

RESEARCH INSIGHT

Impact of Artificial Intelligence on ESG Issues – Critical Investigation of Data Centers' Economics

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The development of Artificial Intelligence [AI] takes the world to a new era of possibilities, and potential challenges. Artificial intelligence acts as both a catalyst and a risk for Environmental, Social and Governance [ESG] initiatives. While AI accelerates sustainability and governance through data-driven precision, AI presents significant environmental challenges—such as massive data center energy, water consumption and pollution— thus creating a complex trade-off between technology's utility and its footprint.

Escalating AI growth needs more Data Centers. The problem has immense challenges and confronts enormous demands in execution. The US must maintain its leadership in AI (or Super Intelligence) to retain its dominant position, and for this data centers construction and growth are crucial. However, there are numerous oppositions because of concerns over heavy resource consumption, social disruptions and pollution due to noise, waste and air quality potentially affecting the quality of life of residents. Numerous States are actively legislating against the construction of Data Centers. There were over 2000 data centers across the US in January 2026 and Cloud Research forecasts there will be over 8,800 data centers worldwide by end of January 2026 underscoring the enormity of the problem. The construction costs went up by \$1.00-2.00 million per MW in 2022. The future points to higher costs. Industry experts predict the average global cost will reach \$11.30 million per MW in 2026, a 6% increase. The demand stems from the expected need of 156 gigawatts of AI-related data center capacity by 2030. While Data Centers are projected to grow at a rate of as much as 33 percent a year over the next 5 years, the World Economic Forum documents that global renewable energy capacity grew only by 15.1 percent in 2024.

Anecdotally, a typical Google data center consumes approximately 450,000 gallons of water per day while each ChatGPT search uses ten times more electricity than a Google search. Amazon's

project Rainier uses half a million Titanium 2 chips. Anthropic is using it to build AI model Claude at accost of \$11 billion. Project Rainier draws around 2.2 gigawatts of electricity per hour and uses 0.15 liters of water per kilowatt-hour and most notably produces exceeding amounts of electronic waste and carbon emissions.

Given the exponential computing boom, what environmental trajectory will it take? And more importantly, what choices do we need to steer toward sustainability? In this paper, I examine the quantum of growth of the Data Centers, its Return on Investments, the Economics of Data Centers, and its environmental costs and footprints for the next decade. This will help all the stakeholders understand the analysis and metrics from multiple perspectives.