The global competition for advanced manufacturing jobs

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Global competition is becoming a marathon race toward a new age of advanced or “smart” manufacturing. Some developed and even emerging nations have already jumped the gun with strong industrial policies aligning government, businesses and even educational institutions in collaboration. The European Commission invested the equivalent of about $1.5 billion into a “Factories of the Future” public-private partnership more than a year ago in their economic stimulus package.

A traditional manufacturing leader like the United States will not retain its preeminence in the global economy if it loses its robust manufacturing sector. Manufacturing represents 57 percent of U.S. exports today, and produces 21 percent of the world’s industrial output. It supports about one in six private-sector jobs.

But increasingly, Americans invent great products like personal computers or cell phones and then manufacture them elsewhere. To capture the full economic benefits of new technology, we must tie high tech innovation to value-added manufacturing. If we fail to do so — and not do it quickly — centers of innovation will begin to relocate closer to emerging manufacturing centers in China, India, Brazil and elsewhere. Developed and emerging nations are in heated competition to create the most compelling opportunities to innovate, build a highly skilled workforce, improve standards of living and enhance national security.

These global competitive challenges demand that we act now. To retain and build its competitive lead in the world, the U.S. must respond boldly to the transformation that is under way in global manufacturing. Manufacturing is and will continue to be an essential path for attracting and maintaining investments, spurring innovation and creating high value jobs.

America must craft and mount a strategic response to provide jobs for its citizens in the 21st century. We need an engaged and skilled workforce, rapid deployment of new-frontier science and technology, deep pools of risk capital, and revitalized physical and virtual infrastructures to drive America’s competitive advantage.

To this end, the Obama Administration has made it a priority to revitalize manufacturing, stimulate job creation and double U.S. exports.

Thus, the Council on Competitiveness with the support of Rockwell Automation and many of our nation’s leading businesses, universities and labor organizations has launched a new U.S. Manufacturing Competitiveness Initiative. The Council’s initiative will support the Administration and U.S. manufacturing in fulfilling these goals by shaping a holistic manufacturing strategy. This strategy will be delivered to the Administration and Congress at a National Manufacturing Summit in 2011.

As part of this initiative, please read inside about how advanced or “smart” manufacturing technology contributes to the future of manufacturing competitiveness.

Sincerely,

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A new strategy for U.S. industrial competitiveness is essential to the American economy and standard of living. However, advancements in manufacturing technology and innovation are rapidly transforming the way goods are produced worldwide. Those changes, in turn, are driving fierce and mounting competition from both developed and emerging economies to win a large share of this new age of 21st century “smart” manufacturing.

The United States still produces 21 percent of the world’s manufacturing output. Manufacturing comprises 11 percent of our nation’s gross domestic product and directly employs nearly 10 percent of the U.S. workforce in higher wage jobs with good benefits. It supports about 6.6 million additional jobs in adjacent sectors. Moreover, nearly 50 percent of the nation’s research and development spending occurs in the manufacturing sector. In manufacturing, American ingenuity is expressed in the drive to solve problems, improve processes, reduce costs and satisfy customers.

Now, America’s longstanding leadership in manufacturing is being challenged by economies that have recognized the potential of advanced or “smart” manufacturing technology. Nations that once fostered competitiveness through subsidies and low-wage work are now investing in advanced manufacturing infrastructure and the workforce development it demands. They are quickly gaining a competitive edge.

Create policies to spur opportunity
Strengthening America’s competitive stance in the global manufacturing marketplace requires a comprehensive, bold approach. These solutions will require an array of policy changes and investments that will build competitive strengths and bridge the gaps between the policies and practices of other nations and those in the U.S. They include:

**Infrastructure:** Invest in transportation, communication and energy infrastructure to support faster, more reliable, environmentally sustainable operations.

**Tort and regulatory reforms:** Enable businesses to engage confidently in advanced planning and investments by reducing the legal and regulatory challenges they face.

**Trade policy:** Open new markets for American-designed and –made goods through trade agreements that make the United States the premier platform for exports to the world.

**Talent pool:** Create the future workforce through education in science, technology, engineering and math (STEM).

**Taxes:** Revise our tax code to make it competitive with the rest of the world. The U.S. statutory corporate tax rate is the second highest among major industrial countries, exceeded only by Japan. The U.S. is the only major nation that taxes a company’s global income; all other major industrial countries use a territorial tax.

These policies would eliminate conditions that substantially increase the base cost of doing business here, and drive investment offshore.
Invest now in advanced manufacturing and workforce development

These longer-term improvements to the American business climate are detailed in the “Manufacturing Strategy for Jobs and a Competitive America” platform developed by the National Association of Manufacturers. Changing these policies over time will not only benefit the manufacturing sector but will help generate competitive opportunities for all American businesses — and workers.

Two additional, near-term changes will help rebuild America’s manufacturing competitiveness despite the structural disadvantages created by U.S. policy:

• Rapid testing and deployment of smart manufacturing technology, and

• Closer collaboration between businesses and educators to prepare workers for advanced manufacturing jobs — many of which are unfilled today despite high unemployment.

Smart manufacturing transforms competition

Smart manufacturing has reshaped the competition for manufacturing leadership. Advantage is no longer defined by finding the cheapest labor or improving processes in small increments. Instead, a dramatic step-change in integrating information, technology and human ingenuity — known as advanced or “smart” manufacturing — is driving a revolution in the development and application of manufacturing intelligence to every level, from product invention through design, sourcing, production and delivery.

This revolution will result in dramatic gains in productivity, cost-effectiveness, worker safety and environmental sustainability. Within a decade, it will bring about a disruptive shift in markets, making it possible to produce and deliver customized, high quality products at prices well below current levels. With smart technologies, manufacturers can shorten time-to-market, cut manufacturing costs, ramp up exports and offset the higher costs of U.S. taxation and regulation. Smart manufacturing will make workers safer and the environment cleaner: it will make zero-incident, zero-emissions manufacturing possible while reducing energy demand. Use of recycled and reused materials will increase as processes are

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refined, and consumers will have easy access to carbon footprint data to enable eco-conscious product choices. Digitized product genealogy tracking could even dramatically reduce product safety recalls from months to hours.

Seizing the promise of smart manufacturing to produce these game-changing competitive advantages requires strong partnerships between universities, the federal government and U.S. industries. The United States must reinvigorate applied research by closing the major funding gap between basic and applied science, bringing them back to the equal status they shared until 1990. We must build demonstration sites where smart manufacturing technologies and approaches can be tested and developed rapidly for application in multiple industries throughout the nation. And we need to prepare workers with the skills they need to succeed.

Access to skilled workers is pivotal
Manufacturing executives around the world identified access to a skilled workforce as the single most critical driver of a nation’s competitiveness in the new global manufacturing landscape. They ranked it 20 points higher than any other single driver of competitiveness, ahead of the costs of labor, materials and energy, according to the 2010 Global Manufacturing Competitiveness Index, a joint study by Deloitte Touche Tohmatsu and the U.S. Council on Competitiveness. More than 400 CEOs and senior leaders from around the world responded to the study, which was supported by the U.S. Department of Commerce.

Yet American businesses consistently report a serious shortage of qualified employees who can contribute effectively to innovation, productivity and competitive leadership. We must reshape education and training programs for all citizens — from those already in the workforce to the youngest children. Investments in science, technology, engineering and mathematics (STEM) education, and the development of a consistent set of industry-recognized credentials in fundamental skills including math, science and analytical abilities are essential to prepare workers to thrive amid the new technologies and rapid changes that define 21st century manufacturing.

Too many people hold outdated views of manufacturing work that are at odds with the daily experience of nearly 12 million Americans who work in America’s factories — Americans who earn 22 percent more than their neighbors in other fields. These are not unskilled, manual labor positions. Instead, production employees, managers and engineers work together using advanced technology to configure, control and monitor processes. These jobs require highly skilled employees who are prepared for lifelong learning. The changes smart manufacturing will bring to the production plant will be even more dramatic, and will demand ever more rigorous training and skills development.

Smart manufacturing has reshaped the competition for manufacturing leadership

Revive American ingenuity
Now is the time for leaders in American business, public policy and education to reinvigorate the pioneering spirit that has defined our nation from its beginnings. America is a nation of inventors, innovators and competitors. Now it faces a steep challenge to its longstanding competitive dominance in the marketplace — which, in turn, will challenge the standard of living. Meeting that challenge requires a comprehensive strategy and close collaborations between policy makers, industry leaders, educational institutions and the American workforce. We cannot afford to delay.
Call to Action
Learn more about the U.S. Manufacturing Competitiveness Initiative at Compete.org. The initiative’s goal is to deliver to the Administration and the Congress, at a national summit convened in 2011, a realistic and comprehensive solutions roadmap—with the advice, participation and buy-in from a wide range of stakeholders—that will energize a vibrant, diversified and technologically advanced manufacturing value chain, resulting in American jobs, economic growth and energy and national security.

We need a new U.S. industrial strategy for competitiveness to:

• Level the playing field — on everything from energy costs to effective tax rates and other cost burdens on manufacturers — so they have fewer financial incentives to go overseas.

• Embrace free trade so overseas markets are opened to U.S. made goods.

• Encourage federal, state and local governments to aggressively assist innovators in financing, building and operating 21st century “smart” manufacturing facilities.

• Adopt a new applied research tax credit for pioneering innovative processes on the plant floor that enable businesses to competitively manufacture goods in America again.

The Facts About Manufacturing in the U.S.

• The United States is the world’s largest manufacturing economy, producing 21 percent of global manufactured products. Japan is second at 13 percent and China is third at 12 percent.

• U.S. manufacturing produces $1.6 trillion of value each year, or 11 percent of U.S. GDP.

• Manufacturing supports an estimated 18.6 million jobs in the U.S.—about one in six private sector jobs. Nearly 12 million Americans (or 10 percent of the workforce) are employed directly in manufacturing.

• In 2009, the average U.S. manufacturing worker earned $70,666 annually, including pay and benefits. The average non-manufacturing worker earned $57,993 annually.

• U.S. manufacturing workers are the most productive in the world—twice as productive as workers in the next 10 leading manufacturing economies.

• U.S. manufacturers perform half of all R&D in the nation, driving more innovation than any other sector.

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