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CONGRESSIONAL TESTIMONY

**Examining the Department of Energy's
Loan Portfolio**

**The House of Representatives Committee on
Science, Space and Technology's Subcommittee on
Energy and Subcommittee on Oversight**

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My name is Nick Loris and I am 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 would like to thank the House of Representatives Committee on Science, Space and Technology's Subcommittee on Energy and Subcommittee on Oversight for the opportunity to address the Department of Energy's (DOE) loan portfolio.

Opponents of the DOE's loan and loan-guarantee programs point to bankrupt projects as reasons to close the program. Proponents argue that the health of the portfolio is strong; outperforming many private portfolios and the federal government could make money if the interest payments more than cover any losses. However, neither justifies the Department of Energy's role as an investment banker. In fact, both the failures and the successes illustrate why the federal government should not use taxpayer-backed loans to intervene in market investment decisions.

In some instances, DOE has lent out taxpayer dollars to projects that could not survive even with policies trying to prop up favored technologies. In other instances, successful projects result from the DOE awarding money to very profitable, well-established companies or ones that benefit from the great number of federal, state, and local subsidies at their disposal. Their current and long-term success depends on more subsidies. Furthermore, there could be instances where some companies quite simply have an innovative, money-making technology. If that is the case, private actors should bear the full risk and reap the benefits of investing in such endeavors.

The DOE's two loan-guarantee programs and its Advanced Technology Vehicles Manufacturing program have and continue to put taxpayers at risk. But the economic pain cuts deeper than wasted taxpayer money because government interventions distort free enterprise, create government dependence, and allow Washington to direct the flow of private-sector investments. This is not a recipe for more innovation and economic growth. Congress should prevent the DOE from administering any new loans and loan guarantees and pursue three fundamental energy policy objectives: open markets, eliminate favoritism, and reduce the regulatory burden for all energy sources and technologies.

A Review of the DOE's Loan Portfolio and Common Themes

Below is a brief review of each project (listed alphabetically) in the DOE's entire loan portfolio, including the 1703 loan-guarantee program, the 1705 loan-guarantee program, and the Advanced Technology Vehicles Manufacturing (ATVM) loan program. Several patterns and problems stand out throughout the portfolio, which will be discussed in more detail following the review of each project. When analyzing all of the projects, the following themes are pervasive:

- Failed companies that could not survive even with the federal government's help.

- Projects labeled as success stories but are still in the infancy of their operation and it is too early to tell if they will succeed in the long run.
- Projects that have the backing of companies with large market capitalizations and substantial private investors. These companies should have no trouble financing a project without government-backed loans if they believe it is worth the investment.
- Private investors hedging their bets and congregating toward public money. These projects on their surface appear to be financial losers but the government involvement entices companies to take a chance.
- Companies and projects that benefit from a plethora of federal, state, and local policies that push renewable energy.
- Government incompetence in administering and overseeing the loans.

1366 Technologies

1366 Technologies was the recipient of an Advanced Research Projects Agency-Energy (ARPA-E) loan in October 2010 and subsequently received \$20 million in venture capital funding and seed funding, including from South Korea's Hanwa Chemical Corporation that has a market capitalization of more than \$4 trillion.¹ 1366 has a strategic partnership with the major chemical corporation.² The company then received a loan from the Department of Energy in 2011. Fast Company named 1366 technologies one of the most innovative technologies in energy for 2015.³ The company is pushing to make a silicon wafer that will produce solar cheaper than coal; if the solar company can produce a cost-competitive technology, it should not need any special government-backed loans.

Jonathan M. Silver, the head of the Energy Department's loan-guarantee program, said that 1366's innovation was "the result of exactly what the Department of Energy is trying to do, to develop a cradle-to-market innovation strategy that helps identify transformative technologies early in the process, and makes it possible for them to grow and mature more rapidly, and leapfrog many of the steps along the way." However, the opportunity cost of leapfrogging is that government-anointed winners get public and private backing, while other innovative or profitable technologies miss out.

Abengoa Bioenergy's Mojave and Solana Projects

¹Matthew Wald, "A Cheaper Route to Solar Cells," *The New York Times*, October 19, 2010, <http://green.blogs.nytimes.com/2010/10/19/a-cheaper-route-to-solar-cells/> (accessed February 26, 2016).

²Bloomberg Business, "Company Overview of 1366 Technologies, Inc," February 26, 2016, <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=42747014> (accessed February 26, 2016).

³Press release, "1366 Technologies Named 'One of Ten Most Innovative Companies in Energy' for 2015 by Fast Company Magazine," 1366 Technologies, February 10, 2015, <http://1366tech.com/1366-technologies-named-one-of-the-ten-most-innovative-companies-in-energy-for-2015-by-fast-company-magazine/> (accessed February 26, 2016), and Yahoo! Finance, Hanwha Chemical Corp, February 26, 2016, <http://finance.yahoo.com/q?s=009830.KS> (accessed February 26, 2016).

Abengoa Bioenergy, one of the largest renewable energy giants in Spain and all of Europe, is in financial trouble. The company recently released a “Viability Plan” that seeks another \$1.85 billion in creditor support to avoid bankruptcy. According to credit analyst Felix Fischer of Lucror Analytics in Singapore, “[T]he outline of the business plan does little to comfort investors in terms of providing fresh capital.”⁴ The United States government is Abengoa’s largest creditor. The Federal Financing Bank, overseen by the U.S. Treasury, holds more than \$2.34 billion in the company.⁵

Abengoa received two DOE loan guarantees for solar projects: \$1.2 billion for Mojave, a California-based solar power plant⁶ and \$1.45 billion for Solana, an Arizona solar plant with molten salt thermal energy storage.⁷ According to the DOE, the Mojave project is improving the efficiency of a technology that has been around for more than two decades: “Mojave uses innovative solar receiver and frame designs to further enhance already proven parabolic trough technology that has been employed for nearly 25 years at facilities throughout the Mojave desert.”⁸ And some of the loan-guarantee projects still need to use natural resources such as oil or natural gas. For instance, the Solana project uses solar to heat synthetic oil that runs through tubes to generate steam to power the turbine generator.

The Mojave Solar Project was also the beneficiary of a \$376.8 million cash grant from Treasury as part of the 2009 American Recovery and Reinvestment Act, more commonly known as the stimulus bill.⁹ Language in the 2009 stimulus allowed renewable companies to take cash grants from the Treasury Department in lieu of the targeted tax credits they would normally receive.

The loan program office also issued a \$132.4 million loan guarantee to Abengoa for a commercial cellulosic ethanol plant in Kansas.¹⁰ The DOE also awarded Abengoa \$97 million in direct grant money to build the bioenergy plant in 2007.¹¹ Keep in mind, the federal government has also mandated the production of billions of gallons of cellulosic ethanol, provided special tax

⁴Macarena Munoz Montijano, “Abengoa Seeks \$1.85 Billion in Funds to Back Viability Plan,” Bloomberg, February 17, 2016, <http://www.bloomberg.com/news/articles/2016-02-17/abengoa-seeks-1-85-billion-in-funds-to-back-viability-plan> (accessed February 26, 2016).

⁵Daniel Badia, “Abengoa creditors : United States, Santander and more than 200 entities,” Expansion, November 26, 2015, <http://www.expansion.com/empresas/energia/2015/11/26/5656ad0bca4741a43c8b461f.html> (accessed February 26, 2016).

⁶Department of Energy Loan Programs Office, Mojave, <http://www.energy.gov/lpo/mojave> (accessed March 1, 2016).

⁷Department of Energy Loan Programs Office, Solana, <http://www.energy.gov/lpo/solana> (accessed March 1, 2016).

⁸Department of Energy Loan Programs Office, Mojave, <http://energy.gov/lpo/mojave> (accessed March 1, 2016).

⁹U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

¹⁰Department of Energy Loan Programs Office, Abengoa Bioenergy, <http://energy.gov/lpo/abengoa-bioenergy> (accessed March 1, 2016).

¹¹Department of Energy Office of Energy Efficiency and Renewable Energy, Abengoa, <http://www.energy.gov/eere/bioenergy/abengoa> (accessed March 1, 2016).

breaks for biofuels, and spends taxpayer dollars through the annual appropriations process at the DOE attempting to commercialize and reduce the cost of biofuels.

Abengoa repaid the DOE in full in March 2015 for the bioenergy loan, but creditors of a bioenergy plant in Nebraska have not been as lucky where creditors are seeking \$4 million from Abengoa in unpaid grain costs.¹² If Abengoa restructures to reduce its debt or ultimately becomes insolvent, U.S. taxpayers could be out billions of dollars.

Abound Solar

Abound Solar is one of several DOE loan-guarantee failures and the venture failed quite quickly. The DOE conditionally approved the loan guarantee in July 2010 and made the first loan disbursement in December 2010. By September 2011, the DOE already suspended funding because Abound failed to meet milestone markers. Less than a year later Abound filed for bankruptcy, leaving toxic waste at its empty facilities behind.¹³

A 2014 DOE Inspector General (IG) Audit report on the DOE loan to Abound expounds on several of the problems with the government's involvement in financing projects. The audit identified many glaring issues with the DOE's administration and monitoring of the loan. Specifically, the report criticized the Program Office for:

- **Failing to tell the Department's Credit Review Board that it had significantly lowered the estimated recovery rate from 38 percent down to 8.3 percent.** The change is significant because the estimated recovery rate affects the amount of money distributed as part of the credit subsidy. The credit subsidy is the "net present value of the difference between projected cash flows to and from the government over the life of the loan."¹⁴ In the case of Abound, lowering the estimated recovery rate increased the credit subsidy from \$71 million to \$96 million, paid for with taxpayer money from the American Recovery and Reinvestment Act of 2009.¹⁵
- **Ignoring concerns from technical experts and proceeded to distribute taxpayer-backed loans.** The loan program's internal solar expert and independent engineer recommended that the office not lend additional money because of product quality and

¹²"Creditors Seek to Put Abengoa's U.S. Bioethanol Unit into Bankruptcy," Reuters, February 3, 2016, <http://www.reuters.com/article/abengoa-restructuring-nebraska-idUSL2N15120H> (accessed February 26, 2016).

¹³ Mark Jaffe, "Bankrupt Abound Solar's toxic wastes cleaned at 4 Colorado facilities," July 8, 2013, http://www.denverpost.com/ci_23621546/bankrupt-abound-solars-toxic-wastes-cleaned-at-4 (accessed March 1, 2016).

¹⁴Government Accountability Office, "Department of Energy: Current Estimated Net Costs Include \$2.2 Billion in Credit Subsidy, Plus Administrative Expenses," April 2015, <http://www.gao.gov/assets/670/669847.pdf> (accessed February 26, 2016).

¹⁵U.S. Department of Energy Office of Inspector General Office of Audits and Inspections: Audit Report, "The Department of Energy's Loan Guarantee to Abound Solar Manufacturing, LLC," U.S. Department of Energy, April 14, 2014, <http://energy.gov/sites/prod/files/2014/04/f15/DOE-IG-0907.pdf> (accessed March 1, 2016).

control issues, including concerns that the panels could catch fire.¹⁶ Despite the technical concerns and an initial suspension of funding, the DOE continued to disperse funds.

- **Lacking expertise and failing to document assumptions when analyzing the financial prospects of the company.** If the federal government wants to have a role as an investment banker, one would assume they would hire competent expertise. This was not the case for Abound. The analysis of market conditions to approve and disperse the money had little, if any, documentation to support how analysts reached their conclusions. Perhaps even more alarming, the IG report says, “we noted that the individual assigned to monitor the Abound loan had no prior loan management experience and limited background in project finance and financial statement analysis.”¹⁷

The federal government’s involvement in promoting Abound’s technology began even before the loan guarantee and in fact dated back to the 1990s. The National Science Foundation and the DOE’s National Renewable Energy Laboratory (NREL) spent money trying to advance Abound’s technology, a thin-film cadmium telluride solar technology.¹⁸ Funding provided the means to refine and attempt to prove commercial viability. Abound provides an example of the problems when the government directs taxpayer money toward specific technologies, even when the money is allegedly spent for basic research and development. The government money funnels to politically preferred technologies and tries to force them to succeed. Researchers at the national laboratories could be working on other projects and spending taxpayer dollars more efficiently—or saving them altogether by simply not spending money on activities where the federal government should have no part.

Agua Caliente

Agua Caliente is an Arizona-based solar project using thin-film technologies built by First Solar. The company received a \$967 million conditional commitment from the DOE in January 2011 and the agency finalized the loan guarantee August 5, 2011.¹⁹ The well-established renewable energy company NRG purchased the project from First Solar the exact same day. NRG has a market capitalization of \$3.45 billion. In January 2012, Berkshire Hathaway Renewables

¹⁶Ibid.

¹⁷Ibid.

¹⁸Statement of Craig Witsoe, CEO Abound Solar, Inc., Regarding the U. S. Department of Energy 1705 Loan Program Before the Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending House of Representatives Committee on Oversight and Government Reform, May 16, 2012, <https://oversight.house.gov/wp-content/uploads/2012/05/5-16-12-RegAffairs-Witsoe.pdf> (accessed February 26, 2016).

¹⁹U.S. Department of Energy, “Department of Energy Offers Support for Arizona Solar Project,” January 20, 2011, <http://energy.gov/articles/department-energy-offers-support-arizona-solar-project> (accessed February 26, 2016), and U.S. Department of Energy, “Department of Energy Finalizes a \$967 Million Loan Guarantee to Support the Agua Caliente Solar Project,” February 5, 2011, <http://energy.gov/articles/department-energy-finalizes-967-million-loan-guarantee-support-agua-caliente-solar-project> (accessed February 26, 2016).

acquired 49 percent of the company.²⁰ The project began commercial operation in 2014 and proponents of the DOE program hail Agua Caliente as a success story.²¹

As of 2014, nearly 90 percent of Berkshire Hathaway Energy, of which Berkshire Hathaway Renewables is a subsidiary, is owned by Berkshire Hathaway.²² The multinational holding company run by Chief Operating Officer Warren Buffet has a market capitalization of \$325.8 billion. In 2013, Berkshire Hathaway Energy alone raised \$8.3 billion for investments in their projects.²³

Alamosa

The Alamosa Solar Generating Project, owned by Cogentrix, received a conditional loan-guarantee commitment in May 2011 and the DOE finalized the \$90.6 million loan guarantee that September. The project, which commenced commercial operations in April 2012, is one of the first utility-scale high-concentration photovoltaic solar projects in the United States, having nearly 30 megawatts of generation capacity.²⁴

At the time of the loan guarantee, a subsidiary of Goldman Sachs owned Cogentrix. Goldman Sachs had a market capitalization of \$77 billion at the time and is one of the most successful financiers in the world.²⁵ The Carlyle Group, “global alternative asset manager with more than \$203 billion in assets under management across 129 funds and 141 fund of private equity funds vehicles” acquired Cogentrix from Goldman Sachs in 2012.²⁶ Cogentrix also received a \$35 million cash grant from the Treasury in July 2012.²⁷

Antelope Valley Solar Ranch

The Antelope Valley Solar Ranch (AVSR) is a utility-scale solar project in southern California that received a \$646 million loan guarantee. Now owned by massive energy-provider Exelon, the solar ranch illustrates how loan guarantees can misallocate capital and reduce overall output. Much like the Agua Caliente project, First Solar first developed AVSR. Hours after receiving the

²⁰BHE Projects: Agua Caliente, https://www.bherenewables.com/aguacaliente_solar.aspx (accessed February 26, 2016).

²¹Department of Energy Loan Programs Office, Agua Caliente, <http://energy.gov/lpo/agua-caliente> (accessed March 1, 2016).

²²“Buffett’s MidAmerican Energy Adopts Berkshire Name,” Reuters, April 30, 2014, <http://www.reuters.com/article/berkshirehathaway-midamerican-namechange-idUSL2N0NM21620140430> (accessed February 26, 2016).

²³Berkshire Hathaway Energy, Financial Strength, <https://www.berkshirehathawayenergyco.com/investors/> (accessed February 26, 2016).

²⁴Department of Energy Loan Programs Office, <http://energy.gov/lpo/alamosa> (accessed March 1, 2016).

²⁵Nicolas Loris, “Spurring Investment in America’s Clean Energy Technology,” testimony before the Committee on Natural Resources, U.S. Senate, <http://www.heritage.org/research/testimony/2013/09/spurring-investment-in-america-clean-energy-technology> (accessed February 26, 2016).

²⁶Cogentrix, A Leading Independent Power Producer, <http://www.cogentrix.com/> (accessed February 26, 2016).

²⁷U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

\$646 million loan guarantee, First Solar sold the project to Exelon for \$75 million.²⁸ The loan guarantee makes the project more attractive to potential purchasers, like Exelon, by lowering borrowing costs.

In 2012 testimony, my colleague David Kreutzer estimates the value of the loan guarantee:

If a federal loan guarantee cuts the interest rate by two points, say from 6.5 percent to 4.5 percent, the loan would cut \$9 million per year from the finance costs on the \$646 million, 20-year loan. This saving would have a present value of about \$100 million. An 8-K filing First Solar made with the Securities and Exchange Commission reveals that First Solar sold the project to Exelon for only \$75 million. This implies that without the loan guarantee, the project's net expected value would have been negative. Of course, the overall cost of the project to Exelon will be much more than \$75 million, but the project also comes with power-purchase agreements that guarantee a revenue stream.

So the present value of the revenue stream appears to be \$25 million less than the present value of the costs without the loan guarantee. If this were the case, it is not too surprising that Exelon would not want to privately finance the project regardless of Exelon's market capitalization.²⁹

Blue Mountain and Ormat Nevada

Nevada Geothermal Power is another company that received help from the taxpayers in several capacities. In September 2010, the DOE issued a \$98.5 million partial loan guarantee through its Financial Institution Partnership Program (FIPP) for the Blue Mountain geothermal power plant in Nevada. According to the DOE, FIPP is "designed to expedite the loan guarantee process for renewable energy generation projects that use commercial technologies and to expand credit capacity for financing of U.S. renewable energy projects. In a FIPP financing, the DOE provides a partial guarantee for up to 80 percent of a loan provided to a renewable energy project by qualified financial institutions." The company also received nearly \$66 million in July 2011 from the U.S. Treasury through the 1603 grant program in the stimulus.

Through this program, the DOE poured taxpayer dollars into a struggling project that already had established lenders. A 2012 House of Representatives Committee on Oversight and Government Reform details the financial troubles Nevada Geothermal Power faced—troubles the DOE was well aware of when administering the loan guarantee. Furthermore, the Oversight report emphasizes that the government-backed loan served more as a creditor bailout than anything else:

²⁸SustainableBusiness.com News, "First Solar Sells Massive Solar Projects to Utilities," October 3, 2011, <http://www.sustainablebusiness.com/index.cfm/go/news.display/id/22981> (accessed February 26, 2016).

²⁹David Kreutzer, "Testimony before the Committee on Energy and Commerce Subcommittee on Energy and Power United States House of Representatives," July 12, 2012, <http://www.heritage.org/research/testimony/2012/07/the-american-energy-initiative-the-cost-of-loan-guarantees> (accessed February 26, 2016).

Less than three months after the conditional approval, DOE finalized this loan guarantee, enabling Nevada Geothermal to refinance a loan from TCW through John Hancock. The loan did not finance any new construction and therefore did not help to create a single new job. DOE's awarding of this loan guarantee raises questions about why DOE was investing significant taxpayer resources in an entity with well-established financial difficulties.³⁰

The Blue Mountain project under-delivered on its projected power generation for years and the future viability of the project remains unclear. AltRock, founded in 2007 by some of the United States' largest venture capital firms including Google.org, Vulcan Capital, and Kleiner Perkins, acquired the company in May 2015.³¹ At that time, AltRock's CEO Aaron Mandell said his company would fully repay the DOE's loan guarantee by 2029.³² Ormat Technologies received nearly \$80 million for the engineering, procurement, and construction for the Blue Mountain project.³³ The same company benefitted from the DOE finalizing a \$350 million partial loan guarantee through FIPP for geothermal power plants owned by Ormat Nevada.³⁴

California Valley Solar Ranch

The California Valley Solar Ranch (CVSR) is a 250-megawatt utility-scale solar project that received a \$1.24 billion loan guarantee from the DOE September 30, 2011.³⁵ SunPower originally sponsored the project and applied for the loan guarantee but Fortune 500 company NRG acquired the project shortly thereafter and worked with SunPower to build the plant.³⁶ SunPower had a power purchase agreement with Pacific Gas & Electric a few years before the project began commercial operation in October 2013. If the solar generation remains commercially viable, CVSR will help California meet its ambitious renewable portfolio standard of providing 33 percent of its electricity from renewable power by 2020. At its peak in June 2014, the project had a capacity factor of nearly 33 percent (for a comparison, a nuclear power

³⁰U.S. House of Representatives Committee on Oversight and Government Reform, "The Department of Energy's Disastrous Management of Loan Guarantee Programs," March 12, 2012, <https://oversight.house.gov/wp-content/uploads/2012/03/FINAL-DOE-Loan-Guarantees-Report.pdf> (accessed February 26, 2016).

³¹Press release, "Baseload Clean Energy Partners Acquires the Blue Mountain Geothermal Power Plant," AltaRock Energy, June 1, 2015, http://altarockenergy.com/in_the_news/baseload-clean-energy-partners-acquires-blue-mountain-geothermal-power-plant/ (accessed February 26, 2016).

³²Katie Fehrenbacher, "A Troubled Geothermal Plant Finds a Savior in a Startup and Vinod Khosla," *Fortune*, May 20, 2015, <http://fortune.com/2015/05/20/geothermal-altarock-nevada/> (accessed February 26, 2016).

³³U.S. House of Representatives Committee on Oversight and Government Reform, "The Department of Energy's Disastrous Management of Loan Guarantee Programs," March 12, 2012, <https://oversight.house.gov/wp-content/uploads/2012/03/FINAL-DOE-Loan-Guarantees-Report.pdf> (accessed February 26, 2016).

³⁴Department of Energy Loan Programs Office, Ormat Nevada, <http://energy.gov/lpo/ormat-nevada> (accessed March 1, 2016).

³⁵U.S. Department of Energy, "Energy Department Finalizes \$1.2 Billion Loan Guarantee to Support California Solar Generation," September 30, 2011, <http://energy.gov/articles/energy-department-finalizes-12-billion-loan-guarantee-support-california-solar-generation> (accessed February 26, 2016).

³⁶Business Wire, "NRG Energy, NRG Yield and SunPower Begin Commercial Operations at 250 MW California Valley Solar Ranch," October 31, 2013, <http://www.businesswire.com/news/home/20131031006341/en/NRG-Energy-NRG-Yield-SunPower-Commercial-Operations#.U29fhUks8oA> (accessed February 26, 2016).

plant has a capacity factor of 90 percent) and as of November 2014, CVSR had a capacity factor of less than 16 percent.³⁷

Crescent Dunes

The DOE issued a \$737 million loan guarantee in September 2011 to SolarReserve's Crescent Dunes concentrated solar project in Tonopah, Nevada.³⁸ The \$1 billion plant received the large majority of its funding from the federal government with an additional \$260 million in equity financing from SolarReserve, ACS Cobra, and Banco Santander.³⁹

SolarReserve's solar project with thermal storage is operational and performed some test runs delivering electricity to the grid and could soon begin supplying power to Nevada. The facility is a 110-megawatt tower consisting of more than 17,000 mirrors that collect the sun's energy to heat molten rock stored in a 640-foot tower. The molten rock will then flow through the tower to a storage tank to generate steam and therefore electricity.⁴⁰ The company entered into a 25-year power purchasing agreement. SolarReserve will sell its power to Nevada Power Company at 13.5 cents per kilowatt hour, about twice the cost of electricity supplied from a natural gas-fired power plant.⁴¹ For reference, Nevadans paid 8.10 cents per kilowatt hour across all sectors of the economy in November 2015.⁴²

Desert Sunlight and Genesis

Former DOE loan-guarantee director Peter Davidson called the Desert Sunlight project a "shining example" of how the loan program is bringing utility-scale solar into the market.⁴³ More accurately, Desert Sunlight is a shining example of corporate welfare. The DOE issued two partial loan guarantees in September 2011 totaling nearly \$1.5 billion through FIPP. The lead funder through this program was Goldman Sachs Lending Partners LLC with Citigroup Global Markets co-arranging the funding. Again, almost immediately after closing the taxpayer-backed

³⁷U.S. Energy Information Administration, Electricity Data Browser, <http://www.eia.gov/electricity/data/browser/#/plant/57439/> (accessed February 26, 2016).

³⁸Department of Energy Loan Programs Office, Crescent Dunes, <http://www.energy.gov/lpo/crescent-dunes> (accessed March 1, 2016).

³⁹Kevin Smith, "Crescent Dunes Solar Energy Project Tonopah, Nevada," Solar Reserve, June 27, 2012, <http://www.csptoday.com/usa/presentations/day1/920-Kevin-Smith-Solar-Reserve-2.pdf> (accessed February 26, 2016).

⁴⁰U.S. Department of Energy, "Energy Department Finalizes \$737 Million Loan Guarantee to Tonopah Solar Energy for Nevada Project," September 28, 2011, <http://energy.gov/articles/energy-department-finalizes-737-million-loan-guarantee-tonopah-solar-energy-nevada-project> (accessed February 26, 2016).

⁴¹Eric Wesoff, "Almost \$5B in DOE Loans: Antelope Valley, Desert Sunlight, CVSR Funded, Sold; Prologis Funded," Greentech Media, September 30, 2011, <http://www.greentechmedia.com/articles/read/doe-closes-two-solar-loans-just-before-the-deadline> (accessed February 26, 2016).

⁴²U.S. Energy Information Administration, Electric Power Monthly, "Average Price of Electricity to Ultimate Customers by End-Use Sector by State November 2015 and 2014 (Cents per Kilowatt-hour)," January 26, 2016, https://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a (accessed February 26, 2016).

⁴³U.S. Department of Energy, "Desert Sunlight Is Shining Example of How DOE Loan Guarantees Helped Launch Utility-scale PV Solar Market," February 9, 2015, <http://energy.gov/lpo/articles/desert-sunlight-shining-example-how-doe-loan-guarantees-helped-launch-utility-scale-pv> (accessed February 26, 2016).

loan guarantee, First Solar sold the project to three of the world's largest corporations—General Electric (market capitalization of \$296 billion), NextEra Energy (market capitalization of \$53 billion) and Sumitomo Corporation (market capitalization of \$13 billion). The Desert Sunlight project also received more than \$360 million as part of the stimulus program.⁴⁴

The project, which uses thin-film cadmium-telluride solar panels as opposed to the more common crystalline-silicon panels, is on federal government land. The company is renting the federal land at a discounted price of \$1.37 million per year and has entered into power purchase agreements with Pacific Gas & Electric and Southern California Edison to help meet the state's renewable portfolio standard.⁴⁵

NextEra was also the recipient of an \$852 million partial loan guarantee through FIPP for Genesis Solar Project. The solar facility is also on Bureau of Land Management property and much like the Solana project, it uses solar to heat synthetic oil that runs through tubes to generate steam to power the turbine generator. According to the plant manager, it takes an hour and a half to heat the oil running through the tubes necessary to generate electricity on a good sunny day.⁴⁶ Genesis Solar also received a \$328 million Treasury grant in lieu of the solar investment tax credit.

Fisker

Fisker Automotive is one of the failures from the DOE's Advanced Technology Vehicles Manufacturing (ATVM) program. The DOE awarded the electric car company a \$529 million loan in April 2010 to develop and produce two lines of hybrid plug-in vehicles at a plant in Delaware. Fisker's inability to meet performance targets caused the DOE to cap the money lent at \$192 million. Fisker filed for bankruptcy in November 2013. The federal government recovered \$28 million and recovered another \$25 million by selling the loan at auction, leaving a loss of \$139 million.⁴⁷

Red flags that existed should have made it apparent that Fisker was not credit-worthy for a government loan. Fisker spent \$600,000 per car that was sold to auto dealers for an average of \$70,000 and had a CCC+ credit rating.⁴⁸ After the Fisker failure, head of the loan program office

⁴⁴U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

⁴⁵"DOE Closes on Four Major Solar Projects," Renewable Energy World, September 30, 2011, <http://www.renewableenergyworld.com/articles/2011/09/doe-closes-on-three-major-solar-projects.html> (accessed February 26, 2016).

⁴⁶K. Kaufmann, "Riverside East Solar Zone's Genesis Project Is Ready," *The Desert Sun*, April 24, 2014, <http://www.desertsun.com/story/tech/science/energy/2014/04/25/riverside-east-solar-zone-nextera-energy-genesis-ready/8137853/> (accessed February 26, 2016).

⁴⁷Peter Davidson, "An Update on Fisker Automotive and the Energy Department's Loan Portfolio," U.S. Department of Energy, September 17, 2013, <http://energy.gov/articles/update-fisker-automotive-and-energy-department-s-loan-portfolio> (accessed February 26, 2016).

⁴⁸PrivCo, "Fisker Automotive's Road to Ruin: How a 'Billion-Dollar Startup Became a Billion-Dollar Disaster'" April 17, 2013, <http://www.privco.com/fisker-automotives-road-to-ruin> (accessed February 26, 2016), and Aamer

Peter Davidson offered why the government sank money into the project, writing, “Early on, Fisker Automotive looked very promising—raising more than \$1.2 billion from leading private sector investors who believed in the company and its business plan, and also attracting strong support from both Republicans and Democrats.”⁴⁹ If a company can attract \$1.2 billion from the private sector, it should not need help from the federal government. The question is would Fisker have generated that much investment absent the government’s loan.

The DOE loan artificially made this dubious investment appear more attractive and lowered the risk of private investment. For instance, private investors sank \$1.1 billion into Fisker but much of the private financing came after the Department of Energy approved and closed the loan for Fisker. Fisker, formed in August 2007, raised \$94 million before the DOE approved the loan in September 2009.⁵⁰ Fisker raised another \$57 million between the time the DOE approved and closed the loan in April 2010. After the DOE closed the loan, Fisker raised over \$1 billion in various rounds of venture-capital funding.⁵¹

Ford and Nissan

The DOE issued ATVM loans to both Ford and Nissan North America to retool their factories to produce more fuel-efficient and electric vehicles. In September 2009, the DOE issued \$5.9 billion to Ford to upgrade facilities in Illinois, Kentucky, New York, Michigan, Missouri, and Ohio. DOE officials boasted that the funds helped Ford manufacture and sell its Ford 3.5-liter V6 EcoBoost®-equipped F-150 truck. They tout that EcoBoost trucks save drivers money because of improved fuel efficiency and also take “another step in helping our country become more resilient against the threats presented by climate change.”⁵² Nissan’s involvement with the ATVM program is similar. In January 2010, the DOE issued a \$1.45 billion loan to build a battery manufacturing plant and retool existing factories to expand the development of its electric vehicle, the Nissan LEAF.⁵³

Ford and Nissan are well-established companies that have market capitalizations of \$48 billion and \$36 billion, respectively.⁵⁴ Drivers value energy efficiency and saving on fuel costs. If Ford and Nissan thought these investments and retooling of manufacturing plants were a way to meet market demand, they should have been completely privately financed outside the DOE. Additionally, the government mandates efficiency through its corporate average fuel economy

Madhani, “GOP, White House Clash over Loan to Troubled Car Maker,” *USA Today*, April 24, 2013, <http://www.usatoday.com/story/money/cars/2013/04/24/obama-fisker-gop/2110689/> (accessed February 26, 2016).

⁴⁹Peter Davidson, “An Update on Fisker Automotive and the Energy Department’s Loan Portfolio,” U.S. Department of Energy, September 17, 2013, <http://energy.gov/articles/update-fisker-automotive-and-energy-department-s-loan-portfolio> (accessed February 26, 2016).

⁵⁰Fisker raised \$68 million of the \$94 million after submitting the loan application.

⁵¹PrivCo, “Fisker Automotive’s Road to Ruin.”

⁵²Peter Davidson, “ATVM Loans Help Boost Pickup Truck Efficiency,” U.S. Department of Energy, May 7, 2014, <http://energy.gov/lpo/articles/atvm-loans-help-boost-pickup-truck-efficiency> (accessed February 26, 2016).

⁵³Department of Energy Loan Programs Office, Nissan, <http://energy.gov/lpo/nissan> (accessed March 1, 2016).

⁵⁴Yahoo! Finance, Ford Motor, Co., <http://finance.yahoo.com/q?s=F> (accessed February 26, 2016).

standards. The government should not be forcing efficiency through mandates in the first place, but they should not be subsidizing companies through loans or targeted tax credits to meet those targets.

Granite Reliable

Granite Reliable received a partial loan guarantee of nearly \$169 million through FIPP in September 2011. The DOE provided the money to build a 99-megawatt wind farm in New Hampshire. Granite is 75 percent owned by Brookfield Asset Management, whose market capitalization is more than \$30 billion.⁵⁵ Granite Reliable also collected \$56.2 million as a cash grant from the 1603 Treasury grant program in 2012.⁵⁶ Much of the electricity generated by Granite Reliable will be sold to Vermont utilities to meet their renewable portfolio standard.

Ivanpah

Ivanpah, a 392-megawatt solar plant in California, received a \$1.6 billion loan guarantee backed by the taxpayers in September 2011.⁵⁷ BrightSource Energy and Bechtel developed the project, which had financial backing from NRG Energy and Google, among other investors. The more than \$2 billion plant is failing to deliver on how much electricity it projected to produce.

Along with replacing broken equipment the plant has run into several problems. As *The Wall Street Journal* reports,

One big miscalculation was that the power plant requires far more steam to run smoothly and efficiently than originally thought, according to a document filed with the California Energy Commission. Instead of ramping up the plant each day before sunrise by burning one hour's worth of natural gas to generate steam, Ivanpah needs more than four times that much help from fossil fuels to get the plant humming every morning. Another unexpected problem: not enough sun. Weather predictions for the area underestimated the amount of cloud cover that has blanketed Ivanpah since it went into service in 2013.⁵⁸

The company is at risk of defaulting on their contracts to distribute electricity to Pacific Gas & Electric. To pay off the loan, the company is applying for a \$539 million taxpayer-funded grant. In applying, NRG said the company “believes in a clean and sustainable energy future and

⁵⁵Bloomberg Business, Brookfield Asset Management Inc., <http://www.bloomberg.com/quote/BAM:US> (accessed February 26, 2016).

⁵⁶U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

⁵⁷Department of Energy Loan Programs Office, Ivanpah, <http://energy.gov/lpo/ivanpah> (accessed March 1, 2016).

⁵⁸Cassandra Sweet, “High-Tech Solar Projects Fail to Deliver,” *The Wall Street Journal*, June 12, 2015, <http://www.wsj.com/articles/high-tech-solar-projects-fail-to-deliver-1434138485> (accessed February 26, 2016).

therefore participates in available government programs to develop and expand the use of clean energy to accelerate America's energy independence."⁵⁹

One problem with NRG's statement is that even if Ivanpah generated the 392 gross megawatts of power it plans to, the additional electricity will not make much difference when it comes to energy independence. Most electricity consumed in the United States is produced domestically, with a small amount imported from friendly nations. Another problem is that energy independence should not be the goal of energy policy. The goal should be to create a free market in energy that allows producers and consumers to respond to energy prices and market signals appropriately.

Kahuku

Kahuku Wind Power, LLC, the owner and operator of the Kahuku Wind Power project, received a \$117 million loan guarantee in July 2010 to develop a 30-megawatt wind facility.⁶⁰ Treasury also awarded Kahuku with a \$35.1 million cash grant in February 2012.⁶¹ Kahuku has an agreement to sell to the Hawaiian Electric Company and will help to meet the state's renewable mandate where utilities have to have 30 percent of its net electricity sales come from renewables by 2020, and 100 percent by 2045.⁶²

Mesquite

Mesquite Solar 1 received a loan guarantee of \$337 million in September 2011 to finance a 170-megawatt solar plant in Arizona.⁶³ Mesquite is owned by a subsidiary of Sempra Energy, whose market capitalization is \$25 billion.⁶⁴ Mesquite was also the beneficiary of a \$163.8 million cash grant from the Treasury in August 2013.⁶⁵ Sempra has a 20-year power purchase agreement with Pacific Gas & Electric Company and the state has a 15 percent by 2025 renewable portfolio standard. Sempra has another customer for the third phase of its Mesquite Solar Complex: the

⁵⁹William La Jeunesse, "World's Largest Solar Plant Applying for Federal Grant to Pay Off Federal Loan," FoxNews, November 8, 2014, <http://www.foxnews.com/politics/2014/11/08/world-largest-solar-plant-applying-for-federal-grant-to-pay-off-its-federal.html> (accessed February 26, 2016).

⁶⁰U.S. Department of Energy, "Secretary Chu Announces Closing of \$117 Million Loan Guarantee for Kahuku Wind Power Project," June 27, 2010, <http://energy.gov/articles/secretary-chu-announces-closing-117-million-loan-guarantee-kahuku-wind-power-project> (accessed February 26, 2016).

⁶¹U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

⁶²U.S. Department of Energy Efficiency and Renewable Energy, DSIRE, Renewable Portfolio Standard, <http://programs.dsireusa.org/system/program/detail/606> (accessed February 26, 2016).

⁶³Department of Energy Loan Programs Office, Mesquite, <http://energy.gov/lpo/mesquite> (accessed March 1, 2016).

⁶⁴Yahoo! Finance, Sempra Energy, <http://finance.yahoo.com/q?s=SRE> (accessed February 26, 2016).

⁶⁵U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

federal government. Sempra will supply a third of the electricity for 14 U.S. Navy and Marine Corps bases in California.⁶⁶

One Nevada Line

The DOE's loan program has involvement in supporting the build of transmission lines, too. One economic challenge facing renewable energy facilities is delivering the electricity. Many large-scale renewable projects in the United States are located in remote areas and therefore transmission lines are necessary to take the power to more densely populated areas. The DOE granted a \$343 million loan guarantee for the One Nevada Line transmissions project in February 2011, which brings wind and solar power from rural areas of Idaho, Nevada, and Wyoming to urban areas.⁶⁷ The project is mostly owned by LS Power Equity Advisors, an "established investment manager with \$6.36 billion in equity capital raised across three private equity investment funds."⁶⁸ NV Energy owned the rest of the project. Berkshire Hathaway Energy acquired NV Energy in 2013.⁶⁹

Record Hill Wind

Owned by Record Hill Wind and Yale University, the small 51-megawatt wind project received a \$102 million loan guarantee in August 2011.⁷⁰ Less than a year later, Record Hill collected a \$33.7 million cash grant from the Treasury's 1603 program.⁷¹ The money helped pay for two Siemens wind turbines, a company with a market capitalization of \$68 billion.⁷² Though hailed as an innovative technology, the 2012 House Oversight Committee reveals that was not the case. The money helped deploy an already existing technology that had been operating in Europe since 2005 and in the U.S. a year later. More than 1,300 of these turbines exist worldwide and implementing minor modifications does not signify the cutting edge technology the program is supposed to support.⁷³

⁶⁶Sempra U.S. Gas and Power, Solar Under Construction: Mesquite Solar 3, <http://www.semprausgp.com/project/mesquite-solar-3/> (accessed February 26, 2016).

⁶⁷Peter Davidson, "Loan Guarantees Can Play a Role in Rural Opportunity Investment," U.S. Department of Energy, July 24, 2014, <http://energy.gov/lpo/articles/loan-guarantees-can-play-role-rural-opportunity-investment> (accessed February 26, 2016).

⁶⁸LS Power, About Us, <http://www.lspower.com/about.htm> (accessed February 26, 2016).

⁶⁹U.S. Securities and Exchange Commission, Merger agreement among MidAmerican Energy Holdings Company, Silver Merger Sub, Inc., and NV Energy, Inc." December 19, 2013, <http://www.sec.gov/Archives/edgar/data/71180/000119312513479163/d647847d8k.htm> (accessed February 26, 2016).

⁷⁰Department of Energy Loan Programs Office, Record Hill, <http://energy.gov/lpo/record-hill> (accessed March 1, 2016).

⁷¹U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

⁷²Yahoo! Finance, Siemens Aktiengesellschaft, <http://finance.yahoo.com/q?s=SIE.DE> (accessed February 26, 2016).

⁷³U.S. House of Representatives Committee on Oversight and Government Reform, "The Department of Energy's Disastrous Management of Loan Guarantee Programs," March 12, 2012, <https://oversight.house.gov/wp-content/uploads/2012/03/FINAL-DOE-Loan-Guarantees-Report.pdf> (accessed February 26, 2016).

Shepherds Flat

In December 2010, the DOE announced a \$1.3 billion partial loan guarantee to support the world's largest wind farm. The money went to one of the world's largest companies, General Electric, whose market capitalization is more than \$270 billion.⁷⁴ Google also invested \$100 million in the project.⁷⁵ The project also provides another example of the egregious amount of subsidies at all levels of government to support such corporate welfare and how little private companies have to spend to hedge their bets. In fact, a Memorandum for the President written by Obama Administration officials Carol Browner, Ron Klan, and Larry Summers identifies the amount of double-dipping for taxpayer handouts a company can collect, including federal, state, and local handouts.⁷⁶

Solyndra

Solyndra became the poster child for why the federal government should not be an investment banker. Solyndra received one of the first stimulus loan guarantees, a \$535 million loan in September 2009.⁷⁷ During a visit to the plant, President Obama touted: "Companies like Solyndra are leading the way toward a brighter and more prosperous future."⁷⁸ The company also benefited from other state handouts from California.

Not soon after, Solyndra closed one of its facilities and canceled its initial public offering, and Solyndra filed for Chapter 11 bankruptcy and laid off all of its 1,100 workers in September 2011. Solyndra provides another example of private-sector investment chasing after a government-anointed project. Private investors sank \$1.1 billion into Solyndra. Much of the private financing came after the Department of Energy announced Solyndra was one of 16 companies eligible for a loan guarantee in 2007.

Stephentown Spindle (Beacon Power)

Beacon Power received a \$43 million loan guarantee in July 2009. Beacon Power filed for bankruptcy in the fall of 2011, a few months after Solyndra. Stephentown Spindle uses Beacon's flywheel technology for energy storage and is still in operation. Nevertheless, it is clear that in the instances of Solyndra, Beacon, Fisker, and other failures of loan-guarantee recipients, the lack of financing for these projects was not a result of a market failure or bridging the valley of

⁷⁴Yahoo! Finance, General Electric Company <http://finance.yahoo.com/q?s=GE> (accessed February 26, 2016).

⁷⁵Rick Needham, "Shepherding the Wind," Google, April 18, 2011, <http://googleblog.blogspot.com/2011/04/shepherding-wind.html> (accessed February 26, 2016).

⁷⁶Carol Browner, Ron Klan, and Larry Summers, Memorandum for the President, Renewable Loan Guarantees and Grants, <http://dailycaller.com/wp-content/uploads/2010/11/browner-loan-guarantee-memo.pdf> (accessed February 26, 2016).

⁷⁷U.S. Department of Energy, "Timeline of DOE's Review of the Solyndra Loan Guarantee Application," <http://energy.gov/sites/prod/files/Solar%20Background%20Document%201.pdf> (accessed February 26, 2016).

⁷⁸George Avalos, "Fremont Solar Tech Firm Solyndra to Shut Down, Lay Off Hundreds of Workers," *San Jose Mercury News*, 2011, http://www.mercurynews.com/bay-area-news/ci_18795739?source=rss (accessed February 26, 2016).

death that ostensibly necessitates preferential financing from the government. They were economically uncompetitive ventures and failed even with help from the government.

Tesla

The DOE and proponents of government-backed loans and loan guarantees advertise Tesla as a success of the ATVM program. The DOE issued a \$465 million loan January 2010 to reopen a former plant in California for the production of Tesla's electric vehicles and to develop a manufacturing plant to produce battery packs. Tesla fully paid back the loan in May 2013. Whether Tesla remains profitable remains to be seen, especially if policymakers strip away all of the state and federal incentives for electric vehicles. The company collected more than \$1.8 billion in state and local subsidies since 2007.⁷⁹ However, if Tesla's electric vehicles are the wave of the future, they should have secured investment and loans through the private sector.

Chairman and CEO Elon Musk and his companies (Tesla, among others) have had their share and benefitted from an array of government handouts in the forms of government loans and special tax breaks, all without any say from the taxpayer. However, one should not fully place blame at the companies taking advantage of taxpayer-funded program. Instead, the bulk of the blame belongs with the politicians who dangle these policies in front of investors in hopes of building plants in their districts and to help them out come election time. Such crony behavior when the federal government involves itself with decisions that should be made in the marketplace.

U.S. Geothermal Oregon

U.S. Geothermal received a \$97 million loan guarantee from the DOE in February 2011 and began commercial operations in November 2012.⁸⁰ The loan comprised 75 percent of the total cost of the project.⁸¹ Enbridge, the Canadian-based energy-delivery company with a market capitalization of \$28 billion, is an equity partner.⁸² Treasury also gave a \$32.7 million cash grant for the Neal Hot Springs facility.⁸³

Vogle

⁷⁹Good Jobs First, Tesla Motors, <http://subsidytracker.goodjobsfirst.org/prog.php?parent=tesla-motors> (accessed February 26, 2016).

⁸⁰Department of Energy Loan Programs Office, USG Oregon, <http://energy.gov/lpo/usg-oregon> (accessed March 1, 2016).

⁸¹Press release, "U.S. Geothermal Receives Funding from \$96.8-Million Loan for Neal Hot Springs Project," U.S. Geothermal Inc., August 31, 2011, <http://www.sec.gov/Archives/edgar/data/1172136/000106299311003532/exhibit99-1.htm> (accessed February 26, 2016).

⁸²Yahoo! Finance, Enbridge Inc., <http://finance.yahoo.com/q?s=ENB> (accessed February 26, 2016).

⁸³U.S. Department of Treasury, 1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits, <https://www.treasury.gov/initiatives/recovery/Pages/1603.aspx> (accessed March 1, 2016).

Of the four nuclear reactors under construction in the U.S. today, two are being subsidized under a DOE loan guarantee. The DOE awarded a loan guarantee of \$8.3 billion for construction of Southern Company's Vogtle 3 and 4 reactors in 2014. Contrary to claims that federal support was necessary to kickstart a nuclear renaissance, the loan guarantee was blatant corporate welfare. Years before the loan guarantee was finalized, construction on the reactors began in 2009, investors were willing to finance the project (Georgia Power reportedly had amassed \$4.3 billion by 2012), and Southern Company initially claimed it did not need a loan guarantee. Two other companies considering the DOE's loan-guarantee program ultimately rejected it, explaining that private financing was more attractive than complying with the overly expensive and complicated process for the DOE loan program.

Nuclear subsidies like the DOE's loan program are a bad deal for the industry and taxpayer alike. Subsidies only temporarily mask the deeper wrinkles in regulatory environment that does not promote growth, innovation, or competition. Further, the Vogtle agreement took over four years to complete. Taxpayers would have been better served if the DOE focused on the regulatory issues that currently restrain the U.S. commercial nuclear industry.

The DOE concluded the first loans under the Section 1703 program this year, all of which went to the Vogtle reactor project in Georgia. The DOE calculated the cost of the Vogtle subsidy to be zero dollars. The subsidy cost is supposed to be the money that the loan recipient pays to protect the taxpayer against the risk of default. In determining that the cost is zero, the Department of Energy is essentially suggesting that Vogtle is absent of risk. Why then would the DOE feel obliged to guarantee such a loan? The private sector would surely jump at the opportunity to finance a risk-free project. And, indeed, it did. The Vogtle project was well underway by the time the federal loan guarantee was executed. Essentially, the DOE decided, for whatever reason, to intervene in an otherwise viable private transaction.

The problem, though, is that the loan is not risk-free and zero does not represent the true cost of the loan to taxpayers. The Congressional Budget Office concluded that

budgetary cost estimates...are not a comprehensive measure of the cost to taxpayers of those guarantee commitments. Specifically, [Federal Credit Reform Act] estimates do not recognize that the government's assumption of financial risk has costs for taxpayers that exceed the average amount of losses that would be expected from defaults.⁸⁴

Where the government does not have complete or perfect information, the result is a vicious cycle that always leaves the taxpayer in a worse position than if the project were to remain in the private sector. Increasing loan fees to protect taxpayers from losses drives away more creditworthy companies. This seems to be the case in 2010 when Constellation Energy turned

⁸⁴ Congressional Budget Office, "Federal Loan Guarantees for the Construction of Nuclear Power Plants," August 2011, <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/122xx/doc12238/08-03-nuclearloans.pdf> (accessed March 1, 2016).

down the DOE's loan proposal. As Constellation COO Michael Wallace explained, the \$880 million subsidy cost and the "unreasonably burdensome conditions" of the loan guarantee were enough for the company to walk away. Consequently, this also increases the likelihood that those that do accept the guarantee are also projects that will cost the government more than estimated and ultimately expose taxpayers to undue risk. Conversely, if the DOE were to lower the fees in order to attract more and better projects, this would endanger the taxpayer with uncovered risk and would amount to nothing shy of corporate welfare.

VPG

The Vehicle Production Group (VPG) received a \$50 million direct loan through the DOE's ATVM program in March 2011 to develop and produce natural gas-powered vehicles that were wheelchair accessible.⁸⁵ The VPG failed to make loan payments, the DOE discontinued the project, and the company ceased operation in May 2013.⁸⁶ The DOE recovered \$3 million by selling the loan and recovered \$5 million from an escrow payment, leaving a loss of \$42 million. The company had raised \$400 million in private capital, including from investor T. Boone Pickens.

Alcoa

Alcoa is another well-established company that received an ATVM loan. The company has market capitalization of \$11.6 billion, had \$23 billion in sales in 2013, and a CEO who made \$18.2 million.⁸⁷ One would think it would not be too difficult to attract private financing or self-finance with that market. However, in March 2015, the DOE conditionally approved a \$259 million loan for Alcoa to produce high-strength aluminum for vehicle manufacturing. Alcoa is another company that benefits tremendously from other federal and state subsidies.⁸⁸

Government Meddling Distorts Investment Opportunity

The number of investment opportunities is broad and expansive, but the capital to finance them is not. This requires that choices be made among the different investments. Through a number of regulations, mandates, and subsidies, the federal government clouds these decisions. Government investments essentially pull capital out of those limited reserves and dictate who should receive it. While established and "sure-bet" companies will likely still receive a loan, those that are more on the margin may lose an opportunity.

⁸⁵Department of Energy Loan Programs Office, Portfolio Projects, <http://energy.gov/lpo/portfolio-projects> (accessed March 1, 2016).

⁸⁶Chris Woodyard, "Van Maker VPG, Backed by DOE Loans, Shuts Down," *USA Today*, May 8, 2013, <http://www.usatoday.com/story/money/cars/2013/05/08/vpg-auto-fisker-solyndra-tesla-doe-loan/2143201/> (accessed February 26, 2016).

⁸⁷Yahoo! Finance, Alcoa Inc., <http://finance.yahoo.com/q?s=AA> (accessed February 26, 2016).

⁸⁸Good Jobs First, Alcoa, <http://subsidytracker.goodjobsfirst.org/prog.php?parent=alcoa> (accessed February 26, 2016).

There are substantial opportunity costs caused by government's loan and loan-guarantee programs. Because capital is in limited supply, a dollar loaned to a government-backed project will not be available for another project. This means that the higher-risk, higher-reward companies that drive innovation and bring new services and technologies into the marketplace may not get support, while companies with strong political connections or those that produce something that politicians find appealing will get support.

Private investors look at government loans as a way to substantially reduce their risk. Even if a project may be an economic loser but has a huge upside, private companies can invest a smaller amount if the government provides a loan. These investors are using political calculus to hedge their bets. Many of the projects in the DOE's loan-portfolio program demonstrate how private investors will flock toward government-backed projects, oftentimes without an adequate analysis of the merits of the project.

Imagine, for instance, that you and your friends have an NCAA college bracket pool with a \$100 buy-in. Twenty friends participate in a winner-take-all pot of \$2,000. Though the opportunity sounds enticing, maybe \$100 is too much of a risk for you to enter. But then the government comes along and says it will pitch in \$75. If you win, you can pay the government back with some interest but if you lose, you lose less and the taxpayers bear a substantial portion of the loss. This distortion of risk calculation made by private investors is very problematic when the government meddles in capital markets.

The market, not politicians in Washington, is much better at determining how to allocate resources to meet consumer demand. When a firm minimizes costs, the firm not only maximizes profit but also maximizes value to the consumer. The government's intervention in capital markets significantly distorts that process. Furthermore, when the government dictates how private-sector resources are spent, both industries that stand to benefit and those that are harmed by those policy decisions will concentrate more effort into lobbying for government handouts to prevent competitors from receiving the handout.

This process, which results in the political process continually picking winners and losers, has been identified by economist Gordon Tullock and later defined by economist Anne Krueger as rent-seeking.⁸⁹ Rather than engaging in a profit-seeking behavior, the producer is engaging in a rent-seeking behavior. The more the government involves itself in decisions that should be made in private financial markets, the more the American economy will experience misallocated labor and capital. The result will be less economic growth, not more.

Government-backed loans also create a moral hazard problem. Government officials administering and monitoring the loan have less at stake because it is not their money. Private

⁸⁹Gordon Tullock, "The Welfare Costs of Tariffs, Monopolies, and Theft," *Western Economic Journal*, Vol. 5, No. 3 (1967), pp. 224–232, and Anne Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review*, Vol. 64, No. 3 (1974), pp. 291–303.

investors have less at stake because of the government's involvement, leading to less than optimal oversight and scrutiny. Both Government Accountability Office (GAO) and DOE Office of Inspector General reports identify that the loan programs were fraught with inefficiencies, lack of due diligence, and inadequate oversight and management.⁹⁰ Ensuring proper oversight, transparency, and accountability are necessary. What is more important, however, is to emphasize what led to these problems in the first place and that is the federal government's involvement with investment decisions that are better left for the private sector. The government's intervention in the market rewards political connectedness over economic viability.

Successful Projects in Loan Portfolio Does Not Equate to a Successful Policy

Whether it is the Department of Energy's ATVM loan program or its 1703 and 1705 loan-guarantee programs, supporters argue a few failures are worth the risk and the number of success stories far outweigh bankrupt companies or ones facing difficult financial times. But even if a project receives a DOE loan or loan guarantee, it is a mistake to attribute that company's success to the federal government's investment. There are companies that would, and often do, receive investment from the private sector because their technology is profitable or because investors find their technology promising and want to pursue the risk. In these cases, the DOE's loan partially offsets private-sector investments that would have been made without the federal backing.

A few failures could mean that the government invests in less risky projects or provide loans and loan guarantees to well-established companies that could secure private financing if they truly believed the project was worth the risk. Many alleged successful programs within the DOE's loan portfolio are nothing more than blatant corporate welfare.

A project's success may also result because of a multitude of policies at the federal, state, and local level to pick winners and losers. As stated in many of the project descriptions, these companies can take advantage of state renewable portfolio standards, state and local grants and tax credits, government renting land at below market value, collecting premium prices for electricity generated through multi-decade power purchase agreements, federal tax credits, and federal grants in lieu of tax credits. All of these policies give companies an opportunity to remain in business; however, it is not the model for long-term technological innovation.

Energy subsidies for all sources and technologies significantly obstruct the long-term success and viability of the very technologies and energy sources that they were intend to promote. Instead of relying on a process that rewards competition, taxpayer subsidies prevent a company

⁹⁰Government Accountability Office, "DOE Loan Guarantees: Further Actions Are Needed to Improve Tracking and Review of Applications," March 2012, <http://www.gao.gov/assets/590/589210.pdf> (accessed February 26, 2016), and U.S. Department of Energy Office of Inspector General Office of Audits and Inspections, Audit Report, "The Department of Energy's Loan Guarantee to Abound Solar Manufacturing, LLC," April 14, 2014, <http://energy.gov/sites/prod/files/2014/04/f15/DOE-IG-0907.pdf> (accessed February 26, 2016).

from truly understanding the price point at which the technology will be economically viable. When the government plays favorites, it traps valuable resources in unproductive places. Companies will plead for “business certainty” when asking for special tax treatment or subsidies, but the political process of picking winners creates dependence, not certainty. True business certainty will occur when America ends federal policies that subsidize and mandate specific energy sources and technologies.

Valley of Death or Valley of Wealth?

The problem with the federal government’s investment in the clean-energy economy is that it does not allow technologies and companies to recognize the true point toward achieving economic viability, but instead induces them to rely on the crutch of the taxpayer. Or, the federal government coerces the taxpayer to subsidize investments that would be successful on their own. If the cost of renewable-energy technologies decreases or improves and the price of conventional energy increases, we may see increased generation. However, the signals of profits and losses determine what adds economic value and should determine the extent of that transition, and investors should obtain their financing in private markets to properly align the risk and reward of such investments.

To be clear, the market opportunity for clean energy investments already exists. Americans spend hundreds of billions of dollars annually on gasoline. Both the electricity and the transportation fuels markets are multi-trillion-dollar markets. The global market for energy is \$6 trillion.⁹¹ Clean-energy investments alone totaled \$1 trillion from 2004–2011.⁹² Any clean-energy technology that obtains a part of that market share will make tens, if not hundreds, of billions of dollars annually.

And the reality is many Americans are likely willing to pay more for an energy with specific characteristics. Ratepayers may pay a premium knowing their energy comes from wind power. But those decisions should be driven by choice, not forced upon consumers through regulations, mandates and subsidies.

Families in the United States and all over the world desire to get their vehicles from point A to point B and to turn their light switches on with a sense of reliability and affordability. The market demand for transportation and electricity is incentive enough to spur competition in the industry and obtain private financing without distortions from the federal government.

More Internets, Fewer Solyndras

⁹¹SelectUSA, “The Energy Industry in the United States,” <http://selectusa.commerce.gov/industry-snapshots/energy-industry-united-states> (accessed February 26, 2016).

⁹²Bloomberg New Energy Finance, “Clean Energy Attracts Its Trillionth Dollar,” December 6, 2011, <http://bnef.com/PressReleases/view/176> (accessed February 26, 2016).

When the government involves itself in capital markets, Americans are continually promised the next Internet but we continually experience the next Solyndra. That is not to say, however, that the federal government does not have a role or that innovative technologies cannot emerge from federal research. But there is a stark difference between how the Internet became commercially viable versus attempts to commercialize energy technologies.

Government projects that have become commercial successes—the Internet, computer chips, the global positioning system (GPS)—were not initially intended to meet a commercial demand but 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 research to meet government objectives and create a system that allows the private sector, using private funds, to tap into that research and commercialize it. Federal labs should allow research to reach the market organically.

Move toward Energy Free Enterprise, Not Energy Intervention

The road map for abundant energy supplies, competitive prices, more innovation, and a better standard of living is centered on open markets and less government intervention. Establishing a framework now that relies on market forces and eliminates favoritism will benefit the American people, taxpayers, businesses, the energy sector, and the economy at large.

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