The Under Secretary for Science
Washington, DC 20585

November 12, 2026

Dr. Persis Drell
Chair
Office of Science Advisory Committee

Dear Dr. Drell:

Microelectronics are everywhere – embedded in consumer products, in power, transportation, and information infrastructure, and in key national security applications. According to the Semiconductor Industry Association, worldwide semiconductor sales are expected to exceed a trillion dollars in 2026. For decades the Department of Energy's (DOE) Office of Science (SC) has been at the leading edge of microelectronics, both as a consumer and as an engine of scientific understanding that has enabled many of the technological breakthroughs adopted by industry. In turn, strong commercial demand fueled the pace of scaling and assured that the needs of SC facilities were met. SC supports robust basic research portfolios and scientific user facilities for chemical, physical, mathematical, and computational sciences, and modeling/simulation.

Microelectronic technologies form the computing foundation of the Genesis Mission, will be critically important for advances in quantum computing, sensing, and communication, enable the world's most advanced experimental and computational research facilities, and broadly support nearly all high-priority DOE missions in energy and national security. While the semiconductor industry has made spectacular advances over the last 60+ years, it continues to be clear that semiconductor scaling is beginning to push the limits of physics and our understanding of the device and circuit behavior at these scales. Sustained research and development (R&D) is still needed to ensure continued United States (U.S.) innovation that will benefit the Nation.

I am asking the SC Advisory Committee (SCAC) to form a subcommittee to study how best to prioritize SC resources, strengthen U.S. leadership, and accelerate scientific discovery in microelectronics R&D. This study should include a rigorous assessment of the current landscape, identifying critical scientific targets and technical opportunities and gaps, with a focus on developing the underlying science impacting future microelectronics. Based on the findings, the subcommittee should propose a course of action and make recommendations about where SC resources could be invested in the near- and mid-term for maximum impact to long-term microelectronics science.

The study should also consider the breadth of the field with relevance to SC programs including materials, chemistry, processing, devices, architectures, and computing approaches. The subcommittee's recommendations should be made in the context of other DOE and Federal government activities, including but not limited to the Genesis Mission and Quantum Genesis, Department of War Microelectronics Commons, and Department of Commerce CHIPS for America. The subcommittee should consider

opportunities to create public-private partnerships leveraging DOE capabilities, private sector advances, and other agency resources to maximize impact.

Based on the subcommittee's expertise and broad stakeholder input, the subcommittee shall provide an assessment of the current landscape and recommendations for near- and mid-term investment priorities by July 2027 to the SCAC for deliberation.

Sincerely,

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Darío Gil
Under Secretary for Science