

Watch How We Change Minds About Manufacturing

written by admin | March 8, 2016

The National Association of Manufacturers is on the move. Last month, we concluded our 2016 State of Manufacturing Tour, and now we want to give you the chance to see what we saw and get a glimpse of the innovation revolution happening across America. Start with a look at our recap video:



Then, check out these great photos in our gallery here.

Finally, if you haven't already, learn about some really cool companies from the multimedia tour recaps posted on our recently redesigned blog, Shopfloor.org, where you can also follow the latest policy developments in manufacturing.

IMC Named 2015 Top 100 Organization

written by Lauri Moon | March 8, 2016



Every year, the Pennsylvania Business Central selects and profiles the Top 100 Organizations in their 23-county readership.

IMC had the honor of being selected as one of those organizations for 2015

Since 1988, IMC, a private-public partnership, has been helping Central Pennsylvania manufacturers tap into the most effective regional, state and national resources to innovate, grow and prosper. Through a dedicated staff that provides objective, expert advice and actionable solutions, IMC has collaborated on more than 3,000 projects with over 600 Central Pennsylvania manufacturers and entrepreneurs to help them become more innovative, productive and profitable. As a result, manufacturers have reported over \$640 million in impact, including new and retained sales and cost savings as well as reported 4,400 jobs created or retained. IMC also coordinates activities for the Williamsport-Lycoming Keystone Innovation Zone, which works with entrepreneurs and start-up businesses interested in developing new products or technologies, inventions or innovative ideas and also includes the Williamsport Inventor's Club, which is a forum to help inventors turn their ideas into commercially viable products. IMC offers various forums for manufacturers to learn and share best practices through Executive Forums, the Manufacturing Applications Knowledge Exchange (MAKE) and Lean Users Groups. IMC is supported through the U.S. Department of Commerce, NIST Manufacturing Extension Partnership (MEP) program and the Pennsylvania Department of Community and Economic Development, Partnerships for Regional Economic Performance (PREP) program.

Congratulations to these Manufacturers and Partners that were also selected:

- Huntingdon Fiberglass Products
 - North Central Sight Services
- Concurrent Technologies Corp
 - Curry Supply
- American Eagle Paper Mills
 - Restek
- Nittany Paper Mills
- Wood-Mode Fine Custom Cabinetry
 - Videon Central
 - DelGrosso Foods
 - Penn College
 - NPC
 - SpectraWood
 - SEDA-COG

Governor's Award for Safety Excellence

written by admin | March 8, 2016

It's Time To Apply for the 2016 Governor's Award for Safety Excellence

If you're proud of your safety and prevention program for its impact on reducing employee injuries, financial and other achievements, why not apply for the Governor's Award for Safety Excellence? The purpose of the award is to recognize outstanding prevention programs and the superior efforts that make these programs so successful. Companies can nominate themselves or be nominated by a third party.

For more information and to download the nomination form:

[Click Here](#)

ALL APPLICATIONS MUST BE SUBMITTED BY JUNE 1, 2016 TO:

Margaret (Peggy) Day
Program Coordinator
Bureau of Workers' Compensation
Health and Safety Division
1171 South Cameron Street
Harrisburg, PA 17104

For additional information or assistance call (717) 772-1917 or email marday@pa.gov

Manufacturers Unsure About Cybersecurity and R&D Tax Credits for Internet of Things Investments

written by admin | March 8, 2016

The MPI Internet of Things Study indicates manufacturers are unsure or not confident in their ability to prevent a cybersecurity breach at their company, and are not planning to take tax credits available for IoT investments.

(SupplyChain 24/7 - 24/7 Staff: 2-22-16) While roughly two-thirds of manufacturers believe that the Internet of Things (IoT) will increase their profitability, they are lagging in two critical areas to maximize their IoT opportunities: cybersecurity and research and development (R&D) credits.

These are among the findings from the MPI Internet of Things Study, sponsored by U.S. professional services firm BDO.

The study revealed that nearly half of manufacturers (49 percent) are unsure or not confident in their ability to prevent a cybersecurity breach at their company.

Only 8 percent of manufacturers report they are very confident in their current cybersecurity protections to prevent an IT breach.

Security challenges are becoming more prevalent across all industries, but particularly for manufacturers who are pushing full steam ahead to upgrade their production processes and evolve their products. Last year, the BDO Manufacturing RiskFactor Report found that 86 percent of manufacturers cited risks related to data security in 2015, up from 78 percent in 2014.

Despite those risks, nearly half of manufacturers (45 percent) do not have or are unsure if they have an information security policy in place addressing Internet connected devices that are not used as a computing or communications platform. Moreover, 44 percent do not have or are unaware as to whether or not they have the ability to detect and identify unauthorized Internet connected devices.

“The ability to detect and manage a data breach is critical for manufacturers in order to protect their IP, as well as their employees’ and customers’ privacy,” said Shahryar Shaghghi, National Leader, Technology Advisory Services for BDO.

“As manufacturers move to a more connected way of doing business, they need to be mindful that with more access points come more opportunities for hackers to infiltrate the network, making it imperative that companies embed security into IoT products and services from design through distribution, assessing risks and considering the exploitability of cybersecurity vulnerabilities in all products is vital.”

The survey also highlighted underused research and development tax credits. A vast majority of manufacturers (84%) are not planning to take advantage of tax credits and incentives, like the R&D tax credit, available for IoT investments.

“Manufacturers agree that IoT is a groundbreaking opportunity for advancement in the manufacturing industry, and can leverage the R&D tax credit to save more than 15% of eligible qualified spending as they attempt to develop or improve software or sensors or other IoT components,” said Rick Schreiber, partner and national leader of BDO’s manufacturing and distribution practice.

“They have some catching up to do in order to fully capitalize on IoT’s potential. Shoring up security in the wake of newly connected systems and products and taking advantage of the newly permanent R&D credit are critical steps.”

Just 17 percent of manufacturers said they were planning to claim tax credits and incentives for their IoT investments. For those manufacturers not planning to claim credits and incentives for IoT investments, concern about the associated costs is identified by only 11 percent of respondents, while nearly half (45 percent) of manufacturers say the reason for not claiming the credits is based on a lack of documentation.

“Manufacturers that attempt to develop or improve software or sensors or other IoT components can leverage the R&D tax credit, which can equal more than 15 percent of eligible qualified spending,” says Chris Bard, tax partner and R&D practice leader at BDO. “And although documentation is useful to support these credits, courts have ruled repeatedly that oral testimony can be used to support them as well.”

Smaller manufacturers also stand to benefit. For taxable years beginning after 2015, smaller companies may now claim credits against their alternative minimum tax and up to \$250,000 of their payroll taxes. “This greatly expands the range of the credit’s benefit,” Bard says.

“Now start-up companies and others, who in the past couldn’t use the credit because it could be used only against regular income tax liability, can benefit from it.”

The MPI Internet of Things Study, sponsored by BDO, evaluated the readiness of U.S. manufacturers to incorporate smart devices and embedded intelligence within their plants and into their companies’ products.

The study was conducted by The MPI Group and sponsored by BDO. In August and September 2015, 350 manufacturers participated in the study.

Why Mercedes is Halting Robots’ Reign on the Production Line

written by admin | March 8, 2016

Robots can’t deal with the degree of individualization and the many variants that we have today ... we’re saving money and safeguarding our future by employing more people.

(IW - Bloomberg: 2-25-16) Mercedes-Benz offers the S-Class sedan with a growing array of options such as carbon-fiber trim, heated and cooled cup holders and four types of caps for the tire valves, and the carmaker’s robots can’t keep up.

With customization key to wooing modern consumers, the flexibility and dexterity of human workers is reclaiming space on Mercedes’s assembly lines. That bucks a trend that has given machines the upper hand over manpower since legendary U.S. railroad worker John Henry died trying to best a motorized hammer more than a

century ago.

“Robots can’t deal with the degree of individualization and the many variants that we have today,” Markus Schaefer, the automaker’s head of production, said at its factory in Sindelfingen, the anchor of the Daimler AG unit’s global manufacturing network. “We’re saving money and safeguarding our future by employing more people.”

Mercedes’s Sindelfingen plant, the manufacturer’s biggest, is an unlikely place to question the benefits of automation. While the factory makes elite models such as the GT sports car and the ultra-luxury S-Class Maybach sedan, the 101-year-old site is far from a boutique assembly shop. The complex processes 1,500 tons of steel a day and churns out more than 400,000 vehicles a year.

That makes efficient, streamlined production as important at Sindelfingen as at any other automotive plant. But the age of individualization is forcing changes to the manufacturing methods that made cars and other goods accessible to the masses. The impetus for the shift is versatility. While robots are good at reliably and repeatedly performing defined tasks, they’re not good at adapting. That’s increasingly in demand amid a broader offering of models, each with more and more features.

“The variety is too much to take on for the machines,” said Schaefer, who’s pushing to reduce the hours needed to produce a car to 30 from 61 in 2005. “They can’t work with all the different options and keep pace with changes.”

With manufacturing focused around a skilled crew of workers, Mercedes can shift a production line in a weekend instead of the weeks needed in the past to reprogram robots and shift assembly patterns, Schaefer said. During that downtime, production would be at a standstill.

‘Robot Farming’

The revamped Mercedes E-Class, which goes on sale in March, is an example of cutting back on machines. To align the car’s head-up display, which projects speed and navigation instructions onto the windshield, the carmaker will replace two

permanently installed robots with either one movable, lightweight machine or a worker.

While robots won't completely disappear, they'll increasingly be smaller and more flexible and operate in conjunction with human workers rather than set off behind safety fences. Mercedes calls equipping workers with an array of little machines "robot farming." About 1.3 million industrial robots will go into operation in the next two years, the International Federation of Robotics said in a study published on February 25.

The world's second-largest maker of luxury cars isn't doing this in isolation. BMW AG and Volkswagen AG's Audi are also testing lightweight, sensor-equipped robots safe enough to work alongside people. The edge they're seeking is to be better and faster than rivals as the pace of change affecting the auto industry quickens. Cars are increasingly morphing into smartphones on wheels, and manufacturers are under pressure to upgrade their models more frequently than the traditional seven-year cycle.

More Than Black

Automakers also need to cater to consumers demanding to be different. For Mercedes, that means adding 30 models by the end of the decade, including 10 all-new styles, and offering custom options such as bamboo trim, interior fragrances and illuminating the Mercedes star. That's a stark contrast to the days when mass-production pioneer Henry Ford quipped that customers could have any color they wanted as long as it was black.

"We're moving away from trying to maximize automation with people taking a bigger part in industrial processes again," said Schaefer. "We need to be flexible."

Workers are the Biggest Asset in the Evolving Manufacturing Industry

written by admin | March 8, 2016

It's not your granddad's factory job anymore.

(Fortune - Ed Frauenheim: 2-16-16) The instruction manual for a typical CNC mill - the modern equivalent of a lathe that chisels parts from hunks of metal - is 200 pages long. The machine requires one to two years of training to operate, and those qualified to run it earn wages comparable to teachers or many others with bachelor's degrees. Manufacturing has changed. The shop floors of most American industrial facilities would be unrecognizable to someone working in them only a generation ago. So have many of their jobs, pushing companies to retool their relationships with employees as they compete for a shrinking pool of skilled workers.

"Manufacturing companies clearly understand now that, in order to be exceptional and successful, it's not just about hiring hands. It's about hiring and engaging heads and hearts," says Anil Saxena, Partner at Great Place to Work and an expert on workplace culture.

That's certainly the case at the Best Workplaces in Manufacturing and Production, announced today by Fortune and Great Place to Work. These organizations stand apart not only for the level of trust their employees express in anonymous surveys, but also for defying outdated perceptions of working in these industries.

Take job security: 92 percent of employees at companies on the list say their leaders would lay people off only as a last resort. That's even better than the response from people at companies on the broader ranking of the [Fortune 100 Best Companies to Work For](#), which includes organizations in healthcare and technology experiencing much faster growth. Although the recent crash in oil prices will no-doubt affect energy companies on the manufacturing list, their employees can at least face 2016 with confidence that their organizations will handle the turmoil in good faith.

People at the best employers in manufacturing and production also feel they get a fair shake during positive economic cycles, with an average of 82 percent saying they receive a fair share of profits. This is helped by innovative compensation programs like Hilcorp's practice of letting employees invest in - and collect returns from - specific company projects. The share-of-profits survey question also reveals another surprising area where companies on the manufacturing list collectively outperform their peers among the broader Fortune 100 Best Companies to Work For.

Retaining Talent

It's not just generosity behind these organizations' drive to create a happy workforce. The job skills crucial to a 21st century manufacturing environment give the people who possess them leverage to expect more from employers.

"It is a small number of folks who run machines that do a lot," says Saxena. "It's not a sweat shop. Modern factories are marvels of engineering."

Among the leading manufacturing employers, the share of team members categorized as production workers punching a clock for hourly pay has decreased by more than 20 percentage points since 2006 to just 26 percent of the workforce. At the same time, salaried professional and technical positions now make up the largest share of jobs, with 34 percent of the positions at companies on the list in 2016.

Some of this change might be explained by the breadth of these companies' business interests, particularly at organizations with diverse divisions like J.M. Family Enterprises, which distributes auto parts, runs a Lexus dealership and offers finance and insurance products for the automotive industry. Regardless, the highly skilled workforce that forms the backbone of today's industrial sector brings a different set of expectations than the archetypal factory worker of days past. Notes Saxena: "This whole notion of 'the whistle blows and I'm out of here,' and that 'the job is just a place I where spend eight hours' - that's just not accurate anymore."

High engagement, low turnover

In fact, pride and a sense of purpose represent further areas where the best

manufacturing and production employers outshine their peers. Ninety-three percent of employees among these companies say they're proud of what they accomplish on the job, and 94 percent say they feel good about the ways they contribute to the community.

Field Fastener, for example, engages its people through a program that helps employees at any level of the organization suggest improvements that have saved the company more than \$1 million in just two years. Likewise, medical device company Stryker connects team members to the organization's mission through a program that helps people of all job descriptions interact with patients and clinicians using their products. Stryker also takes steps to help employees develop what it describes as "best friends at work" to enhance the social and professional ties that create a trusting workplace.

"They care enough to want people to have somebody closely aligned to them who they work with," says Saxena. "It's not necessarily what you'd think of when you think manufacturing."

As a result of this employee-focused approach, companies that made the list have an average turnover rate of just 7.2 percent, much lower than the national industry average of 13 percent reported by the Bureau of Labor Statistics.

Skills Shortage

Keeping that turnover low will offer a real advantage to these companies in the years ahead. As the president of the National Association of Manufacturers recently pointed out, the sector is expected to create 3.5 million new jobs in the next decade, but a lack of skilled workers is likely to leave 2 million of them unfilled. On top of the skills deficit, the industry also faces the challenges an aging U.S. workforce and rising labor costs in Asia that make it easier to "insource" many of the jobs that left the U.S. in decades past.

In this context, the Best Workplaces in Manufacturing and Production aren't just exceptional for their HR policies. They're at the forefront of an entire industry that will need to create high-trust work environments in order to stay competitive in the years ahead.

“There’s a lot of hiring in manufacturing, and there’s a lot of demand in manufacturing,” says Saxena, who points out that the perception of the sector as less-than-glamorous needn’t be a barrier to retaining valuable people. “If you treat your employees with respect and you involve them in your decision making, they’ll go the extra mile for you, regardless of their job title.”

Entrepreneurs Take on Manufacturing

written by admin | March 8, 2016

(HBR - Mark Muro: 2-22-16) When it comes to consumer-facing service industries like e-commerce, media, and ride- or apartment-sharing, it’s not new to suggest that “software is eating the world,” to use the phrase of venture capitalist Marc Andreessen.

However, in recent years a parallel explosion of digital tools and services has taken place in the manufacturing realm as well, drawing in computer-assisted design and 3D printing equipment to open-source operating systems, the cloud, and the Internet of Things (IoT).

Much has been made of this software-powered “hardware renaissance,” particularly as it has spawned a vibrant local “maker movement” and hardware hobbyist community. But the locus and scale of this activity is now changing. Just as with software 15 years ago, start-up manufacturing is beginning to graduate to the bigger time. New tools, resources, and intermediaries are allowing a new generation of serious entrepreneurs to begin to bridge the worlds of hacker space and industry. As a result, software-enabled manufacturing start-ups are poised to have a large economic impact.

Examples of this trend include the Pebble, a Kickstarter-funded project that has now

sold over one million smart watches (and which predated Google's Android Wear smart watch and the Apple Watch). Likewise, Nebia — a start-up water-efficient showerhead maker in San Francisco — recently scored investment money from Apple CEO Tim Cook and Google Chairman Eric Schmidt's family foundation. And then there is Drop, a startup that makes a \$100 iPad-connected kitchen scale and software app now widely available in Apple Stores and the Apple website, and the well-known Fitbit.

Hardware startups like these haven't historically been so easy to get off the ground.

"A lot of lifestyle businesses used to not be able to get started in larger-run manufacturing which was a pitfall for any small-scale renaissance," observes Mark Hatch, founder of TechShop, a chain of urban maker spaces in U.S. metros like Austin, Pittsburgh, and the Bay Area. "Now, access to tools, capital, and other supports [make] manufacturable products like the [Oru] collapsible kayak possible."

The rise of hardware startups still has the feel of an insurgency. But in my research, and in conversations with hardware entrepreneurs throughout the country, I have noticed several developments that have put manufacturing start-up activity on a faster, more commercial track.

First, Kickstarter and other crowd-funding sources have opened up new options for initial finance. Second, a number of important inputs have gotten cheaper. Open-source operating systems, accessible design tools, and 3D printing are making development and prototyping easier, and the crashing prices of microchips, sensors, and other components now make it possible for a small company to design sophisticated, commercially relevant devices at reasonable cost.

Third, hardware entrepreneurs in some cities can now access a sophisticated supporting infrastructure, including a sizable ecosystem of hardware "studios," incubators, accelerators, and service-providers that has grown up to abet start-ups in dozens of cities from Austin to Providence to Miami.

Last year, for instance, Andy Rubin, the creator of the Android mobile operating system, announced that his new company Playground Global LLC will serve as a sort of incubator "studio" where entrepreneurs and small firms can focus on building

new gadgets while Playground takes care of the physical-world challenges: engineering, manufacturing, scale-up financing, supply-chain management, and distribution.

Likewise, companies like PCH International and Dragon Innovation are now available to manage contract manufacturing and otherwise “make manufacturing feel easy” to entrepreneurs or small companies, as noted by The Wall Street Journal’s Chris Mims last year.

And hardware startups that enter Y Combinator or other accelerators can now take advantage of labs full of equipment for prototyping, provided by Bolt, a venture-capital firm associated with Dragon.

Lastly, big- and medium-sized contract manufacturers are taking an interest in this movement, and looking to work with start-ups in a way they weren’t five years ago. In 2013, the multinational contract manufacturer Flextronics — which makes products for Apple and Microsoft — began offering Lab IX, a service that connects startups with manufacturing partners. Other contractors have also begun to engage, seeing real market value. Says CEO Nat Mani of the Silicon Valley contract manufacturer Bestronics: “We are increasingly seeking to work with start-ups as a form of business development, but also to stay on top of new technologies. The new guys are frequently trying new things that we need to know about.”

The upshot: The same sorts of tools and support systems that have fostered the software boom are now becoming available in the hardware world and opening new avenues.

This opens up possibilities. For his part, Mims imagines an age in which “new products — actual, physical products — will go from idea to store shelves in a matter of months.” Surely a surge of startup ferment would be energizing for America’s manufacturing sector. Such an age could be beneficial for the U.S. given the nation’s advantages in creativity, software, and cloud-based business organization, even if much of the resulting new production winds up offshore.

Beyond that, this surge could help cities. Currently, urban startup communities remain heavily oriented to software ideas and consumer internet ventures. That

leaves urban economies narrower than they might be. By contrast, the emergence of new cloud-enabled, incubator-supported manufacturing startups could widen the aperture. New opportunities will be possible if physical-world inventors and entrepreneurs gain traction alongside virtual ones. Likewise, manufacturing enterprises could flourish without needing large exurban spaces. Ultimately, cities and their innovation districts will benefit if they can channel more of the hardware-oriented tinkering and entrepreneurship that launched Silicon Valley and other tech corridors in the first place.

In the end, it seems likely that both the national economy and U.S. metropolitan areas can benefit if their advanced industry sectors become potent meet-ups of software and hardware competency. Given U.S. digital dominance and hacker dexterity, digital entrepreneurship looks set to further energize the manufacturing industries and give them a new shot at competitiveness.

(Mark Muro is a senior fellow and director of policy for the Metropolitan Policy Program at Brookings.)

Two Key Innovation Questions

written by Lauri Moon | March 8, 2016

Q 1. What is an Innovative Enterprise?

Q 2. And why is innovation so directly aligned with success?

An Innovative Enterprise is probably best defined as a company that can continually *improve and reinvent* its *products and services* and its *work processes* - both *what* it brings to the marketplace and *how* it does that - and that has that whole “renewal process” integrated into its normal operations.

And what does that output look like?

[Click here to find out!](#)

Innovations in Infrastructure Will Boost Manufacturing

written by admin | March 8, 2016

(Area Development - Stephen Gray: First Quarter 2016) From innovative road repair, driverless trucks, bullet trains, and 3D bridges, advances in technology will help to bring the nation's infrastructure up to speed while creating high-skilled manufacturing jobs.

When the long-term highway bill was signed into law last December, it was a step in the right direction not only for our nation's transportation sector, but for manufacturing as well. It's common knowledge that the United States' aging infrastructure makes it harder for manufacturers to deliver products to customers on time, which in turn creates a major ripple in our country's overall competitiveness. This bill is one of the most important things that congress can act on for our country. Infrastructure's critical role in our nation's overall competitiveness cannot be ignored any longer.

Rehabilitating Infrastructure Through Innovation

Rosabeth M. Kanter, who holds the Ernest L. Arbuckle Professorship at Harvard Business School, wrote in her book *Move: Putting America's Infrastructure Back in the Lead*, "We should be thinking not just about repair, which tends to be the conversation. We should be thinking about reinvention. I'm arguing for more technology, better connections, and understanding how to design a system in which the parts augment and enhance each other."

We should be thinking not just about repair, which tends to be the conversation. We should be thinking about reinvention. I'm arguing for more technology, better

connections, and understanding how to design a system in which the parts augment and enhance each other. Kanter is exactly right. The future of American mobility is hinged upon not only the repair of what we already have, but more so on the innovation required to bring us back on the playing field. As a key driver of global competitiveness, innovation is at the forefront of advancing every industry in the world. Just as manufacturing is seeing rapid changes in efficiency and production thanks to advanced technology, transportation infrastructure is on the cusp of this transformation as well.

Construction materials and methods used to repair and rebuild our infrastructure are being designed to be more efficient, reliable, and durable. For example, manufacturers are now producing ground tire combined with asphalt that extends the lifespan of pavement by 20 years. Three-D printers can now make reinforced structural beams for the construction of buildings and bridges. There are even gravity-defying robots being built that promise to 3D print a steel bridge in mid-air. These changes will not only revolutionize infrastructure maintenance and rehabilitation in America, they also hold the promise of creating American manufacturing jobs that will help us to better fulfill our economic potential.

Driverless Trucks to Transform Logistics and Transportation

A recent Forbes article estimated that the technology enabling driverless trucks to take off would largely be in place within three to five years. The first driverless freightliner, manufactured by Daimler, hit the road in May 2015 in Nevada. Autonomous trucks could provide a host of advantages to manufacturers, particularly in the logistics space. For example, whereas human drivers are required to take mandatory rest periods resulting in lost time, autonomous trucks can move continuously, driving increased efficiency and fewer delays in delivery — not to mention the fact that the shortage of humans willing to take the wheel is only worsening. The American Trucking Association predicts that by 2022, the industry could be short some 240,000 drivers, which does not fare well for manufacturers and distributors who are being challenged with increased demands for efficiency from online shoppers.

As this promising new mode of transportation takes off, auto manufacturers will see an increased need for highly skilled workers trained to maintain the technology

required to keep these vehicles safe on the road. Likewise, if the layout and design of interstate roads are adjusted to accommodate the operation of driverless trucks, the impact on the industrial material manufacturing market could be substantial.

Bullet Trains to Bolster Manufacturing

A recent issue of Gray Construction's external newsletter publication, the GrayWay, discussed how high-speed rail in the U.S. could be a major game-changer for our nation's infrastructure. In addition to alleviating congestion on the highways, waterways, and airways, high-speed rail could have powerful implications for manufacturing.

"If you get one of those lines up and running, I think it would be quite an eye-opener," says Marcia Hale, president of Building America's Future. "And just think of the jobs that could be provided in manufacturing engines and cars and rail lines and the steel that's needed."

A recent Forbes article estimated that the technology enabling driverless trucks to take off would largely be in place within three to five years. Though several delays have hindered its course thus far, California is one state that's ready to roll on high-speed rail, as evidenced through the billion-dollar bullet train contract introduced last year. And Siemens is eager to capitalize on the opportunity. Last summer, Siemens opened a 125,000-square-foot manufacturing facility on its French Road plant site in Sacramento, California, in hopes of using it for manufacturing high-speed trains. With this facility will come more highly skilled, technical manufacturing jobs for the state.

The Reinvention of Construction Materials

As stated, also set to advance transportation infrastructure is 3D printing. For example, the first 3D printed bridge is set to be "built" in 2017 by 3D printing R&D firm MX3D, Autodesk, and construction and civil engineering company Heijmans. The pedestrian steel bridge will be built across a canal in Amsterdam by a multi-axis robotic 3D printer that "draws" structures in the air.

Engineers will use AutoCAD to first input the design and give directions to the robotic printers. Then, robots will heat the metal to a molten 2,700 degrees Fahrenheit and construct the bridge "drop by drop." Amazingly, the steel, which is

developed to “dry” rapidly, will be able to neutralize the effects of gravity to keep the lines straight. The autonomous robots will create their own supports and have the ability to cross the metal formations as they build a self-supporting bridge design. While this bridge, in particular, will not support vehicles, it does prompt one to wonder if similar technologies could eventually be applied on larger-scale infrastructure projects in the future.

Another advancement in transportation infrastructure that’s already made a major impact is the creation of “instant bridges” through accelerated bridge construction. These bridges can be built off-site and transported into place in a matter of days (as opposed to years), resulting in a lighter impact to traffic flow than a long-term bridge construction project.

Looking to the Future

As new technologies become more widely adopted across the industry, more high-skilled jobs in manufacturing will be generated. Future jobs in the operations and maintenance of 3D printers, the management of complex and hyper-connected supply chains, and advanced manufacturing facilities will be generated, with hope that they spark the interest of industry newcomers and address the skills gap.

These innovations barely scratch the surface of what’s possible, or needed, to move our nation’s transportation infrastructure forward. But, with the National Network for Manufacturing Innovation (NNMI) advanced manufacturing hubs working hard to continually unveil new technologies to boost our competitiveness, I am hopeful that we will continue to see positive advancements. Our friends at the National Association of Manufacturers have long been rallying for a greater focus on our country’s infrastructure, as these improvements are critical for the future productivity and the global competitiveness of manufacturing as a whole. So, as we look to the future of repairing America’s transportation infrastructure, let’s not forget that our leaders must embrace the power of innovators to create the changes that will have a lasting effect on our economy.

Building Manufacturing Communities for the long haul

written by admin | March 8, 2016

(Brookings - Mark Muro: 2-18-16) The National Network for Manufacturing Innovation (NNMI) institutes have rightly emerged as centerpieces of the nation's push to increase the competitiveness of America's advanced manufacturing sector. Through the program the nation is slowly building a robust network of industry-university collaboration hubs. If all goes well the centers will soon solve critical manufacturing technology problems and drive necessary American gains in advanced manufacturing.

And yet, along with creating innovation hubs the nation also needs to rebuild its regional manufacturing ecosystems. Technology hubs won't help much if the nation lacks robust regional manufacturing clusters to deploy and scale up breakthrough technology.

Which is why the Obama administration created another initiative in 2013 called the Investing in Manufacturing Communities Partnership. Launched through administrative action, the partnership aimed to both call forth and reward regional manufacturing initiatives by giving winning regions priority access to the resources of multiple federal departments and agencies.

In 2014, the first 12 manufacturing communities were designated from over 70 applications and given access to funding to carry out their plans for advanced research, workforce training and retraining, supply chain development, and other initiatives. Although 12 more communities around the country were designated last year, the program's future is uncertain given the waning of the current administration.

Last week, though, a way forward became visible. Extending the notable bipartisan support for federal action on advanced manufacturing, five U.S. senators and six representatives introduced bipartisan, bicameral legislation to make the Manufacturing Communities program permanent.

In keeping with that goal, the new bill would create a standing program to competitively award regions with the “Manufacturing Community” designation and associated funding benefits. This designation would move winning communities to the front of the line when they apply for up to \$1.3 billion in currently available federal economic development funding for manufacturing.

In this manner, the legislation encourages a regionally driven approach to strengthening manufacturing. To compete for funding through the program and earn the designation, communities would need to *demonstrate the significance of manufacturing in their region* and *create supportive regional partnerships with key stakeholders* such as local and state economic development officials, local governments, manufacturers, labor organizations, and higher education or other training providers.

To prevail, the regions would need to develop strategies for employing their “Manufacturing Communities” designation in making investments in six areas: advanced research ... workforce training and retraining ... supply chain support ... export and foreign direct investment ... investment support for process upgrades, incubator activities ... and other activities.

In short, the proposed permanent program holds out a chance for the nation to get as serious about ecosystem building as it has gotten about technology development.

Complementing the nation’s manufacturing hubs with Manufacturing Communities built for the long haul will increase economic activity and jobs.

(Mark Muro is Senior Fellow and Policy Director, Metropolitan Policy Program.)