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CONGRESSIONAL TESTIMONY

**Department of Energy Oversight:
Office of Energy Efficiency and
Renewable Energy**

**Subcommittee on Energy
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Technology**

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My name is Nick Loris. I am a senior energy policy analyst and the Herbert & Joyce Morgan Fellow at The Heritage Foundation. The views I express in this testimony are my own, and should not be construed as representing any official position of The Heritage Foundation.

I want to thank the members of the Committee on Science, Space and Technology Subcommittee on Energy of the U.S. House of Representatives for this opportunity to address the Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE).

For far too long, the Department of Energy (DOE) has attempted to use taxpayer money to drive technologies to the market, crippling the role of entrepreneurs and wasting billions of taxpayer dollars in the process. If the global race for clean energy technologies is as valuable and promising as President Obama's Fiscal Year (FY) 2016 budget proposal says it is, the private sector will find ways to capture those opportunities.

Often overlooked in the criticism of taxpayer-funded grants, targeted tax credits, government-backed loans and loan guarantees is the proper scrutiny of all the spending programs within EERE. Policymakers have used EERE to drive their desired technologies into the marketplace. The given logic for many of these initiatives is that a gap exists between basic research and economic viability, and more taxpayer money must be spent to attract private investment for commercialization. Littered throughout the President's budget justification are phrases such as cost reduction, risk reduction, energy savings, improved U.S. competitiveness, keeping production and jobs in America, technology validation, performance improvement, and workforce training.

Such initiatives and objectives are exactly the wrong role for the federal government and the wrong approach to spur innovation at the DOE. When the government attempts to drive technological commercialization, it circumvents the competitive process that properly assigns risk and reward in an open market. Using taxpayer dollars to force commercialization is wasteful and disregards how markets and private investment efficiently determine how to allocate investments.

Basic research that has promising commercial application will attract private investment. Some of those investments will succeed, and others will fail. But when private money is spent, benefits and losses will be assigned to the appropriate entities, rather than the taxpayer. The objective for Congress and the federal government is to fund basic research that meets national objectives and create the proper pathway for DOE laboratory researchers to push basic research out to the market and the private sector to tap into the expertise housed at America's national labs.

Some research conducted by the DOE may never have commercial application but we should not view those programs as failures because commercial application should never be the objective. Programmatic success should be determined by whether or not the program meets the established government need or national objective. Value exists in

national objectives that advance scientific discovery or is critical to meeting government needs and priorities. Granted, there is spending within EERE that the private sector might not undertake on its own but that does not mean the federal government needs to fill the gap. Even if that research qualifies as basic, government spending should not establish a specific roadmap to commercialization.

A legitimate government function exists for saving energy within the federal government because the government as energy consumers do not face the same incentive structure as families and businesses. But those programs should be carried out in a technology-neutral manner to ensure the purpose is energy savings and reducing the cost to the taxpayer, not meeting a political agenda. Additionally, the office can also play a role in assisting with collecting information, for instance, assisting in voluntary energy-information programs like EnergyStar, and reducing true market barriers created by unnecessarily onerous permitting and regulatory days.

The following testimony dissects the EERE budget in four sections: alternative transportation fuel technologies, alternative electricity technologies, advanced manufacturing and energy efficiency spending, and federal energy use.

America does not need a “man on the moon”-style mission for energy because the country has a diverse mix of energy suppliers to competitively price energy and provide families and businesses with choices. When energy markets do not operate efficiently, it is largely because of government meddling, either through blocked access, burdensome regulations or an array of market-distorting subsidies. True reforms that lay the framework for renewable energy technologies (and all energy technologies) to succeed and to achieve the goals EERE sets will not come from more government spending, but instead free-market reforms that create a competitive economic environment.

Alternative Fuels: Vehicle, Bioenergy, Hydrogen, and Fuel Cell Technologies

The President’s budget request bemoans the fact that Americans have been sending billions of dollars overseas to buy oil and that oil volatility impacts household budgets (although it ignores that we receive a useful commodity in return). Therefore, the budget recommends using taxpayer dollars to “replace conventional fuels with cost competitive domestically produced alternatives and use conventional fuels more efficiently.”¹ Spending initiatives include: attempting to lower the costs of alternative fuels, improving electric vehicle battery life, accelerating alternative fuel infrastructure, using more natural gas in transportation, improving heavy-duty engine efficiency, among others. Both the reasoning behind the vehicle technologies program and the activities in which the government spends taxpayers’ dollars is not in the government’s purview and leads to a profound misuse of taxpayer dollars for the following reasons:

¹U.S. Department of Energy, *FY 2016 Congressional Budget Request, Volume 3*, February 2015, http://www.energy.gov/sites/prod/files/2015/02/f19/FY2016BudgetVolume3_7.pdf (accessed March 20, 2015).

The Incentive for Alternative Fuel Technologies Already Exists. Oil’s dominance as a transportation fuel is not because a government program is lacking or because more taxpayer investments are needed to jumpstart a transformation in the fuel industry. It is because oil is the most efficient and economic source of transportation fuel, even when oil prices were high. Americans spend approximately a billion dollars a day on gasoline and in many cases more than that.² Globally, the transportation fuels market is a multi-trillion-dollar one. If any alternative fuel technology captured a mere slice of that market, it would capture billions of dollars in profit annually. The market demand for transportation fuel is incentive enough to spur competition in the industry. Breaking into this market is not a problem of the so-called valley of death where good ideas are not able to attract substantial investment. It is a valley of wealth waiting to be had. Any viable technology that competes with the internal combustion engine will not need help from the federal government. This is why, for example, more heavy-duty trucks are fuel switching to natural gas.

The Auto and Trucking Industries Are Well Aware of Fuel Efficiency. The budget request includes funding to “award new cost-shared projects with industry under the SuperTruck II Initiative to develop technologies to improve the freight hauling efficiency of heavy-duty Class 8 long-haul vehicles by 100 percent in 2020, compared to a 2009 baseline vehicle.”³ Auto manufacturers and the freight and long-haul transportation industry understand the importance of fuel efficiency. Nearly 3 million heavy-duty Class 8 trucks carry approximately 70 percent of America’s freight, consuming more than 50 billion gallons in fuel and spending more than \$140 billion in diesel costs.⁴ The industry operates on razor-thin margins and plans its driving routes down to the tenth of a mile to save on fuel costs. Companies are driven to invest in innovative technologies or alternative fuel to lower costs when it makes sense for them to do so. Of course, the industry will support such programs, whether paid outright by the taxpayer or cost-shared with the taxpayer, because it substantially reduces their risk. The spending will offset private-sector money that would be spent if the idea was worthy of investment. But even if the program fails, industry is willing to take a chance because the taxpayers cover a share of the loss.

Oil Price Volatility Does Not Justify Government Intervention. Many subprograms within the Vehicles Technologies program spend money to address economic concerns stemming from oil price volatility. Oil price volatility is no reason for government intervention through spending in the DOE. Markets adapt to changes in resource demand and supply through the price mechanism. If vehicles powered by natural gas, electricity, or biofuel became economically competitive, consumers would respond, and alternative-fuel vehicles and necessary supporting infrastructure would be built.

²Philip Bump, “Americans Are Spending More than \$2 Billion Less a Week on Gas than This Time Last Year,” *The Washington Post*, January 13, 2015, <http://www.washingtonpost.com/blogs/the-fix/wp/2015/01/13/americans-are-spending-over-2-billion-less-a-week-on-gas-than-this-time-last-year/> (accessed March 20, 2015).

³U.S. Department of Energy, *FY 2016 Congressional Budget Request, Volume 3*.

⁴American Trucking Association, Reports, Trends & Statistics, http://www.trucking.org/News_and_Information_Reports_Energy.aspx (accessed March 20, 2015).

One example within EERE is the Bioenergy Technologies program, which is pushing to make advanced biofuels cost-competitive with conventional gasoline at \$3 per gallon.⁵ The goal for hydrogen from renewable resources is \$4 per gallon of gasoline equivalent.⁶ However, as the country has experienced over the past several months, gasoline prices could be well below that for a long period of time. How does the federal government know \$3 will be the magic price point at which alternative fuels become competitive in the marketplace? What prevents these sources of energy from becoming volatile? Market analyses and government projections may deem that the appropriate price point, but unpredicted drop in oil prices indicates just how unreliable future cost projections are and, importantly, how unpredictable markets are. Furthermore, fuel prices in much of Europe were \$8 equivalent for an extended period of time and there was no massive fuel-switching; even at such high prices, oil-based fuels served as the most affordable and reliable fuel. Even if \$3 or \$4 does change the market for alternative fuels, businesses are much better equipped and flexible to deal with changing economic circumstances. Most importantly, the private sector is the one that should be responsible for innovating to lower costs.

Markets Solve the Chicken-and-Egg Problem. A common argument for federal spending is not only technology validation to reduce the risk for private investment, but also spending on the infrastructure necessary to support those alternative sources. Proponents of such spending initiatives argue that consumers will not buy the cars if they have no place to re-charge or re-fuel them, thus creating a chicken-and-egg problem. However, markets and economically viable technologies overcome the chicken-and-egg problem all the time. Consumers would not buy diesel cars without diesel pumps, nor would they buy cell phones without cell phone towers. Neither needed massive government spending programs to get them off the ground, nor does their commercial success come from a technology-specific initiative.

Renewable Electricity: Solar, Wind, Water, and Geothermal Energy

Through direct government spending, grants, loan guarantees, and targeted tax credits, the federal government has spent billions of dollars to integrate more renewable energy into America's electricity mix with little to show for it. Wind and solar technologies supply only 6.5 percent of the nation's electricity generation.⁷ In attempts to boost solar, wind, geothermal, and hydropower's place in the market, the federal government extends well beyond basic research to promote the development of specific technologies. Even the so-called basic R&D has the end goal of reducing costs for these energy sources. Policymakers should recognize that:

Cost Reduction Is Not a Federal Government Role. The role of the federal government should not be to reduce the costs of technologies or sources of energy, yet many programs within the EERE explicitly state cost reduction and performance improvement as objectives. For instance, the DOE's SunShot Initiative launched in 2011 and mirrored

⁵U.S Department of Energy, *FY 2016 Congressional Budget Request, Volume 3*.

⁶Ibid.

⁷Ibid.

after President Kennedy's man-on-the-moon mission aggressively pursues a goal of cutting the cost of solar-energy technology by 75 percent by 2020. The budget request states that "[r]educing the total installed cost for utility-scale solar electricity to roughly 6 cents per kilowatt hour without subsidies will result in rapid, large-scale adoption of solar electricity across the United States." The statement is fundamentally oxymoronic. The SunShot Initiative is itself a huge government subsidy, spending hundreds of millions of taxpayer dollars a year to reduce the cost of solar. Government has no business trying to make private-sector projects cost-competitive or improving a technology's reliability to make it more palatable for private investors and financiers. Furthermore, the government is not very good at it compared to those industries that have skin in the game. How many times have we heard from the DOE that an economically viable alternative-energy source was "just around the corner"? Years later and billions of taxpayer dollars squandered, the technology is still just around the corner.

The same is true for the DOE's Wind Energy Program and the "Atmosphere to Electrons" initiative to reduce costs for onshore and offshore wind. Nor is it the responsibility of taxpayers to pay for programs that provide cost projections for wind and conduct economic feasibility analyses. Congress should eliminate these activities for all alternative electricity technologies.

Such wasteful spending is not unique to the EERE; Congress should eliminate similar spending activities for nuclear or conventional electricity sources such as coal and natural gas. It is neither appropriate nor necessary; furthermore, the government is not the best vehicle to take on the risks when there are potential profits to be had.

Much like transportation, the market for electricity already exists and is not going anywhere any time soon. Residential energy expenditures averaged \$750 per person in 2012.⁸ Americans paid more than \$350 billion in retail electricity and more than \$1.35 trillion in total energy expenditures for the same year.⁹ The opportunity to provide electricity is a multi-trillion-dollar market with more than a billion people without reliable electricity who desperately want it. President Obama's budget request cites a Navigant Research study that says the global market for small wind farms will double to 180 megawatts from 2013 to 2018. Similarly, the budget points to tremendous potential for offshore wind, geothermal, and hydropower. If the opportunity is there, the industry, using its own money, will find ways to capture it. And if opportunities exist to form partnerships to make the entire industry competitive while protecting proprietary information, that should be done solely through private participation. The federal government does not have to be the facilitator nor does the partnership have to be public-private in nature.

⁸Daniel Wood, "How Much Do You Spend?" U.S. Department of Energy, July 2, 2014, <http://energy.gov/articles/how-much-do-you-spend> (accessed March 20, 2015).

⁹U.S. Energy Information Administration, Table E8. Primary Energy, Electricity, and Total Energy Expenditure Estimates, 2012, http://www.eia.gov/state/seds/sep_sum/html/pdf/sum_ex_tot.pdf (accessed March 20, 2015).

More Spending Is Not the Path Toward Making America More Competitive. The EERE attempts to address some of the soft costs involved with renewable energy such as “financing, customer acquisition, permitting, installation, labor, inspection, and other non-hardware costs.”¹⁰ But the EERE’s spending goes about addressing these issues through a top-down, federal approach and spending more money rather than addressing the underlying policy problems that could reduce the burden. For instance, the budget request for solar includes the focus area of Empowering State and Local Leaders, calling for \$25.2 million to support leaders “that develop strategies and reduce the costs and barriers to solar access and that may slow deployment at the local level.”¹¹ To the extent that is a problem, regional, state, and local leaders should address those problems; assistance does not need to come from Washington.

Another subprogram within the EERE is the Innovations in Manufacturing Competitiveness, which aims to improve U.S. competitiveness for clean energy manufacturing. Part of the program spends money to keep the American manufacturing solar supply chain competitive with companies in other nations. There are three problems with this line of thinking: (1) we are unlikely to outspend countries like China; (2) even if the United States would outspend other countries, it would be wasteful and ignores the real policies that make American less competitive; and (3) the United States is not going to have a competitive advantage in every product in the world. If it makes sense to import a product or technology at a lower cost, consumers in the U.S. are made better and it frees up resources to be more productive elsewhere in the economy.

Advanced Manufacturing, Building Technologies, and Weatherization

A significant portion of the EERE’s budget allocates money toward advanced manufacturing technologies, improving energy efficiency in residential and commercial buildings, and weatherizing homes to save homeowners money on their energy bills. These activities typically enjoy bipartisan support because the promotion on American manufacturing and the enticement of saving families and businesses money makes these spending initiatives appear to be win-win. The reality, however, is that manufacturers both large and small are driven to provide consumers with better products at lower costs, leading to dramatic improvements in energy consumption per dollar of gross domestic product. Families and businesses have the wherewithal to make energy-saving investments with their own money and when they choose not to, they are making that choice after weighing preference and trade-offs. When discussing energy efficiency it is important to note that:

Manufacturers, Builders, and Families Know Energy Is a Significant Cost. The EERE’s goal of supporting American manufacturing and making America’s energy-intensive industries more competitive is a laudable one. But the solutions are not found in taxpayer-funded programs. Manufacturers know that energy is a significant input cost and will innovate to find ways to lower their costs and gain any competitive advantage they can. Companies will make these investments if they believe that the technology is

¹⁰U.S. Department of Energy, *FY 2016 Congressional Budget Request, Volume 3*.

¹¹Ibid.

promising, worth the risk, and the best use of their investment dollars. Instead, the DOE's Advanced Manufacturing Office provides nothing more than corporate welfare. For instance, past grant recipient companies have included LyondellBasell—one of the largest chemical companies in the world—and Dow Chemical—which had \$57 billion in sales in 2013 and invests over \$1 billion annually in research and development.¹² Even if the EERE does not allocate grants or funds to specific companies, the general spending on materials, structures, chemical processes and machinery to reduce technical uncertainty and reduce risk for the private sector is a misappropriation of taxpayer monies.

Markets Will Provide Better Buildings, More Efficient Homes. The EERE provides money to reduce energy consumption in commercial and residential buildings through spending on innovative materials for the structure and windows or attempting to approve efficiency in technologies such as HVACs, water heaters, air conditioners, and appliances like washers and dryers. In addition, the EERE's weatherization assistant program supplies grants to retrofit homes to reduce energy consumption and worker training programs to provide the necessary support to weatherize the homes. The argument for subsidized worker-training programs is not just that without the trained expertise the construction industry will lack the necessary labor force to identify energy savings and build more energy-efficient homes and buildings. The argument also rests on the assumption that the federal government is the best institution to incentivize that training. Proponents of such an approach either lack an understanding of how industries generate workforces, or acknowledge that the efficiency gains they are advocating do not have much market value. What is clear is that they understand how it is easy to get the federal government to pay for state, local, or private-sector needs.

Whether federal handouts are distributed at the federal level or funneled down to the state and local communities, the government should not be in the financing or banking business. The fact is that if efficiency improvements really saved that much money, and if demand for more energy-efficient buildings and manufacturing processes existed, these programs would not be necessary. The private sector expands and trains workers appropriately to meet demand or capture more opportunities and will make those investments with its own resources. For example, there are already “energy home audits”—services that identify how homes could save energy—and companies that sell energy-efficient windows and other technologies for commercial and institutional buildings, which should be the ones training the workers. Those who invest wisely today will be the ones best positioned to take advantage of any emerging markets in the future. The federal government's involvement distorts that risk, or makes investments for a market that would otherwise not exist, and with insufficient demand, these subsidies will be a serious waste of taxpayer money.

Taxpayers already experienced the inability of the federal government to create a market through the green-jobs training programs funded in the stimulus. When the government doled out billions of dollars in the stimulus bill to make homes more energy efficient,

¹²The Dow Chemical Company, “Our Company,” <http://www.dow.com/company/index.htm> (accessed March 20, 2015), and The Dow Chemical Company, “Research and Development,” <http://www.dow.com/michigan/locations/midmichigan/research.htm> (accessed March 20, 2015).

shoddy workmanship requiring follow-up work, uncompetitive bidding, poor record-keeping, and overpriced energy-efficient light bulbs and carbon-monoxide detectors became commonplace across the U.S.¹³ A September 2011 Department of Labor Office of Inspector General report found that “grantees have expressed concerns that jobs have not materialized and that job placements have been fewer than expected for this point in the grant program.”¹⁴ A follow-up report released in October 2012 found that the program fell well short of its retention goal of 71,017 workers (only 16 percent of participants remained employed longer than six months); much of the training was delivered to already employed workers and was not necessary for them to perform their jobs.¹⁵ The same report also found that more than 20 percent of training certificates went to workers who had only one day of training, and 47 percent received five or fewer days of training.¹⁶ Job-training programs may score political points for politicians who like to point to the jobs they “created” at election time, but they are a needless waste of taxpayer money.

Manufacturers Have Preferences, Constraints, and Trade-offs to Consider.

Supporters of energy-efficiency mandates and subsidies argue that, by failing to realize all of their possible energy savings, manufacturers are virtually throwing away money. Plenty of engineering analyses support the idea that an “efficiency gap” exists and investments will yield substantial savings.¹⁷ But there are several problems with these engineering analyses of energy investments. The most glaring problem with many of these engineering analyses is that they fail to take into account the costs of the paternalistic role of the federal government. That is, when the government forces efficiency measures on people, it takes away choices, or at the very least, overrides them. When firms are not spending money for the most energy-efficient technology, it is not that they are acting irrationally; they simply have other preferences, budget constraints, and other ignored costs such as comfort, convenience, and product quality. A business very well knows that investing in a more energy-efficient technology will save energy in the long run, but they may choose to spend money on hiring more employees or allocating those resources elsewhere.

¹³See, for instance, U.S. Department of Energy, Office of Inspector General, “Audit Report: The State of Illinois Weatherization Assistance Program,” October 2010, <http://energy.gov/sites/prod/files/igprod/documents/OAS-RA-11-01.pdf> (accessed May 16, 2013), and U.S. Department of Energy, Office of Inspector General, “Examination Report: Cuyahoga County of Ohio Department of Development—Weatherization Assistance Program Funds Provided by the American Recovery and Reinvestment Act of 2009,” September 2011, <http://energy.gov/sites/prod/files/OAS-RA-11-19.pdf> (accessed March 19, 2015).

¹⁴U.S. Department of Labor, Office of Inspector General, “Recovery Act: Slow Pace Placing Workers into Jobs Jeopardizes Employment Goals of the Green Jobs Program,” September 30, 2011, <http://www.oig.dol.gov/public/reports/oa/2011/18-11-004-03-390.pdf> (accessed March 19, 2015).

¹⁵U.S. Department of Labor, Office of Inspector General, “Recovery Act: Green Jobs Program Reports Limited Success in Meeting Employment and Retention Goals of June 30, 2012,” October 25, 2012, <http://www.oig.dol.gov/public/reports/oa/2013/18-13-001-03-390.pdf> (accessed March 19, 2015).

¹⁶Ibid.

¹⁷McKinsey & Company, “Unlocking Energy Efficiency in the US Economy,” July 2009, http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy (accessed July 29, 2013).

In fact, studies have shown that manufacturers will reject about half of the energy-efficiency projects recommended by engineering analyses because of unaccounted physical costs, risks, opportunity costs, lack of staff of implementation, risk of inconvenience to personnel, or suspected risk of problems with the equipment.¹⁸ Other problems with efficiency spending for businesses include questions about the cost of the upfront investment, the payback horizons, overstated energy savings, and predictions of future energy prices, all of which play an important role in the actual savings realized from investments and make families and businesses skeptical of efficiency upgrades.¹⁹

Federal Energy Management Program: Opportunity for Savings, not for a Political Agenda

President Obama's budget request highlights that the federal government is America's largest energy consumer, spending \$24 billion on energy.²⁰ While the government's energy use comprises only 1.7 percent of the nation's total energy consumption, opportunities exist to reduce that consumption and save taxpayers money. Improving energy efficiency in the federal government can save taxpayer dollars when done appropriately, but those investments should remain technology neutral and does not need to be housed within the EERE. Whereas the government has less incentive than businesses and homeowners to save money, energy-efficient investments can make economic sense for the taxpayer.

Nonetheless, those investments should not be made to advance a renewable energy or climate agenda—they should be done on the merits of reducing energy costs and on improving capabilities. However, this is clearly not the case. For example, Executive Order 13423 requires federal agencies to achieve goals such as increasing the “use of alternative fuel consumption by at least 10 percent annually, compared to an FY 2005 baseline,” and increasing the “purchase of alternative fuel, hybrid, and plug-in hybrid vehicles when commercially available.”²¹ Though required mandates originate from legislation or executive orders and not the EERE, Congress should eliminate any technology-specific requirements or mandates.

Additionally, Congress should do more to ensure that these efficiency upgrades are actually saving money. Today, an energy service company (ESCO) will identify potential savings for a federal agency and enter into an energy savings performance contract (ESPC). The ESCO guarantees the cost savings, and those cost savings pay for the service rendered by the ESCO with additional cost savings after completion of the

¹⁸Hunt Allcott and Michael Greenstone, “Is There an Energy Efficiency Gap?” *Journal of Economic Perspectives*, Vol. 26, No. 1 (Winter 2012), pp. 3–28.

¹⁹Ibid., and Lucas Davis, “Evaluating the Slow Adoption of Energy Efficient Investments: Are Renters Less Likely to Have Energy Efficient Appliances?” Energy Institute at Haas *Working Paper* No. 205, June 2010, http://ei.haas.berkeley.edu/pdf/working_papers/WP205.pdf (accessed July 29, 2013).

²⁰U.S. Department of Energy, *FY 2016 Congressional Budget Request, Volume 3*.

²¹ U.S. Environmental Protection Agency, “Strengthening Federal Environmental, Energy, and Transportation Management,” Executive Order No. 13423, January 24, 2007, <http://www.epa.gov/oaintrnt/practices/eo13423.htm> (accessed March 20, 2015).

contract accruing to the federal agency.²² While ESPCs have lowered energy use and saved taxpayers money, the Government Accountability Office and the DOE's Inspector General (IG) have outlined problems with ESPCs, including lack of reliable data, failure to verify savings, failure to protect agency interests, and agencies paying ESCOs even though no energy savings had been realized.²³

A Better Path Forward from Research to Marketplace

The criticism of the EERE and spending on specific technologies with the goals of cost reduction, commercialization, and risk reduction is not to say, however, that the federal government does not have a role in technology development or that innovative technologies and commercial products cannot emerge from federal research. Proponents of government spending promise the next Internet, but deliver Solyndras instead. That is because there is a stark difference between how the Internet became commercially viable versus attempts to commercialize energy technologies.

Advocates of government spending on technology-specific activities tout the federal government's involvement in commercial successes such as the Internet, computer chips, and the global positioning system (GPS). But none of these was initially intended to meet a commercial demand; they were developed for national security needs. Entrepreneurs saw an opportunity in these defense technologies and created the commercially viable products available today. The role of the DOE should be to conduct the basic research to meet national objectives that the private sector would not undertake and create a system that allows the private sector, using private funds, to tap into that research and commercialize it. Federal labs should allow basic research to reach the market organically.

A current challenge to transferring research from government labs to the market is cultivating a better relationship between the labs and industry. Connecting the two so that industry can use lab resources with their own money to do research, identify new commercialization opportunities, or enhance or develop a product would drive innovation and economic growth. Members of Congress have taken steps to address such challenges through the Senate's INNOVATES Act and the House of Representatives' Department of Energy Laboratory Modernization and Technology Transfer Act of 2014.²⁴

Address Cost and Competitiveness Concerns Through Free Markets

Opportunities exist to implement market reforms that would allow renewable energy companies and all other energy technologies to be more competitive and operate on a level playing field. Free-market reforms that address poor tax policy, inadequate access to capital, burdensome environmental regulations, and labor regulations would do much

²²U.S. Department of Energy, Federal Energy Management Program, "Energy Savings Performance Contracts," <http://www1.eere.energy.gov/femp/financing/espcs.html> (accessed March 20, 2015).

²³Ibid.

²⁴Nicolas Loris and Katie Tubb, "Six Easy Energy Reforms for Congress to Take Up," Heritage Foundation *Backgrounder* No. 2981, December 8, 2014, <http://www.heritage.org/research/reports/2014/12/six-easy-energy-reforms-for-congress-to-take-up>.

more to accomplish the EERE's objectives of cost and risk reduction and the creation of a competitive manufacturing sector with a vibrant labor supply.²⁵

For instance, America is experiencing a manufacturing resurgence, but not because of a government program or generous taxpayer-funded initiatives. Entrepreneurs and energy producers sparked a shale gas revolution that has dramatically lowered input costs. American manufacturers and chemical and industrial companies are flocking to the United States and citing cheap natural gas as the reason why. Imagine the growth if Congress and the federal government implemented free-market tax, labor, energy, and regulatory reforms.

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²⁵David, Burton, testimony before the Committee on Small Business, U.S. House of Representatives, March 4, 2015, <http://www.heritage.org/research/testimony/2015/building-an-opportunity-economy-the-state-of-small-business-and-entrepreneurship>.