



POSITION STATEMENT

AI and The Electric Grid

*Adopted by the IEEE-USA
Board of Directors (22 May 2025)*

The United States is experiencing a renaissance in the industrial leadership of high-tech industries, including artificial intelligence, data centers, cryptocurrency, semiconductors, and computer-driven manufacturing. This is envisioned as an economic growth engine for the American people.

However, there are two significant strategic risks. First, leadership is not guaranteed as the United States faces intense and fast-paced global competition, especially in leading an AI-based future. The U.S. is at significant risk of falling behind its international counterparts and ceding its advantage, just like it did with semiconductors and networking. Second, industries such as AI are energy-intensive and are expected to place staggering demands on our already stressed energy infrastructure. These stresses are exacerbated by the rapid decline of large-scale and reliable generation, the slow and costly expansion of transmission lines, and aspirations of a sustainable and efficient energy infrastructure. Some regions of the US already lack grid capacity, thus forcing new industries to wait in multi-year queues or go elsewhere.

Therefore, IEEE-USA believes that the U.S. must make strategic choices in grid investments and governance to ensure the United States harnesses the potential of new industries, such as AI. This will enable the US to maintain a competitive economic edge while limiting the harm resulting from the accelerated burden on our energy supply, the grid, and the communities it serves. To that end, IEEE-USA recommends that the U.S. government:

1. Secure, modernize, and expand energy generation:

- Ensure an “all of the above” approach to energy generation - including but not limited to renewable, nuclear, and fossil fuel generation - to close the gap while the U.S. transitions its generation fleet.
- Reduce or remove barriers that hamper the ability of new generation to interconnect with the grid, including incentivizing generation that can be co-located or placed near data centers with AI workloads to reduce strain on the current grid.

- Assess and strengthen the physical, climate, environmental, and cyber security resilience of the energy infrastructure.

2. Facilitate the construction and improvement of transmission infrastructure:

- Offer financial incentives (e.g., tax credits, subsidies, accelerated depreciation) for entities investing in the expansion and modernization of regional transmission infrastructure.
- Reduce the burden of building and updating transmission lines across federal lands and incentivize the relaxation of jurisdictional barriers that hamper projects involving state and local lands.
- Enhance regional and local grids by leveraging the next generation of grid-enhancing technologies.

3. Develop frameworks, standards, models, and metrics for the energy impacts of AI and data centers.

- Develop metrics and baselines, and employ standards for the
 - Energy efficiency of semiconductor chips, AI model training, and AI model use (including searches, prompts, inferences, predictions, and conclusions); and,
 - Infrastructure involved in powering AI workloads (including semiconductor chips, electronics, software, power generation, transmission, and data centers).
- Create an industry-recognized label program for benchmarking energy efficiency targets for chip design, AI model training, and AI model use.

4. Encourage partnerships between government, private entities, and universities:

- Develop and expand the future workforce including technicians and engineers in the power sector.
- Foster transparent and inclusive community engagement at the local, regional, and national levels to address environmental, security, resilience, cost, and other concerns in energy and infrastructure projects.
- Leverage joint investments and attract state, local, and private funding, including but not limited to:
 - Rewarding research on energy and AI topics to develop new technologies, frameworks, models, metrics, and energy sources.
 - Building and expanding data centers housing existing supercomputers and compute clusters to accelerate the development of AI and energy efficient methods.

This statement was developed jointly by the IEEE-USA Artificial Intelligence Policy Committee and the IEEE-USA Energy Policy Committee and represents the considered judgment of a group of U.S. IEEE members with expertise in these subject fields. IEEE-USA advances the public good and promotes the careers and public policy interests of the nearly 160,000 engineering, computing, and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of IEEE or its other organizational units.