June 1, 2021

Kei Koizumi
Chief of Staff
Office of Science and Technology Policy
Eisenhower Executive Office Building
1650 Pennsylvania Avenue
Washington, D.C. 20504

Dear Mr. Koizumi:

As leaders of The Minerals, Metals & Materials Society (TMS), a nonprofit professional society that represents nearly 13,000 materials scientists, engineers, and students from the United States and across the globe, we are writing to offer input as a follow-up to President Biden's January 20, 2021 letter to Dr. Eric S. Lander, now Director of the OSTP, to offer guidance in identifying key gaps in infrastructure as they relate to materials.

Materials extraction, development, and manufacturing impacts the daily lives of all Americans through technological advances such as high temperature structural materials used in efficient passenger airplanes, environmentally responsible lead-free solders used in integrated circuits, and advanced aluminum alloys used in lightweighting vehicles that reduce emissions and make transportation more energy efficient. Historically, these materials and the methods used to manufacture them were developed or updated over decades via incremental changes, with narrow technological focus. However, in 2011 advances in materials characterization, processing and high-performance computing motivated investment in the Materials Genome Initiative (MGI), launched by President Obama Administration's OSTP and spearheaded in part by TMS members on the National Science and Technology Council MGI subcommittee. The MGI is revolutionizing materials development and manufacturing in the United States by enabling the rapid development of new and improved materials and creating a common platform for the translation of materials technology across industry sectors. This visionary program helped to focus and unify materials and manufacturing R&D and has trained a new generation of engineers and scientists to utilize newly developed Artificial Intelligence (AI)-based tools and methods. This effort has resulted in direct, significant, gains to the United States economy, made the US-based Science, Technology, Engineering, and Math (STEM) workforce more competitive globally, and improved the lives of Americans by enabling acceleration of technology advances and their translation to the market. Examples, ranging from electric vehicles and more fuel-efficient transportation systems, more efficient high temperature materials for energy applications, and many more have contributed to the improvement of quality of life for Americans in addition to enhanced opportunities for STEM-related jobs across education levels.

A decade has passed since the landmark initial framing of the MGI announced by OSTP in 2011. It is now time for renewed investment in the science and technology infrastructure that undergirds our collective success. In that light, TMS leadership is requesting your attention in the framing policies and approaches to address the following key issues:

- Development of new materials and manufacturing processes that enable the realization of next-generation technologies such as hypersonic vehicles, quantum computing, medical devices, and infrastructure ensuring the United States' preeminence in defense and space technologies, new information technologies, more efficient energy utilization, more reliable communication networks and more resilient infrastructure.
- Investment in new extraction processes, materials, and recycling methods to reduce foreign reliance on critical materials found in virtually all modern technologies, including electronic devices, batteries, windmills, jet engines, to name a few.

- Leverage the explosion of data science, artificial intelligence, and machine learning to accelerate materials discovery and development, dramatically affecting manufacturing by reducing time to market, costs, greenhouse emissions, and waste.

The benefits of these investments must be coupled with a strong investment in the human resources who create, innovate and advance our technology. We respectfully request that matters related to workforce development remain a priority. Specific recommendations include:

- Diversity in our workforce is our strongest competitive edge. Secondary and higher-education institutions, as well as professional societies, should be incentivized societies, to provide online learning opportunities that also address needs of underserved populations and minorities. Diversity and equity in training the future workforce, as well as retraining current workforce, should be systematically addressed.

- In the 20th century the United States attracted the best minds from around the world who contributed to much of our scientific, technological and economic wellbeing. As we compete with near peer countries and regions in this new century, we believe that the immigration process must be streamlined to both attract and retain the world's best scientists and engineers, with visa policies that address gaps in America's STEM workforce.

Thank you for your consideration of our position on the future of materials innovation for the betterment of the United States. We would welcome additional discussion how TMS leadership or any of our 13,000 members can be of assistance to this mission.

Very respectfully,

Ellen Cerreta
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cc: Patrick Looney