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

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

Questions for the Record

Responses from Ed Abbo, President and Chief Technology Officer, C3 AI

<u>**The Honorable Brett Guthrie**</u>

1. **Last year during Winter Storm Elliott, communities in my district experienced rolling blackouts over Christmas due to equipment failure, high demand, and insufficient capacity, among other factors.**

    a. **How could AI help build resiliency in our grid and help prevent some of these critical failures from happening in future storms and other weather emergencies?**

    b. **Do you have anything to add?**

    AI-enabled systems can be used in a variety of ways to increase grid resiliency against extreme weather events. Applications range from assessing grid health, support for targeted allocation of capital to improve grid resiliency and reliability, and near real-time predictive insights for decision-making support to quickly address critical failures or outages.

    During both daily operations and extreme weather events, AI applications can support utilities with:
    1. Demand Forecasting: more accurate AI demand forecasting to surface overloaded assets and inform next day loading, which can be used to support load shedding and maintenance actions.
    2. Grid maintenance and investment planning: AI optimized predictive maintenance and capital allocation for more targeted and cost-effective grid sustainment, hardening, and upgrades.
    3. Storm planning: AI scenario simulation to identify grid nodes at risk of failure to inform preventative actions and pre-storm crew and equipment positioning to ensure service continuity.
    4. Storm response and recovery: AI situational awareness and dynamic logistics optimization to accelerate power restoration.
    5. Customer engagement: support for proactive customer communication, precise estimated time of restoration, and demand response targeting.

Encouraging and empowering your local utility to pilot, test, and deploy proven AI applications will help ensure your constituents have a more consistent, reliable, and affordable energy supply.

2. We're interested in the possible benefits that AI can bring to our energy sector and our grid. But electric and other utility providers across my district are concerned about cyberattacks. Just last year, a municipal utility provider in my district was the victim of a ransomware attack that disrupted service for approximately 18 hours.

a. How can utilities harness AI to help secure energy infrastructure from cyber-attacks?

There are a wide range of ways that AI systems can protect power grids from cyber-attacks. There are organizations that analyze and develop solutions to protect critical infrastructure. For example, C3 Digital Transformation Institute funded advanced research awards at leading U.S. universities focused on the use of AI to harden information security and secure critical infrastructure in the following areas:

1. AI Resilience: Techniques and methods to enable the development of AI algorithms that are resilient to adversarial attacks.
2. Anomaly Detection: AI techniques to provide early detection of system and/or network anomalies that might be indicative of unauthorized access, denial of service, or data exfiltration.
3. Advanced Persistent Threats: AI techniques to detect the presence of advanced persistent threats.
4. Securing Critical Cyber-Physical Infrastructure: AI techniques to secure critical infrastructure against cyber threats.
5. Forensics: AI forensics and attribution techniques to identify sources of attacks.
6. Insider Threats: Change management techniques to prevent the weaponization of innocent and malicious insiders.
7. Vulnerability Identification: AI techniques to identify previously unknown malware, ransomware, and zero-day vulnerabilities, enabling isolation and neutralization.

b. As AI is integrated more into our energy sector, what needs to be done to ensure the sector is not more vulnerable to cyberattacks?

As we continue to expand the use of AI in the energy sector, it is critically important that we encourage best practices and cybersecurity measures such as those that I raised in my testimony:

1. Deploying mission critical systems into secure compute infrastructure with zero trust architectures in compliance with industry security standards, such as NERC CIP and NIST's Cybersecurity Framework.
2. Establishing 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 verifiable.

The Honorable H. Morgan Griffith

1. **Do you believe that the proliferation of cheaper AI software will lead to more oil, gas, and maybe even coal discoveries around the world, including in developing countries?**

AI is being increasingly used by energy companies to accelerate and improve energy resource exploration in the U.S. and abroad. Examples include seismic data interpretation and geosteering to optimize the well drilling process in real-time to maximize exposure to target reservoirs. This provides for more effective and economical global energy exploration.

2. **Do you believe that using AI for fossil fuel exploration will result in efficiency gains of a significant magnitude?**

AI can significantly drive efficiency gains across the energy value chain, including fossil fuel exploration:

1. Exploration: More efficient and less invasive subsurface modeling by leveraging and unifying a larger array of disparate data including well and seismic logs, geospatial data, historical production, geological, and geophysical data.
2. Operations: Reduced downtime and overall operational costs through predictive and prescriptive maintenance.
3. Drilling & Production: Optimization of drilling and production while reducing safety and environmental hazards, damages to formations, and wear on equipment.