



18th Annual Washington Policy Conference – June 27-28, 2007

“Making Manufacturing a National Priority”

Technology and Innovation Breakout Session:
Open Innovation and Strengthening the Innovation Infrastructure

On June 27-28, 2007, NACFAM convened manufacturers, researchers, government, and association leaders to begin work in developing innovation initiatives and related programs required for strengthening the overall U.S. innovation infrastructure. NACFAM's Technology and Innovation Advisory Council began the process of identifying major issues and key policy recommendations for NACFAM and the membership to carry out as next steps in this area.

We concluded that one of the foremost issues facing the United States manufacturing sector relates to the under- investment¹, both in the private and public sectors, in the **transitional phase² of manufacturing research** – the feasibility, reproducibility and scalability of new technologies.

Examples of the best practices in collaborative research models that could be emulated for today's most important and under-addressed transitionally related manufacturing research include:

- United States Council for Automotive Research (USCAR)
 - Similar to FreedomCar, there needs to be a ManCar focused on the transitional phase of manufacturing research
- United States Advanced Battery Consortium (USABC)
- Semiconductor Research Corporation (SRC)
- Semiconductor Manufacturing Technology (SEMATECH)
 - Focused mission, based on technology pull, incorporates an exit strategy
- University Technology Centers (UTCs)
 - Good Example: Rolls-Royce / Univ. of Sheffield / U.K. Government
- DARPA-style initiative for manufacturing technologies
- NIST Advanced Technology Program (ATP) / Technology Innovation Program (TIP)

¹ It has been estimated that only 3% of the total automotive R&D has focused on early-stage technical development (ESTD). See Auerswald, Philip E., Lewis M. Branscomb, Nicholas Demos, and Brian K. Min, [Understanding Private-Sector Decision Making for Early-Stage Technology Development, A “Between Invention and Innovation Project” Report](#), NIST GCR 02–841A, September 2005.

² The terminology of “transitional phase of manufacturing research” has often been referred more commonly as “applied manufacturing research” – focused on the ability to rapidly move from technical feasibility to commercial viability. For further description of “transitional research” see Appendix I.

- National Transitional Research Strategy for Manufacturing
 - Good Example: Japan Ministry of Economy, Trade and Industry (METI)

Other issues discussed at the 2007 conference included:

- There is too much cost, risk and knowledge required for independent transitional research by any one company. We need to develop common consensus on a list of high impact projects with understandable needs and benefits, clear and measurable project objectives, each participant with skin in the game and pressure to deliver.
- Open collaboration in manufacturing research can be fostered through web-connected networks as seen in the cancer research or nanotechnology fields www.nanohub.org.
- Need for better communication, coordination and partnering between industry, university research, and federal lab initiatives.

Summary of “Straw Poll” Survey Results:

- NACFAM should take the lead in the prioritization, justification, dissemination and transitional research related to manufacturing technology and innovation.
- NACFAM must help broker the support and creation of these top transitional research initiatives.

What recommendations do you have on how to better connect NIST and other labs with industry needs?

- 45.0% (18) – **More Collaboration**
 - Set priorities jointly with industry
 - Simpler and more standardized engagement procedures
 - More activities that engage with industry
 - Increasing need for specific mfg tech focused consortiums
- 22.5% (9) – **More Transparency / Access / Communication**
 - Centralized inventory of federal projects and personnel expertise
 - Develop a collaborative network of virtual mfg tech centers
 - Communicate future joint-direction through conferences and summits
- 12.5% (5) – **Policy Related Issues**
 - Ease restrictions on collaboration
 - IP-Patent-Licensing rules to enhance not hinder collaborative research
 - Improved federal inter-agency activity coordination

What potential transitional research areas should be considered & what would the goals be?

- 15.0% (6) – Energy Efficient Manufacturing (including measures and standards)
- 12.5% (5) – Interoperability
- 7.5% (3) – Automotive Battery Technologies
- 7.5% (3) – Model Based Enterprise
- 7.5% (3) – Wireless Production Networks
- 5.0% (2) – Composite Mfg Technologies
- 5.0% (2) – Joining, Forming and Non-Destructive Testing Technologies
- Other notables – Adhesive Bonding, Liquid Skin, Smart Assembly

From these discussions, the next steps included:

1. Create NACFAM consensus paper (top ten manufacturing technologies – perhaps with a delphi style survey) to call for collaborative transitional research as a national priority, particularly for the 2008 Presidential candidates.
2. Develop high priority collaborative manufacturing technology project proposals requiring transitional research.
3. Better communicate needs, abilities, and collaborative opportunities between industry and federal labs.
4. Promote and assist open innovation using a web-connect manufacturing research hub.