



REPORT TO THE PRESIDENT Ensuring American Leadership In Advanced Manufacturing

Executive Office of the President
President's Council of Advisors on
Science and Technology



Summary of Key Conclusions

- The United States is losing leadership in manufacturing – not just in low-tech industries and products and not just due to low-wages abroad. We are losing ground in the production of high-tech products, including those resulting from U.S. innovation and inventions, and in manufacturing-associated R&D.
- As U.S. leadership in manufacturing declines, other nations are investing heavily in advancing their manufacturing leadership, innovation systems, and R&D.
- Advanced manufacturing has the potential to create and retain high-quality jobs in the United States.



Summary of Key Conclusions

- The Nation's long-term ability to innovate and compete in the global economy greatly benefits from co-location of manufacturing and manufacturing-related R&D activities in the United States. The loss of these activities will undermine our capacity to invent, innovate, and compete in global markets.
- A strong advanced manufacturing sector is essential to national security.
- The United States lags behind competitor nations in providing the business environment and skilled workforce needed for advanced manufacturing.



Summary of Key Conclusions

- Federal investments in new technologies, shared infrastructure, and design tools have been crucial to the birth and growth of major new industries.
- Individual companies cannot justify the investment required to fully develop many important new technologies that will have spillover benefits or to create the full infrastructure needed to support manufacturing. Therefore:

Private investment must be complemented by public investment to overcome market failures. Key opportunities include investing in the advancement of new technologies with transformative potential, supporting shared infrastructure, and accelerating the manufacturing process through targeted support for new methods and approaches.



Principles for Promoting Advanced Manufacturing in the US

(1) Create a fertile environment for innovation here.

- Encourage firms to locate R&D and manufacturing activities in the US through tax and business policies
- Support a robust basic research enterprise
- Ensure a supply of skilled workers, through policies that cultivate and attract high-skilled talent



Principles for Promoting Advanced Manufacturing in the US

(2) Invest to overcome market failures, to ensure new technologies are developed here and technology-based enterprises have the infrastructure to flourish here.

- Support applied research programs in most promising new technologies
- Co-invest in public-private partnerships to facilitate development of broadly-applicable technologies with transformative potential
- Develop and disseminate design methodologies that decrease the time and lower the barriers to make products
- Invest in shared technology infrastructure that would help U.S. companies improve their manufacturing



Summary of Recommendations

Recommendation 1: Launch An Advanced Manufacturing Initiative

The Federal Government should launch an Advanced Manufacturing Initiative for America's Future (AMI). AMI should be a concerted, whole-of-government effort, spearheaded by the Department of Commerce, Department of Defense and Department of Energy and coordinated by the Executive Office of the President (EOP).



Summary of Recommendations

Recommendation 1 (cont'd)

The coordinating body of AMI should prepare a bi-annual report to the President on the most important needs for Federal investments, including:

- (i) Coordinated Federal support to academia and industry for applied research on new technologies and design methodologies
- (ii) Public-private partnerships (PPPs) to advance such technologies through pre-competitive consortia
- (iii) Development and dissemination of design methodologies
- (iv) Shared facilities and infrastructure to help small and medium-sized firms compete globally



Summary of Recommendations

Recommendation 1 (cont'd)

- AMI should identify the most pressing technological challenges that merit focused attention for these activities.
- AMI should also report on the availability of financing for pilot plants and early-stage activities within these technology areas.
- Funds to implement the programs recommended by AMI should be appropriated to the 3 Departments, at the level of \$500 million rising to \$1 billion over four years.



Criteria for AMI Investments

Should be justified by potential for transformative impact.

Opportunities should be selected based on the merits of the proposals, & below criteria:

- Technology has a high potential payoff in employment and output.
- Prospect of sustainable competitive advantage for the U.S.
- Identifiable market failures impede private investment
 - PPPs include industrial partners are willing to co-invest
 - PPPs include industrial partners with sufficient size to invest at scale
- Investments will help anchor subsequent manufacturing in the United States
- Shared infrastructure will help existing firms and industries compete globally



Summary of Recommendations

Recommendation 2: Improve Tax Policy

The Federal Government should:

- Reform corporate income taxes, to bring the rate in line with other OECD countries, as advocated by President Obama
- Extend the R&D tax credit permanently and increase the rate to 17 per cent, as advocated in the Presidents' Innovation Strategy.



Summary of Recommendations

Recommendation 3: Support Research

The Federal Government should:

- Fulfill the President's plan to double the research budgets of three key science agencies over the next ten years: the National Science Foundation, the Department of Energy's Office of Science, and the National Institutes of Standards and Technology.
- Ensure appropriate research budget levels for other research agencies.
- Help fulfill the President's goal that public and private investment R&D reach 3% of GDP.



Summary of Recommendations

Recommendation 4: Strengthen the Workforce

The Federal Government should:

- Strengthen science, technology, engineering and mathematics (STEM) education.
- Expand the number of high-skilled foreign workers that may be employed by U.S. companies.

