

# MANUFACTURING & TECHNOLOGY NEWS

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## NAM Board Votes In Favor Of Multinationals In Debate Over China's Currency

For members of the National Association of Manufacturers' Domestic Manufacturers Group, September 28 will be a day to remember. Their two-year effort to persuade NAM to endorse a currency manipulation bill was rejected by the association's executive committee and board of directors. Members of the Domestic Manufacturers Group (DMG) claim the loss was the result of opposition from the large multinational corporations that benefit from China's pegged currency working in concert with NAM's senior leaders intent on quashing an uprising. NAM leaders counter that the legislation was not going to force a sovereign nation of 1.3 billion to change its policies any time in the near future.

BY RICHARD McCORMACK

The 100-plus members of the DMG are now regrouping after the NAM board voted 55 to 25 not to endorse the legislation (HR-1498) sponsored by Reps. Duncan Hunter (R-Calif.) and Tim Ryan (D-Ohio). The legislation is co-sponsored by 178 members of the House of Representatives. The NAM board vote is said to be about proportional to the dues structure of the organization: 70 percent from large multinationals and 30 percent from small- and medium-sized manufacturers.

Members of the DMG are considering their options: quietly dropping out of NAM one by one; creating a new organization that would lobby on behalf of domestic

manufacturers; or staying in NAM and continuing to fight for their cause. The DMG expects to meet again before the end of October to discuss the options. "It's going to be very interesting to see how it goes," said one member of the group.

The NAM board vote is not sitting well with many of the domestic manufacturers that put so much emotional energy into the initiative. These companies — particularly in the metal forming industries — are struggling to remain competitive with the multinationals' Chinese production and Chinese suppliers. They believe that the multinational companies are the real "protectionists" — defending

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## Competitiveness Bill Rises In The Senate

BY KEN JACOBSON

A new attempt at competitiveness legislation is rising from the ashes of numerous stalled bills that had been introduced over the past 10 months in response to a pair of influential reports, the National Academies' "Rising Above the Gathering Storm" and the Council on Competitiveness's "Innovate America," and to the Bush administration's American Competitiveness Initiative (ACI).

Introduced on September 26 by Senate Majority Leader Bill Frist (R-Tenn.) and Minority Leader Harry Reid (D-Nev.), the bipartisan National Competitiveness Investment Act of 2006 (NCIA) boasts a list of cosponsors whose number had swollen to 37 — 19 Republicans and 18 Democrats — by press time. While its passage in the current Congress looks doubtful, competitiveness advocates see this support as a promising sign that their concerns are gaining traction.

The wide-ranging, 210-page bill (S. 3936) is the product of work undertaken following a July request from Frist by the staffs of three Senate committees — Commerce, Science &

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# 2007 Federal Budget Remains In Limbo

BY KEN JACOBSON

Managing to pass only two of 11 appropriations bills for 2007, those for the Department of Defense (DOD) and Department of Homeland Security (DHS), before going home to campaign, Congress has left most of the federal government funded under a continuing resolution until November 17 and up against the prospect of an omnibus appropriations measure down the road.

Most Senate appropriations panels had reported their bills out between late June and mid-July — with relative dispatch, that is, after receiving them from the House — the better to keep control in their own hands and out of the hands of their leadership. But the measures went no further.

“There was no political incentive to finish them before the election, with the exception of DOD and DHS, the two that contain big increases,” explains Kei Koizumi, director of the R&D Budget and Policy Program at the American Association for the Advancement of Science (AAAS).

“There could have been amendments adding money to tight bills that would have been difficult for Republicans to vote against but would have busted their budget caps. And the Democrats are hoping to be in a better bargaining position after the elections.”

In the meantime, programs everywhere but at the Pentagon and DHS are living off their 2006 funding level or that passed for 2007 by the House, whichever is lower. This means less funding for two Commerce Department programs: the Manufacturing Extension Partnership, whose current allowance is based on the House-passed \$92 million for 2007 rather than 2006’s \$104.6 million, and the Technology Administration, which is being funded on the basis of the \$2 million the House voted it for 2007, far below its \$5.9 million in 2006.

On the other hand, those zeroed out in House legislation — the Advanced Technology Program (ATP) being one example — are receiving money into this new fiscal year at last year’s pace. That means ATP continues to bump along at a rate corresponding to the \$79 million it got in 2006 even though both the full House and the relevant Senate Appropriations subcommittee voted to terminate it in 2007.

In bills actually enacted, basic and applied research and advanced technology development at DOD escaped a combined 16.3 percent cut requested by the Bush administration but still ended up with a drop of 0.6 percent in nominal terms from

last year’s levels, totaling \$13.17 billion in 2007 compared to \$13.25 billion in 2006. DARPA’s budget went up 1.4 percent in nominal terms to reach \$3 billion for 2007.

Although the overall DHS budget went up to \$34.8 billion in 2007 from \$32.1 billion in 2006, the department’s R&D budget fell for the first time in its existence, settling at \$1 billion, 22 percent below its 2006 level.

As for what remains to be done, Koizumi warns that the longer the appropriations process drags on, the likelier that increases for basic research in the physical sciences will be imperiled, even though they are in line with the White House’s American Competitiveness Initiative and have been included in both House and Senate bills.

“In trying to wrap up appropriations, it becomes very tempting to move money from programs that are getting increases to those that are in line for cuts,” he says, adding: “In a lame-duck session behind closed doors, who knows what will happen?”

## *FDA Issues Final Regs To Assure Quality Of Drug Manufacturing*

The Food and Drug Administration has issued its final rules for regulating drug manufacturing processes. The “Quality Systems Guidance” utilizes regulations that “incorporate modern quality principles into FDA’s approach to manufacturing, encouraging industry adoption of new technological advances and integrated quality systems,” says Janet Woodcock, FDA deputy commissioner for operations.

The rules use current “Good Manufacturing Practices” to “help manufacturers maintain consistent high quality and improve efficiency,” says FDA. “The document demonstrates to industry the benefits of incorporating modern quality principles which should foster technical advancements into their manufacturing processes to better ensure the safety and efficacy of drugs for people and animals.”

The rules should lower the cost of drugs and prevent shortages of medicines “due to manufacturing failures that can result in production stoppages and recalls,” says the FDA. The rules are part of the agency’s Critical Path initiative (<http://www.fda.gov/oc/initiatives/criticalpath/>), which seeks to modernize the development of new drugs.

“This will help take a drug from laboratory development to mass production in a way that can better assure its initial success and continued quality production,” says the agency. “FDA will continue to monitor manufacturing plants through its inspection program and will continue to advance the training of its investigators in the latest technologies.” The full text of the guidance can be found at: <http://www.fda.gov/cder/guidance/7260fnl.htm>.

# U.S. R&D Tax Credit Is Weaker Than That Of Most Foreign Rivals

The United States is no longer offering the world's best incentive for research and development, according to the Information Technology and Innovation Foundation (ITIF). The country's R&D tax credit, considered to be the most generous tax incentive in the world in 1981, has now dropped to being the 17th most generous, says a new report by ITIF.

R&D tax incentives are important because they have been found to generate spending on research and because they are being used as an enticement by other countries to attract foreign investment in R&D. "Not only may companies cut costs by investing R&D resources in nations with lower wage skilled researchers, they can also save money by investing R&D resources in nations that provide more generous financial incentives," says the study.

The United States now provides one of the weakest incentives among the world's leading economies, below Canada and Mexico and behind many Asian and European nations, according to the study. "It's ironic at a time of increased concern about America's growing competitiveness challenge, our credit is getting weaker both in absolute terms and relative to other nations."

The U.S. decline is due to changes made to the credit by Congress over the last 25 years, and because other nations are improving the benefits of their programs. The U.S. tax credit expired at the end of last year and Congress has failed to renew it.

The United States offers a credit of 20 percent only on a company's increased spending on research as a percentage of sales. "In contrast, many other countries provide either higher rates or credits on all increases, not just increases in R&D investments (or both)," according to the analysis.

Spain offers a flat tax credit of 30 percent on all R&D expenditures. France provides a credit of 45 percent on incremental spending, plus a 5 percent credit on non-incremental expenditures. "The UK and Australia provide the equivalent of a 7.5 percent flat credit on R&D, meaning that their effective credit is almost twice as generous as that of the United States," says the study. The same holds true of Japan, which offers a flat rate of 8 percent on all expenditures.

Mexico offers an R&D tax credit of 30 percent for all expenses and equipment. Canada offers a flat 20 percent credit, but offers a 35 percent credit on the first million dollars invested. Canadian provinces offer additional incentives. "A

cents in the United States."

The credits offered by Asian countries are even better. China provides a 150 percent deduction on R&D if those expenses increase by 10 percent; India offers a 125 percent deduction.

Nations are now aggressively marketing their R&D tax incentives to U.S. companies, describing their advantages over the U.S. system in advertisements in business magazines. Studies have shown that countries offering better R&D tax incentives are experiencing higher rates of investment in R&D. "Given the relative generosity of our foreign competitors' treatment of R&D, it's perhaps not surprising that between 1998 and 2003, investment in R&D by U.S. majority-owned affiliates increased twice as fast overseas as it did at home (52 percent vs. 26 percent)," says the study.

For a copy of the nine-page paper entitled "The Research and Experimentation Tax Credit: A Critical Policy Tool for Boosting Research and Enhancing U.S. Economic Competitiveness," call 202-626-5732 or send an e-mail to mail@itif.org.

U.S. firm investing in R&D in Ontario receives a tax credit of 49 cents for every dollar of R&D it invests in, compared to around 6

## Feds Say IPR Protection Is A Priority

The federal government is ramping up enforcement of intellectual property protection, according to a report from the Bush administration's National Intellectual Property Law Enforcement Coordination Council (NIPLECC). Since 2001, the Department of Homeland Security has initiated more than 31,000 seizures of goods worth an estimated \$482 million.

The federal government is beefing up all aspects of IPR protection, the NIPLECC claims. It has staffed the newly created position of U.S. Coordinator for International Intellectual Property Enforcement at the Commerce Department. It is expanding the IP law enforcement attaché program at the Department of Justice to cover Asia and Eastern Europe. It has created five new Computer Hacking and Intellectual Property (CHIP) units in U.S. Attorney's Offices in Nashville, Orlando, Pittsburgh, Sacramento and Washington, D.C., bringing the number of these units to 25 with 230 CHIP prosecutors nationwide. Within these units, the number of defendants charged with federal intellectual property crimes increased 65 percent from 109 in 2004 to 180 in 2005.

"Over the past five years, approximately half of all defendants convicted of federal intellectual property crimes in the United States received some amount of jail time," says the NIPLECC. The Commerce Department is expanding its IP attaché program in China and is creating new regional attachés in Brazil, Russia, India, Thailand and the Middle East. The State Department is "significantly" expanding training of embassy staff in IPR issues and is increasing its interaction with U.S. industry. The federal government is expanding its Strategy Targeting Organized Piracy (STOP) program to reach out to small- and medium-sized businesses. And it is expanding its Stopfakes.gov Web site.

The 168-page "2006 Report to the President and Congress on Coordination of Intellectual Property Enforcement and Protection," released on Sept. 28, is located at [http://www.commerce.gov/opa/press/Secretary\\_Gutierrez/2006\\_Releases/September/2006%20IP%20report.pdf](http://www.commerce.gov/opa/press/Secretary_Gutierrez/2006_Releases/September/2006%20IP%20report.pdf).

## ***New Senate Competitiveness Bill...*** (Continued from page one)

Transportation; Energy & Natural Resources; and Health, Education, Labor & Pensions — with the backing of their chairmen and ranking minority members alike.

It consolidates various bills earlier referred to the different panels: the National Innovation Act (S. 2109) and the American Innovation and Competitiveness Act (S. 2802), which were based on “Innovate America,” and a trio of acts dubbed Protecting America’s Competitive Edge, or PACE (S. 2197, 2198, and 2199), which embodied the recommendations of “Rising Above the Gathering Storm,” also known as the Augustine Report.

NCIA includes five-year authorizations for the National Institute of Science and Technology (NIST), the National Science Foundation (NSF), NASA, and the Department of Energy’s Office of Science (DOE-OS) that raise funding for basic research significantly; provisions creating a DARPA-like unit within DOE to fund innovative energy technologies, and an Aeronautics Institute for Research at NASA. Other measures are designed to improve teaching methods in math and science and to recruit and train teachers in those fields.

Also incorporated is a five-year authorization for the Manufacturing Extension Partnership (MEP) that would begin at \$110 million for fiscal year 2007 and rise in \$5-million annual increments to reach \$130 million in 2011. Other provisions would institute a one-year probationary period for MEP centers that failed to receive a satisfactory rating and allow centers to accept funds from other federal agencies and from the private sector.

“Private-sector funding would not be considered a part of the federal share for the purpose of center cost-sharing,” according to a summary of S. 3936 prepared by Senate staff. “Funding accepted from other federal departments or agencies may be considered in the calculation of the federal share of capital and annual operating and maintenance costs.”

The sheer scope of the legislation, combined with the uncertainty surrounding both the outcome of next month’s congressional elections and the length of a subsequent lame-duck session that will have the lion’s share of federal appropriations for 2007 on its plate, makes prospects for its passage in the current Congress iffy at best.

For even if the Senate were to act on S. 3936 with the dispatch that its bipartisan sponsorship could permit, there are both procedural and political questions regarding what might happen to it on the House side, and they are substantial.

A provision directing every agency that finances research in science, math, engineering or technology to set aside around 8 percent of its annual R&D budget to fund a new Innovation Acceleration Research Program could, for example, put the legislation within the purview of 10 House committees, give or take. The apparent absence of any effort to “pre-conference” the bill with a view to either resolving jurisdictional problems or incorporating House members’ ideas could

prove too much to overcome, especially in a lame-duck session.

As for political concerns, conservatives in the House have shown themselves dead set against creating new programs and have been effective in keeping bills that are not acceptable to at least half of its GOP contingent, the so-called “majority of the majority,” off the floor. That some House Republicans refer to S. 3936 as “S. 72,000,000,000” for its alleged cost — which the Senate Majority staff, in contrast, puts within ACI’s target at \$20.3 billion in new money — suggests that it would not fly through the House as currently composed.

But neither NCIA’s long-shot status in the current Congress nor the pile of dead bills from which it has risen seem to daunt Robert Boege, executive director of the Alliance for Science & Technology Research in America (ASTRA), a group with members from industry, professional societies and academia that has been a prominent voice on research funding and competitiveness. “We already have the buy-in,” he stated. Concern for the issues it addresses have spread beyond the members who originally championed them and will live on into the next Congress, he believes, no matter what its composition.

Even the length and messiness of the process are seen as “encouraging” by Boege. “When an idea becomes popular, everyone wants to introduce a bill,” he observed. “Thank goodness they want to amend it; it means they’ve bought in.” And he takes for granted that “even a good idea takes a long time to gain bipartisan momentum.”

### ***Manufacturer Is Making Headway Against Incumbent***

Manufacturing company owner Jack Davis, who is running for Congress against Rep. Tom Reynolds (R-N.Y.), has pulled ahead in the polls, due to Reynolds’ role in the Foley congressional sex scandal. The latest Zogby International poll taken of voters in the upstate New York district on Oct. 4 and 5 finds Democratic challenger Davis leading Reynolds by a 48 to 33 percent margin. Davis, 73, is a life-long Republican and is rare among candidates in that he owns a manufacturing company and is intent on reforming the government’s trade agenda. He ran against Reynolds in 2004 and captured 45 percent of the vote. Davis owns I Squared R Element, a maker of silicon carbide heating elements.

“There is no other way to look at these numbers except to say Tom Reynolds is in trouble,” says pollster John Zogby. Thirty-two percent of the 402 likely voters surveyed said that Reynolds should be re-elected, while 58 percent said it’s time for someone new.

Before the Foley scandal broke, Davis had pulled even with Reynolds in the polls. Reynolds, chairman of the National Republican Congressional Committee, is the fourth most powerful Republican in the House.

## Japanese Auto Firms Buy Lots More U.S. Parts

Japanese automobile manufacturers' purchases of parts made in the United States reached a new record of \$48.4 billion last year, up 7 percent from 2004, according to the Japan Automobile Manufacturers Association (JAMA). Japanese purchases of U.S. auto parts have more than doubled in the past decade and are up from only \$2.5 billion in 1986.

The cumulative investment of Japanese auto companies in manufacturing capacity in the United States now stands at \$30 billion, and is set to increase by another \$1.73 billion over the next two years. Japanese companies are opening three new manufacturing plants this year and one more is scheduled to open in 2008. The new plants will add another 4,680 production workers to the Japanese auto companies' workforces, for a projected total of 62,594. Japanese auto companies now employ 431,738 workers, including those at 7,050 dealership franchises, 36 research facilities and 25 manufacturing facilities.

Japanese auto companies produced almost 3.5 million automobiles in the United States last year, an increase of 10 percent over 2004. Imports of Japanese autos increased from 1.56 million units in 2004 to 1.66 million in 2005.

Japanese auto companies in the United States exported 269,716 vehicles last year, or 19 percent of total U.S. exports of 1.4 million vehicles. For more information, including a list of all the Japanese auto companies' plants, their production levels for last year and capacity, go to <http://www.jama.org>.

## Technology Sector Adds Jobs, Even In Manufacturing

The United States technology industry added 140,000 new jobs during the first half of 2006, nearly double the growth from the first half of 2005 and the strongest gains in employment since 2001, according to the American Electronics Association. The 2.5 percent increase to 5.81 million tech workers includes 33,100 additional manufacturing jobs, the second consecutive year that high-tech manufacturing is seeing net job growth, says AEA. "The good news is that the U.S. high-tech industry is adding jobs for the second year in a row, and adding jobs across all tech sectors," says AEA president William Archey. "But job growth is by no means as strong as we believe it could be and it continues to lag growth in the private sector as a whole."

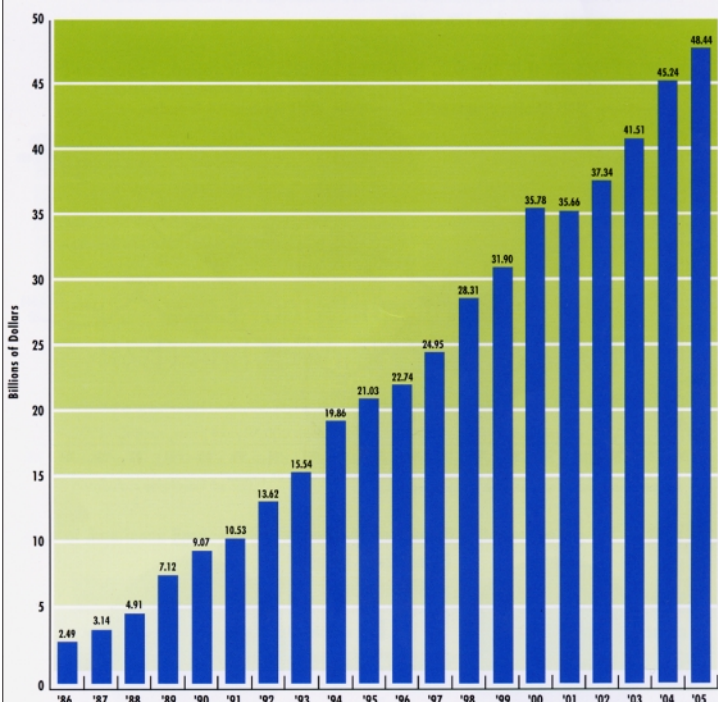
The technology sector's job growth would be higher if the United States got serious about training more scientists and engineers, says Archey. "Our companies struggle to find workers to fill thousands of technical positions in the United States. The problem is compounded because U.S. companies face restrictions on hiring the best and brightest from around the world. Companies can't obtain visas to bring them here and many highly skilled and educated foreign nationals are finding opportunities at home. We can't afford to let these talented individuals get away. One of every four scientists and engineers in the United States is a foreign national. They have created tens of thousands of high-paying jobs over recent decades."

## Government To Develop Hand-Held Rad Detectors

The U.S. Department of Homeland Security has awarded \$22 million in contracts to develop pocket-sized radiation detectors. The agency awarded 27-month contracts under a competitive solicitation to General Electric Global Research, Lawrence Livermore National Laboratory and Smiths Detection of Pasadena, Calif., to develop prototype devices that detect the source of radiation and discriminate between normally-occurring radioactive materials, background and potential threats.

Border patrol agents, customs and Coast Guard officers and other law enforcement agencies "will know in real time if they confront a security or safety risk from a device that fits in the palm of their hand," says Vayl Oxford, director of the Homeland Security Department's Domestic Nuclear Detection Office.

Japanese Auto Companies' Purchases Of U.S. Parts, 1986 - 2005



(Source JAMA)

## NAM Vote... (Continued from page one)

unfair subsidies that the Chinese government is erecting in their favor, especially a currency that is estimated to be at least 25 percent, and perhaps as much as 60 percent, undervalued.

In an e-mail sent to NAM president Gov. John Engler, Nucor chairman and CEO Dan DiMicco said, "John — You just don't get it." NAM's refusal to acknowledge unfair trade as being the primary cause of declining U.S. industrial competitiveness is a "blatant stab in the back" to domestic manufacturers, DiMicco wrote Engler. NAM's efforts "have shown us that the current NAM does not represent domestic manufacturing interests and we will have to deal with that soon," writes the Nucor CEO. "You have left us no choice."

The NAM executive committee took up the matter of Hunter/Ryan during the association's annual fall board meeting. After a discussion during which the leading proponents and opponents made their case, the board overruled a vote taken on June 27 by the association's International Economic Policy Committee (IEPC), which favored NAM's endorsement of Hunter/Ryan. That vote passed the IEPC by a margin of 75 to 46.

NAM executives at the board meeting told members of the DMG that domestic manufacturers were able to achieve a lopsided — though temporary — victory on June 27 by packing the room and allowing companies to vote via proxy through Washington representatives and via teleconference.

The domestic manufacturers were especially displeased when, two weeks before the NAM board meeting on Sept. 28, Engler sent a letter to the 130 or so board members with a legal brief describing how the Hunter/Ryan bill may not be compliant with the WTO. Those favoring Hunter/Ryan claim that brief made a specious argument and they countered it by providing the NAM board with legal briefs of their own. Thirty-two members of Congress signed a Sept. 27 letter to Engler, stating that his correspondence to NAM's board was "flawed in certain fundamental respects."

"We clearly knew where Engler was and what he was trying to do," says one DMG member. "At the meeting, Engler led the opposition. People are now blaming John Engler for killing the Hunter/Ryan bill."

The NAM board spent little time discussing Hunter/Ryan's WTO compliance, and instead focused on whether it would provide relief to U.S. companies any time soon. The consensus was that it would not.

NAM asked that everyone in

attendance at the Sept. 28 board meeting not talk to the press about the meeting, as a means to allow a more open conversation.

Word of the domestic manufacturers' loss spread quickly throughout the country. "It is now clear what the NAM is and whose interests count," wrote one member of the DMG in an e-mail to some members of the group, a copy of which was forwarded to *MTN*.

Dave Frenkel of Penn United Technology Inc., a leader in the Domestic Manufacturers Group, said he was disappointed with the outcome, but not defeated. "We're energized by this," he said. "They missed an opportunity to take a position on an issue that's getting bigger and bigger. We've worked together as a group and have taken the high ground. I just feel disappointed that NAM isn't doing likewise."

Others state that NAM is in a precarious position. It claims to represent the interests of all U.S. manufacturers, but that really is not the case, and U.S.-based producers have proof in the form of a vote that was directed against their interests.

"If they want to be an organization that says it works for a small group of powerful people with lots of money then they can't claim to represent the rank and file and tell us that the silent majority ought to just pay their dues and stay silent," the president of one small company member of NAM told *MTN*. "We're not going to do that and we're not going to play that role."

Another participant in the meeting said afterward: "Small manufacturers have every reason to feel slighted that their interests and concerns are not being addressed. For NAM to say that we agree with you that something should be done to put pressure on

(Continued on page seven)

## July Trade Deficit Ten Years Ago

U.S. trade deficit in goods is spiraling deeper into the red. July set a monthly record deficit for goods at \$74.4 billion, an increase of \$3 billion from the previous month and up by \$10 billion from the same month last year.

Exports of goods during July reached \$85.5 billion, up \$10 billion from the same month in 2005, but imports of goods increased by more than \$20 billion from \$138 billion in July 2005 to \$157 billion in July 2006. In July 2004, the U.S. imported \$123 billion in goods, and exported \$68 billion worth.

Five years ago, in July 2001, the United States ran a trade deficit in both goods and services of \$34 billion. Ten years ago, in July 1996, the U.S. ran a trade deficit in both goods and services of \$16 billion.

The United States' largest trade deficit in July (which includes trade in both goods and services) was with China (at \$17.6 billion), followed by Japan (\$6.6 billion), Canada (\$6.4 billion), Germany (\$4.6 billion), Mexico (\$3.5 billion), Venezuela (\$2.7 billion), Malaysia (\$2.2 billion), Saudi Arabia (\$2.1 billion) Nigeria (\$2 billion), Italy (\$1.99 billion), Ireland (\$1.5 billion), Russia (\$1.2 billion) and South Korea (\$892 million).

## NAM Vote... (Continued from page six)

China and then not to do something, then their interests are not being served by the NAM. If NAM wants to have a unified manufacturing structure then every once in a while the [domestic] guys have to get their way. This might be that once in a while.”

One large corporate member of the DMG who is also on NAM's board said NAM president John Engler “is taking one heck of a risk with this for the organization. I don't think he realizes that within this group of smaller manufacturers there are quite a few trade associations that are specialized to very narrow industry segments and they represent thousands of companies. These manufacturing associations provide a vehicle for communication that is pretty significant. If they communicate to their members that NAM is a bad thing, their members will listen to the guy they talk to more often and the organization they have influence in.”

Others associated with the DMG couch the debate between U.S.-based manufacturers versus multinationals in a grand societal scheme, saying the struggle is as important as the civil rights and environmental movements of the 1960s. One executive commenting on the vote says that it is like the beginning of the end of feudalism in previous centuries. “The whole history of mankind is a movement away from slavery and serfdom to liberty and freedom,” he says. “We have always figured out how to get the power back away from the few — the people with all the money making all of the decisions — to the many. It takes a while for the masses to figure out how to wrench it away from the smart and clever and powerful. We figured out how to deal with kings and that took a long time and they aren't a problem any more. Mankind has not yet determined how to deal with a multinational.”

The NAM board did take action on the China currency issue, however. It passed a resolution to create a task force to work with Treasury Secretary Henry Paulson on pressuring China to let its currency float at market rates. “We believe that Sec. Paulson must be given some time to implement the newly enhanced high-level engagement and dialogue with China's top leaders that he announced last week to accelerate movement in China's currency,” says the NAM board resolution. “We are hopeful that his new approach will work and we urge him to redouble his efforts.”

Some of the domestic manufacturers feel this is a step in the right direction, but they virtually unanimously and vehemently disagree with Engler's characterization of NAM's role in “leading the charge” on China's currency. “NAM has opposed every piece of legislation with any enforcement teeth in it,” says a DMG e-mail rebutting NAM's claim. “Its idea of tough enforcement is a higher pile of required reports from the Treasury.”

NAM supported filing a Section 301 case, then

opposed it, resulting in a split in the Fair Currency Alliance in August 2004, said the e-mail. The China Currency Coalition, of which NAM is not a member, has been pushing the issue ever since. NAM's Coalition for a Sound Dollar, says the e-mail, raised some awareness on the issue in 2003 and 2004, but it has “ceased to function,” says the DMG analysis. “It has not even met this year, even as the trade and current account deficits spiraled to unprecedented levels.”

Moreover, NAM has worked “overtime to frustrate the clear will of the majority of its members for meaningful action on currency problems. This campaign reached a new low when NAM commissioned a poorly argued and fundamentally flimsy attack on HR 1498, embraced its novel arguments uncritically and then sent the document out to all board members as if it were the last word on the subject.”

If NAM insists on taking credit for “leading the charge” on the China currency issue, then “it should get commensurate credit for the results to date: a further weakening of the renminbi since July 20, 2005 in real terms (i.e. when taking account of China's inflation). This is not the sort of ‘meaningful results’ that America's manufacturers require.” Finally, says the e-mail, “Gov. Engler by his actions and words, both in private as well as in public, seems to be saying to NAM's silent majority that numbers many thousands: please remain silent; do not participate in our committee deliberations, do not exercise your right to a proxy; just keep sending your dues checks.”

NAM doesn't deserve such criticism, says Pat Cleary, NAM senior vice president of communications. The issue “is on everybody's screen and that's great,” he says. “There are not a lot of organizations in this town that are going to thrash this out. Nobody walked away from [the NAM board of directors meeting] thinking that this an issue that's going to go away. Everybody knows this is a huge issue for us as an organization and one that we're going to have to continue to deal with.”

Adds Frengel: “The conversation in D.C. is changing and it is all moving in our direction. We haven't won the big votes yet. We haven't gotten anywhere near winning them, but when we look at the progress we've made compared to this small setback, we're pretty pleased. We're not going to run away.”

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***“Everybody knows this is a huge issue for us as an organization and one that we're going to have to continue to deal with.”***

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# The Lessons From Sematech Should Be Applied To Many Other Industries

The semiconductor industry sits at the world pinnacle of technology, and to stay there requires a unique collaboration of competitors working closely together to advance the state of the art. No other industry can claim a similar level of cooperation. For the semiconductor industry, that collaboration takes place in a formal way at a 370,000-square-foot facility in Austin, Texas, operated by Sematech, which stands for Semiconductor Manufacturing Technology.

But the world is quickly changing. Sematech realizes that the technical challenge of keeping the industry on the "Moore's Law" productivity curve, which is the doubling of chip capability every 18 to 24 months, will require the

efforts of other industries that need to move with alacrity to adopt nanotechnologies. The ubiquitous spread of nanotechnology rests squarely on the processes developed by the semiconductor industry. With or without their knowledge, old-line industries will soon be addressing the colossal challenges that have confronted the semiconductor sector since its inception: the mass production of nano-scale products.

To survive, Sematech technology visionary and strategist Randy Goodall believes the leading competitors in other major industries must learn how to collaborate on projects that put them on the Moore's Law productivity curve.

*Manufacturing & Technology News* editor Richard McCormack recently interviewed Goodall about what is required for success not just of other industries, but of state and local jurisdictions as well as the United States economy as a whole.

As director of external programs for Sematech, Goodall is in charge of creating programs for technology-based economic development. He has been involved in many technical aspects of Sematech's operations. He holds a BS from Caltech in physics and a Masters and Ph.D. in experimental solid state physics from the University of Oregon. He can be reached at [randy.goodall@sematech.org](mailto:randy.goodall@sematech.org). Here's what he had to say:

**Question: Most industrial R&D consortia have a difficult time surviving and prospering. What is the reason for Sematech's success?**

**Goodall:** Although it is easy to say the number of transistors on a chip doubles every 18 to 24 months or that the cost of building a transistor drops 30 percent per year, doing that is really hard. It is impossible for any one company to take a path of their own and get a lead in the market based on a radically different manufacturing paradigm. It's too expensive to invent a new way of doing it. Everyone continues to have to share the same essential manufacturing capability, which is extremely expensive to bring into existence. With companies spending between 10 to 20 percent of their revenue on R&D it creates the raw ingredients for collaboration.

Right now, there is a guy designing a cell phone or an I-Pod that he actually can't make. He trusts that at some point in the next 18 or 24 months when it goes to market that the chips he's going to need are going to be small enough and cheap enough that he can make a profit selling it. When he doesn't design a product that you can't have yet, that's when he's only going to want more of what he's got. At that point, it's the end of an era. The whole investment engine for the industry grinds to a halt. That is not a good thing.

**Q: Why is collaboration so hard for most industries?**

**Goodall:** I have talked to a lot of people who want to start a collaborative effort and the very first question I ask them is how are you defining your pre-competitive boundaries. Usually they have never heard of nor ever thought about it. Yet defining those boundaries is one of the most essential ingredients to knowing if a

collaboration is actually possible. It is the essential question that doesn't get addressed.

**Q: What are pre-competitive boundaries?**

**Goodall:** If you find any entities that want to collaborate but don't have a shared competitive space, they either have a natural, pain-free collaboration or they're not really collaborating. They're just all doing their job in the same place with resources divvied among them.

Intel and AMD really compete. When they are working together at Sematech it is the exact opposite of the real world where they are duking it out with each other.

There is a competitive boundary between their chips in the marketplace versus their researchers at Sematech working on the same project. The real tension that exists between real competitors collaborating generates some of the energy and impact of a place like Sematech. If you had two companies operating in two different markets and they don't compete in any sense, then there is not a pre-competitive boundary so there is not any tension between them. They might get together to work on a common project and you can call that a collaboration, but it's really only ganging up on a problem or a pooling of resources. It's not a high-impact activity to which we would associate.

You can collaborate if you get companies of a similar type together. You can't drag a whole supply chain in because you don't have a competitive boundary that is definable.

**Q: Why do most R&D collaborations fail?**

*(Continued on next page)*



## Sematech... (Continued from page eight)

**Goodall:** They think about the tasks they want to do together more than the relational structure of the collaboration. In some industries, they're just terrified that it might be competitive and they panic because they don't understand what the National Cooperative Research and Production Act offers. So they either panic over the antitrust side; they pooh-poo the complexities of managing around the competitive boundary; they focus too much on the task and miss the relational structuring; or they get it and do the right thing. I think Sematech gets it and is doing the right thing.

**Q: Are there other organizations that succeed in a way similar to Sematech, like the Electric Power Research Institute or the Gas Research Institute?**

**Goodall:** Those organizations seem somehow different. One of the things about Sematech is that we have always enjoyed high impact. Our industry learned how to collaborate in action and in strategy. The International Technology Roadmap for Semiconductors provides the runway. It's 20 years long.

What do we need to do to fly this crazy thing? The maturity level for collaboration in other industries is much lower and they haven't reached the point of being able to build elaborate forward-looking roadmaps that allow them to collaborate way out on a timeline and reel

that in to the present.

That is where your competitive boundaries start to show up, and most other industries don't know how to manage it.

Sematech is a building, an organization, a fab and hundreds of people doing real work together that we deliver to the companies that join Sematech. A lot of these other collaborations are some people who get together and say let's pool our money and pay a university to do something. The collaboration is around topic generation. It's safe. Nobody has to worry about it. It's way out there in the future. It's usually granted as opposed to sponsored research contracts, so there aren't even deliverables. That is what universities request. A lot of times those collaborations are driven by universities saying, "Why don't you guys get together, pool your money and give it to us?"

**Q: What do you think of the National Science Foundation's Engineering Research Centers?**

**Goodall:** They are driven by the NSF with a big pile of money. NSF issues an RFP and it becomes a matter of who can write the best sounding proposal. University researchers' collaborating is like a funny bird. Where is their competitive boundary? What do they compete on? If you want a true collaboration, you need to pay attention to what they are competing with each other for.

(Continued on page 10)

### THE SEMATECH STORY

**Why collaborate?** Shared or common needs. Rising costs to achieve goals. Higher quality results. Can't do it alone.

- More transistors/bits are produced each year than grains of rice: one grain of rice buys 100's bits. A single 300mm DRAM wafer today contains more bits than the entire world's production of DRAM in 1995.

- Today 1 Gbit ~ \$8.00; In 1985, 1 Gbit ~ \$32,000.

- In 2006, there were 1 quintillion transistors produced; in 2016 there will be 60 quintillion.

- In 2006, there were 100 billion chips produced; in 2016 there will be 400 billion

- Sematech members represent half of the world's semiconductor sales and include half of the 2005 top 10 total private patent recipients. They are: AMD, Freescale, HP, IBM, Infineon, Intel, Panasonic, Philips, Renesas, Samsung, Spansion, Texas Instruments and TSMC.

Sematech is the catalyst for accelerating the commercialization of advanced technology innovations into manufacturing solutions. It develops and improves processes, materials, test devices and equipment with rapid cycles of learning and experience with different

materials.

- \$3 billion in investment since 1987.
- 370,000-square-foot facility.
- 62,000-square-foot clean room.
- Seven-day, 24-hour production.
- 400 employees, 80 industry assignees.

**Sematech's Network:** Universities, suppliers, industry groups, industry labs, government and other consortia. Average member reported return on investment is 540 percent per year. Over five years, Sematech has delivered more than \$2 billion in research value to its members.

**Sematech Methodology:** Industry leadership, technology strategy and a focus on manufacturing productivity. Extend current technologies to their limit. Build infrastructure for emerging technologies. Value and mature the future options in nanoelectronics.

**Technology Roadmaps:** Consensus based, global span. Living document — annual update — 1,000 people...1,000 pages. Gives entire industry a view into the future. Coordinates the R&D collaborative pipeline.

**Consortium Governance:** Combination of stockholder, customer, product/portfolio management. Hierarchical system of advisory groups, persistent and flexible. Individual projects ranked by experts several times per year for performance and importance.

## Sematech...*(Continued from page nine)*

**Q: Is Sematech one of the reasons the semiconductor industry has stayed on the cutting edge of technology while so many other industries have not?**

**Goodall:** Knowing how to collaborate and the willingness to collaborate comes out of deep and visionary insight of the leadership of the industry. It can be driven by the need to stay on the cutting edge out of panic and desperation confronting the daunting problem that we always see in front of us. Whatever the root cause, we do in fact collaborate and that absolutely keeps us on the cutting edge.

We've been able to create for the rest of the world a defined movement forward of the cutting edge and we've kept the ball going. If you look back at the cost per transistor, the number of transistors on a chip or DRAM pricing, those all have had long continuous linear runs for decades. That predictability is just unheard of in the history of the world.

The real threat to our industry is a change in the investment culture of the world and people who have the capital for investing in laying the track while the train is racing ahead. If that investment culture pulls away from that volatility, then you can end up stunting the growth of the industry. That is another way the industry can mature, by people either tiring of it or becoming too fearful. If you start to have an effect on the underlying engine it's hard to change it back. The people in these companies know that and they're willing to stay on the leading edge because that's what it's all about.

**Q: When you say it's essential to lay down the track, isn't China doing that now and not the United States?**

**Goodall:** They have serious subsidies going on. But AMD has a fab that it is going to build in New York. They received a big New York subsidy. They've gotten big German subsidies. Everyone in the world recognized that the high tech, semiconductor and nanoelectronics industries are the economic drivers in the 21st century economy.

Because of globalization, corporations that bring economic advantage aren't connected to the ground very well. They're on the slippery surface of the Earth. They represent a free market for economic development drivers. If you're a state like Texas, New York or California or you're a country like Germany or Singapore, you're stuck in the place on Earth where you are. You have to make a decision: Am I going to be a player in the free market for things that help my economy?

**Q: Has the U.S. government decided to do that?**

**Goodall:** The U.S. government has not quite gotten there. We still chafe at the corporate welfare image. People want to turn the cart over and ask, "Is this corporate welfare?" — as if you're bailing somebody out.

But the fact is if a company like AMD wants to build a new \$4-billion or \$5-billion manufacturing facility that will draw supply chain players, universities, researchers

and engineering around it, it's going to be a powerhouse in your economy.

If you're going to do that, then buying them — if you will — is very different from propping up some old manufacturer that isn't competitive with someone in another part of the world. In that case, propping them up artificially so you don't lose the jobs is corporate welfare.

In the other case, you're in the marketplace for economic development drivers and you're buying one. It is a free market. You don't have to participate. You don't have to go buy anything that you don't want to go buy. Governments have to decide whether they want to participate — "Will we go get things?" Some of the states have made that decision: they're going to take a shot at it and bring these things in.

**Q: The genesis of Sematech came from the U.S. government and concerned people in the Reagan administration at the Defense Advanced Research Projects Agency. It was considered by many people to be corporate welfare, yet it wouldn't have happened if the United States government had not been engaged.**

**Goodall:** If the United States is going to do these kinds of things, then Sematech is the crack you can move through to make something happen at the federal level. That crack generally appears when there is a national interest.

The purpose of the federal government is to do what is best for the country. What gets people bent out of shape and appropriately so is when an individual company preferentially benefits from the federal government. That's not what the government should be doing. But if the government recognizes that it's in the national interest for an industry to be present — especially industries that have a defense security focus — then not having that in your country represents something that is not in the best interest of the country. If we have a consortium of the key players then we haven't picked a winner. We haven't done conventional corporate welfare. We've said this is an industry that we need. That is not subsidizing them. It's enabling them to be better and to serve the national interest.

**Q: Would government support help create Sematech types of consortia in other key industries.**

**Goodall:** Yes. When the U.S. helped put Sematech together it was half paid for through the government and half paid for by the industry at about \$100 million each. You can go to the bio or pharmaceutical industries and say: "What it is that is keeping you guys from delivering solutions faster? We want that to happen in the U.S."

Maybe there isn't the national interest of another country eating our lunch, but the citizens of America might perceive a national interest associated with longevity of life that is worth spending money on. If that's the case, then the government could conceivably say let's put together a consortium of these companies and we'll put in some money to take some of the risk out of it. They can incentivize them over the hurdle that

*(Continued on next page)*

## Sematech...*(Continued from page 10)*

says, "We don't want to do this because whatever helps my competitor hurts me."

That mentality sits out there in the world, and the government as a third party might be able to get them over it. They might want to start small.

They have to be like companies with enough similarity in their roadmap. Even if they never wrote a roadmap together, if you can academically or intellectually imagine their roadmaps, they have enough common future that collaborating now brings them individually competitive benefit from having shared in the collaboration. If that's the case, you could form a consortium. If you have the right model and somebody who is credible, you can convince a particular industry that they ought to collaborate even if there wasn't any incentive. You can use a credible story with the example of Sematech. We've told that story and people can use it to move forward.

**Q: There is a strong feeling among many in the government that they have provided R&D funding to U.S. firms that sell out to foreign companies. The taxpayer loses that investment or, even worse, they have helped build a formidable competitor for the remaining companies in the United States. There's a sense that the taxpayers put a lot of money into Sematech and now the companies are building their fabs in China, and there is no benefit for the United States. Why should taxpayer dollars go into these endeavors only to see them disappear or benefit some other country?**

**Goodall:** They have carried only one thread of an argument. You could put nothing into them and they would just go away faster. What do you really want to have happen? A lot of times these things come down to what kind of economist are you? What is your economic dogma? What do you really believe in terms of jobs at any cost? Do you want the most productive economy with the lowest priced goods and services even if they can come from someplace else? Do you imagine having only a service economy? How much innovative churn do you need in an economy to sustain largely a service-based economy? You can't be pure service because then nothing is actually being generated. Does it need to be 1 percent innovative churn, 5 percent or 10 percent?

**Q: There have been reports done by the Defense Science Board and the President's Council of Science and Technology Advisors that say the United States risks losing the semiconductor industry. Does that concern exist at Sematech, given that so many of your members are not U.S. companies?**

**Goodall:** It's not in Sematech's mission to do something particular for the United States at this point. It was at the beginning, and it evolved. Part of not taking federal money means that you're not doing that. There is some concern that is valid from a U.S. point of view because the semiconductor industry really is the embodiment of miniaturized specialty materials and that

manufacturing infrastructure. Having that industry present in your technical environment requires lot of people, a lot of R&D investment, big manufacturing investment. The churn that it generates is throwing off people, infrastructure, equipment, labs and university programs that go off into bio, alternative energy and nanotechnology.

If you don't have a semiconductor industry you will have to significantly artificially stimulate everything else. If you have a semiconductor industry plowing the hard ground, then you have a better chance of having these other industries grow up in that fertile soil.

Staying on the Moore's Law curve means that we have to invest a certain amount in R&D all the time. If your revenues are slowing down — and in a maturing industry they will — how can you possibly stay on Moore's Law? Maybe you can't keep it going exactly at the same rate forever, but one of the ways you can stay there is if other industries can start reaping the benefits and join the mass nano-scale manufacturing environment. They have to start investing in things that are synergistic. Through inter-industry collaboration you can start to see a way to stay on Moore's Law longer than you should have been able to.

**Q: Do you see other industries beginning to realize this?**

**Goodall:** We see it starting in Texas. We're looking at biotech alliances with university researchers. They want to use the nanofabrication capability that we have here to build nanofluid medical devices for implants. That's a very small scale investment, but when these things take off in the marketplace and are being used in people and animals, then there will be a multi-trillion dollar industry bigger than semiconductors. There will be a lot of interest in the R&D necessary to push forward the front of nano-structured devices.

We hope Sematech can be a conjunction point where these different things meet. If we play our cards right, then we will be able to help the world at large understand how to do things that are synergistic. At some point, that will help the semiconductor industry stay a little bit more on track or figure out how to make devices 20 years from now.

**Q: Texas learned from the oil bust in the 1980s that it had to diversify its economy and embrace technology. Some states understand how important this really is.**

**Goodall:** It would be really difficult for a random state in the Midwest to get someone to dump a fab in there because they require such a broad infrastructure.

It was a bold move when the auto industry built auto plants in the middle of Tennessee. There was nothing. Now there is infrastructure and the industry is moving down the Ohio River Valley.

It's hard to put a fab that costs \$5 billion where there is nothing. What you don't ever want to have happen is if you have that in your economy, you don't want it out. It's very hard to get but it's really bad to lose.

## People On The Move

The American Forest & Paper Association has a new president. Juanita Duggan, currently president and CEO of the Wine and Spirits Wholesalers of America, has been selected to replace retiring Henson Moore, who said: "She brings all the necessary qualities to step right in and lead our industry."

The Association for Manufacturing Excellence has a new president: Ralph Keller, who is described as being "a longtime leader and innovator in manufacturing processes." Keller was also named to the board of the Chicago Manufacturing Center.

Taffy Kingscott, IBM's Washington, D.C.-based executive in charge of technology policy issues, has taken a job as a professor at the Industrial College of the Armed Forces at the National Defense University. Kingscott has been named to the IBM Industry Chair, which the company is creating at NDU. It is the university's first industry chair and Kingscott will be using it to "bring the fullness of American industrial experience and views to bear on these issues with some of the brightest people in government," she writes in an e-mail. Susan Tuttle is replacing Kingscott as IBM's director of worldwide innovation policy. Tuttle has experience in IBM with trade, export regulation and human resource issues and has expertise in India and China. "I am confident she will be a great addition to the innovation policy community," writes Kingscott, who can be reached via e-mail at [kingscottk@ndu.edu](mailto:kingscottk@ndu.edu).

The National Council for Advanced Manufacturing has named Paul Fowler to be its new director of research. Fowler joins NACFAM from the National Academy of Sciences, where he was a senior research associate. Fowler spent 13 years in production, process and plant engineering positions in both discrete manufacturing and chemical plants.

Microsoft has named John Fikany to be vice president in charge of its manufacturing industry division, a group that generates \$1.5 billion in revenue and supports more than 1,100 customers. Fikany served as general manager of Microsoft's automotive and industrial equipment division and was general manager of its Great Lakes District.

Olwen Huxley, a professional staff aide on the House Science Committee's subcommittee on environment, technology and standards, has left her post and moved to Hawaii. Huxley was in charge of authorization bills related to the Manufacturing Extension Partnership and fought for the program's survival as the Bush Administration tried to eliminate it. "She's gone to Hawaii with her husband to start another kind of life," said one of her co-workers.

The Aerospace Industries Association has named Cord Sterling to be its new vice president of legislative affairs. Sterling joins AIA from the Capitol Hill office of Sen. John Warner (R-Va.), chairman of the Senate Armed Service Committee. AIA has also hired J.J. Gertler to be in charge of issues regarding the defense budget, industrial base and R&D. Gertler joins AIA from a position on the House Armed Services Committee where he managed military procurement and defense budgets.

The National Association of Manufacturers has seen some turnover and new additions. Long-time technology policy specialist David Peyton has left to start his own firm representing a number of manufacturers in Washington, D.C. Nathan Koble has joined NAM in the newly-created position of director of Internet strategies. Koble will spearhead NAM's efforts to create podcasts, blogs, Webcasts and other new media.

### Quotable:

"The chemical industry, which relies on natural gas for both energy and as a feedstock, has lost 100,000 jobs and \$50 billion in business because of rising prices. Of 120 chemical plants worth \$1 billion or more being built in the world today, only one is being built in the United States. The plastics industry, which also uses natural gas both for energy and as a feedstock, lost 150,000 jobs and \$14.6 billion between the years 2000-2002. The fertilizer industry has lost more than 36 percent of domestic capacity since 2002, and much of that will never return to the United States."

—Gov. John Engler, *President of the National Association of Manufacturers*, in a Sept. 11 request that Congress pass legislation allowing drilling on the Outer Continental Shelf. Congress left town on Sept. 30 without taking up the measure.

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