Sustainable Manufacturers are Taking Financial Advantage of Green Corporate Bonds

written by admin | April 4, 2016

Manufacturers are reaping financial benefits from the robust green bond market that grew to $55 billion / yr. in just the last three years.

(Capital Markets Partnership – Mike Italiano: 3-31-16) Green Bonds are reducing carbon and other pollution as a very important addition to the traditional global capital markets bond function of providing an investment vehicle, tradable instrument, and bank underwriting fees. Wind and solar projects have been frequent green bond assets especially by the World Bank: http://treasury.worldbank.org/cmd/htm/WorldBankGreenBonds.html

Investors with over $70 trillion in assets want to buy green bonds, thus causing a rapidly growing market with bonds selling out providing cheaper cost of capital, higher valued bonds, and investors accepting lower bond yields.

Manufacturers also benefit from brand and share value improvement provided the green bonds are based on activities documented to reduce pollution and avoid greenwash which green bond investors are very wary of.

Greenwash is unlawful and can destroy brand and increase liability risk. For example, according to The Wall Street Journal (3-28-16), the Federal Trade Commission (FTC) filed a complaint against a leading car manufacturer for misleading claims touting its diesel vehicles as environmentally friendly, while admitting in enforcement actions initiated by the government that it installed some 600,000 U.S. vehicles with software meant to trick emissions tests.

Most manufacturer green bonds have been for LEED green buildings, hybrid cars, wind farms, and solar construction, e.g. Apple and Toyota green bonds.

Apple's $1.5 billion corporate green bond is paying for the company's renewable

energy, energy and water efficiency, and green building projects supporting its manufacturing and office buildings. Apple's preliminary 2013 green bond prospectus states the bond will help reduce carbon and other pollution and toxic substances used in manufacturing.

Apple stated the primary purpose for its green bond is to *"allow investors to show they will put their money where their hearts and concerns are"* according to Reuters. Apple is the first computer and phone manufacturer to issue a green bond. The UK's *Inquirer* (5-3-13) reported that the bond oversubscribed many times (sold out), which provides financial benefits through greater bond proceeds and cheaper cost of capital.

Toyota's $1.75 billion green bond financed more sales and leases of hybrid cars that have greater fuel efficiency and reduced tailpipe emissions. The bond was initially set at $1.25 billion, but due to strong investor demand it quickly oversubscribed and issued at $1.75 billion according to Toyota Financial Services.

Toyota announced that the *"Green Bond program is unique in the auto industry and enhances Toyota's leadership reputation for green innovation"* (6-18-15 Toyota press release).

The bond finances cars with minimum EPA-estimated MPG of 35 city / 35 highway and California Low-Emission Vehicle II (LEV II) certification of super ultra-low emission vehicles (SULEVs) or higher, which would include partial zero emissions vehicles (PZEVs) and zero emissions vehicles (ZEVs).

Unilever's $360 million corporate green bond finances waste, water, and energy reduction in manufacturing. The bond was 3x oversubscribed in three hours with many new investors. In addition to oversubscription, investor diversification reducing risk is an important benefit to bond issuers as emphasized by DC Water's CFO Mark Kim. The utility's $300 million green bond received orders for $1.1 billion allowing more proceeds with the bond finally issued at $350 million according to Kim.

Unilever's CEO Paul Polman, whose company makes Lipton tea, Magnum ice cream and Dove soap, said sustainable consumption makes business sense because it

"saves us money," according to the Financial Times (3-19-14). The peer-reviewed *Green Bond Business Case* released at the New York Stock Exchange documents ten years of increased profitability from sustainable manufacturing due to reduced operating costs from less waste, and energy and water efficiency.

Leading underwriters are structuring green IPOs (initial public offerings), green corporate bonds, and cheaper cost of capital programs for certified sustainable manufacturers meeting consensus underwriting standards that document pollution reductions, social equity, reuse, reduction of toxins over the supply chain, certified compliance with the FTC's environmental marketing guides, and increased cash flow. Standard development and approval was led by Standard & Poor's, Allianz Global Investors, UBS, and National Wildlife Federation.

Sustainable manufacturing bonds are expected to be a large and long term market due to:

- Substantial and pent-up investor demand and resulting financial benefits to manufacturers
- Interest by purchasers for more certified sustainable products
- Increasing regulatory constraints on carbon as well as growing and substantial divestment and stranded assets
- Increasing regulatory constraints on carbon including divestment
- Standard & Poor's planned climate credit rating downgrades to warn investors as required by law
- Liability risk reduction
- Increased profitability of certified sustainable manufacturing

Think nothing is made in America? Output has doubled in three decades

written by admin | April 4, 2016

U.S. manufacturing isn't dead; factories are running at close to a record pace

(Market Watch – Rex Nutting: 3-28-16) The U.S. manufacturing sector doesn't get any respect. Ask a random sample of people on the street and you're likely to hear that America doesn't make anything anymore, that China, Mexico and Vietnam took all of our factories, and that the only jobs left in America are flipping burgers and cleaning hotel rooms.

"Throughout history, at the center of any thriving country has been a thriving manufacturing sector," says presidential candidate Donald Trump. "But under decades of failed leadership, the United States has gone from being the globe's manufacturing powerhouse — the envy of the world — through a rapid deindustrialization."

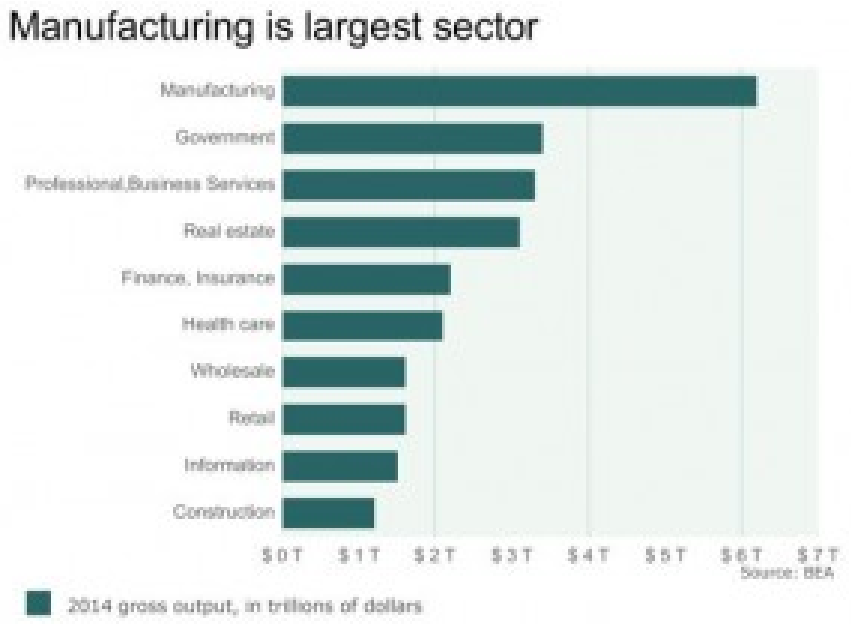
As with all myths, there's some element of truth in what everyone says.

The number of jobs in the manufacturing sector has declined by about 5 million since 2000, falling from 17.3 million at the turn of the century to 12.3 million in 2015.

During World War II, when America was the Arsenal of Democracy, manufacturing provided more than a third of civilian jobs in the U.S., but that share has declined to only 8.7% in 2015. Only one of every 11 jobs is in a factory. Retail, health care, professional and business services, and leisure and hospitality services now employ more workers than manufacturing does.

The decline in manufacturing jobs certainly makes it seem as if America has been deindustrialized, but it's not so. America still makes lots of stuff, but the number of jobs has shrunk because it doesn't take nearly as many workers as it used to.

Here are four surprising facts about American manufacturing you may not know.



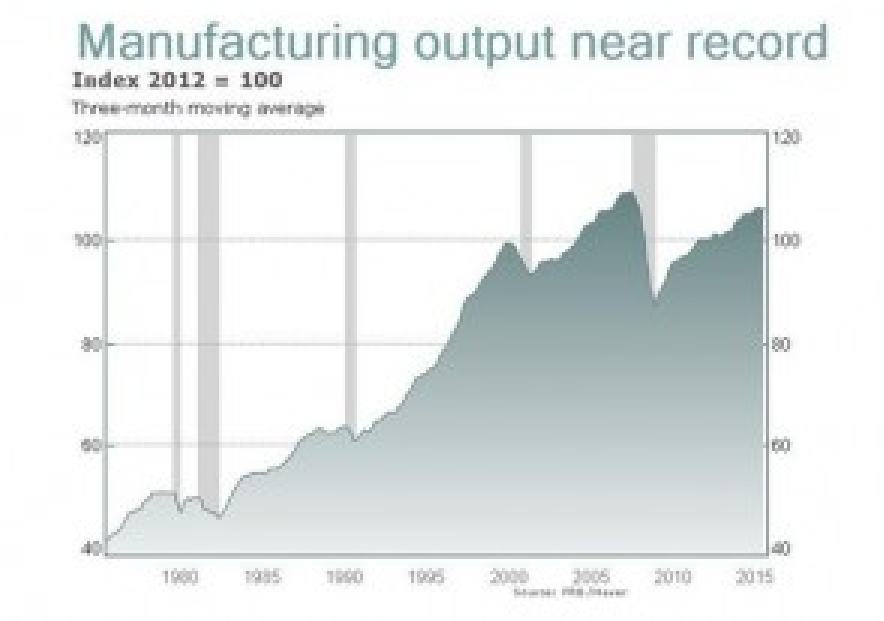
Surprising Fact No. 1: Manufacturing is the largest and most dynamic sector of the U.S. economy.

China became the leading manufacturing economy in the world in 2010, but the United States maintains a strong second-place standing. The *value added* by U.S. factories is more than $2 trillion a year, equal to the next three countries (Japan, Germany and South Korea) combined. U.S. manufacturing is still the envy of the world.

Gross output of U.S. manufacturing industries — counting products produced for final use as well as those used as intermediate inputs — totaled $6.2 trillion in 2015, about 36% of U.S. gross domestic product, nearly double the output of any of the other big sectors: professional and business services, government and real estate.

Manufacturing is at the center of the economy; it's highly connected with most other sectors, such as transportation, retail, mining, utilities and business services.

Manufacturing companies also account for about 77% of what the private sector spends on research and development each year. If it weren't for manufacturing, there would be very little innovation in the United States.



Surprising Fact No. 2: Manufacturing output is a near a record high.

Technology and new ways of organizing work have revolutionized the American factory since the Golden Age of the 1980s. *Today, U.S. factories produce twice as much stuff as they did in 1984, but with one-third fewer workers.*

Total production of U.S. factories peaked in 2007 before falling by 18% during the Great Recession, according to the Federal Reserve's industrial production report, which measures the volume of goods produced rather than the market value of those goods. The manufacturing sector has nearly recovered from the recession; output in 2015 was within 3% of the 2007 level.

But factory output has now stalled, with a strong dollar boosting demand for foreign-made goods at the expense of things made in the USA. It may take a few more years of growth to beat that record.

The output of durable goods was at an all-time high in 2015, more than triple what it was in 1980 and double what it was 20 years earlier. The production of electronics, aerospace goods, motor vehicles and machinery are at or close to all-time highs.

On the other hand, the production of nondurable goods is still down 7% from the peak. The output of the food and petroleum industries are at record highs, but the output of the chemicals, paper and printing industries are all off significantly from

the pre-recession peak.

And, of course, other industries have nearly disappeared. The output of the apparel industries is down more than 80% since the heydays in the 1980s, while the output of textile mills is down about 50% since 2000. Those are the factories and jobs that are really gone for good.

When you buy a gallon of gasoline, tip your hat to the American workers who made it.

Surprising Fact No. 3: Refined oil is America's top manufactured good.

Most Americans use something every day that's made in America without ever thinking about where it's made: gasoline.

The crude oil may come from Canada, Saudi Arabia or North Dakota, but it's refined right here in America.

Refined petroleum products — such as gasoline, fuel oil, jet fuel and liquefied refinery gases — are America's top manufactured product, with a value of shipments going out the factory door of nearly $700 billion in 2014, more than four times as much as the No. 2 product: light trucks.

America's other top manufactured products are pharmaceuticals, airplanes and automobiles. Rounding out the top 10 are iron and steel, animal slaughtering, plastics, organic chemicals and petrochemicals.

American companies sell more airplanes to foreigners than any other kind of manufactured good.

Surprising Fact No. 4: America also exports a lot of gasoline.

Despite what the haters say, the U.S. exports a lot of manufactured goods: $1.3 trillion worth in 2015. Last year, the leading exported manufactured good was

civilian airplanes worth $63 billion, followed by auto parts ($58 billion), pharmaceuticals ($55 billion), autos ($55 billion), and gasoline, diesel and other refined oil distillates ($46 billion).

Other top exports include semiconductors, telecommunications equipment, medical equipment, plastics and airplane engines.

In 2014, before the price of gasoline tumbled along with the price of crude oil, refined oil was America's biggest exported good, worth $62 billion.

Conclusion

American manufacturing isn't dead by any means. But the loss of good-paying manufacturing jobs has devastated the working class, and made reaching the American dream more difficult. Technological advancements and the rise of low-skilled manufacturing in China and other developing nations mean that fewer Americans work in factories, just as technological advancements 100 years ago meant that fewer Americans worked on farms.

Most Americans now work in service-producing industries, where inequalities in opportunities, skills and incomes are more apparent. Recreating an economy that provides equitable growth won't be easy, especially if we pine for the good old days when a third of us worked at the factory.

Those days are gone for good, even if U.S. factories still churn out lots of items that are Made in the USA.

Look Out China, US Manufacturing

is Headed for No. 1

written by admin | April 4, 2016

U.S. expected to take crown as most competitive manufacturing nation by 2020

(IW – Steve Minter: 3-31-16) Advanced manufacturing technologies are helping to push the United States back toward being the most competitive manufacturing nation in the world, according to a new survey of global CEOs and other senior executives.

While China is the world's most competitive manufacturing nation, according to the 2016 Global Manufacturing Competitiveness Index developed by Deloitte and the Council on Competitiveness, the U.S., now ranked second, is expected to take the top spot by 2020.

U.S. manufacturers are investing in technologies such as predictive analytics, the Internet of Things (IoT), smart factories, and advanced materials that will be keys to improved competitiveness in the coming years. Other traditional manufacturing powerhouses – Germany, Japan and the United Kingdom – are making similar investments that will maintain or improve their competitive positions.

While technology is a critical factor in future competitiveness, *manufacturers rank talent as the most critical driver of competitiveness*. Just behind is cost competitiveness and productivity, not surprising given slow growth in most economies, and then supplier network.

What accounts for China's anticipated drop to second in manufacturing competitiveness? Though China has increased its investment in R&D, the economy is slowing and manufacturing activity has dropped, resulting in excess capacity. The report notes that China's auto industry has capacity utilization of 70% versus nearly 100% in 2009. China also is seeing a rise in labor costs, up five-fold since 2005.

"Concerned by rising labor costs and declining cost arbitrage between advanced economies and China, some companies from advanced economies have moved their production to alternate low-cost nations or back to their home nations," the report states.

Compared to the 2013 survey, U.S. manufacturing executives were more favorable about policies in the country. They cited as helping to create a competitive advantage U.S. policies on sustainability, technology transfer, monetary control, science and innovation, foreign direct investment, intellectual property protection, and safety and health regulation. Working against U.S. manufacturers, said survey respondents, were policies on corporate tax rates, healthcare, labor, and taxation of foreign earnings.

The survey shows two strong regions for manufacturing have emerged. For North America, the United States, Canada and Mexico are all in the top 10 most competitive countries today and will remain so in 2020, executives predict. By 2020, the top 10 is also expected to have five Asia Pacific nations – China, Japan, South Korea, Taiwan and India. India is expected to jump from number 11 in 2016 to number 5 in 2020.

Once growth darlings, the BRIC nations have felt the brakes applied on their economies. Brazil fell from the eighth most competitive nation in 2013 to 29th in 2016. Russia dropped from 28th in 2013 to 32nd in 2016. China and India are expected to remain in the top 10 most competitive nations.

Likely to take an increasingly important role in global manufacturing are the so-called Mighty Five – Malaysia, India, Thailand, Indonesia and Vietnam. "These nations could represent a 'New China' in terms of low cost labor, agile manufacturing capabilities, favorable demographic profiles, market and economic growth," the report stated.

The report concludes that the most competitive manufacturing nations are embracing higher-value manufacturing profiles reflective of Industry 4.0. "In the wake of this transformation, the days when a country could establish a position of manufacturing dominance on the back of a single point of strength, such as cost competitiveness, are decidedly gone," the report notes. "In fact, leading countries are taking a much more balanced approach to talent, cost competitiveness, and innovation to set themselves apart from the global crowd."

How a Best Plant Prepares Its Future Workforce

written by admin | April 4, 2016

Among the most effective tools Pratt & Whitney's North Berwick, Me., plant uses to attract young people to manufacturing is plant events that show them the high-tech machining used in producing jet engine parts.

(IW – Steve Minter: 3-21-16) "If you don't build it, you're not going to have it."

Patrick Regan, product director at Pratt &Whitney's North Berwick, Maine plant, isn't talking about a specialized tool or an exotic component for one of the jet engines Pratt produces. He's referencing a necessity for every U.S. manufacturer – developing a robust workforce with the skills necessary to manufacture 21st Century products.

The need is particularly pressing at the North Berwick plant, a 2015 IndustryWeek Best Plants winner. The plant, which started up in 1979, is facing the prospect not

only of baby boomer employees retiring but also the demands of a huge modernization and expansion project aimed at increased production of components and modules for new commercial and military jet engines. In 2015, the plant hired 186 employees, bringing its total workforce to more than 1,400. The local workforce, Regan explains, simply won't provide the numbers of skilled employees needed without a concerted effort by the plant to attract and train new manufacturing workers.

"We're in a huge investment cycle right now," says Michael Papp, the general manager. "Spending the money wisely is important." The plant is expected to spend a total of $150 million on physical plant improvements and new processes and equipment that will make the plant more productive and position it for the future. But that won't happen just by putting in new machinery, he emphasizes.

"Pat and his guys are out there making sure we get the equipment in. That's important but you can put equipment anywhere," Papp says. "The difficulty is getting the people with the skill sets that make you competitive."

Papp and his team are tackling that challenge in a variety of ways. For the long term, they use community outreach to fight negative stereotypes about manufacturing and show the opportunities that it provides. Those efforts range from visiting high schools to inviting Eagle Scouts in for tours and hosting the local United Way banquet.

"We invited about 20 counselors from grade schools in the area," notes Deb Chipperfield, the human resources manager. "We brought them in, did a presentation and then took them out into the plant to show that this is high-tech machining in a clean, modern facility with a skilled and collaborative workforce. This is not a stereotypical factory environment from 30 years ago. This is a great place to work and learn and grow. They can transfer that message when they are talking to the youth about careers and manufacturing.."

In April 2013, North Berwick created an apprenticeship program to fuel the skilled worker pipeline. Apprentices go through rotation assignments in various areas of the plant such as machining, coatings and assembly. They also go to school during this time. When the first class graduates in March 2017, they will be certified in the

machine trades by the state of Maine and will have an associate degree from York County Community College.

In a time of rising student debt, one attraction for young people is that they can work at North Berwick while getting their degree. A student can work on afternoon or night shifts, or on weekends, and the company will pay for their education, Papp notes.

Plant officials underscored the importance of building relationships with local colleges.

“Five years ago, York County Community College did not have any machining programs,” says Papp. Plant officials worked with the school to set up a curriculum and donated surplus machinery and $90,000 to the new program. Today, the school has added a building for its manufacturing programs, purchased equipment and offers both 1-year certificate and 2-year associate degree programs in precision machining. For graduates of the program, Papp notes, “In essence, you are writing your ticket to a pretty good career.”

Filling the plant’s manpower needs involves extra effort for a leadership team already overseeing a physical plant transformation. In 2014, for example, the plant held an onsite job fair.

“We thought we would try a little job fair,” recalls Chipperfield. “We had over 600 people come in.” Applicants lined up onto the street for the event, which made for a very long and successful day.

More recently, the plant has been holding large interview events, dubbed “superdays,” on Saturdays on a quarterly basis. The plant brings in 40 people and divides them up with four teams of an HR manager and a supervisor for interviews. Papp said doing this on a weekend eliminates employee conflicts with busy schedules and also helps candidates who might have trouble coming in during the workweek.

Pratt is also partnering with YCCC on an onboarding program. Before they step on the production floor, new employees go through a six-week program, conducted by

college instructors and Pratt subject matter experts, that trains them on basic shop math, reading blueprints, machining, safety, quality and other aspects of their new job. Training doesn't stop there. The plant has over 300 certified trainers in its workforce who provide continuing on-the-job training to employees.

All of this training helps to reinforce a work culture that strives for perfection in the products it makes.
"We spend a lot of time putting visibility on the importance of our product," says Leo Dionne, the plant's transition manager. "We are making jet engine components. There is no space for errors with these parts."

U.S. Manufacturing Retaining Its Competitive Edge

written by admin | April 4, 2016
(Manufacturing Leadership – Jeff Moad: 3-22-16) Despite significant headwinds brought on by the dramatically strengthening U.S. dollar and upheaval in the oil and gas industry, the U.S. manufacturing sector remains the most competitive worldwide, according to a new report by economics forecasting and modeling company Oxford Economics.

Impressive and ongoing productivity gains among U.S. manufacturers over the past few years as well as easy access to robust domestic markets have offset the strong dollar, collapsing oil prices, and other factors such as moderately rising wages, are continuing to provide the U.S. manufacturing sector a sustained competitive advantage over most other countries, according to the report from Oxford, which is a commercial venture that partners with Oxford University's business college.

The report also predicts that, barring an unexpected additional surge in the dollar's value on global markets, the U.S. manufacturing sector will continue to enjoy a

competitive advantage over at least the next year.

“Since the US manufacturing sector’s competitive edge emanates from a combination of higher absolute productivity than most of its peers, solid productivity growth partially offsetting wage growth, and a myriad of other indirect advantages, including low energy costs, a stable regulatory environment, and proximity to a large domestic market, we believe it would take a substantial further appreciation of the US dollar to make it lose its global leader position,” states the report, authored by Oxford Economics’ Head of US Macroeconomics Gregory Daco and Director of Industry Services Jeremy Leonard.

The report said the basis of U.S. manufacturing’s continued strong competitive position is increasing productivity. The productivity of U.S. manufacturers has risen by 40% since 2003, outpacing competitors such as Germany (23%), the UK (30%), and Mexico (18%). While productivity of manufacturers in China and India has more than doubled over the same period, the report notes, U.S. manufacturers in 2016 are still nine times as productive per employee than manufacturers in China.

“In 2016, US manufacturing productivity was 25% higher than the second best economy, Japan, and 45% higher than in Germany,” the report says. “Compared with emerging economies, the US manufacturing sector remains 80-90% more productive than Mexico, India, Brazil and China.”

Besides enjoying a continued productivity advantage, U.S. manufacturers benefit from a wide range of other factors including higher research-and-development spending, access to an agile and well-educated workforce, relatively less bureaucratic red tape, better intellectual property protection, lower energy costs, and proximity to large markets.

The competitiveness of U.S. manufacturers has also benefited from rising labor costs in some countries, particularly China, the report finds. While hourly compensation in the U.S. was 42 times higher than in China in 2003, it has since fallen to 9 times higher than China in 2009. The hourly compensation disparity between the U.S. and Mexico has been much more stable over that period, and today U.S. labor costs are 7 times those in Mexico.

But when hourly wages are factored with productivity rates and exchange rates, the Oxford Economics study says, labor unit costs of U.S. manufacturers has essentially reached parity with those facing manufacturers in China. While unit labor costs in China were 2.5 times cheaper than those in the U.S. in 2003, the report says, today they are only 4% cheaper in China than in the U.S.

Due to fairly flat wage growth between 2003 and 2016, unit labor costs in Mexico are now 10% cheaper than in China and 16% cheaper than in the U.S.
The only major economy to have pressed a significant competitive advantage over that period compared to the U.S. has been Japan, where unit labor costs are now 25% less than those faced by U.S. manufacturers thanks largely to slow wage growth over that period, improved productivity, and a massive devaluation of the yen.

U.S. manufacturing verticals that have enjoyed the greatest drops in unit labor costs, the report says, are computers and electronics, transportation equipment, and primary metals. Less effective at reducing unit labor costs have been U.S. manufacturers in the chemicals, fabricated metals, and apparel sectors.

The report predicts that U.S. manufacturers will retain their competitive advantage, particularly if, as expected, the rise of the dollar slows. “If, however, the dollar were to appreciate another 20% over the next five years, and remain at that level, this would represent a much more important dent in U.S. competitiveness,” the report warns.

(Jeff Moad is Research Director and Executive Editor with the Manufacturing Leadership Community. He also directs the Manufacturing Leadership Awards Program.)

PennTAP Advanced IT Teams with the Applied Research Laboratory

written by admin | April 4, 2016

PennTAP Advanced IT has recently shared a report by the Applied Research Laboratory at Penn State, titled *Understanding Security.* This study encourages immediate action to secure critical information at small to medium businesses (SMBs). The realities of escalating informational threats to SMBs are shown through examples and details of attacks. A list of 100 things under $100 explains how to mitigate risks and vulnerabilities.

Read more here.

Attention Expanding Manufacturers – This project may qualify for savings with tax-exempt financing

written by admin | April 4, 2016

US TREASURY WILL PAY UP TO 40% OF A MANUFACTURER'S INTEREST EXPENSE TO FINANCE EXPANSION PROJECTS.

Are you a manufacturer? Are you expanding? Are you investing in real estate or equipment? If you answered yes to these questions then you probably qualify for a huge subsidy from the US Treasury. The feds will subsidize up to 40% of your interest expense to fund your expansion project.

Here is an example of a company that could take advantage of the program:

Custom injection molder Gemini Plastics Inc. has invested about $1.5 million in capacity expansion and upgrades to keep up with expected sales growth of 20 percent this year.

“We’re getting out to be proactive and to try to diversify,” Gemini business development manager Bob Holbrook said in a phone interview.
In the past nine months, the privately-owned company has installed five new Nissei injection molding presses with clamp forces ranging from 110 to 500 tons and a 140-ton Haitian press at its headquarters plant in Fallsington, Pa., and in Chihuahua, Mexico, for new business and growing orders with existing customers. It also bought three new Yushin robots and two Matsui dryers and improved computer capabilities.

Holbrook said customer growth in North America is the key driver for the company’s climbing sales but Gemini is also alert to any reshoring molding work that could land from overseas. He declined to provide sales figures.
Gemini has a diverse customer base in electronics, industrial, consumer and point of purchase display markets. The expansion program has created 12 new jobs, bringing the company roster to more than 150. The firm’s President, CEO and owner Alan Breece founded Gemini in 1969 as a custom molder. It has grown to about a 40-press business, ranging in size from 28 to 500 tons of clamping force.

[This article was originally featured by Plastics News]

Making Manufacturing Cool Again

written by admin | April 4, 2016
When people ask me what industry I work in, they’re usually surprised to learn that it’s manufacturing. Why? I’m a New York City native who never learned any sort of manufacturing skills. I went to school for publishing and print, and then received a job at a marketing agency. But then I found myself at THOMASNET, a company steeped in manufacturing and supply chain history. And it’s here, writing for all of

you every week, where I discovered something.

Manufacturing is incredibly cool.

And not cool in a flashy technology or dime a dozen trend kind of way. Not the popular kid in high school destined to be forgotten once they leave cool. No, manufacturing is the classic movie, timeless music, ahead of the curve sort of cool.

So many developments in this world are thanks to this industry. The current bandwagon trends of 3D Printing, automation, and the Internet of Things have been around for decades. These technologies have risen from obscurity and made their way to buzzword fame. Yet somehow we haven't gotten the credit we deserve. Somehow, we lost what made us special in the public eye.

Which is baffling. This country has reached its greatness partially by its deep investment in the industrial space. We have a whole time period named after our advancements, introducing textiles, steam power, mechanics, and countless others. In the last century alone, we have had innovations as small as the transistor to as out of this world as the Mars Curiosity Rover. So what happened?

Partial blame can be put on public perception and media promotion of the industry. It is believed that factories are unsafe and undesirable compared to an office job, which is simply untrue. We have to work to change perception. Companies like GE have been doing a great job at tackling this, addressing issues from manufacturing job opportunities to utilizing technology. The public should be more aware that their smart phones, wearables, computers, automobiles, and any number of other technologies could not exists were it not for the manufacturers and engineers who make it possible every day.

While some companies are educating the public through marketing, another tactic is to educate and support the next generation of manufacturers. This can be done through implementing STEM curriculum across all education levels. There was a time when shop class was something students looked forward to, and STEM curriculum is an updated way to recapture the interest of students who would have taken those courses. We have to encourage students to take these classes and develop their interests so they pursue them at advanced education institutes. (Side

note: We also have to stop saying manufacturing is a good alternative to college. That's not helping.)

Additionally, supporting competitions, conferences, and experiences around the industry can help elevate its status to the upcoming generation. For instance, THOMASNET is sponsoring the Seaford Robotics Club to participate in the FIRST Robotics Competition. The sponsorship will allow the team to purchase the parts they need and allow for a fun environment where they are also learning. Get involved by presenting opportunities to students, which could lead them to develop interests in vocational careers. It's a great way to give back, raise the public interest, and support the future of the industry.

Like many of the challenges the industry faces today, this is not an easy fix. The solution is for every member of this community to pitch in and help turn the tide. Manufacturing shouldn't be a secret hidden away due to misconception. It should be celebrated and seen as a viable career option to those entering the workforce. Together, we can make it happen. (Zachary Smith, ThomasNet)

The CEO Perspective: Leadership Challenges for Manufacturers

written by admin | April 4, 2016

(Business, U.S. Manufacturing) Recently I came across the PriceWaterhouseCoopers Annual CEO Survey online and listened to several 3-6 minute videos about leadership challenges for manufacturers. The speakers talked about both new and old trends they are focused on as company leaders, with several that could apply to small and medium-sized manufacturers.

The top five leadership challenges included harnessing digital media, integrating diversity of the workforce, technology adoption in manufacturing, developing

emerging markets and partnering.

Alex A. Molinzaroli, Chairman, President and CEO of Johnson Controls, Inc. spoke about deemphasizing North America and Europe, as growth lessens there, and expanding into emerging markets. A second theme was partnering to accelerate their growth, creating more co-dependency with suppliers and customers. Improving the diversity of their company is also top of mind and the CEO needs to relate to employees by being flexible and trusting people.

A second interview was with Rodney O'Neal, CEO and President of Delphi Automotive Systems LLC talking about how advanced car systems are today (did you know there are over 50 computers in cars today?) and what features we might expect in the near future through technology adoption. He discussed the idea that you can count on change, therefore the CEO has to connect the dots, listen to what the world is saying to create the vision, strategy and tactics for the company and decode the message.

Denise Morrison, President and CEO of Campbell Soup Company US talked about building purpose, a shift in demographics and the change in families that have affected their product lines, using eCommerce with retailers and their customers and the growth of a middle class in emerging markets. As the millennial generation grows up, both as customers and employees, the company faces challenges in products and within their own culture they have to respond to.

Perhaps my favorite video was the interview with Alan Wilson, Chairman, President & CEO of McCormik & Company. He talked about this 125-year-old spice company learning best practices from other industries, dealing with cybersecurity, working with social networks for new product development and using lab robots to mix and identify origins and flavor notes. He also spoke to diversifying their workforce to leverage talent around the world and a natural curiosity that a CEO must have to be successful.

These are short, poignant videos that are interesting to listen to and not just because

3 of the 4 companies have been MEP clients. If you are interested in executing any of the concepts discussed in these videos around emerging markets, technology adoption, workforce development or supply chain partnering, contact your local MEP Center. They can help translate large company successes into success with your business.

Where Your Productivity Problem Is Hiding

written by admin | April 4, 2016

The farther we get from the production line, the less adept we are at managing productivity.

(IW – William Heitman: 3-10-16) A global auto parts manufacturer was introducing a new engine component and wanted to use more digital technology for its assembly and packaging.

Its industrial engineers designed a full-scale prototype and proceeded to testing. Videos and other documentation ensured relentless scrutiny, fine-tuning and consistency.

The results were impressive: factory labor was cut by more than half.

Although the team's actions seemed instinctive, they followed a centuries-old "industrialization" process that balances three characteristics of effective work: *standardization, specialization of labor* and *management of worker autonomy*. As they would eventually learn—painfully—these characteristics apply to any work anywhere in the company.

For example, the new robotics required more rigorous levels of parts interchangeability. This required that existing standardization for parts be improved to levels measured in microns. Next, the work activities had to be redistributed among new machines and workers. The existing specialization of labor was redesigned. Job roles and tasks were restructured. Finally, the new robotic process required changes to the workers' traditional decision-making authority—their autonomy. A new schedule of worker decision authority was specified and managed as precisely as a parts list for inventory.

The goal of industrialization is to harmonize the operation of tangible capital—machinery—with intangible capital, especially human activity and know-how. Well-documented records of work methods allow businesses to convert the skills of individual workers, which are costs, into institutional knowledge, which is an asset.

This institutional knowledge is the company's "experience curve." It is a critical component of the intangible capital that accounts for a majority of the value of businesses today. It provides a formidable barrier to competitors. And, ideally, it advances in a never-ending march of increasing refinement.

Like any asset, however, the experience curve can be underused and its value wasted. Anything that reintroduces errors, ambiguity or variance undermines a painstakingly developed experience curve.

Often this wasted value is the unintended consequence of an otherwise well-intentioned improvement. Call it "Virtuous Waste."

Unfortunately, a malfunctioning experience curve will not leak oil or flash a warning buzzer. This intangibility, plus the good intentions that inadvertently created the waste, means the symptoms will likely be overlooked and misinterpreted.

And that is precisely what happened a year later at the auto parts maker. Downtime had increased gradually and persistently. No one knew why. To investigate, engineers added a new digital entry station to each machine operator's station. The plan was for workers to enter the reasons for machine downtime directly into the plant control system.

In theory, this was an excellent idea. In practice, it only created a new problem: each digital station used a free-text entry field. No standardized directions, codes or drop-down menus were provided. This allowed each operator to describe a downtime root cause "using his own words." The result: an entry station at a single machine typically generated more than a thousand "falsely unique" descriptions.

In hindsight, the problem was obvious. The implementation of the digital entry stations ignored the three elements of industrialization: standardization, specialization of labor and management of worker autonomy. The solution was simple: integrate these elements into root cause identification.

The hard part was recognizing that the well-intentioned digital improvements had backfired. Virtuous Waste is difficult to spot and painful to acknowledge. It's a psychological problem, not a technical problem.

The improvement team worked quickly to industrialize. It discovered that many causes were merely identical problems worded differently. Fewer than a dozen causes accounted for three-quarters of the downtime. Standardized drop-down menus were added to the entry stations.

More than half of the newly standardized causes, however, involved operator error: misunderstanding the operating instructions, mistreating the equipment or misdiagnosing the problem. Thus new rules to manage worker autonomy were needed. The plant changed workers' "decision rights" and introduced specialization of labor for diagnosis. An operator could enter simple causes. More complex causes required consultation between the operator and his supervisor. A third category required diagnostic tests prior to entry. All of this was documented on laminated cards mounted next to the entry stations.

Downtime was cut by three-quarters in eight months.

Want to find a treasure trove of Virtuous Waste improvements in your business, as this manufacturer did? Search beyond historically industrialized areas. Industrialization receives generous management attention when it involves the direct activities of production. Look at worker activities that are about production, that are one step removed from the line. Scrutinize them every bit as scrupulously.

(William Heitman is managing director at The Lab Consulting, which has been implementing non-technology business improvements since 1993. He holds an MBA from The Wharton School of the UofP.)