CLARITY AI

# The Essentials of AI and ESG

## Opportunities, Risks, and Governance **Insights** for Institutional Investors

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# To really harness AI, sustainable investors need to fit the smoke alarms

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## Introduction

Artificial intelligence is already revolutionizing how we live, work, and play, and it's set to radically transform global progress on sustainability. It is no surprise therefore that business leaders such as Google CEO Sundar Pichai predict that its impact on human society will be as profound as the discovery of fire.

But like fire, the transformative power of AI comes with risks too. So, the central question for investors right now is how to harness the potential of AI, without getting burned.

## Key Insights

- AI presents both transformative opportunities and meaningful risks for sustainable investors
- Investing in AI has the potential to improve risk-adjusted returns while advancing sustainable goals.
- AI can enhance the investment decision-making process of sustainable investors.
- Managing AI requires comprehensive ESG frameworks and robust governance.
- Key considerations include technical safety, regulatory compliance, environmental impact, and social responsibility.
- Practical implementation policies and guidelines are essential for success

## The Power of Long-Term Capital Meets the Power of Tech

The way institutional investors in particular respond to this challenge could shape all our futures.

Institutional investors are large-scale players that manage huge pools of capital including pension and insurance schemes. Unlike other participants in global markets, they tend to take a long-term view – investing in a way that aims to produce sustainable returns 25 years or more from now. This makes sustainability a key consideration for institutional investors, as evidenced by the fact that over half of the world's institutional assets are now managed by signatories to the UN Principles for Responsible Investment.[1]All of this makes institutional investors critical to shaping how AI gets embedded across industries in the years ahead

## Investing in the AI Sustainability Revolution

AI has the potential to revolutionize fields as diverse as energy, agriculture, healthcare, and ocean conservation, helping us monitor, optimize, and predict (MOP) progress toward global sustainability goals, as shown in Figure 1. I like to think of investors as using AI to "MOP up" sustainability challenges.

By channeling capital into AI-driven innovations, investors not only accelerate progress toward key global targets, such as the Paris Agreement, the SDGs, and the 30x30 goal of the Global Biodiversity Framework, but also unlock potential opportunities for better risk-adjusted returns. In this dual role, they support a more sustainable, low-carbon economy while enhancing their own resilience in a rapidly changing market.

Currently, they are looking at AI to drive sustainability in two key ways:

1

**Investing in the AI Sustainability Revolution:** They see how investing directly or indirectly in companies that provide or deploy AI can help catalyze the transition to a low-carbon, sustainable economy. This could help them both to manage the long-term risks linked to climate change and nature loss and to grasp new opportunities to invest in the sustainability winners of tomorrow.[1]

2

**Empowering Investment Decisions With AI:** Investors are looking at AI as a tool to enhance the speed, quality, depth, and scope of their investment decision-making processes.

1. Atkin, David. "Meeting Investors Where They're At: PRI Launches New Strategy." Principles for Responsible Investment. Accessed November 4, 2024.
2. Climate Change AI is a good resource to explore the potential of AI, especially machine learning, in addressing climate change.

**Figure 1:** How AI Can Be Used to MOP Things Up In Sustainability

## Monitoring

- Deforestation
- Ocean acidification
- Epidemic monitoring
- Methane leaks
- Endangered species
- GHG emissions

### How AI is used for monitoring:

AI converts unstructured satellites, sensors and other tech generated info into structured data that enables more accurate and real-time monitoring of environmental harms.

### Use Case

Global Forest Watch uses AI to track deforestation and has led to a 50% reduction in deforestation rates in certain areas where timely data was used to design policy & implement protective measures. [3]

↓ 50%

## Optimizing

- Energy usage
- Agricultural yields
- Sustainable transport systems
- Accessible finance
- Circular economy systems
- Recycling systems

### How AI is used for optimizing:

AI and machine learning are able to enhance data processing and analysis to suggest the most efficient use of resources (e.g. via smart batteries & grids).

### Use Case

Siemens uses AI to optimize wind turbine performance and has found it can improve efficiency by 10% and increase profitability by 20%.[4]

↑ 20%

## Predicting

- Extreme weather events
- Health issues
- Future pollution levels
- Sea level rises
- Credibility of corporate transition plans

### How AI is used for predicting:

AI leverages pattern identification and iterative learning to signal potential future-looking outcomes based on big data.

### Use Case

IBM's Green Horizon project uses AI to predict air pollution levels. In pilot projects, cities using the platform have reported a 20% reduction in air pollution levels due to better predicting and optimizing traffic flows and energy use.[5]

↓ 20%

3. World Resources Institute. "Global Forest Watch Helps Indigenous Peoples Reduce Deforestation." Accessed November 4, 2024.
4. BloombergNEF. "Siemens Says AI Can Boost Power Plant Profit by 20%: Q&A." Accessed November 4, 2024.
5. "IBM Expands Green Horizons Initiative Globally to Address Pressing Environmental and Pollution Challenges." Newswire, December 9, 2015. Accessed November 4, 2024.

## Empowering Investment Decisions With AI: From Data to Action

The second approach to sustainability institutional investors are taking with AI is to enhance the speed, quality, depth, and scope of their investment decision-making processes.

Institutional investors diversify their portfolios across thousands of global companies and securities creating an ecosystem of millions of data points. This comes with persistent challenges over the quality and coverage of that data and information, and how to turn it into valuable knowledge, wisdom, and action. Enter AI, with the potential to fundamentally reshape all parts of the Knowledge Pyramid behind each investment decision (See Figure 2).

For data collection, AI and machine learning are invaluable for capturing information from diverse sources and formats (such as text, tables, and graphs) and improving data reliability. This quality control is not a marginal issue. Our research found that across three data providers that offered clients the same reported emission data points, the data was different 13% of the time and showed a discrepancy of over 20%.

AI can also help close data gaps when corporate self-reported data is not available, making more accurate estimations beyond industry averages by using comparable and alternative sets of information like news or geospatial data. For example, AI tools can now overlay corporate human rights disclosures with information pulled from global news and independent sources to see if they match up.

**Our research found that across three data providers that offered clients the same reported emission data points, the data was different 13% of the time and showed a discrepancy of over 20%.**

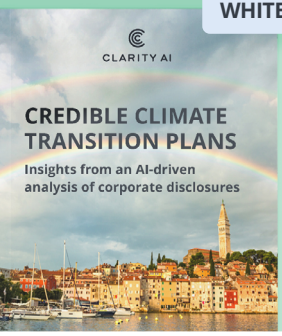

**The Next Frontier in Investment Management: GenAI for Smarter, More Efficient Portfolios**

Across three data providers that offered clients the same reported emission data points, the data was different 13% of the time and showed a discrepancy of over 20%.

Read More

To transform data into actionable insights, AI assistant solutions now allow institutional investors to converse intelligently with their portfolios on sustainability topics. They can inquire about data sources, methodologies, performance, and recommendations for improving scores. Additionally, AI is being used to provide forward-looking insights. For example, we used AI to analyze the decarbonization plans of the world's 400 largest emitters, finding that only 40% have credible transition plans.

Finally, AI is already helping investors to report back to their many stakeholders in different formats, styles and languages. Perhaps most importantly for investors today, AI can offer ways to optimize compliance reporting, reducing the reporting burden, and allowing responsible investors to focus on making investment decisions.




**Credible climate transition plans: Insights from an AI-driven analysis of corporate disclosures**

We used AI to analyze the decarbonization plans of the world's 400 largest emitters, finding that only 40% have credible transition plans.

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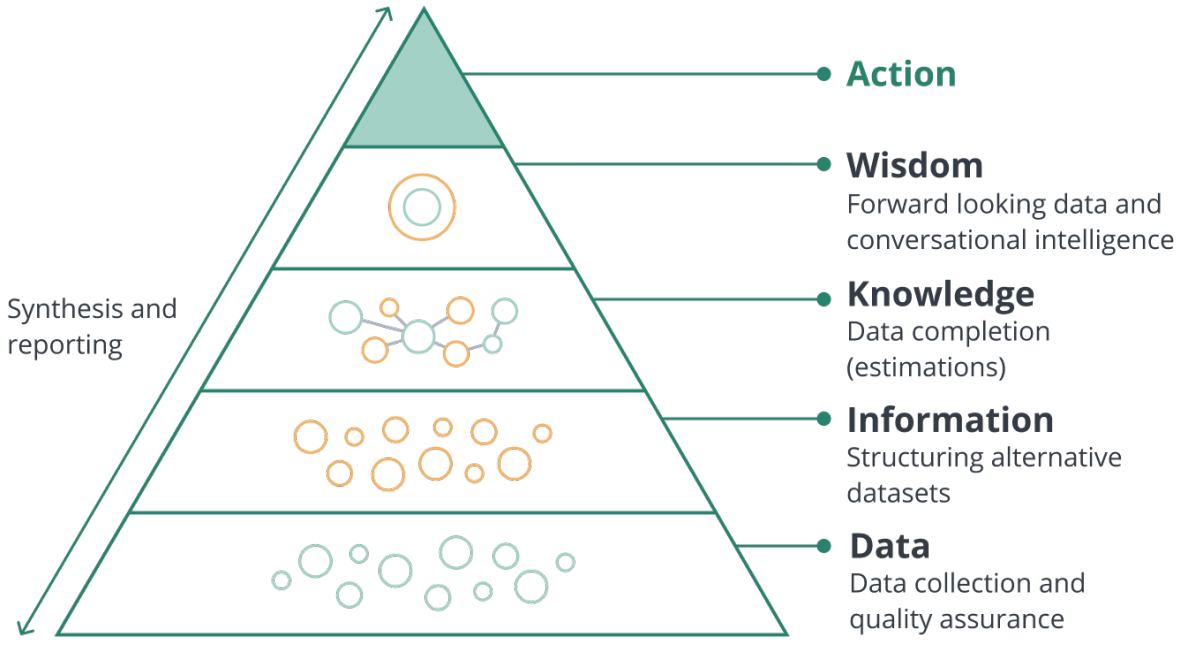
**Figure 2:** The Knowledge Pyramid



## Installing the E, S and G Smoke Alarms

The potential rewards of AI are enormous, but they do not come risk-free.

Just as smoke alarms safeguard our homes, the modern economy needs to install early warning systems and guardrails that will enable us to safely power ahead with the use of AI.

That means minimizing the potential misuse of AI in the three key areas of environmental, social and governance risk. As is often the case with investors, let's start with governance

### Managing governance risks for AI

Even in AI's early stages, poor governance has emerged, as seen with Clearview AI. The US-based facial recognition company faced fines from regulators in the UK, Netherlands, and elsewhere for scraping billions of social media images without user consent.

To address these risks, investors need to apply governance principles and guidelines for managing AI. The key principles guiding the industry are the OECD AI Principles. Updated in May 2024 to capture the emerging risks introduced by generative AI tools like ChatGPT and Google's Bard, they are the main reference point for anyone wanting to tackle AI responsibly.

In addition, there are a growing number of players offering risk management guidelines such as The Partnership on AI, AI4People, Future of Live Institute, The Green Digital Finance Alliance (GDFA) and The Responsible AI Institute (RAI).

Investor specific guidelines include WEF's Responsible AI Playbook for Investors, the CFA Institute's Ethics and Artificial Intelligence in Investment Management and RAI's "Guiding Framework for Responsible AI Integration Into ESG Paradigms" tackles specifically sustainable investing.

### There are many factors to capture in the governance of AI

A simplistic way to capture them is using the following main points:

- **Accountability and oversight:** Assigning clear responsibility for the ownership and management of the AI that they are investing in or using. It should never get to "it is the AIs' fault!"
- **Disinformation and hallucinations:** Ensuring that the AI model has the appropriate guardrails in place to avoid results that are misleading or outright fabrications.
- **Data privacy and security:** Ensuring that the AI or the user interacting with it is not using data that it does not have authorized access to.
- **Fairness and non-discrimination:** Ensuring that the AI model or algorithm is not trained on biased data which can lead to the unfair treatment or the exclusion of certain individuals or groups.
- **Transparency and explainability:** Ensuring that the workings of the AI model are disclosed and explained to an extent that makes it trustworthy and understandable.

These principles and guidance aim to prevent AI from amplifying issues like bias and misinformation, or enabling harms such as mass surveillance and human rights abuses. They emphasize accountability, requiring transparency on who deploys AI and who is responsible for its outcomes.

We are also seeing emerging discussions on what are the best practices for AI policy especially following the ratification of the EU AI Act. We expect that more regulations will aim to govern AI and we are seeing strong policy ideas emerge that focus on balancing innovation with risk management, creating sandboxes for testing, tailoring rules by sector, and ensuring cross-border interoperability aligned with OECD AI Principles.

### Managing governance risks for AI

AI has the potential to accelerate progress toward global climate and nature goals. However, AI also poses environmental challenges that must be managed. Most prominent is its use of electricity and water.

Data centers, essential for AI infrastructure, account for 2-4% of electricity consumption in major economies like the US, China, and the EU—a figure expected to grow with rising demand for AI. Similarly, AI systems require significant water, with estimates predicting it may require up to 6.6 billion $m^3$ of water withdrawal globally by 2027, over half the UK's annual water use.

Due to their investments in AI, tech players like Microsoft and Google have seen their GHGs grow about 30 to 50%, despite their net zero commitments.

Investors play a key role in managing these risks. AI's electricity consumption should increasingly rely on renewable energy, which is why tech companies are investing heavily in carbon-free energy.

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Examples include Microsoft's partnership with Brookfield Renewable and recent investments by Amazon and Google in small nuclear reactors for clean energy.

Water use should also be minimized through closed-loop systems and sustainable practices, ensuring it's not diverted from essential human needs and that wastewater is safely managed and reused, for example, in local heating systems.

To reduce environmental impacts, AI model designs should also be resource-efficient and aligned with specific use cases—generative AI models aren't always necessary when simpler, less resource-intensive models suffice. Notably, AI is helping mitigate its own environmental footprint. Google's DeepMind AI, for example, optimizes the energy use in its data centers and has achieved a 40% reduction in energy use for cooling.[6]

Lastly, responsible environmental management of AI requires sustainable sourcing of materials for data centers and hardware. Rare earth metals, like lithium and cobalt, are vital for AI but carry environmental and human risks if mined irresponsibly. Additionally, AI hardware often uses toxic chemicals and heavy metals such as lead, cadmium, mercury. Without proper disposal, these can leach into soil and water.

## Managing social risks for AI

AI's potential social benefits—ranging from new healthcare treatments to improved access to education—are significant, though often less discussed than environmental impacts. A study published in Nature Journal in 2020 found that AI could help to positively contribute to 134 of the 169 (79%) UN Sustainable Development Goals (Figure 3).[7]

**Figure 3:** Positive vs. negative impacts of AI on achieving a sample of the SDGs


**Source:** Nature Journal
**Note:** Sample based on the 9 'Society-related' SDGs only)

6. "DeepMind AI Reduces Google Data Centre Cooling Bill by 40%." DeepMind, July 20, 2016. Accessed November 4, 2024.
7. Rolnick, David, Priya L. Donti, Lynn H. Kaack, Kelly Kochanski, Alexandre Lacoste, Kris Sankaran, Andrew Slavin Ross, et al. "Tackling Climate Change with Machine Learning." Nature Communications 11, no. 1 (2020): Article 132.

However, it also warned that the social risks that come with AI might hinder progress on 59 of the 169 (35%) SDGs if it is not managed wisely.[8] Some of these issues overlap with the governance issues outlined above. For example, there is a risk that AI could exacerbate biases or unfair treatment in recruitment processes.

One of the most prominent social concerns discussed in relation to AI, is its impact on the labor market. While AI will boost productivity and create new roles, McKinsey predicts that by 2030, activities that account for up to 30% of hours currently worked across the US economy could be automated due to the accelerating use of generative AI. Just like for climate change, this shift will require a "just transition", with governments and companies investing in training to help workers adapt.

While it is not the whole story, there is something to the much-quoted point that "*AI is not going to take your job, but someone who knows how to use AI will*".

Encouragingly, AI ethics and governance are already being integrated in the curriculums of relevant university and technical institutes. We need to see more of this and more public awareness campaigns by governments, NGOs, and educational institutions to equip citizens with the knowledge to navigate AI's risks

## An AI cheat sheet for investors

Institutional investors are already closely monitoring the ESG risks of AI. A recent Capital Group survey of over 1,000 institutional investors shows that these risks are viewed as material across various regions and topics. Data protection and privacy emerge as the top concerns, while other governance, environmental, and social issues are considered material by at least half of the respondents in one or more regions globally.[9]

**By 2030, activities that account for up to 30% of hours currently worked across the US economy could be automated due to the accelerating use of generative AI.**

***"AI is not going to take your job, but someone who knows how to use AI will".***

8. Ibid

9. Jessica Ground. "The Rise of AI and ESG." Capital Group, accessed November 8, 2024.

To help investors address these challenges, Figure 4 outlines key risks and mitigation actions. These can be applied when employing AI, or used as criteria when evaluating investments in companies that develop or deploy AI.

**Figure 4:** Key ESG Risks of AI for Sustainable Investors and Management Strategies

## Environmental

### Risks

- High electricity usage drives CO2 emissions
- High water usage
- Chemical waste from old hardware disposal
- Mining impact due to copper and other specific commodities required for data centers

### Mitigation strategies

- Select and drive further growth of renewable energy.
- Manage water resources to ensure circular use (e.g. heating homes), limit harming other water consumption (human or agricultural), and limit biodiversity damage (e.g. avoid disposal of hot water in habitats).
- Select models that are designed for specific use cases, limiting waste and driving optimization of energy use.
- Select hardware and chips that drive energy efficiencies.
- Ensure proper supply chain tracking to ensure commodities come from responsible mines.
- Oversee proper disposal of toxic waste.

## Social

### Risks

- Job displacement
- Risk of exacerbating bias & discrimination
- Violations of data privacy and security

### Mitigation strategies

- Engage with governments and regulatory bodies to ensure we design policies for a just transition.
- Ensure models are audited and reviewed regularly to avoid bias, especially linked to recruitment and health.
- Offer training and educational programs for staff, supply chain and end-users.
- Invest in reskilling programs to help employees transition to roles that complement AI, like oversight and strategy.
- Promote human-AI Collaboration by focusing on using AI as a tool to augment human decision-making rather than replace it entirely.
- Adopt the Governance actions outlined above.

## Governance

### Risks

- Unclear roles & responsibilities
- Hallucinations by GenAI models
- Violations of data privacy and security
- Bias
- Lack of transparency & explainability

### Mitigation strategies

- Assign clear accountability and oversight (operationally and at board level).
- Apply judicious AI models, use case specific, and with the appropriate guardrails (e.g., humans are in the loop as appropriate).
- Ensure data privacy, anonymization, and security, gaining proper and recognised certifications, and applying existing and upcoming legislation (including EU AI act).
- Continuously test AI models to ensure they remain resilient to cyber threats and function accurately.
- Select your data sets appropriately and fairly so they truly represent the user population you are serving
- Implement guardrails against hallucinations, e.g. by providing references.
- Offer transparency of data sources, model design, factors used, and learning approach.
- Check for explainability as it is key and legally required in different jurisdictions

## Delay is not an option

What does this all mean for sustainable investors? AI can enhance investment decisions across the portfolio cycle—from data collection to reporting—and transform the financial and sustainability outcomes of their investment activity. But it's not a free lunch. Investors must fireproof their use of, and investment in, AI by designing their own approach to managing its risks.

The starting point is to establish accountability and governance to oversee AI strategy and implementation, using principles like the OECD AI Principles, aligning with new frameworks and regulations, and balancing risk management with innovation.

They must also address AI's environmental and social risks by, for example, using energy-efficient models and chips, choosing AI that relies on renewable-powered data centers, and investing in AI training for both technical and non-technical staff, while supporting an AI "just transition".

**The technology is developing at speed, and institutional investors that do not take their first steps soon risk being left behind.**

## About Clarity AI

Clarity AI is the leading sustainability tech company, leveraging advanced technology and AI to provide data-driven environmental and social insights to investors, corporates, governments, and consumers. AI has been at the core of Clarity AI's offering from the start, supporting a fully flexible set of data solutions, insights, analytics capabilities, and tools used for portfolio management, corporate research and engagement, benchmarking, regulatory reporting, online banking, and e-commerce. Clarity AI was named a leader by independent research in The Forrester Wave: ESG Data & Analytics, Q3 2024.

Within the investment sector, Clarity AI serves a direct network of clients managing over $60 trillion in assets and includes firms like Invesco, Nordea, Lazard Asset Management, and Santander. Our strategic partnerships with financial institutions such as BlackRock, the London Stock Exchange Group (LSEG), BNP Paribas, Caceis, or SimCorp, allow thousands of users to access Clarity AI advanced data analytics capabilities through their usual investment platforms, ensuring a seamless workflow experience. Clarity AI has offices in North America, Europe, and the Middle East.
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