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INSIGHT

U.S. Technology Made in China: The Role of Federal Technology Licensing Policies

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A recent news report questioned why a potentially revolutionary battery technology discovered at a Department of Energy (DOE) national laboratory was licensed to a firm that manufactures the batteries in China. U.S. competitiveness and national security concerns often focus on Chinese acquisition of critical U.S. technologies. This Insight outlines current federal technology licensing policies and agency actions intended to further the domestic manufacturing of federally funded innovations.

U.S. Breakthrough Batteries Made in China

In 2011, a group of scientists working at DOE's Pacific Northwest National Laboratory (PNNL)—a federally funded research and development center (FFRDC) that is managed and operated for DOE by Battelle—developed two innovations in the chemistry of vanadium redox flow batteries that greatly improved their efficiency and viability for grid-scale energy storage. Capable of storing enough energy to power a house, vanadium redox flow batteries have been hailed as a breakthrough in stationary energy storage technology because they may be capable of recharging for up to 30 years without performance degradation. In 2012, Battelle and PNNL entered into a licensing agreement with a Washington state-based firm, UniEnergy Technologies LLC, "intended to advance and commercialize 'redox flow' battery technology." According to National Public Radio (NPR), the CEO of UniEnergy Technologies reported difficulty securing capital from U.S. sources to commercialize the batteries and subsequently pursued Chinese investment funds and eventually agreed to sublicense with a company that currently manufactures the batteries in China—a violation of the original licensing agreement. The sublicense has since been terminated.

Federal Technology Licensing Policies

Technology and expertise generated using federal funding often has application beyond the immediate goals or intent of the original R&D. Congress has established various mechanisms—primarily through the Stevenson-Wydler Technology Innovation Act of 1980 (P.L. 96-480) and the Bayh-Dole Act of 1980 (P.L. 96-517)—to encourage the commercialization of technology and research resulting from federal funds.

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One mechanism involves licensing federally funded technologies and patented inventions to private businesses for commercialization. Under Section 6 of the Bayh-Dole Act (35 U.S.C. §202) and Executive Order 12591, federal contractors, including FFRDCs, businesses, and universities, may seek intellectual property (IP) rights to inventions made with federal support and license those inventions to industry partners. Thus, a federal contractor (e.g., Battelle)—and not the government—typically obtains the patent rights to inventions made under a federal contract or grant. Bayh-Dole, however, requires that the federal government receive a non-exclusive, royalty-free license to use the invention, and imposes other conditions on the contractor's IP rights, such as the U.S. manufacturing preference discussed below.

Limits of the U.S. Manufacturing Preference in the Bayh-Dole Act

Section 6 of the Bayh-Dole Act (35 U.S.C. §204) also prohibits contractors who received title to a patent under Bayh-Dole and their assignees from licensing the exclusive right to use or sell a covered invention in the United States unless the licensee agrees it will be "manufactured substantially in the United States." Some observers argue that this "Preference of U.S. Industry" clause has been too easily evaded. For example, according to DOE, "while Bayh-Dole has been one of the most impactful pieces of legislation for economic growth over the past century, the U.S. Preference provision contains textual limitations that allow recipients to easily maneuver around it." Others support the law in its current form.

The law authorizes federal agencies to waive the requirement in individual cases when "domestic manufacture is not commercially feasible" or "reasonable but unsuccessful efforts" have been made to find licensees who would manufacture substantially in the United States. It is unclear how often agencies grant such waivers. From 2009 to 2014 the National Institutes of Health included the number of waivers issued as part of its technology transfer data collection and reporting, but comparable data is generally not available for other years and other agencies.

DOE's Determination of Exceptional Circumstances

DOE recently highlighted the statutory limitations of the U.S. manufacturing preference clause, explaining that the clause applies only to inventions "exclusively licensed to a third party" and to licenses for "use and sale in the U.S." Citing "inadequate safeguards" of the U.S. preference provision and "the hypercompetitive race to develop several critical and emerging technologies," the DOE letter outlined the need to "take action to support critical domestic supply chains and protect the rights of American taxpayers."

In June 2021, DOE issued a Determination of Exceptional Circumstances Under the Bayh-Dole Act to Further Promote the Manufacture of DOE Science and Energy Technologies, authorizing the inclusion of a "U.S. Competitiveness Provision" in future DOE funding agreements. Per the Bayh-Dole Act (35 U.S.C. §202), a Determination of Exceptional Circumstances is necessary if a federal agency wants to restrict IP rights under a funding agreement. DOE's competitiveness provision extends the U.S. manufacturing requirement to cover non-exclusive licenses as well as the use and sale of subject inventions outside the United States, among other changes. It does not, however, preempt DOE's ability to grant U.S. manufacturing waivers to companies who can demonstrate feasibility concerns, or for other reasons.

Policy Considerations

The highly publicized example of vanadium redox flow batteries that incorporated technology developed at PNNL and originally licensed to a U.S. firm being manufactured in China could raise several questions about the efficacy of current technology transfer and licensing requirements that Congress may consider:

- Should DOE's 2021 Determination of Exceptional Circumstances, which goes beyond current statutory requirements related to U.S. manufacturing preferences, be codified and applied to all federal agencies and their technology transfer and licensing activities?
- Do DOE and the contractors that manage and operate its national laboratories adequately enforce the terms of licensing agreements? If not, what additional resources or authorities, if any, would be needed to enable adequate enforcement?
- How do other federal agencies monitor and enforce the implementation of the U.S. manufacturing preference clause?
- How often do DOE and other federal agencies grant waivers of the U.S. manufacturing preference clause in licensing agreements? Should waivers be reported to Congress?
- Could DOE's Determination of Exceptional Circumstances, which restricts contractors' use of IP developed with federal support, deter future public-private collaborations?

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