ANNEX 32

SCALE-UP POLICY:

Supplemental Information and References

Supplemental Information

Supply Network Intermediaries

Supply Network Intermediaries	Geographic Scale	Primary Funding Model	Organizational Examples
Industry Cluster Groups & Firm Networks	Regional/State/ City	Membership fees, Grants, Technical services (information)	American Chemical Society Entrepreneurial Resources Center™; LifeScience Alley (MN); Rochester Regional Photonics Cluster (NY), Arizona Optics Industry Association (AZ)
Virtual and Physical "Maker Spaces"	City and/or Metro area	Membership fees, Fee for service	Maker's Row (NY), SF Made (CA), ADX Portland (OR), TechShop (multi-site)
Manufacturing Extension Partnerships	State and region	Public appropriations, Grants, Fee for service	MAGNET: Northeast Ohio's MEP, Georgia MEP (GaMEP), NIST TDMI Program
Regional Stakeholder Partnerships	Regional/Metro (Multi-County)	Public/Private partnerships; Public grants	NorTech (OH); FuzeHub (NY); National Supply Chain Network Initiative with GlobalFoundries (NY)
Comprehensive Applied Research Organization	National and International	Contract fee for service and multi-year public sector grants	The Fraunhofer Institutes and Research Establishments (Germany); NNMI (US), Networks of Centres of Excellence Canada
Academic or University-based	Regional & State	State appropriations, federal grants, and private contracts	The Michigan State University Center for Regional Food Systems; Iowa State University Center for Industrial Research and Service; University of Michigan, The Institute for Research on Labor, Employment, and the Economy

Federal Financing Programs Relevant to Manufacturing Scale-Up

Peter Singer, MIT Washington Office, May 27, 2014

A number of federal programs that address aspects of the financing manufacturing production scale-up problem are discussed below. There is no single program that fully addresses the scale-up problem, but a patchwork of these programs could provide significant support. The majority of programs that are focused on small businesses do not provide financing for amounts above the $5 million range, which may raise questions about how advanced manufacturers fit in programs that are

classified as small business oriented, in comparison with the nation's other small businesses.

The Defense Production Act Title III Program

The DPA Title III Program focuses directly on the scale-up problem for defense manufacturers. The program uses the authorities granted in the Defense Production Act in a number of ways; the most relevant is through purchases, purchase commitments, purchase guarantees, or leases of advanced manufacturing equipment for installation in government or privately owned facilities. The DPA Title III Program currently funds or has funding planned for 56 projects, totaling just over $1 billion. The portfolio of projects is broken up into four sections, space industrial base council, electronic materials & devices, structural materials, and advanced technologies & systems. Projects typically last 3-6 years and funding ranges from 8 to 20 million dollars; cost sharing is typical. In the last ten years there have only been 3 projects over $50 million. The technologies the program funds are typically at TRL/MRL (technology/military readiness level) 7 or higher, the focus is on commercial-scale production. There are currently projects in some 17 states.[1]

Small Business Investment Company (SBIC) Program

One of three programs within the Small Business Administration that helps provide financing for manufacturers, the SBIC Program enables qualified private investment funds to use their capital plus borrowed funds, guaranteed by the SBA, to make investments in small businesses (with a tangible net worth of less than $18 million and an average of $6 million in net income over the previous. The average investments by SBICs range from $1 million to $10 million, with loans to manufacturers typically higher than other businesses.[2]

7(a) Loan Program

Also within the SBA, the 7(a) Loan Program provides loan guarantees for small business to obtain financing, with a maximum loan of $5 million. Minorities, women, or veterans, located in rural areas or special zones in need of economic development, own most businesses that benefit from this program. One third of the businesses that receive loans through the program are start-ups.[3]

Certified Development Company 504 Loan Program

Loans are made by Certified Development Companies (CDCs), which are nonprofit corporations certified and regulated by the SBA, and cam be used to purchased land, including existing buildings, purchase improvements, construct new facilities, and renovating or converting existing facilities. There are 270 CDCs, each covering a specific geographic area, across the United States. A bank partners with a CDC, with a bank covering 50% of project costs and the CDC covering up to 40%. For small manufacturers the maximum loan is $4 million and one job must be created or retained for every $100,000 guaranteed by the SBA (for other businesses the

[1] A list of current DPA Title III Program projects available here: http://www.dpatitle3.com/dpa_db/landing_search.php

[2] More information on the SBIC Program available here: http://www.sba.gov/category/lender-navigation/sba-loan-programs/sbic-program-0

[3] More information on the 7(a) Loan Program available here: http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/sba-loan-programs/7a-loan-program

maximum loan is $5 million and $65,000 for each job). Manufacturing SMEs could use the program for small plants and facilities or modernization of existing facilities. The caps on loan size for manufacturers limit its applicability to major production scale-up, but this could support smaller-scale efforts.[4]

DOE Loan Programs

The DOE Loan Programs provide loan guarantees to private clean energy companies to spur private investment. The program also provides direct loans to manufactures of advanced technology vehicles and components. Currently the Section 1703 Loan Program is accepting solicitations for its Advanced Fossil Energy Projects and the Advanced Technology Vehicles Manufacturing Loan Program is accepting solicitations. The 1703 program still has $1.5 billion in renewable energy funds. The 1705 program no longer has funding but the Loan Programs Office has around $2 billion in mixed-use authority and hundreds of millions in credit subsidy authority that could potentially be used for advanced electric grid technology and storage. The 1705 program while widely successful provided the loans to Solyndra and is unlikely to be restarted as a result. It does not appear that significant portions, if any, of the funds the DOE is looking to begin using will be available for advanced manufacturing with the current focus on energy generation projects.[5]

New Markets Tax Credit (NMTC) Program

The NMTC Program attracts investment capital to low-income communities by permitting individual and corporate investors to receive a tax credit against their Federal income tax return, 39% of the original investment over seven years for individual or corporate investors, in exchange for making equity investments in specialized financial institutions called Community Development Entities (CDEs). CDEs can be certified by the Community Development Financial Institutions Fund if they are a domestic corporation or partnership, primarily serve or provide investment capital for low income persons or communities, and if the low income community is represented on a governing or advisory board.

Since the NMTC Program's inception, the CDFI Fund has made 749 awards allocating a total of $36.5 billion in tax credit authority to CDEs through a competitive application process. The CDEs can make loans or equity investments in businesses, and in 2012 approximately 58% of NMTCs were used in this way, such as for small business lending or million dollar equity investments in neighborhood development projects.[6] Approximately 23% of NMTCs were used to support manufacturing.[7]

Small Business Lending Fund

Treasury invested $4 billion in the fund with 332 participating institutions to provide capital to community banks (with consolidated assets under $10 billion) and community development loan funds to encourage small business lending. Small

[4] More information on the 504 Loan Program available here: http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/sba-loan-programs/real-estate-and-eq

[5] More information on DOE Loan Programs available here: http://energy.gov/lpo/loan-programs-office

[6] More information on the New Markets Tax Credit Program available here: http://cdfifund.gov/what_we_do/programs_id.asp?programID=5

[7] New Market Tax Credit Coalition, *2014 Progress Report,* available at nmtccoaltion.org.

business lending fund banks reported at 48% median change over the base line to the commercial and industrial sector as compared to a 13% increase from their peer group and 2% increase in the comparison group. This program helps smaller banks lend to their communities, and could potential reinvigorate the community-banking sector, which was vital for manufacturers in the past.[8]

State Small Business Credit Initiative

The State Small Business Credit Initiative is a $1.5 billion initiative to strengthen state programs that support lending to small business and small manufacturers. States can use federal funds for their programs that leverage private lending. Programs and participation vary on a state by state, but include collateral support programs, capital access programs and loan guarantee programs. Between 2011 and 2012, states received between $13 and $168 million. About half of the companies that receive loans through SSBCI programs are less than 5 years old. The SSBCI Capital Access program in Minnesota, for example, provides portfolio insurance so banks, credit unions, and community development finance institutions will make loans that don't quite meet the lenders' underwriting standards; the maximum loan is $5 million. This program could be used by states to support advanced manufacturing facilities for smaller manufacturers. While the scale of lending would not support large scale-up production, it could be useful in niche production markets or for advanced equipment financing.[9]

Interviews, Focus Groups, Meetings and Roundtables

- AMP2.0 Georgia Tech Regional Meeting and Scale-Up Breakout Sessions February 2014. Inputs from 41 participants representing education (10/25%), large industry (9/22%), small industry (16/39%), government (4, 10%), and economic development (1, <1%)
- AMP2.0 University of Akron Regional Meeting: Scale-Up Expert Panel April 2014. Dr. Daniel E. Berry, CEO and President MAGNET. Dr. Al Green, CEO Kent Displays. Mr. Matthew Hlavin, CEO Thogus Products Companies. Dr. Brian K. Paul, Assistant Director of Technology and an Advanced Manufacturing National Fellow within the interagency Advanced Manufacturing National Program Office.
- AMP2.0 Financing Scale-Up Roundtable March 2014: Ted Acworth, Co-Chair of the Business Resources and Capital Working Group of the Massachusetts Advanced Manufacturing Collaborative (AMC); founder and CEO, Artaic; Linda Moulton, Co-Chair of the Business Resources and Capital Working Group of the Massachusetts Advanced Manufacturing Collaborative (AMC), CEO, Tru Corporation; Brian Clayton, Nortech, Cleveland, Ohio; Ethan Karp, Director, PRISM, MAGNET (Manufacturing Advocacy and Growth Network), Cleveland, Ohio; Rob Ginn, Georgia Tech MEP, Atlanta, Georgia; Andy Mason,

[8] More information on the Small Business Lending Fund available here: http://www.treasury.gov/resource-center/sb-programs/Pages/Small-Business-Lending-Fund.aspx

[9] More information on the State Small Business Credit initiative available here: http://www.treasury.gov/resource-center/sb-programs/Pages/ssbci.aspx

VRA Partners, Atlanta, Georgia; Tony Eisenberg, Arctaris, Detroit, Michigan. Federal Departments: Doug Devereux, NIST, MEP. Rajesh Mehta, NIST, SBIR program, advanced manufacturing portfolio

- AMP2.0 Corporate Partners Interviews March 2014: Ulf Lindqwister, Caterpillar. Sarah Peach, Siemens Technology to Business Berkeley. Christian Jepsen, Alcoa. Erin O'Driscoll, Dow Chemical Corporate Ventures. Kevin McElgunn, Dow Chemical Corporate Venture Capital
- AMP2.0 NMTC discussions May 2014: John May, Stern Brothers, 14 May 2014. Mark Riedy and Matt Ferguson, Kilpatrick Townsend, 19 May 2014
- AMP2.0 Massachusetts Institute of Technology Regional Meeting May 2014: Breakout session and panels on Biopharmaceuticals; Clean Energy, Digital Manufacturing, Aerospace and Defense, Biomedical Devices
- AMP2.0 Round-table organized by Art Ware of The New York Dormitory Authority on 4 June 2014 (out growth of Troy, NY Regional Meeting: Anthony Marshall and Doron Bar-Levav, Harris Beach. Robert James, Golden Holley James, LLP. Neil Faden and William Bernstein, Manatt, Phelpps & Phillips, LLP. George Cregg and A. Joseph Scott, Hodgson Russ. Carl Desenberg, Polsinelli
- AMP2.0 NIST and MEP Interviews Jan 2014-April 2014: Interviews with representatives from NIST, National MEP Program, TDMI Program, Tech Scouting Program, MAGNET (Ohio MEP Center), MMTC (Michigan MEP Center), Georgia Center for Innovation in Manufacturing
- AMP2.0 Printed Electronics Scale-Up Roundtable June 2014: Dr. Margaret Joyce – Director, Center for the Advancement of Printed Electronics at WMU. Jeff Banker – Entrepreneur in Residence, Western Michigan University. Mike O'Reilly – Director of Aerosol Jet Product Management, Optomec. Kira Barton – Assistant Professor of Mechanical Engineering, University of Michigan. Ken Church – CEO, nScrypt. Mark Gordon – Director of the Defense Program at the National Center for Advanced Technologies. Abhai Kumar – Senior Analyst, ANSER Innovation Analysis Division. Tim Fahey – Director of Cluster Acceleration, NorTech. Jeffrey M. Brancato – Vice President of Strategic Initiatives, NorTech. Constance J.S. Philips - Sr. Program Manager, National Center for Manufacturing Science. Mark Heise - Applications Engineer, **ArjoWiggins** Creative Papers. Carl Dekker – President, Met-L-Flo. James L. Zunino, U.S. Army RDE Command, RDAR-MEE-M, Picatinny Arsenal, NJ.

<u>AMP2.0 Web-based Survey Dec 2013-Feb 2014:</u>

A web-based survey instrument to understand barriers to scale-up and possible solutions was distributed to AMP2.0 Steering Committee organizations and to regional meeting participants at Georgia Tech and University of Akron. Five (5) responses represented Industry, Academia and Labor and included Dow Chemical Company, US Steelworkers, Georgia Institute of Technology, Georgia Tech MEP, and IAM Portable Trailer Group, Inc.

AMP2.0 Scale-Up Pilot May 2014-Aug 2014:

A research project to understand scale-up barriers using a specific SMM company and advanced manufacturing technology as an example. Project identified barriers to scale-up and developed frameworks to assist SMMs gather market and technical insight, and identify attractive opportunities to utilize and adopt advanced manufacturing technology. Project sponsored by Mac Arthur Corporation, University of Michigan College of Engineering, Technology Commercialization Assistance Program, the National Center for Manufacturing Sciences. Project team comprised of Tauber Institute for Global Operations students and faculty advisors and Mac Arthur Corporation management team: John Scrudato - JD/MBA Candidate Stephen M. Ross School of Business & The University of Michigan Law School, Satish Subramanian M.S.E. Candidate Industrial & Operations Engineering, Kira Barton – Assistant Professor, University of Michigan College of Engineering, Jeff Sinclair – Adjunct Professor University of Michigan Stephen M. Ross School of Business and the College of Engineering, Alan Woodliff - Adjunct Professor, University of Michigan College of Engineering and Ross School of Business, Christie Wong Barrett – CEO, Mac Arthur Corporation, Thomas F. Barrett – President, Mac Arthur Corporation.