

Request for Information: National Network for Manufacturing Innovation

Background

As part of the Colorado Blueprint for energizing the local economy and attracting new capital and jobs to the region, the Colorado Governor's Office of Economic Development and International Trade (OEDIT), is partnering with the Colorado Advanced Manufacturing Alliance (CAMA), regional research Universities, and other regional entities, to support and advance innovation in manufacturing. A key opportunity to advance this effort is to support the Federal government's National Network for Manufacturing Innovation (NNMI, Network) program, which is looking to co-invest in approximately 15 new institutes around the country that support innovation in manufacturing. The program is hosted by the National Institutes for Standards and Technology's (NIST's) Advanced Manufacturing National Program Office (AMNPO). One of these institutes has already been awarded to support the advancement of additive manufacturing (i.e., 3 dimensional printing). The purpose of these institutes is, according to NIST, "to improve the U.S. manufacturing sector's competitiveness and innovation performance, focusing on the scale-up of new product and process technologies." Currently, NIST, as well as the Department of Energy (DOE), are seeking input regarding the technology-focus areas and potential structure for future institutes. OEDIT is requesting your support in responding to this request for information (RFI) as a manufacturing stakeholder in the Rockies region. Attached you will find instructions, as well as a template to respond to the NNMI. We politely ask that you complete the template and **submit it no later than October 25, 2012 to the following email address: nnmi_comments@nist.gov**. For more information regarding the NNMI, please visit: <http://www.manufacturing.gov/nnmi.html>

Regional Strengths and Opportunities for Improvement

Below you will find the results of a brief survey conducted by OEDIT and CAMA, primarily consisting of open ended questions², to gather high-level consensus basic information regarding manufacturing strengths and weaknesses in the Rocky Mountain region. To protect respondents and support candid commentary, the survey was administered anonymously to manufacturing industry leaders, engineers, and researchers. These results are being provided for your information only.

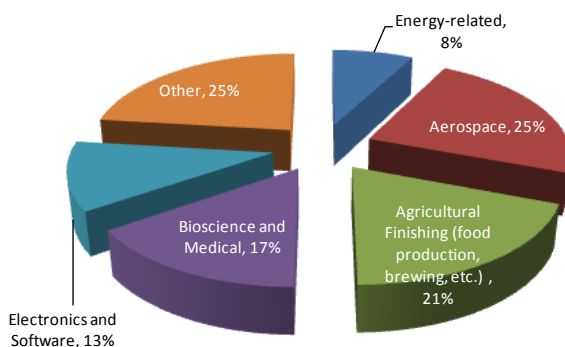
Why do we need your help?

OEDIT is requesting your support in responding to a request for information (RFI) as a representative of a manufacturing stakeholder in the Rockies region. We politely ask that you complete the template and submit it to NIST no later than October 25, 2012: nnmi_comments@nist.gov

What is advanced manufacturing?

"... the rapid transfer of science and technology into manufacturing products and processes."¹

What do you feel are the major manufacturing industries in Colorado and surrounding regions?



What do you feel needs to change to support a stronger manufacturing environment in the region?

Opportunities for technical, vocational, and apprenticeship training	31%
Connectivity between programs and industry	25%
Cost structures for raw materials	13%
Lack of existing skilled manufacturing base	13%
Lack of access to capital to help manufacturers advance	13%
Culture and attitude towards manufacturing as a career	6%

What do you feel are some of the region's strengths in terms of manufacturing technologies?

Advanced materials (composites, semiconductors, polymers, etc.)	23%
Rapid Prototyping, Design Engineering and Process Development	18%
Robotics	14%
Additive Manufacturing	14%
Nanotechnology related	9%
Other	23%



¹ Presidents Council of Advisors on Science and Technology (PCAST), April 2010

² Note, the survey conducted was not scientific and was only for informational purposes only.

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https://www.federalregister.gov/articles/2012/05/04/2012-10809/request-for-information-on-proposed-new-program-national-network-for-manufacturing-innovation-nnmi#table_of_contents

Technologies With Broad Impact

1. *What criteria should be used to select technology focus areas?*
2. *What technology focus areas that meet these criteria would you be willing to co-invest in?*
3. *What measures could demonstrate that Institute technology activities assist U.S. manufacturing?*
4. *What measures could assess the performance and impact of Institutes?*

Institute Structure and Governance

5. *What business models would be effective for the Institutes to manage business decisions?*
6. *What governance models would be effective for the Institutes to manage governance decisions?*
7. *What membership and participation structure would be effective for the Institutes, such as financial and intellectual property obligations, access and licensing?*
8. *How should a network of Institutes optimally operate?*
9. *What measures could assess effectiveness of Network structure and governance?*

Strategies for Sustainable Institute Operations

10. *How should initial funding co-investments of the Federal government and others be organized by types and proportions*
11. *What arrangements for co-investment proportions and types could help an Institute become self-sustaining?*
12. *What measures could assess progress of an Institute towards being self-sustaining?*
13. *What actions or conditions could improve how Institute operations support domestic manufacturing facilities while maintaining consistency with our international obligations?*
14. *How should Institutes engage other manufacturing related programs and networks?*
15. *How should Institutes interact with state and local economic development authorities?*
16. *What measures could assess Institute contributions to long term national security and competitiveness?*

Education and Workforce Development

17. *How could Institutes support advanced manufacturing workforce development at all educational levels?*
 - a. *Institutes would serve as the catalyst that bring together and facilitate partnerships between education, workforce centers, economic development and manufacturing employers to ensure effective communication among the partners. By engaging manufacturers and partners in the development of Manufacturing Career Pathways that cross all levels of education and incorporate work experience and work place learning, the results would be programs and services that continually evolve to meet the current and emerging needs of the industry.*
 - b. *To work with regional Sectors Partnerships to ensure that local teams of economic development, education and workforce development representatives work seamlessly with manufacturers that are looking to expand, retain existing employees through training programs or seek assistance with new hire screening, evaluation and testing of potential candidates for employment. As a result, the team serves as liaisons between the employers and the main offices at their respective organizations, and example would be in higher education where emerging trends in new materials or manufacturing process can be relayed or translated into adjustment to curriculum in degree programs that provide graduates better prepared to enter the workforce.*

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- c. Utilization of Colorado’s Career Pathways System to increase awareness of manufacturing careers to educate and inform youth and adults about careers in manufacturing and the skills required to qualify for them.*
- d. Provide connections to manufacturers willing to support work place learning such as field trips, career shadowing, internships, apprenticeships, on-the-job training, etc.*

18. *How could Institutes ensure that advanced manufacturing workforce development activities address industry needs?*

- a. Colorado’s Sector’s strategies ensure workforce activities address industry needs. Colorado has three existing regional manufacturing sector partnerships that represent manufacturing employers, education, economic development and workforce partners who are focused on workforce needs of their industry within a regional labor market. Through a Sectors Summit in January 2013 new sectors partnerships will launch. By engaging with existing and new sectors partnerships the Institutes could build upon them to ensure alignment between industry needs and workforce development activities. Institutes can provide the overarching framework to link the regional Sector Partnerships together and to ensure that industry needs are being met.*
- b. As mentioned above, alignment and collaboration of public and private partners is key to workforce and education systems (supply) meeting the needs of industry (demand). Sectors Partnerships led by industry are serving as the primary mechanism for communication between education, workforce centers, economic development and industry partner at the regional level. The Institutes could serve as a central hub or informal repository of feedback and information regarding the knowledge, skills, and abilities needed for the manufacturing technologies.*
- c. Create a “Pull Concept” from the manufacturers vs. a “Push Concept” from education: By getting manufacturing employers more engaged at strategic levels throughout the educational pipeline, we can create a stronger sense of career awareness, program content, emerging needs, both technical and occupational and other key elements that will lead to employers potentially providing incentives such as scholarships, internships, and to some degree employment opportunities upon graduation. In other words, employers help shape and guide students through the educational process with the intent to hire them, essentially investing in their future workforce. The existing “Push Concept” in education is often referred to as the “Train and Pray” approach, education believes their job is to train people and then pray they find a job and meet the needs of their future employer. This methodology must evolve if we hope to create a more robust and better prepared workforce of the future.*

19. *How could Institutes and the NNMI leverage and complement other education and workforce development programs?*

- a. Current avenues for private/public led workforce and education program development:
 - i. The Colorado Workforce Development Council Strategic Priorities:
 - 1. Integration of OEDIT’s Key Industries Initiative with State Sectors Strategies*
 - 2. Implementation of workforce and education goals through Career Pathways*
 - 3. Regional implementation through multiple regional manufacturing sectors partnerships*
 - 4. Increased workplace learning opportunities including career awareness, internships, apprenticeships and on-the-job training.**
 - ii. Statewide Sectors Strategies, OEDIT’s Key Industry Initiative, Colorado Community College System business advisory boards, National accreditation process, Career and Technical Education advisory boards, Economic & Workforce Development Divisions at several of Colorado’s Community Colleges, and CDLE’s Workforce Development Programs, local Workforce Investment Boards and Workforce Centers Business Services Teams**
- b. Sectors strategies could help by aligning around specific industry needs within a regional labor market. This ensures streamlined communication and prevents duplicative education and workforce programs. Regional alignment through Sectors strategies aims to fill skills gaps by working inside a regional economy in order to address the specific needs in that area. This strategy uses labor market information to stay informed of changing demands, and due to the close partnerships and consistent communication, education partners are kept informed of these changes in order to meet the demands of industry. Alignment, coordination, communication and collaboration through sectors strategies are the best way to leverage and complement efforts by public and private partners.*
- c. Utilize the outcomes from the Colorado Office of Economic Development and International Trade’s (OEDIT) Key Industry Initiative, which serves as a mechanism to listen, collect, and analyze current industry needs as they pertain to workforce, education and training. Following analysis, public and*

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private partners within education, workforce and economic development have the opportunity to work together to match systems (supply and demand) in order to leverage resources and complement effort while working towards statewide economic vitality. As a statewide initiative, the Key Industry Initiative provides the opportunity for a series of partnerships to come together and align around the demands of industry.

- d. Colorado currently has Career Clusters (CTE) and Career Pathways plans, a broad partnership of state and local partners are working to develop a Colorado Career Pathways Model to increase our systems ability to meet employer's needs through a better match of supply and demand.
 - e. Work with Sectors Partnerships to ensure that Local Workforce Investment Boards, Career and Technical Education Advisory Boards, the Colorado Community College System business advisory boards as well as with regional manufacturing groups/forums to ensure industry needs are properly conveyed to the supply side partners.
 - f. To maximize the federal and private investment, the institutes could have, satellites as part of their regional system. The satellites would essentially be smaller institutes that serve a regional manufacturing market. By co-locating the smaller institutes with existing technology based organizations such as universities, colleges and privately operated centers of excellence, we can look to have a stronger presence locally with access to space, equipment, processes that could be hosted at the smaller sites.
 - g. Use the Institutes to access value-added assets in-use currently, look to connect training and education resource needs with providers. Example: One community college in Colorado has a fleet of (7) mobile learning labs that are self-contained learning environments that serve to train technicians in electrical, mechanical, manufacturing and welding technologies through the use of hands-on industrial grade equipment. The mobile learning labs can be pulled to an employer's location, setup, classes taught and upon completion pulled to the next training site. The Institute's Economic along with Sectors Partnerships could look to add more capacity and capability that would service the entire institutes region.
 - h. Institutes, as the Subject Matter Experts (SMEs) about very specific technologies, have the opportunity to work with education, training and workforce program partners through close partnership with the Colorado Workforce Development Council (CWDC). The CWDC serves as the convener for statewide alignment among these agencies and works to see that every Colorado business has access to a skilled workforce and that every Coloradoan has access to meaningful education and training programs and careers resulting in statewide economic vitality.
20. What measures could assess Institute performance and impact on education and workforce development?
- a. Critical indices could include:
 - i. Number of people trained
 - ii. Number of manufacturers served with services or programs
 - iii. Number of trainee's placed in manufacturing careers
 - iv. Number of trainees who retained employment or where promoted as a result of training.
 - v. New companies locating to the area or expanding with education and workforce components serving as a vital part of the decision process
 - vi. Total number of people employed in manufacturing in a region associated to the institute or one of its smaller institute sites
 - vii. Changes or enhancements in regional educational program curricula or training programs as a result of information passed through the institute (may be a bit hard to track accurately)
21. How might institutes integrate R&D activities and education to best prepare the current and future workforce
- a. By co-locating institutes and satellites of smaller institutes with existing research and development facilities such as federal labs, universities, colleges, and private centers of excellence, we would envision the institute having an R&D liaison office that is responsible for making connections between employers, education and federal agencies. The connection provides manufacturers with access to research through effective and appropriate means for potential commercialization of new innovations, all while providing existing and future employees opportunities to work with materials, processes and innovations they may be involved with on the job. .
 - b. The best way to prepare the current and future workforce is to ensure students and job seekers are equipped (educated and trained) to meet the demands of industry. This is best done through Sectors strategies (alignment, collaboration, communication and coordination among public and private partners in workforce, education and economic development around a single critical industry). Sector strategies integrate supply-side strategies such as career pathway programs with demand side

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strategies such as local industry initiatives in order to prepare the workforce, grow an industry and become economically vital.