

# Commerce Secretary Submits Annual Report and Strategic Plan for First Manufacturing Institutes

written by admin | February 24, 2016

(Department of Commerce Press Release - Office of Public Affairs: 2-19-16) U.S. Secretary of Commerce Penny Pritzker has submitted to Congress the first legislative reports required of the National Network for Manufacturing Innovation (NNMI). The NNMI Annual Report highlights the program's initial success in spurring private-sector investment to support the development of manufacturing processes based on U.S. innovations.

Secretary Pritzker also submitted a Strategic Plan that describes the program's goals for the next three years and how its performance will be measured.

"With the support of more than 800 members - including blue chip companies, leading universities, and numerous small businesses and non-profits - the institutes are undertaking applied research in support of solutions to industry-relevant problems, strengthening the skills of America's workforce, and securing U.S. leadership in emerging manufacturing technologies," said Secretary Pritzker. "I am excited to celebrate the success of the President's vision for a National Network for Manufacturing Innovation, and the Department of Commerce's role in supporting and growing the NNMI program."

The NNMI is an interagency, public-private partnership initiative aimed at bridging the gap between invention and commercialization. Its regional manufacturing innovation institutes work individually and together to strengthen the competitiveness of United States manufacturing by supporting research and collaboration on specific topics, from next-generation electronic components to 3D printing. Each institute also serves as a workforce training leader in its technical area through collaborations with educational institutes, companies and industry associations.

The President's Council of Advisors on Science and Technology initially recommended the NNMI initiative in 2011 and a pilot institute was launched in 2012. The *Revitalize American Manufacturing and Innovation Act of 2014* authorized the NNMI, and the network now includes a total of seven institutes with more than 800 member organizations participating in nearly 150 research and development projects.

The annual report details how the first institutes are spurring not only collaboration around their topic areas, but additional investment and, in some cases, economic development in surrounding areas. The report highlights institute efforts to develop sustainable business models that engage all parts of the supply chain, from large manufacturers to their smaller suppliers. The institutes are developing individual strategic plans by analyzing their industries' needs, workforce gaps and potential.

The institutes included in the report are those launched by the end of September 2015:

- America Makes - the National Additive Manufacturing Innovation Institute (Youngstown, Ohio)  
Focus: additive manufacturing and 3D printing technologies
- Digital Manufacturing and Design Innovation Institute (Chicago)  
Focus: integrated digital design and manufacturing
- PowerAmerica - The Next Generation Power Electronics Manufacturing Innovation Institute (Raleigh, N.C.)  
Focus: wide bandgap semiconductor-based power electronics
- Lightweight Innovations for Tomorrow (Detroit, Mich.)  
Focus: lightweight metals manufacturing technology
- Institute for Advanced Composites Manufacturing Innovation (Knoxville, Tenn.)  
Focus: advanced fiber-reinforced polymer composites
- AIM Photonics - American Institute for Manufacturing Integrated Photonics (Rochester, N.Y.)  
Focus: integrated photonic circuit manufacturing
- NextFlex - America's Flexible Hybrid Electronics Manufacturing Institute (San Jose, Calif.)

Focus: the manufacture and integration of semiconductors and flexible electronics

The NNMI Strategic Plan represents the consensus of the participating agencies and industry leaders and lays out how the network will achieve its goals to:

- Increase the competitiveness of U.S. manufacturing,
- Facilitate the transition of innovative technologies into scalable, cost-effective and high-performing domestic manufacturing capabilities,
- Accelerate the development of an advanced manufacturing workforce, and
- Support business models that help institutes to become stable and sustainable without continuing federal support.

The existing NNMI Institutes are funded by the Department of Defense and the Department of Energy. The Department of Commerce has just released a solicitation for its first open-topic institutes.

For more information, see NNMI Annual report and NNMI Strategic Plan. Additional information can be found on [www.manufacturing.gov](http://www.manufacturing.gov).

---

## **Majority of CEOs unwilling to share cyber-security information with outsiders**

written by admin | February 24, 2016

(ZDNet - Eileen Yu: 2-17-16) Some 55 percent of CEOs acknowledge industry collaboration is necessary in fighting cyber-crime, but only 32 percent are willing to share their company's data on cyber-security incidents with others.

This reticence also conflicted with the fact that 55 percent of CEOs acknowledged

industry collaboration was necessary to fight cyber-crime, according to an IBM study, which polled more than 700 CXOs in 28 countries. Some 24 percent of respondents were from the Asia-Pacific region, including Singapore, Australia, China, and India.

“This exposes a resistance to widespread and coordinated industry collaboration, while hacking groups continue to perfect their ability to share information in near real-time on the Dark Web,” noted IBM.

The CEOs stressed the need for external parties to do more as well as stronger government oversight, increased industry collaboration, and cross-border information sharing. Asked about an external party’s role in addressing cyber-crime, 61 percent of CEOs said governments should play a stronger role, while 53 percent said cross-border information sharing was essential.

“[It’s] a dichotomy that needs to be resolved,” it said, pointing to further findings that indicated confusion among CXOs about who the real cyber-security adversary was and how to fight them effectively.

For instance, the study revealed that 70 percent of the c-level respondents believed rogue individuals posed the biggest threat to their enterprise. The reality, though, was that 80 percent of cyber-attacks originated from highly organized crime networks in which data, tools, and expertise were widely shared, IBM said, citing findings from a United Nations report.

Some 54 percent of the CXO respondents did highlight crime rings as a concern, but 50 percent also pointed to competitors as equally worrying.

IBM Security’s vice president Caleb Barlow said: “The world of cyber-crime is evolving rapidly, but many c-suite executives have not updated their understanding of the threats.

“While CISOs and the board can help provide the appropriate guidance and tools, CXOs in marketing, human resources, and finance-[encompassing] some of the most sensitive and data-heavy departments-should be more proactively involved in security decisions with the CISO,” Barlow urged.

Because these business units managed sensitive customer and employee data as well as corporate financials and had access to banking details, they were among the primary targets for cyber-criminals, IBM said.

The study further revealed that 60 percent of CFOs, chief HR officers, and CMOs admitted they were not actively engaged in their company's cyber-security strategy and execution. Only 57 percent of HR heads, for instance, had deployed employee training in cyber-security.

The level of assurance also appeared to vary between the types of c-level executives within the organization. The survey found that 65 percent of CXOs were confident their company's cyber-security plans were well established. But while 77 percent and 76 percent of chief risk officers and CIOs, respectively thought so, only 51 percent of CEOs felt likewise.

"Considering that successful cyber-criminals are known to collaborate among themselves, it stands to reason collaboration on security management and incidents among organizations would contribute to risk reduction," IBM said.

"Among cyber-criminals, that collaboration takes the form of one actor discovering a weakness and making the knowledge available for sale for others to exploit. CEOs of cyber-secured organizations are much more likely to share incident data with external parties. They are three times more likely than others to collaborate with industry competitors, and twice as likely to collaborate with third-party security services firms and vendors and partners."

Big Blue added that CXOs should recognize the value of external collaboration as a way to combat cyber-crime. As organizations shared more knowledge about cyber-criminals and their activities, including incident reports, the better prepared they would be to implement the necessary mitigation plans.

(Eileen Yu is an independent business technology journalist based in Singapore. In her *By The Way* blog, she covers industry developments in Singapore as well as other Asian markets, and enjoys pushing the line in her discussions about the impact of government regulations and policies.)

---

# Manufacturing's Economic Impact: So Much Bigger Than We Think

written by admin | February 24, 2016

*New research by MAPI shows manufacturing's total value chain actually accounts for about one-third of U.S. GDP, or three times the impact that official data suggest.*

(IW - Stephen Gold: 2-17-16) Two measures commonly used by the government to measure manufacturing's overall impact on society are badly underestimating the impact of that critical sector. One is the proportion of gross domestic product for which manufacturing accounts. The other is the "multiplier effect," which measures the impact on other industries from an increase in economic activity by a specific industry.

Official national statistics state that manufacturing's proportion of GDP—its annual value-added divided by the value of all goods and services produced in the country—stands at about 11%. The U.S. Department of Commerce finds the total requirement manufacturing multiplier is around 1.4.

Both figures grossly understate manufacturing's impact. By a long shot. Intuitively, we should know this—contemporary Americans are surrounded by and completely reliant on thousands upon thousands of manufactured goods, whether we're working, eating, driving, flying, sleeping, playing, or relaxing. Judging by the sheer volume of stuff in our lives, how could manufacturing represent only a tenth of the economy?

*The manufacturing footprint is about a third of the economy, not a tenth. Policymakers need to sit up and take notice of who's really driving our economy.*

It doesn't. New research by MAPI Foundation Chief Economist Dan Meckstroth, using analysis of national input-output tables by Interindustry Forecasting (Inforum) at the University of Maryland, shows manufacturing's total value chain actually

accounts for about one-third of U.S. GDP, or three times the impact that the narrow official data suggest. Moreover, manufacturing's multiplier is 3.6, also nearly three times as high as the simplistic estimates; we find that every \$1.00 of manufacturing value-added generates \$3.60 of value-added elsewhere across the U.S. economy.

Why is the government's estimate so misleading? For one thing, there are several inaccuracies, such as including final sales of imports and some double counting of transactions in the Commerce Department calculations.

More substantively, official manufacturing statistics are based narrowly on information collected at the "establishment"—or plant—level, as opposed to the "firm" level. That means numerous manufacturing-related activities, such as corporate management, R&D, and logistics operations, are not included within the NAICS codes for manufacturing (31-33) when they are located separate from plants. For example, Commerce classifies the work of senior executives in Briggs & Stratton's headquarters as "management of companies and enterprises" (NAICS 55), Caterpillar's R&D centers as "professional, scientific, and technical services" (NAICS 54), and Stanley Black & Decker's warehouses as "wholesale trade" (NAICS 42). The MAPI Foundation's approach places the value of these firm-related activities back into the calculus of manufacturing's total economic clout.

Yet another reason the government measure is misrepresentative: it captures only the creation of upstream value, including the processing of raw materials and intermediate inputs, and the production process. The manufacturing value stream is actually much broader, encompassing the associated activities in both the upstream supply chain and the downstream sales chain of manufacturing goods sold to final demand.

Even this definition of the value stream is incomplete. Final demand goods are those destined for an end user; they are either exports or goods sold to households, businesses, and government. The data for final demand goods do not include intermediate inputs for nonmanufacturing supply chains, such as gypsum and cement bound for the construction supply chain or chemical fertilizer used in the agriculture supply chain. Adding this data provides a more holistic and accurate perspective, because but for the production of all of these manufactured goods, no

value would be generated in manufacturing's upstream supply chain and downstream sales chain, or in supply chains of other sectors.

Let's take a closer look at this new, improved analysis of manufacturing's total value chain. Start with the upstream activities associated with manufactured goods for final demand: these include the value of all the intermediate inputs purchased for use in production, such as raw materials, process inputs, and services. As Meckstroth observes, car manufacturers need steel to make cars, the steel manufacturers need coal and iron ore to make steel, and all the raw materials need to be transported from place to place. The value-added of all intermediate inputs upstream of the factory that go into manufactured goods destined for final demand is \$3.1 trillion.

As the goods move downstream from the factory loading dock through the sales chain, add in the value derived in the transportation, wholesaling, and retailing of the goods. More value is generated in related services such as rental, leasing, insurance, professional services, maintenance, and repair. Combine the value of all these downstream activities with the producers' value and throw in the value derived from manufactured imports, and this makes up the manufactured goods sales chain. The MAPI Foundation estimates that downstream added value on manufacturing goods for final demand totals \$3.6 trillion.

Combined, the (up and down) value stream of manufactured goods for final demand equals \$6.7 trillion.

Again, this reflects only the value chain for goods made for end users such as households and businesses. Goods designated for nonmanufacturing supply chains provide an additional \$510 billion in value-added to manufacturing's total value chain.

*In all, manufacturing's total impact on the economy is 32% of GDP.* In other words, the manufacturing footprint is about a third of the economy, not a tenth. Policymakers need to sit up and take notice of who's really driving our economy.

(Stephen Gold is President and Chief Executive Officer, Manufacturers Alliance for Productivity and Innovation (MAPI))



---

# Five Fundamental Areas that Are Key to Success for Innovative Manufacturers

written by admin | February 24, 2016

A more demanding business environment will require CEOs and their management teams to think more holistically about innovation, their operating models, and even how their products and services get at their end customers' needs.

(IW - Brian Heckler: 2-5-16) It seems everywhere one looks that technology is evolving more rapidly than at any time in history. From personal electronics devices to self-driving cars, innovation is moving forward at a swift pace. As a result, manufacturing leaders are spending an increasing amount of time asking themselves, "How can I ensure my organization keeps pace?"

The reality for leaders is that it will take more than increased capital and enthusiastic leadership to create innovative manufacturers. It will also require CEOs and their management teams to think more holistically about innovation, their operating models, and even how their products and services get at their end customers' needs.

Many manufacturers break down "innovation" into three main areas: product innovation, manufacturing innovation, and business model innovation. Most CEOs intrinsically understand the need for product innovation. If customer demand isn't driving product innovation, the need to compete for sales almost certainly is.

Numerous manufacturing CEOs are highly focused on reducing cost and achieving efficiency in their manufacturing process. It's one of the main reasons why they are streamlining plant layout, consolidating footprint, increasingly adopting advanced manufacturing techniques and piloting new manufacturing technologies (everything

from 3D printing and nanotechnology to robotics and predictive analytics) in order to gain a competitive edge through reduced costs and speed to market.

Probably the most difficult type of innovation for manufacturing CEOs, however, will be in catalyzing business model innovation. The fact is that traditional business models are coming under increasing pressure as new, more nimble competitors take advantage of their agility to create and dominate new market segments and sales channels.

## **Overcoming Challenges and Competition**

Yes, there will be challenges. And creating a sustainable approach to innovation will take time, experience and practice. But our experience working with leading manufacturers suggests that there are often five key areas that the more innovative manufacturers recognize as being fundamental to success.

### **1. Running at multiple speeds**

While most capital investment plans tend to span five-year periods, technology is evolving at a much more rapid pace. The traditional capital investment screening and payback analysis, implementation horizon, and managerial speed must accelerate to be nimble and take advantage of the much faster technology evolution cycle. Consumer electronics firms for instance have developed their entire business models to allow the flexibility to adopt, develop, and adapt new technologies as they emerge through an extended ecosystem, flexible design of physical product and other techniques.

### **2. Recognizing the inflection point**

Most innovation happens in small, incremental steps, so it is easy to miss the point where an emerging trend becomes a breakthrough technology. That is why manufacturing CEOs are now striving to figure out how to stay on top of developments—both in their immediate peer group and in other industry sectors—and how to assess and monitor threats and opportunities as they emerge. In KPMG's 2015 Global CEO study for example, 74% of respondents indicated they are concerned about new entrants disrupting their business model, and 72% said they

are troubled about keeping up with new technologies.

### **3. Creating today's innovative culture**

Innovation for manufacturers in the current environment must fundamentally evolve. Frequently, it either is restricted to a few in an isolated research lab or a small team focused on operational improvement on the plant floor. Balancing the different objectives of achieving profitable results from existing products and encouraging employees to try new things (and, if necessary, fail and try again) goes against the manufacturing DNA or operating model of many manufacturers focused on incremental "continuous improvement" techniques. Today, innovative companies need different ways to motivate and reward breakthrough innovation, and its inherent risks and targeted outcomes.

### **4. Adapting the business model**

Whether to defend against a new competitor, respond to a growing customer demand, or to take advantage of emerging trends, leading manufacturers are already adapting their existing business models and creating new ones. 44% of CEO's in a recent KPMG survey are concerned about whether their business model is adequate. Many are now focusing on overcoming the challenges related to managing, maintaining, and optimizing multiple business models simultaneously without disrupting the core business. Traditional manufacturers are looking to leverage data and analytics for new solutions like a leading global manufacturer who strives through data, analytics, software and solutions to deliver greater asset reliability, lower operating costs, reduced risk and accelerated operational performance for its customers. They also are evolving services and solutions through the internet of things (IoT) and connected, intelligent products like Joy Global's JoySmart Solutions.

### **5. Having a long term vision**

Nobody knows exactly how technology will evolve over the next 10 years. But leading manufacturers and their executive teams are, nonetheless, developing a clear vision of how their innovation investments align to their long-term business objectives. And they are clearly articulating that vision to employees, suppliers,

customers, and shareholders to drive real competitive advantage from their innovation investments.

(Brian Heckler is national sector leader of Industrial Manufacturing at KPMG LLP.)

---

# Reasons To Improve the Climate Impacts of Your Supply Chain

written by admin | February 24, 2016

CDP's Dexter Galvin explains how business can benefit by increasing their supply chain's commitment to sustainability.

(GreenBiz - Jocelyn Timperley: 2-4-16) Following the release this week of a report that showed that even green-minded multinationals can struggle to keep tabs on their supply chain's carbon footprint, Dexter Galvin of CDP —one of the organizations behind the report — discusses how and why businesses should be looking at where they are buying as well as where they are selling.

## **Supply chains account for the bulk of corporate emissions**

If a company is aspiring to cut the carbon impact of its products, looking only within its own four walls won't cut it. The CDP research reveals most supply chain emissions are around four times the operational emissions for most companies (with the exception of energy or mining firms). "Essentially a lot of big purchasing organizations around the world have effectively outsourced their emissions to their supply chains," said Galvin, head of CDP's supply chain program. "We think one of the solutions is to get more and more companies to start measuring, managing and disclosing their carbon emissions."

## **Engagement takes time, and is trickier than you think**

Many suppliers are still turning a blind eye to the climate debate — leaving many big

firms in the dark as to the true impact of their business. Of the almost 8,000 key suppliers contacted through CDP's study on behalf of the multinationals, only 51 percent even gave a response. "These are the key suppliers for some of the world's largest corporations," said Galvin. "In light of the Paris Agreement, we think that there's very significant risk in corporate supply chains from suppliers who have no awareness of climate risk at the moment."

### **Major internationals are spearheading supply chain reform**

While the high carbon impact of supply chains presents significant risk, it also presents a huge opportunity. Many big corporations are already beginning to take their supply chain impacts more seriously, and companies who don't could risk being left behind. CDP has 75 major multinationals — including Coca-Cola, Goldman Sachs and Walmart — signed up to its program and collecting data from their suppliers every year. Collectively, these organizations account for around \$2 trillion of annual spending. Even the U.S. federal government is signed up, as well as the electronics industry through its industry group the Electronic Industry Citizenship Coalition (EICC). More than half of these companies are already using CDP data to assess their suppliers. L'Oréal, for example, has made a commitment that its top 300 suppliers will have a carbon reduction target in place by 2020 — and has made clear it isn't afraid to deselect suppliers who don't perform. Dell has a similar set of demands, and even requires suppliers to engage their own supply chain in turn.

### **Regulation is lurking around the corner**

Following the Paris Agreement many countries are already beginning to take swift action on emissions. Only last week China announced that the list of industries set to be covered by its national carbon market will include petrochemicals, power, the construction and steel industries, and even aviation. Waiting for regulation can cause a lot of problems, not least cost increases in the supply chain, [while] companies that have been managing this issue in their own will naturally be more prepared for regulation. All this means companies that use a take-it-as-it-comes approach may find themselves disadvantaged down the line, as a world striving to keep up with an ambitious global agreement could have trouble finding the time to bring the laggards up to speed, said Galvin.

“There’s a huge amount of risk out there in the world at the moment on climate change,” said Galvin. “Waiting for regulation can cause a lot of problems, not least cost increases in the supply chain, [while] companies that have been managing this issue in their own operations for a number of years will naturally be more prepared for regulation.”

Meanwhile, although many companies believe their “global sourcing strategy” means they can just source their supplies from elsewhere, it may not be as simple as this. “If we look at regulatory risk specifically, the Paris Agreement means that regulation will be implemented across the world in order to meet [the agreement’s] ambitions,” said Galvin. “The regulatory frameworks in most emerging markets would need to change very significantly.” All this means those areas companies typically may have moved to could be at the most risk of fast-rising cost increases, as regulation rapidly comes into play.

One example, said Galvin, is a recent estimate from Bank of America predicting the annual cost impacts on the company should the U.S. federal government pass a carbon tax. When the company alone was considered, it estimated the cost would be between \$13 million and \$26 million — but when the bank’s complex supply chain costs were factored in, it estimated that potential additional costs could reach between \$180 million and \$500 million.

### **Don’t forget water**

While emissions reductions and energy often steal the limelight as far the climate goes, the CDP report also highlights the risk to companies of ignoring the issue of water shortages. Of the 8,000 suppliers CDP asked to report on their water risk, only 34 percent had even undertaken a water risk assessment. “A very important starting point for a company engaging on water as an issue is for them to understand how it’s going to impact their operations,” said Galvin. “It’s a very scarce commodity and we feel that a lot of the suppliers are not helping their customers to deliver water stewardship in their own supply chains.”

### **Supply chain reform has measurable effects ...**

While the CDP reported disappointing returns for the number of suppliers who

responded to request for climate information, where suppliers did report back there were often significant improvements. Between the first and third year of being in the program, suppliers become far more likely to report on their emissions, much better at identifying risk to their organization, and even twice as likely to have a reduction target in place. “Of course to measure is to manage,” said Galvin. “When you look at the suppliers themselves, where the suppliers take management of this issue seriously, you can see that it yields results.”

Purchasers also can push progress by setting an emissions reduction target in their own supply chain. “Obviously those companies that have targets that include their supply chain are much more likely to see their suppliers respond, to report emissions reductions and to report emissions reductions targets as well,” said Galvin. “You can see a very significant increase in the performance of their suppliers.”

### **And saves cash**

Reducing risk is not the only reason for purchasers to engage with their supply chain — it also can deliver huge cost savings. CDP found that those suppliers that did disclose their climate information reported combined savings of \$6.6 billion. The savings also increase with time — those suppliers who have been reporting the information for at least three years reported average savings of \$1.5 million per emissions reductions initiative. “We’re seeing very significant savings across the board,” said Galvin. CDP found that those suppliers that did disclose their climate information reported combined savings of \$6.6 billion.

“If we look just at the emissions that suppliers have reduced that they attribute directly to their customer engagement with them ... we’ve actually captured 3.5 million tons of carbon emissions that were directly attributable to customer engagement last year. Which is the equivalent of 90 million trees over 10 years.”

### **Supply chain engagement is going public**

CDP is concerned that too few companies are engaging their supply chains on climate — so this year it will begin scoring companies on the management of carbon and climate change across their supply chains, with rankings to be released in a

year's time. For companies keen to keep their green credentials clean, this may be the right year to check that all of their house is in order.

---

# **Council on Competitiveness Report Makes Recommendations for National Skills Agenda**

written by admin | February 24, 2016

(SSTI Weekly: 2-4-16) As long-term trends continue to impact the U.S. economy and its recovery from the Great Recession, more must be done to develop diversely skilled and adaptable workers, according to a new report by the U.S. Council on Competitiveness.

In addition to describing the radical changes facing the landscape for America's workforce, *WORK: Thriving in a Turbulent, Technological and Transformed Global Economy* provides numerous recommendations on how to best respond to these challenges. Ultimately, the *WORK* report views itself as a roadmap to align education and training to 21st century skills needs, effectively leverage intellectual capital, and supply businesses with the talent needed to compete globally.

Although American workers have struggled in the years following the Great Recession, the U.S. labor force is also heavily impacted by several long-term trends. Even though agriculture, mineral extraction, and manufacturing drove the U.S. economy in the 19th and 20th centuries, it is driven by knowledge, technology, and innovation (KTI) in the 21st century.

While the U.S. has the highest concentration of KTI industries among major economies, this has also led to a polarization in the labor market. Demand has grown for both high-end workers for jobs involving non-routine cognitive tasks ... and for



low-skill/high-touch workers, but has stagnated for many middle-skill workers, according to the report.

Macroeconomic trends such as globalization, trade liberalization, and the digital revolution have complicated this as skilled individuals from around the globe can now compete to perform the world's work, oftentimes for lower wages than American workers.

As the digital revolution continues to spur disruption, the rise of machines, and large-scale technological changes, skills and labor markets must be flexible to respond to changes in demand.

The report concludes with a series of recommendations to address the challenges of new workforce realities intrinsic in today's highly productive, dynamic, and knowledge-driven economy. As a complement to two strategic plans developed by the Obama administration - A Strategy for American Innovation ... and A National Strategic Plan for Advanced Manufacturing - WORK also recommends the development of a National Skills Agenda to help ensure the employability of Americans in an era of rapid change and an increasing demand for skills.

Because it is difficult to predict what the jobs of the future might be, the report recommends encouraging real-world skills and experiences that help build a foundation for success in a highly skilled knowledge and technology-driven global economy.

Pillars of technology-based economic development, such as the development of science and engineering skills through STEM education and the nurturing of the next generation of entrepreneurs, are also recommended.

Other recommendations include better communication channels for industry to communicate its needs to educators, students, and job seekers; continued engagement of the aging workforce; and, establishing pathways to transition veterans into the workforce.

The report also emphasizes the importance of a new era of sustainability and energy innovation as an opportunity to boost U.S. employment in a variety of new, well-

paying jobs for high/medium/and low-skill workers alike. To take advantage of this potential growth, the report recommends teaching and developing skills in sustainability, committing a portion of the federal government's R&D budget to energy-related fellowships, and scholarships for students who commit to serving in an energy-related career.

---

# Wirerope Works Hosts M.A.K.E. Forum

written by Lauri Moon | February 24, 2016

Thanks to Wirerope Works for hosting the quarterly Manufacturing Applications Knowledge Exchange (M.A.K.E.) Forum meeting and providing participants with a tour of their facility.







---

# Power of Small

written by admin | February 24, 2016

Today the National Association of Manufacturers (NAM) is launching an exciting, new campaign called “Power of Small” to tell the story of small and medium-sized manufacturers. The new “Power of Small” webpage will showcase the amazing work of small manufacturers, highlighting our critical contributions to the U.S. economy.

Our success as an industry, and as a country, depends on small manufacturers across the United States, which represent 90 percent of the NAM’s membership.

[Click Here](#) for more information on the “Power of Small” campaign. Share the link with members of your community as well as manufacturers who don’t yet know what the NAM can do for them.

---

# Penn State Announces SME Additive Manufacturing Challenge

written by admin | February 24, 2016

Partnering with America Makes and MEP, Penn State’s Center for Innovative Materials Processing through Direct Digital Deposition (CIMP-3D) is sending an open invitation to SMEs to present ideas for how Additive Manufacturing can revolutionize their business. The challenge will be focused on concepts that utilize additive manufacturing for improving a current product or developing a new product. Although the Challenge will focus on additive manufacturing of metals, applications involving polymer printing will also be considered depending upon the impact of improving or developing a product through additive manufacturing. The

top five submissions will be awarded stipends and access to Penn State and America Makes world class facilities and research personnel in order to validate, demonstrate, and showcase their ideas.

\*The SME Challenge proposal should include IMC as the regional NIST MEP as an integral member of the proposal team. Concepts due March 27, 2016.

[Click Here](#) for more information and directions on how to enter the challenge.

---

# Wearables and the ‘New Toolkit for Modern Manufacturers’

written by admin | February 24, 2016

*With dozens of new products introduced at the Consumer Electronics Show, 2016 might really be the turning point for wearables on the factory floor. If you already implemented some of the new tech, get ready to upgrade. If you haven't ... why are you waiting?*

(IW - Matt LaWell: 1-21-16) *Two seconds.* ... In 1968, an IBM psychologist named Robert B. Miller presented a paper on computation response time at the Fall Joint Computer Conference that focused in part on that passed-in-a-flash stretch of time. Miller had been studying early computer operators for years and — long before the first personal computers, the first laptops, the first tablets, and certainly before the first connected eyeglasses and watches and rings — focused on what he called the *two-second response* theory.

“The tasks which humans can and will perform with machine communication will seriously change their character if response delays are greater than two seconds,” Miller wrote. More simply, we will shake our heads and walk away (or at least say

we will) if our various devices fail to deliver what we ask within two seconds. Good thing wearables help cut down on that response time, technologically spoiling us that much more. The next round of wearables will continue the trend.

New hardware and software, some of it delivered at the most recent Consumer Electronics Show earlier this month in Las Vegas, could finally allow our dreams of a wired workforce to become reality. We all know that Google Glass sputtered for the consumer market and is a relative hit for the factory floor, and that Apple Watch has sparked more general interest than any other wearable, with strong potential for industry. There are plenty of other options out there now, though, and the number of choices will continue to climb.

The Daqri Smart Helmet and Kopin Smart Glass, for starters, “have the potential to give manufacturers more choices to support workers with real-time, on-body connectivity to applications and data,” said Plex CTO Jerry Foster, who is at work on new wearables apps for the floor and the warehouse.

“Wearable devices are part of the new toolkit for modern manufacturers,” Foster said, “with cloud solutions making it easy to connect new products and innovation as fast as they hit the market.” Which is a little slower than two seconds, but still really fast.

We are still in the early days of adaptation and implementation, but if this round of products delivers, 2016 really could be the turning point — especially for manufacturers.

Let’s start with the scale of deployments, which could be even more important this year than the technology itself, at least according to Brian Ballard, CEO and co-founder of APX Labs, which has carved its early wearables niche in developing software for some major names in the oil, gas and defense sectors.

“Smart glasses really cemented themselves as something companies were using in 2015, but ... it takes almost a year to get through everything,” Ballard said. “You’ll start seeing them used on a much larger scale than they were in 2015: Moving from one line to the whole factory, or from one factory to the whole bullpen of factories that support a process.

“There are still some areas inside logistics that we won’t see — the hardware can’t replace all the tools used today — but in field service and manufacturing, I think you’re going to see a big uptick in the technology.”

Ballard and APX Labs could play a part in that uptick, thanks to another recent round of funding that increased its total raised to \$29 million and included considerable investment from General Electric, which is also a customer. (Boeing is another customer, as are two of the five largest companies in the oil and gas industries, though they don’t allow their names to be used.)

“We started off in the defense space,” Ballard said, “building software to power defense-focused wearable technology — almost entirely smart glasses and heads-up displays. ... We thought you could eventually do anything and everything on wearable glasses, so we built a flexible, powerful platform, then thought about our feature set in terms of specific verticals.

“If I’m a manufacturer, what are the five or 10 top things every manufacturer has to do? We put a lot of energy into those features, but it has flexibility for a bunch of different use cases.” Among those top 10 things are inspection and compliance, the collection and access of knowledge, and the implementation of an easy-to-use work process.

“The same platform your supervisors are using is the same one your technicians are using and the same one your supply chain is using. It’s a hyper-connected, multi-player work environment,” Ballard said. “We didn’t see this as just a bunch of individual users working together. We saw it as a team working together — with your existing legacy systems, with your robotics, with your IoT — and all that together could be a game-changer.”

### **What Will We Use? And Who Will Make It?**

Glasses might not be the biggest game-changer, though. A recent study from IDC forecasts about 160 million wearables shipped in 2019, with more than 120 million of them headed for your wrist. (For the sake of comparison, about 25 million wearables shipped in 2014, and close to 80 million shipped last year.) Connected glasses, modular and clothing will make up almost all of the remaining quarter.



“A lot of companies will use ergonomic sensors,” including some in clothing, said Rana J. Pratap, principal technology consultant for LexInnova. Why clothing wearables? It’s a safety measure, more than anything else, and “safety is a huge area. I don’t see a lot of wearable applications used just for the heck of it. More will be used for safety, for improving the worker productivity.”

Clothing wearables could be used most prominently to help workers remain visible, especially to, say, forklift drivers, when they would otherwise remain hidden around corners or behind other machines. They could also, Pratap said, help maintain temperature in extreme conditions, though “those applications are more futuristic.”

At least as interesting as what the new wearables will be is *who* might be manufacturing them. In a new paper titled “Wearable Technology: Patent Landscape Analysis,” LexInnova breaks down which companies have the most current wearable tech patent filings. Smartphone leaders Samsung and Apple do not top the list — ranking fourth and 12th, respectively, with 498 patents and 197 patents, with Fitbit even lower at 15th thanks to its 192 patents. Granted, those companies might have better patents — quality over quantity, which is also measured in the paper — but different companies at the top could open the door to more innovation and competition.

And the top three on that list? Microsoft and Philips, which are neck and neck at 757 and 756 wearable patents, respectively, and Alphabet (which is still just Google for all intents and purposes) at 602.

That number of patents, and the corresponding level of possibility, is exciting. “We’re in the first phase of wearables,” Plex vice president of development Jason Prater said. “In the next five to seven years, as the consumerization continues to drive the innovation, you’re going to see some amazing things. I think this iteration of wearables is going to continue to go faster.

“And even after that,” his Plex partner, CTO Jerry Foster, said, “you’re going to see ingestibles that start to monitor things inside you. That’s fascinating and kind of scary at the same time.” Technology, tracking you, measuring you, telling you about yourself ... from your insides.

In a 2013 interview with *Wired*, Evernote CEO Phil Libin said that wearables will “make you more aware, more mindful. They’ll reduce the number of seconds in the day when you’re confused.” And they will keep you more aware and give you a sense of where you are, whether you wear them on your wrist, your fingers or your eyes, in your clothing ... even whether you swallow them first.

“That’s what this whole connected universe will do,” Libin said. “It will make you a functionally smarter human.”

In just two seconds. Or less.