

Smart, Safe, Sustainable Manufacturing: A New U.S. Industrial Strategy for Competitiveness

By Keith D. Nosbusch, Chairman and CEO — Rockwell Automation, Inc.



As we begin to see signs of an economic recovery, America needs a transformation unlike any other in its history. We can't miss the role that manufacturing should play in this transformation. To succeed at home as well as around the world, we need a comprehensive U.S. industrial strategy for competitiveness that enables our future and takes advantage of the many emerging opportunities such as the transition to a "green" economy. One that focuses not just on R&D breakthroughs and commercializing new products, but also puts equal emphasis on industrial innovation in smart, safe, and sustainable manufacturing.

Innovation must be a high priority to maintain our nation's current but very vulnerable leadership as the world's largest manufacturer. Our public and private sectors have to invest in advanced technology and training that will increase flexibility, lower costs, increase productivity, and make U.S. manufacturing competitive globally.

We need to embrace manufacturing's critical role in our economic future. Numerous studies show that an overwhelming majority — more than eighty percent — of Americans rank manufacturing as the most important aspect of our economy, above technology, energy, healthcare, retail, communications and financial services.

Manufacturing Revolution Goes Unnoticed and Unsupported

As Emily DeRocco, president of The Manufacturing Institute describes, "Cutting-edge technology has transformed manufacturing in ways that are hard to imagine if you haven't visited a factory lately." Today, factories can be smart, safe and sustainable, which is quite the opposite from public perception.

A recent Opinion Research survey found that nearly half of Americans believe the U.S. has lost its competitive edge in manufacturing technology and automation, and think the U.S. manufacturing sector has become less competitive in the past 10 years.

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However, the average American does indeed understand the benefits of manufacturing innovation. Most think investments in innovation would result in high-pay, high-skill manufacturing jobs. Americans strongly support federal, state and local programs that would provide incentives to U.S. companies that invest in technology and automation to stay competitive. That's why a majority of Americans believe it's highly important that President Obama's administration provides a stimulus program to increase the number of automated, modern factories and plants.

A new survey developed by Deloitte LLP and The Manufacturing Institute also validates those findings. An overwhelming majority of respondents surveyed view manufacturing as most important to their standard of living. Nearly three-quarters said that the U.S. should further invest in manufacturing industries.

Congress needs to make sure legislative priorities are in line with those of manufacturers and the general public.

Smart Manufacturing: The Next Era of Industrial Innovation

The potential for manufacturing innovation is enormous. Today control, communications, information and power technologies are converging to enable the next industrial renaissance. At the heart of this renaissance are advanced, smart manufacturing technologies that blend the best in people, physical assets, business processes and data, and seamlessly connect the plant floor to the enterprise, supply chain and the customer. These advanced technologies make manufacturing more productive and globally competitive.

With smart manufacturing, an entire plant can be optimized. Real-time information flows from machine to machine and across production lines. Plant-floor data is networked into enterprise business systems and connected with suppliers or linked to customers. Flexible, reconfigurable and scalable manufacturing equipment can respond to fast-changing consumer preferences. Intelligent machines can monitor their own health, throughput and yield, and report corrective action to maintenance staff. Through collaboration technology employees can share best practices and tap the knowledge and experience of their colleagues across the world.

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Smart manufacturing is a growth engine for a sustainable economy. A \$50 billion investment in retooling factories would generate up to \$120 billion in revenue resulting from increased demand for products, according to a study by the Apollo Alliance, a business-labor coalition. Manufacturers would achieve higher levels of business performance, turn resources into assets, and discover unique opportunities for competitiveness.

Innovation is no longer the exclusive domain of the U.S. It can and does occur around the world. The European Union has already approved 1.2 billion Euros for a new "Factories of the Future" research program as part of their economic recovery plan. Their R&D initiatives and policies aim to "help

EU manufacturers adapt to global competitive pressures by increasing the technological base of EU manufacturing through the development and integration of enabling

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technologies of the future.” The European Union is ahead of the U.S. in the race to re-industrialize their manufacturing base with smart, safe and sustainable manufacturing. This is a race we must win.

While R&D tax credits promote product innovation, we need similar tax credits to promote manufacturing process innovation and allow companies to compete globally. We don’t have to leave good ideas on conference room tables or in R&D labs. We don’t have to send our ideas abroad. By re-thinking manufacturing’s role in our economic base and investing in advanced automation technologies, we can

re-tool our plants into smart factories that become the execution machine for American innovation. And smart manufacturing could be the means to an export-led recovery of the U.S. economy.

Peter Drucker summed it up best: “Innovation is the instrument of entrepreneurship... the act that endows resources with a new capacity to create wealth.” We can create wealth with innovation in manufacturing. Without it, our prosperity as a nation will decline and we will leave the next generation with a lower standard of living.

Government & Public Benefits of Smart, Safe, Sustainable Manufacturing

The priorities of almost every federal agency, including those addressing labor, energy, the environment, and product and employee safety, require some aspect of smart, safe, sustainable manufacturing to achieve their objectives during the Obama administration.

A clear benefit of a productive, competitive manufacturing sector is that it will sustain a greater number of jobs than a declining sector would. The Apollo Alliance study explores the job creation potential of a program to retool the manufacturing sector. Two other recent reports found that investing \$150 billion per year in energy efficiency and clean energy technologies will generate 1.7 million jobs, enough to cut current U.S. unemployment by one percent.

Smart manufacturing is essential for industrial energy management and someday to connect smart plants to the smart grid. Businesses could even measure the carbon footprint of each product they make. Highly-automated, advanced factories protect workers from job injuries, and can better track and trace materials to help ensure consumers get safe, quality products, catching problems before the products even leave the factory or facilitating faster, focused recalls if necessary – while enhancing the performance of inspectors.

The Opinion Research Corporation study cited earlier found consumers recognize that government incentives to invest in highly-automated, modern factories can both stimulate U.S. economic growth and lead to smart, safer and more sustainable production. Americans’ priorities are clear. Now the government must act to meet those priorities.

Last year an interagency workgroup concluded a major six-year study and recommended that smart factories (which they called Intelligent and Integrated Manufacturing) should be one of the federal government’s top three manufacturing R&D priorities.



Establish A New U.S. Industrial Strategy for Competitiveness:

- *Double federal R&D funding for manufacturing innovation*
- *Start with a \$2 billion federal R&D private-public partnership program to develop smart, safe and sustainable manufacturing*
- *Expand the federal R&D tax credits to include investments in advanced technologies that automate and modernize factories*
- *Offset the 17 percent cost disadvantage that U.S. manufacturers face by doing business in America*

That mandate has yet to be funded. We call on the administration and Congress to act now to aggressively promote smart, safe and sustainable manufacturing.

Although the Obama administration has committed to doubling federal R&D in some areas, we encourage them to make smart manufacturing a top priority for federal R&D spending and to double federally-funded support for manufacturing innovation. And that's just to bring us to the level of where we were in the 1970s. This could start with a \$2 billion federal R&D program for private-public partnerships to develop smart, safe and sustainable manufacturing. We also need to expand the federal R&D tax credits to include investments in advanced technologies that automate and modernize factories. Investment in R&D is especially important to partially offset the 17 percent cost disadvantage that U.S. manufacturers face in doing business in America according to the National Association of Manufacturers.

In the article *The Creativity Agenda*, published in McKinsey: What Matters, Information Technology and Innovation Foundation (ITIF) President Robert D. Atkinson, Ph.D., and co-author Stephen J. Ezell note "the emerging global innovation model embraces a broad set of values," including generous R&D tax credits, and strong levels of government and private-sector R&D investment. According to an ITIF report, U.S. science, technology, and innovation leadership has weakened because we have fallen behind "the policy competition."

Atkinson and Ezell have it right. "Policies matter. The Obama administration has a choice. It can make technology, innovation, and national competitiveness a priority. Or it can watch U.S. innovation leadership migrate to more welcoming locations." We need the government to create the environment that will enable global competitiveness of U.S. manufacturing and reduce the structural cost disadvantage that exists today.

It's time to re-industrialize America and reclaim world manufacturing and economic prosperity leadership with a U.S. industrial strategy for competitiveness that deals head-on with the realities that we face as a nation today and will face in the future. A competitive, innovative manufacturing sector will help the U.S. to remain the land of opportunity, where lower income citizens have the best chance of moving up the economic ladder.

Rockwell Automation, Inc. (NYSE: ROK), the world's largest company dedicated to industrial automation and information, makes its customers more productive and the world more sustainable. Headquartered in Milwaukee, Wis., Rockwell Automation employs about 20,000 people serving customers in more than 80 countries.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846