United States Senate

WASHINGTON, DC 20510

September 12, 2024

The Honorable Jennifer Granholm
U.S. Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585

Dear Secretary Granholm,

We write to you today regarding the use of artificial intelligence (AI) in the Department of Energy's National Laboratories, and to urge to the Department of Energy to prioritize research that harnesses AI to accelerate the discovery, synthesis, and evaluation of novel compounds of national interest.

As you are likely aware, the Pacific Northwest National Laboratory (PNNL) announced in January that it was in the process of testing a new material that could be capable of reducing the lithium content in batteries by as much as 70%. This material was the product of an initiative that combined artificial intelligence with high-performance computing, taking less than five days to model and filter through 32 million potential compounds until the most promising candidates could be identified and tested. In doing so, this approach condensed decades of research into a matter of days, and possesses tremendous potential in a broad range of sectors moving forward.

Critical minerals such as lithium are essential to our national security, the transition to clean energy, and the continued development of advanced technologies. However, the production and processing of critical minerals is largely in the control of foreign countries of concern. We believe that, in addition to supporting responsible domestic production and processing, the United States must also work to reduce the demand of critical minerals by identifying much cheaper, sustainable, and domestically-sourced alternatives. We further believe that this particular research methodology presents a key opportunity toward achieving these goals in a meaningful timeframe.

Beyond the national security and energy sector implications, this research framework also presents unique opportunities to accelerate innovation in the technology, medicine, and environmental sectors. Whether the product is more efficient semiconductors, more effective catalytic converters, or more effectual antibiotics, rapidly unlocking these novel compounds that align with our national interests must be a top priority.

As a result, we urge the Department of Energy take immediate and substantive action to prioritize AI-enabled research and development into novel compounds of national interest, particularly as they relate to furthering our national security, energy security, and environmental health goals. This is critical as AI continues to use increasing amounts of electricity, threatening climate goals. Such priority research should include, but should not be strictly limited to:

- Any chemical compound that can eliminate or substantially reduce the use of critical minerals in, or substantially increase the performance or efficiency of, batteries, microchips, or electrical generation or transmission infrastructure;
- Any material or material use strategy that would reduce the energy consumption of computer processing and data storage equipment, while maintaining adequate performance; and
- Catalysts or other compounds used in the efficient and economical production of renewable energy, alternative fuels (including renewable hydrogen), clean air, or clean water.

We appreciate the role that the Department of Energy's National Laboratories have played in advancing our understanding of the world, improving our technological capabilities, and ensuring the competitiveness of our industries, and we look forward to accelerating the rate at which they can continue to innovate and positively impact the world.

Sincerely,

Ron Wyden
United States Senator

John Fetterman
United States Senator