

**U.S. House of Representatives
Committee on Science, Space, and Technology
Subcommittee on Investigations & Oversight**

HEARING CHARTER

*The Impact of International Technology Transfer on
American Research and Development*

Wednesday, December 5, 2012
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On Wednesday December 5, 2012, the Subcommittee on Investigations and Oversight will hold an oversight hearing titled “The Impact of International Technology Transfer on American Research and Development.” U.S. taxpayers provide both direct and indirect support for private sector research and development. Recipients of this federal support are often required to transfer that technology overseas in order to gain access to foreign markets. The hearing will examine issues related to international technology transfers, particularly as it pertains to how and where the benefits of American research, development, and innovation are realized. The Committee is interested in understanding the methods by which domestic technology and intellectual property are transferred to foreign countries, as well as the overall scope of such efforts. The hearing will also seek to identify measures that might limit such activity.

Background

American Research and Development Efforts

American taxpayers fund significant amounts of basic and applied research and development (R&D). In 2012, an estimated \$139 billion of federal funds were directed towards federal R&D programs across a number of agencies in several categories.¹

	<u>Federal R&D Funding (in billions)</u>	
	<u>FY2011</u>	<u>FY2012 (est.)</u>
Basic research	\$29.70	\$30.18
Applied research	\$30.83	\$31.78
Development and facilities	\$82.19	\$76.91
TOTAL	\$142.71	\$138.87

The results of this federal investment are often commercialized by the private sector which invests additional private sector resources into R&D. According to the annual R&D study conducted by Batelle, American industry and entities such as universities and non-profit grant

¹ Congressional Research Service, “Federal Research and Development Funding: FY2013,” CRS Report R42410, October 1, 2012.

organizations invest more than double the federal investment in R&D, resulting in a total American investment in R&D of \$436 billion in 2012.² Private sector entities can also deduct a portion of their own R&D investments from their annual federal tax obligation, resulting in an indirect subsidy of private sector R&D efforts.³ In 2008, for which the most recent data is available, American companies deducted \$8.3 billion in R&D credits.⁴ In contrast to the \$444 billion in direct and indirect U.S. R&D investments, the rest of the world invests approximately \$840 billion overall.⁵

Using the American intellectual property system, commercial entities can obtain exclusive rights for a limited amount of time to sell or transfer their newly discovered inventions.⁶ Enacted in 1980, the Bayh Dole Act extends these rights to small businesses, non-profit organizations, and universities for inventions created by federally funded R&D.⁷ Although there are generally very limited downstream restrictions on where most non-defense taxpayer funded R&D can be commercialized, most of the benefits have historically accrued to American taxpayers, either directly through more American jobs or indirectly through higher tax receipts from companies that commercialize the R&D in the U.S. or overseas. Recent stimulus funding also included domestic sourcing requirements where possible.⁸

Foreign Policies Impacting Market Access

Although the U.S. has entered into a number of trade agreements to better enable free trade, a range of actions undertaken by foreign governments have prohibited the ability of American companies to enter overseas markets without transferring corporate R&D including:

1. Procurement Barriers Imposed by Governments and State Owned Entities
2. Technology Standards Manipulation
3. Joint Venture / Domestic Location Requirements
4. Intellectual Property Theft
5. Technology Transfer as a Government Policy
6. Technology Transfers Via Corporate Asset Sales and Bankruptcy

These actions are often sharply reduced for American companies that agree to open local factories or transfer their R&D to an entity in the foreign nation. This technology transfer can have a significant effect upon America's balance of trade. For example, the American software industry remains one of the few sectors of the U.S. economy that maintains a highly positive balance of trade with the rest of the world.⁹ In software, the balance of trade is approximately \$20 worth of exports for every \$1 of imports. Trade groups such as the Business Software Alliance (BSA) have studied the impacts of foreign government policies that limit access of their

² 2012 Global R&D Funding Forecast, Batelle.

³ Chapter 41 of the Internal Revenue Service Code sets the requirements for claiming this deduction.

⁴ U.S. Department of Treasury, Office of Tax Policy, "Investing in U.S. Competitiveness," March 2011, p. 2.

⁵ *Ibid.*

⁶ This authority is vested in Article 1, Section 8 of the U.S. Constitution.

⁷ P.L. 96-517.

⁸ Section 1605 of the American Recovery and Reinvestment Act of 2009.

⁹ Import / export data for all industries can be found at <http://www.census.gov/foreign-trade/statistics/country>. Other industries that maintain a positive balance of trade include the aviation and entertainment industries.

member companies to specific markets.¹⁰ These policies, amongst others, reduce the positive balance of trade for the affected industries.

1. Procurement Barriers Imposed by Governments and State Owned Entities

Government procurement can be a major driver of local economies. State owned entities can dominate particular industries and there may be few alternatives to selling to them. This allows governments to easily discriminate against foreign manufacturers that choose not to make available relevant R&D in return for market access. For example, India issued regulations in 2009 that only required imported telecommunication products to be tested and certified by local laboratories before being made available for sale. Domestic firms were exempt from this testing and certification requirement.¹¹ In addition, India imposed a mandatory facility inspection requirement that allows the Indian government or its designee(s) to inspect the technology and components used in all telecommunications products.¹² During these inspections, there are no guarantees that such inspections will not lead to the surreptitious transfer of intellectual property to domestic competitors.

Government procurement barriers may also occur at multiple levels of government. In November 2009, China issued a list of products that would receive preferential treatment for government purchases.¹³ Eligibility for products to be listed was limited to those products that contained Chinese owned intellectual property and Chinese registered trademarks. This policy would require corporations to enter into joint ventures or transfer their R&D to China in return for market access. After numerous objections from its international trading partners including repeated negotiations with the U.S. Trade Representative, the lists of approved products were rescinded. However, these lists then reappeared at the local level in a variety of forms, making it even harder for USTR and international companies to identify these barriers. Efforts are still ongoing to eliminate these lists.

2. Technology Standards Manipulation

Technology standards and certification manipulation can be another impediment to accessing foreign markets. In most free market economies technology standards and certifications are established and conducted by industry coalitions and nongovernment standards bodies. However, in some countries government agencies are responsible for establishing at least some standards based upon an open process of soliciting private sector feedback, such as with NIST in the U.S. Not all countries use an open process to determine standards. Products can be required to be funneled through government certification agencies before they are allowed market access, resulting in delays and opportunities for industrial espionage. As products make their way through the certification process, their design and specifications are meticulously studied and recorded. A major concern is that this information may wind up in the possession of domestic, government-supported manufacturers. Even if the intellectual property is protected, the

¹⁰ “Lockout, How a Wave of Protectionism is Spreading Through the World’s Fastest Growing IT Markets – and What to Do about It,” report by the Business Software Alliance, June 2012, http://www.bsa.org/~media/Files/Policy/Trade/BSA_Market%20Access_Report_FINAL_WEB_062012.ashx

¹¹ *Ibid*, p. 10.

¹² *Ibid*.

¹³ Robert Atkinson, “Enough is Enough: Confronting Chinese Innovation Mercantilism,” Information Technology & Innovation Foundation, February 2012, <http://www2.itif.org/2012-enough-enough-chinese-mercantilism.pdf>, p. 30.

certification process can be extended to delay market access to foreign products while allowing local competitors to produce their own slightly modified product and capture the market.¹⁴

Over the last decade, the Chinese government began looking at ways to expand and redevelop its telecommunications infrastructure. To avoid paying more fees and royalties to Western patent holders, including those available under the fair, reasonable, and non-discriminatory (FRAND) licensing model, China formed a partnership with Siemens AG to develop its own 3G standard known as TD-SCDMA that was required to be used in China.¹⁵ Based upon foreign R&D, TD-SCDMA is only used in China, forcing manufacturers to build to this standard or not be able to sell in the Chinese marketplace.

In an effort to boost the utilization of its GLONASS satellite positioning system, similar to the American GPS system, Russia has sought to impose a 25% duty on devices containing position locating systems that do not also include the ability to use GLONASS signals.¹⁶ Cell phone manufacturers are now including GLONASS capabilities in their phones. For example, the iPhone5 now includes the ability to receive GLONASS signals.¹⁷

India similarly announced a policy in 2010 to require open standards on e-governance technology.¹⁸ The Indian policy would require intellectual property owners wanting to access the e-governance market in India to essentially license their technology for free, transferring R&D paid for by other nations, including American taxpayers.

3. Joint Venture / Domestic Location Requirements

The creation of a local high-tech manufacturing base is of major interest to many foreign nations looking to “move up” in the technology economy. Although technology assembly operations provide jobs, access to core R&D is viewed as an important goal for economic policy.

Advanced alternative energy technology is sought by foreign governments in order to supplant traditional energy sources. The U.S. government provided significant financial incentives towards the development of alternative energy technologies, through such programs as ARPA-E and the American Recovery and Reinvestment Act.¹⁹ This American R&D is now in high demand in other nations. For example, in 2011, General Motors and Ford sought to sell hybrid technology cars in China that benefited from long-term American R&D investments. The Chinese government refused to allow American manufacturers to qualify for Chinese tax subsidies unless they entered into a joint venture with a local partner, agreed to share the underlying technology, and manufacture the vehicle domestically.²⁰ Ford agreed to transfer its

¹⁴ See *supra*, note 11.

¹⁵ *Ibid.*

¹⁶ GPS Import Duties to Promote Russia’s GLONASS”, Russian-American Business, February 21, 2012, http://russianamericanbusiness.org/web_CURRENT/articles/878/1/GPS-import-duties-to-promote-Russia%92s-GLONASS.

¹⁷ See the technical specifications for the iPhone5 at <http://www.apple.com/iphone/specs.html>.

¹⁸ See *supra*, note 11.

¹⁹ P.L. 111-5.

²⁰ Keith Bradsher, “Hybrid in a Trade Squeeze”, *New York Times*, September 6, 2011, <http://www.nytimes.com/2011/09/06/business/global/gm-aims-the-volt-at-china-but-chinese-want-its-secrets.html>

own technology to a local partner in order to qualify for the subsidies that were worth up to \$19,000 per vehicle, while GM chose not to transfer its technology.²¹

Other countries have sought to set minimum domestic content requirements in return for tax and subsidy incentives. Ukraine requires up to 30 percent of clean energy technologies to be built locally in order to qualify for government subsidies and some provinces in Canada require up to 60 percent for similar subsidies.²² The U.S. also enacts similar restrictions, imposing “Buy America” provisions in ARRA, although waiver provisions were included to allow the use of foreign manufactured goods if commercially necessary.²³

In addition to physical goods, R&D for services industries is of interest to foreign governments as well. Countries such as Indonesia have enacted regulations requiring local construction of data centers to host electronic domestic transactions.²⁴

4. Intellectual Property Theft

After making successful R&D investments, U.S. companies use American intellectual property laws to create a limited monopoly for use of that intellectual property. In the U.S., interested parties can apply for a patent that awards them exclusive rights to their invention for twenty years in return for payment of fees ranging from several hundred to several thousand dollars.²⁵ In addition to foreign government policies that encourage or force technology transfers, American companies routinely face intellectual property theft and corporate espionage. Local governments that fail to investigate or prosecute local entities responsible for theft and espionage may be indirectly or directly complicit in the theft, often enabling the thief to continue using American intellectual property.

The example of American Superconductor (AMSC) of Devens, Massachusetts is instructive. AMSC entered into a joint venture with Sinovel Wind Group, the world’s third largest wind turbine manufacturer, headquartered in Beijing, China.²⁶ In June 2011, AMSC employees discovered that their technology had been incorporated into Sinovel products without authorization.²⁷ From that point forward, AMSC’s attempts to continue its sales in the Chinese market were met with regulatory burdens and delays while the Sinovel Wind Group sales expanded. AMSC later discovered extensive evidence that one of its employees in Serbia was bribed by Sinovel in return for the transfer of AMSC’s intellectual property. Repeated efforts by the U.S. Trade Representative have led to progress for AMSC’s legal complaint before China’s

²¹ *Ibid.*

²² Matthew Stepp and Robert Atkinson, “Green Mercantilism: Threat to the Clean Energy Economy,” Information Technology & Innovation Foundation, June 2012, <http://www.itif.org/publications/green-mercantilism-threat-clean-energy-economy>, p. 7.

²³ Section 1605 of the American Recovery and Reinvestment Act of 2009.

²⁴ See *supra*, note 21.

²⁵ A full fee schedule can be found at <http://www.uspto.gov/web/offices/ac/qs/ope/fee092611.htm>.

²⁶ Jonathan Weisman, “U.S. to Share Cautionary Tale of Trade Secret Theft With Chinese Official,” *New York Times*, February 14, 2012, <http://www.nytimes.com/2012/02/15/world/asia/chinese-official-to-hear-trade-theft-tale.html>.

²⁷ Michael A. Riley and Ashlee Vance, “China Corporate Espionage Boom Knocks Wind Out of U.S. Companies,” *Bloomberg*, March 15, 2012, <http://www.businessweek.com/news/2012-03-15/china-corporate-espionage-boom-knocks-wind-out-of-u-dot-s-dot-companies>.

Supreme People's Court.²⁸ A final resolution to this intellectual property theft case has not yet been reached.

5. Technology Transfer as a Government Policy

Experts generally agree that efforts to encourage or force the international transfer of technology appear to be the most strident in China where international technology transfers are a matter of fundamental state policy. China is better able than other countries to force these technology transfers due to the strong desire of foreign companies to access their large and growing domestic market, as well as the significant role that the government plays in the private market through state-owned corporations.

In January 2006, China unveiled a new policy to become a world leader in science and technology. The new proposal termed, "The National Medium- and Long-Term Plan for the Development of Science and Technology (2006-2020)" (MLP), called for China to become innovation oriented by 2020 and a world leader in science and technology by 2050.²⁹ The plan listed the most significant Chinese structural deficits along with the goals and corrective measures to address them using science and technology development. In order to achieve these goals, the MLP called for increasing R&D expenditures from 1.3 percent of Gross Domestic Product (GDP) in 2006 to 2.5 percent by 2020 and use China's huge market as leverage against foreign businesses hoping to gain access.³⁰ By comparison, the U.S. currently spends 2.8 percent of its GDP on R&D.³¹

The MLP places particular emphasis on "indigenous innovation," defined as "enhancing original innovation through co-innovation and re-innovation based on the assimilation of imported technologies."³² The policy builds upon a series of bureaucratic policies first created in the 1980s and 1990s to limit foreign competition and protect domestic industries. Lax enforcement of intellectual property rights (IPR) has been especially challenging for foreign businesses operating in China. In many cases of IPR theft, local law enforcement appears to prefer protecting the domestic business, often refusing to address theft complaints or ruling against foreign companies despite substantial evidence in their favor.³³ Additionally, in August 2008 the central government enacted the "Anti-Monopoly Law" (AML), seemingly directed at foreign entities while exempting state-sanctioned monopolies and state-owned enterprises (SOE).

²⁸ Ehren Goossens, "AMSC Taking Sinovel Infringement Suit to China's Supreme Court," *Bloomberg*, April 9, 2012, <http://www.bloomberg.com/news/2012-04-09/amsc-taking-sinovel-infringement-suit-to-china-s-supreme-court.html>

²⁹ U.S. China Economic and Security Review Commission, "China's Program for Science and Technology Modernization: Implications for American Competitiveness," January 2011, http://www.uscc.gov/researchpapers/2011/USCC_REPORT_China%27s_Program_forScience_and_Technology_Modernization.pdf.

³⁰ James McGregor, "China's Drive for 'Indigenous Innovation: A Web of Industrial Policies,'" US Chamber of Commerce, 2010, <http://www.uschamber.com/reports/chinas-drive-indigenous-innovation-web-industrial-policies>

³¹ Batelle, *supra*.

³² "China's Program for Science and Technology Modernization: Implications for American Competitiveness", *supra*.

³³ UK China IPR Forum, "Intellectual Property Rights in China: Risk Assessment, Avoidance Strategy and Problem Solving," 2004, http://www.chinabusinesssolutions.com/dbimg/china_ipr_guidelines1.01.pdf

Commentators have stated that the Law's lack of clarity and detail also provides "enforcement agencies and courts wide discretion to use the AML to protect domestic companies."³⁴

6. Technology Transfers Via Corporate Asset Sales and Bankruptcy

American companies that are unable to succeed commercially typically seek additional financial resources from another entity either through a partial or complete sale of the company or simply declare bankruptcy. In both situations, American technology can be transferred internationally as part of the corporate restructuring process. The goal in federal bankruptcy policy is to generate the largest financial return to corporate bondholders and others owed money by the failing company. Recent efforts by China to acquire failing green energy companies are instructive of how countries can acquire cutting edge American technology.

In August 2009, A123 Corporation of Waltham, Massachusetts was awarded a \$249 million grant under the Advanced Vehicle Technologies Manufacturing Loan Program to produce advanced batteries for hybrid electric vehicles.³⁵ In 2012, A123 Corporation repeatedly stated in its official corporate filings that it was facing significant financial difficulties.³⁶ In August 2012, Wanxiang Group of China agreed to invest \$465 million dollars in A123 that would allow A123 to continue operating. This proposed investment raised fears that advanced battery technology funded by American taxpayers would be transferred to China.³⁷ The investment did not occur and, in October, A123 filed for bankruptcy. At the time of the bankruptcy filing, A123 agreed to a packaged bankruptcy in which Johnson Controls of Milwaukee would acquire its assets for only \$165 million.³⁸ Given the large difference in the two amounts, the federal court decided that an asset auction will occur on Thursday December 6, 2012. Johnson Controls and Wanxiang Group have both expressed interested in using the auction to acquire the assets of A123 Corporation.

Issues

Monitoring the Scope and Impacts of International Technology Transfer

The Committee is not aware of any U.S. government agency that coordinates efforts to monitor the scope of the issues; nor are there any that coordinate a response to efforts to force international technology transfers. As part of its trade negotiating authority, the Office of the U.S. Trade Representative does assist individual companies facing efforts to force international technology transfer and negotiates with foreign government to remove discriminatory regulations

³⁴ See *supra*, note 28.

³⁵ White House Press Release dated August 5, 2009, http://www.whitehouse.gov/the_press_office/24-Billion-in-Grants-to-Accelerate-the-Manufacturing-and-Deployment-of-the-Next-Generation-of-US-Batteries-and-Electric-Vehicles.

³⁶ Multiple SEC filings by A123 are available at <http://ir.a123systems.com/sec.cfm>.

³⁷ Norihiko Shirouzu, "Chinese say green battery technology leak fears overblown," *Chicago Tribune*, August 17, 2012, http://articles.chicagotribune.com/2012-08-17/news/sns-rt-usa-batterieschinal4e8jf1xr-20120816_1_a123-battery-maker-lithium-ion-battery.

³⁸ Julie Wernau, "A123 scraps deal with Chinese firm, files for Chapter 11 protection," *Chicago Tribune*, October 17, 2012, http://articles.chicagotribune.com/2012-10-17/business/ct-biz-1017-a123-bankrupt--20121017_1_a123-wanxiang-group-battery-maker.

or laws that violate U.S. trade agreements with that nation. However, no federal agency proactively reviews this issue in an attempt to quantify the impact upon America's competitiveness or determine who ultimately benefits from taxpayer funded R&D investments. With over \$400 billion in combined annual public and private sector R&D, significant amounts of R&D funding may be transferred without any way to identify it. Key unanswered questions include:

- Are American taxpayers paying for R&D investments whose benefits are being realized by foreign countries? Can accurate statistics be obtained?
- Are American companies paying for R&D investments whose benefits are being realized by foreign countries? Can accurate statistics be obtained?
- Will this issue continue to grow in scope, both in the numbers of countries attempting to force international technology transfer and the aggressiveness of the effort by particular countries?
- Are there any affirmative steps that can be taken to reduce or limit either the amount of forced technology transfers or their impact?
- How should technology transfers that result from corporate bankruptcies be addressed, if at all?
- How are competing interests weighed in determining the impact of technology transfers?
- What are federal agencies doing to monitor this issue?

Witnesses

Dr. Robert D. Atkinson
President
Information Technology & Innovation Foundation

The Honorable Dennis C. Shea
Chairman
U.S. China Economic and Security Review Commission