Manufacturing Extension Partnership Program: An Overview

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Summary

The Hollings Manufacturing Partnership (MEP) is a program of regional centers that assist smaller, U.S.-based manufacturing companies in identifying and adopting new technologies. Operating under the auspices of the National Institute of Standards and Technology (NIST), centers in all 50 states and Puerto Rico provide technical and managerial assistance to firms. Federal funding is matched by non-federal sources. Existing resources in government, business, and academia are leveraged while the program endeavors to build on current state and local activities and industrial extension efforts.

The MEP program has, at times, been included in the discussion surrounding termination of government programs that provide direct federal support for industry. Questions have been raised in congressional debate as to the appropriateness of government funding for this program when the technologies are available in the marketplace. Instead of the government picking "winners and losers," opponents argue, the marketplace should make decisions regarding firms worthy of investment. However, proponents of the program stress that, to date, no direct funding is available to companies through MEP and that assistance is technical, scientific, and/or managerial. The centers facilitate the adoption of new technologies that foster competition and promote innovation. As Congress continues to make appropriation decisions, support for manufacturing extension may be discussed in the context of the role of the federal government in facilitating research and technological advancement.

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Background

The trade debate in the mid-1980s, which ultimately resulted in passage of the Omnibus Trade and Competitiveness Act (P.L. 100-418), underscored the critical role of technological advance in the competitiveness of individual firms and in long-term national economic growth and productivity. Reflecting these and other ideas, legislation established a public-private program, now known as the Hollings Manufacturing Extension Partnership (MEP), to assist smaller, U.S.-based manufacturing firms in identifying and adopting new technologies. The focus on small and medium-sized companies derived from their perceived contribution to job creation, innovation, and manufacturing. Research at that time indicated that businesses of fewer than 500 employees were about 2.5 times as innovative per employee as large firms. The 330,000 firms that fit this category represented almost 99% of the nation's manufacturing enterprises, employed approximately 9.7 million people, and accounted for 60% of total U.S. manufacturing employment in 2007.[1]

The improved use of technology by small and medium-sized businesses is seen as important to the competitiveness of American manufacturing firms. How a product is designed and produced often determines costs, quality, and reliability. Lack of attention to process technologies and techniques may be the result of various factors, including finances, absence of information, equipment shortages, and/or undervaluation of the benefits of technology. The purpose of the centers program is to address these issues through outreach and the application of expertise, technologies, and knowledge developed within the manufacturing research activities of the federal government.

The Program

Located at the National Institute of Standards and Technology (NIST), a laboratory of the Department of Commerce, the Manufacturing Extension Partnership program is built on regional centers to assist companies in adopting and adapting new technologies and manufacturing techniques generated by the federal agencies in pursuit of their various missions. The transfer of public sector expertise, particularly that found in NIST, as well as technology suited to the individual requirements of a firm, is to be accomplished through a "manufacturing extension" system. Federal funding is offered on a competitive basis to nonprofit, state, or local organizations for development and management of the centers. Government financing was initially limited to six years, a provision temporarily suspended by the FY1997 and FY1998 appropriations acts, and eliminated by P.L. 105-309. Initially non-federal sources were required to provide 50% or more of each center's capital and costs through matched dollars, fees for service collected, and/or industry contributions. After six years, federal funding may be provided at no more than one-third of these costs if the center has received a positive, independent evaluation.

Centers are selected in response to open and competitive solicitations and are merit based. According to NIST, the selection criteria include "knowledge of target firms in the proposed region; linkages to sources of technology; technology delivery mechanisms; and management and

[1] National Institute of Standards and Technology, *The Manufacturing Extension Partnership, Delivering Measurable Results to Its Clients, Fiscal Year 2009 Results*, March 2011, available at http://www.nist.gov/mep/upload/MEP-Measuring-Results-Mar11-FINAL.pdf.

financial plans." The sponsor, locally based, is expected to provide expertise reflecting the needs of the business community and the type of industries in that region. No direct financial support is available for companies through the center; the program offers only technical and managerial assistance that is generally reimbursable on a sliding scale. Center staff are employees of the center and the partners, not the federal government. The intent is to have a center not more than two hours away from potential clients.

In 1994, the initial regional centers program expanded when NIST took over support of 36 extension centers originally funded by the Department of Defense through the Technology Reinvestment Project. The combined programs became the Manufacturing Extension Partnership with approximately 60 centers and over 440 field locations that cover all 50 states and Puerto Rico.

The intent of the original legislation creating the manufacturing extension effort was to provide cutting-edge technology developed within NIST and other federal laboratories to small and medium-sized manufacturing companies. Royalties and licenses paid to the centers and/or the government for the use of these technologies were expected to make the centers self-sufficient after the initial six years of operation.

However, the focus on the application of advanced, federally funded technology to small and medium-sized manufacturing firms did not prove satisfactory to most users of the centers. What was seen as being of value to these firms were off-the-shelf technologies and business advice. A 1991 assessment of the program by the General Accounting Office (GAO, now the Government Accountability Office) concluded that

> While legislation establishing the Manufacturing Technology Centers Program emphasized the transfer of advanced technologies being developed at federal laboratories, the centers have found that their clients primarily need proven technologies. **Thus, a key mandate of this program is not realistically aligned with the basic needs of most small manufacturers** [emphasis added] ... according to officials from professional and trade associations representing small manufacturers and the results of key studies on U.S. manufacturing competitiveness, such advanced, laboratory-based technologies are not practical for most small manufacturers because these technologies generally are expensive, untested, and too complex.[2]

In recognition of this situation, the manufacturing centers program was reoriented to offer basic technologies that permitted small and medium-sized firms to improve their competitive position. By the mid-1990s, MEP was providing "a wide range of business services, including helping companies (1) solve individual manufacturing problems, (2) obtain training for their workers, (3) create marketing plans, and (4) upgrade their equipment and computers."[3] Current efforts are focusing on issues of concern to the small manufacturing community including, as identified by NIST, technology acceleration, supplier development, sustainability, continuous improvement, and workforce development. The "overarching strategy" for the MEP program going forward is to reduce manufacturing costs through "lean, quality, & other programs targeting plant efficiencies"

[2] General Accounting Office, *Technology Transfer, Federal Efforts to Enhance the Competitiveness of Small Manufacturers*, GAO/RCED-92-30, November 1991, 3.

[3] General Accounting Office, *Manufacturing Extension Program, Manufactures' Views About Delivery and Impact of Services*, GAO/GGD-96-75, March 1996, 2.

and to increase profitability "through business growth services resulting in new sales, new markets, and new products."[4]

Centers offer expertise, needs evaluation, application demonstrations for new production technologies, training, and information dissemination. Larger, regional organizations use federal, university, and private sector technologies, knowledge, and skills in providing improved manufacturing techniques designed to increase efficiency and quality and to decrease costs. They also can furnish individual project engineering, help in selecting and employing software and equipment, factory assessments, and provide on-site assistance with new technologies. Identification of and access to local and national experts may be provided. Managerial, financial, and marketing services are accessible. No new R&D is conducted by the centers, which only use technologies available elsewhere in the network. One center may have several field offices to provide support to a broader population. Generally these programs are associated with operating technical or training institutions such as community or technical colleges, vocational institutions, university manufacturing programs, or state technical assistance efforts.

The partnership leverages existing resources—whether from government, business, or academia. It does not attempt to supplant the private sector. The program endeavors to build on existing state and local activities and industrial extension efforts. According to NIST, cooperative efforts involve other federal agencies, the National Association of State Development Agencies, the State Science and Technology Institute, the National Association of Manufacturers, and various universities and community colleges.

The America COMPETES Act (P.L. 110-69) authorized the creation of (but did not fund) several new manufacturing programs to be administered by NIST including collaborative manufacturing research pilot grants for partnerships between industry and other educational or research institutions to develop new manufacturing processes, techniques, or materials; a manufacturing fellowship program with stipends available for post-doctoral work at NIST; and a manufacturing research database.

In October 2010, NIST announced $9.1 million in cooperative agreements for 22 projects "designed to enhance the productivity, technological performance and global competitiveness of U.S. manufacturers."[5] The funding was granted on a competitive basis to non-profit organizations that will work with the MEP centers and address one or more of the areas that have been identified by NIST as critical to U.S. manufacturing including

- Responding to evolving supply chains;
- Accelerating the adoption of new technology to build business growth;
- Implementing environmentally sustainable processes;
- Establishing and enabling strong workforces for the future, and;
- Encouraging cultures of continuous improvement.[6]

[4] Slides provided by Roger D. Kilmer, Director, Hollings Manufacturing Extension Partnership, NIST, May 19, 2010.

[5] National Institute of Standards and Technology, NIST Manufacturing Extension Partnership Awards $9.1 Million for 22 Projects to Enhance U.S. Manufacturers' Global Competitiveness, Press Release, October 5, 2010, available at http://www.nist.gov/mep/upload/100410-MEP-Competition-press-release-FINAL.pdf.

[6] Ibid.

These grants differ from the established MEP effort in which no new manufacturing research is conducted and funded as existing manufacturing technology is applied to the needs of small and medium-sized firms.

Funding

Initial appropriations for NIST manufacturing extension programs totaled $12.5 million for FY1989 and FY1990. Further funding included $11.9 million in FY1991, $15.1 million in FY1992, and $16.9 million in FY1993. In FY1994, the State Technology Extension Program was combined with the centers' activity to create the Manufacturing Extension Partnership. Appropriations for the larger effort totaled $30.3 million. Funding for FY1995 was $90.6 million and included a new program, LINKS, to network federal, state, and local agencies, the private sector, and the manufacturing outreach institutions through communications and data systems. However, $16.3 million of this amount was rescinded. MEP was provided with $80 million for FY1996 and P.L. 104-208 provided $95 million for FY1997 while temporarily removing the six-year time limit for federal support of the individual centers. For FY1998, $113.5 million was appropriated while the following year MEP was funded at $106.8 million, which reflected a decrease in the federal share of support as the centers matured. P.L. 105-309 ended the six-year restriction on federal funding if a positive evaluation through an independent review is received at least every two years. Federal financing is limited to no more than one-third of the annual operating and maintenance costs of the center. For FY2000, the partnership was financed at $104.2 million (after a mandated rescission) and $105.1 million was appropriated for FY2001. In FY2002, MEP received $106.5 million in funding.

The Bush Administration's FY2003 request of $12.9 million for the partnership reflected the recommendation that centers in operation for more than six years no longer receive federal support; however, funding totaled $105.9 million. The following year, the President's FY2004 budget again included a significant reduction in support for the extension program and only $38.7 million was appropriated. Funding increased to $107.5 million in FY2005. While the Administration's FY2006 and FY2007 budgets included substantial decreases in financing for MEP, Congress appropriated $104.6 million in FY2006 and $104.6 million in FY2007.

In FY2008, the President's budget proposal included $46.3 million for MEP, 56% below the FY2007 figure; however, the program was funded at $89.6 million, which was 14.4% below the previous fiscal year. For FY2009, the Bush Administration's amended budget request provided $2 million to close out the federally funded portion of MEP. No final FY2009 appropriations legislation for the program was enacted by the close of the 110th Congress. P.L. 110-329, the Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009, provided, in part, funding for MEP at FY2008 levels through March 6, 2009. P.L. 111-8, the FY2009 Omnibus Appropriations Act, provided $110.0 million in support for manufacturing extension, a 22.8% increase over FY2008.

P.L. 111-117, the Consolidated Appropriations Act, 2010, as well as the President's budget request and H.R. 2847, as originally passed by both the House and Senate, fund MEP at $124.7 million, a 13% increase over FY2009.

The Administration's FY2011 budget included $129.7 million for the Manufacturing Extension Partnership program, 4.0% more than the FY2010 appropriation. S. 3636, the FY2011 Commerce, Justice, Science appropriations bill reported from the Senate Committee on

Appropriations during the 111th Congress, also provided $129.7 million for MEP. No FY2011 Commerce, Justice, Science appropriations bill was reported from the House Appropriations Committee in the last Congress.

MEP operated under a series of Continuing Resolutions until a final appropriations bill was enacted. The last CR, P.L. 112-6, in effect through April 8, 2011, provided funding for MEP at the FY2010 figure of $124.7 million. Under H.R. 1, as passed by the House (the "Full-year" CR), FY2011 support for the program would have remained at $124.7 million.

The final FY2011 appropriations legislation, P.L. 112-10, provided $128.4 million for MEP, 3.0% more than both the FY2010 appropriation and the funding included in the Full-Year CR, and 1.0% below the Administration's budget.

The Administration's FY2012 budget proposed $142.6 million in support for MEP which represents an 11.1% increase over FY2011 funding. H.R. 2596, as reported from the House Committee on Appropriations, would provide $128.4 million for MEP, the same amount as FY2011, but 10.0% less than the Administration's request. The FY2012 consolidated appropriations bill covering the Department of Commerce (among other agencies) passed by the Senate, H.R. 2112, would fund MEP at $120.0 million, 6.5% below the amount in H.R. 2596 and that appropriated in FY2011, and 15.8% below the President's budget request.

Evaluations of the Manufacturing Extension Partnership

In an August 1995 briefing paper, the General Accounting Office (GAO, currently the Government Accountability Office) explored how small and medium-sized firms were served by various manufacturing extension efforts, including the MEP program (*Manufacturing Extension Programs, Manufacturers' Views of Services*). Of the 551 responses (to 766 questionnaires distributed), approximately 73% found that their relationships with an extension activity had a positive effect on the company's business performance. Fifteen percent indicated that there was no effect at all. Among the impacts identified were improved use of technology (63%), better product quality (61%), and expanded productivity (56%). According to GAO, this suggested that manufacturing extension activities "had some success in achieving their primary goal of helping manufacturers improve their operations through the use of appropriate technologies and through increases in product quality and worker productivity." The study also found that companies which used internal funding to implement recommendations offered by extension programs were the most likely to find an overall positive impact. "Significantly, approximately 97 percent of [these respondents] ... said that they believed that this investment had been worthwhile." Those who utilized these organizations noted that practical experience in the field contributed to the success of staff activities, as did the affordability of the assistance. Companies that did not utilize the resources provided by the MEP tended to be those that were unaware of the program and the opportunities associated with it.

Further refining this information in a March 1996 report, *Manufacturing Extension Programs, Manufacturers' Views about Delivery and Impact of Services*, GAO also noted that company size and age were significant factors in business perceptions of the extension program. Smaller (under $1 million gross sales) and newer (established after 1985) firms "were most likely to report that their overall business performance was boosted by MEP assistance." While there were no real

differences in perception between extension services offered by NIST and those funded by other institutions, there was a difference in assessments of effectiveness based on whether or not payment was required. According to GAO, those firms that paid fees "were half as likely as those that paid no fees to credit the assistance for having an extremely positive impact, as opposed to a generally positive impact, on their business performance."

The National Academy of Public Administration also studied the MEP program and in a 2004 report stated that while "on balance ... the MEP Program performs capably and effectively and that the core premise ... remains viable as it is fulfilling its mission by leveraging both public and private resources to assist the nation's small manufacturers," there should be consideration of a "fundamental change in the mix of the types of services it provides as well as the structures for delivering them."[7] As such, a Next Generation Strategic Plan was developed by the partnership to concentrate on not just the shop floor but on "the entire enterprise and its position in the marketplace." In addition to individual manufacturing firms, NIST concluded that MEP "must focus on industry/supply chain requirements as well as overall economic development trends."[8]

According to NIST, MEP centers have responded to approximately 400,000 requests for assistance since the program's inception.[9] Regular reporting is required of the centers, covering the number and type of projects undertaken. Centers also are mandated to collect information that may provide indicators of longer-term results, including changes in sales, financial investments, inventory reduction, savings in labor and materials, and jobs created or saved. In a survey of clients using the centers during FY2009, NIST found that companies reported "$3.6 billion in new sales, $1.1 billion in cost savings and the creation or retention of more than 52,000 jobs."[10]

Issues and Concerns

The Manufacturing Extension Partnership has, at times, been included in the discussion surrounding termination of government programs that provide direct federal support for industry. Questions have been raised as to the appropriateness of government funding for this program when the technologies are available in the marketplace. Instead of the government picking "winners and losers," opponents argue, the marketplace should make decisions regarding firms worthy of investment. However, proponents of the program stress that no direct funding is available to companies through MEP and that assistance is technical, scientific, and/or managerial. The centers facilitate the adoption of new technologies that foster competition and promote innovation.

Congress continues to explore the issue of manufacturing extension within the context of federal support for research and development. Until FY2004, despite some opposition to the Manufacturing Extension Partnership, there had been continued and generally increased funding

[7] National Academy of Public Administration, The Manufacturing Extension Partnership Program, Report 2, Alternative Business Models, May 2004, available at http://www.napawash.org/Pubs/NIST6-2-04.pdf.

[8] Manufacturing Extension Partnership, *Next Generation Strategic Plan*, available at http://www.mep.nist.gov/documents/pdf/about-mep/Next_Gen_MEP_Strategy.pdf.

[9] National Institute of Standards and Technology, *The Manufacturing Extension Partnership: Partnering for Manufacturing Innovation and Growth*, February 2010, available at http://www.nist.gov/mep/upload/new_partnering_impact_doc_feb_2010_8-5x11.pdf.

[10] Ibid.

for the program. The lower level of appropriations for FY1999 and FY2000 reflected a decrease in the federal portion of center financing as the programs surpass the original six-year funding limit, not declining congressional support for the activity. The ongoing involvement and financial backing of state and local organizations may indicate additional, widespread commitment to a program designed to expand private sector use of manufacturing technologies already funded by the government and developed by the agencies in response to their mission requirements. While the Bush Administration's budget proposals continued to call for substantial reductions in support for MEP, with the exception of FY2004, Congress had appropriated full funding for the centers program although in FY2008 support fell 14.4% from the previous fiscal year. The final FY2009 appropriations legislation provided a large increase in financing for manufacturing extension initiatives; the Consolidated Appropriations Act, 2010, again included a significant increase in support for MEP. A small increase in support was provided for FY2011.

The issue of the statutory six-year limitation on government financing of individual centers was addressed by the Technology Administration Act of 1998 (P.L. 105-309). Yet, questions still remain as to whether or not the centers should be required to be self-supporting, the federal contribution should remain at one-third of the operating costs, or federal funding should be increased to 50% as in the original legislation. Continued federal support, albeit on a reduced level, was considered necessary because the loss of federal funding would have required increases in service charges which, it was argued, would put use of the centers beyond the financial ability of many small companies. The requirement for companies to pay for services is important because, as GAO found in a 1995 study, firms that used internal funding to implement recommendations offered by extension programs were the most likely to find an overall positive impact on their manufacturing position.[11] According to a 1998 NIST sponsored study,

> Analysis indicates that to offset lost public revenue centers would need to take on much larger projects at much higher billing rates and focus on repeat business. As a result, many small manufacturers would not be able to afford these services. Given this conclusion, the best way to ensure high-caliber nationwide assistance to smaller manufacturers is to commit to a stable amount of renewable federal funding for those centers which receive successful evaluations.[12]

The financial support system created by Congress in the original legislation was based on matching financing between the federal government and state, local, and/or private non-profit entities. The Senate Committee report to accompany S. 907 (100th Congress) directed that "the percentage of funding offered by particular applicants be considered in deciding which applications be selected."[13] Cost-sharing strengthens the ties between the organizations involved in the cooperative arrangement and as such, the committee stated that "special attention will be given to innovative ways in which Federal laboratories, State agencies, and business and professional groups can work together."[14] In Senate hearings preceding the passage of the Omnibus Trade and Competitiveness Act, former Director of the National Bureau of Standards Ernest Ambler testified that it was critical that his organization work with state and local

[11] General Accounting Office, *Manufacturing Extension Programs, Manufactures' Views of Service*, GAO/GGD-95-216BR, August 1995, 2.

[12] E.S. Oldsman, G.M. Ugiansky, and R. Jamin, *Review of Mission and Operations of Regional Centers*, National Institute of Standards and Technology, Publication Citation, February 1, 1998, available at http://www.nist.gov/cgi-bin/view_pub.cgi?pub_id=200288&divison=260.

[13] *Technology Competitiveness Act of 1987*, 10.

[14] Ibid., 17.

government programs and "by working with them, and through them in some kind of cooperative way that we will be most effective."[15]

An issue currently under consideration is raising to 50% the federal contribution to the MEP program. Some commentators argue that in the current difficult economic situation, state and local financial support may be curtailed. At the same time, client fees for service decreased 13.4% between FY2008 and FY2009, the first significant decline since FY1996.[16] Advocates of increasing the federal share note that such action would not release state and local partners of their responsibility to support the centers, but would permit continued outreach to small manufacturers without pricing the services out of reach.

Opponents of this approach argue that the one-third federal contribution is sufficient and that the successful operation of the program is dependent on the financial participation of state and local government as well as the companies that utilize the partnership. The House Committee on Science report to accompany H.R. 1274 (which became P.L. 105-309) states: "The Committee notes that the 33⅓% cap on federal contributions to all centers which have exhausted their original 6-year life-cycles is a ceiling. The Committee supports efforts to make individual centers more self-sufficient and less reliant on federal funding whenever possible."[17] The matching provisions are seen as a means to ensure that the centers reflect the actual needs of the manufacturing companies in the area they serve.

These and other issues may be debated as Congress continues to make appropriation decisions relating to manufacturing extension as it pertains to the role of the federal government in facilitating research and technological advancement.

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[15] Senate Committee on Commerce, Science, and Space, Subcommittee on Science, Technology, and Space, *Department of Commerce Technology Programs Authorization*, Senate Hearings 100-146, March 17, 1987, 26.

[16] Slides provided by Roger D. Kilmer, Director, Hollings Manufacturing Extension Partnership, NIST, May 19, 2010.

[17] House Committee on Science, *National Institute of Standards and Technology Authorization Act of 1997*, H.Rept. 105-64 to accompany H.R. 1274, 15.