

CLEAN ENERGY

Winning the Race 2012 is a series of ten policy briefs that lay out broad principles and actionable ideas for the next administration to embrace to help the United States win the race for global innovation advantage.

Context and Policy Divide

Developing and deploying affordable, high-performance clean energy technologies are one of the great challenges of our time. It's central to reducing global greenhouse gas emissions, improving the U.S. balance of trade, and bolstering national security. And yet over the last 40 years, U.S. energy policy has been marked by government underinvestment in R&D and prolonged policy debates on what would have ultimately proved to be ineffective carbon pricing schemes. And the recent temporary spike in clean energy investment through the Stimulus was focused too much on deploying uncompetitive existing generations of technologies instead of working to develop better transformative technologies.

But implementing new clean energy policy has never felt so far from reality. Political gridlock is fueled in part by high-profile bankruptcies of government-supported clean energy firms that weren't ready for prime-time and/or were undercut by Chinese green mercantilist policies. Many on the left have doubled down on their "green jobs" narrative by supporting the renewal of subsidies for low-risk uncompetitive technologies. Many also remain steadfast in support for carbon caps, although some grudgingly have accepted carbon pricing as a second-best solution. Meanwhile, many on the right insist the private sector will develop cheap energy technologies and that government intervention, with perhaps the exception of a modest, revenue neutral carbon tax, is doomed for failure.

The next administration needs to put aside these obsolete assumptions and recognize that transformative, next-generation clean energy innovation is not going to arise from a price on carbon, subsidizing what are essentially today's clean energy "Edsels," or even the profit motive of an expected \$2 trillion-dollar a year global clean energy market. Instead, developing the needed clean energy breakthroughs requires a national strategy, with significant public investments in R&D and cohesive policies to unleash private sector innovation.

Innovation Race Principles

- **Clean energy is not ready for prime-time.** Clean energy technologies are expensive and only competitive with fossil fuels in niche markets with costly government subsidies. Moreover, today's clean energy doesn't provide the same level of performance as its fossil

fuel competition. As a result, simply subsidizing existing clean energy technologies more isn't necessarily going to lead to more global deployment, especially in lower income nations. Resources are better invested innovating fundamentally new, cheaper, and better performing technologies that can be competitive without government subsidies or mandates.

- **Robust public investments are critical to clean energy innovation.** The notion that the market alone will invest in breakthrough clean energy technologies ignores the last century of technology development. Industry has little incentive to invest in complex, capital intensive, high-risk clean energy technologies. Consistent public investment in innovation was key to the development of past energy breakthroughs such as nuclear power, shale natural gas, and the gas turbine. Developing next-generation clean energy requires similar support. It's not enough for government to occasionally increase support for clean energy innovation only to cut funds after a few years. This boom-and-bust trend has plagued clean energy and needs to end.
- **Funding basic clean energy research is not enough.** Clean energy innovation is often confused with supporting basic energy research alone. But this misreads the nature of innovation, where there are often no sharp lines between basic and applied research. We need more research, period. And the research needs to be "strategic:" funded with the goal of getting clean energy breakthroughs. Some of this may be very early stage research in the behavior of nano particles while some might be on which catalyst best generates electricity in a battery. We also need a system that better helps get research discoveries over the so-called "valleys of death" to the marketplace. Addressing this policy gap not only requires public investment, but also requires reforming publicly funded research institutions. Transferring clean technologies to market and partnering with industry to commercialize new ideas should be a fundamental goal of federally-funded research

Policy Recommendations

- ✓ **Increase public investment in clean energy RD&D:** According to ITIF's Energy Innovation Tracker, the federal government invests roughly \$6 billion per year in clean energy innovation programs. Yet in comparison to other leading innovation challenges, clean energy is significantly underfunded: the United States annually invests \$9.5 billion for space exploration, \$30 billion in healthcare research, and \$70 billion to develop new weapons. The administration should ramp-up clean energy innovation investment to at least \$15 billion per year. This would include fully-funding key RD&D programs like the Advanced Research Projects Agency – Energy (ARPA-E), which invests in high-risk, high-reward technology ideas, any one of which would transform the energy industry. It would also include investing in the U.S. national laboratory system especially in programs like user facilities that link laboratory researchers with industry. And it would also boost funding for key university research programs, especially those which form partnerships such as those in the Energy Innovation Hubs and Energy Research Frontier Centers.



- ✓ **Expand oil and gas drilling and dedicate royalties to pay for increased clean energy RD&D:** The notion that the world won't ultimately burn the same amount of oil if we limit U.S. oil drilling, as many environmental groups advocate, is simply wrong. Rather than limit oil drilling, we should expand it. But similar to how the federal government supported breakthrough shale natural gas technologies through a surcharge on gas prices, the administration should increase royalties on onshore and offshore oil and gas drilling and use the additional revenue to support clean energy innovation. Just a 5 percent increase in royalties on existing offshore oil and gas leases would raise at least \$2 billion. The next Administration should increase royalties to between 10 to 20 percent for both onshore and offshore leases as well as expand the number of leases in proven environmentally safe areas. The revenue should be put in a clean energy trust that, similar to the Highway Trust Fund, would provide dedicated funding to increase key clean energy innovation program budgets.

- ✓ **Reform public research institutions to support clean energy commercialization:** The next administration should lead the charge to reform and reorganize government energy innovation institutions. One way of doing this is to reform the mission of the National Laboratory system so that barriers to the labs partnering with industry are removed and that labs are rewarded in part on the basis on the outcomes of the research they are performing. Additional steps should be taken to officially link key DOE innovation programs with DOD's operational energy strategy so that DOD's procurement system can leverage DOE's RD&D investments, providing both benefits to the military as well as support the scale-up of new energy technologies. The Administration should also accelerate efforts to implement the widely successful ARPA-E program management model to other DOE programs, where relevant.

Related ITIF Resources

Lean, Mean, and Clean II: Assessing DOD Investments in Clean Energy Innovation

Green Mercantilism: Threat to the Clean Energy Economy

Future of Global Climate Policy Series

A Model for Innovation: ARPA-E Merits Full Funding

Lemons to Lemonade: Funding Clean Energy Innovation with Offshore Drilling Revenues

Inducing Innovation: What a Carbon Price Can and Can't Do



Ten Principles for Creating a New U.S. Clean Energy Policy

Rising Tigers, Sleeping Giant: Asian Nations Set to Dominate the Clean Energy Race by Out-Investing the United States



The United States is losing the race for global innovation advantage and the jobs and income that come with that. Many other nations are putting in place better tax, talent, technology and trade policies and reaping the rewards of higher growth, more robust job creation, and faster income growth. It's not too late for the United States to regain its lead but the federal government will need to act boldly and with resolve to design and implement strategies that include cutting business taxes and boosting public investment. *Winning the Race 2012* is a series of ten policy briefs that lay out broad principles and actionable ideas for the next administration to embrace to help the United States win the race for global innovation advantage. For more actionable policy ideas, visit ITIF's *Policymakers Toolbox* at www.itif.org/policymakers-toolbox.

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