# MAKING AMERICA STRONGER:
# A Report With Legislative Recommendations On Restoration of U.S. Manufacturing


**OFFICE OF SENATOR JOSEPH I. LIEBERMAN**



**SEPTEMBER 2003**

# Introduction:
# Senator Joseph I. Lieberman

September 2003

As I write this, halfway through the month of September 2003, the U.S. Department of Labor has just announced the third straight week of increases in the number of people filing first-time unemployment claims. It's a safe bet that many of those new jobless were in manufacturing-related jobs.

Nationwide, we lost about 44,000 manufacturing jobs last month. About 71,000 the month before that. And this is during what is supposed to be an economic recovery. In terms of jobs, the U.S. manufacturing sector has slipped every month for the last 37 months. 2.7 million jobs. In my own state of Connecticut we've lost more than 14 out of every 100 manufacturing jobs in the past three years, and it's cold comfort that we're not the worst.

Our manufacturing sector is hemorrhaging jobs at a dismaying rate. And not just jobs but industries. Economists at the Federal Reserve Bank of New York recently published an analysis of the current "jobless recovery." Their conclusion is stark:

> *Our inquiry into the reasons for the current labor market slump suggests that structural change has played an important role. Industries that lost jobs during the recession have continued to shrink during the recovery, and permanent job losses have eclipsed temporary layoffs.*
>
> "Has Structural Change Contributed to a Jobless Recovery?"
> Erica L. Groshen and Simon Potter

There are many reasons behind these closed plants, these lost jobs, these devastated families. Fierce competition from overseas competitors — some of them playing on fields tilted distinctly in their favor — has played a major role. So did the severe recession we are only now climbing out of. The collapse of the telecom industry had severe consequences for manufacturers that served the electronics and information technology industries. This report discusses a number of challenges and problems facing American industry.

But the most imperative question is, "What does the Bush Administration intend to do about it?" Its recent acknowledgment of foreign country manipulation of their currencies is welcome, but the Administration is not utilizing it current authority to remedy this abuse; this is the key point of my legislation: S. 1592, the Fair Currency Enforcement Act of 2003, discussed in depth in this report. Creating an Assistant Secretary for Manufacturing and Office of Industry Analysis simply rearranges existing boxes, and submerges them deep in the Commerce Department. This report recommends making the Commerce and Defense Secretaries themselves responsible. Their plan remains lacking in content and vision.

Forgive me, but the time has come to be blunt. Every sector of the American economy plays a role in the strength and security of our nation, but the role played by manufacturing is unique, and uniquely important. To do nothing, to roll over and play dead, is not the American way. Sadly, it seems to be the approach favored by the current Administration.

The problems we face are complex, the response needs to be thorough, broad-based, and coordinated. That's what this report is really about. Here we present the broadest, most comprehensive and insightful plan to revitalize U.S. manufacturing yet proposed.

We need to understand that trade is not the problem, it's part of the solution. And we need to deal with the obstacles raised in some countries to a free and fair trade in American goods. We need to invest in the future of manufacturing, in the research and development of new, path-breaking manufacturing processes. We need to invest in our workforce, in the training and education needed to excel and prosper in a world labor market. We need to reinvigorate partnerships between state and Federal government, and between government and industry.

Indeed, this is not a task for government alone. The proposals outlined in this paper call upon industry and academia, upon labor and management, upon the private and public sectors to contribute to the solutions we need.

It will require all of us, pulling together.

I invite your comments. I also invite the Administration to review these recommendations and take vigorous action to protect the U.S. manufacturing sector.

I want to thank Michael Baum, along with William Bonvillian and Chuck Ludlam of my staff for their efforts in preparing what I believe will be a useful and timely report.

Joseph I. Lieberman
United States Senator
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# Executive Summary

Of all the sectors of America's economy, none are as critical to our productivity and our prosperity as our manufacturing base, and none have been hit harder by the recent recession. Our producers are facing a real crisis, which can be measured not only in the dry statistics of escalating balance-of-trade deficits and foreign outsourcing, but in the enormous loss of good, high-paying American jobs — jobs that may be gone forever.

The decline of our manufacturing base threatens our entire economy. Manufacturing is an enduring source of productivity gains, provides high-paying jobs, promotes growth in the economy better than any other single sector. The value added by efficiently producing manufactured goods is the root of our nation's wealth.

But the manufacturing sector is witnessing the slowest recovery from a recession since the U.S. government began recording industrial production in 1919, while our trade deficit in manufactured goods has reached record levels. Manufacturing seems to be moving overseas, and taking manufacturing jobs with it.

If we want to have a strong manufacturing sector, we need a strong manufacturing policy. Aggressive pursuit of free trade is one element of that policy, but it's only part of the job. Our manufacturing strategy must be to compete. And win. America needs strong, activist trade and manufacturing policies not only to knock down barriers to our products, but also to build up our competitive strengths in manufacturing: our ability to rapidly and continuously introduce new, more efficient processes and materials, our trained and adaptable workforce, our innovative products.

This report outlines a comprehensive plan for the revitalization and growth of manufacturing in America. The main elements include:

<u>Enforcement of trade agreements and trade promotion</u>

- Press for an end to unfair currency practices in international trade.
- Enforce trade laws and fight non-tariff trade barriers to U.S. goods.
- Expand export promotion.
- Back up enforcement with trade compliance oversight.
- Vigorously defend our intellectual property.
- Expand Trade Adjustment Assistance programs.
- Eliminate the tax benefits for offshore corporate "inversions."
- Incorporate workers' rights and environmental protection in trade agreements.

<u>Tax policies to encouraging new investment in manufacturing</u>

- Target tax incentives for manufacturing, especially in information technology.
- Give smaller manufacturers new access to capital.
- Retarget the extraterritorial income tax code to benefit domestic production.

A Federal manufacturing R&D policy to promote innovation

- Double the budget for the Defense Department's Manufacturing Technology (ManTech) program.
- Develop 21st Century manufacturing technologies at the Defense Advanced Research Projects Agency (DARPA)
- Unleash the Commerce Department's Advanced Technology Program on manufacturing processes.
- Rescue and expand the Manufacturing Extension Partnership.
- Partner Federal manufacturing programs with regional industry clusters.
- Better coordinate Federal manufacturing programs across agencies.

Expanding and enhancing worker skills to build a 21st century workforce

- Establish Regional Skills Alliances for manufacturing.
- Preserve and enhance the workforce training mission of our community colleges.
- Create a national network of learning guides.
- Encourage state innovation in support of workforce training.
- Create state-of-the-art web-based learning resources.
- Encourage the development and use of industrial "skill standards".
- Increase our annual output of American scientists and engineers and offer education in new specialties.
- Make training more affordable.

Preserving our strategic manufacturing capabilities

- Conduct annual reviews of the ability of domestic industry to meet Defense supply needs.
- Use DoD purchasing power to support manufacturing elements critical to the national security.
- Aggressively pursue policies to retain U.S. strength in the semiconductor industry.

Improving Federal partnerships with states to support manufacturing

- Expand the EDA mission to prevent the loss of manufacturing jobs.

Creating new 21st century infrastructures to drive new manufacturing processes and products

- Accelerate the build-out of broadband networks.
- Leverage DOD network technology for the private sector.
- Rebuild 19th and 20th century infrastructures with "green" technologies.

Tapping industry expertise with a blue-ribbon Presidential Commission on Manufacturing Competitiveness

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## INTRODUCTION — THE CURRENCY OF INTERNATIONAL TRADE

At the outset of the 90's a senior economic official[1] gained notoriety (perhaps unjustly) for the reputed comment that it didn't matter if the United States produced "potato chips or computer chips," the point being that, after all, production is production. At the time, more acute observers wondered if there wasn't in fact an economic advantage to being the world leader in the high technology products that were shaping the markets of the future.

After a recovery in the 90's we've since lost ground — the debate has shifted from what *sort* of manufacturing is important to the economy to whether or not manufacturing *itself* is important.

It is.

Of all the sectors of America's economy, none are as critical to our productivity and our prosperity as our manufacturing base, and none have been hit harder by the recent recession. Our producers are facing a real crisis, which can be measured not only in the dry statistics of escalating balance-of-trade deficits and foreign outsourcing, but in the enormous loss of good, high-paying American jobs — jobs that may be gone forever.

A recent economic study prepared for the National Association of Manufacturers summarizes the manufacturing sector's essential contributions to our economy[2]. The main points:

- During the 1990's manufacturing contributed almost 30 percent of our economic growth, and twice the productivity growth of the service sector during the same period.

- Manufacturing still provides higher-paying jobs and a higher standard of living — average weekly earnings for manufacturing workers in 2001 was 23 percent higher than for service sector workers.

- Manufacturing promotes job growth even in non-manufacturing industries. The average manufacturing job creates an additional 4.2 jobs throughout the economy, nearly three times the rate for the business and personal services sector. According to the Commerce

[1] The line was widely quoted and attributed to Michael J. Boskin, chairman of President Bush's Council of Economic Advisers, speaking off the cuff at a conference. He denied ever having said it, and the story may well be apocryphal.
[2] Popkin, Joel et al., *Securing America's Future: The Case for a Strong Manufacturing Base*, Joel Popkin and Company, Washington, D.C., June, 2003.

Department's Bureau of Economic Analysis, the "multiplier effect" – a measure of how growth in one sector of the economy induces growth in others – is higher for manufacturing than any other sector of the economy. In 2002 it is was estimated at 2.43. (For comparison, the multipliers for information services and for financial and business services are 1.8 and 1.5, respectively.)[3]

Some argue this doesn't really matter, because the United States is transitioning to a new economy, one based on information and services. Information and services are important and growing sectors of our economy, but all the evidence suggests that even in this high-tech era, manufacturing — the creation of goods of value — still provides our economic foundation.

High-value manufactured goods are the currency of the global economy, and our supply of this currency is eroding. The value added by efficiently producing manufactured goods is the root of our nation's wealth. But the manufacturing sector is witnessing the slowest recovery from a recession since the U.S. government began recording industrial production in 1919. More and more of our manufactured goods come from outside our borders. The U.S. trade deficit in merchandise has reached record levels — over $482 billion in 2002[4]. Let's make that clear: every hour of every day, 24/7, the U.S. spends $55 million more to buy imported goods than it sells.

Some underlying strengths have masked the true dimensions of the manufacturing crisis. Manufacturing productivity, for example, has continued to climb almost without interruption since the first half of 2001[5]. In truth manufacturing, from cheap molded beach toys to sophisticated microprocessor chips, is a large and complex sector of the economy with many apparent contradictions. On the one hand we read that the U.S. is the world's largest exporter of manufactured goods[6], on the other, that foreign imports threaten the health of our manufacturers. On the one hand we read of the growing loss of manufacturing jobs — more than 2.7 million jobs lost since July 2000[7] — on the other, that more than 80 percent of large and small manufacturers report a "moderate to serious" *shortage* of qualified workers[8].

In fact, we are part of the way to a strong manufacturing policy. Aggressive pursuit of free trade has brought world markets to our doorstep. That's good, but it's only the start of the job. There is no hiding from today's global economy, no way to shut the door in its face. And sacrificing our manufacturing sector to global competition is not acceptable either — manufacturing remains the most productive, wealth-creating sector of our economy.

Our manufacturing strategy must be to compete. And win. America needs strong, activist trade and manufacturing policies not only to knock down barriers to our products, but also to build up our competitive strengths in manufacturing: our ability to rapidly and continuously introduce new,

[3] Ibid., quoting Bureau of Economic Analysis data.
[4] Foreign Trade Statistics, 2000-2002, U.S. Census Bureau.
[5] U.S. Department of Labor, Bureau of Labor Statistics data.
[6] World Trade Organization, *International Trade Statistics, 2002*.
[7] Bureau of Labor Statistics tables, Manufacturing (All employees, seasonally adjusted).
[8] National Association of Manufacturers et al., *Keeping America Competitive – How a Talent Shortage Threatens U.S. Manufacturing*.

more efficient processes and materials, our trained and adaptable workforce, our innovative products.

Most experts tell us that we're not going to bring about a sustained high growth economic recovery — and growing productivity and opportunities for the American people — without taking concrete steps to revitalize our manufacturing sector. Here we consider the nature of the problem we face, and the elements of a comprehensive national policy to address it.

## THE PROBLEM

Is there any real problem with the manufacturing sector of the U.S. economy? Certainly there are some positive numbers. Manufacturing productivity – the output per hours worked – generally has been rising since 2001[9], but productivity can rise from layoffs and cut-backs rather than positive growth. Employment indicators tell a very different story:

- Manufacturing employment has fallen for 37 straight months. In fact, 2.7 million manufacturing jobs have disappeared since July 2000 — the largest decline in the post-WWII era.[10]

- The recession has caused job losses in many sectors, but manufacturing has been far and away the hardest hit. Manufacturing makes up only about 15.1 percent of the private, nonfarm labor force, but it has absorbed more than 90 percent of the total jobs lost since March 2001.[11]

- Not surprisingly, manufacturing jobs are declining in terms of the total U.S. workforce, from 13.2 percent in 2000 to 11.4 percent in early 2003.[12]

- This job loss is matched by a hollowing out of manufacturing capacity. Plant closures accounted for 50 to 60 percent of the "job displacements" for manufacturing workers with three or more years of tenure from 1993 through 2001. On the average, 177,000 manufacturing workers with three or more years of tenure lost their jobs every year from 1993 through 1998. From 1999 through 2001 that figure shot up to 230,000.[13]

- As the employment figures suggest, manufacturing is fading as a component of the U.S. economy. The Industrial Union Council notes that, "Manufacturing output as a share of the U.S. GDP, which has fallen steadily for more than 50 years, suffered its largest decline (1.4 percent) in a single year, to 14.1 percent in 2001. By contrast, in Germany manufacturing accounts for 21 percent of that nation's GDP; in Italy it equals 19 percent; and in Japan and

[9] U.S. Department of Labor, Bureau of Labor Statistics data.
[10] U.S. Department of Labor, Bureau of Labor Statistics data.
[11] Various sources, but see *Revitalizing American Manufacturing*, AFL-CIO Industrial Union Council Publication No. 03025-01-O-4.25
[12] Op. Cit. *Securing America's Future*.
[13] Ibid., quoting the Bureau of Labor Statistics *Displaced Workers Survey.*

Korea the shares are 22 percent and 31 percent, respectively, placing the United States at the end of the list of advanced industrial nations."[14]

- Perhaps most disturbingly, many experts now believe — backed by a study by the Federal Reserve Bank of New York — that the manufacturing job losses we sustained as a result of the 2001 recession are largely the result of permanent, structural changes accelerated by the recession. They're not coming back.

  Past recessions have generally been followed by a period of rapid job recovery as employers who laid off workers pick them back up again to meet renewed demand. But the current recession/recovery is different, experts say. In 2002 and 2003 the economy grew at rates between 1.3 and 5 percent (annualized) while the number of payroll jobs fell an average 0.4 percent every quarter. Unlike most previous recessions, the 2001 recession was characterized by a relatively low rate of "temporary layoffs" and a relatively high rate of permanent layoffs.[15]

Those jobs aren't simply evaporating — they're moving overseas. That's made plain by a number of trade indicators that show where our dollars and opportunities are flowing. As we noted earlier, America is running the largest trade deficit in history — $482 billion (in goods) in 2002. (For contrast, the U.S. trade deficit in goods was about $67 billion in 1991 and $22 billion in 1981.[16]) Put another way, we're buying an increasing number of manufactured goods from foreign workers.

In particular, our manufacturing trade deficit with China is the worst bilateral manufacturing deficit in the world — the July trade deficit with China in goods was $11.3 billion, and we're on track for a cumulative trade deficit with China exceeding $120 billion for 2003[17]. We have a trade deficit with China in every major manufacturing industry except aircraft, with electronics, machinery, textiles, and apparel the worst.

How does this relate to manufacturing jobs? The Industrial Union Council summarizes:

> *Although real U.S. GDP grew by $2.4 trillion from 1992 to 2000, adding 23 million jobs to the economy, the rapidly growing trade deficit over that period cost 3.8 million job opportunities, primarily in manufacturing. An* [Economic Policy Institute] *study estimates that the rising U.S. trade deficit cost nearly 2 million actual and potential manufacturing jobs since 1994. If the U.S. trade deficit had remained constant, there would be 1.4 million more manufacturing jobs today. The stagnation in manufacturing workers' earnings since the mid-1970s also coincides with the U.S. trade balance in goods falling into chronic deficit. The trade deficit accounts for an estimated 40 percent of the decline in real wages over this period.*[18]

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[14] Op. Cit. *Revitalizing American Manufacturing*.
[15] Groshen, Erica L. and Potter, Simon, "Has Structural Change Contributed to a Jobless Recovery?", *Current Issues in Economics and Finance*, V. 9 No. 8, Federal Reserve Bank of New York, August 2003. But see also Weisman, Jonathan, "Casualties of the Recovery – Job Cuts Since 2001 Are Gone For Good, Study Says", *Washington Post*, September 5, 2003.
[16] Department of Census figures.
[17] Department of Census figures as of 11 September 2003.
[18] Op. cit. *Revitalizing American Manufacturing*.

This is not just an issue of economic strength, but one of national security. A strong manufacturing base and technology leadership has always been a key to our national security. But increasingly defense prime contractors are subcontracting parts and tooling for critical parts and components to foreign suppliers.

- The Pentagon's Advisory Group on Electron Devices (AGED) has warned that the Department of Defense (DoD) faces shrinking advantages across all technology areas due to the rapid decline of the U.S. advanced technology industry, and that the off-shore movement of intellectual capital and industrial capability, particularly in microelectronics, has impacted the ability of the U.S. to research and produce the best technologies and products for the nation and the war-fighter. The Advisory Group reported to the Secretary of Defense that DOD is now in the position of having to obtain the most advanced technologies from overseas, which "assigns those nations leverage over the U.S."[19]

- This rapid global technology migration has also been confirmed in a recently released National Research Council/National Academy of Sciences report on the U.S. semiconductor industry, which details the significant growth in foreign programs that support national and regional semiconductor industries. This support is fueling the structural changes in the global industry, and encouraging a shift of U.S. industry abroad. [20]

- Earlier this year it was revealed that an Indiana plant manufacturing a key component of the Defense Department's "smart bombs" is closing down and the production is moving to China.[21] This problem is now widespread in many defense areas.

The crisis in American manufacturing traces back to many factors. The sharp decline of the information technology sector in the past two years was a body blow to both the semiconductor industry and to communications equipment manufacturing in general. Longer range factors include the growing global economy, the increasing sophistication of the foreign workforce, U.S. tax and trade policies, shrewd industrial "capture" strategies from competitors abroad, and a dollar that is overvalued relative to the currencies of major trading partners. There is no one simple answer — no "one-size-fits-all" solution.

But the stakes are quite clear. America's economic well-being depends on reversing this drain of manufacturing capability and talent. If the United States is to have a viable, internationally

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[19] C. Kirkpatrick, et. al., Proceedings of the Advisory Group on Electron Devices (AGED), National Technology Leadership Forum, Microelecronics Case Study, September 24, 2002, summarized in *Manufacturing and Technology News*, Volume 10, No. 10 (May 16, 2003); see also Lieberman, Joseph I., *White Paper: National Security Aspects of the Global Migration of the U.S. Semiconductor Industry*, June 2003. [Congressional Record for June 5, 2003, pp. S7468-S7471.]

[20] C. Wesner, ed., Securing The Future: Regional and National Programs to Support the Semiconductor Industry, Board on Science, Technology, and Economic Policy, National Research Council, 2003.

[21] Reported by Scott Wheeler in Insight magazine ("Missile Technology Plant Move to China"). The issue has been followed closely by Senator Evan Bayh.

competitive manufacturing sector in the future, it will require a major effort and commitment from both the private and public sectors, from industry, academia, and government.

The Federal Government can no longer take a hands-off approach — we must show some leadership, and make this a national priority. That means developing a focused, strategic vision and a systematic plan to realize it.

## THE SOLUTION

The key to fixing the weaknesses in our manufacturing sector lies not in following our competitors' lead with lower wages and poorer working conditions, but in building on America's inherent economic strengths — innovation, entrepreneurship, and a skilled workforce. It means standing up to unfair trade practices — currency manipulations and non-tariff trade barriers — that hinder our exports and drown our manufacturers with a flood of protected imports.

We can once again dominate manufacturing in the increasingly competitive global marketplace by insisting on the enforcement of international trade laws to ensure that free trade is also fair trade; by intelligent tax policies and federal R&D investments that leverage private-sector innovation, and by leading in workforce quality through a revitalized training and education system. We can purposefully target the product markets of the future with smart manufacturing processes and products that are energy-efficient and environmentally sound.

**A first step in any reform is to make sure there are leaders placed in charge and made responsible for the effort. The President should name the Secretaries of Commerce and Defense to take charge of an interagency effort. This is not a job that can be managed at the junior Assistant Secretary level. And it is vital enough to the nation's wellbeing that two cabinet officials with major existing responsibilities for our industrial base and the power to mobilize resources be held accountable for success in reversing our nation's industrial manufacturing decline.**

Here are other ways where we can legislate to meet those critical goals.

### • Trade Enforcement & Support

Other countries, including some of our major trading partners, seem to do a far better job of promoting their manufacturers than we do. Free and vigorous competition is in the finest tradition of American business, but we need to ensure that when our manufacturers compete in global markets, the competition is not only free but *fair*. One of our most immediate tasks is to seek an end to the gross manipulation of currency values for competitive advantage by some of our major trading partners.

Several Asian nations have for years intervened aggressively in currency markets to maintain their national currencies at artificially low values relative to the dollar. China, whose currency (the *renminbi*, or *yuan*) is thought to be undervalued by as much as 40 percent, and Japan, whose *yen* is

undervalued by as much as 20 percent, are the two most obvious examples, but other nations including Taiwan and South Korea also have engaged in large-scale currency intervention.[22]

Manipulation occurs when a nation either intervenes in currency markets through long term, large-scale purchases of dollar assets or (as in China's case) by having its central bank(s) peg a currency to the dollar at a fixed amount. These are the essential techniques for suppressing the value of one's own currency.[23] Together these four nations alone currently hold over $1.2 trillion in foreign currency reserves, about half the world's total dollar reserves. And they've acquired about half that just since 1999.[24]

In a potential move that could limit the U.S. response to these undervalued currencies, Japan and China have been purchasing large amounts of the burgeoning U.S. National Debt. Over the first six months of 2003, they bought more than $96 billion in U.S. government securities. Japan now holds $440 billion in U.S. government debt and China has more than $122 billion.[25] This is a growing potential leverage point over the U.S. economy; very simply, lenders have power over debtors. Foreigners now hold fully 46% of the U.S. National Debt[26] and Goldman Sachs now estimates that the National Debt will nearly triple in the next ten years, requiring massive borrowing by our government.[27] This dependency on foreign lenders is unwise, much as is our dependency on foreign supplies of petroleum products. A reluctance by these foreign lenders to buy these securities could push yields (and commercial, mortgage, and other consumer lending rates) sharply higher, reducing stimulus to the economy and stifling economic growth.

As a result of these currency manipulations, these nations have achieved and sustained an unfair advantage in international trade. A product from China, for example, starts out with up to a 40 percent price advantage over a comparable product from the U.S. solely due to this currency manipulation. The result is the gradual, inexorable destruction of manufacturing in the U.S. and month after month of job losses in manufacturing. The U.S. needs to respond. It should:

- **Press for an end to unfair currency practices in international trade.** In September, 2003, Senator Lieberman introduced S. 1592 ("Fair Currency Enforcement Act of 2003") that:
  - Directs the President to begin immediately a 90-day period of bilateral negotiations with those nations that are most egregiously engaged in currency manipulation to bring an end to it;
  - Directs the International Trade Commission during those 90 days to gather facts and prepare the legal basis for action under existing provisions of the International

[22] Preeg, Ernest H., *Exchange Rate Manipulation to Gain an Unfair Competitive Advantage: The Case Against Japan and China*, Manufacturers Alliance/MAPI, 24 September 2002.
[23] Ibid.
[24] Coalition for a Sound Dollar, *Asian Currency Manipulation Monitor*, August, 2003.
[25] Peter S. Goodman, "U.S. Debt to Asia Swelling -- Japan, China Leading Buyers of U.S. Treasuries," Washington Post Foreign Service, September 13, 2003.
[26] "Foreign Holdings of U.S. Treasuries Hit Record of 46%," Financial Times, September 11, 2003; and "Foreigners May Not Have Liked The War, But They Financed It," Wall Street Journal, September 12, 2003.
[27] Daily Financial Market Comment, 9/09/03 Goldman Sachs Economics.

Monetary Fund, the World Trade Organization, and various U.S. trade laws (including sections 301 and 406 of the Trade Act of 1974);
  - Directs the President, in the event that the 90 day bilateral negotiations fail, to institute formal trade proceedings in the appropriate national and international agencies as detailed by the ITC report, and to seek damages and remedies for U.S. manufacturers. If he declines to act, the President must give the Congress detailed reasons and an accounting of his rationale; and
  - Requires the preparation of additional reports and recommendations from the Administration on the impact on our national security due to the loss of key industries (such as semiconductor manufacture) due to currency manipulation; more effective enforcement of existing trade laws and agreements; and better utilization of government resources for trade promotion.

- **Enforce trade laws and fight non-tariff trade barriers to U.S. goods.** We must undertake a full reexamination of the adequacy of the enforcement of multilateral trade laws and the impact of non-tariff barriers in the key manufacturing sectors, and promptly implement an aggressive strategy to turn these problems around.

  China, for example, assesses a 17 percent value-added tax on certain manufactured goods both imported and locally produced. Perfectly legal under international trade agreements. But in the case of semiconductor devices, for example, China then provides targeted *rebates* that effectively lower the VAT on integrated circuits manufactured in China to six percent — *three* percent if the IC is both designed and produced in China. As a result, China is capturing a greater and greater portion of the world's semiconductor industry. This maneuver is almost certainly in violation of the General Agreement on Tariffs and Trade (GATT) and the agreements of the World Trade Organization.[28] U.S. manufacturers trying to export still face prohibitive tariff and non-tariff barriers and major tax asymmetry in many nations. An exhaustive effort to remove these impediments to our goods must be undertaken.

- **Expand export promotion.** We must sharply increase and improve our export promotion efforts to boost sales of American manufactured goods abroad.

  - U.S. export assistance programs are broad but thin. Disparate efforts exist at the Commerce, State, and Agriculture departments in particular, together with numerous state and regional programs, but they are poorly coordinated and often under-staffed and under-funded. Our export-assistance dollars would be much more effectively spent through better coordination and cooperation among Federal, regional, and state export programs, and between export programs and manufacturing assistance programs like the Commerce Department's Manufacturing Extension Partnership (MEP).

  - Foreign market research to determine the feasibility of launching a product overseas is a particularly tough hurdle for small manufacturers. We should explore a program

[28] Various sources including the Semiconductor Industry Association, but see also "How China Is Quickly Capturing The World's Semiconductor Industry," *Manufacturing & Technology News*, Vol. 10 No. 15, 4 August 2003.

modeled after one in Denmark[29] in which the government would offer cost-sharing incentive grants to regional industry clusters to assist them in researching specific export markets.

- **Back up enforcement with trade compliance oversight.** The U.S. is at the heart of a global trading system linked by extensive agreements with most nations of the world. But we lack adequate oversight mechanisms to monitor whether other nations are abiding by their side of the bargains they have entered into — we need backup for the enforcement efforts described above. U.S. manufacturing has been damaged by widespread non-compliance and the Department of Commerce, which already has major international trade responsibilities, should be charged to promptly organize a systemic compliance oversight effort.

- **Vigorously defend our intellectual property.** A key U.S. trade priority must be to prevent foreign piracy of U.S. intellectual property. Foreign copyright violations alone cost the U.S. more than $20 billion in annual losses, according to industry estimates. U.S. copyright-based industries contribute almost $800 billion to the U.S. economy, and almost $90 billion in exports and foreign sales. Patent infringement pushes the costs much higher. The United States Trade Representative estimates the annual cost to U.S. industry due to piracy, counterfeiting, and infringement of intellectual property rights at $200 to $250 billion[30]. Now U.S. advanced manufacturing processes and technologies also are vulnerable to theft. Theft of trademarks is a massive problem.[31]

- **Expand Trade Adjustment Assistance programs.** We need to expand the Trade Adjustment Assistance (Department of Labor) and Trade Adjustment Assistance for Firms (Economic Development Administration) programs to provide immediate relief for manufacturers, workers, and communities hurt by manufacturing imports, and integrate these programs with other workforce training programs.

- **Eliminate the tax benefits for offshore corporate "inversions."** We need to reform U.S. tax law (as proposed last year in S. 2119[32]) to end the tax incentives that result in offshore corporate "inversions" — current tax treatment enables companies to cut taxes by nominally moving their headquarters overseas. This notorious tax dodge not only deprives the Treasury of tax revenues but also encourages companies to ship manufacturing and jobs offshore as well, because foreign operations of the now "foreign" corporation are removed from U.S. tax jurisdiction.

- **Incorporate workers' rights and environmental protection in trade agreements.** In promoting international trade, we must ensure that manufacturing does not become a "race to the bottom" by insisting that appropriate worker rights and environmental

[29] Southern Growth Policies Board proposal.
[30] United States Trade Representative "Special 301 Report" for 2003.
[31] "Bootleggers Raise Stakes in China's Piracy Fight: Safety becomes the key issue as counterfeiters turn to knockoffs of drugs and auto parts," Los Angeles Times, July 20, 2003
[32] S. 2119, the "Reversing the Expatriation of Profits Offshore Act", was introduced in the 107th Congress by Senator Charles Grassley and co-sponsored by 11 other senators including Senator Lieberman.

protections be incorporated in trade agreements.[33]

We should look at innovative approaches to promoting workers rights worldwide, such as encouraging industry to develop an easily recognized mark to be attached to products that are certified as produced with appropriate protections for workers — no child labor, for example — and the environment. [34]Or tie foreign aid levels to progress in implementing a basic set of protections — for workers and the environment.

## • Tax policies — Encouraging New Investment

An immediate priority has to be re-energizing the capital markets for investment in manufacturing, particularly for small and mid-sized manufacturers. Strategic, targeted tax incentives can focus badly needed capital in the following ways:

- **Target tax incentives for manufacturing, especially in IT.** Short-term Investment Tax Credits (ITC) and Accelerated Depreciation rates for capital plant and equipment are needed immediately to help boost manufacturing out of this recession. Much of the manufacturing decline is in the information technology and communications areas, and a 20 percent ITC for acquisition of those products will not only help manufacturing but help carry productivity gains into the economy as a whole.

- **Give smaller manufacturers new access to capital.** Small and mid-sized manufacturers are suffering from a lack of access to capital and venture capital. A zero capital gains rate for multi-year investments in small and mid-sized manufacturing firms should put more capital into our system for key business growth investments.[35]

- **Retarget the extraterritorial income tax code to benefit domestic production.** Decisions by the World Trade Organization require the U.S. to repeal our tax code provisions for "extraterritorial income" (ETI) or face annual tariff penalties of up to $4 billion per year. These tax code provisions were meant to offset a competitive disadvantage faced by U.S. exporters because of fundamental differences between U.S. and European tax law. They should be repealed to honor our commitment to free and open trade, but we must ensure that the benefit is retargeted to benefit domestic manufacturers. Senator Lieberman has cosponsored legislation introduced by Senator Fritz Hollings to phase out the ETI tax benefit and replace it with a graduated tax incentive for domestic production[36].

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[33] In 2000 the U.S. – Jordan Free Trade Agreement became the first such U.S. trade agreement to include measures calling for environmental protection and incorporating the basic workers' rights standards of the International Labor Organization's Declaration on Fundamental Principles and Rights at Work.

[34] See Lieberman amendment number 3419 offered on May 15, 2002 to the "fast track" legislation, H.R. 3009, to strike language that would have barred, "retaliation…based on the exercise of…the right to establish domestic labor standards and levels of environmental protection." This limitation on retaliation basically stated that the U.S. would not seek to enforce any labor or environment protections contained in a trade agreement. This is a limitation that did not apply to any of the other protections that might be contained in such an agreement. Senator Lieberman's amendment failed.

[35] In the 107th Congress, Senator Lieberman twice introduced this proposal (Section 4 of S. 798 and S. 1134).

[36] S. 970, the Job Protection Act of 2003. This is the companion bill to H.R. 1769, introduced in the House of Representatives by Representatives Philip Crane and Charles Rangel.

## • Federal Manufacturing R&D Policy — Promoting Innovation

To compete successfully in the global manufacturing sector, the United States must emphasize its historic strengths, particularly innovation. But the Federal Government — our single biggest source of research funding — has halved its investment in manufacturing R&D over the past decade.

In fact, key elements of a formerly aggressive Federal manufacturing program have been eliminated, slated for elimination, or sharply reduced, including. electronics manufacturing programs at the Defense Advanced Research Projects Agency (DARPA), the Department of Defense (DoD) Manufacturing Technology (ManTech) program, the Commerce Department's Manufacturing Extension Partnership (MEP) and Advanced Technology Program (ATP). We need to reverse course to rebuild a strong, coordinated effort on manufacturing process research:

- **Double the DoD ManTech budget.** The budget for the Defense Department's Manufacturing Technology program has declined to roughly half of what it was in the early 90's when it was responsible for a broad array of innovations in key manufacturing technologies. In particular, the Administration's budget requests for the Air Force and Navy ManTech programs are at their lowest levels in decades.

  This is particularly short-sighted in view of DoD's increasing reliance on high-tech weaponry requiring robotic systems and advanced optics, as well as other technologies requiring precision manufacturing. The current ManTech budget of $174 million (FY 04 request) should be doubled, and the program refocused on the most essential manufacturing technologies.

- **Develop 21st Century manufacturing technologies at DARPA.** A new program in manufacturing process research should be established at the Defense Advanced Research Projects Agency focusing on the highest priority manufacturing challenges of the 21st Century.

  Truly “flexible” manufacturing that can produce custom products in low volumes at competitive cost; practical manufacturing of nanodevices; intelligent manufacturing systems that integrate design and manufacturing with the rest of the business enterprise — advanced manufacturing capabilities like these will benefit not only the defense supply chain but U.S. manufacturing as a whole.

- **Unleash the ATP on manufacturing processes.** The Advanced Technology Program, which encourages industry investment in economically important technology R&D through cost-share funding, has been chronically underfunded for years. Despite this ATP has achieved a notable record of successes in manufacturing technologies, including (among others) new automobile manufacturing technologies widely used throughout the auto industry, new processes and instruments for electronics manufacture, and new process-control systems.

The Administration has announced plans to phase the program out, but the ATP has a proven ability to work with industry to define practical research roadmaps in strategic technology areas and make them happen. It should be turned loose on manufacturing process technology. Doubling the budget — to $350 million — with a special focus on manufacturing processes would enable the ATP to launch dozens of new research projects in manufacturing. And it would still be less than 7 percent of the budget of the National Science Foundation.

- **Rescue and expand the Manufacturing Extension Partnership.** In partnership with state and regional organizations, the Commerce Department's Manufacturing Extension Partnership co-funds and networks a nationwide system of manufacturing support centers to assist small and mid-sized manufacturers. Based on the same approach as agricultural extension centers, MEP centers offer small manufacturers a broad array of consulting and support services ranging from plant modernization and employee training to business practices and IT. In fact, a survey of manufacturing center clients served in FY 2001 reported that as a result of MEP services they created or retained 25,000 jobs, increased or retained $2.2 billion in sales, realized $442 million in cost savings, and invested $681 million in modernization.[37]

  The Administration has recommended cutting off long-term cost-share funding for this highly successful program, a move which will force the closure of many centers and require the survivors to significantly increase their fees, pricing them out of the range of many of the small companies they were created to serve. MEP should be fully funded to continue support for its national network — at roughly $100 million per year the program is an excellent investment given its benefits — and given increased resources to develop cooperative workforce training programs nationwide.

- **Partner Federal manufacturing programs with regional industry clusters.** Across the nation many regions benefit from industrial "clusters" — Silicon Valley is famous, as are automotive clusters in Michigan, biotech clusters in the Northeast, textile industry clusters in the Carolinas, and many more.

  The Manufacturing Extension Partnership and the Advanced Technology Program should be given additional resources to partner with state and regional economic development organizations in creating with industry cluster cooperatives. These cooperatives would facilitate both the exchange of current industry "best practices" guidelines (a mission of the MEP) and the development of critical industry R&D roadmaps (for potential support from the ATP.)

- **Better coordinate Federal manufacturing programs.** In 2001 a group of Federal technology managers quietly launched GATE-M (Government Agencies Technology Exchange in Manufacturing), an interagency work group that promotes coordination and information exchange among several agencies working on manufacturing issues — including the National Institute of Standards and Technology (NIST), DOD, the Office

[37] Manufacturing Extension Partnership internal assessment survey. See http://www.mep.nist.gov

of Energy Efficiency and Renewable Energy (EERE, DOE), NASA, the National Nuclear Security Administration (DOE) and the National Science Foundation. They showed commendable initiative, but GATE-M remains an informal effort with no funding of its own.[38]

Instead, GATE-M should be:

- given a formal charter to ensure strong commitment from all the federal agencies engaged in manufacturing research;
- given an operational budget to increase its activity level;
- be expanded to include representatives from both manufacturing companies and the manufacturing workforce; and
- tasked to conduct regular cross-agency assessments of the Federal R&D effort in manufacturing, identify gaps and redundancies when compared with industry needs, and develop interagency "roadmaps" to close the gaps and eliminate duplication of effort.

## • Worker Skills — Building a 21st Century Workforce

As technology advances — particularly in information technology — play an ever-growing role in manufacturing, a skilled workforce trained in the use of these new technologies becomes an essential component of any manufacturing strategy. Industry studies indicate that 60 percent the new jobs created in the 21st century will require skills held by only 20 percent of today's workforce. Clearly we need to address workforce training. But it doesn't stop there. We need to think beyond "worker retraining" programs to a new educational paradigm. The old model of education as something you do before you get a job can't match the pace of technological advance in the 21st century. Education for the manufacturing workforce — for everyone — can no longer stop at high school or college. We need to lay the foundations — organizations, programs, technologies — for a new system of lifetime learning that enables and encourages people to acquire new skills as they need them. Today, small and mid-sized companies simply don't have the resources to create and sustain first-rate in-house training programs for their employees. As delineated below, we should bring together regional manufacturers, workforce representatives, and community colleges to create programs and centers in states and regions to provide worker training where they need it. We should also create a website and supporting network to provide a easy-to-use source for distance training in a wide range of skills areas. The nation that can provide a steady, predictable stream of skilled, cutting-edge manufacturing talent is the nation that wins jobs and industry.

- **Establish Regional Skills Alliances for manufacturing.** Continuous improvement of worker skills to meet changing technologies and needs is key not only to the success of the workers, but to the success of their companies as well. Small and mid-sized companies simply do not have the resources or specialized skills to maintain effective, permanent in-house training programs — but by pooling resources and capabilities in a "Regional Skills Alliance" they don't have to. A Skills Alliance partners companies with

[38] Useful background on GATE-M is available from the program web site: http://www.mel.nist.gov/gatem

unions, community colleges, economic development organizations, and other regional resources to create a workforce training resource tailored to regional industries and needs.

Alliances like the Wisconsin Regional Training Partnership have demonstrated the power of this concept to create successful, long-term partnerships in learning, training workers in basic and advanced workplace skills, often in their workplace. The Manufacturing Extension Partnership (MEP), which already has significant experience in both workforce training programs and regional partnerships, should be given additional resources and tasked to encourage and support new regional skills alliances on a national basis, patterned after successful programs such as the Wisconsin partnership.

- **Preserve and enhance the workforce training mission of our community colleges.** We need to recognize that our nation's extensive system of community colleges is our frontline resource for continuing education and workforce training. In many states recession-driven budgets are forcing cuts to community college programs when we should be expanding them. As part of an expanded mission in workforce training, the MEP should be given the resources to work with community colleges to reinforce and expand their workforce training programs. Preferably, that should be done through regional skills alliances that include manufacturers, representatives of the manufacturing workforce, and state economic development organizations to ensure that the programs focus on the skills needed for real-world manufacturing jobs.

- **Create a national network of learning guides.** The average worker seeking to update his or her skills faces a difficult challenge not only in picking the right workforce development program, but even in finding out what programs and courses are available. Where do you start? You should be able to start at any of a nationwide network of easily recognizable learning centers, where trained staff assess your continuing education needs, lay out the options, and identify any possible sources of financial aid.

  To make that ideal a reality, we need to partner the Federal government with state and local governments, workforce development organizations, and far-sighted corporations to establish a national "learning guide" network that utilizes all the tools of modern outreach, including store-front operations, self-service kiosks, interactive web sites, and even on-site offices at major employers.

- **Encourage state innovation in support of workforce training.** Some states help companies train and place disadvantaged workers through programs tied to unemployment insurance. A Federal policy to encourage other states to establish similar programs this should be reviewed and evaluated.

- **Create state-of-the-art web-based learning resources.** We have scarcely begun to tap the potential of information technology and the Internet as a learning resource, particularly for lifelong learning and workforce training. Today's web-based learning materials are seldom more than web-page versions of conventional textbooks, perhaps

with animated graphics. On-line learning resources should truly interact with the student. They should draw on cognitive science research on how people actually learn. They should modify instructional style, materials, and speed to adapt to each student. When real money is at stake this happens, which, ironically, is why PC game designers do some of the best work in "teaching" players and adapting play level to their current skills.

We need to recognize that this is both a very hard problem and a very important one. To take a single — critical — example from homeland security, our first-response emergency personnel in localities nationwide need to maintain sharp, current skills to deal with potential, extraordinary events such as a bioweapons attack. Prudence would suggest national simulation drills on an annual or semi-annual basis, but the cost would be crippling. Detailed, network-enabled, multi-player simulation "games", on the other hand, would be a cost-effective way of maintaining the skill-levels of first-responder teams and rapidly introducing new strategies and emergency response tools — a new diagnostic technology, for example — on a national basis.

A key element of this strategy is to **accelerate the build-out and use of broadband** Internet service, which we discuss later. But in addition, the government should take the lead, in partnership with the educational community and the private sector, in designing and funding a broad, cross-disciplinary R&D program in simulation, interface design, language processing, and the other IT challenges involved. We should have as a goal the creation of web-authoring tools that allow topic experts to create vibrant, responsive, and effective on-line learning resources without needing to be experts in computer programming. We can stimulate a new generation of 21st Century learning tools to augment the work of classroom teachers and to bring our workforce the most up-to-date skills in the world.

- **Encourage the development and use of industrial "skill standards."** Organizations such as the National Coalition for Advanced Manufacturing (NACFAM) has been working in specific industries to develop "skill standards" that describe the nature of the job, how well the work must be performed to meet employers' expectations, and the level of knowledge and skill required to perform that work. Skill standards help workers assess their own training needs and help community colleges and other workforce training organizations design their curricula. Both help keep the U.S. workforce at the leading edge. It should be national policy to aid the development of manufacturing skill standards and encourage their use in training nationwide.

- **Increase our annual output of American scientists and engineers and offer education in new specialties.** We need to increase America's science and engineering workforce, the wellspring of manufacturing talent. In many key areas of science and engineering the number of U.S. citizens receiving undergraduate and graduate degrees has been flat or declining. We should expand and fully fund the Lieberman "Tech Talent" bill, passed last year, to encourage more graduates in manufacturing science and manufacturing-related engineering. In line with lifelong learning, we also should assist

our scientific and enginering workforce in identifying and acquiring new skills and capabilities in new specialties when advancing technologies create new opportunities.

- **Make Training More Affordable**. In the knowledge economy, workers need to update their skills on an ongoing basis or risk becoming uncompetitive. Unfortunately, the current process for securing training assistance is inefficient. We should survey and streamline existing Federal training offerings and create a new training effort offering up to $1,500 a year to help both current and displaced workers obtain and retain quality jobs in our rapidly-evolving economy.

## • Preserving Strategic Manufacturing

America's weakening manufacturing sector is a potential danger to national security as well as economic security. The past decade has seen an increasing trend in defense prime contractors subcontracting parts and tooling for defense systems abroad. DOD is becoming increasingly dependent on foreign suppliers for critical parts and components of weapons systems, such as laser diodes, gallium arsenide (a high-performance semiconductor used in high-speed chips for military applications), and charge-coupled devices -- the heart of modern digital imaging equipment and missile guidance systems. An as-yet officially unreleased study by the Pentagon's Advisory Group on Electron Devices says that DoD must use the most advanced electronics technologies available in its weapons systems if it is to retain battlefield advantage — and those technologies increasingly have to be obtained from overseas suppliers. Simply put, we cannot allow our military to be dependant on Asian imports for strategic technologies.

- **Conduct annual reviews of the ability of domestic industry to meet Defense supply needs.** The Department of Defense, working jointly with the Commerce Department's Office of Strategic Industries and Economic Security (charged by Congress with gathering and analyzing data, and developing and implementing policies to ensure a strong, technologically superior U.S. defense industrial base) and the Department of Labor should:
  - create a watchlist of domestic manufacturing industries essential to national security, including (for example) semiconductor fabrication, precision manufacturing, metals and metal fabrication, aerospace, machine tools, telecommunications, and advanced composites, and closely monitor it for indications of critical decline;
  - determine if sufficient domestic production capabilities exist to meet foreseeable defense needs;
  - examine the impact of Federal support programs affecting those industries, including Commerce and Defense Department R&D and technology transfer programs; and
  - devise strategies, make policy and budget recommendations to Congress, and implement policies to ensure that critical U.S. defense needs can be met by U.S. industry.

- **Use DoD purchasing power to support domestic industry.** One obvious policy strategy: DoD should leverage its purchasing power to “buy smart” - to retain and strengthen domestic manufacturing capabilities in strategic manufacturing industries. As

part of this effort, DoD should use its long-standing "Buy America" authority to assure retention of critical defense industrial capabilities. The Secretary of Defense has been trying to weaken the "Buy America" provisions of Defense procurement, but this short-sighted policy fails to consider our need for a strong manufacturing base. "Buy America" authority should be used to make strategic purchases to protect critical manufacturing sectors.

- **Aggressively pursue policies to retain U.S. strength in the semiconductor industry.** The problem is most acute in semiconductor manufacturing, where the United States has traditionally led the world. The U.S. semiconductor sector currently employs 240,000 people in high-wage manufacturing jobs, and had sales totaling $102 billion in the global market in 2000 (50% of total worldwide sales). In 1999, this sector was, far and away, the largest value-added industry in manufacturing in the U.S. The productivity growth in the U.S. in the 1990s was due in significant part to the computer production and advances in information technology that depended on the semiconductor industry.

  But today, driven by market forces, the consolidation of the industry, declining sales, and very aggressive industry-capture policies on the part of foreign governments, production of semiconductor chips is migrating from the United States to countries in East Asia, particularly China. If that's not bad enough, production drags with it the industries that make advanced tools for semiconductor fabrication, followed by advanced semiconductor design capabilities, and the human talent that fuels those industries.

  This is a high-priority issue — a very narrow window of time is available to halt this migration and retain a viable U.S. capability in advanced semiconductors. There are several things we can and should do immediately, including:

  - actively enforce GATT trade rules;
  - encourage domestic semiconductor makers in the use of joint production agreements that allow them to pool resources to create the highly expensive "fab" lines needed for advanced semiconductor devices;
  - explore creative business models that can help DoD and intelligence agencies obtain improved access to advanced manufacturing lines;
  - create tax incentives for U.S. investment in semiconductor industries;
  - increase in federal funding and cooperative research agreements for semiconductor R&D;

  - These and other options are discussed in greater detail in a recently-released Lieberman white paper: *National Security Aspects of the Global Migration of the U.S. Semiconductor Industry* (June 2003).[39]

[39] Congressional Record for June 5, 2003, pp. S7468-S7471.

## • Improve Federal partnerships with states to support manufacturing

State and local governments well understand the economic importance of their manufacturers. We need to take steps to expand Federal partnerships with the states to support them in retaining manufacturing industries and jobs, not just helping with relief after those industries and jobs are lost.

- **Expand the EDA mission to prevent the loss of manufacturing jobs.** The Commerce Department's Economic Development Administration was established to provide grants for infrastructure development and business development to help economically distressed communities reduce chronic unemployment. The definition of a "distressed community" should be expanded to include those that are losing significant numbers of manufacturing jobs, and the EDA should be given a new role to help state and local economic development organizations prevent the loss of industries and jobs. The EDA should assist state and regional organizations by:
    - helping to assess the health of manufacturing in key regions;
    - examining in detail those sectors that are in trouble and figure out why; and
    - creating an economic toolbox of loans, grants and other assistance to coordinate with the states in providing assistance in introducing new technologies, training programs, and capital for modernization.

  To help meet this expanded mission, the EDA should develop close working ties and coordinate with Commerce's Manufacturing Extension Partnership.

## • Creating 21st Century Infrastructures

Government has always played a major role in the creation of the nation's most important infrastructures, from the transcontinental railroad (financed by government land grants) to the interstate highway system to the Internet, which famously began as the ARPANET defense research project. And it's always paid off, as entrepreneurs and visionaries stepped into to build industries, create jobs and wealth, and spur economic growth based on the new capabilities and resources.

We need to look at the infrastructures needed for the 21st century, and consider government's role in supporting the framework for tomorrow's prosperity, on which our manufacturing companies and workforce can build new products and applications.

- **Accelerate the build-out of broadband networks.** Broadband information networks will be a fundamental element of technology and productivity tools in this century. But the U.S. is lagging behind some of our foreign competitors — notably Japan and South Korea — in the widespread deployment of broadband service to its citizens. Granted, the task is easier in countries with major population concentrations, but we need to be much more aggressive in promoting broadband.

  Through more R&D, deployment and more efficient use of wireless, government can

promote the development and implementation of truly high-speed wireless broadband technologies to supplement optical networks to cross the "last mile" to American households and small businesses. Our policy should be to drive this transformation by encouraging both the "pull" of market demand and the "push" of technology innovation.

- **Low consumer demand** is one of the major barriers to widespread development of advanced broadband networks in the U.S. — only one consumer in five who has access to today's relatively low-end broadband services chooses to use it. By supporting and encouraging the development of transformative applications in critical fields where government has a major mission — such as health care and education — applications that leverage the data, graphics, and video capabilities of high-speed broadband Internet, we can create particularly powerful drivers for market demand.

- **The DOD network technology can be leveraged for the private sector.** The Defense Department is constructing a "Global Information Grid" that is expected to be operational by the end of the decade. Involving advanced internet protocols, a satellite-based multi-channel optical data "mesh" around the world, and next-generation cryptographic capabilities, the GIG will deliver secure, 100+ Mbps wireless data transfer an. revolutionize global network capabilities[40]. If the experience of the ARPANET is any guide, these revolutionary capabilities could move quickly to the private sector Internet. We need to ensure that DoD develops and encourages close information and technology-transfer ties with U.S. hardware and software manufacturers and systems designers as the GIG program proceeds so they are positioned to take advantage of this revolution, to be the suppliers to the world of next-generation network hardware and software.

- **Rebuild 19th and 20th century infrastructures with "green" technologies.** Environmental issues are a growing concern worldwide, and the U.S. is a recognized leader in environmental technology. There is an opportunity to "re-engineer" major 20th century infrastructures, energy and transportation in particular, with advanced, environmentally benign technologies. Fuel cell technologies are one potential route. Today's auto and light bulb offer two clear challenges, both rooted in last-century industrial designs that must be transformed. Intentional replacement has become imperative. While one cannot predict exactly the propulsion systems of new cars, they will have electric drives powered by on-board generation. Likewise, today's energy-demanding lighting must yield to solid-state lighting. Both the House- and Senate-passed energy bills contain authorization for a solid-state lighting initiative with industry and higher education, and a major initiative here is an evident component of both energy policy and manufacturing policy. The U.S. should lead the way — and government policy should pave the way — to make sure that these infrastructure transforming technologies are developed in the U.S. and unlock world-wide markets to be served by U.S. companies and workers.

  In addition to in-house R&D, the Federal government should offer cost-shared incentive

[40] Department of Defense, Implementing The Global Information Architecture: Power To the Edge (January 2003).

grants to establish industry "green consortia" creating forums for industry to develop R&D roadmaps for environmentally beneficial technologies, set-up R&D consortia to pursue those roadmaps, and exchange best practices on cost-effective control, recycling, and disposal technologies for a cleaner, greener world.

- **Tapping Industry Expertise**

While this paper lays out an initial program for addressing critical manufacturing issues, it does not pretend to be a complete agenda. Government should not provide the only input in this process. An essential step is convene a high-level task force involving all the stake-holders — government, industry, and the workforce — to examine the issue in detail and make recommendations:

- Establish a blue-ribbon commission to further examine all aspects of U.S. manufacturing competitiveness. A high-level, Congressionally-mandated commission should be established to examine a broad range of issues affecting the American manufacturing base, including trade policies, Federal R&D support, taxation, access to capital, and other factors, and make specific recommendations for changes in government policy to strengthen manufacturing. Because of the diversity of the manufacturing sector, the commission should consider individually each major division, including IT and telecommunications equipment, automobiles and automotive parts, durable goods, light manufacturing, textiles, and semiconductors.

## CONCLUSION — TIME TO ACT

This report has presented a detailed description of the crisis facing American manufacturing. It has provided a description of the problem and a comprehensive outline of possible approaches and solutions.

It explains why the decline of our manufacturing base threatens our entire economy.

It sets a clear and emphatic goal -- adoption of a manufacturing strategy where America competes and wins.

It argues that if we want to have a strong manufacturing sector, we need a strong manufacturing policy.

It outlines realistic strategies which can be legislated to enforce trade agreements and promote trade, adopt tax policies to encourage new investment in manufacturing, adopt a Federal manufacturing R&D policy to promote innovation, expand and enhance worker skills to build a 21st century workforce, preserve our strategic manufacturing capabilities, improve Federal partnerships with states to support manufacturing, create new 21st century infrastructures to drive new manufacturing processes and products, and tap industry expertise with a blue-ribbon Presidential Commission on Manufacturing Competitiveness

It is time to act.