"The Role of Artificial Intelligence in Powering America's Energy Future"

Hearing before the Subcommittee on Energy, Climate & Grid Security of the House Committee on Energy and Commerce

Statement of Ed Abbo
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Chairman Duncan, Ranking Member DeGette, and distinguished Members of the subcommittee, my name is Ed Abbo and I serve as President and Chief Technology Officer of C3 AI.

Thank you for the opportunity to testify today.

C3 AI designs, develops, deploys, and helps operate large-scale predictive analytics (Enterprise AI) applications for some of the world's largest organizations such as Koch Industries, Shell, Exxon, Con Edison, Duke, NYPA, Engie, and the Department of Defense.

As a company, we started in the energy sector, looking to harness advancements in information technology such as cloud computing, ubiquitous sensors (that are part of the "internet of things"), and artificial intelligence to help unlock efficiencies across the value chain, including for those that produce energy resources, and those that generate, transmit, and consume power.

I refer to Artificial Intelligence as computer software that can identify patterns difficult for humans to discern and be trained to reason and solve specific dedicated tasks at precision levels and velocity previously unattainable.

Unlike traditional algorithms that require a software programmer to specify a series of logical steps, AI algorithms learn and fine tune themselves based on data, within designated operating boundaries.

AI algorithms are applied in the energy sector today to accurately predict potential critical equipment malfunction in advance of catastrophic failure, increase production yield and throughput, accurately forecast grid load and distributed generation capacity, integrate renewables, detect grid disturbances that can be precursors to failure, and secure the energy infrastructure from cyber-attack.

One of our customers deployed AI-enabled predictive maintenance across their onshore, offshore, and refining assets, as part of an asset reliability program, and improved availability and production by 5%. In that case, the AI algorithms continuously correlate and analyze equipment sensor readings from over 10,000 pieces of equipment, and combined with maintenance records, weather conditions, and imagery from drone inspections, proactively

identify potential reliability and safety issues to be mitigated in advance of unplanned downtime and safety incidents.

AI Smart Energy solutions are being increasingly deployed to secure the supply of cleaner, cheaper, more reliable energy, and accelerate the adoption of renewables in a manner that is resilient to cyber-attack. This fundamentally transforms the value chain of energy production, delivery, and consumption.

There are noteworthy breakthroughs in generative artificial intelligence (Generative AI) using advances in natural language processing including large language models (LLMs) that, according to Goldman Sachs, could lift productivity growth and drive a 7% increase in global GDP. Employed properly, these generative AI systems can help less experienced workers to quickly troubleshoot complex operations and maintenance issues as effectively as more experienced operators. The implications of this application to challenges related to employee turnover and talent shortage is significant.

I conclude by noting a few best practices and safeguards for secure and responsible use of AI:

1. Deploy mission critical systems into secure compute infrastructure in compliance with industry security standards, such as NERC CIP and NIST's Cybersecurity Framework.

2. Establish AI model governance and review processes to:
   a. Ensure ongoing AI model monitoring against expected performance.
   b. Ensure use of AI models to provide recommendations to be actioned by human operators and semi-autonomous use that is subject to strict guardrails.
   c. Ensure use of Generative AI models in ways that are secure and reliable.

We applaud the Committee's focus on AI and how it can be leveraged to secure our nation's energy future. The responsible use of AI across the entire value chain presents a unique opportunity for competitive advantage for the US.