

# Manufacturing Extension

## An International Perspective



Evaluating the Implications of the MIT  
Final Report on Advanced Manufacturing  
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# The MIT Report: A Wake Up Call

- **Manufacturing Matters:** From this morning's presentations, we know that Manufacturing Matters for Innovation, Growth, Employment, and National Security
- **Key Message :** Decades of corporate restructuring, outsourcing, and overseas manufacturing have eroded the industrial capacity needed to turn the nation's innovations into products — and jobs.

# Competitiveness and the Manufacturing Challenge

- The rest of the world already knows that Manufacturing Matters
- Our leading competitors have established substantial programs to support manufacturing and innovation.

# Countries of the World that think Manufacturing doesn't matter



P.S. The Government of Great Britain is changing its mind

# Newly Released Academy Study Reviews MEP & Foreign Programs to Support Manufacturing

21<sup>st</sup> Century Manufacturing: The Role of the  
Manufacturing Extension Partnership Program

**NB: See the Report for Findings & Recommendations**

# A Rigorous Review Based on Multiple Sources

- An informed committee chaired by Philip Shapira of Georgia Tech
- Five NRC workshops
- Interviews, data analysis, literature review
- Site visits and/or consultations with MEP Centers
  - Georgia: GA-Tech; Ohio: MAGNET; Pennsylvania: DVIRC and Catalyst; Indiana: Purdue; California: CMTC; Minnesota: Enterprise Minnesota; Alabama: Alabama Technology Network; MEP of Mississippi, Tennessee MEP; North Carolina MEP
- Onsite visits to foreign manufacturing programs in Canada, Germany, Taiwan, UK, and France

# Key Questions Guiding the Study

- How can we improve MEP to address today's manufacturing challenge?
- What are leading countries doing to support on-shore innovation and manufacturing?
- What can MEP and other manufacturing programs learn from global best practices?

# Why Review Foreign Programs?

- Insights drawn from programs with similar components can be relevant.
  - The importance of a comparative perspective
- MEP's mission now includes promotion of innovation in manufacturing by SMEs
  - Best practices used by leading foreign programs to foster innovation can provide valuable lessons.
- MEP is seeking to improve the efficiency of its services.
  - Leading foreign programs like Fraunhofer and ITRI have provided similar services and MEP can learn from their experiences.



# What are some of the Key Features of Foreign Programs?

# Canada's Industrial Research Assistance Program (IRAP)

- **Brand:** Canada's premier innovation assistance program for SMEs
- **Reach:** Supports over 8,500 SME's across Canada to develop and commercialize their technologies
- **Network:** More than 200 field staff located in over 130 offices across Canada
- **Services:** Comprehensive suite of locally-delivered advisory services.
- **Budget:** Federal support for IRAP roughly doubled in 2012 from \$128 to \$220 M: 2 x MEP in an economy 10 times as small

# The German Fraunhofer Institutes

- **Broad Network:** Stable and well-organized system of over 60 research institutes covering major areas of basic & applied research
- **Scale:** Over 22,000 employees, many with advanced degrees
- **Partnership:** Each institute paired with a university
- **Competition:** Institutes compete, but also network effectively
- **Budget:** Sustained and substantial investment
  - \$2.45 Billion budget with 1/3 state; 1/3 federal and 1/3 private contributions
  - In effect, approx. 80% of budget is from public sources

# Taiwan's Industrial Technology Research Institute (ITRI)

- **Strong Brand:** Transformed Taiwan's economy with its focus on applied research and technical services for existing firms
- **Strategy** fosters the creation of entire industry chains supporting the manufacturing process
  - From design, materials, equipment, testing, packaging, quality control, and applications
- **Budget** of \$600 million/year; half from the government
- **Close Links** to Taiwan's universities to turn research into new products and manufacturing processes.

# France's Carnot Program

- Competitively awarded seal of excellence for public research organizations.
  - Continued participation of centers based on periodic evaluation of cooperation with industry
- 34 Carnot Institutes, distributed across France :
  - Engage in basic as well as applied research
  - Employ 25,000 researchers
  - Annual Budget of \$2.6 Billion (2011)
  - 7800 direct annual research contracts with companies
  - Revenues of ~ \$480 million
  - About half of the institutes research is financed by private companies; \$82 million for SMEs.

# What can we learn from Foreign Manf. Programs?

## Best Practices Include:

- Substantial and sustained funding
- Long-term focus on manufacturing
- Well equipped facilities and Highly trained staff
- Training of Graduate and Undergraduate students in a hands-on environment; co-located with universities
- These foreign programs offer customized and flexible field services directly to firms
  - information, diagnostics, mentoring, technology support, prototyping, demonstration, networking, and referral and expert personnel

# Best Practices from Foreign Programs

- **Substantial Autonomy** in establishing strategies and deploying resources but with long-term accountability
- **Links to local clusters**, including partnerships with universities and long-term collaboration with private firms
- **Support for start-ups**: Space; equipment; legal, IP and technical assistance; management advice and business connections for funding and markets
- **Regular assessment**, learning, program adaptation, shifts in priorities over time

Can we apply these lessons at  
home?

The Academy's Study of the  
Manufacturing Extension Partnership  
(MEP) suggests we can.



# MEP's Unique Role

- Leading US program designed explicitly to provide support services to small and medium manufacturers
  - These SMEs have limited market alternatives
  - MEP reaches out to some 7000 SMEs a year
  - Distributed program, with some 60 Centers addressing needs particular to different regions
- MEP is a key element in NIST's support for U.S. based manufacturing

# MEP: An Effective Program

- **The Program Works:** The MEP program makes effective use of relatively limited resources for reaching and supporting small and medium sized manufacturers.
- **Focus on Lean:** MEP's introduction of lean manufacturing techniques to small manufacturers has been valuable.
- **The New Innovation-Focused Strategy is sound:**
  - A concerted effort to encourage MEP Centers to develop a wider range of services focused on innovation and growth.

# What can MEP do better?

- **Improve learning across the MEP System:** Substantially expand sharing and use of best practices across its Centers
- **Develop positive incentives** for MEP Centers to improve the delivery of their services.
- **Draw on Global Best Practices:** MEP needs to better understand the operations and impact of leading foreign programs and draw on their best practices lessons.
- **To do these things, MEP funding needs to increase.**

# What can we learn from Global Best Practices?

- **Stable Funding:** More, and more stable public funding is needed to encourage flexibility, better management and support new initiatives.
- **Linkages:** Establish closer ties to universities and draw in expertise from university researchers.
- **Training:** Provide hands-on training for students
- **Above all, focus:** Long-term, sustained policy focus on manufacturing is necessary in a competitive world.

# To Conclude...

We need to pay attention to what  
the rest of the world is doing.

Long-term, sustained policy focus  
on manufacturing is necessary in a  
competitive world

The rest of the world is investing in  
manufacturing.

Without such support, innovative new local  
firms will migrate to other regions



Thank You

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