**Q: What is smart manufacturing?**

**A:** Smart Manufacturing is a set of advanced sensing, instrumentation, monitoring, controls, and process optimization technologies and practices that merge information and communications technologies with the manufacturing environment for the real-time management of energy, productivity, and costs across our factories and companies.

**Q: There are already private sector efforts to develop smart manufacturing technologies. Why is this institute necessary?**

**A:** Adoption of Smart Manufacturing technologies has been limited to small fractions of the high-tech and high-value-added industries due to the prohibitive cost and complexity of the technologies. While cost is currently a barrier, an industry group stated that Smart Manufacturing capabilities, “open the door to substantially drive down the actual and perceived risk for legacy facilities to explore and investigate capabilities, technologies, and approaches for modernizing without the risk of operational failure.” Further, individual industry players are not likely to individually address the key foundational challenges that need to be overcome for widespread adoption such as technology integration and open, interoperable platforms.

In response to the recent White House Advanced Manufacturing Partnership 2.0, a year-long partnership with the private sector and university leaders, Smart Manufacturing was identified as one of the highest impact priority - areas for the development of new technology affecting manufacturing.

**Q: What are the goals (qualitative and/or quantitative) for this institute?**

**A:** Detailed goals for this institute are being developed as part of a funding opportunity announcement, planned for release in early 2015. Examples of technical goals being considered include commercializing a robust sensor for process monitoring and demonstrating a 25% reduction in costs for selected manufacturing processes in 5 years with a plan to achieve a 50% reduction in these costs in ten years. The overall objectives of the institute are to reduce life cycle energy use and increase energy productivity, regional economic development and jobs, and domestic production to support U.S. manufacturing competitiveness.

**Q: How will the new institute be selected?**

**A:** Just like the process to select the manufacturing innovation institutes for next generation power electronics and for advanced composites, this institute will be selected through an open, competitive merit-based process. The merit review process will utilize technical experts, which may include representatives from the Departments of Defense, Energy, Commerce and Education as well as NIST, NASA and NSF to evaluate applications. Further information on the selection process will be available in the funding opportunity announcement for the institute.

**Q: What are the criteria for selection?**

**A:** The merit review criteria will be described in the planned funding opportunity announcement. The criteria may include, but are not limited to: technical merit, innovation, and impact; team and resources; and operations and management plan.

**Q: Broadly speaking, how does the institute different from other similar federal programs and state/regional clusters?**

**A:** While the federal government has a number of effective programs to support manufacturing research and development, these programs tend to be sector- or agency-specific, concentrate on early stage R&D or promote much later stage commercialization. Uniquely, each manufacturing innovation institute is designed to serve as a regional hub to bridge the gap between applied research and product development, bringing together companies, universities and other academic and training institutions, and Federal agencies to co-invest in technology areas that encourage investment and production in the United States. The atmosphere of innovation unleashed by these institutes encourages collaborations between organizations, leverages expertise and resources, and promotes breakthroughs that wouldn’t be possible working separately.

Each institute also helps to strengthen existing state and regional clusters while linking these local efforts to a nationwide advanced manufacturing initiative. The success of each institute depends on strong public-private partnerships at the national, state and regional level as well as coordination with ongoing research and development efforts such as the Department’s Energy Innovation Hubs and national laboratories.

**Q: What would the Institute “make”?**

**A:** The Smart Manufacturing Institute will develop technology for sensors that work in high temperature and high pressure environments, control systems that use data from these sensors, computational models that simulate the operations of the sensors and control systems, and an open platform to demonstrate how all these technologies can be integrated.