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Thought Leadership

Here's How the U.S. Can Outcompete its Competitors: Part 1

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Special to The Digest

Editor's Note: CJ Evans and his teams of subject matter experts have helped more than 250 companies of all sizes prepare applications for federal grants and loan guarantees over the past 20 years. He has seen far too many projects fall by the wayside, not because they were flawed or not any good, but because they could not get additional grants and funding in a timely way and, thus, were unable to proceed. CJ discusses the impact this had had on U.S. innovation. He also offers a solution in Part 2 of this article that will greatly advance and accelerate U.S. innovation.

The United States has the capacity to be the global leader in virtually every field of technology and innovation.

It has an abundance of can-do, let's-try-this visionaries and innovators. It is imbued with tremendous natural, financial, and human resources.

It also has large, untapped resources such as its abundance of biomass that can be converted into biofuels, critical chemicals, and consumer products (as documented in the Department of Energy's 2023 "[Billion Ton Report](#)"), which includes agricultural residuals, forest debris, and urban and rural organic and woody wastes that are a nuisance, currently carry a cost for management and disposal, and can be a liability, such as increasing wildfire danger in the Nation's forests.

Multiple companies, including many of the Alternative Fuels & Chemicals Coalition's (AFCC's) 110+ member companies, are pursuing grants and loan guarantees to finalize development of innovative first-of-a-kind technologies and jumpstart operations to convert these wastes from liabilities into assets that provide additional sources of income for agriculture and forestry landowners and broaden the U.S. production of energy, fuels, chemicals, and consumer products.



The U.S. is still a global leader in this and other areas. But other nations such as China are catching up and even passing the U.S. in several areas.

The U.S. Was Once the Undisputed World Leader in Innovation



The United States, for approximately four decades following World War II (roughly 1945 to the 1980s), was the undisputed, dominant global leader in almost every major area of innovation, including science, defense, technology, aerospace, computers, automation, the foundation for the internet, and, in many respects, health and biotechnology.

This period of unparalleled supremacy was driven by massive government investment in research and development (R&D) aimed at maintaining a technological edge over the Soviet Union during the Cold War.

Where does the U.S. stand today?

Here's where U.S. global competitiveness currently stands:

According to multiple sources, including Washington, DC's Innovation Technology & Innovation Foundation and U.S. News; New York City's CEOWORLD Magazine and SG Analytics; the "2025 International Patent Activity Report;" the World Economic Forum; and the World Intellectual Property Organization's "2025 Global Innovation Index:"

The U.S., the home of Silicon Valley and world-renowned universities, still dominates in artificial intelligence (AI), machine learning algorithms, biotechnology and pharmaceuticals, software, defense, space, and quantum computing.

But ...

- **China** leads the word in 5G/6G, electric vehicles, renewable energy, battery supply / energy storage, digital payments, high-speed rail, and advanced materials, and is rapidly closing in on U.S. dominance in AI, semiconductors, and chemicals,
- **Japan**, home to the world's largest science and technology cluster, leads in robots and automation,

- **Germany** leads in manufacturing output and engineering and industrial vigor,
- **South Korea** leads in consumer electronics, semiconductors, and telecommunications,
- **Israel**, known as the “Startup Nation,” sits at the top of the cybersecurity industry and fintech.

China’s Ascendancy

In recent years, China has rapidly climbed the ranks, leveraging its growing technological capabilities with substantial government investment in research and development.

According to an April 17, 2025 article in Canada’s Visual Capitalist, China’s R&D investment has surged nearly 18x since 2000, reaching \$723 billion in 2023. It now leads the U.S. in its number of patent filings and scientific publications according to the World Intellectual Property Organization’s “World Intellectual Property Indicators 2025.”

China has become “a manufacturing powerhouse” because of its “bold industrial policy [and] generous government subsidies.” **It also is “dramatically outperforming the United States in the vast majority of critical technological fields,”** according to a September 23, 2025 article by Information Technology & Innovation Foundation, Washington, DC, and the Federal Reserve System’s, August 5, 2025 FEDS Notes.

Currently, China is in the process of building 43 pilot scale biomanufacturing platforms by 2027, which “dwarfs any other program in the world to build scale-up facilities,” according to Dirk Van Der Kley of Australia who specializes in technology competition and innovation between the U.S. and China.

Der Kley points out that China’s rapid advances are due to “significant government financing and strategic policies to ensure that the country remains a global powerhouse focused on innovation.”

China is not only a manufacturing powerhouse – evidenced by a trade surplus that reached a record \$1.2 trillion in 2025, with exports hitting \$3.7 trillion against \$2.58 trillion in imports – its investments in its universities and university research have made it a powerhouse in that area as well.

A January 15, 2026 New York Times article, “Chinese Universities Surge in Global Rankings as U.S. Schools Slip,” notes that, in the early 2000s, seven U.S. schools dominated the top 10 international rankings for science and technology studies and their scientific output, such as published journal articles, while only one Chinese school, Zhejiang University, barely made the top 25. Today, Zhejiang University ranks #1, Harvard ranks #3 and it is the only U.S. university still near the top of the list. Of the remaining eight schools in the top 10, seven are Chinese.

The article points out that six other prominent American schools that were in the top 10 in the first decade of the 2000s are producing more research than they did two decades ago. “But,” as the article states, “production by the Chinese schools has risen far more.”

To Make America Great Again the U.S. Government Needs to Invest More in Innovations



Government funding for grants, programs, and staff are strategic investments in the Nation's future and its global competitiveness and national security.

The payoff for these investments is not always immediate; hence, it is easy to see them as expenditures which, if cut back, will save U.S. taxpayers money, but only in the short run.

What is not immediately apparent is that the initiatives that are proven, advance, and go into commercial operation can more than pay for their investments ... and for the investments in initiatives that fail. The payoff may not occur until a decade later, but it pays off many times over in their capacity to create jobs, expand domestic manufacturing, bring economic growth to local communities, increase tax revenues, and contribute to global competitiveness.

Here are two examples:

One project that was awarded a \$2 million grant by the U.S. Department of Energy (DOE) in early January 2025 has yet to receive its award.



Here's what this grant will enable: The grant will allow the company to optimize its technology so that it can move forward with building its first commercial facility, which will be done through an application that it has underway for a U.S. Department of Agriculture (USDA) loan guarantee.

The project's first commercial facility, which the grant will help make possible, will contribute as much as \$100 million to an economically depressed area in Louisiana during construction and \$20 million per year thereafter (times 20 during its 20-year lifetime), according to an economic impact study by the Alternative Fuels & Chemicals Coalition.



That is a 250x return on investment ... and that's for just one project. Once the first project is successful and, thus, derisked, private capital will be unleashed, building more and more facilities in other places in the nation, replicating its benefits over and over again.

The project was founded on a simple idea: that America's agriculture waste can become one of its most valuable resources.

By using these wastes, it will create additional revenue for farmers, while producing synthetic aviation fuel and critical chemicals, including a chemical to be used by the Department of War as an energetic binder for missile and rocket fuel – which will secure a critical supply chain during contested logistics – thus contributing to national security.

This is a chance to demonstrate America First Innovation in biomanufacturing: utilizing local resources and local technology to produce critical fuels and chemicals for use by American industries.

This is an example of what just one DOE grant can do to propel the Nation forward.

Here's a second example, from the U.S. Department of Agriculture (USDA):



One \$200 Million Grant Program Can Generate \$14 Billion in Economic Growth

The USDA's Biobased Markets and Development Access Program (BDAP), created with \$200 million in Commodity Credit Corporation funds, [has awarded two \\$10 million grants](#) and is listed as an [open program on the USDA website](#) for which "Applications will be accepted until funds are exhausted."

Yet its funds are currently frozen, with further awards on hold.

Once the BDAP funds are made available, they will provide \$10 million each to another 18 large, almost-ready-to-go domestic manufacturing projects to meet the final requirements of USDA's Section 9003 Biorefinery, Renewable Chemical, and BioBased Productions Manufacturing Assistance Loan Guarantee Program.

The requirement stipulates that each project company must build and operate an Integrated Demonstration Unit (IDU) that replicates its proposed commercial facility in every way, but on a smaller scale. This requirement is key to derisking a new technology before it receives funding through the loan guarantee so it can be deployed.

It has proven, however, to be extremely difficult for companies applying for the loan guarantee to raise sufficient private capital to meet this requirement because they are first-of-a-kind (FOAK) projects. Hence, the reason for the BDAP grants.

These FOAK projects will launch emerging technologies into the marketplace and advance U.S. global leadership in energy, critical fuels and chemicals, and new materials.

Once these FOAK projects are functioning successfully and have been de-risked – which is the purpose of the grants and a critical key to successfully implementing the USDA Section 9003 program – additional private sector investments will be stimulated, thus “priming the pump” to replicate these projects throughout the Nation and multiply their benefits many times over.

In accordance with the USDA Section 9003 guidelines, each facility already has private-sector investors and lenders willing to invest an average of \$200 million in project financing, subject to USDA 9003 approval, **resulting in a direct investment of \$4 billion over the next three years.**

- Each \$1 invested by the private sector will generate an average of an additional \$3.5 in economic stimulus.
- **Thus, the \$200 million in grants will generate \$14 billion in economic stimulus, a 70x return ... just for the first facilities that are built ... a huge return on investment.**

The BDAP funds, once released, will allow the projects awaiting awards to:

- Commence construction in 2027 and 2028 with operations starting, in many cases, in 2029,
- Use agricultural residues and organic wastes that presently carry a cost and effort for disposal,
- Convert these wastes into valuable fuels and chemicals providing additional income for agriculture and forestry landowners,
- Expand domestic manufacturing, add to the Nation’s agriculture and national security, and support the goal of U.S. energy dominance with alternative fuel and chemical production, and
- **Create 10,000 direct jobs in operations and 50,000 jobs during construction.**

These are just two examples of what federal funding for grant programs can do to propel the Nation forward. This process of federal funding supporting companies in their early stages has been true for many U.S. innovators including Tesla, as well as the Nation’s first utility utility-scale energy storage, and various biotechnology companies.

Advancing Innovations Is Also Important for National Defense

The bipartisan Senate National Security Commission on Emerging Biotechnology (NSCEB), which originated in the 2022 National Defense Authorization Act, is leading the charge in conducting a comprehensive review of the national security implications of emerging biotechnologies. It provided 43 recommendations to the U.S. Congress in its April 2025 report for maintaining American dominance in this area, including investing \$15 billion over the next five years in advancing biotechnology.

In 2024, the Department of War (DoW) announced the Defense Industrial Base Consortium (DIBC) and the [Distributed Bioindustrial Manufacturing Program](#) (DBIMP), aiming to strengthen the U.S. defense industrial base and domestic supply chains.

The DBIMP identified five defense-critical areas: Fuel, Food, Fabrication, Fitness, and Firepower. [DoW issued 34 awards for a combined value of over \\$60 million](#) as part of Phase I of the program.

In 2025, DoW entered Phase II of the DBIMP, focused on providing follow-on funding awards of up to \$100 million for each awardee to support construction of a bioindustrial manufacturing facility based in the United States (with up to a five-year performance period).

However, the program has not advanced and Phase II grants have not been awarded.

The question facing the U.S. is: How can it take advantage of its natural, financial, educational, and human resources to outcompete its competitors, outmaneuver its adversaries, and maximize the benefits that can be derived from its innovations?

See CJ's answer in [Part 2 here in The Digest: "Supercharging U.S. Innovation – How to Bring Technologies to Market Faster."](#)