92] *Legal AI Tools Essential for Legal Teams*, THOMSON REUTERS (Aug. 26, 2024), https://legal.thomsonreuters.com/blog/legal-ai-tools-essential-for-attorneys/ [[https://perma.cc/EGJ4-RWSQ] (citing a litigation managing attorney who said, "CoCounsel helps improve the quality of our representation. It finds things in 2,000-page police reports and transcripts that humans miss.").

[93] *See id.* (noting that "lawyers use . . . AI tool[s] to create concise summaries of legal issues and data sets for clients and stakeholders.").

[94] *See id.* ("A GenAI tool like CoCounsel reads a hundred pages in their entirety and can answer complex questions about them in three minutes.").

[95] In some jurisdictions, there are board diversity requirements that must be met. AI can ensure these requirements are met in the target company.

[96] *See Data Driven ESG Decisions in a Global Agri Chem Business*, DATAMARAN, https://blog.datamaran.com/customer-stories/data-driven-esg-decisions-in-a-global-agri-chem-business-nutrien [https://perma.cc/EZD2-LLPY] (last visited Sept. 25, 2025) (detailing how Nutrien used Datamaran to identify future ESG risks and opportunities and how, in turn, their leaders are now on top of emerging issues that may impact the company financially); SESAMM, THE BOEING SCANDAL: CAN AI PREDICT CONTROVERSIES BEFORE TRADITIONAL TOOLS?, at 5 (2024) (eBook) (highlighting the importance of AI technology's ability to "analyze vast amounts of unstructured data from diverse sources" to private equity firms).

[97] *Datamaran AI-powered Smart ESG Platform*, DATAMARAN, https://www.datamaran.com/esg-software (last visited Sept. 25, 2025) [https://perma.cc/C6M7-W38K].

Datamaran's AI platform "empowers business leaders to navigate the complex ESG landscape with confidence by transforming vast amounts of information into actionable insights."[98] World-leading companies use Datamaran's AI technology, such as Cisco, KraftHeinz, and Dell Technologies.[99]

Morningstar Sustainalytics (Sustainalytics)[100]: has been developing AI solutions for ESG metrics for a decade.[101] In 2015, Sustainalytics began using NLP to process corporate ESG disclosures.[102] The company now has in-house LLMs to retrieve information from sustainability disclosures.[103] Most notably, Sustainalytics uses AI to analyze large datasets from a range of sources to reveal and understand companies' ESG performance.[104]

RepRisk: RepRisk's data aims to identify and assess ESG risks that are deemed material.[105] Information is analyzed from public sources and stakeholders, instead of internal disclosures. "AI and ML empower the size and scale" of their dataset.[106] RepRisk's ML models can identify ESG risks in line with international standards and norms definitions of ESG.[107] Examples include the 17 Sustainable Development Goals, the SASB Materiality Map, and the Sustainable Finance Disclosure Regulation.[108]

Truvalue Labs: Truvalue Labs' mission is to use AI to quantify data for enhanced investor intelligence.[109] Truvalue Labs uses AI in

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[98] *Id.*

[99] Mark Segal, *Morgan Stanely Invests $33 Million in ESG Risk Management Software Provider Datamaran*, ESG TODAY (Sept. 24, 2024), https://www.esgtoday.com/morgan-stanley-invests-33-million-in-esg-risk-management-software-provider-datamaran/ [https://perma.cc/6T6W-ZWZC].

[100] KILIAN THIEL & ARIK BRUTIAN, ARTIFICIAL INTELLIGENCE FOR ESG ASSESSMENTS 2 (2024), https://connect.sustainalytics.com/hubfs/INV%20-%20AI%20&%20ESG%20White%20Paper.pdf [https://perma.cc/W2TY-4W8A].

[101] *Id.*

[102] *Id.* at 6.

[103] *Id.*

[104] *Id.* at 10.

[105] *RepRisk Methodology Overview*, REPRISK, https://www.reprisk.com/research-insights/resources/methodology [https://perma.cc/BRH2-GWP3] (last visited Sept. 25, 2025) ("RepRisk systematically flags and monitors material business conduct and ESG issues that can translate into financial, reputational, and compliance risks.").

[106] *Approach*, REPRISK, https://www.reprisk.com/approach [https://perma.cc/P4JF-F8Z7] (last visited Sept. 25, 2025).

[107] *The Advantage of Artificial + Human Intelligence at RepRisk*, REPRISK, https://www.reprisk.com/insights/resources/the-advantage-of-artificial-human-intelligence-at-reprisk [https://perma.cc/BRH2-GWP3] (last visited Sept. 25, 2025).

[108] *Sustainable Development Goals: One Step Forward, Sixteen Steps Back?*, REPRISK, https://www.reprisk.com/insights/reports/sdg-risk-lens [https://perma.cc/7BAT-99YX] (last visited Sept. 25, 2025); *RepRisk Integrates Sustainability Accountability Standards Board Framework*, REPRISK, https://www.reprisk.com/insights/news-and-media-coverage/reprisk-integrates-sustainability-accounting-standards-board-sasb-framework [https://perma.cc/28YE-DB4X] (last visited Sept. 25, 2025).

[109] *Introduction*, BRAND TRUVALUE LABS, https://brand.truvaluelabs.com [https://perma.cc/UB43-G5PE] (last visited Sept. 25, 2025). In 2020, Factset acquired

sources, including news and industry reports, to provide "daily signals" for ESG behavior.[110] Factset Truvalue offers an array of ESG products, such as external stakeholder insights into a company's ESG behavior, and a workflow to integrate ESG scores, news, and events from multiple sources to holistically reflect ESG performance.[111]

One other notable company, SESAMm, analyzes datasets from news outlets, non-governmental organizations (NGOs), and public works to detect ESG controversies and may be able to detect risks before traditional rating agencies.[112] SESAMm is an AI company that can provide ESG risk assessments and also may be able to detect potential ESG risks before they arise.[113] A recent case study conducted by SESAMm details how their AI system detected early signs of issues regarding Boeing's safety practices and governance.[114] Their AI platform can actually detect whistleblower complaints if people announce potential negative events, and their voices are captured properly.[115] Also, their platform can look at local sources such as local news, and, for example, individual factories of Boeing, that may have already reported concerning events and issues.[116] SESAMm's case study illustrates AI's promising risk detection capabilities and uses in the ESG space in the future.

C. Benefits

Using AI-powered software and integrating it into business operations and decisions can lead to real benefits in all ESG categories. Law and consulting firms enthusiastically point to ways AI algorithms help analyze and reduce environmental impacts (the "E" in ESG) through:

Truvalue Labs, thus information related to AI-driven ESG metrics may be found there. Press Release, FactSet, FactSet Enters into Agreement to Acquire Truvalue Labs (Oct. 20, 2020) (on file with author).

[110] Press Release, FactSet, *supra* note 109.

[111] *ESG Investing Solutions,* FACTSET, https://www.factset.com/solutions/esg-investing [https://perma.cc/Z5DP-3KKH] (last visited Sept. 25, 2025).

[112] *See generally Alerts & Monitoring,* SESAMM, https://www.sesamm.com/alert-monitoring [https://perma.cc/K6NX-JDKZ] (last visited Sept. 25, 2025) (noting that "any private or public company" can be monitored).

[113] *New Research Confirms ESG Controversies Increase Company Risk — Here's What Investors Should Know*, SESAMM, https://www.sesamm.com/blog/esg-controversies-and-company-risk#:~:text=About%20SESAMm,at%20 [https://perma.cc/NUC5-L3GF] (last visited Sept. 25, 2025).

[114] *E.g.*, Abir Hbibi, *Boeing and ESG: An Examination of ESG Practices in the Aerospace Sector*, SESAMM, https://www.sesamm.com/blog/boeing-esg-controversies [https://perma.cc/EME3-V2C5] (last visited Sept. 25, 2025).

[115] *E.g.*, *Can AI Predict Controversies Before Traditional Tools?*, SESAMM, https://www.sesamm.com/blog/boeing-scandal-webinar-replay [https://perma.cc/NFA8-4CBD] (last visited Sept. 25, 2025).

[116] SESAMM, *supra* note 113; SESAMM, *supra* note 14.

- Detailed Energy Consumption Analysis: AI goes beyond surface-level insights, delving into granular energy consumption data for each business process, identifying specific inefficiencies, and suggesting energy-saving measures and tailored sustainable alternatives.
- Optimized Resource Allocation: AI-driven algorithms can manage resources dynamically, adapting to changes in demand to minimize environmental impact. AI's advanced algorithms can not only reduce waste but also contribute to sustainable resource management by predicting future resource needs and optimizing their allocation.[117] Businesses can use AI to assess deforestation and wildlife populations to lessen their environmental impact and enhance their sustainability practices.[118]
- Advanced Predictive Maintenance: By forecasting machine failures, AI reduces unexpected downtimes, conserves resources, and minimizes pollutant emissions, reducing the environmental footprint of machinery malfunctions.[119] ML and predictive analysis can allow businesses to effectively monitor and allocate their resources.[120]
- Smart Building Management: AI can adapt energy use in real-time, accounting for occupancy and weather conditions, leading to significant reductions in the carbon footprint of commercial and industrial buildings.
- Waste Management Optimization: AI can improve waste sorting accuracy, enhance recycling processes, and identify opportunities to repurpose waste materials, leading to a reduction in overall environmental impact.[121] AI can track and manage businesses' waste, and thus identify strategies to reduce waste and enhance recycling practices.[122]
- Carbon Footprint Tracking and Reduction: AI enables continuous tracking and management of carbon emissions with precision, offering actionable insights to support the transition to more sustainable operations. It can identify opportunities to reduce greenhouse gas emissions through targeted improvements in logistics, manufacturing, and supply chain processes.[123]
- Biodiversity Protection Insights: By analyzing satellite imagery and sensor data, AI can assess ecosystem health and

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[117] Reema Alsabt et al., *Optimizing Waste Management Strategies Through Artificial Intelligence and Machine Learning — An Economic and Environmental Impact Study*, 8 CLEANER WASTE SYSTEMS, August 2024, at 2–3.

[118] *See* Rane et al., *supra* note 12.

[119] *Id.*

[120] *Id.*

[121] *Id.*

[122] *Id.*

[123] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

develop tailored conservation strategies based on specific local conditions. This is especially valuable in regions impacted by industrial activity.[124]

- Water Usage Efficiency: AI can forecast water demand, enhance the efficiency of irrigation systems, and detect leaks, contributing to more sustainable water management. These capabilities are especially beneficial in water-scarce areas where conservation is critical.[125]

The hope is that AI can also improve social responsibility and employee well-being and safety (the "S" in ESG) through tracking diversity and inclusion metrics, anticipating hazardous situations in the workplace using sensor data to trigger alerts and prevent accidents, and using blockchain technology to trace the ethical sourcing of materials.[126]

In terms of the "G" in ESG, AI can improve corporate governance and compliance by monitoring regulatory changes globally, evaluating board composition against industry benchmarks, analyzing stakeholder communications, and detecting signs of corruption or fraud that might elude human auditors.[127]

Will the promise of AI in ESG be achieved? Expectations are strong. There is evidence that AI can "[foster] an ESG landscape that shifts from primarily profit-driven to value-driven."[128]

> Artificial intelligence (AI) has the potential to revolutionize environmental, social and governance (ESG) practices, offering innovative solutions and insights that can help businesses operate more sustainably, ethically and transparently. As corporations face increasing pressure from stakeholders to improve their ESG performance, AI has emerged as a powerful tool to help address these challenges.[129]

However, skepticism remains. While AI certainly holds promise in transforming ESG practices, a more nuanced approach that considers materiality frameworks must be applied to determine its benefits to value-driven ESG. In this context, AI has potential to contribute to a value-driven ESG landscape when properly aligned with a double materiality approach.[130]

Furthermore, other benefits that AI may bring to the ESG space are related to how this technology may detect false and misleading statements related to environmental claims. AI technology designed around ESG metrics may help detect instances of greenwashing, for

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[124] *Id.*
[125] *Id.*
[126] *Id.*
[127] *Id.*
[128] Rivera, *supra* note 76.
[129] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.
[130] *See infra* Part IV.B. for an in-depth description of materiality and its influence on AI and ESG interactions.

example, by analyzing corporate sustainability claims against a company's reported carbon footprint.[131] ChatGPT may also help investors with proxy voting advice, for example, to vote for proposals that reduce reliance on fossil fuels and increase renewable energy.[132] Still, the use of AI chatbots may exacerbate greenwashing. A recent report by Global Witness showed that AI may replicate greenwashing statements because generative AI tools fail to adequately reflect fossil fuel companies' complicity in climate change.[133] These risks, as many others, are going to be addressed further in the next section.

III. LEGAL RISKS WHEN USING AI IN ESG ANALYSIS

AI use comes with a host of legal risks that should be considered carefully. AI is an unknown topic for investors and responsible use of AI in the ESG space is uncertain.[134] For now, in the U.S., there is no regulatory structure for AI-based auditing and no established practice for the responsible use of AI in ESG metrics.[135] Also, given the current political landscape, this regulatory gap is unlikely to be addressed in the near future.[136]

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[131] Rivera, *supra* note 76, at 206–07; Barbara Ballan & Jason J. Czarnezki, *Disclosure, Greenwashing, and the Future of ESG Litigation*, 81 WASH. & LEE L. REV. 545, 549 (2024) (commenting on the exacerbation of "greenwashing" as corporate ESG initiatives grow in significance).

[132] Chen Wang, *Outsourcing Voting to AI: Can ChatGPT Advise Index Funds on Proxy Voting Decisions?*, 29 FORDHAM J. OF CORPORATE & FINANCIAL L. 113, 130 (2023).

[133] *Greenwashing and Bothsidesism in AI Chatbot Answers About Fossil Fuels' Role in Climate Change*, GLOBAL WITNESS (Jan. 22, 2025), https://www.globalwitness.org/en/campaigns/digital-threats/greenwashing-and-bothsidesism-ai-chatbot-answers-about-fossil-fuels-role-climate-change/ [https://perma.cc/QVG8-96JG].

[134] HOLLY J. GREGORY, AI AND THE ROLE OF THE BOARD OF DIRECTORS (2023).

[135] Rivera, *supra* note 77, at 196 ("While corporate matters typically fall under the jurisdiction of state corporate law or federal regulatory bodies, there are no specific binding regulations in place for ESG.").

[136] *See, e.g.*, *Exec. Order No. 14,319, Preventing Woke AI in the Federal Government,* 90 Fed. Reg. 35, 389 (July 28, 2025), https://www.federalregister.gov/documents/2025/07/28/2025-14217/preventing-woke-ai-in-the-federal-government [https://perma.cc/2NFX-93RS] (directing federal agencies to identify and eliminate AI tools deemed "woke" and to certify that future systems are ideologically neutral); David Shepardson, *Trump Revokes Biden Executive Order on Addressing AI Risks*, REUTERS (Jan. 21, 2025, 12:33 PM), https://www.reuters.com/technology/artificial-intelligence/trump-revokes-biden-executive-order-addressing-ai-risks-2025-01-21/ [https://perma.cc/BG7W-8VX3] (noting Trump's revocation of a Biden-era Executive Order that "sought to reduce the risks that artificial intelligence poses to consumers, workers, and national security," as well as required AI-developers to submit results of safety tests to the government prior to making AI systems publicly available); David Morgan & David Shepardson, *U.S. Senate Strikes AI Regulation Ban from Trump Megabill*, REUTERS (July 1, 2025, 5:26 PM), https://www.reuters.com/legal/government/us-senate-strikes-ai-regulation-ban-trump-megabill-2025-07-01/ [https://perma.cc/5USD-HYKF] (reporting that the Senate removed a provision blocking future federal AI regulation from a major spending bill).

This section groups AI legal risks into five main categories of legal risks that emerge when using AI in the ESG space: (A) transparency issues; (B) bias issues, (C) lack of accuracy and hallucinations; (D) directors, officers, and lawyers' liability; (E) the unknown landscape of AI that creates data privacy issues and reputational risks.

A. Transparency

In AI systems, algorithms often operate within a "black box" shielded by technical complexity and trade secret protections.[137] This algorithmic opacity has led to significant issues, including unfair treatment in areas such as the employment, housing and medical care.[138] Algorithms with the ability to manipulate human decisions remain largely free from public scrutiny due to technical illiteracy and insufficient regulatory oversight.[139] Despite growing regulations in the U.S., the law has not adequately protected individuals from the influence of these opaque systems.[140]

The Securities and Exchange Commission (SEC) emphasizes transparency as a cornerstone of market integrity.[141] However, current disclosure frameworks do not adequately address the complexities of algorithmic opacity. Expanding disclosure requirements to include algorithmic operations could strengthen protections for both consumers and investors.[142]

On the one hand, companies must be cautious not to mislead the public and government about their use of AI for ESG. On the other hand, companies should be careful about their use of AI to handle ESG data to avoid additional risk exposure. A barrier to full transparency and AI use may be the cost of disclosures relating to AI.

Disclosures are generally expensive because of the costs of data collection, the costs of preparing the information, and the costs that

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[137] *See* ECOACTIVE TECH, *supra* note 23; Sylvia Lu, *Algorithmic Opacity, Private Accountability, and Corporate Social Disclosure in the Age of Artificial Intelligence*, 23 VAND. J. ENT. & TECH. L. 99, 114–17 (2020); Richard Raysman, *Protection of Proprietary Software in the Computer Industry: Trade Secrets as an Effective Method*, 18 JURIMETRICS J. 335, 343–44 (1978) ("The applicability of trade secret protection to software is clear. Some sort of proprietary protection is required for computer programs . . . .").

[138] Lu, *supra* note 137, at 104 (citing Karl Manheim & Lyric Kaplan, *Artificial Intelligence: Risks to Privacy and Democracy*, 21 YALE J.L. & TECH. 106 (2019)).

[139] *Id.*

[140] Lu, *supra* note 137, at 104.

[141] *See Structured Disclosure at the SEC: History and Rulemaking*, U.S. SECS. EXCH. COMM'N, https://www.sec.gov/page/osdhistoryandrulemaking [https://perma.cc/P7MH-FVRX] (last updated Jan. 24, 2025); Lu, *supra* note 137, at 129.

[142] Lu, *supra* note 137, at 132–33 (explaining that because stakeholders play a key role in deciding the value of AI, it would be beneficial to expand algorithmic disclosures to include these individuals).

come with the increased liability in making the disclosures.[143] The high cost may limit the implementation of AI. Companies may disclose how they use AI for their ESG disclosures, but they may be deterred from integrating AI to aid with their ESG metrics due to the cost and time of disclosing their AI use and disclosing their ESG metrics.[144] Overall, there are many issues that fall under transparency or lack thereof.

Users of AI in the ESG space must be careful not to "AI wash." SEC chairman warned of this practice and compared it to "greenwashing."[145] AI washing may happen when a company is misleading investors regarding its use of AI. For instance, businesses may tout that they use AI technologies, when in fact they only use a small amount or maybe not any at all.[146] Greenwashing is where a company's environmental or sustainability-related claims are misleading or false.[147] Recently, SEC enforcement actions have arisen out of alleged ESG and climate-related misconduct.[148] Shareholders have also brought greenwashing suits.[149] Thus, if a company is either inflating or deflating its AI reporting, similar suits may arise. Companies, especially public companies, must ensure they are correctly advertising and disclosing their use of AI within the ESG space to avoid misleading the public and the SEC about their actual use of AI.

Issues with transparency may also arise relating to data control and governance.[150] For instance, if a company relies on external AI systems to create data about their company, such as the company's supply chain, the company exposes itself to additional risks if its vendors are not meeting ESG standards.[151] Vendors may use various ESG considerations in their models, resulting in inconsistency regarding ESG risk management across the overall organization.[152] Moreover, because AI algorithms are extremely complex, there is a lack of

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[143] Elad L. Roisman, Commissioner, US Secs. and Exch. Comm'n, *Putting the Electric Cart Before the Horse: Addressing the Inevitable Costs of a New ESG Disclosure Regime* (June 3, 2021).

[144] For a discussion on the high costs of ESG disclosures, see generally *id.* (outlining the various cost concerns that companies will have to undertake if the new disclosure regime takes place).

[145] David Shargel et al., *Compliance Risk after SEC Warning Against 'AI Washing,'* LAW 360 (Jan. 3, 2024, 5:22 PM), https://www.law360.com/articles/1780363 [https://perma.cc/525J-DBVA].

[146] *Id.*

[147] *Id.*

[148] *Id.*

[149] *Id.*

[150] *ESG, Blockchain, And AI — Oh My!*, BARNES & THORNBURG (Mar. 10, 2023), https://btlaw.com/en/insights/alerts/2023/esg-blockchain-and-ai—-oh-my [https://perma.cc/9RKX-R8X7]; Katherine Forrest et al., *The Intersection of Artificial Intelligence and ESG,* CORP. COUNS., (June 20, 2023, 10:50 AM), https://www.law.com/corpcounsel/2023/06/20/the-intersection-of-artificial-intelligence-and-esg/ [https://perma.cc/LL2D-X7QK].

[151] *ESG, Blockchain, And AI — Oh My!*, *supra* note 150.

[152] *Id.*

transparency and explainability in the decision-making process.[153] This creates a challenge for stakeholders to fully understand decisions made.[154] There may be cases where AI-made decisions lead to unintended and oppositional ESG outcomes, and due to the lack of transparency and explainability it will be extremely difficult to allocate responsibility.[155] This will create legal issues regarding corporate governance controls and issues regarding tracing responsibility to the appropriate decision-maker within a corporation. Issues could also pertain to investors; investors may not be able to obtain sufficient data in order to understand how companies are utilizing AI.[156] It is important companies provide the essential information regarding their use of AI directly.[157]

Transparency issues may also arise in terms of mixing public and private data. There is now an array of sources that provide information about physical climate-related risks.[158] This makes it difficult to determine where data was sourced and what provider added what information.[159] Sources of data may be upstream sources, like government institutions that collect weather data, and downstream sources, like localized professionals that analyze local climate risks.[160] If there are already market risks associated with physical climate risk assessments,[161] AI may exacerbate these risks as it potentially takes data from these assessments. Climate services, such as ESG rating companies, may be illustrative of this if they do not use climate modelling or data, but perhaps only use data like news reports about corporations to gather information about their exposure to climate-related risks.[162] Thus, if the data is not fully accurate or transparent, the information AI gathers may create more market risks if the technology predicts misleading or false climate physical risks to a company.

Transparency issues may directly lead to litigation risks. If a company chooses one ESG rating over another, they could expose

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[153] *Id.*

[154] *Id.*

[155] *Id.*; Forrest et al., *supra* note 150 ("It is beneficial for companies to understand particular risks that AI tools can carry, and what is then needed in terms of governance to manage them. This has clear importance as it relates to public ESG commitments the company has made and whether those commitments are being upheld.").

[156] Natalie Runyon & Zach Warren, *From Hallucinations to Clarity? The Potential – and Pitfalls – of Using AI in ESG Reporting*, REUTERS (January 8, 2024, 3:11 AM), https://www.reuters.com/sustainability/sustainable-finance-reporting/hallucinations-clarity-potential-pitfalls-using-ai-esg-reporting-2024-01-08/ [https://perma.cc/UN88-JYX5].

[157] *Id.*

[158] *Id.*

[159] Madison Condon, *Climate Services: The Business of Physical Risk*, 55 ARIZ. ST. L. J. 147, 151 (2023).

[160] *Id.*

[161] *Id.*

[162] *Id.* at 177.

themselves to suits as different ESG firms produce different results.[163] There has been an increase in critiques over ESG-firm-created physical-risk scores for lack of constancy.[164] Companies should closely monitor these developments and be mindful when choosing an AI platform to gather data for their ESG ratings and metrics.

There may be a lack of transparency in supply chain data. AI may not be able to access the necessary data it needs to do a full supply chain analysis. If AI does not have access to enough data from a company's supply chain, its capabilities to learn about supply chain risks are incredibly limited.[165] Limited data can also create less accurate predictions of inefficiencies in supply chains. Limited data could stem from the close-knit community of teams throughout supply chains.[166] Teams may not work together and thus do not communicate with each other. Lack of communication most likely leads to lack of data.[167]

While there are issues surrounding the lack of available data, there are also risks pertaining to the data that is available. Access to data throughout a company's supply chain will inevitably create data risks.[168] Because the AI system used will have access to massive amounts of data, like data about operations, customers, and suppliers, a data leak would be catastrophic for a company. Recent reports reveal supply chain data attacks are increasing.[169] If companies use web-based AI models, they open themselves up to data risks that can attack their supply chain data.[170]

B. Bias

The use of AI requires clearly defined objectives, as AI can raise fairness, opportunism, and bias concerns because it is difficult for

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[163] *Id.* at 151–52 (*citing* Linda I. Hain et al., *Lets get Physical: Comparing Metrics of Physical Climate Risk,* 46 FIN. RSCH. LETTERS 1, 3 (2022)).

[164] *Id.*

[165] Anita Raj, *Beyond the Hype: 12 Real Challenges of AI in Supply Chain,* THROUGHPUT INC. (Feb. 2, 2024), https://throughput.world/blog/challenges-of-ai-in-supply-chain/ [https://perma.cc/K556-A7RU].

[166] *3 Steps to Solve the Problem of Data Silos in Your Supply Chain*, EUROSTEP, https://www.eurostep.com/3-steps-to-solve-the-problem-of-data-silos-in-your-supply-chain/ [https://perma.cc/C66G-AJ4A] (last visited Sept. 25, 2024) (explaining that data silos happen when information is kept within a specific team or organization within the supply chain).

[167] Raj, *supra* note 165.

[168] Sitaram Iyer, *Are AI Data Poisoning Attacks the New Software Supply Chain Attack?,* SEC. MAG. (Apr. 18, 2024), https://www.securitymagazine.com/articles/100590-are-ai-data-poisoning-attacks-the-new-software-supply-chain-attack [https://perma.cc/Q2CJ-DJDS].

[169] Pallavi Kalapatapu, *Top 15 Software Supply Chain Attacks: Case Studies*, OUTSHIFT, https://outshift.cisco.com/blog/top-10-supply-chain-attacks [https://perma.cc/PG9V-8RDN] (last modified Feb. 4, 2025) (discussing supply chain attacks in 2023).

[170] Iyer, *supra* note 168.

algorithms to take into account ethical considerations.[171] Biases can be manifested in various ways: there might be a data selection bias, an algorithmic bias, or human bias.[172] Sources of biases interact with each other and can be problematic when companies are disclosing ESG.

Biases related to data selection occur when algorithms are trained using historical data, which may also be complex and misleading because it perpetuates "the precise biases one expects [algorithms] to eradicate."[173] Thus, because AI ML models have relied on historically collected data, "populations that experienced human and structural biases in the past are vulnerable to harm by incorrect predictions."[174]

AI bias can raise discrimination lawsuits. This may create legal risks pertaining to the use of AI and the "S" in ESG.[175] For example, if a company uses AI for hiring decisions, it risks discrimination lawsuits relating to AI biases.[176] The first lawsuit relating to AI biases in hiring decisions arose in 2022.[177] The U.S. Equal Employment Opportunity Commission sued three companies based in China (iTutorGroup), alleging their AI hiring software discriminated against age.[178] Specifically, the suit alleged the software automatically rejected applicants due to their older age.[179] As more companies use AI for hiring, biases and potentially more lawsuits may arise.[180] Thus, companies that use AI software for hiring decisions must ensure the software is not hiring disproportionally and should maintain adequate controls over the software.

Like humans, AI automation will also have biases such as algorithmic biases, socioeconomic disparities, and cultural sensitivity

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[171] Hertig, *supra* note 22, at 443–46.

[172] *ESG, Blockchain, And AI — Oh My!*, *supra* note 150.

[173] Hertig, *supra* note 22, at 445.

[174] Ana Teresa Freitas, *Data-Driven Approaches in Healthcare: Challenges and Emerging Trends*, *in* 58 MULTIDISCIPLINARY PERSPECTIVES ON ARTIFICIAL INTELLIGENCE AND THE LAW 65, 72 (Henrique Sousa Antunes et al. eds., 2024) (citing A. Rajkomar et al., *Ensuring Fairness in Machine Learning to Advance Health Equity*, 169 ANNALS INTERNAL MED. 866, 866–72 (2018)).

[175] Forrest et al., *supra* note 150.

[176] Tara K. Giunta & Lex Suvanto, *Board Oversight of AI*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Sep. 17, 2024), https://corpgov.law.harvard.edu/2024/09/17/board-oversight-of-ai/ [https://perma.cc/HCW3-WH5C].

[177] *See* EEOC SUES ITUTORGROUP FOR AGE DISCRIMINATION, U.S. EQUAL EMP. OPPORTUNITY COMM'N (May 5, 2023), https://www.eeoc.gov/newsroom/eeoc-sues-itutorgroup-age-discrimination [https://perma.cc/TH9S-3GZA].

[178] Joint Notice of Settlement at 1, EEOC v. iTutorGroup, Inc., et al., No. 1:22-cv-02565 (E.D.N.Y. Aug. 9, 2023).

[179] *Id.*

[180] *See* Jack Fitzpatrick et al., *AI Hiring Tools Risk Discrimination, Watchdog Tells Congress*, BLOOMBERG GOV'T (Oct. 4, 2024, 2:00 AM), https://news.bgov.com/bloomberg-government-news/ai-hiring-tools-risk-discrimination-watchdog-tells-congress [https://perma.cc/M3YE-6KEM].

biases.[181] Since AI programs rely in part on existing data generated from humans, existing human biases can impact the way AI is trained and the knowledge it obtains and uses to generate data.[182] For example, racial or gender biases based on historical human data will impact AI technology when used in the ESG space, and may lead to choices that discriminate against certain groups and ultimately lead to a less diverse and inclusive workplace.[183] Biases may also impact hiring decisions when AI relies on historical data to make such decisions; AI systems could favor wealthier or more advanced regions, which could increase inequalities amongst various socioeconomic groups.[184]

Moreover, cultural misunderstandings or misalignment with applicable ethical standards may lead AI systems to misinterpret certain cultural information.[185] Thus, companies must account for biases AI may develop as it obtains training data. Accounting for biases helps minimize legal scrutiny related to bias and mitigates the risks of discrimination lawsuits.

In relation to AI algorithm bias, the algorithm may be designed to some definition of "success," which generally translates into making a profit. Thus, the AI may create a false or misleading narrative that purports to carry a "sustainability" label but that is being manipulated on behalf of the commercial interest by disclosing environmental, social, and governance data that supports the "successful" narrative.[186] These issues can raise not only ethical concerns and incoherent results, but can also create legal issues, such as consumer fraud and securities laws liabilities where companies disclose false and misleading information to investors and consumers.[187] Also, companies may be able to adjust and change their sustainability statements if they know the machines are listening, which is regarded as a "feedback effect."[188]

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[181] Forrest et al., *supra* note 150; *see also* Iyer, *supra* note 168; Hertig, *supra* note 22, at 447–50.

[182] Max Knutsen, *What are the Implications of AI for ESG?*, PLURAL POL'Y, https://pluralpolicy.com/blog/ai-and-esg/ [https://perma.cc/9U6V-XXXD] (last visited Sept. 25, 2025); *The Key Legal Issues Relating to the Use, Acquisition, and Development of AI*, THOMSON REUTERS BLOG (Mar. 1, 2024), https://legal.thomsonreuters.com/blog/the-key-legal-issues-with-gen-ai/ [https://perma.cc/3XTK-AYLP] (discussing how biases used to train an AI model will inform the output it generates).

[183] Knutsen, *supra* note 182; BARNES & THORNBURG, *supra* note 150; Forrest et al., *supra* note 150 ("For instance, an AI tool used in a hiring environment on a non-representative data set could predict that an ideal employee might be male, white and between the ages of 30 and 40; a different and more inclusive data set could predict ideal employees as ethnically more diverse and as including a wider age group.").

[184] Knutsen, *supra* note 182; BARNES & THORNBURG, *supra* note 150.

[185] BARNES & THORNBURG, *supra* note 150.

[186] THE SOCIAL DILEMMA, *supra* note 30, at 45:00–46:00.

[187] *See generally* Ballan & Czarnezki, *supra* note 8 (broadly discussing the expansion of legal issues in the corporate world due to greenwashing and false or misleading ESG initiatives).

[188] A 2020 research paper shows how corporate disclosure firms are able to manage "sentiment" and "tones" perceived by machines and adjust the way they talk knowing that

Comparatively, the sustainability movement from which ESG was borne intends to serve the planet and the people, which creates a tension between the use of AI as a profit-driven tool to assess ESG. When choosing and measuring material topics, such as human rights, biodiversity, or diversity and equal opportunities, a company assesses the risks and opportunities related to that topic. What is material depends on how the company understands its impacts. There are two different ways of understanding materiality.[189] First, the traditional financial materiality approach applied in the U.S. securities laws assesses whether a "reasonable investor" will be influenced by the business claim; this approach is purely financial and focuses on the impacts happening "inside" the company.[190]

On the other hand, the "double materiality" approach, applied by the European Union disclosure frameworks, considers material impacts as those happening to the planet and the people both inside and outside the business.[191] If AI is used by corporations that capture a traditional financial materiality approach, the AI algorithm will sustain that narrative and inhibit real authentic change towards sustainability.

The approach that a company is mandatorily or voluntarily taking when reporting on ESG disclosure information will influence the information available and how the AI will calculate risks and opportunities. Thus, the effect of the materiality approach will be essential for understanding how social and environmental impacts will be addressed by AI, and can help the company progress beyond profit towards a sustainable future that also considers social and environmental concerns.

During the last few years, the EU have mandatorily required environmental regulatory compliance of ESG and sustainability reporting information under a double materiality approach.[192] Thus,

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machines are listening. *See* Sean Cao et al., *How to Talk When a Machine Is Listening?: Corporate Disclosure in the Age of AI* 2 (Nat'l Bureau of Econ. Rsch., Working Paper No. 27950, 2020).

[189] *See* David Lopez et al., *The Materiality Debate and ESG Disclosure: Investors May Have the Last Word*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Jan. 31, 2022), https://corpgov.law.harvard.edu/2022/01/31/themateriality-debate-and-esg disclosure-investors-may-have-the-last-word/ [https://perma.cc/Z9HQ-25H7] (differentiating "double materiality" from traditional financial materiality).

[190] In U.S. securities law, a stated or omitted fact made by a company is "material" when there is a substantial likelihood that a "reasonable investor's" decision to buy or sell the security would be influenced by the business claim. *See* TSC Indus., Inc. v. Northway, Inc., 426 U.S. 438, 445 (1976).

[191] *See* Matthias Täger, *'Double Materiality': What is it and Why Does it Matter?*, LONDON SCH. OF ECON. & POL. SCI. (Apr. 21, 2021), https://www.lse.ac.uk/granthaminstitute/news/double-materiality-what-is-itand-whydoes-it-matter/ [https://perma.cc/87T8-KHY7] (explaining the concept of double materiality).

[192] *See, e.g.*, Council Directive 2022/2464, 2022 O.J. (L 322) (EU) (recognized as the "Corporate Sustainability Reporting Directive"). The CSRD builds on the EU's original ESG reporting framework, the Non-Financial Reporting Directive (NFRD) which also relied on voluntary frameworks such as TCFD reporting requirements. *See* MATT HADDON

organizations are required to identify, assess, and manage impacts and opportunities from an inside-outside perspective. AI tools, such as Datamaran, assess double materiality solutions for companies that report under the European Union's Corporate Sustainability Reporting Directive (CSRD).[193]

C. Lack of Accuracy & Hallucinations

AI may generate inaccurate information. In the legal space, there have already been cases where AI made up cases used as precedent in a court-filed motion.[194] Thus, if AI is used for ESG reporting, there is risk it may fabricate data about a company in the ESG report, more commonly known as "AI hallucinations."[195]

For instance, governments and corporations have already paused AI use for ESG reporting.[196] A recent study conducted by Arize AI revealed that while the number of Fortune 500 companies reporting AI use increased, there was also a 473.5% increase in identifying AI risks.[197]

Furthermore, AI hallucinations may pose risks to investors if companies make false claims about their AI use.[198] For the maintenance of investor confidence and market stability, it is crucial to have reliability and accuracy of AI outputs.[199] AI hallucinations may also pose risks to social impact investors or investors that rely on sustainability

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ET AL., THE EVOLUTION OF SUSTAINABILITY DISCLOSURE: COMPARING THE 2022 SEC, ESRS, AND ISSB PROPOSALS 4 (2022), https://www.sustainability.com/globalassets/sustainability.com/thinking/pdfs/2022/comparing-the-secefra-and-issb.pdf [https://perma.cc/UGS2-94PA].

[193] *Transforming Double Materiality with AI-Powered Insights*, DATAMARAN (Feb. 13, 2024), https://blog.datamaran.com/transforming-double-materiality-with-ai-powered-insights [https://perma.cc/X8AY-DYNR].

[194] As courts may be wary of AI & ESG due to inaccurate information, companies should be cautious when/if they use AI to create an ESG report. *See supra* Part I.

[195] Natalie Runyon & Zach Warren, *From Hallucinations to Clarity? The Potential – and Pitfalls – of Using AI in ESG Reporting*, REUTERS (Jan. 8, 2024), https://www.reuters.com/sustainability/sustainable-finance-reporting/hallucinations-clarity-potential-pitfalls-using-ai-esg-reporting-2024-01-08/ [https://perma.cc/4LZC-5XT5].

[196] Knusten, *supra* note 182.

[197] *Generative AI in SEC Filings*, ARIZE (Aug. 14, 2024), https://arize.com/wp-content/uploads/2024/07/The-Rise-of-Generative-AI-In-SEC-Filings-Arize-AI-Report-2024.pdf [https://perma.cc/V5JH-ZCXF] (highlighting that one in five Fortune 500 companies mention generative AI or LLMs in their annual financial reports and the various AI risk factors amongst these companies).

[198] Cara M. Peterman et al., *Navigating AI-Related Disclosure Challenges: Securities Filing, SEC Enforcement, and Shareholder Litigation Trends*, ALSTON & BIRD (July 26, 2024), https://www.alston.com/en/insights/publications/2024/07/navigating-ai-related-disclosure-challenges [https://perma.cc/DUU9-WGCP].

[199] *See Navigating AI Risks: Key SEC Enforcement Trends*, HARTER SECREST & EMERY LLP (Nov. 6, 2024), https://hselaw.com/news-and-information/legalcurrents/navigating-ai-risks-key-sec-enforcement-trends/ [https://perma.cc/Q383-JS3Z].

claims from companies.[200] As explained above, AI can be used to collect data and report on metrics such as greenhouse gas emissions.[201]

Nevertheless, transformative AI offers promising applications that could address significant challenges in ESG reporting, such as through the development of personalized "AI- powered ESG assistants".[202] However, for the accurate use of this tool, investors need to have sufficient data to understand how companies are utilizing generative AI. Investors cannot base assumptions on unavailable information, and it is essential for companies to disclose how they are using these tools. Nevertheless, there is currently a large regulatory gap due to the lack of standards governing the reporting of AI, which prevents the accurate use of these tools.[203]

Furthermore, if AI is overly relied upon, human decision-making may be diminished.[204] Human judgment and ethical judgment is necessary in certain ESG matters such as governance or social considerations.[205] AI systems are still prone to errors when used for more complex ESG uses.[206] Errors such as misinterpreting data and not recognizing context-specific distinctions may occur as a result of a lack of human oversight and a loss of human/ employee critical thinking skills.[207] Errors made can contribute to false or misleading ESG data for a company that may expose a company to legal issues regarding false reporting.[208] For instance, an AI chatbot in New York City informed small businesses that it was legal to fire workers that complained about sexual harassment.[209] Thus, more AI system utilization may decrease the need for human decision-making and create opportunity for legal scrutiny.[210] Additionally, minimizing human decision-making may cause

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[200] Gary Gensler, Chair, U.S. Sec. and Exchange Comm'n, AI, Finance, Movies, and the Law – Prepared Remarks Before the Yale Law School (Feb. 13, 2024) (noting AI hallucinations may bring problems for advisors that use AI to aid with their investing decisions).

[201] *See supra* Part III.

[202] Natalie Runyon & Zach Warren, *supra* note 195.

[203] *Id.*

[204] *ESG, Blockchain, And AI — Oh My!*, *supra* note 150.

[205] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[206] *Id.*

[207] *Id.*

[208] *Id.* ("AI systems, while often efficient, can still make errors in complex ESG contexts, such as misinterpreting data or failing to recognize context-specific nuances. These errors could lead to misinformed decisions with potentially significant negative impacts on ESG goals.").

[209] Giunta & Suvanto, *supra* note 176.

[210] Matthew Stepka, *Law Bots: How AI Is Reshaping the Legal Profession*, ABA BUS. L. (Feb. 21, 2022), https://www.americanbar.org/groups/business_law/resources/business-law-today/2022-march/law-bots-how-ai-is-reshaping-the-legal-profession/#:~:text=However%2C%20AI%20cannot%20yet%20replace,overcome%20before%20adopting%20it%20further [https://perma.cc/PU4R-4VGC] ("AI is not yet ready to replace human judgment in the legal profession. The risk of embedded bias in data that fuels AI and the inability to adequately understand the rationale behind AI-derived

employees to lose critical thinking skills, which may result in overreliance and more potential for errors due to a lack of human oversight.[211]

D. Director, Executive Officer, and Lawyer Liability

Directors, executive officers, and lawyers may be exposed to liability for AI use within corporations. As fiduciaries, directors and executive officers have an obligation to monitor and oversee corporate activities, including risks associated with AI implementation.[212] Failure to fulfill these oversight responsibilities could expose them to liabilities. Similarly, lawyers, particularly in due diligence contexts, may be liable for lack of AI oversight. Moreover, in-house counsels should also consider that they might be held accountable for the company's use of AI that could give rise to legal risks and compliance issues.

1. Director and Executive Officer Liability

In the realm of corporate law, the board of directors and corporate officers have specific duties that they owe to the corporation when they act as its fiduciaries. State law governs how directors must comply with these duties, which are primarily the duty of care and the duty of loyalty.[213]

The duty to monitor and oversee flows from the duties of care and loyalty.[214] Directors and corporate officers have specific oversight duties related to the corporation they govern. In the leading case *In re Caremark Int'l Inc. Deriv. Litig.*,[215] the U.S. Supreme Court recognized a two-pronged standard for corporate oversight, dubbed "Caremark duties," that continues to this day.[216] The Caremark duties specify that

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decisions in a way understandable to humans. . . must be overcome before using the technology in some legal contexts.").

[211] BARNES & THORNBURG, *supra* note 150 ("AI predictions can vary in accuracy, and overreliance on these predictions for ESG risk management could lead to suboptimal decisions.").

[212] In the leading case, *In re Caremark*, the Supreme Court recognized that directors must have a system in place that allows them to monitor and oversee in good faith how the company complies with the laws. *See In re* Caremark Int'l Inc. Derivative Litig., 698 A.2d 959, 971–72 (Del. Ch. 1996). *See also* Peter P. Tomczak, *Director's Duties Regarding Sustainability and ESG*, *in* ESG IN THE BOARDROOM: A GUIDEBOOK FOR DIRECTORS 37, 39 (Katayun Iris Jaffari & Stephen A. Pike eds., 2022).

[213] *See, e.g.*, Smith v. Van Gorkem, 488 A.2d 858, 872–73 (Del. 1985) (discussing a director's duty of care); Guth v. Loft, 5 A.2d 503, 510 (Del. 1939) (discussing a director's duty of loyalty).

[214] "The duty to monitor or oversight is an obligation that flows from the duties of care and loyalty and has particular significance in approaching sustainability and ESG issues." *See* Barbara Ballan, *The ESG Paradox Revisited: Integration of Environmental Justice Criteria*, at 60 (forthcoming). *See also* Tomczak, *supra* note 212.

[215] *In re Caremark Int'l Inc. Derivative Litig.*, 698 A.2d at 970.

[216] *Id.*

the board of directors are liable to a corporation if they 1) do not adequately implement or monitor systems to detect and report misconduct, and 2) fail to oversee such systems.[217]

In 2023, the Supreme Court expanded these duties to corporate officers in *In re McDonald's Corp. S'holder Derivative Litig*.[218] The Court held that corporate officers must report "red flags" of improper oversight, and stated that the scope of the oversight duties is context-specific for each executive position.[219]

It is important to note that *Caremark* is limited because it only applies to the monitoring of fraudulent or criminal conduct or other legal compliance. Thus, monitoring of ordinary business risks typically falls within the presumption of the business judgment rule.[220] The business judgment rule is a court-constructed principle that defers to a director's decisions as long as the director exercises their duty of care and acts in good faith of the corporation's best interest.[221] Thus, the Caremark duties are particularly difficult to plead and prove for plaintiff stockholders because they do not imply mere business risk-taking. Nevertheless, the Caremark duties still apply to diverse compliance violations, and directors should oversee how the corporation complies with the laws and regulations.

If the board is not properly overseeing AI integration, they may open themselves and the company up to lawsuits.[222] As new technology use increases in companies so does the increase in board oversight duties discussed above.[223] Integrating AI into businesses brings risks such as data privacy and cybersecurity risks, discrimination, and environmental risks.[224] If the board does not implement adequate controls for AI use, they may expose themselves and the company to

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[217] *Id.*

[218] *In re* McDonald's Corp. S'holder Derivative Litig., 289 A.3d 343 (Del. Ch. 2023).

[219] *Id.* at 350; Doug Davison et al., *US: Delaware Court Recognizes Duty of Oversight for Corporate Officers, Including in Respect of ESG Issues*, LINKLATERS (Feb. 13, 2023), https://sustainablefutures.linklaters.com/post/102i7kn/us-delaware-court-recognizes-duty-of-oversight-for-corporate-officers-including [https://perma.cc/E8ES-KGUN].

[220] *See* AM. BAR ASS'N, ENVIRONMENTAL, SOCIAL, GOVERNANCE: THE PROFESSIONAL'S GUIDE TO THE LAW AND PRACTICE OF ESG 247, 248 (Brian Israel et al. eds., 2023).

[221] *See* Smith v. Van Gorkem, 488 A.2d 858, 872 (Del. 1985) (defining the business judgment rule as "a presumption that in making a business decision, the directors of a corporation acted on an informed basis, in good faith and in the honest belief that the action taken was in the best interests of the company").

[222] *In re* Caremark Int'l Inc. Derivative Litig., 698 A.2d at 970 (holding boards have an inherent duty to oversee risks in the company).

[223] Giunta & Suvanto, *supra* note 176; Joseph Richard Tiano Jr. et al., *The Duty of Supervision in the Age of Generative AI: Urgent Mandates for a Public Company's Board of Directors and Its Executive and Legal Team* (Mar. 26, 2024), https://www.americanbar.org/groups/business_law/resources/business-law-today/2024-march/the-duty-of-supervision-in-the-age-of-generative-ai/ [https://perma.cc/5B4M-KQZV] (noting that if a public company does not establish adequate AI procedures and policies, it puts itself at risk of litigation brought by stockholders, regulatory agencies, and third-parties).

[224] Giunta & Suvanto, *supra* note 176.

liabilities such as failure of oversight lawsuits. This also applies to executive officers of publicly traded companies.[225] Executive officers, such as CSOs, now may have a duty to oversee AI use in the ESG and sustainability space, as they are largely responsible for assessing the environmental impacts of the company.[226] If AI is integrated to aid with a company's ESG metrics, monitoring AI may fall within a CSOs context-specific oversight duties.[227]

Caremark duties, such as the duty of corporate directors to maintain adequate oversight of a company, have evolved. Specifically, Caremark duties have expanded from a general duty of supervision to a heightened standard of supervision.[228] In the Boeing Derivative litigation, the Delaware Court of Chancery held there is an increased duty of supervision where a corporations business practices may present unique or extraordinary risk.[229] AI use presents this "unique and extraordinary risk," as it is recently emerging and comes with a plethora of risks that may open a public company up to material risks.[230] Thus, board directors and executive and corporate officers must be aware of their duties to oversee AI use, especially when used in an unique way such as in the ESG space. Specifically, the board and corporate officers should ensure the company's use of AI coincides with their business operations and also consider developing AI controls to adequately comply with their duty of supervision.[231]

2. Lawyer's Duties and Liabilities

Lawyers' duties and liabilities in regard to AI use include due diligence monitoring, which is essentially the search into a business or person in order to gather information about that individual or

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[225] *In re* McDonald's Corp. S'holder Derivative Litig., 289 A.3d 343, 350 (Del. Ch. 2023) (extending the duty of supervision to executive management and corporate officers).

[226] *See* Davison, *supra* note 219 (discussing the McDonald's Corporation Stockholder Suit and potential implications for oversight duties in the ESG space).

[227] *Id.*

[228] *In re* The Boeing Co. Derivative Litig., No. 2019-0907-MTZ, 2021 WL 4059934, at *24 (Del. Ch. Sep. 7, 2021).

[229] *Id.*

[230] Joseph Richard Tiano Jr. et. al, *The Duty of Supervision in the Age of Generative AI: Urgent Mandates for a Public Company's Board of Directors and Its Executive and Legal Team* (Mar. 26, 2024), https://www.americanbar.org/groups/business_law/resources/business-law-today/2024-march/the-duty-of-supervision-in-the-age-of-generative-ai/ [https://perma.cc/5B4M-KQZV] (risks include "privacy violations, AI hallucinations, 'deep fakes,' bias, lack of transparency . . . ").

[231] Doug Davison, et al., *US: Delaware Court Recognizes Duty of Oversight for Corporate Officers, Including in Respect of ESG Issues*, LINKLATERS (Feb. 13, 2023), https://sustainablefutures.linklaters.com/post/102i7kn/us-delaware-court-recognizes-duty-of-oversight-for-corporate-officers-including [https://perma.cc/MQ7Z-SFPP].

business.[232] When AI is used to conduct due diligence, it may miss metrics that a (human) lawyer could have found.[233] If lawyers rely on AI to conduct their due diligence, they need to closely monitor and double check all their work to ensure any information AI may have missed is disclosed to avoid legal liabilities.[234]

Lawyers should also be cautious of their duty to maintain client confidentiality if they are using AI models such as LLMs to sort through client documents and data.[235] LLMs may not safeguard client information and may destroy attorney-client privilege or breach client data security.[236] Additionally, lawyers must have adequate knowledge of the technology and keep up with AI developments.[237]

Lawyers must conduct due diligence in many situations such as M&A, reviewing and analyzing large volumes of documents, and evaluating value and risk. AI can assist attorneys with various tasks including data and contract analysis.[238] However, AI may miss important details that lawyers could identify through their own due diligence. Although AI excels at spotting patterns, it generally cannot understand the significance of documents.[239] For example, the heightened risk of using AI in due diligence can be illustrated in an M&A deal, where AI could hallucinate a company's ESG metrics, or either downplay or exacerbate environmental risks and employee diversity data.[240] Specifically, if AI is used to search through a company's history of environmental or social litigation, fines, and penalties, it could generate data from outdated sources and miss recent environmental fines or discrimination lawsuits.

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[232] Chris O'Leary, *Due Diligence*, THOMSON REUTERS (Aug. 23, 2024), https://legal.thomsonreuters.com/blog/due-diligence/.

[233] *AI for Due Diligence: Applications, Benefits, Solutions, and Implementation*, https://www.leewayhertz.com/ai-in-due-diligence/ [https://perma.cc/NQ7Y-YT76] (last visited Sept. 25, 2025).

[234] *The Key Legal Issues Relating to the Use, Acquisition, and Development of AI*, *supra* note 182 (legal liabilities include malpractice lawsuits due to attorneys replacing their stated expertise with AI models).

[235] MODEL RULES OF PRO. CONDUCT r. 1.6.

[236] *The Key Legal Issues Relating to the Use, Acquisition, and Development of AI*, *supra* note 182.

[237] *Id.*

[238] THOMSON REUTERS, *CoCounsel: The Legal AI assistant and Tool Essential for Legal Teams* (Aug. 26, 2024), https://legal.thomsonreuters.com/blog/legal-ai-tools-essential-for-attorneys/ [https://perma.cc/47QP-PBAX] (even partners at AMLaw 100 firms are utilizing AI platforms, such as CoCounsel, to "produce top-quality work with greater speed and accuracy").

[239] *AI for Due Diligence: Applications, Benefits, Solutions, and Implementation*, *supra* note 233.

[240] *How AI is Blazing a Trail in ESG Reporting*, *supra* note 83 (noting hallucinations may create risks when "[a] fairly minor flaw or assumption creeps into your inputs and software then magnifies it – with the potential that it could create misleading outputs: reports that look truthful, but aren't"); *see also infra* Section III.E for a discussion of AI hallucinations.

If a company wants to acquire another company and ensure it has ESG goals, while AI can be trained to search for a company's ESG metrics, AI may hallucinate ESG metrics and make a company appear to have positive environmental goals or a diverse employee base, when that is not the case. [241] As mentioned above, AI may also exhibit bias.[242] If AI has diversity biases based on its training, and is used in an M&A deal, it could bring those biases into the deal.[243] Thus, it is important that a lawyer not replace their own due diligence with AI tools, but instead use these tools to complement their expertise.

In addition to the lawyer's role to monitor and oversee AI in the due diligence context, lawyers serving as in-house counsel may also have an obligation to oversee AI.[244] The role of in-house counsel to oversee AI is emerging. In-house counsel have the opportunity to guide companies toward mitigating the risks of AI.[245] For instance, in-house counsel may need to evaluate the use of AI to ensure accuracy and responsible use.[246] In-house counsel are already obligated to keep up with developments in company strategy and are therefore in a place to keep up with the risks of AI within the ESG space.[247]

E. Unknown Landscape Issues

AI is still a developing technology, and the potential uses and implications it may have on corporate governance within the ESG space are not fully known.[248] Therefore, various legal risks may arise. AI tools have already been connected to risks related to intellectual property, data privacy and confidentiality, cybersecurity, bias, and reputational damage.[249] Moreover, because AI is rapidly developing, other legal risks will arise that perhaps have not yet been considered.[250]

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[241] Liza Kirillova & Adam Bingham, *AI Risks in M&A Transactions*, CORPORATE COMPLIANCE INSIGHTS (Jan. 15, 2024) ("[I]nternal facing AI tools used in hiring and HR processes can also expose a buyer to AI-related litigation and compliance risks.").

[242] *The role of AI in ESG and sustainability reporting*, KEY ESG (July 3, 2024), https://www.keyesg.com/article/the-role-of-ai-in-esg-and-sustainability-reporting [https://perma.cc/35QT-6XE4].

[243] *Id.*

[244] Ella Sherman, *Can In-House Counsel Mitigating Emerging Technology's ESG Impact?*, LAW.COM (Oct. 24, 2024 at 11: 11 AM), https://www.law.com/legaltechnews/2024/10/24/can-in-house-counsel-mitigate-emerging-technologys-esg-impact/?slreturn=20241028180216 [https://perma.cc/8SDL-T3GK].

[245] *Id.*

[246] *Id.*

[247] *Id.*

[248] Bryant Rivera, *Green Bonds: Reforming ESG Regulation in the United States to Meet the Requisite Funding Demand for a Decarbonized Economy*, 28 HASTINGS ENV'T L. J. 191, 194, 196 (2022).

[249] Jon Solorzano et al., *ESG Is Over — As We Know It*, WESTLAW TODAY (Jan. 3, 2024), https://www.velaw.com/insights/esg-is-over-as-we-know-it/ [https://perma.cc/PP6M-D8QR].

[250] *Id.*

The use of AI in the ESG space may also bring a wave of lawsuits due to the complexity and novelty of the technology.[251] As AI and ESG-related regulations and frameworks develop, AI and ESG developments may outpace one another. For one, AI systems used to enhance ESG performance and metrics may not be able to keep up with the evolving ESG-related laws and standards across different jurisdictions.[252] This inability to keep up with changing laws increases the risk of unintended non-compliance with AI based ESG metrics and current ESG regulations and standards.[253] Like ESG regulations and standards, AI standards and regulations are evolving every day. Recently, the United Nations released a report proposing oversight of a global effort to monitor and govern AI.[254] The Governor of California also signed several bills relating to GenAI; AB 2013 also required AI developers to post information on the data used to train the AI system or service on their website.[255] On the contrary, the rapid development of AI may actually outpace ESG regulations and standards and result in various legal issues such as intellectual property rights, and liability for the collection, maintenance, and use of data.[256]

The lack of a standardized system to regulate AI creates various legal risks;[257] without a standardized system, including policies, procedures, and other mechanisms to comprehend and mitigate the risks from AI, AI use may not develop in compliance with applicable federal laws and policies.[258] Potential risks arising from data privacy,[259]

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[251] Forrest et al., *supra* note 151 ("The swiftly advancing technology poses novel challenges for courts and in the law.").

[252] *ESG, Blockchain, And AI — Oh My!*, *supra* note 151

[253] *Id.*

[254] *See* UNITED NATIONS, *Governing AI For Humanity: Final Report* (2024), https://www.un.org/sites/un2.un.org/files/governing_ai_for_humanity_final_report_en.pdf [https://perma.cc/L5AE-4YJ7].

[255] *See Governor Newsom Announces New Initiatives to Advance Safe and Responsible AI, Protect Californians* (Sep. 29, 2024), https://www.gov.ca.gov/2024/09/29/governor-newsom-announces-new-initiatives-to-advance-safe-and-responsible-ai-protect-californians/#:~:text=Within%20the%20past%20two%20weeks,role%20in%20defining%20that%20future [https://perma.cc/5XQT-HMM5].

[256] Bruce White, *Potential Opportunities and Risks AI Poses For ESG Performance*, XV NAT. L. REV. (Mar. 31, 2025), https://natlawreview.com/article/potential-opportunities-and-risks-ai-poses-esg-performance [https://perma.cc/K865-UXB4].

[257] Giunta & Suvanto, *supra* note 176 ("[B]oards and management need to ensure they are not only responding to the current legal, regulatory and enforcement environment, but are also anticipating areas of vulnerability and potential further regulation or legal accountability.").

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> Artificial Intelligence must be safe and secure. Meeting this goal requires robust, reliable, repeatable, and standardized evaluations of AI systems, as well as policies, institutions, and as appropriate, other mechanisms to test, understand, and mitigate risks from these systems before they are put to use. It also requires addressing AI systems' most pressing security risks — including with respect to biotechnology, cybersecurity, critical infrastructure, and other national security

misinformation (or a lack of accuracy thereof), inequality, and bias may arise under the ESG umbrella.

Specifically, if AI is used to handle large databases to analyze a company's ESG metrics, data privacy and security issues may arise.[260] When AI is used to handle large databases the risks of exposure to confidential information increases.[261] Confidential information, such as customer and business data, is at risk of identity theft and financial fraud which may lead to public distrust.[262] Cybersecurity risks also arise when AI is integrated with a company's institutional policies; integration can create a gateway for hackers, which may lead to data theft and even disrupt operations.[263]

As mentioned in Part II, AI, specifically large models, uses a significant amount of energy to run, which can lead to substantial energy consumption.[264] Thus, the use of AI for ESG may inadvertently result in lawsuits on the environmental impact of such use.[265] Using AI to analyze a company's environmental impact for ESG metrics may be self-defeating and contradict environmental and sustainability efforts.[266]

Additionally, AI use may come with ethical and reputational risks.[267] Using AI in the ESG space could further the "fury" over ESG in the environmental world. As mentioned above, there is already pushback regarding ESG practices within the environmental community. Because of this pushback, adding AI into the mix could

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dangers — while navigating AI's opacity and complexity. Testing and evaluations, including post-deployment performance monitoring, will help ensure that AI systems function as intended, are resilient against misuse or dangerous modifications, are ethically developed and operated in a secure manner, and are compliant with applicable Federal laws and policies.

Exec. Order No. 14110, 88 Fed. Reg. 75191 (Oct. 30, 2023); *See also* Giunta & Suvanto, *supra* note 176 (explaining how executive orders may lead Congress to create regulations and laws so companies have further guidance on AI use).

[259] *ESG, Blockchain, and AI — Oh My!*, *supra* note 151.

[260] *Id.*

[261] *See* Paolo Passeri, *The Risk of Accidental Data Exposure by Generative AI is Growing*, INFOSECURITY MAG. (Aug. 16, 2023), https://www.infosecurity-magazine.com/blogs/accidental-data-exposure-gen-ai/ [https://perma.cc/733N-4FYU] (showing that recent increases in generative AI uses have led to increases in data breaches).

[262] BARNES & THORNBURG, *supra* note 150.

[263] MAIA HAMIN ET AL., AI IN CYBER AND SOFTWARE SECURITY: WHAT'S DRIVING OPPORTUNITIES AND RISKS? 3 (Aug. 2024).

[264] *See supra* Part II.

[265] BARNES & THORNBURG, *supra* note 150; *see also supra* Section III.E (discussing the various legal risks of AI in the ESG space).

[266] BARNES & THORNBURG, *supra* note 150*; but see* discussion *infra* Part IV (describing how companies can responsibly employ AI in the context of ESG).

[267] Peterman et al., *supra* note 198 ("Companies note[] that public debate over the development, use, and potential misuse of AI may in turn harm their reputation among consumers and employees.").

further weaken the field of ESG. ESG is also a new concept, so adding AI may tend to confuse people like newly hired CSOs or ESG employees within companies. Backlash may also occur when you intertwine AI and ESG because of all the climate risks that come with AI,[268] specifically the environmental degradation and harm that comes with AI.[269]

F. Summary of Risks

Overall, using AI in the ESG space comes with an array of risks, some of which are still unknown. The new and emerging technology of AI, plus the emergence of ESG in the legal world, create various legal issues. Companies utilizing AI in the ESG space must be transparent and cautious as AI continues to develop. Companies should consider the regulatory and legal landscape when deciding to use AI for various ESG applications, particularly as courts and regulators develop new policies and standards to regulate AI. Due to the unknown landscape of AI and ESG, as well as issues surrounding the potential inaccuracy of AI systems, companies should ensure they are not using AI at the expense of human intelligence. Companies must also ensure AI's environmental risks are included in their ESG reports, and companies should assess the impacts of these risks within their business. As AI continues to develop, so will the legal risks; companies should proactively monitor legal risks regarding AI in the ESG space.

IV. AI & ESG: BEST PRACTICES GOING FORWARD

Looking towards the future, companies and others using AI in the ESG space should proceed by maximizing the benefits of AI and reducing the risks. This Part addresses how companies should be proactive in mitigating the risks of AI. Section A details blockchain's potential to integrate AI into a company. Section B explains why and how companies should develop strategies—especially board oversight strategies, clearly drawn-out policies and procedures—and ensure data privacy and security to mitigate the risks of AI. Section C discusses the role of the board of directors in mitigating AI risks. Lastly, Section D details a company's responsibility to continuously monitor regulations globally and nationwide to ensure it is complying with updated AI and ESG standards.

A. Blockchain: The Future of ESG Transparency

Companies should consider the emerging technology blockchain within their best AI and ESG practices going forward. Using blockchain

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[268] *See* discussion *supra* Part II (discussing the environmental impacts of AI).
[269] *Id.*

in the ESG space will aid in implementing AI into businesses and protect against AI risks and misuse.[270] Moreover, adopting blockchain within a company's AI usage will allow companies to ensure records are transparent and traceable.[271] Since AI is partly trained from publicly available data (though this is not always the case), utilizing blockchain within a company's AI & ESG practices could also ensure responsible AI implementation and conformity with data protection regulations.

While AI can aid companies in analyzing large ESG data sets, blockchain can ensure traceability and transparency within a company's ESG data.[272] Companies can use blockchain to track various practices that may relate to their ESG goals. For instance, blockchain can record ethical sourcing decisions, labor practices, and emissions reductions while preventing changes to the data.[273] Furthermore, if a company adopts blockchain technologies, it can establish traceable records of its IP content and mitigate data security risks.[274]

Blockchain has immense potential to transform a company's ESG goals and strategies. Blockchain can embed data throughout supply chains and create a platform for a trustworthy carbon trading system.[275] Moreover, blockchain allows stakeholders to access data pertaining to certain ESG goals and strategies employed throughout a company.[276] Stakeholders can access ESG-related data, including a company's environmental footprint or governance structure.[277] Thus, due to the array of benefits blockchain offers, companies should look to emerging technology to aid in implementing AI into ESG practices.[278]

B. Maximize Benefits & Decrease Risks: Developing Strategies

Although AI has the potential to increase a company's profitability and efficiency, mitigating risks, clarifying who is responsible for oversight of AI decisions, and employing best practices are essential to ensure AI is employed effectively and with the least risk possible. Further, transparency with stakeholders must be considered in evaluating AI and ESG strategies. Companies should communicate how AI is being used within ESG initiatives and include this information in

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[270] *Artificial Intelligence and Blockchain: The New Power Couple*, *supra* note 28.

[271] *Id.*

[272] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[273] Amitav Bhattacharjee, *The ESG Revolution: How Blockchain, AI, and Big Data Are Redefining Sustainability!*, LINKEDIN (Feb. 25, 2024), https://www.linkedin.com/pulse/esg-revolution-how-blockchain-ai-big-data-redefining-bhattacharjee-fomyc/ [https://perma.cc/9JQG-JU8K].

[274] *Artificial Intelligence and Blockchain: The New Power Couple*, *supra* note 28.

[275] Bhattacharjee, *supra* note 273.

[276] *Id.*

[277] *Id.*

[278] *See Artificial Intelligence and Blockchain: The New Power Couple*, *supra* note 28 ("blockchain can be the 'bouncer' that generative AI needs.").

their reporting.[279] Moreover, companies should employ sustainable AI practices such as energy-efficient AI models and sustainable lifecycle management.[280]

To begin implementing AI into a company's ESG strategy, companies should carefully choose AI technologies and solutions that align with their ESG goals.[281] To do this, companies may want to start with "pilot projects" to integrate AI into ESG strategies before scaling up.[282] Companies should carefully choose AI vendors that coincide with their ESG values, and ensure that the vendors are compliant with existing regulations.[283] Companies should also consider how they train and develop their AI projects. Strategies must be in place to ensure AI is focusing on the relevant documents and information only instead of veering off path. More concretely, AI experts within the company can train the AI programs to focus on the information given while also making sure the output does not focus on outside information that may contain biases. This will also steer AI models away from hallucinating information that may not exist within the given inputs.[284]

Heading into the future, companies should develop clear policies to govern their use of AI as well as guarantee human oversight in AI decision-making.[285] Companies should also strongly consider the U.S. Department of Labor's recent guidance on AI principles and best practices for the workplace.[286] Companies should develop strategies to ensure policies and procedures are in place for AI failures.[287] Specific strategies related to AI and supporting ESG goals should be implemented. Laying out where AI can have the most beneficial impact, such as reducing carbon footprint in supply chains or enhancing social goals, must be included within a company's best practices.[288] Moreover, companies should ensure AI use is aligned with ESG strategies and initiatives. Other strategies and best practices include establishing an AI specialist team to oversee AI use and report to management on specific uses as well as working with the ESG experts within the

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[279] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[280] *Id.*

[281] *Id.*

[282] *Id.*

[283] *Id.*

[284] *How AI is Blazing a Trail in ESG Reporting*, *supra* note 83 ("If you are analyzing a sustainability report and ask, 'What are the Scope 1 emissions of this company?' and there's nothing about Scope 1 in the files, the results should reflect that, rather than make up an answer that doesn't exist.").

[285] Ari M. Berman, *AI and the "G" in ESG*, PILLSBURY (Jan. 25, 2024), https://www.pillsburylaw.com/en/news-and-insights/ai-esg-governance.html [https://perma.cc/2KC8-YXXP]; *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 63.

[286] U.S. DEPT. OF LABOR, ARTIFICIAL INTELLIGENCE AND WORKER WELL-BEING: PRINCIPLES AND BEST PRACTICES FOR DEVELOPERS AND EMPLOYERS 4 (Oct. 16, 2024).

[287] Berman, *supra* note 285.

[288] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 63.

company. Companies may also want to consider appointing an AI expert who can work with ESG specialists. Audits and risk assessments of data sets and AI models may also be employed to mitigate legal risks and ethical concerns.[289]

The collection of information regarding AI use in the ESG space is of the utmost importance. Companies should ensure their AI tools are aiding their ESG goals rather than hindering them through various legal risks.[290] Specifically, corporate counsel may consider implementing an inventory of tools that keep track of the various AI tools used and their specific roles within the company.[291] Inventory may include what each tool does, how it is used, what value it provides, and who is responsible for oversight.[292] Inventory will provide transparency within a company and its AI use, and will also aid companies in tackling any issues swiftly.[293] Inventory should also include results from regular AI testing. Companies should regularly test the AI tools they employ to guarantee the tools align with expected output; this includes regularly monitoring data sets used by AI tools as they may change over time.[294]

In order to further decrease the risks associated with AI use in the ESG space, companies should designate an individual responsible for the AI inventory.[295] This individual, similar to a record keeper, should be able to explain what each tool does and how it makes decisions. This role will be important if a regulatory investigation arises.[296] Additionally, this inventory role is important for AI due diligence. AI developments within the ESG system should be considered within the AI inventory.[297]

C. Board of Directors & Their Role in Mitigating Risks: The "G" in ESG

Companies should consider how they manage the legal risks associated with AI and how to oversee AI. The board of directors and management within a company are responsible for ensuring AI is integrated into the company properly.[298] Directors must closely monitor AI risks and uses within their company.[299] Directors must not "stick their head in the sand" and must keep up to date with laws and developments regarding AI use. Overall, the board may want to fulfill their oversight duties with respect to AI, specifically in terms of asking

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[289] Berman, *supra* note 285.
[290] *See* discussion *supra* Part IV.
[291] Forrest et al., *supra* note 150.
[292] *Id.*
[293] *Id.*
[294] *Id.*
[295] *Id.*
[296] *Id.*
[297] *Id.*
[298] *See supra* Part III.D.
[299] *Id.*

the right questions and testing plans to implement AI within the company.[300] This can be attributed, in part, to AI having "a life of its own such that it does not report to a human being within a company."[301] The board and management must employ proper AI disclosures and ensure proper AI oversight.

To mitigate the breach of oversight duties, boards should consider implementing a team to oversee all AI tools. This team should consist of a variety of departments, including management and the board.[302] The AI team should be responsible for managing AI tools and implementing AI strategies and internal controls. Additionally, an AI task force could be employed to further assist with the best AI practices.[303] Members of the task force would ideally be from the legal team, risk management team, and finance departments.[304] A task force would focus on AI compliance and would ensure the company can show the AI tools used are trustworthy and reliable.[305]

The SEC's rule relating to climate-related risks was expected to place additional duties on a company to disclose the identity of board members or committee members who are responsible for the oversight of climate-related risks.[306] However, the SEC climate-related disclosure rules are currently stayed and facing ongoing legal challenges, which highlights the regulatory uncertainty surrounding ESG initiatives in the U.S. This limbo reflects broader political and judicial tensions which may affect how AI is regulated.

Regarding AI and ESG, the absence of robust regulatory frameworks increases the importance of corporate self-regulation. Companies aiming to demonstrate authentic commitment to ESG must proactively address the integration of AI in corporate governance structures and respect environmental and social concerns. The AI self-governance mechanisms will require organizational and technical controls.[307] Nevertheless, there is a global trend towards AI regulation,[308] including the EU AI Act and U.S. state level initiatives

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[300] Berman, *supra* note 285.

[301] *Id.*

[302] Forrest et al., *supra* note 150.

[303] *Id.*

[304] *Id.*

[305] *Id.*

[306] The Enhancement and Standardization of Climate-Related Disclosures for Investors, 89 Fed. Reg. 21668, 21915 (proposed Mar. 28, 2024) (to be codified at 17 C.F.R § 229).

[307] Heather Domin, *AI Governance Trends: How Regulation, Collaboration and Skills Demand are Shaping the Industry*, WORLD ECON. F. (Sep. 5, 2024), https://www.weforum.org/stories/2024/09/ai-governance-trends-to-watch/ [https://perma.cc/G345-AEBV].

[308] *See AI Trends for 2025: AI Regulation, Governance and Ethics*, DENTONS (Jan. 10, 2025), https://www.dentons.com/en/insights/articles/2025/january/10/ai-trends-for-2025-ai-regulation-governance-and-ethics [https://perma.cc/ZV2V-9DUQ] (listing regional approaches to AI regulation).

like the AI Transparency Act in California.[309] Requirements might include detailing how AI systems impact ESG goals and ensuring alignment between actual use of AI and corporate statements about its use. Thus, U.S. public companies will most likely be subject to a "fragmented and patchwork landscape" of AI disclosures.[310]

D. Staying Ahead of Future Regulatory Action

As AI and blockchain regulations continuously evolve, companies must "stay ahead of the curve."[311] Pressure on Congress to regulate AI and blockchain will increase as the use of the technology increases.[312] Thus, companies must keep up with AI- and ESG-related regulations and standards locally and globally.[313] Companies should implement mechanisms to certify that AI systems are in line with current regulations as well as anticipated regulations.[314] In other words, companies should go beyond compliance. Companies should also conduct regular audits of AI systems to ensure they are compliant with legal standards.[315] Additionally, companies should be prepared to adapt to future AI technologies and stakeholder feedback.[316]

Particularly related to data privacy and security, companies should ensure they have strong data protection policies in place.[317] Data protection policies should align with applicable data privacy laws. Going further, companies should ensure cybersecurity defenses are in place to protect against data breaches within their AI systems.[318] Regular audits of AI systems should also be conducted to pinpoint security risks and other data security-related vulnerabilities.[319]

Looking toward the future, integrating AI into ESG practices has the potential to transform business practices. However, companies must employ best practices to ensure compliance with regulations and to pave the way for the future of AI and ESG. Companies must implement proper board oversight, continuously monitor regulations and the legal landscape, develop various and specific strategies, and

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[309] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonized rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139, and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797, and (EU) 2020/1828 (Artificial Intelligence Act), 2024 O.J. (L 1689) 1; California AI Transparency Act, 2024 Cal. Stat. 91 (codified in CAL. BUS. & PROF. CODE § 22757).

[310] DENTONS, *supra* note 308.

[311] *Potential Opportunities and Risks AI Poses for ESG Performance*, *supra* note 62.

[312] *Id.*

[313] *Id.*

[314] *Id.*

[315] *Id.*

[316] *Id.*

[317] *Id.*

[318] *Id.*

[319] *Id.*

overall ensure they are maximizing the benefits of AI while mitigating the array of risks that come with the evolving technology. Companies should also adopt blockchain to aid in integrating AI into their ESG initiatives. If companies can successfully employ best AI practices within their ESG initiatives, they will set themselves up for a more efficient and technologically advanced future.

E. Human-Centered Artificial Intelligence

Human-centered artificial intelligence (HCAI) is emerging as a transformative approach to AI development, emphasizing the integration of human needs, values, and controls into AI systems. This Section explores the main principles, practices, and challenges associated with HCAI as an incipient field.

HCAI focuses on creating AI systems that amplify human abilities, rather than replace them, by ensuring that AI operates transparently, equitably, and ethically.[320] HCAI emphasizes collaboration between humans and AI to enhance outcomes across domains such as sales, finance, and human resources.[321] This collaborative approach leverages human expertise and AI automation to solve complex problems.[322]

However, research reveals an existing gap between developers' priorities and user experiences in HCAI.[323] While developers focus on ethics, privacy, and security, users prioritize AI's social impact and functionality.[324] Notably, users value being understood by AI more than understanding AI, which suggests a need for systems that align closely with human contexts and needs.[325] Responsible HCAI entails designing systems that foster trust, mitigate biases, and provide transparent outputs.[326] For instance, IBM's SCORE engine integrates explainable AI techniques for allegedly transparent decision-making processes that have driven significant business outcomes.[327]

Furthermore, HCAI efforts have been driven by academia. In 2019, Stanford University founded the Institute for Human-Centered AI to guide and build the future of AI.[328] The Institute emphasizes the

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[320] *See* Werner Geyer et al., *What is Human-Centered AI?*, IBM (Mar. 31, 2022), https://research.ibm.com/blog/what-is-human-centered-ai [https://perma.cc/YKD5-EFHP].

[321] *Id.*

[322] *Id.*

[323] *See generally* William Bingley et al., *Where Is the Human in Human-Centered AI? Insights From Developer Priorities and User Experiences*, 141 COMPUT. HUM. BEHAV. 107617 (2023) (explaining how AI falls short of objectives laid out by HCAI).

[324] *See id.*

[325] *Id.*

[326] *See* Geyer, *supra* note 320.

[327] *Id.*

[328] *See Stanford Institute for Human-Centered Artificial Intelligence (HAI)*, STAN. UNIV., https://online.stanford.edu/schools-centers/stanford-institute-human-centered-artificial-intelligence-hai [https://perma.cc/XX6S-CP7V] (last visited Sept. 25, 2025).

global significance of HCAI and advocates for technologies that contribute to a better future for humanity. Their research ranks nations based on their AI capabilities and highlights the importance of collaboration and shared responsibility in advancing HCAI principles globally.[329]

Nevertheless, there are ongoing challenges for the development of this type of AI that meets diverse human needs and contexts. Future research must focus on fostering human-AI collaboration, addressing procedural justice, and ensuring equitable access to AI technologies.[330] Efforts should also explore how HCAI can integrate environmental and social considerations and align with broader societal goals.[331]

In essence, HCAI represents a paradigm shift in AI development by advocating for systems that consider human and environmental benefits besides profit. By integrating user feedback, ethical considerations, and collaborative frameworks, HCAI has the potential to redefine our interactions with technology and contribute to a more equitable and sustainable future.

V. CONCLUSION

This Article offers a comprehensive analysis of the interactions between artificial intelligence ("AI") and Environmental, Social, and Governance ("ESG") frameworks. ESG frameworks serve as a means for companies to report on sustainability issues, a metric-driven approach to corporate accountability, and a risk management tool. When integrated with AI tools, ESG holds the potential to foster environmental and social progress while enhancing corporate governance structures. AI is both a valuable tool for ESG data analysis, ESG reporting, and risk management assessment, and also a threat to achieving a sustainable future.

This Article critically examines the use and misuse of AI in the ESG space, focusing on its legal, environmental, and social implications. Transparency issues arise as AI systems often suffer from algorithmic opacity and leave humans vulnerable to manipulation. Additionally, the use of AI can raise bias concerns as algorithms can sidestep environmental and social considerations for the sake of delivering profitable results. Furthermore, AI may unintentionally generate inaccurate information or "hallucinate." Thus, overreliance on AI poses significant risks and can potentially lead to serious financial

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[329] *Id.*

[330] *See, e.g.*, Keller et al., *The US Must Balance Climate Justice Challenges in the Era of Artificial Intelligence*, BROOKINGS (Jan. 29, 2024), https://www.brookings.edu/articles/the-us-must-balance-climate-justice-challenges-in-the-era-of-artificial-intelligence/ [https://perma.cc/D3AJ-ABF4] (discussing how HCAI aligns with the need to integrate environmental and social considerations into technological systems).

[331] *Id.*

consequences. Moreover, AI has a plethora of environmental risks that may heighten legal and social risks, such as intensifying climate change.

Despite these challenges, AI will persist as a powerful and evolving tool and may offer solutions for various ESG goals. AI has immense use potential and an array of benefits within the ESG space, and companies should move towards adopting technologies to streamline their ESG practices. Companies can mitigate risks by anticipating regulatory action and exceeding compliance standards to ensure long-term viability and promote social and environmental welfare. Blockchain technology, for instance, could address some challenges posed by unregulated AI, particularly those related to transparency and reliability in ESG disclosures.

Even more, as AI advancements continue to emerge, so does the possibility of reducing its environmental impact, introducing a solution to the "double-edged sword" dilemma.[332] That is, this technological revolution may reduce the immense amount of energy and time required to build the technology.[333] Specifically, the recent emergence of DeepSeek illustrates how advancements in the technology may signal more efficiency and lower energy demand.[334] Upon DeepSeek's surprise emergence, experts are hinting that even though data centers will still be built, they may be able to operate more efficiently, and in turn require less energy.[335] Thus, there may be promise for AI advancements to coincide with energy efficiency and a lower environmental impact.

To conclude, the ethical and legal risks of AI are numerous. This Article emphasizes the cautionary approach one must take when incorporating AI within the already-unsteady ESG landscape. The best practices discussed here, together with an ongoing survey of the legal landscape, are essential. AI will inevitably become more prominent in the modern world—so why not harness its benefits and leverage it within ESG practices?

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[332] *See supra* Part II.

[333] Jennifer McDermott & Matt O'Brien, *DeepSeek Says It Built Its Chatbot Cheap. What Does that Mean for AI's Energy Needs and the Climate?*, AP NEWS (Jan. 28, 2025), https://apnews.com/article/deepseek-ai-china-climate-fossil-fuels-00c594310b22afbf150559d08b43d3a5 [https://perma.cc/BS48-R2HG].

[334] *Id.*

[335] *Id.*; *see also* Tim Mohin, *EU Compass Pointing Toward Deregulation,* LINKEDIN (Jan. 31, 2025), https://www.linkedin.com/pulse/eu-compass-pointing-toward-deregulation-tim-mohin-87zfc/ [https://perma.cc/QCK8-KNW6] ("With Deep Seek requiring 10% of the computational power as other models and the energy use of data centers being directly correlated to computational power, it could mean substantially less energy use.").