



Addressing Supply Chain Challenges for Advanced Superconductors

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What should the US Government do to ensure that manufacturing of critical materials needed to build large science facilities is ready when construction begins? This question reflects supply-chain challenges across a wide range of strategic and economic sectors. An Executive Order¹ charged the US Department of Energy (DOE) with analyzing challenges and finding solutions.

The DOE Office of Accelerator R&D and Production (ARDAP) awarded funds to look at the supply chain in the accelerator sector. Particle accelerators are not only used in large science facilities like particle colliders and x-ray light sources, the superconducting magnets they use are also key components in medical systems, fusion reactors, and many other applications. The MagLab also relies on these same superconducting magnet materials and supply chains to provide the world's highest magnetic fields to its users.

The manufacturing economic ecosystem is often strained by the large time gaps that occur between facility construction projects. This makes manufacturing production runs episodic and puts manufacturing capabilities and know-how at risk. A workshop was recently convened to solve a challenge of this type for advanced superconducting wires. Outcomes of the workshop lay the foundation for a possible innovation institute or national manufacturing hub for advanced superconductors of interest to the MagLab and others.



Attendees at a historic workshop held at Tufts University in March 2022 included leaders of projects to build multi-billion-dollar science facilities, CEOs of companies that manufacture superconductors and superconducting magnet systems, technology developers in aerospace, fusion, and medical systems, raw materials suppliers, university faculty, and national laboratory program heads, including representation from the MagLab. The meeting identified key elements of public-private partnerships that underpin business models for manufacturing of advanced superconductors for magnet technology. Image Credit: Lance Cooley, MagLab's ASC

¹Executive Order (E.O.) 14017 "America's Supply Chains," signed February 24, 2021, by President Joseph Biden