VCAT Manufacturing Subcommittee Recommendations on Design Principles for the Advanced Manufacturing Technology Consortia (AMTech)

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Design Principles for AMTech

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- What management models are most effective for the public-private partnerships – specifically AMTech – taking into consideration the following concerns:
  - To facilitate development, diffusion, and adoption of knowledge and technology transfer
  - To facilitate participation by small manufacturers

Design Principles for AMTech

- What management models are most effective for the public-private partnerships – specifically AMTech?
  - A good model is the Nanoelectronics Research Initiative (NRI)
    - The NRI has leveraged modest Federal funding with significant co-investment from state and local governments along with industry partners to establish regional research centers and enjoys extensive participation by educational institutions.
  - As a starting point for discussion, we propose that AMTech be managed through consortia, led by industry, that include broad participation by universities and government agencies.

How to ensure the participation of small firms

- Through tiered membership in consortia (e.g., sliding scale of dues)
- Through weighted voting rights
- Through performance of research tasks
- Through access to specialized shared facilities
- Through special consideration for consortia led by small firms
- Other?

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- What are appropriate performance goals and evaluation criteria
    - For the overall Program?
    - For selecting awardees (consortia or other)
    - For measuring the performance of the awarded teams

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- What are appropriate evaluation criteria for the overall Program?
  - Identification of critical gaps (e.g. technology, skill sets, etc.) in manufacturing that are common to an industry or sector
  - Creation of roadmaps* that guide new research and development to address industry problems
  - Ability to attract and leverage participation by multiple government agencies (including state and local governments), industry members, and universities
    - Resource commitment and leveraging

* Roadmaps should identify problems that need to be addressed – not solutions - and include the timeframes in solutions need to be developed.

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- What are appropriate evaluation criteria for the overall Program? (continued)
  - The Program's awardees produce well-founded plans for the research life cycle, including technology diffusion and path to commercialization, and execute them
    - Is the full supply chain participating?
    - Output as US jobs
  - Creation of platform technologies that accelerate advancements in key manufacturing areas to dramatically increase U. S. competitiveness
  - Solutions generated to roadmap problems, commercialization, and US jobs

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- What are appropriate evaluation criteria for selecting awardees (consortia or other)?
  - Clearly-articulated vision for developing roadmap or other means of identifying technology challenges that are suited to AMTech Program
    - Innovativeness
    - Significant impact on U. S. competitiveness
  - Track record of participants
  - Breadth of types of entities included in consortium
    - including small and medium manufacturers where appropriate

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- What are appropriate evaluation criteria for measuring the performance of the awarded teams?
  - Attainment of stated goals and quality of scientific results: published roadmaps, research publications, formation of testbeds, . . .
  - Demonstration(s) of how research outputs address noted technology gaps, . . .
  - Effectiveness of management/oversight to ensure that goals are attained
  - Evidence of risk-taking in the technologies tackled
  - A vision that includes “grand challenges”
  - Successful inclusion of small and mid-sized firms
  - Robust diffusion of technology and commercialization
  - Rigorous tracking and evaluation of economic/technical impacts
  - Amount of investment and resources leveraged from other government agencies (including state and local governments), industry members, and universities

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- What enabling technologies can make U.S. Manufacturers more competitive globally?
  - Note that selection of investment areas should not be technology specific but should be driven by the competitive criteria of the proposals.
    - Process technologies and advanced materials rather than product technologies – platform technologies that improve the way manufacturing is done or enable manufacture of new products
    - Balance of short to long-term outputs
    - Scale-up gaps that hinder a technology from being deployed for large-scale manufacturing

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- Are there other key challenges that we need to be aware of?
  - Interactions with state, local, and other economic development agencies
  - Influence of mission-specific federal agencies
  - “Messaging” – conveying that this program is not picking winners and losers
  - Ensuring that U. S. manufacturers gain competitive advantage

Key Challenges

- How to measure the benefit of the AMTech program to the U.S.?
- Competitiveness of
  - U.S. - headquartered firms
  - U.S. “owned” firms
  - Any firm with substantial U.S. research and manufacturing facilities
  - Domestic content of products
  - other