Executive Summary
Testimony of Yvette Pena Lopes
Deputy Director, BlueGreen Alliance
United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Commerce, Manufacturing and Trade
March 21, 2013

The American manufacturing sector forms a cornerstone of our national economy, providing nearly 12 million good-paying jobs for middle-class families across the country. Yet, the economic downturn and years of shifting production took a significant toll on U.S. manufacturers and their workers. An estimated 5.5 million manufacturing jobs were lost over the last decade. America has begun to change this, adding back more than 500,000 manufacturing jobs since the beginning of 2010,[1] but much more needs to be done to bring these jobs back and ensure that American manufacturing — and the steel industry in particular — are drivers of America's 21st century clean economy.

To achieve this rebirth, we must implement the following five drivers of American manufacturing:

First, we must rebuild our nation's infrastructure. Investments in our infrastructure can yield tremendous benefits, including jobs and expanded demand in our domestic steel sector.

Second, we must deploy more industrial energy efficiency. Energy efficiency leverages productivity and power from resources that, in many cases, would otherwise literally vanish into thin air.

Third, we must integrate more advanced transportation and clean energy into our economy. Whether it is more efficient technology and advanced materials for automobiles, commercial-scale wind turbines, or rail lines, steel is a necessary component for these industries that will drive the 21st century.

Fourth, we must ensure products and components are made in America. Buy America policies reflect where the jobs are, not where the manufacturing companies are headquartered or incorporated. This approach ensures that the job-creating impact of critical infrastructure investments is maximized, and that taxpayer dollars are reinvested in jobs and communities here at home.

Fifth, we must continue to support research and development. Manufacturing is responsible for 70 percent of all private-sector research and development spending and 90 percent of all American patents.[2]

These five measures will go a long way toward helping America and its workers reinvigorate the steel sector, along with the rest of American manufacturing, revitalize the American middle class and move America to a clean economy, ensuring that we continue to address climate change.

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[1] *U.S. Manufacturing Continues to Create Jobs in the U.S.* (The Commerce Blog, U.S. Department of Commerce, August 2012) http://www.commerce.gov/blog/2012/08/03/us-manufacturing-continues-create-jobs-us
[2] *A Framework for Revitalizing American Manufacturing* (Executive Office of the President, December 2009) http://www.whitehouse.gov/sites/default/files/microsites/20091216-maunfacturing-framework.pdf

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Mr. Chairman, Ranking Member and Members of the Subcommittee, I am Yvette Pena Lopes, Deputy Director of the BlueGreen Alliance. On behalf of my organization, our fourteen national labor and environmental partners and the estimated 15 million members and supporters they represent, I want to thank you for holding these hearings today on the future of American manufacturing.

We appreciate the invitation to testify and are honored to join the other panelists from the Congressional Steel Caucus and the steel industry, in particular Mike Rippey, President and CEO, ArcelorMittal USA; Richard Harshman, Chairman, President and CEO, Allegheny Technologies Inc.; and Mike Rehwinkel, President and CEO, Evraz North America, who are each valued members of the BlueGreen Alliance's Corporate Advisory Council.

The BlueGreen Alliance is a national partnership of 10 labor unions and four environmental organizations. The United Steelworkers and the Sierra Club founded BlueGreen Alliance in 2006, and have since grown to incorporate 12 other labor and environmental organizations to create an Alliance built with a wide variety of priorities and backgrounds. Yet through that variety, our partners have come together to move America towards a 21st century clean economy, and manufacturing has consistently been a major focus of our Alliance.

The American manufacturing sector forms a cornerstone of our national economy, providing nearly 12 million good-paying jobs for middle-class families across the country. Yet, the economic downturn and years of shifting production took a significant toll on U.S. manufacturers

and their workers. An estimated 5.5 million manufacturing jobs were lost over the last decade. America has begun to change this, adding back more than 500,000 manufacturing jobs since the beginning of 2010,[3] but much more needs to be done to bring these jobs back and ensure that American manufacturing — and the steel industry in particular — are drivers of America's 21st century clean economy.

Steel and the clean economy

Rebuilding American Infrastructure

The Tappan Zee Bridge connects Rockland County to Westchester County in New York's heavily populated Lower Hudson Valley. It utilizes 62.5 miles of steel "H" pile, 6.3 miles of 30-inch steel pipe, and its falsework used roughly 1,700 tons of steel.[4] This bridge is about to undergo a major overhaul, which will make it the world's widest bridge.

There are many, many more infrastructure projects that require an overhaul like the Tappan Zee Bridge. Recently, the American Society of Civil Engineers (ASCE) updated their report card giving our nation's infrastructure an overall grade of D+, and highlighted especially alarming disrepair in many key areas, such as wastewater management (D) schools (D) and energy (D+).[5]

Many U.S. cities rely on pipes that are, on average, a century old.[6] Leaking pipes lose an estimated 7 billion gallons of clean drinking water a day and are known to leach contaminants and breed bacteria in drinking water, jeopardizing the health of our nation's communities. An

[3] *U.S. Manufacturing Continues to Create Jobs in the U.S.* (The Commerce Blog, U.S. Department of Commerce, August 2012) http://www.commerce.gov/blog/2012/08/03/us-manufacturing-continues-create-jobs-us
[4] *About the Tappan See Bridge* (Rand Commercial Services) http://tappanzeebridge.randcommercial.com/about-the-tappan-zee-bridge/
[5] *2013 Report Card for America's Infrastructure* (American Society of Civil Engineers, March 2013) http://www.infrastructurereportcard.org/
[6] "Clean Water, Good Jobs" (BlueGreen Alliance, October 2012) http://www.bluegreenalliance.org/news/publications/clean-water-good-jobs

average of 850 water main breaks[7] in North America occur daily. According to a 2002 congressional study, corrosion of these systems costs over $50.7 billion annually.

Our natural gas pipeline infrastructure, particularly at the distribution level, is comprised of aging assets; approximately 3 percent are constructed of cast and wrought iron installed at the first half of the 20th century.[8] Distribution pipelines are volatile and susceptible to failure, and their modernization is a critical step towards a safe, efficient 21st century clean energy economy.

According to the Federal Highway Administration, one out of every four of the nation's bridges[9] are structurally deficient or functionally obsolete, nearly a quarter of the nation's bus and rail infrastructure is in marginal or poor condition and more than half of the miles driven on federal highways are on roads that are in less than good condition.

Across the country, estimates say 700,000 tons of steel plate is used annually in bridge and building construction projects.[10] Rebuilding our nation's infrastructure must be at the top of our policy agenda. Investments in our infrastructure can yield tremendous benefits, including jobs and expanded demand from our domestic steel sector. Every $1 billion invested in water infrastructure is estimated to create more than 20,000 new jobs.[11] And, if an infrastructure program is implemented and structured with the right mandates to ensure domestically produced components, job creation for the manufacturing sector could clear 250,000 new jobs.

Automobiles

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[7] Water Main Break Clock http://www.watermainbreakclock.com/
[8] *The State of National Pipeline Infrastructure* (U.S. Department of Transportation, http://opsweb.phmsa.dot.gov/pipelineforum/docs/Secretarys%20Infrastructure%20Report_Revised%20per%20PHC_103111.pdf
[9] "National Policy on Transportation" (BlueGreen Alliance, June 2011) http://www.bluegreenalliance.org/news/publications/document/BGA_PolicyBrief_Transportation_FINAL.pdf
[10] "Structural Steel: An Industry Overview" (American Institute of Steel Construction, September 2012) http://www.aisc.org/uploadedFiles/SteelDay/2011/Documents/Sept.%20%20Industry%20Overview.pdf
[11] *America's Water Infrastructure Near a Bursting Point* (BlueGreen Alliance, January 2013) http://www.bluegreenalliance.org/blog/americas-water-infrastructure-nearing-a-bursting-point

Last year, the Obama administration set forth the strongest cleaner car standards in a generation, which will nearly double the fuel efficiency of cars on US roads by 2025. While plug-in hybrids and electric vehicles will help the US meet these standards, making conventional technology significantly more efficient and using advanced materials to make our cars stronger yet lighter will make the biggest contributions toward getting the American personal vehicle fleet to 54.5 miles per gallon over the next 12 years.

These advanced materials include steel products, such as Advanced High Strength Steel (AHSS). Various research studies have shown that proper application of AHSS can cut a vehicle's weight between 10 and 25 percent.

Over the last six years, steel maintained a high percentage of total vehicle content by weight — nearly 60 percent. New metals and composite materials will continue to develop as a complement to steel components, which will also continue to evolve as a leading material choice for vehicles of the future.

Furthermore, using U.S.-made steel components in vehicle production decreases the negative environmental impacts of long-distance transport and under-regulated manufacturing in foreign countries. For example, in a 2009 assessment of environmental regulations in the U.S. and Chinese steel industries, the Alliance for American Manufacturing found that the amount of carbon dioxide emissions per ton of steel produced are nearly double in China compared to the U.S.[12]

Additionally, production of steel and advanced steel compare favorably in terms of greenhouse gas (GHG) emissions versus other advanced materials. Steel and advanced steel entail only a

[12] *American Steel is Cleaner than Chinese Steel* (Alliance for American Manufacturing, April 2009) http://www.americanmanufacturing.org/p/1191

third of GHGs produced per unit compared to aluminum, and only a tenth per unit produced compared to carbon and magnesium. Steel continues to hold an advantage, between 1and 3 percent fewer GHGs produced overall when factoring the life-cycle impact of steel vehicle components versus other advanced materials.

Transit

Over the course of the next decade billions of tax dollars will be spent on the purchase of rail cars, buses and other transit equipment. There are an estimated 413 planned and proposed transit projects across the U.S., worth an estimated $233 billion.[13]

Existing public transit bus, rail vehicle and clean truck supply chains support approximately 40,000 U.S. manufacturing jobs. While relatively small today, jobs in these supply chains are spread across all 50 states, among more than 320 existing companies that could scale up to meet expanded demand.[14] Every $1 billion invested in public transit creates around 1,400 manufacturing jobs.[15] Stronger Buy America requirements will help make sure more of those manufacturing jobs remain here.

For example, the U.S. Department of Transportation's Federal Transit Administration (FTA) awarded $23 million from the American Recovery and Reinvestment Act's TIGER (Transportation Investment Generating Economic Recovery) program to Portland, OR. The city of Portland, the Portland Bureau of Transportation and TriMet used these funds to reconstruct Portland's Moody Avenue. The Recovery Act funds were used to create dual streetcar tracks, widening Moody Avenue, and raising it up 14 feet in order to link with a transit bridge that accommodates streetcar, light rail, bus, bicycle and pedestrian traffic. Raising the street also

[13] Jeff Wood, Elizabeth Wampler and Bill Sadler. "Jumpstarting the Transit Space Race: 2011". Reconnecting America.
[14] Marcy Lowe et al., *U.S. Manufacture of Rail Vehicles for Intercity Passenger Rail and Urban Transit* (Raleigh, NC: Center on Globalization, Governance & Competitiveness, Duke University,June 2010), p. 13.
[14] U.S. PIRG Education Fund, op. cit. note
[15] Bivens, J.; Irons, J.; and Pollack, E. *Transportation Investments and the Labor Market* (Economic Policy Institute, April 2009).

allowed surrounding land, which had been designated a Superfund cleanup site, to be capped, opening up the large parcels of land for development.

The streetcars will be manufactured in Portland by United Streetcar, a subsidiary of Oregon Iron Works, which was created to meet the revived demand for streetcars created by the growth of Portland's transit system. With a workforce represented by the International Brotherhood of Electrical Workers (IBEW) and by the Ironworkers, and with 90 percent domestic content (aiming for 100), the company has been honored as an exemplary "high road" and green employer by both the Apollo Alliance and American Rights at Work. The cars rolling out of United Streetcar have the highest percentage of American parts and labor of any streetcar in the last 50 years. That means United Streetcar's innovation is creating an economic ripple effect, providing business for an all-American supply chain of more than 200 different vendors in 20-plus states across the U.S. [16]

ArcelorMittal, located in Steelton, Pennsylvania, has become the first domestic steelmaker to enter an emerging market for so-called block rail — a product that is being used, for the first time in the United States, to help build the new Portland streetcar line.[17] ArcelorMittal employees 700 employees in Steelton and the streetcar revival may one day eliminate the need to import streetcar rail from foreign countries.[18]

Industrial Energy Efficiency

Ensuring long-term success requires support for the efficient use of energy resources in American manufacturing. As the industrial sector consumes about a third of all energy used in the United States — a large portion of which is simply lost due to inefficiencies — measures to

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[16] *United Streetcar putting Americans to work, putting America in position to win the future* (U.S. Department of Transportation, April 2011) http://fastlane.dot.gov/2011/04/united-streetcar.html#.UPBITqwkRGM

[17] *The Federal Transit Administration Showcases Economic Development at the Site of the SW Moody Avenue Streetcar Project* (Federal Transit Administration, January 2012) http://www.fta.dot.gov/newsroom/12286_14274.html

[18] Id.

help reduce energy costs and boost efficiency within the industrial sector will go a long way toward honing our competitive edge and keeping jobs and supply chains operating here in the United States.

As noted in a July 2009 McKinsey and Company report,[19] we can reduce primary industrial energy consumption by 21 percent by 2020 — saving U.S. industry $47 billion per year — just by unlocking the potential for energy efficiency in the industrial sector.

Some leading U.S. industrial facilities are already taking advantage of the huge savings that energy efficiency improvements can provide to their bottom lines, thus adding value to their companies, freeing up capital, decreasing exposure to energy price fluctuations, and preserving and creating jobs.

In today's fast-moving business climate, the need for rapid return on investment can make productive industrial energy efficiency projects challenging to carry out. Good government policy, however, can provide needed leverage for such projects. In one such example, the support of a $31 million Department of Energy (DOE) matching grant under the American Recovery and Reinvestment Act (ARRA), enabled ArcelorMittal to retrofit its Indiana Harbor steel manufacturing facility in East Chicago, Indiana, saving the company nearly $20 million in energy costs each year.[20]

Through the use of innovative technology designed to capture and re-use waste boiler gas that would otherwise be flared off and lost, Arcelor now generates 36 megawatts of its own power, enough to power some 30,000 American homes for a year. In addition, this project decreases greenhouse gas emissions by 330,000 tons annually, the equivalent of removing 60,800 cars

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[19] "Unlocking Energy Efficiency in the US Economy" (McKinsey, July 2009) http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy

[20] "Rebuilding Green" (BlueGreen Alliance, February 2011) http://www.bluegreenalliance.org/news/publications/rebuilding-green-the-american-recovery-and-reinvestment-act-and-the-green-economy

from the road. For the residents of the surrounding community, this project is also yielding substantial economic benefits by preserving existing jobs and creating new employment opportunities. According to company estimates, the design, construction and manufacture of the equipment created 360 jobs, and employed 200 local tradespeople. Further, the competitive cost advantage created by the ongoing energy savings is helping to keep nearly 6,000 workers employed at the mill.

The Obama administration has taken a leadership role in promoting efficiency by issuing its Executive Order on accelerating investment in industrial energy efficiency last August. This Order provides direction as to how the federal government can promote the use of combined heat and power (CHP) efficiency technology in industrial processes. Historically, the energy simply wasted by traditional systems on an annual basis has been greater than the total annual energy use of the nation of Japan. Although the average generation efficiency of grid-supplied power has hovered near 34 percent in the U.S. since the 1960s, CHP technology, by contrast, harnesses energy that would otherwise be lost in order to operate at efficiencies of 60-80 percent.[21]

Too often overlooked as an energy resource, efficiency can provide a means to harness energy that is already being generated, without the need to develop entirely new primary sources of energy. Energy efficiency leverages productivity and power from resources that, in many cases, would otherwise literally vanish into thin air. Done right, economical CHP technology can enable large energy users to reduce purchased electricity or to leave the grid entirely by self-generating. When combined with smart policies aimed at minimizing the economic impact to power providers, efficiency gains can be a win for manufacturers, utilities, workers, consumers, and the environment. Achieving this thoughtfully and equitably can position American industry

[21] *Executive Order -- Accelerating Investment in Industrial Energy Efficiency* (White House, August 2012) http://www.whitehouse.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency

to be globally competitive throughout the 21st century. We must continue to pursue avenues legislatively, through the Obama Administration, and within the private sector to deploy industrial energy efficiency.

Clean Energy

Transitioning to a clean energy economy will enable the U.S. to take advantage of a swell of clean energy investments, maximize its competiveness in the global market and increasing demand for domestic manufacturing. Over the next decade, an estimated $2.3 trillion will be invested in clean technologies,[22] and a systematic greening of the U.S. economy will attract some of this investment. However, according to Ernst and Young[23] the U.S. renewable energy investment climate is losing attractiveness while countries like China and Germany are gaining ground. In fact, between 2005 and 2010, China's 5-year clean energy growth rate toppled the U.S.'s by 27 percentage points.[24]

Furthermore, because other countries have developed long-term policy to foster investment and support of clean technologies while the U.S. has not, the U.S. is currently "ceding job growth and profits to companies overseas that now profitably export their goods and expertise to the United States."[25] Accordingly, China produces almost 48 percent of all solar photovoltaic cells in the world, followed by Taiwan, and Germany, whereas the U.S. only produces 4.6 percent of all solar photovoltaic cells.[26] Chinese manufacturers account for 4 of the top 10 wind equipment

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[22] "Global Clean Power: A $2.3 Trillion Opportunity," (The Pew Charitable Trusts, 2010) http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Global_warming/G20-Report-LowRes.pdf (accessed January 24, 2012).
[23] The Ernst and Young Country Attractiveness Indices provide scores for national renewable energy markets, renewable energy infrastructures, and their suitability for individual technologies. The indices provide scores out of 100 and are updated on a quarterly basis.
[24] "Global Clean Power: A $2.3 Trillion Opportunity" (The Pew Charitable Trusts, 2010) http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Global_warming/G20-Report-LowRes.pdf (accessed January 24, 2012).
[25] *U.S. Is Falling Behind in the Business of 'Green'* (New York Times, June 8, 2011)
[26] *Year of the Tiger* (PHOTON International, March 2011) http://www.photon-international.com/download/photon_cell_production_2010.pdf (accessed July 8,2011).

manufacturers in the world, while only one U.S. company ranks among the top 15 wind equipment manufacturers.[27]

Steel is especially prevalent in the production of wind turbines. A typical wind turbine contains 89.1 percent steel,[28] measuring upwards of 200 tons of steel per turbine.[29] According to the American Wind Energy Association, in 2008, utilities and manufacturers installed more than 5,000 utility scale wind turbines in the United States, requiring more than 1.1 million metric tons (Mt) (1 million short tons) of iron and steel[30] Installed capacity has grown each year over the last 5 years, topping out 13,124 MW installed in 2012 (up from 8,361 MW in 2008).[31]

Available data also suggests that developing the commercial wind turbine industry to a level sufficient to meet a 20 percent wind energy by 2030 goal would require 36 to 44 Mt of cast iron and steel from 2010 to 2030, or an annual average of 1.8 Mt.

With regards to solar energy, according to the International Stainless Steel Forum, "There are many approaches to producing electricity and domestic hot water from solar energy. Whatever the technology, stainless steel has a role to play. It can be used as part of a substrate of amorphous cells or as a collector material in solar thermal panels. It can be found in ancillary components such as frames, fasteners and connectors. Stainless steel can also be an essential element in downstream equipment such as tanks and heat exchangers.

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[27] *China Rivals Narrow Gap on Wind Leader Vestas*, (Reuters, March 15, 2011)
[28] *Increasing wind energy's contribution to U.S. electricity supply: U.S. Department of Energy* (U.S. Department of Energy, 2009) http://pubs.usgs.gov/sir/2011/5036/sir2011-5036.pdf. Originally from *20% wind energy by 2030* (U.S. Department of Energy, 2008) http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf (accessed April 4, 2010,)
[29] For more information on the wind industry manufacturing supply chain, including a detailed description of the anatomy of a wind turbine, please see the Wind Energy Manufacturing Supplier Handbook (Clean Energy Manufacturing Center, BlueGreen Alliance Foundation) http://www.thecemc.org/body/Wind-Energy-Industry-MFG-Supplier-Handbook_1.pdf
[30] *Basics about the wind energy value chain* (American Wind Energy Association 2009) http://www.awea.org/la_pubs_factsheets.cfm (accessed April 4, 2010)
[31] *Industry Stats* (American Wind Energy Association) http://www.awea.org/learnabout/industry_stats/

Wherever it is used, stainless steel makes a contribution to the sustainability and eco-friendliness of our built environment."[32]

Here are a few more examples of the usage of steel, particularly stainless steel, in clean energy manufacturing:

- Stainless steel can be used in the manufacture of condensing boilers. Condensing boilers are today's most energy efficient heating method, with a 100 percent efficiency rating. Stainless steel is required because of the condensation that occurs during the process — therefore corrosion resistance is of high importance.
- Rooftop solar panels do not just reduce the use of fossil fuels they mean that renewable sources can be used instead. Stainless steel versions can account for a considerable part of the energy needed for the preparation of hot water and room heating. Solar panels can also be integrated into the buildings roofing or cladding possibly adding to its aesthetic appeal.
- Fuel cells are a source of energy for the future. Much like a battery the fuel cell converts chemical energy into electrical energy. Working from either natural gas or hydrogen, they generate heat and electricity with only one emission: water. Stainless steel is used for supporting the electrodes which are stronger, easier to manufacture and cheaper than ceramic versions. Fuel cells can be used in a variety of places including in cars and in domestic heating systems alike.

The domestic clean energy industry has built up due to its sincere potential and with the help of necessary policy support, as every other energy source has been afforded. Yet, existing policy support for clean energy does not provide adequate long-term certainty for the industry to

[32] "Stainless Steel In Solar Energy Use" (International Stainless Steel Forum) http://www.worldstainless.org/Files/issf/non-image-files/PDF/ISSF_Stainless_Steel_in_Solar_Energy_Use.pdf

succeed. In order to capture the potential clean energy brings, for supply chain manufacturing and more broadly, we must implement policies that provide long-term policy certainty.

Trade and Competitiveness

Buy America[33]

Buy America policies reflect where the jobs are, not where the manufacturing companies are headquartered or incorporated. This approach ensures that the job-creating impact of critical infrastructure investments is maximized, and that taxpayer dollars are reinvested in jobs and communities here at home.

Any weakening of the existing Buy America standard — including the requirement that steel be "melted and poured" in the United States in order to be Buy America compliant — would undermine this job-creating potential. It would encourage capital and resource intensive processes to move overseas, jeopardizing U.S. steelmaking jobs as well as those jobs associated with production of the raw materials used to make steel. Weakening the existing standard would also be fundamentally inconsistent with Congressional intent and would be an unwarranted departure from more than 30 years of precedent. As a result, Congress should reject any attempts to weaken the existing Buy America preferences and should maintain the long-standing requirement that steel used in taxpayer-funded infrastructure projects be "melted and poured" in the United States.

A majority of steelmaking jobs are concentrated at the hot end of production; but it is not just those direct steelmaking jobs that are at stake. Domestic integrated steel producers rely heavily upon domestic suppliers of key inputs such as iron ore mined in Minnesota and Michigan; and limestone from states such as Alabama, Indiana, Michigan, Missouri, Ohio, Pennsylvania, Texas,

[33] For more information on Buy America, please see: *Buy America: One Element of the Solution to Our Jobs Crisis* (BlueGreen Alliance, August 2011) http://www.bluegreenalliance.org/blog/buy-america-one-element-of-the-solution-to-our-job-crisis

and Wyoming. Additionally, minimills source approximately 93 percent of their scrap domestically. Domestic producers also rely upon domestic energy sources, such as natural gas. According to the American Iron and Steel Institute's ("AISI") *2010 Annual Statistical Report*, for every one of the steel industry's 135,000 direct jobs, the steel sector generates seven jobs in upstream and downstream industries, adding an additional 945,000 jobs to the economy.

Some U.S. steel converters are arguing for a change in the definition of both steel and manufactured goods, with the intended result that steel slab or materials and components that go into manufactured goods could be produced offshore, but the final product would be deemed "domestic" if further processing occurs in the United States. Such a fundamental change to a lesser "substantial transformation" definition — a dramatic departure from longstanding and well-established law in this area — would encourage broad outsourcing of manufacturing and would lead to a huge decrease in American steel and manufacturing jobs, as well as jobs the in the critical raw materials sectors that serve these industries.

In addition to the loss of quality, high paying jobs, such outsourcing of American production risks discouraging domestic iron and steelmaking altogether and increases our dependence on foreign producers. For products necessary to so many critical sectors of our economy—from infrastructure to energy to housing, and especially national defense — increasing our reliance on foreign producers presents both economic and national security concerns.[34]

Research and Development

Manufacturing is responsible for 70 percent of all private-sector research and development spending and 90 percent of all American patents.[35] Manufacturing is also a productivity powerhouse and major driver of economic growth. Between 1997 and 2005, labor productivity

[34] Information within this subsection heavily references a white paper produced by the Alliance for American Manufacturing. Please see here for more information: http://www.americanmanufacturing.org/

[35] *A Framework for Revitalizing American Manufacturing* (Executive Office of the President, December 2009)

in manufacturing grew 60 percent more than in the economy as a whole.[36] Every dollar in final sales of manufactured products supports $1.37 in other sectors of the economy, compared to about 50 cents for every dollar of activity in the financial services sector.[37] If we fail to restore our manufacturing base, our innovation edge and research and development capacity will also falter.

For example, the Department of Energy's Advanced Manufacturing Office recently launched the Innovative Manufacturing Initiative, which selected 13 projects that achieved transformational manufacturing processes and materials. One of the 13 projects selected was Flash Ironmaking technology, which is a cleaner, coke-free way to produce iron from abundant domestic iron ore concentrates and natural gas, with 32-57 percent improved energy productivity. The Department of Energy partnered with the American Iron and Steel Institute, ArcelorMittal, U.S. Steel and others to provide $7.1 million to support the Scale-up Process Validation phase at the University of Utah.

We must continue to support research and development such as this being done in the Advanced Manufacturing Office, as well as the work being done at the Department of Commerce.

Addressing the Threat of Climate Change and Mitigating Environmental Impacts

According to the World Steel Association, "Steel is at the core of the green economy, in which economic growth and environmental responsibility work hand in hand. Steel is the main material used in delivering renewable energy — solar, tidal and wind. All steel created as long as 150 years can be recycled today and used in new products and applications. By sector, global steel recovery rates for recycling are estimated at 85% for construction, 85% for automotive, 90% for machinery and 50% for electrical and domestic appliances. This leads to a global

[36] Schwenninger, S. and Sherraden, S. *Manufacturing and the U.S. Economy* (New America Foundation, July 2009)
[37] "America Needs a Manufacturing Strategy" (New America Foundation, February 3, 2010)

weighted average of over 70%. The amount of energy required to produce a tonne of steel has been reduced by 50% in the last 30 years. Nowadays, 97% of steel by-products can be reused."[38]

Left unaddressed, climate change will wreak havoc on the globe. By the end of this century, the world will see more and more superstorms like what the Mid-Atlantic experienced with Sandy, longer and more intense heat waves, increased instances of flash floods, significant changes in water availability for human consumption, increased length and severity of drought, and other catastrophic effects.[39] To avoid the upheaval of unchecked climate change, we require immediate and coordinated action to transition the global economy to a clean energy economy. We can no longer consider economies productive if they rely on ever-increasing emissions of climate change pollution. We must take every action necessary to reduce or prevent these emissions in a manner that can build a lasting, sustainable economy that provides high quality employment and helps rebuild the middle class.

No response to climate change can be sufficient without incorporating support for domestic manufacturing. Supporting domestic manufacturing decreases the negative environmental impacts of international shipping and under-regulated manufacturing in foreign countries. Ninety percent of the world's trade travels by sea, according to the International Maritime Organization.[40] Carbon emissions from the shipping industry are growing steadily as developed countries increasingly outsource production overseas. The U.S. Environmental Protection Agency estimates carbon emissions from global shipping are expected to increase 150 to 250 percent by 2050 if policies to reduce emissions aren't implemented.[41] For example, the share of steel traded internationally has grown from 22 percent in the mid-1970s to 40 percent in 2000,

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[38] *Key Facts* (World Steel Organization) http://www.worldsteel.org/media-centre/key-facts.html
[39] "Global Climate Change: The current and future consequences of global change" (NASA) http://climate.nasa.gov/effects/ (accessed July 16, 2012)
[40] *IMO and the Environment (*International Maritime Organization.) (accessed May 2012)
[41] *Adoption of an Energy Efficiency Design Index for International Shipping* (Environmental Protection Agency, 2011.)Web. 31 May 2012.

making it a contributor to the impact of overseas shipping.[42] Purchasing domestically manufactured goods thus decreases the effect of international shipping on the environment.

In addition, purchasing domestically manufactured goods assures that the mining of iron ore, domestic steel and manufacturing are done in a manner consistent with U.S. pollution control standards. Meanwhile, foreign competitors may follow much less stringent pollution control standards — especially in developing countries — and consequently cause harm to the environment. For example, Chinese steelmakers, free of stringent pollution control standards, emit 3.53 kg of carbon dioxide per ton of steel produced, while steelmakers in the U.S. emit 0.7 kg of carbon dioxide per ton of steel.[43]

Conclusion

Mr. Chairman, Ranking Member, and fellow Members of the Subcommittee we truly believe that reinvigorating the steel sector, along with the rest of American manufacturing, can revitalize the American middle class and move America to a clean economy, ensuring that we continue to address climate change. We look forward to working with you to implement and foster solutions that achieve this.

Once again, thank you for the opportunity to testify today and I look forward to your questions.

[42] Bradley, Rob et al. *Slicing the Pie: Sector-Based Approaches to International Climate Agreements.* Washington, D.C. (World Resources Institute, 2007) (accessed May 2012)
[43] *An Assessment of Environmental Regulation of the Steel Industry in China.* (Alliance for American Manufacturing, 2009) (accessed May 2012)