

# Green Manufacturing Practices in America Can Help Profits, Will Help Planet



More U.S. Firms Going Green,  
Yet Effort Must Grow

*May 2011*



© May 2011 copyright Fabricators and Manufacturers Association, International®

## Green Helps Profits, Planet



It's a perfect storm – but a positive one. Two strong forces today are converging in the U.S. manufacturing sector that can deliver a whirlwind of benefits for those companies – and the environment. First, at long last, American industrial executives are, slowly but surely, recognizing the importance of preserving and enhancing the use of our precious natural resources through the use of green energy practices in a vast array of manufacturing applications. Second, it's also becoming apparent to manufacturers that this altruistic perspective, unlike many, can actually have a positive impact on their

bottom lines by delivering cost-saving benefits both short term and long term. In addition, there is a plethora of new opportunities for suppliers of green technology and solutions to target these companies and capture their business.

A new study of manufacturing professionals confirms the value of this strategy. When asked by IFS North America what's driving their companies to adopt and implement green initiatives, "it's a management directive" shared top billing on the list, cited by 54 percent of respondents. "It's a social responsibility" also was cited by 54 percent of the manufacturers, followed closely by "customers are demanding it" (50 percent).

In addition, a 2011 study by the Material Handling Industry of America (MHIA) revealed a whopping nine in 10 executives (92 percent) surveyed say their companies believe that sustainable initiatives have the potential to both save money and resources.

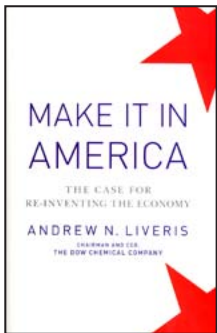


*Green Manufacturer*, the specialty trade publication launched by the Fabricators & Manufacturers Association, Intl. (FMA) in early 2010 to specifically address sustainable manufacturing practices and opportunities, announced in March of 2011 the goal of adding to its 75,000 circulation appropriate subscribers from all the manufacturing companies that are included in the Fortune 1000 in order to help them achieve greater efficiency, sustainability, and global competitiveness. These are the companies with the greatest influence over the supply chain, and their acceptance of sustainable practices will lead to a faster adoption by all manufacturers.



The U.S. manufacturing sector can play a significant role in meeting the energy demand challenge. According to The Manufacturing Institute and the U.S. Department of Labor, the industrial sector accounts for nearly one-third (31 percent) of total end-user consumption in the United States, even surpassing transportation (28 percent). Residential (22 percent) and commercial (19 percent) rank third and fourth. Thus, green practices employed by manufacturers will impact a large percentage of energy use.

Indeed, greener, more energy-efficient manufacturing environments represent the ultimate win-win. A recent study by Aberdeen Group on sustainability initiatives conducted by more than 200 companies, many of them in manufacturing, illustrates the benefits of green manufacturing practices. Those deemed “best in class” achieved an impressive 9 percent reduction in carbon footprint while cutting energy costs 6 percent, facilities costs by 7 percent, paper costs by 10 percent and transportation/logistics costs by 7 percent.



And, it's fairly safe to say that this movement transcends politics. A wide swath of the political spectrum addresses the energy challenges the United States and the world face. As duly noted in his new book, *Make It In America*, Andrew Liveris, chairman and CEO of Dow Chemical, writes, “Energy, clearly, is one of the megatrends defining this century. It is only going to grow in importance as global demand increases.” (Book available at [fmastore.org](http://fmastore.org))

## Major “Catch-up” Needed

Although the greening of manufacturing is starting to permeate plants and factories in this country, America has some major catching up to do when compared to other countries. Just from an image perspective, it is unfortunate the U.S. is not the leader in this arena. More critical, though, is America lagging behind when it comes to competitive issues, as enough challenges already exist today for the U.S. economy in general, and manufacturing specifically.



One must acknowledge that China significantly outpaces the U.S. in the green manufacturing arena. In 2008, China nearly doubled the amount of installed capacity of renewable electricity when compared to the U.S.

According to Dow Chemical's Liveris, in 2009 China invested \$34.6 billion in the renewable energy sector, almost twice the amount that the U.S. spent. China also

became the world's biggest maker of wind turbines in 2009 and the largest solar panel manufacturer in 2010, accounting for one third of the world's solar panels. The world's largest privately funded solar research facility began operation in 2010 in Xi'an, China.

Admittedly, one must recognize that China is not a democracy and can mandate initiatives America likely would not. Yet, it's difficult to dispute that China has made the greatest strides globally in instituting renewable, environmentally-friendly energy initiatives.

Perhaps a more “apples to apples” example is Germany, a mature western European economy. Initially fueled in part by passage of its Renewable Energies Act in 2000, which paid any company or individual who sold back renewable energy to the grid, Germany quickly achieved rather ambitious goals. In 2000, the government set an objective to generate 12.5 percent of its electricity from renewable sources by 2012; it attained that level five years early.

A new goal to achieve a 20 percent level by 2020 likely will be achieved in 2011, according to Liveris. Numerous other facts and figures ranging from the surging number of Germans employed in the renewable energy sector to the number of solar cells it produces would make other countries green with envy.



Another comparison of note: in terms of installed wind energy capacity in 2010, the U.S. at 5,115MW of capacity, ranks second, albeit a distant second, behind China. However, a mere four European countries (Spain, Germany, France and the UK) combined equal America's numbers.

## Yet, America's Green Glass is Half-Filled...and Rising

Despite America's need to take longer and faster strides in this critical area of the movement, a number of recent developments has sparked greater participation from manufacturers in green initiatives. The IFS North America research findings indicate a growing commitment to the movement. Close to 70 percent of the manufacturers surveyed say they make purchasing and sourcing decisions based on environmental impact, carbon footprint or other non-financial requirements, or that they are part of a green supply chain where at least one of their customers requires information on the chemical makeup of their products and their company's environmental impact.

This rising level of commitment – and activity – in many regions of the country is cause for optimism.

## New Government Programs Are Green Catalysts

Countries such as China and Germany have achieved such dramatic success in the industrial green arena due, in great part, to the multi-faceted, substantial national programs that make energy efficiency commitments easier and financially rewarding within their borders. Many U.S. pundits voice frustration with America's lack of any comparable national policies. That issue will not be debated here.

But what can be stated with certainty is the existence of a number of new "assistance" programs established by government



### **Green Suppliers Network**

entities to help manufacturers create sustainable programs. One growing in popularity is the Green Suppliers Network established by the U.S. Environmental Protection Agency (EPA) in collaboration with the U.S. Department of Commerce. Its mission is to help small and medium-sized manufacturers stay competitive and profitable while reducing their impact on the environment.

This is accomplished via the network's "Lean and Clean Advantage." The program works with large manufacturers to engage their suppliers in low-cost technical reviews to identify strategies to improve process lines, use materials more efficiently and eliminate the root causes of waste.

Of course, there is a host of U.S. Department of Energy (DOE) initiatives. For example, the department offers the Industrial Technologies Program Save Energy Now that aims to drive a reduction of 25 percent or more in industrial energy intensity in 10 years. The DOE conducts a number of very ambitious energy efficiency research programs.

And, let's not forget the very prominent Leadership in Energy and Environmental Design (LEED®) rating program. Created by the U.S. Green Building Council, LEED awards projects based on their use of sustainable materials and highly efficient equipment.



The newest kid on this lean and clean block is the Economy, Energy and Environment Initiative, known as E3, a coordinated federal and local technical assistance program to provide manufacturers with customized, hands-on assessments of production processes and assist with the implementation of energy-saving projects. In October 2010, the DOE, EPA, U.S. Department of Commerce, U.S. Small Business Administration and U.S. Department of Labor signed a memorandum in support of this worthy initiative.



One example of how this works in real life is the February announcement by Milwaukee Mayor Tom Barrett of the city's new ME3 program that will invite local manufacturers to participate in a new sustainability initiative to drive down waste in their production processes and cut costs. Federal agencies and local partners, such as universities and the state's focus on energy program, will provide technical assistance. And, even the small town of Tonawanda, N.Y., recently announced its E3 program that will offer businesses technical assessments of their facilities' operations.

One can only be encouraged by the variety of programs manufacturers can tap to become more efficient, competitive and sustainable.

## Academia Joins the Movement

Yet another reason to view America's growing focus on the greening of manufacturing operations with hope is the surge in partnerships between academia and industry.



One program growing in prominence is Western Michigan University's Green Manufacturing Initiative, which in late 2010 received a \$1 million grant from the DOE. The goal: establish a consortium between the school and industry partners to solve "green" related issues and assess what projects they should tackle to reduce the environmental and energy impact of their designs, materials, processes and facilities.

The school's program, launched in early 2010, already has produced numerous real-life results. One example: Two student researchers reviewed a local company's overhead doors and the efficiency of door heaters. They provided design solutions that involved differential steam control valves and proximity sensors to automatically operate the doors. An initial investment of \$5,100 now generates an annual energy savings of \$28,400.



A different emphasis that also enhances green industrial development is the new partnership between Rochester Institute of Technology and Caterpillar, Inc. A \$650,000 gift from the company will fund the Caterpillar Professorship in Remanufacturing that will focus on promoting research, education and outreach in remanufacturing, the technical process through which components and parts are restored to "like new" condition to be reused in manufacturing. The technique, used for decades in the automotive sector, has expanded to the consumer electronics, computer and energy industries.

Multiply the inspiring work of just these two schools to the many other U.S. universities tackling the green manufacturing issue and one begins to feel quite upbeat about how America's young people are responding to the challenge.



## Manufacturing Associations Carrying the Green Banner

---

It is not surprising that America's manufacturing trade groups have made sustainability initiatives a priority, but shall we say the "high energy" these organizations are bringing to this one issue may be unparalleled in the history of U.S. industry. In this case, America takes a back seat to no other country.

This is exemplified by programming at the most recent FABTECH tradeshow, co-sponsored by five leading manufacturing associations, including the FMA. "Make Green by Going Green" headlined the keynote presentation and discussion led by Kristin Pierre, the Green Supplier Network manager from the EPA; panelists from companies implementing successful sustainable practices related their experiences to attendees. Many other seminars addressed the issue, covering topics such as "the lean and green audit," "how to be lean and green with your finishing system," and "converting factory lighting." Similar subjects are planned for the upcoming FABTECH 2011 event.

And, let's look at just one four-month period on a green manufacturing events calendar. To list only a few, there's the FMA's "Zero-Waste-to-Landfill Workshop" featuring a tour of a Subaru plant excelling in such an effort; the "Sustainability in Business Conference," presented by the Paul Merage School of Business University of California-Irvine; the Association of Energy Engineers Globalcon 2011 conference; and the Engineering Sustainability 2011 conference focused on a host of sustainability processes and practices.

Thanks to our high-tech era, many individuals can attend educational sessions from their desks via webinars. Here, too, the industry offers numerous opportunities to gain knowledge on the green issue. One example of many is the recent, "The Business Case for Green Manufacturing" webinar, sponsored by the Green Manufacturer Network. It featured case studies presented by manufacturing executives that addressed how the pursuit of sustainable practices in their operations proved to be profitable.

Without question, thanks to these organizations, the green manufacturing messages are being communicated energetically, offering manufacturers many different routes to travel on their journey to achieve sustainable manufacturing practices.

## Trade Editorial Media Vigorously Showcases Solutions

**“*Green Manufacturer* covers how to implement green manufacturing operations and facility improvements and use energy-efficient, eco-friendly equipment and products in a way that is cost-effective – and sometimes even cost reductive”**

Complementing the work conducted by government, academia and industry is the surge in press coverage devoted to the need for manufacturers to engage in green practices. One striking example is the one-year-old *Green Manufacturer* magazine published by FMA Communications, Inc., the publishing affiliate of the FMA. Even in a turbulent economy, the publishers felt the time was right to take a risk and launch a title devoted to this business-critical subject matter.

In the debut issue, editor Kate Bachman explained why, stating, “With increasing frequency, we have received requests from manufacturers looking to implement sustainable practices, which convinced us that the time is right to look at manufacturing through a green filter.

“*Green Manufacturer* covers how to implement green manufacturing operations and facility improvements and use energy-efficient, eco-friendly equipment and products in a way that is cost-effective – and sometimes even cost reductive,” she added.

In another issue, Bachman noted one does not need to be a “climate change believer to know that the growing global demand on energy will continue to apply cost pressures and constrict its availability, or (know) that being energy independent is a good thing.”

With such perspectives guiding its editorial platform, *Green Manufacturer* is now thriving in its second year, regularly reporting on green manufacturing initiatives, eco-friendly equipment and products, manufacturers with successful sustainability stories, and government updates.

Other magazine titles increasingly devote editorial space to such topics, indicative of the continued, growing interest of manufacturing executives to join the green movement.

## Moving from Theory to Real-Life

Research, projections, initiatives and editorials are all well and helpful. What's truly exciting, educational and inspiring is how these discussions and programs are applied in real-life manufacturing situations. The case studies reported today encompass so many industries and so many manufacturers large and small. Here are just a few examples:

### Car Companies Commit to Renewable Energy

Energy savings have long been a mantra for the automotive industry when designing new cars. Now, this goal is a priority in the production process as well.

- More than half of General Motors' global manufacturing facilities are achieving landfill-free status. At a landfill-free plant, more than 95 percent of waste is reused or recycled. Further underscoring that green is both good for the planet and the pocketbook, GM reports it generates more than one billion dollars in revenue from recycled scrap metal alone.
- At the Ford Motor Co. in Wayne, Mich., solar panels are used to generate about 500 kilowatts of power to augment the conventional power sources in the plant's electrical system. The pilot project may be extended to other Ford plants. In addition to the solar panels, the system has a storage facility that can store 2 million watt-hours of energy. Also, Ford will install 10 electric vehicle charging stations to charge trucks that transport parts between buildings at the manufacturing site.
- Taking it one step further is Freightliner Custom Chassis Corp. (FCCC) of Gaffney, S.C. Once the local landfill's best customer, FCCC, the nation's largest producer of diesel-power chassis for van, buses and other vehicles, dumps zero waste in any landfill. Essentially, FCCC reduced the waste with reusable packing and product redesigns and identifying recycling recipients for all of its remaining solid waste.




*Green Manufacturer* featured the efforts of Freightliner Custom Chassis Corp., Gaffney, SC, in its Sept./Oct. 2010 issue.

### Lighting the Way

For many companies, changing the lighting systems in their plants represents an extremely effective and relatively elementary method to save energy.

- Aqua Lung, a Vista, Calif., manufacturer of diving and snorkeling equipment, installed a "daylighting" system that harnesses natural daylight for the company's 60,000 square-foot facility. Through the use of photocontrols and a dedicated phone line to the local utility to monitor usage, the site achieved an immediate electricity consumption reduction of 33 percent.

- 
- United Displaycraft, a Des Plaines, Ill.-based manufacturer of point-of-purchase displays, turned to the sun to generate “green” electricity and take advantage of government incentives with the largest privately-owned commercial photovoltaic solar panel installation in Illinois. The solar system will pay for itself in four to five years due, in part, to the reduced carbon footprint, a grant from the Community Renewable Energy Program and a 30 percent federal solar tax credit.

### Fabricators a Force

Manufacturers in the fabricating industry are among the leaders in aggressively implementing green tactics:

- DeWys Manufacturing of Grand Rapids, Mich., a precision fabricator, learned from an environmental audit that reducing wastewater was an area it should target. Through increased employee vigilance and better monitoring of equipment, the company cut its annual water usage by 58 percent.
- Rapid-Line Inc., Grand Rapids, Mich., a full-service fabrication and tooling shop that designs, manufactures and finishes metal products, initially focused its green efforts on natural gas consumption. Implementing a variety of measures, such as installing insulation and industrial-grade fans to capture and redirect excess heat from its paint line ovens, Rapid-Line reduced its natural gas consumption significantly while saving \$46,000 annually.
- Colson Caster Corp. of Jonesboro, Ark., illustrates how manufacturers can begin these efforts modestly. An analysis of its operations revealed installing a new air compressor and dryer would be an extremely effective first step. A year later, this single initiative resulted in a 25 percent annual energy savings; a savings of \$2,000 per year in repair costs; a three-year ROI; a reduction in use of 700 gallons of non-biodegradable oil per year...and even a safer working environment.

### “Drinking Up” Energy Savings

These two beverage firms can easily “toast” their efforts to green practices:

- The Anheuser-Busch InBev brewery in Newark, N.J., recently installed two solar PV panels on two rooftops that provide 10 percent of the plant’s electricity. The company has incorporated sustainability initiatives at nearly every stage of beer making, including a heat recovery system, a CO2 recovery system, and 99 percent recycling of its production waste.
- Bacardi Limited in Puerto Rico, home to the largest premium rum distillery in the world, now uses two specialized wind turbines to generate approximately 1 million Kwh per year, accounting for 3 to 7 percent of the power Bacardi uses.

## Competing, Cost-Containing...and Caring

The many programs, initiatives and real-life stories described here dramatically reinforce the win-win aspect of green manufacturing.

It's quite apparent that more and more manufacturers understand the value of sustainability initiatives. Two aforementioned studies revealed nearly identical high numbers of executives who recognize this. Nearly nine of 10 respondents (88 percent) in the MHIA study say that sustainability initiatives will be of even greater importance over the next 14 to 18 months. Similarly, 81 percent of those surveyed by IFS expect green supply chain initiatives to become more important in the next three years. Such numbers truly are overwhelming.

As *Green Manufacturer* editor Kate Bachman spelled out so well in one of her latest "Surveying the Greenscape" columns, "The reality we are living and working in today is that we now compete globally with countries that are heavily subsidizing renewable-energy manufacturers and their export activities.

"We need to recognize that North American industry is not operating on its own little island anymore."

**"The reality we are living and working in today is that we now compete globally with countries that are heavily subsidizing renewable-energy manufacturers and their export activities.**

**"We need to recognize that North American industry is not operating on its own little island anymore!"**

**A White Paper prepared by Fabricators & Manufacturers Association, International®**

833 Featherstone Road • Rockford, Illinois 61107

fmanet.org • info@fmanet.org

Phone 888.394.4362 or 815.399.8775 • Fax 815.381.1371

*Based in Rockford, Ill., FMA is a professional organization with more than 2,100 members working together to improve the metal forming and fabricating industry. Founded in 1970, FMA brings metal fabricators and fabricating equipment manufacturers together through technology councils, educational programs, networking events, industry trade publications including The FABRICATOR®, and the FABTECH® trade show. FMA also has a technology affiliate, the Tube & Pipe Association, International (TPA), which focuses on the unique needs of companies engaged in tube and pipe producing and fabricating. To learn more about member services, industry certification and educational programs log on to [www.fmanet.org](http://www.fmanet.org).*