Obama administration launches competition for three new manufacturing innovation institutes

http://manufacturing.gov

The Obama administration announced in May that it is launching competitions to create three new manufacturing innovation institutes with a Federal commitment of $200 million across five federal agencies—Defense, Energy, Commerce, NASA, and the National Science Foundation. To build off the initial success of a pilot institute headquartered in Youngstown, Ohio, the President announced in the State of the Union address in February that his administration would move forward and launch three new manufacturing innovation institutes this year. The President will continue to call on Congress to act on his proposal to create a network of manufacturing innovation institutes across the country.


Credit: Pete Souza

The President's manufacturing agenda starts with his vision for a National Network for Manufacturing Innovation (NNMI). The President's FY14 Budget includes a $1 billion investment at the Department of Commerce to create the NNMI, a model based on approaches that other countries have successfully deployed. Each institute would serve as a regional hub designed to bridge the gap between basic research and product development, bringing together companies, universities and community colleges, and federal agencies to co-invest in technology areas that encourage investment and production in the United States. This type of innovation infrastructure provides a "teaching factory" that allows for education and training of students and workers at all levels, while providing the shared assets to help companies, most importantly small manufacturers, access the cutting-edge capabilities and equipment to design, test, and pilot new products and manufacturing processes.

The technology areas for the new institutes were selected based on their broad commercial applications while meeting critical mission needs determined by the administration. The selected technology areas also build off existing multi-agency priority initiatives like the Materials Genome Initiative.

The Department of Defense will lead two of the new institutes, focused on "Digital Manufacturing and Design Innovation" and "Lightweight and Modern Metals Manufacturing," and the Department of Energy will be leading one new institute on "Clean Energy Manufacturing Innovation."

All three institutes will be selected through an open, competitive process, led by the Departments of Energy and Defense, with review from a multi-agency team of technical experts.

The pilot institute established in Ohio, and which remains in operation, focuses on three-dimensional printing—referred to as additive manufacturing—that will have implications in a wide range of industries including defense, aerospace, automotive, and metals manufacturing. The Department of Defense envisions customizing parts on site for operational systems that would otherwise be expensive to make or ship. The Department of Energy anticipates that additive processes would be able to save more than 50% energy use compared to current manufacturing processes.

Open access to research publications reaching "tipping point"

www.science-metrix.com/pdf/SM_EC_OA_Availability_2004-2011.pdf
www.science-metrix.com/pdf/SM_EC_OA_Policies.pdf
www.science-metrix.com/pdf/SM_EC_OA_Data.pdf

The global shift toward making research findings available free of charge for readers—so-called "open access"—was confirmed today in a study funded by the European Commission (EC). This new research suggests that open access is reaching the tipping point, with around 50% of scientific papers published in 2011 now available for free. This is about twice the level estimated in previous studies, explained by a refined methodology and a wider definition of open access. The study also estimates that more than 40% of scientific peer-reviewed articles published worldwide between 2004 and 2011 are now available online in open access form. The study looks at the European Union (EU) and some neighboring countries, as well as Brazil, Canada, Japan, and the United States.

Máire Geoghegan-Quinn, European Commissioner for Research, Innovation and Science, said, "These findings underline that open access is here to stay. Putting research results in the public sphere makes science better and strengthens our knowledge-based economy."

The study looked at the availability of scholarly publications in 22 fields. Free availability of the majority of ar-

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ticles has been reached in the fields of general science and technology, biomedical research, biology, and mathematics and statistics. The fields where open access availability is most limited are the social sciences and humanities and applied sciences, engineering, and technology.

A recent European Commission Communication identified open access as a core means to improve knowledge circulation and thus innovation in Europe. Therefore, open access will be mandatory for all scientific publications produced with funding from Horizon 2020, the EU's Research & Innovation funding program for 2014–2020. The Communication recommended that Member States take a similar approach to the Commission in their domestic programs.

The study was undertaken by Science-Metrix, a research evaluation consultancy. The study included the 28 EU Member States, as well as Switzerland, Lichtenstein, Iceland, Norway, Turkey, The Former Yugoslav Republic of Macedonia, Israel, Brazil, Canada, Japan, and the United States. Two other reports by the same group were also released in the summer, examining open access policies and the issue of open access to data.

Concerning open access policies, the report found that the majority of 48 major science funders considered both key forms of open access acceptable: open access publications in journals and self-archiving. More than 75% accepted embargo periods of between six and 12 months.

The third study found however that currently fewer policies are in place for open access to scientific data than for open access to publications. Open access to research data is rapidly evolving in an environment where citizens, institutions, governments, non-profit and private companies loosely cooperate to develop infrastructure, standards, protocols, and business models. Under Horizon 2020, the Commission will start a pilot on open access to data collected during publicly funded research, taking into account legitimate concerns related to the grantee's commercial interests, privacy, and security.

The Commission will make open access to scientific publications a general principle of Horizon 2020. As of 2014, all articles produced with funding from Horizon 2020 will have to be accessible as follows:

- articles will either immediately be made accessible online by the publisher—up-front publication costs can be eligible for reimbursement by the EC; or
- researchers will make their articles available through an open access repository no later than six months (12 months for articles in the fields of social sciences and humanities) after publication.

NSF releases study on regional concentration of scientists and engineers

www.nsf.gov/statistics

According to a recently published report by the National Science Foundation (NSF), science and engineering (S&E) employment in the United States is geographically concentrated in a small number of states. Furthermore, several major metropolitan areas within these states account for the highest S&E employment.

California, Texas, and New York together accounted for more than one-fourth of all S&E employment. The states of Florida, Virginia, Pennsylvania, Illinois, Massachusetts, and Ohio accounted for almost another one-fourth. In the physical sciences, high levels of employment were found in areas in the vicinity of Los Angeles, San Diego, Santa Clara, and Oakland, all in California, as well as in Denver, Boston, Houston, and Montgomery County, Md.

According to NSF, S&E expertise is an integral part of a region's capacity to innovate because of the scientists' and engineers' high skill levels, creative ideas, and contributions to scientific knowledge and to research and development.

The data are from the US Census Bureau's 2011 American Community Survey (ACS). Out of the 5.7 million workers employed in S&E, about 368,000 reported being in the physical sciences. □

TABLE. Employment in science and engineering occupations, by PUMA: 2011[a]

S&E occupation and general geographic location	S&E employment		S&E employment in geographic area	
	Number	Standard error	Percent	Standard error
Physical sciences				
United States	368,304	9,656	100.0	-
Los Angeles, CA	9,306	1,535	2.5	0.41
Denver, CO	9,093	1,516	2.5	0.41
Boston, MA[b]	7,992	1,369	2.2	0.38
Houston, TX	7,874	1,411	2.1	0.38
San Diego, CA	7,330	1,361	2.0	0.37
Santa Clara, CA	6,942	1,324	1.9	0.37
Oakland, CA	6,518	1,283	1.8	0.37
Montgomery County, MD	6,238	1,253	1.7	0.37

PUMA = public use microdata area; S&E = science and engineering.

[a]Table selection extracted from Table 2 in the NSF Information Brief, "Regional Concentrations of Scientists and Engineers in the United States," NSF 13-330, August 2013.

[b]In Massachusetts, employment PUMA 3200 covers part of Middlesex County and employment PUMA 3300 covers part of Suffolk County.

SOURCE: Census Bureau, American Community Survey public use microdata sample files, 2011.

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