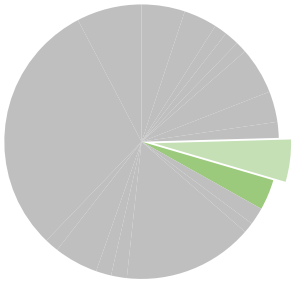
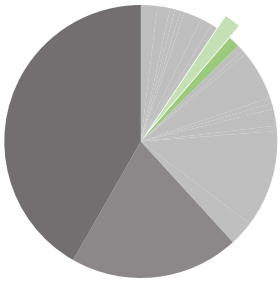
Federal Energy R&D: Advanced Manufacturing

BY DAVID M. HART AND COLIN CUNLIFF | APRIL 2018

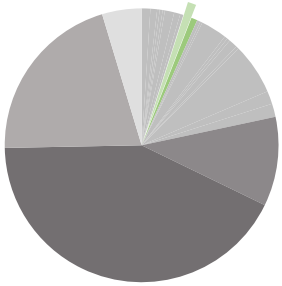
This briefing is part of a series on the U.S. energy budget. See: itif.org/energy-budget.



Manufacturing (light green)
Other Efficiency (green)
Energy R&D (light gray)



Adv Man & Energy R&D
Basic Science R&D
Defense R&D



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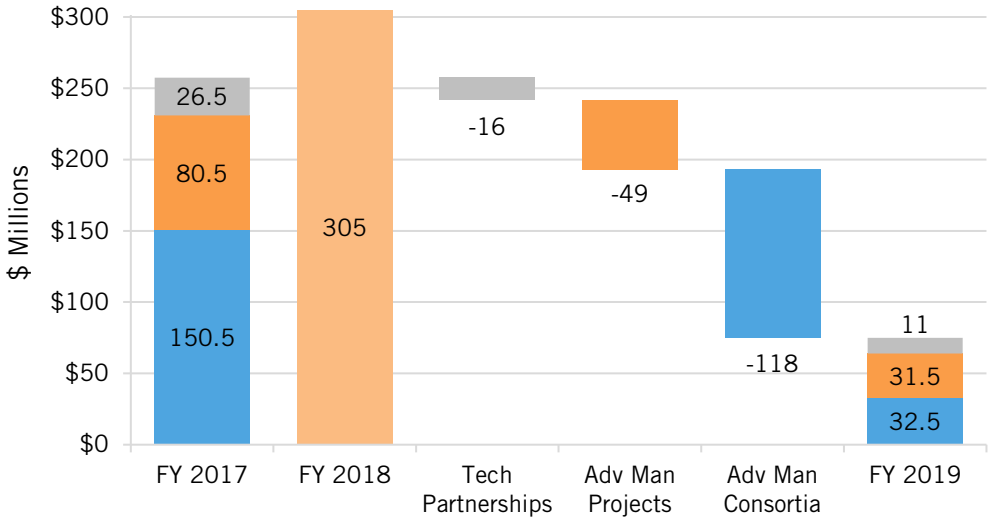
The Department of Energy's (DOE) Advanced Manufacturing Office (AMO) works to improve the energy efficiency and productivity of U.S. manufacturers by focusing R&D on cross-cutting, platform technologies relevant to manufacturing in multiple fields. A key goal is to ensure new energy technologies invented in the United States are also manufactured in the United States. AMO supports R&D through competitive funding opportunities designed to develop novel manufacturing technologies.

Figure 1: The FY 2019 Budget Request Would Cut Advanced Manufacturing R&D by 75 Percent



What's At Risk

Manufacturing plays an outsize role in the health of the U.S. economy because of both its impact on trade and innovation, and its large multiplier effect on other sectors. Accelerated innovation in both industrial processes that use energy and products used by the energy industry would strengthen U.S. manufacturing and hasten progress toward national economic, workforce, security, and environmental goals. Market failures, however, lead to many gaps in the private-sector response to the manufacturing and energy innovation imperative, and have led to significant supply-chain weaknesses, regional hollowing out, and underinvestment in workforce education and training.

AMO helps address such market failures in several ways, with the goal of improving the energy productivity of U.S. manufacturing, reducing lifecycle energy and resource impacts of manufactured goods, and transition DOE-supported technologies and practices into

U.S. manufacturing. Together, these efforts will assist manufacturers in cutting energy costs, which has already been an important driver in the "reshoring" of manufacturing to the United States over the past decade.

Advanced Manufacturing R&D Subprograms

Current R&D activities in AMO are spread across three subprograms:

- **Advanced Manufacturing R&D Projects** focus on high-impact manufacturing technology and process challenges in areas such as advanced materials manufacturing for energy applications, improved energy-efficient process technologies, high-performance computing for manufacturing, additive manufactured materials, and structures used in extreme environments.

- **Advanced Manufacturing R&D Consortia** brings together manufacturers, research institutions, suppliers, and universities in public-private R&D partnership consortia, each of which focuses on a specific set of challenges at the nexus of manufacturing and energy. Examples include the Manufacturing Demonstration Facility (MDF), which focuses on advanced manufacturing technologies to reduce energy and production costs, and five Manufacturing USA institutes that focus on clean energy technologies.[1]

- **Advanced Manufacturing Technical Partnerships** help small and medium-sized manufacturers improve their energy productivity and reduce waste and water use; demonstrate the viability of improved energy-management approaches; and promote combined heat and power (CHP) and waste heat to power technologies to improve efficiencies and lower energy costs.

Key Elements of the FY 2019 Budget Proposal

- **A 78-percent reduction in the Advanced Manufacturing Consortia,** including termination of the Critical Materials Hub, the Energy/Water Hub, the five existing clean energy Manufacturing USA institutes, and new proposed clean energy Manufacturing USA institute.

- **Reduced funding for public-private R&D projects at the Manufacturing Demonstration Facility (MDF) and the Carbon Fiber Test Facility (CFTC)**, including a shift toward early-stage R&D.

- **A 61-percent reduction in Advanced Manufacturing R&D Projects**, which have previously funded R&D in materials for harsh conditions, energy-conversion materials, materials for energy systems, roll-to-roll materials and processes, innovative computational process modeling in manufacturing, and energy-intensive manufacturing processes.

- **Elimination of the Industrial Assessment Centers (IACs)**, which provide technical assistance to small and medium-sized manufacturers. Overall funding for the Technical Partnerships subprogram would be reduced by 58 percent.

ENDNOTES

1. AMO is currently in the process of establishing a sixth Manufacturing USA institute for clean energy.

ABOUT THE AUTHORS

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The Information Technology and Innovation Foundation (ITIF) is a nonprofit, nonpartisan research and educational institute focusing on the intersection of technological innovation and public policy. Recognized as one of the world's leading science and technology think tanks, ITIF's mission is to formulate and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress.

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