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Beyond Solyndra: Examining the Department of Energy's Loan Guarantee Program

Hilary Kao

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BEYOND SOLYNDRA: EXAMINING THE DEPARTMENT OF ENERGY'S LOAN GUARANTEE PROGRAM

HILARY KAO*

ABSTRACT

In the year following the Fukushima nuclear disaster in March 2011, the renewable and clean energy industries faced significant turmoil—from natural disasters, to political maelstroms, from the Great Recession, to U.S. debt ceiling debates. The Department of Energy's Loan Guarantee Program ("DOE LGP"), often a target since before it ever received a dollar of appropriations, has been both blamed and defended in the wake of the bankruptcy filing of Solyndra, a California-based solar panel manufacturer, in September 2011, because of the \$535 million loan guarantee made to it by the Department of Energy ("DOE") in 2009.¹ Critics have suggested political favoritism in loan guarantee awards and have questioned the government's proper role in supporting renewable energy companies and the renewable energy industry generally.²

This Article looks beyond the Solyndra controversy to examine the origin, structure and purpose of the DOE LGP. It asserts that loan guarantees can serve as viable policy tools, but require careful crafting to have the potential to be effective programs. It concludes that the DOE LGP did not have consistent or achievable legislative directives nor did it have a reasonable timetable to implement its Loan Guarantee Program. Overall, projects supported by the DOE LGP are likely to remain a relatively low-risk portfolio (notwithstanding Solyndra and several outliers).³ This risk

* Assistant Professor of Law, Ohio Northern University, Claude W. Pettit College of Law, J.D. Georgetown University Law Center 1998; B.A. Brandeis University 1990. I thank James Barker and Gregory Hoover for their tireless research assistance, my children for their patience and understanding and, most importantly, my wife, Ja Lee Kao, for her invaluable encouragement, support and editorial excellence.

¹ *Chu: Solyndra Demise Due to 'Totally Unexpected' Change in Market*, NBCNEWS.COM (Nov. 17, 2011, 10:16 AM), http://nbcpolitics.nbcnews.com/_news/2011/11/17/8857477-chu-solyndra-demise-due-to-totally-unexpected-change-in-market?lite.

² Amy Payne, *Morning Bell: Wind Energy Subsidies Are as Useful as VHS Tape Subsidies*, HERITAGE BLOG (Aug. 16, 2012, 9:02 AM), <http://blog.heritage.org/2012/08/16/morning-bell-wind-energy-subsidies-are-as-useful-as-vhs-tape-subsidies/>.

³ Alison Williams, *BGOV Study: Solyndra Failure Obscures Low-Risk Energy Guarantees*, BLOOMBERG GOV'T BLOG (Dec. 1, 2011), <http://about.bgov.com/2011/12/01/bgov-study-solyndra-failure-obscures-low-risk-energy-guarantees/>.

profile, however, reflects the DOE's failure to meet some of its statutory goals, because the DOE had competing and contradictory Congressional directives, dooming the Loan Guarantee Program's ability to succeed.⁴

This Article has six sections. First, the Article examines the ambiguous language commonly used to describe renewable energy, green energy, clean energy and industries associated with these terms. It then defines two terms: the Renewable Energy Industry ("REI") and the Renewable Energy Electrical Generation Industry ("REEGI"). Second, the Article examines the state of the market for REEGI and various challenges that face this industry. Third, the Article describes the origin and structure of the DOE LGP and initial assessments of this program prior to the Solyndra scandal. Fourth, the Article examines the details concerning Solyndra's loan guarantee and bankruptcy, and asserts that Solyndra's failure was based on market conditions and the company's business model not on shortcomings in the DOE LGP. Few other DOE loan guarantee recipients will follow in Solyndra's wake. Fifth, the Article analyzes the DOE LGP and asserts that the program's contradictory legislative guidance limited the effectiveness of the program, ensuring the program would face criticism from all sides no matter which projects it supported. The Article also examines the common arguments made against the DOE LGP specifically, and government loan guarantees generally. Finally, the Article concludes that loan guarantees can be viable policy tools, but their effectiveness depends on both the coherence of legislative authority and implementation. In the case of the DOE LGP, competing legislative purposes and lack of specificity hampered the program's effectiveness.

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INTRODUCTION: FRAUD, FAVORITISM, AND FREE MONEY

The Solyndra scandal has garnered national attention ever since it became evident Solyndra would file for bankruptcy during the first week of September 2011.⁵ It was a shock when Solyndra filed for bankruptcy protection, notwithstanding the fact that news of corporate bankruptcies had become distressingly regular news since 2007.⁶ Solyndra was the much

⁵ Solyndra has become the poster child for critics of federal involvement in and support of renewable energy, with frequent allegations of influence peddling, cronyism, and failures of federal government programs. Solyndra filed for bankruptcy on September 6, 2011. See discussion of Solyndra's bankruptcy *infra* note 199 and accompanying text.

⁶ Corporate bankruptcies have been newsworthy for their size rather than the quantity of filings in the past several years. Nevertheless, filings in 2011 were more than double the filings in 2007. See Shira Ovide, *MF Global: Likely Among the 10 Biggest Bankruptcies Ever*, WALL ST. J. BLOGS (Oct. 31, 2011, 10:38 AM), <http://blogs.wsj.com/deals/2011/10/31/mf-global-likely-among-the-10-biggest-bankruptcies-ever/> (noting MF Global's bankruptcy filing, based on asset values at the time of filing, ranked number eight of the ten largest filings; seven other filings on this list occurred in 2008 or later). The list does not include other well-known bankruptcy filings from 2011, such as American Airlines, Borders, Blockbuster, Circuit City and Dynegy (the energy company that almost merged with Enron before the latter filed for bankruptcy in 2001). See generally *Dynegy Scraps Enron Deal*, CNNMONEY (Nov. 28, 2001), <http://money.cnn.com/2001/11/28/companies/enron/>; *U.S. Federal Courts Bankruptcy Statistics*, UNITED STATES COURTS, available at <http://www.uscourts.gov/Statistics/BankruptcyStatistics.aspx> (providing statistics on bankruptcy filings commenced over trailing three or twelve month reporting periods. While the number

touted recipient of the first loan guarantee commitment⁷ issued by the DOE for \$535 million by the DOE's Loan Guarantee Program Office ("LGP Office"). President Obama even personally visited the new factory around the time of the loan guarantee commitment.⁸ The Solyndra matter has been the subject of intense Congressional scrutiny⁹ including an investigation by the Federal Bureau of Investigation ("FBI").¹⁰ In light of the Solyndra scandal, some critics asserted that the DOE LGP engages in crony capitalism, alleging that its recipients are political donors or otherwise well-connected to the Obama Administration.¹¹ Other critics simply believed loan guarantees do not work, and pointed to the DOE LGP as an example of a failed government policy.¹² Still others have criticized the beneficiaries of the program (the renewable energy, green energy, or clean energy

of business Chapter 11 filings commenced on the twelve month period ending Sept. 30, 2011 (10,168 cases) was lower than the number of filings in the same periods in either 2010 or 2009, this figure was greater than the number of filings in 2008 and nearly double the number of filings in 2007 (5317 cases)).

⁷ *Solyndra Inc.*, LOAN PROGRAMS OFFICE, U.S. DEP'T OF ENERGY, <https://lpo.energy.gov/?projects=solyndra-inc> (last visited Jan. 30, 2013).

⁸ NBCNEWS.COM, *supra* note 1; George Gilder, *California's Destructive Green Jobs Lobby*, WALL ST. J., Nov. 16, 2010, at A21.

⁹ The House Energy and Commerce Committee ("HEC Committee") and its Subcommittee for Oversight and Investigations ("Oversight Subcommittee") have held hearings and conducted investigations into the circumstances surrounding all aspects of the Solyndra transaction and the DOE LGP generally. In addition, the House Oversight and Government Reform Committee ("OGR Committee") and its Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending ("RASOG Subcommittee") have also held hearings and conducted investigations on Solyndra, other loan guarantee recipients, and the DOE LGP. By contrast, the Senate Energy and Natural Resources Committee ("SENR Committee") expressly decided against holding hearings on Solyndra. *See* Amy Harder, *Senate Sitting Out Solyndra Saga*, NATIONAL JOURNAL DAILY (Oct. 20, 2011), http://epw.senate.gov/public/index.cfm?FuseAction=Minority.Blogs&ContentRecord_id=21b4be4c-802a-23ad-40ad-d272ba3d958a (last visited Jan. 30, 2013); *The Obama Administration's Green Energy Gamble: What Have All the Taxpayer Subsidies Achieved?: Hearing Before the Subcomm. on Regulatory Affairs, Stimulus Oversight, and Gov't Spending*, 112th Cong. 4–5 (2012) (statement of Jim Nelson, President and CEO, Solar3D, Inc.). This Article will reference some of the publicly available information from the Congressional hearings.

¹⁰ The DOE participated in the FBI's investigation of Solyndra. *See* Matthew Mosk & Ronnie Greene, *FBI Raids 'Connected' Energy Firm Solyndra*, ABC NEWS: THE BLOTTER (Sept. 8, 2011), <http://abcnews.go.com/Blotter/fbi-raids-connected-energy-firm-solyndra/story?id=14473051>.

¹¹ *Id.*; *see also* DARRELL ISSA, COMM. ON OVERSIGHT AND GOV'T REFORM, THE DEPARTMENT OF ENERGY'S DISASTROUS MANAGEMENT OF LOAN GUARANTEE PROGRAMS 19–21, 23 (2012).

¹² *The American Energy Initiative: The Cost of Loan Guarantees, Testimony Before the H. Comm. on Energy and Commerce Subcommittee on Energy and Power*, 112th Cong. (2012) (statement of David W. Kreutzer, Research Fellow at the Heritage Foundation).

industries), rather than loan guarantees as a form of government support because they disagreed with providing incentives to these industries.¹³

This Article assesses whether loan guarantee programs can serve their purpose as policy tools for lawmakers and policymakers and whether the DOE LGP met its goals. It aims to look beyond the politically charged Solyndra debate to consider the origins of the DOE LGP and analyze whether the DOE LGP accomplished its legislative missions. This Article does not consider individual allegations of illegal or unethical activity to procure or modify loan guarantee commitments by Solyndra or any other loan guarantee recipients. Instead, it evaluates the more systemic critiques of the DOE LGP. In order to better understand the framework of the various arguments against the DOE LGP, it is necessary to untangle various issues that complicate the debate over the value of the DOE LGP.

The Article consists of six Parts. Part I examines the ambiguity of language in the area of renewable energy and proposes more accurate terminology. While there are very different views on what federal and state energy policy should be, on a more fundamental level different groups are not even speaking the same language. Identifying this linguistic ambiguity does not solve or even clarify this gap, but doing so may improve the quality of debate over relative merits of different policy positions.

Part II highlights some of the challenges that face the REI¹⁴ as a whole by focusing on a subset of the REI, the REEGI.¹⁵ The broader debate over the appropriate role of government support for renewable energy, clean energy or green energy, as these terms are defined below, is beyond the scope of this Article.¹⁶ Arguments made by critics about any support for these alternative energy sources will be addressed in future work.

Part III details the authorization and funding for the DOE LGP. It describes the application process loan guarantee applicants faced, including concerns over timing and inter-agency communication and coordination.

¹³ See ISSA, *supra* note 11, at 11.

¹⁴ I describe the term "Renewable Energy Industry" as the industries directly connected with renewable energy electrical generation projects, including manufacturers of components used in such projects. See *infra* Parts I.A and I.B.2.

¹⁵ I define the term "Renewable Energy Electrical Generation Industry" as the construction and operation of electrical generation facilities which use renewable sources of energy to generate electricity and the direct participants in this industry who build and operate these facilities. See *infra* Part I.A.

¹⁶ I will review renewable energy incentives in a separate work that will examine the federal and state framework of incentives that are currently in place. I believe a better coordinated framework of incentives is necessary to stimulate sufficient growth of REEGI to reach a level of sustainable development.

It also describes some of the government audits of the DOE LGP conducted prior to the Solyndra scandal. Finally, it describes some industry perspectives of the DOE LGP pre-Solyndra scandal.

Part IV details the Solyndra story, from formation to floundering, and finally to bankruptcy. This Part details the reasons for Solyndra's bankruptcy and references some of the Congressional investigations conducted post-Solyndra. This Part also describes some of the other DOE loan guarantee projects that have failed or experienced difficulties since Solyndra's bankruptcy and differentiates them from the balance of the DOE LGP portfolio.

Part V analyzes the DOE LGP and concludes that its fundamental shortcoming was that its statutory goals were unduly broad and in some cases contradictory. For example, the DOE LGP had incompatible missions, such as supporting innovative technologies on the one hand and supporting commercial (excluding innovative) technologies on the other hand.¹⁷ Contradictory congressional directives¹⁸ with limited guidance meant the LGP Office was doomed to disappoint no matter what types of projects the LGP Office funded. This Part also examines some of the critics' previous arguments against loan guarantees and addresses their validity in the current environment.

The Article concludes that loan guarantee programs, if properly structured, can serve as effective policy tools. In the case of the DOE LGP, it concludes that the initial legislative directives ensured that the DOE LGP would not meet Congress's expectations, because of the contradictory nature of the programs.

I. THE RENEWABLE ENERGY TOWER OF BABEL

This Part highlights the lack of linguistic precision in discussions of renewable energy. Much like mankind in the story of the Tower of Babel,¹⁹ the area of renewable energy suffers from lack of clarity in the language used to describe it. This linguistic ambiguity hinders the growth and development of this area, because the lack of a common understanding prevents effective debate and results in imprecise decision-making by policymakers.

¹⁷ See *infra* Part III.B.3.

¹⁸ See *infra* notes 273–74 and accompanying text.

¹⁹ Mankind was working as one people to build a tower to the heavens. The Lord saw this, and chose to confound mankind and make them speak different languages and scattered them across the earth. *Genesis* 11:5–9 (King James) (“Therefore is the name of it called Babel; because the LORD did there confound the language of all the earth: and from thence did the LORD scatter them abroad upon the face of all the earth”).

This Article does not propose to create common definitions or even to change the many terms presently in use, but rather seeks to identify some of the differences in language to raise awareness of the complexity and confusion that exists in terminology.

Many of the terms used to describe renewable energy are amorphous, bending to fit the particular needs of the author or speaker at the moment they are used. This Part attempts to point out some of these terms and identify the general differences between these terms and the way each is used. This Article defines the terms “Renewable Energy Industry” (“REI”) and “Renewable Energy Electrical Generation Industry” (“REEGI”). It then provides context for where these terms sit in the broader framework of other commonly used identifiers, including green economy, green energy, clean energy and clean tech. It defines renewable energy as a subset of both green energy and clean energy.

A. *Renewable Energy Industry and Renewable Energy Electrical Generation Industry Defined*

This Article focuses on the REI and a subset of this industry, the REEGI. REI is a broad characterization of industries using renewable energy in connection with electrical generation projects, including not only developers and operators of power from electrical generation projects, but also contractors, manufacturers, and applied researchers contributing directly to such projects. Technologies covered by the term REI shall include naturally occurring renewable resources, whether or not they are regarded as depleting resources.²⁰

REEGI is the industry that develops and operates electrical generation facilities reliant on renewable energy, with an emphasis on independent power producers, where a project or facility generates electricity for resale to a utility. There are many participants and variations within the industry, based on types of technology and the roles of participants (developers, contractors, operators, as well as power purchasers). This Article focuses on facilities that are interconnected to the generation network grid,

²⁰ Depleting resources are typically not considered renewable—by definition, depletion implies that a resource cannot be renewed, but the Internal Revenue Code in some places treats renewable resources as depleting ones. *See* 26 U.S.C. § 611(a) (2006) (treating geothermal deposits as depleting resources for tax purposes and eligible for a deduction in computing taxable income for a reasonable allowance for depletion and depreciation of improvements); *see also* 26 U.S.C. § 613(e) (2006) (providing that geothermal deposits are eligible for a 15% depletion deduction from gross income from the property, adjusted for rent or royalties paid by the taxpayer).

rather than purely “behind-the-meter” installations, such as homeowner installations, distributed generation, or purely commercial operations connected to the distribution network.²¹

B. What Is Renewable Energy?

There is no commonly agreed definition or scope for renewable energy. In the evolving debate over the role of renewable energy and the extent of government support for it, many imprecise and overlapping terms are used. Some of the most commonly used terms are “green economy,” “renewable energy,” “clean energy,” “clean tech,” and “energy efficiency.”²² Though these terms are commonly used nearly interchangeably, they do not have the same meanings.

1. Green Economy vs. Green Energy

a. Green Economy

The term “green economy” is often used, but it is a broad and ambiguous term used to convey very different meanings; the Oxford English Dictionary (“OED”) defines green economy as “an economy based on or guided by environmentalist principles; (also) the economic sector devoted to products and services which are intended to minimize or remediate harm to the environment.”²³ “Green economy” can refer to something as broad and difficult to define as guiding principles regarding products and services

²¹ “Behind-the-meter” typically refers to electricity generated on the customer’s side of its electricity meter and connection to the electricity distribution network. *See generally* MARK RAWSON, CALIFORNIA ENERGY COMMISSION, DISTRIBUTED GENERATION ISSUES AND BENEFITS PAPER 5 (July 2004) (providing a definition of distributed generation). A better way to think about the distinction, however, is whether a facility provides power into the bulk power generation grid or simply produces electricity for its own use. *See generally Understanding the Grid*, NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, <http://www.nerc.com/page.php?cid=1|15> (last visited Jan. 30, 2013) (illustrating the North American bulk power system, consisting of the interconnection of generation, transmission, and distribution systems).

²² This set of terms is for illustration purposes and is by no means comprehensive. I picked these terms because of their frequent use. Other terms used include “green energy,” “green companies,” “sustainable energy,” and “green tech” to name a few. *See, e.g., What Is the Future of Natural Gas Use in the U.S.?*, NPR RADIO BROADCAST (Oct. 17, 2011), available at <http://www.npr.org/2011/10/17/141434059/what-is-the-future-of-natural-gas-use> (In this interview, Mr. Daniel Yergin used the term “sustainable energy” to describe wind and solar resources.).

²³ *Green Economy Definition*, OED ONLINE, <http://oed.com/view/Entry/81167?redirectedFrom=green%20economy> (last visited Jan. 30, 2013).

as well as the very specific fields of research, development, production, or manufacturing in any of the following areas: renewable energy electrical generation, alternative fuel development or production (such as hydrogen, fuel cell or ethanol for blending), climate change technologies, reduction of greenhouse gas emissions (“GHGs”), energy efficiency initiatives (such as smart grid projects, improved insulation, improved energy efficient windows, and “green” building technologies), greening of fossil fuels such as carbon sequestration to create clean coal, or “clean tech” technologies.²⁴ Even more confusing, the laundry list of fields in the preceding sentence is by no means a comprehensive list of what people intend when they use the term “green economy.”²⁵ Some people use the term green economy to refer to climate change initiatives focused on pricing of carbon emissions, such as proposals for cap and trade legislation.²⁶ Others use the “green economy” to refer to a transformational shift in where and how resources are allocated, including pricing of emissions, such as carbon emissions, but also other areas such as implementing energy efficiency initiatives.²⁷ Still others intermingle the term “green economy” with other terms, suggesting that the green economy includes clean energy and energy efficiency.²⁸ The term green economy could also conceivably include all recycling industries, from metal salvage, to consumer recycling, or even production of lower impact consumer products, such as paper and plastics produced with recycling materials, production or distribution of low impact products, such as bamboo plates and silverware, or digital recording technologies. Finally, “green economy” can be more broadly used to describe a fundamental cultural shift in the way we produce and consume even the most ordinary consumer goods to achieve sustainability.²⁹ The definition of green economy is likely broader than green energy.

²⁴ See “clean” and related “clean tech” defined in Parts I.B.3 and I.B.4. These terms encompass industries and associated technologies in areas such as energy efficiency, energy conservation, or GHG reductions. See also Timothy F. Slaper, *The Green Economy: What Does Green Mean?*, IND. BUS. REV., Fall 2009, at 10, available at <http://www.ibrc.indiana.edu/ibr/2009/fall/article3.html>.

²⁵ *Id.*

²⁶ See Paul Krugman, *Green Economics: How We Can Afford to Tackle Climate Change*, N.Y. TIMES MAGAZINE, Apr. 11, 2010, at 37.

²⁷ See *id.*; Joseph A. Stanislaw, *Climate Changes Everything: The Dawn of the Green Economy*, DELOITTE, Jan. 15, 2008, at 15–16, available at http://www.cleantechsandiego.org/reports/us_er_Stanislaw_Climate%20Changes%20Everything_01-15-08%20FINAL.pdf.

²⁸ See Lauren Williamson, *The In-House Investment: Interview with Howard Learner*, INSIDE COUNSEL, Apr. 2009, at 62, available at http://media.insidecounsel.com/inside_counsel/historical/Issues/2009/April-2009/Documents/Cover%20story.pdf.

²⁹ For two distinct views on this topic, see THOMAS FRIEDMAN, *HOT, FLAT, AND CROWDED* (2008) and BILL MCKIBBEN, *DEEP ECONOMY* (2007).

b. Green Energy

Green energy is a subset of the green economy which focuses on industries related solely to energy. The OED Online defines “green energy” as “renewable energy; energy produced or harnessed in an environmentally responsible manner.”³⁰ This suggests renewable energy is green energy. The definition also suggests that the production or harnessing of energy in an environmentally responsible manner can be considered green energy.³¹ Would carbon sequestration³² or Integrated Gasification Combined Cycle technologies³³ for coal qualify? Likely yes. Would conventional coal plants that are upgraded to meet new emissions standards for carbon emissions through addition of scrubbers qualify? Perhaps, but this seems like a less likely use of the term “green energy.” From a quick examination of these terms, it is reasonable to conclude that green energy is a part of the green economy. The exact scope of green energy, however, is difficult to pin down, and appears to depend on the user’s threshold for what is or is not “green.” That said, “green” appears to be broader than “renewable,” as discussed below.

2. Renewable Energy

What does “renewable energy” mean? Interestingly, the OED defines “renewable energy” as a synonym for “green energy.”³⁴ Given that green energy can be broad enough to include an increase in efficiency or reduction of emissions at facilities that rely on fossil and conventional fuels, and not just regular operations at facilities that use renewable resources

³⁰ *Green Energy Definition*, OED ONLINE, <http://oed.com/view/Entry/81167?redirectedFrom=green%20energy> (last visited Jan. 30, 2013).

³¹ *Id.*

³² *See generally Carbon Storage, Frequently Asked Questions*, NATIONAL ENERGY TECHNOLOGY LABORATORY, http://www.netl.doe.gov/technologies/carbon_seq/faqs.html (last visited Jan. 30, 2013). Carbon sequestration describes the process of carbon capture and storage (“CCS”). This technology is currently in development and no commercial scale projects have yet been built.

³³ *See generally How Coal Gasification Power Plants Work*, U.S. DEP’T OF ENERGY, <http://www.fossil.energy.gov/programs/powersystems/gasification/howgasificationworks.html> (last visited Jan. 30, 2013). IGCC technology is used to produce electricity from coal that has been converted to synthetic gas. Neither CCS nor IGCC have been built at a commercial scale and development costs for these technologies have been extremely high. In an environment of unusually low natural gas prices, IGCC in particular faces obstacles as synthetic gas is at a price disadvantage.

³⁴ *See Green Energy Definition*, *supra* note 30.

like solar and wind energy, it seems inconsistent to lump all renewable energy in with these other concepts of energy. Using the terms described above would suggest that renewable energy is green energy, but not all green energy is renewable energy. For example, if we define green energy as energy harnessed in an environmentally responsible manner, this does not necessarily require tapping of renewable resources.

For REI as defined in this Article, “renewable energy” is defined as the process of harnessing renewable resources and converting their energy into electricity.³⁵ The most commonly thought of renewable resources are the sun, wind and water (the latter of which includes not only traditional hydroelectric power generation but innovative forms like wave- and tide-generated energy). Another natural resource is underground hot springs, the steam from which is harnessed to produce geothermal energy.³⁶

It is important to note that “renewable energy” is not always defined in such a limited fashion. Often, the term “renewable energy” describes energy that comes from sources other than those considered pure renewables. Other resources that may be considered in a similar category—and require a human hand in their creation—are substances that are a byproduct from other activity, which are then broken down to generate electricity. Examples of this include biomass facilities, which use either crops grown purely for energy or waste products such as wood byproducts from forestry or paper, or even landfill waste.³⁷

This Article defines “renewable energy” in the context of REI and REEGI by limiting it to the process of converting energy from renewable resources to electricity generation. This limitation is included because energy represents a broad spectrum of activities and industries, more than just “electricity.” It is important to highlight the difference between energy and electricity. Energy takes a variety of forms, only one of which is electricity.³⁸ Electricity, is, therefore, a subset of energy.

³⁵ Renewable energy projects are generally divided into several categories based upon the amount of electricity to be generated, the end user of the energy, and how (or if) it is connected to the grid.

³⁶ See *Geothermal Energy, Climate Techbook*, CENTER FOR CLIMATE AND ENERGY SOLUTIONS, <http://www.c2es.org/technology/factsheet/geothermal> (last visited Jan. 30, 2013).

³⁷ See THE BIOMASS ECONOMY, NATIONAL RENEWABLE ENERGY LABORATORY 1–3 (July 2002). How these technologies are classified varies. Generally, they receive similar treatment for public incentives, but are not technically renewable resources based on naturally occurring sources of energy, but rather are recycling byproducts from some other process.

³⁸ *Energy Definition*, OED ONLINE, <http://www.oed.com/view/Entry/62088?rskey=4TMY7S&result=1#eid> (last visited Jan. 30, 2013). Energy can exist in a variety of forms, such as electrical, mechanical, chemical, thermal, or atomic, and can be transformed from one form to another. *Id.*

The term “renewable energy” is often used to describe the entire supply chain associated with the generation of electricity, rather than simply the end facility that actually harnesses and converts energy to electrical power.³⁹ Thus, it looks beyond just the REEGI to the manufacturing companies, suppliers, and various contractors along the entire supply chain. An analogy to the petroleum industry would be the upstream extraction element of oil and gas production⁴⁰ and the downstream refining capacities, the associated industries building equipment for up- and downstream activities, and professionals working in these areas.⁴¹ At its broadest, “renewable energy” is used to describe upstream and downstream activities within the sector, rather than simply one end product. It would be akin to someone saying “petroleum industry” to refer to only independently owned gas stations.⁴²

The imprecision of language can be seen in the common usage of the term “renewable energy.” Often the term is used vaguely, to capture other areas that might not be considered renewable energy *per se* and certainly would not be considered part of the REEGI. For example, alternative fuels⁴³ are often described as “renewable energy” initiatives⁴⁴ and even alternative vehicle manufacturing.⁴⁵ These technologies and industries fit better under the terms described below.

3. Clean Energy

A clearer distinction is the difference between renewable energy and clean energy. Renewable energy is a subset of clean energy; however, clean energy spans much more than just renewables. “Clean energy” refers

³⁹ JESS CHEN, INTERNATIONAL ECONOMIC DEVELOPMENT COUNCIL, RENEWABLE ENERGY SUPPLY CHAINS 42 (2001).

⁴⁰ L.F. Ivanhoe, *World Oil Supply-Production, Reserves, and EOR*, HUBBERT CENTER NEWSLETTER (Colorado School of Mines Petroleum Engineering Dep’t), #2000/1-1, at 6.

⁴¹ *Id.*

⁴² If a town wished to tax gas stations more in their locality, that town would refer to gas stations as opposed to the petroleum industry, lest it inadvertently tax unintended businesses, like a home heating oil company, an asphalt production company, a chemicals company, or innumerable other ventures in which petroleum is a necessary component.

⁴³ The term “renewable fuels” often refers to ethanol (whether corn-based or another feedstock, such as sugar cane, sorghum or newer innovations such as corn stover, switch-grass and algae) and biodiesel. See *Why Renewables: Biofuels*, 25X’25 AMERICA’S ENERGY FUTURE, http://www.25x25.org/index.php?option=com_content&task=view&id=16&Itemid=45.

⁴⁴ See American Recovery and Reinvestment Act of 2009, 26 U.S.C. § 1 (2009) (Energy Efficiency and Renewable Energy heading in appropriations language).

⁴⁵ See Part III.B.3.c.

to energy that is generated from sources that have limited or no carbon footprint, i.e., they have limited or no emissions of GHGs, or at least a reduced amount of GHGs compared to the unclean version of the same energy.⁴⁶ Many of the natural resources described under “Renewable Energy” fall within the term “clean energy.”⁴⁷ In addition to these resources, clean energy often refers to energy derived from natural resources that may not technically be considered renewable resources, such as geothermal energy.⁴⁸ The most important form of electricity generation that is included within clean energy, however, is nuclear power, which does not generate any carbon and therefore no GHGs.⁴⁹ Nuclear power accounts for twenty percent of domestic electricity production.⁵⁰ Clean energy often includes advances in fossil fuel–based electric generation (“conventional generation”),⁵¹ such as sequestration techniques for carbon to create clean coal, including clean coal technologies (“CCT”), carbon capture and storage (“CCS”) and integrated gasification combined cycle (“IGCC”) electrical generating facilities.⁵²

⁴⁶ Clean coal technologies are often included in the category of clean energy in that the technologies offer a smaller carbon footprint for conventional generation. See *Environmental Responsibility*, AMERICAN CLEAN COAL FUELS, http://www.cleancoalfuels.com/cleancoalfuels_environmental.html (last visited Feb. 3, 2013).

⁴⁷ This includes naturally occurring resources such as wind, sun, and water. Geothermal energy is different. See *infra* note 48.

⁴⁸ To extract geothermal energy, wells are drilled and hot steam is accessed deep underground. When generating electricity from this steam, some of the steam is lost and must be replenished with new water that is pumped back into the wells. This loss of the resource technically prevents geothermal energy from being considered a pure renewable resource. Rather geothermal energy is sometimes viewed as a depleting resource. See generally C.E. Clark et al., *Water Use in the Development and Operation of Geothermal Power Plants*, ARGONNE NATIONAL LABORATORY 5 (January 2011) available at web.anl.gov/renewables/pdfs/ANL_EVS_R-10_5.pdf.

⁴⁹ *Clean-Air Benefits of Nuclear Energy*, NUCLEAR ENERGY INSTITUTE, <http://www.nei.org/keyissues/protectingtheenvironment/cleanair> (last visited Jan. 30, 2013).

⁵⁰ ENERGY INFO. ADMINISTRATION, U.S. DEP'T OF ENERGY, ANNUAL ENERGY REVIEW 2009 276, fig. 9.2 (Aug. 2010), available at <ftp://ftp.eia.doe.gov/multifuel/038409.pdf>. While nuclear power leaves no carbon footprint, the country has yet to come up with a long term solution to nuclear waste. Yucca Mountain had long been a proposed storage location, but this program was cancelled and no alternative storage solution has been identified to date. *Yucca Mountain*, BEYOND NUCLEAR, <http://www.beyondnuclear.org/yucca-mountain> (last visited Jan. 30, 2013).

⁵¹ Fossil fuel–based electrical generation will be described as “conventional generation” in this Article. It consists of electrical generation facilities fueled by coal, natural gas, and petroleum products, such as diesel or other fuel oil. The nature or complexity of the generation facility does not matter for the purpose of this definition, just the fuel source.

⁵² U.S. DEP'T OF ENERGY, CLEAN COAL TECHNOLOGY PROGRAMS: PROGRAM UPDATE 2009 1–2 (2009), available at <http://fossil.energy.gov/programs/powersystems/cleancoal/publications>

A prime example of the imprecision of language is the use of “clean energy.” Consider President Obama’s 2011 State of the Union address. President Obama used the term “clean energy” five times in his address and called for eighty percent of the country’s electricity to come from clean energy sources by the year 2035, but never specified how he planned to reach this goal or what, precisely, he meant.⁵³ Commentators surmised, because of the terms he used, the lack of definition given to them, and the significant reduction in GHGs he sought, that his focus was going to be on nuclear energy and cleaning up conventional generation more than on innovation in purely renewable energy sources.⁵⁴ President Obama used the term “clean energy” five times in the 2011 address, but the term “renewable energy” just once.⁵⁵ In 2012, he did the same, using “renewable energy” just once but referring to “clean energy” seven times.⁵⁶ Obama also used the term “American-made Energy.”⁵⁷

Perhaps President Obama’s use of the term “clean energy” is accurate. Use of this term, rather than a more narrowly tailored term, offered the President significant flexibility in how he could reach his carbon reduction goals.

4. Clean Tech

The term “clean tech,” short for “clean technology,” is another term with no common definition.⁵⁸ The term, however, is often used to describe

/CCT_Program_Update_2009.pdf (describing different types of clean coal technologies, as well as technologies to harness energy from hydrogen and natural gas).

⁵³ Pres. Barack Obama, Remarks by the President in State of Union Address (Jan. 25, 2011) [hereinafter 2011 State of the Union Address], *available at* <http://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address> (“So tonight, I challenge you to join me in setting a new goal: By 2035, 80 percent of America’s electricity will come from clean energy sources.”).

⁵⁴ Jonathan Fahey, *Obama’s Clean Energy Standard: How Clean Is It?*, HUFFINGTON POST (Jan. 26, 2011, 5:13 PM), http://www.huffingtonpost.com/2011/01/26/obamas-clean-energy-stand_n_814525.html.

⁵⁵ 2011 State of the Union Address, *supra* note 53.

⁵⁶ Pres. Barack Obama, Remarks by the President in State of the Union Address (Jan. 24, 2012), *available at* <http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-union-address>.

⁵⁷ *Id.* (“And nowhere is the promise of innovation greater than in American-made energy.”).

⁵⁸ For a more in-depth discussion of the idea of clean technology, see Neal Dikeman, *What Is Clean Tech?*, CNET NEWS (Aug. 10, 2008), http://news.cnet.com/8301-11128_3-10012950-54.html. The author describes the origin and use of the term “clean tech,” stating “Cleantech, also referred to as clean technology, and often used interchangeably with the term greentech, has emerged as an umbrella term encompassing the investment asset class, technology, and business sectors which include clean energy, environmental, and sustainable or green, products and services.” *Id.*

companies, not only associated with various aspects of renewable energy, but also a broader spectrum of ventures beyond energy.⁵⁹ The term “clean tech” does not focus on a specific technology, but appears to have a theme of improved efficiency in using resources, whether natural or otherwise, with an improvement to the environment, and associated investment in these ventures and an overriding philosophy in the manner of doing business or investing. Yet, as one can see, the definitions commonly found for the term are not in agreement about what is included or excluded from clean tech.

5. Energy Efficiency

The term “energy efficiency” is broad, though not quite as broad as “clean tech.” Generally, it refers to doing more with less energy, and is often used in connection with building construction and energy usage. Energy efficiency covers much more than buildings—it can apply to improvements in vehicles and aspects of industry, from manufacturing to service, in the manner in which a company runs its business.⁶⁰ It can include reductions in usage of resources as well.⁶¹ Generally, it does not refer to the creation of electricity, but rather a reduction in the amount of electricity or other energy consumed. Examples of energy efficiency include improved insulation in walls, buildings and doors, reduction in the use of plastics, reduction in water consumption, improved fuel economy for vehicles, improved ability to recycle used components, and energy star ratings for consumer appliances.⁶² McKinsey & Company concluded in a 2009 report on energy efficiency that if various energy efficiency measures were implemented at scale, they could reduce projected demand by approximately twenty-three percent by 2020, which McKinsey estimated at 9.1 quadrillion BTUs, and

⁵⁹ See, e.g., *Clean Technology Definition*, BUSINESSDICTIONARY.COM, <http://www.businessdictionary.com/definition/clean-technology.html> (last visited Jan. 30, 2013).

⁶⁰ See generally ENVIRONMENTAL PROTECTION AGENCY, ENERGY EFFICIENCY: REDUCE ENERGY BILLS, PROTECT THE ENVIRONMENT, available at http://www.epa.gov/cleanenergy/documents/suca/consumer_fact_sheet.pdf (last visited Jan. 30, 2013).

⁶¹ *Id.*

⁶² The DOE’s Office of Energy Efficiency and Renewable Energy has a broader mission—it “invests in clean energy technologies that strengthen the economy, protect the environment, and reduce dependence on foreign oil.” The resulting scope for this Office covers a number of different areas within the broad context of energy efficiency, from programs for homeowner weatherization assistance to vehicle technologies. See *Energy Efficiency and Renewable Energy*, U.S. DEPT OF ENERGY, <http://www.eere.energy.gov> (last visited Jan. 30, 2013).

abate up to 1.1 gigatons of greenhouse gases annually.⁶³ There has been significant focus on energy efficiency in recent legislation at the federal level as well as at the state and local levels.⁶⁴ Some scholars have provided recommendations for policymakers and practitioners to promote energy efficiency.⁶⁵

II. STATE OF THE RENEWABLE ENERGY ELECTRICAL GENERATION INDUSTRY

As the description of competing terms and areas evidence, REEGI is only a component of the broader REI and clean tech areas. To provide a sense of scale and the issues surrounding why incentives exist, this Part details the status of the REEGI and obstacles this industry faces. As a subset of the broader REI and clean tech, challenges for REEGI naturally reflect challenges for the broader industries as well. If a developer cannot build a profitable generation project, other businesses in the supply chain, such as solar panel manufacturers, are likely unable to operate profitably either.

A. Market Penetration

While the REEGI has significantly increased its market penetration, it remains a small component of our nation's overall energy generation⁶⁶ when compared to the overall electric generation industry.⁶⁷ To offer the reader a sense of how limited renewable energy generation penetration

⁶³ Hannah Choi Granade et al., *Unlocking Energy Efficiency in the US Economy*, MCKINSEY GLOBAL ENERGY AND MATERIALS (2009), at 1, http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy; see also, Energy Info Admin., *Annual Energy Outlook 2011*, ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, at 34 (Apr. 2011), http://www.eia.gov/oiia/aeo/aeoref_tab.html (EIA provides estimates on energy efficiency projected savings in residential and commercial sectors related to changes in appliance standards and building code requirements).

⁶⁴ ELIZABETH DORIS ET AL., NATIONAL RENEWABLE ENERGY LABORATORY, ENERGY EFFICIENCY POLICY IN THE UNITED STATES: OVERVIEW OF TRENDS AT DIFFERENT LEVELS OF GOVERNMENT iii, v (Dec. 2009), available at <http://www.nrel.gov/docs/fy10osti/46532.pdf>.

⁶⁵ See, e.g., John Dernbach et al., *Energy Efficiency and Conservation: New Legal Tools and Opportunities*, 25 NAT. RESOURCES & ENV'T 7 (2011); Sarah Schindler, Encouraging Private Investment in Energy Efficiency (Jan. 2011) (on file with University of Connecticut School of Law, Center for Energy and Environmental Law).

⁶⁶ *LiveChat Thurs, 10/20, 2pm ET: Clean Tech Markets*, ENERGY.GOV (Oct. 17, 2011), <http://energy.gov/articles/livechat-thurs-1020-2pm-et-clean-tech-markets>.

⁶⁷ The industry is comprised of fossil fuel-based generation or "conventional generation," nuclear generation and renewable energy generation.

is in meeting domestic energy usage, consider that in 2009 all renewable energy resources contributed about 10.6 percent of net national energy production.⁶⁸ Of this aggregate production amount, conventional hydroelectric production⁶⁹ represented 3.6 percent, leaving seven percent produced by all other non-fossil fuel or nuclear resources.⁷⁰ Wind power produced nearly 1 percent of total energy output, geothermal power produced 0.5 percent, and solar power produced 0.15 percent.⁷¹ Based on these statistics, renewable electric generation appears to have significant room for development before these resources serve a material percentage of the domestic electric generation. Studies suggest that even a single resource like wind (as opposed to a combination of resources), if developed, could meet significant percentages of electricity requirements for certain regions of the country.⁷²

1. Grid Parity? Not Yet

REEGI faces an uphill battle to replace conventional generation resources. The single largest factor that prevents more rapid implementation of REEGI is that it costs more than conventional generation.⁷³ At present, the REEGI as a whole⁷⁴ is not at “grid parity” with conventional generation.⁷⁵ Grid parity refers to the point at which renewable energy can

⁶⁸ *Annual Energy Review 2009*, *supra* note 50, at 5, Table 1.1, and at 7, Table 1.2 (Aug. 2010).

⁶⁹ See W. MUSIAL, STATUS OF WAVE AND TIDAL POWER TECHNOLOGIES FOR THE UNITED STATES (Aug. 2008), available at <http://www.nrel.gov/docs/fy08osti/43240.pdf>.

⁷⁰ *Id.* The other resources are renewable resources such as wind, petroleum, wood, waste, geothermal, other gases, solar thermal and photovoltaic, as well as miscellaneous technologies and non-renewable resources, such as batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

⁷¹ *Id.*

⁷² Scott Malone, *Study Finds Huge Wind Energy Potential off Eastern U.S.*, REUTERS (Sept. 28, 2010), <http://www.reuters.com/article/2010/09/28/us-usa-energy-wind-idUSTRE68R0HG20100928>.

⁷³ *Renewable Energy, Green Power and RECs*, COMMUNITY ENERGY, <http://www.communityenergyinc.com/education/renewable-energy0> (last visited Jan. 30, 2013).

⁷⁴ REEGI, while a subset of REI, is itself a very broad industry, because a number of different forms of technologies fall under this umbrella—such as wind, solar and hydro power. Within each, there are different technologies for collection and harnessing of the natural resource. The pace of development in these areas, in particular solar, is extremely rapid with very different types of systems being tested and going into commercial production. The differences between these technologies and the policy implications will be addressed in a future article.

⁷⁵ Ben Elliston et al., *Grid Parity: A Potentially Misleading Concept?*, THE 48TH AUSES ANNUAL CONFERENCE, Dec. 1–3, 2010, Canberra, ACT, Australia, at 2.

produce electricity at the same price per unit as conventional generation.⁷⁶ Some sources question the importance of calculating grid parity.⁷⁷ “Grid parity,” like terms describing renewable and clean energy, is vague. However, when considering REEGI is selling power in the wholesale market to utilities (as opposed to direct sales to retail customers), the price of power generally must be at the purchasing utility’s “avoided cost,” which is the incremental cost to an electric utility for electric energy or capacity, or both, which, but for the purchase from the qualifying facility/(ies),⁷⁸ “the utility would have incurred had it supplied the power itself or had it obtained the power from another source.”⁷⁹

2. Technology Barriers: Incumbent Technologies and Stratification of Industries

Other barriers to the growth of REEGI include the relatively high cost of development for renewable energy projects as compared to facilities running on conventional fuel sources. For this Article, the reader should simply be aware that costs to develop and operate renewable energy projects vary depending on the type of renewable resource being harnessed as well as the technology being used to harness the resource.⁸⁰ Projects typically focus on a single resource and single technology to capture that resource.⁸¹ In some instances, however, developers have sought to combine resources where possible to share fixed costs, such as transmission line installation, as well as renewable/conventional generation combinations to assist in making the renewable resource less variable with conventional generation backstops.⁸² Generally, solar energy incurs the highest

⁷⁶ *Id.*

⁷⁷ *See, e.g., id.*

⁷⁸ See 18 C.F.R. § 292.101(b)(1) for a definition of a qualifying facility; *see also* *What Is a Qualifying Facility?*, FEDERAL ENERGY REGULATORY COMMISSION, <http://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp> (last updated Feb. 3, 2012).

⁷⁹ *What Is Avoided Cost?*, ELECTRIC POWER SUPPLY ASSOCIATION, <http://www.epsa.org/industry/faqs/?fa=avoidedCost> (last visited Jan. 30, 2013); *see also* 18 C.F.R. § 292.101(b)(6) for definition of avoided cost.

⁸⁰ *See* RENEWABLE ENERGY POLICY NETWORK, RENEWABLES 2011 GLOBAL STATUS REPORT 33 (2011), *available at* http://www.martinot.info/REN21_GSR2011.pdf.

⁸¹ *See, e.g.,* Press Release, White House Office of the Press Secretary, *We Can’t Wait: Obama Administration Announces Seven Major Renewable Energy Infrastructure Projects that Would Power 1.5 Million Homes to Be Expedited* (Aug. 7, 2012), <http://www.whitehouse.gov/the-press-office/2012/08/07/we-can-t-wait-obama-administration-announces-seven-major-renewable-energ>.

⁸² Some projects have sought to combine a renewable resource with a conventional generation source; *see First Hybrid CSP–Coal Power Plant Is Fired Up in Colorado*, NATIONAL

costs to produce electricity on a per kW installed basis, while wind energy, which is a more developed industry, is the closest to grid parity (excluding conventional hydroelectric power).⁸³

The aggregating of renewable energy by nonparticipants oversimplifies the different issues each industry within the REEGI faces. Take an analogy to transportation. Suppose someone is talking about the "Transportation Industry," the first question the speaker might get is: Transportation of what? If the speaker refines the industry to the transportation of people, the next questions might be: To where? And how? The inquirer might ask whether the speaker means public or private transportation? If public, does he mean transportation by air, water or surface? Within each of these mediums, you have different modalities—commercial air travel, private air travel, by plane or by helicopter, prop or jet. For water, what type of boat or ship and what destination? A traveler might decline to travel by submarine or fishing trawler to get from Miami to the tip of the Florida Keys, if the traveler had an offshore cigarette-style racing yacht or hovercraft in mind. As for surface, riding on a Greyhound bus or Megabus would be different than being chauffeured in a stretch limousine or a sports car. And what of the regulations regarding the operators of these different vehicles let alone the manufacturers of these different vehicles? Depending on the scope and purpose of the discussion surrounding policies and decision-making for the transportation industry, all of these questions and distinctions are potentially relevant.

While the distinctions within REEGI may not be this vast, there are similar distinctions. A dike in the Netherlands built in 1452 is not the same quality as the Three Gorges hydroelectric dam built in China with the largest total installed (production capacity 18,200 MW) in the world, the construction of which required the displacement of over 1.4 million people.⁸⁴ Similarly, a windmill built in the 1700s is vastly different from

RENEWABLE ENERGY LABORATORY (July 23, 2010), <http://www.nrel.gov/technologytransfer/news/2010/870.html>. For a description of Xcel Energy's experimental Solar CSP and coal fired power plant; see also FLORIDA POWER & LIGHT COMPANY, FPL'S MARTIN NEXT GENERATION SOLAR ENERGY CENTER, *available at* <http://www.fpl.com/environment/solar/pdf/Martin.pdf>, for a description of Florida Power & Light's hybrid solar and combined cycle natural gas plant.

⁸³ See Jason Morgan, *Comparing Energy Costs of Nuclear, Coal, Gas, Wind and Solar*, NUCLEAR FISSIONARY (Apr. 2, 2010), <http://nuclearfissionary.com/2010/04/02/comparing-energy-costs-of-nuclear-coal-gas-wind-and-solar/>.

⁸⁴ See CHINESE NATIONAL COMMITTEE ON LARGE DAMS, THREE GORGES PROJECT, *available at* <http://www.chincolld.org.cn/dams/rootfiles/2010/07/20/1279253974143251-1279253974145520.pdf>; *Three Gorges Project*, CHINA THREE GORGES CORPORATION, <http://www.ctg.com.cn/en/index.php> (last visited Jan. 30, 2013) (site of the project's owner, the China Three

the Shepards Flat wind project constructed in 2010 near Arlington, Oregon that is capable of producing 845MW from 338 turbines, and was anticipated to be the largest land-based wind project in the world at the time of its construction.⁸⁵

3. Conventional Generation

As noted, the majority of electrical energy generation is powered by conventional fuels, specifically coal and natural gas.⁸⁶ Coal is a significant source of our nation's energy output, representing 29.57 percent of the nation's primary energy production.⁸⁷ Coal is not a preferred fuel source these days and, indeed, increasing regulations are causing a number of coal-fired power plants to close down due to the cost of compliance.⁸⁸ In July 2011, the EPA issued the Cross-State Air Pollution Rule ("CSAPR"), with a proposed effective date of January 1, 2012.⁸⁹ This proposed rule faced significant resistance. As a consequence of the EPA's plans, a number of companies announced plans to shut down coal-fired power plants, as the cost of compliance was too great.⁹⁰ A number of companies sought to enjoin the EPA

Gorges Corporation, formed by the State Council in Sept. 1993); Peter Ford, *Controversial Three Gorges Dam Has Problems, Admits China*, THE CHRISTIAN SCIENCE MONITOR, May 19, 2011, <http://www.csmonitor.com/World/Asia-Pacific/2011/0519/Controversial-Three-Gorges-dam-has-problems-admits-China>.

⁸⁵ Press Release, U.S. DEP'T OF ENERGY, *DOE LPO Finalizes Deal on the World's Largest Wind Project to Date* (Dec. 17, 2010), <http://lpo.energy.gov/?p=1955>.

⁸⁶ See HESHAM E. SHAALAN, GENERATION OF ELECTRIC POWER Tbl. 8.2 (2003), available at http://energysystems.princeton.edu/EnergyResources/GenerElectPower_Shalaan.pdf.

⁸⁷ See *Annual Energy Review 2009*, *supra* note 50, table 1.2 (noting that coal produced 21.578 quadrillion Btu out of a total of 72.97 quadrillion Btu in 2009).

⁸⁸ See Gabriel Nelson, *AEP Predicts Need to Shutter 25% of Coal Fleet*, N.Y. TIMES (June 9, 2011), <http://www.nytimes.com/gwire/2011/06/09/09greenwire-aep-predicts-need-to-shutter-25-of-coal-fleet-91911.html> (last visited Jan. 30, 2013). The EPA issued the Cross-State Air Pollution Rule ("CSAPR") in July 2011, which was scheduled to go into effect January 1, 2012. CSAPR required significant reductions in SO₂ and NO_x emissions. The coal electrical generation industry vehemently opposed CSAPR, citing its abrupt emissions requirements and suggested it was impractical to implement in the time provided. As a result, a significant number of coal-fired power plants shut down in 2011 in anticipation of CSAPR. The EPA eventually changed its position on the effectiveness of CSAPR, but this did little to address the shutdown and economic impact of the regulation. See also Dan Testa, *Citing CSAPR, Ameren to Shutter 2 Ill. Coal-Fired Plants*, SNL FINANCIAL (Oct. 4, 2011, 12:22 PM), <http://www.snl.com/InteractiveX/ArticleAbstract.aspx?id=13391363>.

⁸⁹ See EPA Releases Final Interstate Transport Rule, "Cross-State Air Pollution Rule," GEORGETOWN CLIMATE CENTER (July 7, 2011), <http://www.georgetownclimate.org/epa-releases-final-interstate-transport-rule-cross-state-air-pollution-rule>.

⁹⁰ See Dan Lowrey, *Luminant Files Notice with ERCOT to Idle Coal Units*, SNL

from moving forward.⁹¹ Ultimately, the EPA suspended its plans to implement CSAPR at the beginning of the year, but a significant number of plants had already closed by the time the EPA reversed course.⁹²

In addition to coal, a number of power plants are fired by natural gas. Pure natural gas (excluding liquid propane fired plants) generated virtually the same amount of energy as coal at 29.46 percent in 2009.⁹³ All fossil fuels—coal, natural gas, crude oil, and liquid propane—generated 77.92 percent of total energy production in 2009.⁹⁴

Natural gas may be having an independent renaissance that impacts the REEGI. Techniques for extracting natural gas from shale rock formations have advanced very rapidly through hydraulic fracturing techniques.⁹⁵ As the supply of natural gas has expanded, the price of natural gas has dropped precipitously.⁹⁶ This has had a negative impact on the REEGI, because there is less incentive for private companies to develop renewable energy technology with cheap, clean gas at the ready.⁹⁷ The

FINANCIAL (Oct. 4, 2011), <http://www.snl.com/InteractiveX/article.aspx?ID=13391203&CDID=A-13391203-14895&KPLT=4&Printable=1>.

⁹¹ Gabriel Nelson, *Lawsuits Pour in Before Deadline to Challenge EPA's Cross-State Air Pollution Rule*, N.Y. TIMES (Oct. 10, 2011), <http://www.nytimes.com/gwire/2011/10/10/10greenwire-lawsuits-pour-in-before-deadline-to-challenge-67959.html>.

⁹² See Kathleen Hart, *EPA to Miss Deadline for Power Plant Greenhouse Gas Emissions Rule*, SNL FINANCIAL (Sept. 15, 2011), <http://www2.snl.com/InteractiveX/article.aspx?ID=13312568&CDID=A-13312568-13103&KPLT=1&Printable=1>.

⁹³ See ANNUAL ENERGY REVIEW 2009, *supra* note 50, table 1.2 (noting that dry natural gas power plants generated 21.5 quadrillion BTU out of a total of 72.97 quadrillion BTU in 2009).

⁹⁴ See *id.* (noting that all fossil fuels generated 56.86 quadrillion BTU out of a total of 72.97 BTU in 2009).

⁹⁵ *But see* Tennille Tracy, *Whack to Estimate for Natural Gas*, WALL ST. J., Jan. 24, 2012, <http://online.wsj.com/article/SB10001424052970203806504577178892190235190.html> (reporting that the forthcoming Energy Information Administration 2012 annual report reduced estimates of shale gas in the United States from 830 trillion cubic feet to 480 trillion cubic feet. While shale gas reserves are smaller than previously projected, far greater amounts of shale gas are extractable now than several years ago due to improvements in technology).

⁹⁶ See Dan Strumpf et al., *Natural Gas Sinks Beneath \$2 Level*, WALL ST. J., Apr. 11, 2012, <http://online.wsj.com/article/SB10001424052702304356604577337883568116636.html>.

⁹⁷ See Matthew L. Wald & Tom Zeller, Jr., *Cost of Tapping Green Power Makes Projects Tougher Sell*, N.Y. TIMES, Nov. 8, 2010, at A1, A16 (describing the challenges facing wind and solar developers in competing on price for utility contracts and describing actions by state regulators in the public service commissions of Virginia, Idaho, Kentucky and Rhode Island to reject renewable energy deals on the basis of price); see also Russell Gold, *Wind, Sun Power Still Face Hurdles*, WALL ST. J., Mar. 31, 2011, <http://online.wsj.com/article/SB10001424052748703883504576186961618483344.html> (describing challenges for renewable energy including higher pricing for renewable energy, low natural gas prices as a result of shale rock drilling, and variable transmission challenges the technology presents).

attractive pricing for conventional generation, given the abundance of natural gas, provides significant market challenges to the REEGI to operate and grow.

B. 2011—Year of Disaster and Debt Ceiling Turmoil

Much has changed since President Obama's January 2011 State of the Union address. In January 2011 many in the clean energy industry widely anticipated a nuclear renaissance given the Obama Administration's support for new nuclear generation power facilities.⁹⁸ This renaissance fizzled through events, including the glut of natural gas resulting in exceptionally low natural gas prices and heightened nuclear safety concerns following the Fukushima Dai-Ichi incident after the Tohoku earthquake.⁹⁹ This changing environment dramatically shifted the focus of the Obama Administration's energy policy efforts.¹⁰⁰

After Fukushima, President Obama unveiled his energy plan.¹⁰¹ The plan proposed multiple initiatives to reduce dependence on foreign oil by reducing oil imports by one third by 2025, expanding oil production, and increasing the use of natural gas and ethanol in vehicles.¹⁰² The plan also called for clean and renewable energy incentives to support further investment and innovation in clean energy.¹⁰³ It included a clean energy standard goal requiring that eighty percent of electricity come from clean-energy sources by 2035.¹⁰⁴ Energy Secretary Chu made the case for the

These articles noted the challenges facing the REEGI even before the most recent glut in natural gas. As of the beginning of April 2012, prices for natural gas fell to their lowest level in more than a decade, with excess capacity facing the natural gas industry. *See* Strumpf, *supra* note 96 (price of natural gas fell below \$2 per 1000 cubic feet for the first time since January 28, 2002; glut of natural gas is causing some companies to slow production; concerns exist about lack of storage for natural gas).

⁹⁸ 2011 State of the Union Address, *supra* note 53.

⁹⁹ John Broder, *An Energy Plan Derailed by Events Is Being Retooled*, N.Y. TIMES, Mar. 31, 2011, at F7. I will not focus on nuclear energy in this article, except to note that the loan guarantee model applied to nuclear energy faces significant challenges, given the borrower pays for the CSC under the 1703 Program, which puts significant cost pressure on applicants, as described. *See infra* note 148.

¹⁰⁰ Broder, *supra* note 99, at F7.

¹⁰¹ *See* EXEC. OFFICE OF THE PRESIDENT, BLUEPRINT FOR A SECURE ENERGY FUTURE (2011), available at http://www.whitehouse.gov/sites/default/files/blueprint_secure_energy_future.pdf; *see also* Jackie Calmes & John M. Broder, *Obama Sets Goal of One-Third Cut in Oil Imports*, N.Y. TIMES, Mar. 30, 2011, <http://www.nytimes.com/2011/03/31/science/earth/31energy.html>.

¹⁰² BLUEPRINT, *supra* note 101, at 20.

¹⁰³ *See* BLUEPRINT, *supra* note 101, at 15–18.

¹⁰⁴ *See* Laura Meckler, *Obama Outlines Energy Plan*, WALL ST. J., Mar. 31, 2011, <http://online.wsj.com/article/SB10001424052748703712504576232481675369892.html>.

President's plan in testimony before the House Energy and Commerce Committee, noting in particular that the Department was not taking a "kitchen sink" approach, rather the budget represented work that was "being coordinated and prioritized, with a 360-degree view of how the pieces fit together."¹⁰⁵

The energy plan was not accepted by Congress. During the spring and summer of 2011, Congress and the administration struggled over various budget matters and deficit reduction matters, marked by a divisive fight over the U.S. debt ceiling, running down to the wire and downgrading of U.S. sovereign debt. Even Congress's proposed budget cuts for deficit reduction through the Congressional Supercommittee failed when the committee remained deadlocked until its deadline in November 2011. In this contentious environment, the REI faced significant regulatory uncertainty with various government incentives expiring in the fall and winter of 2011. In the midst of this, Solyndra filed for bankruptcy in September 2011, adding an additional accelerant to the already heated debates about government support for the REI.¹⁰⁶

III. DOE LOAN GUARANTEE PROGRAMS

A. *Loan Guarantees Generally*

A federal loan guarantee operates in the same manner as a private loan guarantee—the guarantor provides a promise to repay a loan by the borrower, in the event that the borrower is unable to pay. This encourages the lender to make the loan in question. The general purpose of a loan guarantee is to encourage lending and associated investment that would not otherwise occur absent the loan guarantee.

Take this simple example. Suppose a student wants to buy a new car and wants to get financing through the dealership.¹⁰⁷ Unfortunately,

¹⁰⁵ *The FY2012 Department of Energy and Nuclear Regulatory Commission Budgets: Joint Hearing Before the Subcomm. on Energy and Power and the Subcomm. on Environment and the Economy of the H. Energy and Commerce Comm.*, 112th Cong. 4 (2011) (statement of Steven Chu, Secretary, U.S. Dep't of Energy), available at <http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg68480/pdf/CHRG-112hhrg68480.pdf>.

¹⁰⁶ Scott McGrew, *Solyndra to Declare Bankruptcy*, NBC BAY AREA (Sept. 2, 2011), <http://www.nbcbayarea.com/news/local/Solyndra-Shutting-Down-128802718.html>.

¹⁰⁷ Car dealerships generally offer customers a variety of financing options, ranging on the high quality end directly from the car manufacturer through their financing division, to other financial institutions willing to make loans to less credit-worthy borrowers. *E.g.*, Lee Ann Obringer, *How Car Financing Works*, HOW STUFF WORKS, <http://auto.howstuffworks.com/buying-selling/car-financing3.htm> (last visited Jan. 30, 2013).

as a student, she does not have sufficient credit history or a stable enough income to qualify for a loan with a low interest rate. Rather than turn away a disappointed customer, the lender can seek to mitigate its risk by asking the borrower to have someone else with better credit history and qualifications to guarantee her obligations on her car loan, such as a responsible parent. What is the parent's liability? Assume the parent is a traditional payment guarantor (rather than a demand guarantor);¹⁰⁸ the parent will be jointly and severally liable with the student for all of the obligations on the loan.¹⁰⁹ At the outset of the loan, the parent will have a contingent liability for the full value of the loan. If the student pays the loan, the parent's liability gradually decreases, until the loan is fully repaid. If the student fails to make a payment, the lender may then demand that the parent make that payment. If the student defaults on the loan, the lender can exercise its rights under the guarantee and the parent must pay the full value of the loan.¹¹⁰ Once the parent pays under the guarantee, the parent will be subrogated to the rights of the lender and will have all the rights of the lender against the borrower, the student.¹¹¹

The benefit of a guarantee is that it permits borrowers to not only obtain financing, but to do so at a rate the borrower would not otherwise be able to obtain. Beyond this simple example, loan guarantees are used by lenders in traditional financing structures, including limited recourse project financings often used to develop energy projects, improving credit profiles of transactions, or mitigating specific risks.¹¹² For example, project financings for infrastructure projects often require credit-worthy sponsors to provide limited recourse guarantees for specific purposes, such as funding specific construction, providing capital reserves for projects, etc. When sponsors provide these guarantees, they are able to reduce the financing

¹⁰⁸ Compare Guarantee, *Trade Finance Glossary, Defining Trade Finance*, DLA PIPER, <http://www.dlapipertradefinance.com/en/glossary/g/guarantee.html> (last visited Jan. 30, 2013), with Demand Guarantee, *Trade Finance Glossary, Defining Trade Finance*, DLA PIPER, <http://www.dlapipertradefinance.com/en/glossary/d/demand--guarantee.html> (last visited Jan. 30, 2013).

¹⁰⁹ Guarantee, *Trade Finance Glossary, Defining Trade Finance*, DLA PIPER, <http://www.dlapipertradefinance.com/en/glossary/g/guarantee.html> (last visited Jan. 30, 2013).

¹¹⁰ See *id.*

¹¹¹ Carl D. Ciochon, *Guarantor Liability—A Litigation Perspective*, WENDEL ROSEN BLACK & DEAN, <http://www.wendel.com/index.cfm?fuseaction=content.contentDetail&ID=9018>.

¹¹² See, e.g., PHILLIP BROWN, CONG. RESEARCH SERV., LOAN GUARANTEES FOR CLEAN ENERGY TECHNOLOGIES: GOALS, CONCERNS, AND POLICY OPTIONS 1–9 (2012), available at <http://www.fas.org/sgp/crs/misc/R42152.pdf>; U.S. DEPT OF AGRICULTURE, REAP GUARANTEED LOAN PROGRAM (2012), available at http://www.rurdev.usda.gov/SupportDocuments/OR-bpREAP_GLoverview.pdf.

costs for the borrower, thus leveraging capital more efficiently. Federal loan guarantees operate the same way.

B. DOE Loan Guarantee Program

Federal loan guarantees involve a federal agency or another federally run program providing a guarantee backed by the full faith and credit of the United States of a loan to a private borrower.¹¹³ The purpose of this type of federal credit program is to attract private investment to a specific area or to facilitate a specific activity. The Loan Guarantee Program Office's description of its various programs sets forth the eligibility requirements for each loan guarantee program.¹¹⁴ The effect of the federal guarantee is to lower the borrower's cost of borrowing, because the improved likelihood of repayment to creditors improves the borrower's credit profile to prospective lenders. Like a private guarantor, if the borrower defaults, then the federal government steps in and makes loan payments on behalf of the borrower. The government, as guarantor, then has a right of subrogation against the borrower after demand is made on the guarantee by the lender.¹¹⁵ As in the private market, the guarantor charges the borrower a

¹¹³ Federal Credit Reform Act of 1990, 2 U.S.C. §§ 661–661(f) (Supp. IV 2010) (providing a statutory definition—“The term ‘loan guarantee’ means any guarantee, insurance, or other pledge with respect to the payment of all or a part of the principal or interest on any debt obligation of a non-Federal borrower to a non-Federal lender, but does not include the insurance of deposits, shares, or other withdrawable accounts in financial institutions.”); *see generally* 2 U.S. GOV'T ACCOUNTABILITY OFFICE, PRINCIPLES OF FEDERAL APPROPRIATIONS LAW 11-1 to 11-73 (3rd ed. 2006) [hereinafter Principles of Appropriations Law], available at <http://www.gao.gov/special.pubs/d06382sp.pdf>.

¹¹⁴ *See Eligibility, Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=31 (last visited Jan. 30, 2013). The DOE Loan Programs Office defines loan guarantee as “a contractual obligation between the government, private creditors and a borrower—such as banks and other commercial loan institutions—that the Federal Government will cover the borrower's debt obligation in the event the borrower defaults” *See Department of Energy Finalizes \$169 Million Loan Guarantee to Granite Reliable Power: A Wind Powering America Success Story*, *Wind Research*, NATIONAL RENEWABLE ENERGY LABORATORY (Oct. 25, 2011), <http://www.nrel.gov/wind/news/2011/1634.html>. The Loan Program also “allow[s] the government to share some of the financial risks of projects that employ new technologies that are not yet supported in the commercial marketplace or where private investment has been inhibited.” *See GREAT LAKES WIND COLLABORATIVE, FINANCING MECHANISMS AND FINANCIAL INCENTIVES, BEST PRACTICES FOR SUSTAINABLE WIND ENERGY DEVELOPMENT IN THE GREAT LAKES REGION* (July 2011), available at <http://www.glc.org/energy/wind/pdf/bptoolkit/GLWC-BPToolkit-BP02.pdf>.

¹¹⁵ *See* 10 C.F.R. § 609.15(g) (providing that “The Loan Agreement shall provide that, upon payment of the Guaranteed Obligations, the Secretary shall be subrogated to the rights of

fee for this credit support. However, unlike the private market, the cost of a federal guarantee may not directly correlate to the risk profile of the debtor. Thus, the incentive element of the government's involvement is to stimulate a sector of the economy that would not have access to credit markets at reasonable rates of interest. Loan guarantees are often viewed as a cost-effective government incentive, as they provide contingent support to areas where the government seeks to stimulate private investment and the loan guarantees are often structured to be self-financed.¹¹⁶

1. Authorizing Legislation

The latest version¹¹⁷ of loan guarantees managed by the DOE was initially authorized by Congress under Title XVII of The Energy Policy Act of 2005 ("EPAAct 2005").¹¹⁸ EPAAct 2005 required the DOE to solicit proposals from a wide variety of eligible renewable energy and clean technologies to support their development through federal loan guarantees. The scope and array of renewable and clean energy technologies the DOE was tasked with advancing through the loan guarantee programs was very broad, perhaps too broad.¹¹⁹ This Article focuses on the two principal loan

the Holders The Holder shall transfer and assign to the Secretary all rights held by the Holder of the Guarantee Obligation. Such assignment shall include all related liens, security and collateral rights to the extent held by the Holder.").

¹¹⁶ OFFICE OF MGMT. & BUDGET (OMB), EXEC. OFFICE OF THE PRESIDENT, CIRC. A-129, POLICIES FOR FEDERAL CREDIT PROGRAMS AND NON-TAX RECEIVABLES, PART II—BUDGET AND LEGISLATIVE POLICY FOR CREDIT PROGRAMS (2000) [hereinafter CIRC. A-129], available at http://www.whitehouse.gov/omb/circulars_a129_rev2013_main (identifying goals for federal credit programs: "(1)(a) Correct a capital market imperfection, which should be defined; and/or (b) Subsidize borrowers or other beneficiaries, who should be identified, or encourage certain activities, which should be specified.").

¹¹⁷ DOE has previously administered loan guarantee programs. See John Herrick, *Federal Financing of Green Energy: Developing Green Industry in a Changing Energy Marketplace*, 31 PUB. CONT. L.J. 257, 258–61 (Winter 2002). The article describes the DOE loan guarantee programs authorized in the late 1970s and early 1980s to promote development of synthetic fuels, alcohol fuels, and geothermal energy projects. As Herrick details, these programs had mixed success. In somewhat similar circumstances, the incentives provided were not properly matched to commercial market conditions, or market conditions shifted to make projects no longer economically viable. *Id.* These programs were all implemented prior to the Credit Reform Act so these projects did not have to comply with the Credit Reform Act reporting requirements. See *supra* note 113.

¹¹⁸ Energy Policy Act of 2005, Pub. L. No. 109-58 § 1701 (2005) (codified at 42 U.S.C. § 16511) [hereinafter EPAAct 2005].

¹¹⁹ *Id.* § 1703, 42 U.S.C. § 16513 (Supp. IV 2010). The Energy Policy Act of 2005 provided that loan guarantees would be offered for ten different categories of technologies: (1) Renewable

guarantee programs administered by the DOE, the Section 1703 Program¹²⁰ and the Section 1705 Program.¹²¹ This Article also discusses the Advanced Technology Vehicle Manufacturers Loan Program briefly, as this program has been lumped together with the 1703 and 1705 programs by supporters and detractors alike.¹²²

2. Funding

The authorizing legislation to establish the DOE LGP was first passed in 2005; however, because of a lack of funding, establishing the LGP Office was a slow process.¹²³ Neither the program nor the to-be-formed office received appropriations under EPAct 2005.¹²⁴ In 2007, Congress provided appropriations for issuing guarantees as well as for administrative expenses to staff the LGP Office.¹²⁵ In 2008, as part of the federal response to the Great Recession,¹²⁶ Congress passed the Emergency Economic Stabilization Act of 2008 (“EESA”).¹²⁷ Better known for the Troubled Assets Relief Program (“TARP”),¹²⁸ the EESA also included a number of provisions

energy systems, (2) Advanced fossil energy technologies, (3) Hydrogen fuel cell technologies, (4) Advanced nuclear energy facilities, (5) Carbon capture and sequestration practices and technologies, (6) Efficient electrical generation, transmission, and distribution technologies, (7) Efficient end-use energy technologies, (8) Production facilities for fuel efficient vehicles, (9) Pollution control equipment, and (10) Refineries.

¹²⁰ See *id.* (noting the creation of the 1703 Program under Title XVII of EPAct 2005).

¹²¹ American Recovery and Reinvestment Act of 2009 § 406, 42 U.S.C. § 16516 (Supp. IV 2010) (establishing Section 1705, entitled “Temporary Program for Rapid Deployment Of Renewable Energy and Electric Power Transmission Projects”).

¹²² Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 136, 121 Stat. 1492 (2007).

¹²³ See *History, Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=134 (last visited Jan. 30, 2013).

¹²⁴ *Id.*

¹²⁵ Consolidated Appropriations Act of 2008, Pub. L. No. 110-161, 121 Stat. 1844, 1621 (2008) (authorizing the LGP Office to issue loan guarantees funded by applicant fees under § 1702(b)(2) of EPAct 2005 and providing \$5.5 million to fund administrative expenses for the office); see also U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-08-750, DEP'T OF ENERGY NEW LOAN GUAR. PROGRAM SHOULD COMPLETE ACTIVITIES NECESSARY FOR EFFECTIVE AND ACCOUNTABLE PROGRAM MGMT. (2008) [hereinafter GAO RECOMMENDATIONS] (describing initial authorization and subsequent initial appropriation for LGP).

¹²⁶ David Wessel, *A Big, Bad . . . 'Great' Recession*, WALL ST. J., Apr. 8, 2010, at A2.

¹²⁷ Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, 122 Stat. 3765 (2008).

¹²⁸ See *id.* at Title I (TARP provided significant support for banks and financial institutions, including AIG, as well as General Motors and Chrysler).

focused on the REI, including appropriations for the 1703 Program.¹²⁹ Within months of passing the landmark EESA legislation, which initially authorized \$700 billion in spending according to the CBO,¹³⁰ Congress passed the American Recovery and Reinvestment Act of 2009 (“ARRA”) with an even more ambitious projected cost of \$787 billion.¹³¹ Title IV of the ARRA authorized the 1705 Program.¹³² Both the EESA and ARRA were enormous pieces of legislation designed to stabilize the U.S. economy and jump start the country out of recession by improving confidence and liquidity and stimulating job creation. Both pieces of legislation included significant provisions aimed at the REI and clean tech industries.¹³³

The Energy Independence and Security Act of 2007 separately created and provided appropriations for the DOE for the Advanced Technology Vehicle Manufacturing Program (“ATVM Program”),¹³⁴ which provides direct loans for advanced technology vehicle manufacturers.¹³⁵ The ATVM Program is not a loan guarantee program. It will be briefly described here because the LGP Office administers this program in addition to the 1703 and 1705 Programs, and because the ATVM Program is often considered in tandem with the loan guarantee programs.¹³⁶

With the additional resources allocated in 2009, the staff of the LGP Office grew dramatically in size to handle processing existing and

¹²⁹ See *id.* Division B of EESA is titled Energy Improvement Act and deals with energy production incentives.

¹³⁰ See CONG. BUDGET OFFICE (CBO), REPORT ON THE TROUBLED ASSET RELIEF PROGRAM—DECEMBER 2011 Table 3 (2011), available at <http://www.cbo.gov/publication/42688>.

¹³¹ The American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009). This Act is often referred to as the Recovery Act and was enacted into law on February 17, 2009. The net effect of the Act has been tracked by the government. See RECOVERY.GOV, <http://www.recovery.gov/Pages/default.aspx> (last visited Jan. 30, 2013); see also CBO, ESTIMATED IMPACT OF THE AMERICAN RECOVERY AND REINVESTMENT ACT ON EMPLOYMENT AND ECONOMIC OUTPUT FROM OCTOBER 2011 THROUGH DECEMBER 2011 (2012), available at <http://www.cbo.gov/sites/default/files/cbofiles/attachments/02-22-ARRA.pdf> (adjusting the total fiscal impact of ARRA from \$787 billion to \$831 billion for the 2009–2019 period).

¹³² American Recovery and Reinvestment Act of 2009 (ARRA), § 406, 42 U.S.C. § 16516 (Supp. IV 2010).

¹³³ The EESA and ARRA also made significant changes to existing REI incentives and created new incentives for the REI. See Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, § 101 et seq., 122 Stat. 3765 (2008); see also American Recovery and Reinvestment Act of 2009, § 406, 42 U.S.C. § 16516 (Supp. IV 2010). EESA and also ARRA included funding for the ATVM Program, administered by the LGP Office.

¹³⁴ Energy Independence and Security Act of 2007, § 136, 42 U.S.C. § 17013 (Supp. IV 2010).

¹³⁵ See *infra* Part III.B.3.c (describing ATVM Program).

¹³⁶ See *supra* note 122 and accompanying text.

new loan applications. The DOE issued solicitations from time to time seeking applicants for loan guarantees. The solicitations ranged from broad requests covering all eligible technologies to very specific applications seeking to develop a niche area.¹³⁷

Since the legislation in 2008 and 2009, no additional funds have been appropriated for Title XVII, despite the Obama Administration's efforts to obtain additional appropriations in the 2011 fiscal year and 2012 fiscal year budgets.¹³⁸ In March and April 2011, a number of critics sought to defund the LGP Office and Title XVII altogether as evidenced by the budget plan introduced by the House of Representatives.¹³⁹ Nevertheless, the administration sought additional funding even in the summer of 2011 for both the 1703 and the 1705 Programs.¹⁴⁰

The funding for the 1705 Program was provided under the ARRA sunset on September 30, 2011. The DOE was able to issue loan guarantee commitments for approximately \$10.5 billion in projects in August and September 2011.¹⁴¹ As with many other industries in the private sector, the REEGI and the broader REI remained on the sidelines waiting for Congress and the White House to act. Uncertainty regarding budget

¹³⁷ See Appendix (detailing various solicitations issued by DOE for funding under the 1703, 1705, and ATVM Programs).

¹³⁸ For resolutions authorizing appropriations for the 1703 and 1705 Programs, see Revised Continuing Appropriations Resolution, 2007, Pub. L. No. 110-5, § 20320, 121 Stat. 8, 21 (authorizing \$4 billion in loan guarantees to be issued, with fees to be paid by the applicant); see also American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, T.IV, 123 Stat. 115, 140 (reserving approximately \$25 million for administrative expenses and appropriating the balance of the \$6 billion for loan guarantees made under the 1705 program); Consumer Assistance to Recycle and Save Program, Pub. L. No. 111-47, 123 Stat. 1972 (2009) (redirecting \$2 billion to the program popularly known as CARS. Congress redirected \$2 billion from the \$6 billion given to funding loans by ARRA); Education Jobs Fund; State Fiscal Relief, Pub. L. No. 111-226, § 308, 124 Stat. 2389 (2010) (rescinding an additional \$1.5 billion from the original \$6 billion in order to fund other initiatives, such as education).

¹³⁹ 110 H.R. 1, 112th Cong. § 1425 (2011) (aimed to reduce LGP for innovative technologies by \$25 billion); see also Naureen S. Malik & Cassandra Sweet, *Proposal Aims to Gut DOE Loan Program*, WALL ST. J., Mar. 30, 2011, <http://online.wsj.com/article/SB10001424052748703806304576232712438183564.html> (describing a Republican House Budget proposal seeking to cut the \$41 billion loan guarantee program included in the President's FY2012 budget).

¹⁴⁰ *Examination of DOE's Clean Technology Programs: Hearing Before the Subcomm. on Energy and Environment of the H. Comm. on Sci., Space, and Tech.*, 112th Cong. 1, 1-7 (2011) (statement of David Frantz, Director of the DOE Loan Programs Office), available at science.house.gov/sites/republicans.science.house.gov/files/documents/hearings/061511-Frantz.pdf.

¹⁴¹ *Our Projects*, LOAN PROGRAMS OFFICE, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013).

cuts caused many businesses to place further investments of capital on hold pending action by the Congressional Supercommittee.¹⁴² When the Congressional Supercommittee admitted failure in November 2011,¹⁴³ market uncertainty increased. During this period of legislative and regulatory uncertainty, neither the REI nor the REEGI have received additional government support, especially since the negative attention Solyndra attracted.

In addition to the lack of funding and the limited time the DOE had to implement the LGP, the DOE's funding suffered from the same legislative impediment as its authorizing legislation and mission: Congress was either too specific¹⁴⁴ or too broad.¹⁴⁵ Neither spectrum offered the DOE a proper roadmap to implement the DOE LGP in a productive manner.

3. The 1703, 1705, and ATVM Programs

The LGP Office administers three programs: the 1703 Program, the 1705 Program, and the direct loan ATVM Program. While the LGP Office administers the ATVM Program, it will be discussed later. Projects that were eligible to receive loan guarantees under the 1703 or 1705 Programs had to fall into two general categories. The project either had to employ an innovative or significantly improved technology,¹⁴⁶ or it had to employ

¹⁴² As a compromise to increase the federal debt ceiling during a tumultuous negotiation between Congress and the White House before an August 2, 2011, deadline to extend the federal debt crisis, a bipartisan Congressional Supercommittee was formed which had the stated goal to identify \$1.5 trillion in budget cuts over a ten year period. See David Wessel, *Can the Super Committee Raise Taxes or Not?*, WALL ST. J. BLOGS (Aug. 3, 2011, 2:23 PM), <http://blogs.wsj.com/washwire/2011/08/03/can-the-super-committee-raise-taxes-or-not/>.

¹⁴³ Janet Hook & Naftali Bendavid, *Deficit Panel Folds Its Tent*, WALL ST. J., Nov. 22, 2011, <http://online.wsj.com/article/SB10001424052970204443404577052311834234128.html>.

¹⁴⁴ See, e.g., CBO, FEDERAL LOAN GUARANTEES FOR THE CONSTRUCTION OF NUCLEAR POWER PLANTS 4 (2011), available at <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/122xx/doc12238/08-03-nuclearloans.pdf> (providing funding for a single technology: front-end nuclear facilities).

¹⁴⁵ See Energy Policy Act of 2005, § 1703(b), 42 U.S.C. § 16513(b) (Supp. II 2008) (listing a multiple clean and renewable energy technologies to be supported by loan guarantees with no funding guidance from Congress. DOE issued solicitations that were exceptionally broad in terms of eligible technologies, given the lack of guidance from Congress on funding specific technologies).

¹⁴⁶ See 10 C.F.R. § 609.2 (2012) (defining "New or Significantly Improved Technology" as "a technology concerned with the production, consumption or transportation of energy and that is not a Commercial Technology, and that has either: (1) [o]nly recently been developed, discovered or learned; or (2) [i]nvolves or constitutes one or more meaningful and important improvements in productivity or value, in comparison to Commercial Technologies in use in the United States at the time the Term Sheet is issued.") Note that this is further refined by looking at the definition of Commercial Technology; see *infra* note 147.

a commercial technology project.¹⁴⁷ The type of technology a project employed in both categories was measured at the time of the loan guarantee application. New technology projects could have applied under either the 1703 Program or the 1705 Program. Commercial technology projects were limited to the 1705 Program. Each of the 1703 and 1705 Programs had specific eligible technologies in their authorizing language.

Another significant difference between the 1703 Program and the 1705 Program was whether the applicant had to pay cost of a loan guarantee, called the credit subsidy cost (“CSC”), as calculated by OMB or whether Congressional appropriations were available to fund the applicant’s CSC.¹⁴⁸

a. The 1703 Program

The 1703 Program, initially authorized under EPOA 2005, was created to provide loan guarantees to a broad range of technologies.¹⁴⁹ Applicants had to demonstrate that their projects would meet two principal characteristics, to (1) “avoid, reduce or sequester air pollutants or anthropogenic emissions of greenhouse gases and (2) employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued.”¹⁵⁰ The intent of this innovative technologies program was to assist cutting edge clean and green technologies to bridge the gap from start-up funding to full commercialization.¹⁵¹ The 1703 Program further

¹⁴⁷ See *id.* (defining “Commercial Technology” as “a technology in general use in the commercial marketplace in the United States at the time the Term Sheet is issued by DOE. A technology is in general use if it has been installed in and is being used in three or more commercial projects in the United States in the same general application as in the proposed project, and has been in operation in each such commercial project for a period of at least five years. The five-year period shall be measured, for each project, starting on the in service date of the project or facility employing that particular technology. For purpose of this section, commercial projects include projects that have been the recipients of a loan guarantee from DOE under this part.”).

¹⁴⁸ Credit Subsidy Cost is abbreviated as “CSC” in this Article. See *Glossary of Terms, Loan Programs Office*, U.S. DEP’T OF ENERGY, https://lpo.energy.gov/?page_id=64 (last visited Jan. 30, 2013). See also *infra* note 200 for an explanation of how OMB calculates the CSC. In short, the CSC is either paid by the applicant or is paid by appropriations for the CSC specifically authorized by Congress. When the applicant pays, for example under Section 1703, it is often referred to as the “Borrower Pays” option.

¹⁴⁹ 42 U.S.C. § 16513(b) (Supp. IV 2010) (outlining ten specific technologies).

¹⁵⁰ *Id.* at 16513(a).

¹⁵¹ See BLOOMBERG NEW ENERGY FINANCE, CROSSING THE VALLEY OF DEATH: SOLUTIONS TO THE NEXT GENERATION CLEAN ENERGY PROJECT FINANCING GAP, June 21, 2010, at 5

provided that projects must demonstrate a reasonable prospect of repayment of the loan.¹⁵²

Notwithstanding the initial creation of the DOE LGP under EAct 2005, the Act did not provide any appropriations authority for the program, nor were any funds available to perform administrative functions to create the DOE LGP.¹⁵³ Congress did not appropriate funding for Title XVII until mid-2007.¹⁵⁴ During this interim period, the DOE temporarily reassigned staff to build the LGP Office and take steps necessary to promulgate regulations and create procedures to run the LGP office.¹⁵⁵ However, the lack of funding hampered the DOE's efforts to build up the office and take various steps to implement legislation, including setting up procedures and risk controls, promulgating regulations, and hiring staff. The LGP Office did not issue final regulations for the 1703 Program until October 23, 2007.¹⁵⁶ It was generally understood that during the Bush Administration, establishment and staffing of the LGP Office were not a high priority.¹⁵⁷

(“Moving a technology from the research to the commercial phase is an arduous task, usually requiring it to proceed through the so-called Commercialisation ‘Valley of Death.’”); *see also id.* at 6 (“Project finance funders and bank lenders typically have high levels of capital and can commit to longer-term investments, but they have little or no technology risk tolerance. *No existing class of financing institutions is effectively positioned to address this particular risk/return category.*” (emphasis in original)).

¹⁵² 42 U.S.C. § 16512(d)(1) (2006).

¹⁵³ *See* Allison S. Clements & Douglass D. Sims, *A Clean Energy Deployment Administration: The Right Policy for Emerging Renewable Technologies*, 31 ENERGY L. J. 397, 422–23 (2010) (describing the initial funding issues faced by DOE to create the LGP); *see also* GOV'T ACCOUNTABILITY OFFICE, GAO-07-339R, THE DEPARTMENT OF ENERGY: KEY STEPS NEEDED TO HELP ENSURE THE SUCCESS OF THE NEW LOAN GUARANTEE PROGRAM FOR INNOVATIVE TECHNOLOGIES BY BETTER MANAGING ITS FINANCIAL RISK (2007) [hereinafter KEY STEPS NEEDED], *available at* <http://www.gao.gov/products/GAO-07-339R> (describing DOE's actions to implement the LGP and the intra-agency funding transfers DOE used to create minimal staffing); *see also* U.S. GOV'T ACCOUNTABILITY OFFICE, B-308715, DEPARTMENT OF ENERGY—TITLE XVII LOAN GUARANTEE PROGRAM (2007) (concluding that DOE violated its statutory authority by using appropriated funds to set up the LGP without appropriations authority for the LGP).

¹⁵⁴ *See* EAct 2005, § 406, 42 U.S.C. 16515 (Supp. IV 2010). Congress appropriated funds to establish the program, but did not permit more than \$4 billion in loan guarantees to be issued and required these guarantees had to be self-financed. *See also supra* notes 125, 138.

¹⁵⁵ *See* KEY STEPS NEEDED, *supra* note 153.

¹⁵⁶ Loan Guarantees for Projects That Employ Innovative Technologies, 72 Fed. Reg. 60,116 (Oct. 23, 2007) (to be codified at 10 C.F.R. pt. 609). Note that this final rule was subsequently amended on Dec. 4, 2009, to enable the DOE LGP to have requirements consistent with commercial market practice.

¹⁵⁷ *See* Clements & Sims, *supra* note 153, at 422 (noting the Bush “Administration’s lack of enthusiasm for the program”).

When Congress finally made funds available, it appropriated funds to the DOE with earmarks for the 1703 Program.¹⁵⁸ The wide range of technologies funded included: (1) energy efficiency, renewable energy and advanced transmission and distribution (\$10 billion); (2) nuclear power facilities (\$18.5 billion); (3) “front end” nuclear fuel cycle facilities (\$2 billion); (4) coal-based power generation, industrial gasification and carbon capture and sequestration (\$6 billion); and (5) advanced coal gasification (\$2 billion).¹⁵⁹ The breadth of technologies covered by the 1703 Program was far beyond just REEGI. Clean and green energy technologies, not simply renewable energy technologies, were well represented.¹⁶⁰ In addition, clean technology initiatives like energy efficiency and improvements in transmission grids were also included in the mix of earmarked funding.¹⁶¹

b. 1705 Program

The LGP Office’s role expanded when the 1705 Program was implemented as part of the ARRA, which was passed just a few weeks after the Obama Administration took office.¹⁶² The ARRA was originally estimated to cost \$787 billion when it was passed in 2009. This estimate was revised in 2011 to \$840 billion as a result of scoring changes made by the Congressional Budget Office (“CBO”) and the Office of Management and Budget (“OMB”) to reflect President Obama’s FY2012 Budget.¹⁶³ Three principal goals of the ARRA were to (1) create new jobs and save existing ones, (2) spur economic activity with investment in long-term growth, and (3) foster accountability and transparency in government spending.¹⁶⁴

The funding for the ARRA fell into three general categories: (a) tax cuts and benefits for families and businesses, (b) increased federal funding for entitlement programs, such as unemployment benefits, and (c) funds allocated for contracts, grants and loans.¹⁶⁵ The third category was projected

¹⁵⁸ See GAO RECOMMENDATIONS, *supra* note 125. See also *infra* note 161, and accompanying text.

¹⁵⁹ Loan Guarantee Program Established in EPACKT2005, U.S. ENERGY INFORMATION ADMINISTRATION, http://www.eia.gov/oiaf/aeo/otheranalysis/aeo_2009analysispapers/lgp.html (last visited Jan. 30, 2013).

¹⁶⁰ See Energy Policy Act of 2005, Pub. L. No. 109-58, § 1703(a), 119 Stat. 594, 1120 (2005).

¹⁶¹ See *id.*

¹⁶² President Obama was inaugurated Jan. 20, 2009. ARRA was passed Feb. 17, 2009. See American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009).

¹⁶³ See *Breakdown of Funding by Category*, RECOVERY.GOV, <http://www.recovery.gov/Transparency/fundingoverview/pages/fundingbreakdown.aspx> (last visited Jan. 30, 2013).

¹⁶⁴ See American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, § 3, 123 Stat. 115 (2009).

¹⁶⁵ *Id.* § 2.

to distribute almost \$244 billion in contracts, grants and loans to a variety of recipients.¹⁶⁶ Within this category, \$14 billion was initially earmarked to support energy efficiency and renewable energy.¹⁶⁷ The 1705 Program was created as one component of this package. As a consequence of these three objectives, many aspects of the ARRA, including the 1705 Program, had a limited lifetime; the effectiveness of programs, and thus the continuation of funding, was to be measured by the primary criterion of whether the funded programs created or retained jobs.¹⁶⁸

The 1705 Program differed from the 1703 Program in several respects. First, the scope of projects that could be supported under the 1705 Program was limited to fewer categories of technologies than the 1703 Program. The 1705 Program could support “(1) [r]enewable energy systems, including incremental hydropower, that generate electricity or thermal energy, and facilities that manufacture related components, (2) [e]lectric power transmission systems, including upgrading and reconditioning projects, and (3) [l]eading edge biofuel projects that will use technologies performing at the pilot or demonstration scale”¹⁶⁹

Second, Congress appropriated funds for the 1705 Program to cover the CSC for projects, which could be very substantial, rather than requiring applicants to bear the cost of the CSC.¹⁷⁰ Congress initially appropriated \$6 billion for CSCs in loan guarantees issued under the 1705 Program, which it quickly cut to \$4 billion within six months after the initial appropriation to free an additional \$2 billion in funding for the Cash for Clunkers program.¹⁷¹

The LGP Office issued five solicitations under the 1703 Program before Congress created the 1705 Program.¹⁷² As one might imagine, to

¹⁶⁶ See *Breakdown of Funding*, *supra* note 163.

¹⁶⁷ *Id.* The LGP Office spent \$8.8 billion on the ATVM program. See Joann Muller, *Automakers' Report Card: Who Still Owes Taxpayers Money? The Answer Might Surprise You*, FORBES (Aug. 29, 2012), <http://www.forbes.com/sites/joannmuller/2012/08/29/automakers-report-card-who-still-owes-taxpayers-money-the-answer-might-surprise-you/>.

¹⁶⁸ See *Jobs Summary—National*, RECOVERY.GOV, <http://www.recovery.gov/Transparency/RecipientReportedData/Pages/jobsummary.aspx> (last visited Jan. 30, 2013).

¹⁶⁹ American Recovery and Reinvestment Act of 2009 § 406, 42 U.S.C. § 16516(a) (Supp. IV 2010).

¹⁷⁰ See *supra* note 148 (describing the calculation used to determine the CSC value). See also *1705, Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=41 (last visited Jan. 30, 2013).

¹⁷¹ See Consumer Assistance to Recycle and Save Program, Pub. L. No. 111-47, 123 Stat. 1972 (2009). This program is commonly referred to as Cash for Clunkers.

¹⁷² See Appendix (detailing solicitations issued by DOE for funding under Section 1703, Section 1705, and the ATVM Program).

the extent an applicant was eligible under both Programs, the applicant preferred to be considered under the 1705 Program rather than the 1703 Program, because the applicant's CSC would be covered by appropriations from the 1705 Program. Given both the staggered timing of solicitations issued by the LGP Office and the limits on technology, not all 1703 Program applicants could take advantage of their eligibility under the 1705 Program. However, pending applicants which were eligible under both programs were permitted by the LGP Office to have their application considered under the 1705 Program eligibility requirements.¹⁷³ This aided the LGP Office's efforts to meet statutory deadlines by funding projects that could start construction before September 30, 2011.¹⁷⁴

In addition to the LGP Office's reprogramming of existing applications, the LGP Office also issued a commercial technology solicitation to target renewable power systems projects employing commercially available technologies¹⁷⁵ with preexisting financing commitments. This solicitation, the Financial Institutions Partnership Program ("FIPP"), featured a partial-risk sharing loan guarantee program with project lenders serving as the applicants for these renewable energy generation projects.¹⁷⁶ As with other sectors in the economy, such as the housing construction industry and the small business community, the financial crisis resulted in a virtually complete evaporation of sources of capital and financing for renewable energy projects.¹⁷⁷ The intent of FIPP was to create a government funding option for creditworthy financeable commercial technology projects that, but for the credit crisis and resulting lack of bank liquidity, would have been financed and built.¹⁷⁸ This difference in purpose resulted in FIPP having a different structure. The DOE was to review projects that

¹⁷³ 1705, *Loan Programs Office*, U.S. DEPT OF ENERGY, https://lpo.energy.gov/?page_id=41 (last visited Jan. 30, 2013).

¹⁷⁴ GREG W. DURHAM, CENTER FOR INT'L ENV'T & RES. POL'Y, *NEW ENERGY: THE EFFECTS OF REGULATORY REFORMS ON THE US DEPARTMENT OF ENERGY LOAN GUARANTEE PROGRAM 27-28* (2011), available at <http://fletcher.tufts.edu/CIERP/Publications/more/newenergy>.

¹⁷⁵ See 10 C.F.R. § 609.2 (2012) (highlighting the difference from innovative technologies supported by the 1703 Program).

¹⁷⁶ See U.S. DEPT OF ENERGY, SOLICITATION NO. DE-FOA-0000166, *FEDERAL LOAN GUARANTEES FOR COMMERCIAL TECHNOLOGY RENEWABLE ENERGY GENERATION PROJECTS UNDER THE FINANCIAL INSTITUTION PARTNERSHIP PROGRAM*, 20 (2009) [hereinafter *FIPP Solicitation*], available at <https://lpo.energy.gov/wp-content/uploads/2010/09/CTRE.pdf>.

¹⁷⁷ UNITED NATIONS ENVIRONMENT PROGRAMME, *THE GLOBAL FINANCIAL CRISIS AND ITS IMPACT ON RENEWABLE ENERGY FINANCE 1* (2009), available at http://www.energy-base.org/fileadmin/media/sefi/docs/publications/Study_Financial_Crisis_impact_on_RE_.pdf.

¹⁷⁸ See Gregory J. Lynch & Melissa M. Turczyn, *FIPP May Streamline DOE Loan Guarantee Awards*, *ETHANOL PRODUCER MAGAZINE* (Nov. 11, 2009), <http://www.ethanolproducer.com/articles/6138/fipp-may-streamline-doe-loan-guarantee-awards>.

were “shovel-ready.” The applicant to the DOE was not the project developer itself, but the bank consortium that sought to finance the project.¹⁷⁹ The banks, as the applicants, shepherded the application through the DOE process and provided the DOE with all the due diligence they had already performed on the project.¹⁸⁰ The project being submitted needed to have already obtained all requisite equity and financing to commence construction on a commercially sound project with conventional technology, and completed tasks like obtaining an indicative and satisfactory credit rating for the project’s debt.¹⁸¹ The guarantees available under FIPP also differed from guarantees under the 1703 Program. The guarantees under FIPP were partial risk guarantees, covering only eighty percent of costs instead of one hundred percent of the loan value as under the 1703 Program.¹⁸² The applicant banks under FIPP thus had to have at least twenty percent the loan uncovered.¹⁸³

As with other DOE solicitations, the FIPP application process was extremely detailed. The primary difference, given that the private lender (rather than the project developer) was the applicant under FIPP, was that the LGP Office required the lender-applicants to provide all the due diligence documentation they had gathered in preparation for their private financing, such as all independent technical, development, operational, financing and legal due diligence matters on the project, just like the due diligence standards for traditional limited recourse project financing.¹⁸⁴ In addition to traditional financial due diligence, the LGP Office also imposed statutory requirements on applicants, such as demonstrating compliance with the Davis-Bacon Act,¹⁸⁵ which regulates wages; with the National

¹⁷⁹ See FIPP Solicitation, *supra* note 176, at 7.

¹⁸⁰ *See id.*

¹⁸¹ *See id.* at 7.

¹⁸² *Id.* at 94.

¹⁸³ “Uncovered” is an industry term used to describe the portion of private debt that is not insured by a loan guarantee. Where partial risk guarantees are employed, the lenders’ syndicate will often require that participating lenders hold the same ratable percentage in both the insured and uninsured loan facilities and may even prevent individual lenders from assigning or participating their interests in these facilities separately.

¹⁸⁴ Comments from applicants interviewed in independent reports, Congressional hearings, and news articles consistently cite applicants as stating DOE’s due diligence requirements were as stringent, if not more stringent, than those required in traditional private project financings. Letter from David G. Frantz, Acting Executive Director, Loan Programs Office, to Senator Charles E. Grassley, Ranking Member, Committee on the Judiciary (Aug. 3, 2012), *available at* http://www.thune.senate.gov/public/index.cfm?a=Files.Serve&File_id=7f63b50c-8d9c-4eb4-b819-6b7bc652f9c4.

¹⁸⁵ See FIPP Solicitation, *supra* note 176, at 11.

Environmental Protection Act;¹⁸⁶ with the Buy American Act;¹⁸⁷ and providing indicative credit ratings from two independent rating agencies on the transaction.¹⁸⁸ The FIPP solicitation, which focused just on commercial REEGI projects, and not manufacturing, transmission or biofuels projects, required traditional project finance structural risk mitigation.¹⁸⁹ The projects had to provide evidence of various contractual risk mitigants, such as long term offtake contracts for the electricity generated by the project with creditworthy sponsors (typically utility companies), engineering, procurement, and construction (“EPC”) contracts for the facilities, as well contracts for marketing of any renewable energy credits.¹⁹⁰ The FIPP Solicitation’s focus on REEGI highlighted the DOE’s conflicting missions to support innovative technologies on the one hand, commercial technologies on the other hand, yet in each case limiting the risk of default to taxpayers.¹⁹¹

c. Advanced Technology Vehicle Manufacturers; ATVM Program

While not a loan guarantee program, the ATVM Program is also administered by the LGP Office.¹⁹² Pursuant to Section 136 of the Energy Independence and Security Act of 2007 (the “EISA”), the DOE was authorized to make direct loans to manufacturers of advanced technology and ultra-efficient vehicles, or the component suppliers or engineering integrators for such vehicles.¹⁹³ The statute provided that the DOE may make direct loans for up to thirty percent of the cost of reequipping, expanding, or establishing manufacturing facilities in the United States for any of the

¹⁸⁶ *Id.* at 38. Note that while this solicitation required applicants to comply with NEPA requirements, in the fall of 2011, DOE updated its NEPA requirements for the first time in fifteen years, creating categorical exemptions which significantly reduce the burden on applicants who fall into these exemptions. See generally CH2M-HILL, RDD/112490008, CATEGORICAL EXCLUSION UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA), *White Paper* (2011), available at http://www.ch2m.com/corporate/services/environmental_management_and_planning/assets/Abstracts/2011/CH2M-HILL-categorical-exclusion.pdf.

¹⁸⁷ FIPP Solicitation, *supra* note 176, at 12.

¹⁸⁸ *Id.* at 9.

¹⁸⁹ *FIPP, FIPP Hooray . . . ? Analysis of and Commentary on DOE’s Financial Institution Partnership Program*, WILSON SONSINI GOODRICH & ROSATI (Oct. 28, 2009), http://www.wsg.com/WSGR/Display.aspx?SectionName=publications/PDFSearch/wsgalert_FIPP.htm.

¹⁹⁰ See FIPP Solicitation, *supra* note 176, at 52.

¹⁹¹ See *FIPP, FIPP Hooray . . . ?*, *supra* note 189.

¹⁹² See *ATVM, Loan Programs Office*, U.S. DEP’T OF ENERGY, https://lpo.energy.gov/?page_id=43 (last visited Jan. 30, 2013).

¹⁹³ Energy Independence and Security Act of 2007, § 136, 42 U.S.C. § 17013(b) (Supp. IV 2010).

eligible activities described above.¹⁹⁴ In 2009, Congress expanded the DOE's scope by adding ultra-efficient vehicle manufacturers as eligible businesses and permitted the DOE to reconsider applications that had been timely filed prior to January 1, 2009, but rejected because the applicants were ultra-efficient vehicle manufacturers.¹⁹⁵ The DOE made direct loans under the ATVM Program to several manufacturers, including Fisker Automotive and Tesla Motors, both manufacturers of plug-in electric/hybrid cars, as well as to Ford Motor Company and Nissan North American Inc. in order to repurpose existing manufacturing facilities to produce electric or hybrid vehicles and improve vehicle fuel efficiency.¹⁹⁶ Of all the projects supported by the DOE, ATVM projects have generated by far the greatest number of permanent jobs,¹⁹⁷ which was one of the benchmarks for measuring the success of ARRA implementation.¹⁹⁸ The DOE's success in job creation as a criterion of ARRA has been driven in large part by the DOE's funding of manufacturing jobs, with ATVM playing a significant role in this area.¹⁹⁹

4. OMB's Role in Loan Guarantee Programs

a. Background

OMB is involved in the DOE loan guarantee program under its oversight authority for any credit subsidy calculations done by agencies

¹⁹⁴ *Id.*; see also Consolidated Security, Disaster Assistance and Continuing Appropriations Act, Pub. L. No. 110-329 § 129 (2008), 42 U.S.C. § 17013(d) (appropriating \$7.5 billion for ATVM loans capping total loan principal to no more than \$25 billion, and providing \$10 million for administration). While the ATVM Program was initially authorized under the EISA in 2007, DOE didn't receive appropriations until this 2008 Act. The Federal Financing Bank ("FFB") was authorized to make the direct loans under this program. *Id.* § 129(c)(1).

¹⁹⁵ Energy and Water Development and Related Agencies Appropriations Act of 2010, Pub. L. No. 111-85 § 312(b), 123 Stat. 2875 (adding eligibility of ultraefficient vehicle projects for ATVM Program).

¹⁹⁶ See *Our Projects, Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=45/ (last visited Jan. 30, 2013).

¹⁹⁷ See *id.* (calculating that ATVM projects have saved or created 38,700 jobs). As with any manufacturing projects, the number of jobs these provide will far exceed the number of permanent jobs from projects in REEGI, given the nature of the projects.

¹⁹⁸ ARRA, Pub. L. No. 111-5 § 3, 123 Stat. 116 (Supp. IV 2010).

¹⁹⁹ Ironically, Solyndra was also a manufacturing concern and estimated providing a significant number of jobs when the loan guarantee commitment was issued. The goals of ARRA may have required DOE to use funding and investment criteria that resulted in riskier lending decisions by DOE. See Joel Rosenblatt, *Solyndra Files Plan to Reorganize in Chapter 11 Bankruptcy*, BLOOMBERG NEWS (July 28, 2012), <http://www.businessweek.com/news/2012-07-28/Solyndra-files-plan-to-reorganize-in-chapter-11-bankruptcy>.

pursuant to the Federal Credit Reform Act of 1990 (“Credit Reform Act” or “FCRA”).²⁰⁰ Before the Credit Reform Act, agencies would not seek appropriations for these contingent obligations and kept them as off-budget items. Only when the contingencies arose and losses resulted, would the agency seek appropriations. This pattern was problematic, as agencies would implement federal credit programs without sufficient consideration for the fiscal consequences and did not take into account risk of loss appropriately when implementing these programs.²⁰¹

The Credit Reform Act was passed to remedy this pattern of federal agencies’ budgeting for federal credit programs such as loan guarantee programs and loan insurance programs.²⁰² When implementing FCRA, policy-makers recognized that booking the full loan amounts was not accurate because these federal credit programs represented contingent, not definitive, obligations.²⁰³ Some interim legislative changes required budget appropriations to be obtained. The final solution, embodied by the Credit Reform Act, was to create a new system of booking these contingent obligations.²⁰⁴ The Credit Reform Act requires the expected loss, rather than the full original loan amount, be booked and appropriations authority be sought for this lesser amount.²⁰⁵

b. OMB Guidelines

The Credit Reform Act provides that OMB is required to assess costs to the tax payer of credit programs by agencies, such as loan guarantee programs. OMB’s Circulars A-129 and A-11 provide federal agencies guidance on creating and maintaining federal credit programs, and set forth OMB’s responsibilities.²⁰⁶ A principal aspect of OMB’s review process as required by Circular A-11 is that OMB must calculate the CSC, which reflects an estimated net present value of the aggregate potential

²⁰⁰ Federal Credit Reform Act of 1990 (“Credit Reform Act”), 2 U.S.C. §§ 661–661(f) (Supp. IV 2010).

²⁰¹ See Principles of Appropriations Law, *supra* note 113, at 11-12, 11-13.

²⁰² See *id.* at 11-15, 11-16.

²⁰³ See *id.* at 11-12, 11-14.

²⁰⁴ See *id.* at 11-15.

²⁰⁵ Federal Credit Reform Act of 1990, 2 U.S.C. §§ 661a(5)(B)(iii), 661a(5)(F) (Supp. IV 2010).

²⁰⁶ CIRC. A-129, *supra* note 116 (addressing the goals federal departments and agencies should apply for implementing federal credit programs, including setting relevant criteria and requirements for programs and processes to create new programs or expand additional ones); OMB, EXEC. OFFICE OF THE PRESIDENT, CIRC. A-11 PART 5, PREPARATION, SUBMISSION AND EXECUTION OF THE BUDGET (2011) [hereinafter CIRC. A-11], available at http://www.whitehouse.gov/sites/default/files/omb/assets/a11_current_year/a_11_2011.pdf.

cost or gain to the tax payer of a specific project on a discounted contract cash flow basis.²⁰⁷

Once a final loan guarantee commitment is made, the CSC amount is booked. The amount is subject to re-estimation annually.²⁰⁸ If the agency's original estimate is too low, because, for example, it assumed too low a default rate, then resources must be apportioned to cover the shortfall.²⁰⁹ Section 504(f) of FCRA permits indefinite budget authority for such reapportionment.²¹⁰ If the agency's estimate was too high and the CSC is reduced, this similarly requires re-estimation and reductions to specific budgetary authority to account for any offsetting additional receipts.²¹¹

c. OMB Process with DOE

Notwithstanding the detailed guidance OMB provides in its circulars, OMB does not make publicly available the proprietary financial model it uses to determine the CSC, called the Credit Subsidy Calculator 2.²¹² The process to calculate the CSC for each loan guarantee involves an

²⁰⁷ See Federal Credit Reform Act of 1990 § 503(a), 2 U.S.C. § 661b(a) (2006); see also CIRC. A-11, *supra* note 206, at § 185.2, 185.5(a) (defining subsidy cost as “the estimated present value of the cash flows from the Government (excluding administrative expenses) less the estimated present value of the cash flows to the Government resulting from a direct loan or loan guarantee, discounted to the time when the loan is disbursed.”).

²⁰⁸ See CIRC. A-11, *supra* note 206, at § 185.3.

²⁰⁹ See *id.* at CIRC. A-11, *supra* note 206, at § 185.18 (providing that: “A downward reestimate indicates that the subsidy cost payment to the financing account by the program account was too large so that its assets exceed its liabilities. The reestimate amount (plus interest on the reestimate) must be obligated and disbursed from the financing account. Before recording the obligation, ensure you have adequate resources apportioned. . . . For loan guarantees only, to the extent the reestimate is due to lower default payments than initially estimated, either actual or projected, use your uninvested balance with Treasury to cover the obligation. In cases where amounts less than \$1 need to be returned, do not include the amount on the face of the apportionment”) (Excess funds are then allocated to a downward reestimate receipt account.).

²¹⁰ See Federal Credit Reform Act of 1990 § 504(f), 2 U.S.C. 661c(f) (2006); see also CIRC. A-11 *supra* note 206, at § 185.17.

²¹¹ See CIRC. A-11, *supra* note 206, at § 185.3(v) (defining negative subsidies: “(v) Negative subsidies mean subsidy costs that are less than zero. They occur if the present value of cash inflows to the Government exceeds the present value of cash outflows. In such cases, appropriations bills must still provide specific authority before direct loans or loan guarantees can be made, generally in the form of a loan limitation.”) Any under-estimations or better performance by a credit program is thus transferred out of the agency on an annual basis.

²¹² NUCLEAR ENERGY INSTITUTE, CREDIT SUBSIDY COSTS FOR NEW NUCLEAR POWER PROJECTS RECEIVING DEPARTMENT OF ENERGY (DOE) LOAN GUARANTEES: AN ANALYSIS OF DOE'S METHODOLOGY AND MAJOR ASSUMPTIONS 3, note 1 (2010), available at <http://www.nei.org/filefolder/CreditSubsidyCostWhitePaper.pdf>.

extended process between the DOE and OMB where the DOE provided OMB credit subsidy models for each project and OMB provided feedback.²¹³ OMB's risk modeling generally was not shared with the DOE. OMB's review took significantly longer than the DOE's initial response to applications.²¹⁴ This lack of transparency in performing risk calculations created uncertainty for applicants, because they could not do their own calculations to determine the CSC.

The OMB/DOE's CSC calculation process significantly impacted the DOE LGP. As reported by the DOE Office of the Inspector General in February 2009, it took the LGP Office fifteen months of negotiation with OMB to reach agreement on the model to calculate the CSC.²¹⁵ Even after reaching agreement on the financial model, OMB had not approved the CSC for projects, including the 1703 Program projects.²¹⁶ In one instance, an applicant under the 1703 Program for a nuclear generation loan guarantee, Constellation Energy, publicly announced its decision to withdraw its application after OMB finally released a CSC calculation for the project.²¹⁷ In that case, OMB calculated the CSC to be \$880 million, or 11.6 percent of the total proposed loan guarantee amount of \$7.5 billion.²¹⁸ Under the 1703 Program, this amount would be payable by the applicant and, as Constellation Energy noted, this amount would be in addition to any financing costs the applicant would incur in constructing the project.²¹⁹

²¹³ REPORT OF R. TODD NEILSON, CHIEF RESTRUCTURING OFFICER, SOLYNDRA 80 (2012) [hereinafter Neilson Report], available at <http://www.scribd.com/doc/86910992/Solyndra-CRO-Report-Final>.

²¹⁴ See U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-12-157, DOE LOAN GUARANTEES FURTHER ACTIONS ARE NEEDED TO IMPROVE TRACKING AND REVIEW OF APPLICATIONS 23, 25 (2012) [hereinafter GAO-12-157], available at <http://www.gao.gov/assets/590/589210.pdf>. DOE's initial response on loan guarantee applications in the last year of the 1705 Program was several weeks. As the LGP Office received additional funding to add staff, their stated goals were to decrease initial processing time for loan guarantee applications. According to independent audits, the LGP Office succeeded with these goals. *Id.* at 15.

²¹⁵ See U.S. DEP'T OF ENERGY, OFFICE OF THE INSPECTOR GENERAL, DOE/IG-0812, AUDIT REPORT: THE DEPARTMENT OF ENERGY'S LOAN GUAR. PROGRAM FOR INNOVATIVE ENERGY TECH. 3 (2009), available at <http://energy.gov/sites/prod/files/igprod/documents/IG-0812.pdf>.

²¹⁶ See, e.g., *id.* at 3, 4.

²¹⁷ Mark Peters, *Constellation Energy Quits Loan Guarantee Program*, WALL ST. J., Oct. 11, 2010, <http://online.wsj.com/article/SB20001424052748704442404575542413155178010.html>.

²¹⁸ *Constellation Rejects Loan Guarantee Terms*, WORLD NUCLEAR NEWS (Oct. 11, 2010), http://www.world-nuclear-news.org/NN_Constellation_rejects_loan_guarantee_terms_1110101.html.

²¹⁹ See *id.* Michael Wallace, the COO of Constellation Energy rejected the DOE/OMB's proposed 11.6 percent CSC fee for the company's loan guarantee application for its joint venture with Electricité de France to increase the Calvert Cliffs project. He expressed

Energy Secretary Steven Chu noted that the inter-agency process slowed the review process for loan guarantees. He also noted that statutory constraints on the DOE meant that DOE could not invest in more speculative projects to enhance innovation,²²⁰ highlighting the dichotomy of the DOE LGP's mission of supporting both innovative technology projects and commercial technology projects, while reducing the DOE's exposure to project defaults in both instances.

The lack of transparency and delays by OMB did not go unnoticed by Congress. In the fall of 2010, Senator Jeff Bingaman expressed a view that OMB represented a choke point in the release of federal loan guarantees under the DOE LGP during the Senate Energy and Natural Resources Committee's ("SENRC Committee") hearings, stating "[a]s far as I can tell from the testimony today they [OMB] are a significant part of the problem We will continue to pursue their perspective on this so we can get this loan guarantee program working as we think it should."²²¹ The hearing generally revealed that OMB was an integral part of the process, yet no one testifying from the DOE or industry suggested that OMB was to blame.²²² Rather, witnesses, including Jonathan Silver of the LGP Office, noted that startup programs have growing pains and that interagency cooperation was the best it had been. But given the starting point, this may or may not have been a compliment for OMB's responsiveness.²²³ The SENRC Committee's

particular frustration with OMB and its flawed methodology in calculating the CSC. The article reproduced Wallace's letter to DOE. He wrote, in part that

During the course of our discussions, Constellation Energy and our partners identified a significant problem in the methodology that the OMB requires for the credit cost calculation, a problem that is applicable beyond just our project, and therefore of significant program and policy consequence. Yet in seeking to explore this further, we encountered significant delay and resistance in being able to even engage on the issue. After finally being able to detail our analysis of the problem and possible solutions to key officials, and after Congress held a hearing exploring the broader problem, we understand the [Obama] Administration may convene an interagency process to consider it further. But the timing of such discussions, their ultimate conclusion, and the prospect of a reasonable outcome remain wholly uncertain.

Id.

²²⁰ Robert Thomson, *Politics and Policy: Energy Secretary Steven Chu on the Administration's Game Plan*, WALL ST. J., Mar. 8, 2010, <http://online.wsj.com/article/SB10001424052748704869304575104621269451154.html>.

²²¹ Katherine Ling, *OMB Rebuked at Loan Guarantee Hearing, Despite Absence*, ENV'T & ENERGY DAILY, Sept. 24, 2010.

²²² *Id.*

²²³ Senator Bingaman introduced two bills to streamline the loan guarantee application process by, among other things, including eliminating third party credit rating requirements

support of the DOE and the LGP Office was in sharp contrast to the hearings by the House Energy and Commerce Committee and the Oversight and Government Reform Committee regarding Solyndra and the DOE LGP.²²⁴

Shortly after the SENR hearing on OMB and Constellation's public withdrawal, senior advisors and cabinet secretaries met to brief the President on the issue of the OMB review process for the DOE LGP and possible solutions.²²⁵ The briefing memo, dated October 25, 2010, was jointly prepared by Carol Browner, Energy Advisor to the President; Ron Klain, Chief of Staff to Vice President Biden; and Larry Summers, Director of the National Economic Council, in advance of the President's meeting with Treasury Secretary Geithner and Energy Secretary Chu to discuss options for the 1705 Program.²²⁶ The memo proposed four alternatives to address the delay in issuing loan guarantees: (1) limit OMB and Treasury oversight to permit the DOE greater management of the process, (2) create clear policy principles before any funds were disbursed, (3) create an expedited review by Treasury and OMB, or (4) reprogram 1705 Program funds to a different renewable energy incentive program managed by Treasury.²²⁷ The briefing memo also focused on the risk of providing multiple subsidies. The apparent resolution from the meeting was a commitment by the

for projects less than \$100 million and authorizing the Secretary of Energy to issue conditional commitments after OMB's first recommendation without further approval. S. 3746, 111th Cong. (2010), 156 CONG. REC. S6899–6900 (daily ed. Aug. 5, 2010); S. 3759, 111th Cong. (2010), 156 CONG. REC. S6904 (daily ed. Aug. 5, 2010).

²²⁴ See, e.g., *The No More Solyndras Act (H.R. 6213)*, House Energy and Commerce Committee (Sept. 10, 2012), <http://energycommerce.house.gov/fact-sheet/no-more-solyndras-act-hr-6213>.

²²⁵ Press Release, Energy & Commerce Committee, Energy & Commerce Leaders Probe OMB for Role in DOE Stimulus Loan Guarantees, Risky Half Billion Dollar Award to Solyndra a Top Concern (Mar. 14, 2011), energycommerce.house.gov/press.release/energy-commerce-leaders-probe-omb-role-doe-stimulus-loan-guarantees-risky-half-billion (describing the brief and the concerns it contained).

²²⁶ Memorandum from Carol Browner et al., to the President of the United States, *Renewable Energy Loan Guarantees and Grants* 1–5 (Oct. 25, 2010) [hereinafter White House Briefing Memo], available at http://archives.republicans.energycommerce.house.gov/Media/file/Hearings/Oversight/111711_solyndra/Documents/DB_Part_3_Documents_32A_42K.pdf (labeling the memo "Document F").

²²⁷ *Id.* at 4–6; see also American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1603, 123 Stat. 115, 363–367. Section 1603 provided a cash grant option in lieu of existing investment or production tax credits to owners of various types of REI projects and was administered by the U.S. Department of Treasury. This program was generally referred to as Section 1603 or the Cash Grant program. Section 1603 expired December 31, 2011. The White House Briefing Memo also compared the relative merits of the cash grant program to Section 1705. The variety and complexity of government incentives was difficult to navigate for many participants in the REI. White House Briefing Memo, *supra* note 226, at 2–3.

DOE, OMB, and Treasury to streamline the review process.²²⁸ Despite the briefing memo and meeting, no significant changes were made to the 1705 Program.²²⁹

C. Pre-Solyndra Assessments of the DOE Loan Guarantee Program

1. Government Audits

The U.S. Government Accountability Office (“GAO”) and the DOE’s Office of Inspector General (“DOE OIG”) have conducted several audits of the LGP Office since the Office’s creation. These reports were produced for either Congressional committees and subcommittees or the DOE.²³⁰ These reports highlighted various issues that have arisen within the DOE LGP since its creation in 2005. The reports raised different issues that evolved as the LGP developed and gained funding, with several consistent assertions by the auditing bodies.

The GAO and DOE OIG reports improved over time. Initially, these offices expressed concern about the lack of guidelines and regulations, as well as evaluation criteria.²³¹ As the LGP Office received funding and staffed up, it was able to address a number of these early concerns. By 2010, the GAO’s recommendations had narrowed in scope to address four principal issues.²³² In 2011, the DOE OIG was principally concerned about the LGP Office’s record-keeping procedures.²³³

²²⁸ Tom Hamburger et al., *Obama Advisors Raised Warning Flags Before Solyndra Bankruptcy*, L.A. TIMES (Sept. 26, 2011), <http://articles.latimes.com/2011/sep/26/nation/la-na-energy-loans-20110927>.

²²⁹ *See id.*; Andrew Malcolm, *Obama Was Warned of Loan Dangers Long Before Solyndra Sank*, L.A. TIMES BLOGS (Sept. 27, 2011, 3:08 AM), <http://latimesblogs.latimes.com/washington/2011/09/obama-solyndra-larry-summers.html>.

²³⁰ As part of the appropriations for the DOE LGP, GAO was tasked with undertaking periodic audits of the program and reporting to Congress. *See* GAO-12-157, *supra* note 214.

²³¹ *See also* U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-07-798T, DEP’T OF ENERGY: OBSERVATIONS ON ACTIONS TO IMPLEMENT THE NEW LOAN GUARANTEE PROGRAM FOR INNOVATIVE TECHNOLOGIES (2007), <http://www.gao.gov/assets/120/116357.pdf> [hereinafter GAO-07-798T]. *See generally* KEY STEPS NEEDED, *supra* note 153.

²³² U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-10-627, DEPARTMENT OF ENERGY: FURTHER ACTIONS ARE NEEDED TO IMPROVE DOE’S ABILITY TO EVALUATE AND IMPLEMENT THE LOAN GUARANTEE PROGRAM 13 (2010) [hereinafter GAO-10-627], *available at* <http://www.gao.gov/new.items/d10627.pdf> (noting inconsistent treatment of applicants, no systematic appeals process, and failure to issue a solicitation for all Section 1705 projects, notably manufacturing projects).

²³³ *See* U.S. DEP’T OF ENERGY, OFFICE OF THE INSPECTOR GENERAL, DOE/IG-0849, AUDIT REPORT: THE DEPARTMENT OF ENERGY’S LOAN GUARANTEE PROGRAM FOR CLEAN ENERGY TECHNOLOGIES 2, 3, 10 (2011), *available at* <http://www.recovery.gov/Accountability/inspectors/Documents/IG-0849.pdf>.

2. Industry Perspectives

When the 1705 Program was introduced as part of the ARRA, many in the REI community were supportive and optimistic about the potential to jump start their stalled industry in the midst of the Great Recession and financial crisis.²³⁴ The 1703 Program had existed since 2005, yet no loan guarantee commitments had been issued. The 1705 Program offered hope to the industry, given the appropriations for the cost of the CSC and expansion to commercial technologies in certain areas. Some industries, such as the solar renewable energy industry, were very supportive of the 1705 Program.²³⁵ However, the short program life of the 1705 Program was viewed as limiting the program's scope and potential effectiveness.²³⁶ In addition, the program eligibility requirements as implemented by the LGP Office were less favorable to certain renewable energy industries. The president of the Renewable Fuels Association wrote an open letter to Energy Secretary Chu about the program's eligibility criteria and difficulty for cellulosic ethanol producers to meet the criteria, because the program requirements did not conform to the realities of the ethanol business.²³⁷

Beyond the 1705 Program scope and eligibility debate, some advocates, including financiers and other industry participants, supported a broader approach to government promotion of the REI through a more ambitious proposal to create a separate green bank, similar to the Export-Import Bank of the United States.²³⁸ Their proposed agency was titled

²³⁴ Michael J. Gergen et al., *Investing in a Clean Energy Future*, PFI YEARBOOK (2010).

²³⁵ See *1705, Loan Programs Office*, U.S. DEPT OF ENERGY, http://lpo.energy.gov/?page_id=41 (last visited Jan. 30, 2013).

²³⁶ See Gergen et al., *supra* note 234 (stating that "While the LGP will likely prove to have been a helpful first step in establishing a federal credit support program for clean energy technologies, it is only a first step, especially given its limited appropriations and the limited life of its Recovery Act provisions").

²³⁷ See Letter from Bob Dineen, President & CEO, Renewable Fuels Assoc., to Steven Chu, Secretary, U.S. Dep't of Energy (Oct. 26, 2009), *available at* http://www.ethanolrfa.org/page/-/objects/documents/2677/doe_loan_guarantee_letter.pdf. Mr. Dineen noted that the requirements for (1) long term offtake contracts with guaranteed pricing, (2) extensive commercial scale financial and operational data, and (3) higher levels of equity for startup technologies than for more mature technologies with commensurate indicative debt ratings to prove projects had a reasonable prospect of repayment, could not be easily met by ethanol projects since ethanol is a commodity business and sells its product in the spot market, similar to oil and other refined petroleum products. He also noted that start up businesses could not demonstrate long track records of data and, in the same vein, the equity behind startups was generally less than established businesses and, therefore, credit ratings were not forthcoming for businesses. *Id.*

²³⁸ The Export-Import Bank of the United States is also known as the "Ex-Im Bank." The Bank's mission is to support U.S. jobs through exports and is the United States' export

the Clean Energy Deployment Administration (“CEDA”) and would have greater autonomy and budgetary authority to make direct loans and issue loan guarantees.²³⁹

Practitioners across the energy field worked to identify the key elements of the 1705 Program and watched carefully as the DOE implemented the program and issued several solicitations under the auspices of the 1705 Program.²⁴⁰ One group of practitioners authored an article on the 1705 Program and offered five recommendations on the structure of the program to improve its effectiveness²⁴¹ (I refer to the authors as the “PF authors”). First, the PF authors noted there is a “fundamental tension between the statutory goals of the Loan Guarantee Program and the selection criteria employed in granting loan guarantees.”²⁴² The PF authors noted that while the statutory goals include promoting innovative technology, the DOE’s criteria relied heavily on the creditworthiness or “bankability” of an applicant to determine whether to select a project.²⁴³ The PF authors asserted this would likely prevent many of the innovative projects from moving forward because they were less likely to have the requisite financial support to meet this requirement.²⁴⁴

Second, the PF authors observed that many application requirements were overly burdensome, such as paying application fees up front and in full.²⁴⁵ In addition, the PF authors noted requiring applicants to obtain preliminary credit ratings would impose time and cost burdens on

credit agency. Ex-Im Bank accomplishes its mission by offering a number of products, such as direct loans, loan guarantees and export credit insurance. *See generally Our Mission, About Us*, EXPORT-IMPORT BANK OF THE UNITED STATES, <http://www.exim.gov/about/> (last visited Jan. 30, 2013).

²³⁹ *See generally* Clements & Sims, *supra* note 153. The CEDA proposal was viewed as similar to Ex-Im Bank because it would have the goal of becoming a self-sustaining agency offering a variety of products to assist clean energy industries. Unlike Section 1703 and Section 1705, loan guarantees would be just one product that the CEDA could offer. The CEDA was intended to have significantly more appropriations to expand its scope. *See Clean Energy Development Administration: Hearing on S.1462 Before the S. Committee on Energy and Natural Res.*, 112th Cong. (May 3, 2011); Press Release, U.S. Chamber of Commerce, U.S. Chamber Backs Clean Energy Deployment Administration at Senate Hearing (May 3, 2011), *available at* <http://www.uschamber.com/press/releases/2011/may/us-chamber-backs-clean-energy-deployment-administration-senate-hearing>.

²⁴⁰ *See* Appendix (listing LGP Office solicitations).

²⁴¹ *See* Jennifer F. Massouh et al., *Real Promise or False Hope: DOE’s Title XVII Guarantee*, 22 ELECTRICITY J. 53 (2009) [hereinafter Title XVII Paper].

²⁴² *Id.* at 60.

²⁴³ *Id.*

²⁴⁴ *Id.*

²⁴⁵ *Id.* at 61.

applicants that could have a negative impact on the quality of applications due to self-selection.²⁴⁶ They recommended (a) permitting applications to be received on a rolling basis rather than during the limited periods provided to respond to solicitations issued by the DOE, (b) permitting application fees to be remitted later in the process, and (c) eliminating credit rating requirements or deferring them until later in the process.²⁴⁷

Third, the PF authors noted the inconsistency in traditional financing techniques and other existing loan guarantee programs, such as those used by the Overseas Private Investment Corporation and Ex-Im Bank compared with what the DOE had proposed for collateral arrangements and intercreditor issues.²⁴⁸ The DOE guidance required the DOE to have superior rights on collateral disposition, required non-guaranteed debt to have the same loan tenor as guaranteed loans (as much as thirty years) and did not permit stripping of non-guaranteed debt in sale or participation of debt. Additionally, DOE guidance permitted the DOE to ask for additional collateral beyond the project assets.²⁴⁹ The PF authors noted these various requirements were not consistent with traditional project financing techniques in the private sector or other government programs and were not likely to be well received.²⁵⁰

Fourth, the PF authors highlighted that the DOE required equity contributions to be "cash equity," which would affect the scale and type of applicants, because other forms of equity were not permissible.²⁵¹

Finally, the PF authors noted that the DOE loan guarantees, as originally described, were only available for loans and other debt obligations, which limited some of the more common financing structures for renewable energy projects that have equity components to take advantage of tax credit incentives, such as sale-leasebacks, lease pass-throughs and partnership flip financing structures.²⁵²

²⁴⁶ *Id.*

²⁴⁷ Title XVII Paper, *supra* note 241, at 61–62.

²⁴⁸ *Id.* at 63.

²⁴⁹ *Id.*

²⁵⁰ *Id.*

²⁵¹ *Id.* at 64. Conversely, typical project financing, lenders will often allow the borrower and its equity sponsors to count more than just cash contributed equity as equity. For example, an equity sponsor may contribute land, materials or even equity in a subsidiary to the project borrower and would seek to have such contributions accepted by the lenders. Furthermore, solely utilizing upfront cash equity may not be the most economically efficient capital structure.

²⁵² *Id.* at 64–65.

3. Analysis

The PF authors were not the only ones commenting on the 1705 Program. Other professionals in the industry, as well as developers, financiers, trade groups and interested groups had many comments for the DOE.²⁵³ It listened. The DOE reviewed and revised its regulations in the fall of 2009.²⁵⁴ The DOE addressed a number of the issues raised by the PF authors, as well as other comments from the public.²⁵⁵ The DOE updated its regulations to permit a variety of transaction and financing structures consistent with limited recourse project financings in various other segments of the renewable energy market to expand eligibility for DOE loan guarantees.²⁵⁶ The DOE also modified its interpretation concerning collateral security, project ownership, and the type of equity that could be contributed.²⁵⁷

The fundamental tensions the DOE faced were much greater than the tension between innovation and bankability raised by the PF authors in the Title XVII paper described above. The PF authors questioned whether truly innovative projects on the cusp of commercialization could meet the application requirements set by the DOE, such as indicative credit ratings.²⁵⁸ The DOE focused on tensions that were even broader. It was supposed to support both innovative projects (defined as ones not in widespread commercial use) and commercial technology projects (defined by the number of commercial applications—in use by three or more projects for a period of at least five years).²⁵⁹ Furthermore, the DOE was supposed to support projects that could demonstrate a reasonable prospect of repayment. The DOE had to support projects across a wide spectrum of technologies, each of which posed different risks, not only during the development stage but also during operation.²⁶⁰ The DOE was to support REEGI projects, but also manufacturing projects. The DOE had to support projects that would have been built without government support, but for the lack of financing

²⁵³ See, e.g., Loan Guarantees for Projects that Employ Innovative Technologies, 74 Fed. Reg. 63,544, 63,546 (to be codified at 10 C.F.R. pt. 609) (totaling up the number of interested parties who submitted comments).

²⁵⁴ *Id.* at 64,546 (issuing a revised final rule in this announcement). The DOE had previously issued a Notice of Public Rulemaking and Opportunity to Comment on August 7, 2009. *Id.*

²⁵⁵ *Id.*

²⁵⁶ *Id.* at 63,544.

²⁵⁷ *Id.* at 63,545, 63,546. The Solyndra Part, *infra* Part IV, briefly describes some of the collateral security aspects of these updated regulations.

²⁵⁸ See Title XVII Paper, *supra* note 241, at 57.

²⁵⁹ See 10 C.F.R. § 609.2 (2012) (defining commercial technology).

²⁶⁰ See Title XVII Paper, *supra* note 241, at 54, 55.

generally available in the market, as long as these projects commenced construction by September 30, 2011.²⁶¹ Yet under the 1703 Program, the DOE also had to *support* projects that could pay their own CSC.²⁶² In reviewing the independent assessments of the DOE, a common critique was the DOE's lack of adequate performance metrics. Given the DOE's broad and inconsistent mandate, it is hard to envision how the DOE could have across-the-board performance metrics, or even solicitation-specific performance metrics, given the lack of similarity of projects. The GAO noted this fundamental challenge to the DOE LGP in its 2008 report when it stated:

Further, DOE will not gain significant experience in each technology because the program's objective is to commercialize a limited number of each type of innovative technologies. Therefore, the types of projects will, by design, evolve over time, and the experience and data that DOE gains may not be applicable to evaluating the risks of projects applying in the future.²⁶³

Undaunted by the challenges of inconsistent and conflicting legislative intent between its loan guarantee programs, the LGP Office moved forward to approve loan guarantee commitments.²⁶⁴ The LGP Office issued its first conditional loan guarantee commitment under the 1705 Program in March 2009, and finalized this commitment in September 2009—four years after the DOE LGP was initially authorized.²⁶⁵ Solyndra was the first recipient of a conditional loan guarantee commitment.²⁶⁶ By the end of the 1705 Program's availability period, the LGP Office issued loan guarantee commitments for approximately \$10.2 billion of projects in August and September 2011.²⁶⁷

²⁶¹ *Id.* at 58, 59.

²⁶² 1703, *Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=39 (last visited Jan. 30, 2013).

²⁶³ GAO RECOMMENDATIONS, *supra* note 125, at 20.

²⁶⁴ *See Our Projects, Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013).

²⁶⁵ *Id.*

²⁶⁶ *Id.*; *see* Press Release, Loan Programs Office, U.S. Dep't of Energy, Vice President Biden Announces Finalized \$535 Million Loan Guarantee for Solyndra (Sept. 4, 2009), *available at* <https://lpo.energy.gov/?p=827>; Press Release, U.S. Dep't of Energy, Obama Administration Offers \$535 Million Loan Guarantee to Solyndra, Inc. (Mar. 20, 2009), *available at* <https://lpo.energy.gov/?p=839>.

²⁶⁷ *See Our Projects, Loan Programs Office*, U.S. DEP'T OF ENERGY, http://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013).

IV. SOLYNDRA STORY

A. *Changing the Landscape*

Solyndra's bankruptcy in September 2011,²⁶⁸ has been detrimental to the image of the REI and has highlighted the role that government incentives play in the industry. Solyndra opened the door to critics challenging the effectiveness of the DOE LGP and questioning the broader role of government incentives for the REI.

B. *Background*

Solyndra was founded in May 2005.²⁶⁹ Solyndra's product, a cylindrical photovoltaic panel, was designed to make installations on rooftops significantly easier and thus more cost effective than traditional flat panel photovoltaic systems.²⁷⁰ Solyndra's panel also required less polysilica to create, which permitted the company to achieve a price advantage through its manufacturing process.²⁷¹ The company grew rapidly and began commercial shipments of its photovoltaic systems in July 2008.²⁷² Solyndra planned an initial public offering for 2010 and filed a Form S-1 with the Securities Exchange Commission in December 2009.²⁷³

Solyndra first submitted a pre-application for a loan guarantee in December 2006 under the 1703 Program to finance the construction of an additional manufacturing facility in Fremont, CA, for its thin film cylindrical photovoltaic solar panels.²⁷⁴ Solyndra initially applied as an eligible

²⁶⁸ Peg Brickley, *Solar Energy Firm Files for Chapter 11—Solyndra's Step Marks Big Loss for Backers; U.S. Is Creditor*, WALL ST. J., Sept. 7, 2011, at B5, available at <http://www.djreprints.com/link/DJRFactiva.html?FACTIVA=wjco20110907000029>. Note that this article reported figures \$527 million, while the DOE LPO reported \$535 million, for the amount of Solyndra's loan guarantee. The difference between the two figures is that the original guaranteed loan commitment to Solyndra was for \$535M. At the time of Solyndra's Chapter 11 filing, it had borrowed \$527M of the \$535M.

²⁶⁹ See SOLYNDRA, INC., *Registration Statement (Form S-1)* (Amended by S-1A March 16, 2010) at 16, available at <http://www.sec.gov/Archives/edgar/data/1443115/000119312510058567/ds1a.htm>.

²⁷⁰ See *id.* at 16.

²⁷¹ See *Innovative Cadmium Telluride Technology*, FIRST SOLAR INC., <http://www.firstsolar.com/Innovation/CdTe-Technology> (last visited Jan. 30, 2013). At the time of Solyndra's founding in 2005, polysilica was the only material used to produce solar panels. Since then, other companies have created panels with other materials.

²⁷² See *Registration Statement*, *supra* note 269, at 26.

²⁷³ See *id.* at 1–3.

²⁷⁴ Declaration of W.G. Stover, Jr., Senior Vice President and Chief Financial Officer, In Support of First Day Motions at ¶ 8, *In re Solyndra LLC et al.*, No. 11-12799 (Bankr. Del.

renewable energy manufacturing facility.²⁷⁵ The DOE reached out to Solyndra and fifteen other qualifying companies and invited them to submit full applications under the 1705 Program following the authorization of and appropriations for the 1705 Program.²⁷⁶ Under the 1705 Program, innovative technologies applicants were eligible for full loan guarantees, where the lending, as well as the loan guarantee, was provided by the Federal Government through the Federal Financing Bank (“FFB”).

In March 2009, Solyndra received a conditional commitment for a \$535 million loan guarantee from the DOE; it was the first DOE loan guarantee provided through DOE LGP.²⁷⁷ At the time of the initial loan guarantee, Solyndra was touted by the Obama Administration as an example of the success of the clean-tech economy, the future of jobs in a green economy, and America’s preeminence in the field.²⁷⁸ As one of the loan guarantees funded as part of the ARRA, the loan guarantee was intended to meet the Act’s goals of creating jobs. The DOE made a final commitment to Solyndra for this loan guarantee in September 2009.²⁷⁹

However, Solyndra experienced financial difficulties despite having received the DOE loan guarantee commitment.²⁸⁰ Solyndra suspended its attempt to float a public offering and pulled its registration statement in the middle of 2010.²⁸¹ Solyndra worked to stabilize its finances and engaged in

2011), *available at* <https://www.solyndra-info.com/courtfilings.aspx> (listed under filing date 09/06/2011; filing #13). The new facility was nicknamed “Fab 2” and its construction was the basis for the loan and loan guarantee made to Solyndra. Solyndra had another manufacturing facility nicknamed “Fab 1,” which was idled when Solyndra hit financial troubles in November 2010.

²⁷⁵ See Appendix.

²⁷⁶ See Declaration of W.G. Stover, Jr., *supra* note 274, at ¶ 8.

²⁷⁷ See *id.* ¶ 8.

²⁷⁸ Carol D. Leonnig et al., *Obama’s Focus on Visiting Clean-Tech Companies Raises Questions*, WASH. POST (June 25, 2011), http://www.washingtonpost.com/politics/obamas-focus-on-visiting-clean-tech-companies-raises-questions/2011/06/24/AGSFu9kH_story.html (discussing Obama’s visits to “clean technology” businesses, including a visit to Solyndra in May 2010, weeks after auditors questioned whether Solyndra could remain a going concern); see also Alison Vekshin, *Treasury Department’s Watchdog Probes Federal Bank Role in Solyndra’s Loan*, BLOOMBERG (Sept. 14, 2011, 2:32 PM), <http://www.bloomberg.com/news/2011-09-14/treasury-department-s-watchdog-probes-federal-bank-role-in-solyndra-s-loan.html> (describing the start of a federal probe into Solyndra).

²⁷⁹ See *Our Projects, Loan Programs Office*, U.S. DEP’T OF ENERGY, https://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013).

²⁸⁰ These difficulties culminated in Solyndra’s filing for bankruptcy. See Brickley, *supra* note 268. The problems that caused Solyndra’s demise were market risks, as discussed *infra* Part V.B.

²⁸¹ SOLYNDRA, INC., S-1 Registration Statement Withdrawal, Form RW (June 18, 2010), *available at* <http://www.sec.gov/Archives/edgar/data/1443115/000119312510141727/drw.htm>.

a restructuring in February 2011, which yielded an additional \$75 million of equity investments.²⁸² One component of the 2011 restructuring permitted the new investors to have a senior secured position to the federal government's loan guaranteed by the DOE.²⁸³ News sources also reported another significant component of the restructuring was the subordination of over \$1 billion of equity previously contributed to Solyndra.²⁸⁴

Solyndra was in trouble many months before it filed for bankruptcy. Sources detailed Solyndra's efforts to raise capital, along with its cost structure and capital intensive business, as well as the decreased demand for its panels.²⁸⁵ In March 2011, the CEO admitted missteps, the company expected too much growth, and focused too little on market development.²⁸⁶ Notwithstanding the February restructuring, Solyndra's significant senior secured debt obligations of over \$783 million prevented it from obtaining bridge financing to continue its operations in August 2011, and was a factor in Solyndra's filing bankruptcy.²⁸⁷

C. Bankruptcy

Solyndra's bankruptcy²⁸⁸ in September 2011 had huge repercussions on the REI. The swiftness of the filing, the termination of over 1100

²⁸² See Declaration of W.G. Stover, Jr., *supra* note 274, at ¶¶ 16–24 (detailing the February 2011 Restructuring).

²⁸³ See *id.* ¶¶ 16–22 (describing the intercreditor priorities agreed to during the February 2011 restructuring).

²⁸⁴ See Yuliya Chernova, *After Investing \$1B, Solyndra's Backers Finally Lose Their Grip*, WALL ST. J. BLOGS (Aug. 31, 2011, 6:59 PM), <http://blogs.wsj.com/venturecapital/2011/08/31/after-investing-1b-solyndras-backers-finally-lose-their-grip/>. This title is somewhat misleading, as equity investors are always structurally subordinated to the interests of lenders, and secured lenders stand at the top of the priority pyramid. One of the troubles with the Solyndra restructuring was that significant amounts of equity were converted to debt, of course at a discount, as described later in this Article.

²⁸⁵ Eric Wesoff, *Solyndra IPO Canceled*, GREENTECH SOLAR (June 17, 2010), <http://www.greentechmedia.com/articles/read/solyndra-ipo-cancelled> (reporting on Solyndra's announcement that it filed a request with the SEC to withdraw its S-1 Registration Statement).

²⁸⁶ Yuliya Chernova, *Solyndra CEO: We Made Two Major Mistakes*, WALL ST. J. BLOGS (Mar. 3, 2011, 3:58 PM), *available at* <http://blogs.wsj.com/venturecapital/2011/03/03/solyndra-ceo-we-made-two-major-mistakes> (quoting the CEO that "the company has not focused as much as it should have on commercial aspects. 'The emphasis was on technology innovation,' he said, and 'much less on commercial aspects, like developing market and sales channels.'").

²⁸⁷ See Declaration of W.G. Stover, Jr., *supra* note 274, at ¶ 24 (describing Solyndra's situation after the February 2011 restructuring yielding an additional \$75 million, but resulting in \$783 million in senior secured debt).

²⁸⁸ The project company for the Fremont manufacturing facility, Solyndra LLC, and its parent company, 360 Solar Degree Holdings, Inc., both filed for bankruptcy and these

employees, and idling of Solyndra's two plants took many by surprise.²⁸⁹ Solyndra filed for bankruptcy on September 6, 2011. Competitive pressures from overseas competitors with government backing created pressures for pricing and payment terms, and the reduction or elimination of government incentives for purchasers, particularly in Europe, drastically reduced the market for solar panels, as discussed in more detail below.²⁹⁰

In the initial filing motions²⁹¹ made by Solyndra, also known as "first day filing motions," the Chief Financial Officer ("CFO") stated one of the reasons for Solyndra's bankruptcy filing was its inability to compete with solar panel manufacturers from around the world in a pricing war.²⁹² As described below, the CFO was referring to global pressures, but in particular, to dumping practices by Chinese solar panel manufacturers.²⁹³ The CFO noted that these other panel manufacturers received low cost capital and were able to offer incentives to customers such as extended payment terms that harmed Solyndra's ability to collect accounts receivable.²⁹⁴

Solyndra's initial goal in its bankruptcy proceeding was to seek a turnkey buyer—a buyer willing to restart or continue operations—for its entire business. Solyndra believed there was greater value for its creditors through a turnkey sale rather than piecemeal liquidation.²⁹⁵ Unfortunately, Solyndra was unable to locate such a buyer and has instead engaged in an orderly winding up process with a series of asset sales.

proceedings were consolidated into a single proceeding. This declaration detailed Solyndra's corporate structure and described how the FFB was utilized to construct the Fremont facility. *See* Declaration of W.G. Stover, Jr., *supra* note 274, at ¶ 1, ¶ 10.

²⁸⁹ Ronald D. White, *Solar Panel Firm Solyndra to Cease Operations*, L.A. TIMES, Sept. 1, 2011, <http://articles.latimes.com/2011/sep/01/business/la-fi-solar-shutdown-20110901>.

²⁹⁰ *See* Declaration of W.G. Stover, Jr., *supra* note 274, at ¶ 23.

²⁹¹ "First day filing motions" are motions by the filer, known as the debtor, at the beginning of a bankruptcy proceeding in which the debtor requests certain things from the court to enable the debtor to continue its normal operations, such as the right to use cash collateral to pay routine expenses, such as paying salaries and accounts payables, the ability to hire professionals, typically bankruptcy professionals, obtain financing after the bankruptcy and other matters. *See generally* Daniel M. Press & Brett Weiss, *First-Day Motions in Individual Debtor Chapter 11 Cases*, LEXISNEXIS COMMUNITIES (Dec. 12, 2011, 3:15 PM), <http://www.lexisnexis.com/community/bankruptcylaw/blogs/bankruptcycommentary/archive/2011/12/12/first-day-motions-in-individual-debtor-chapter-11-cases.aspx>.

²⁹² *See* Declaration of W.G. Stover, Jr., *supra* note 274, at ¶ 8.

²⁹³ *See, e.g.*, Wendy Koch, *U.S. Finalizes Steep Tariffs on China's Solar Panels*, USA TODAY (Nov. 7, 2012, 6:23 PM), <http://www.usatoday.com/story/news/nation/2012/11/07/us-tariff-China-Solar-Panels/1689177/>.

²⁹⁴ *See* Declaration of W.G. Stover, Jr., *supra* note 274, at ¶ 23.

²⁹⁵ Jacqueline Palank, *Attorney: Solyndra Still Open to Turnkey Bids*, WALL ST. J. BLOGS (Jan. 31, 2012, 3:44 PM), <http://blogs.wsj.com/bankruptcy/2012/01/31/attorney-solyndra-still-open-to-turnkey-bids/>.

D. *Reasons for Solyndra's Failure—A Perfect Storm*

The problems Solyndra faced, which caused its downfall, were not unique to Solyndra, but applied to other U.S. solar panel manufacturers as well. According to Solyndra's bankruptcy filing, the company failed due to a variety of factors, including a number of competitive pressures. Chief among them was the dumping practices by Chinese solar panel manufacturers, as well as changing market conditions that reduced the customer base for manufacturers.²⁹⁶ Less than one month before Solyndra's bankruptcy filing, two other U.S. solar panel manufacturers—Evergreen Solar, Inc. and SpectraWatt, Inc.—also filed for bankruptcy, although neither company had received a DOE loan guarantee commitment so their filings went largely unnoticed outside the domestic solar industry.²⁹⁷

The entire domestic solar manufacturing industry has faced and continues to face significant market challenges. As a result, a number of domestic companies have folded and consolidation is occurring with the remaining players.²⁹⁸ The market challenges these companies face included: (1) a lack of access to capital at reasonable terms as a result of the Great Recession,²⁹⁹ (2) a greatly reduced demand for solar panels due to cutbacks in government incentives for purchasers, particularly in the European Union, as discussed below,³⁰⁰ (3) a decrease in polysilica prices, which had previously affected the cost to produce to solar panels—this reduction harmed companies like Solyndra with manufacturing techniques that assumed continued high pricing for polysilica,³⁰¹ and (4) a manufacturing trade war involving product dumping into the United States, as discussed below.

1. Trade War

The entire U.S. solar panel manufacturing industry, including Solyndra, faced significant pressure from overseas competitors, China in particular. A group of U.S. solar panel manufacturers led by SolarWorld

²⁹⁶ See White, *supra* note 289.

²⁹⁷ Aviva Gat, *Solar Eclipse? Three U.S. Solar Panel Makers in Chapter 11*, THE DEAL PIPELINE (Sept. 21, 2011), <http://www.thedeal.com/content/restructuring/solar-eclipse-three-us-solar-panel-makers-in-chapter-11.php>.

²⁹⁸ See *id.*

²⁹⁹ See *id.*

³⁰⁰ See *id.*

³⁰¹ Becky Beetz, *PV Polysilicon Prices Continue to Plummet*, PV MAGAZINE, Sept. 17, 2012, http://www.pv-magazine.com/news/details/beitrag/pv-polysilicon-prices-continue-to-plummet_100008512/. "PV" is shorthand for "photovoltaic."

filed a suit with the U.S. International Trade Commission alleging that Chinese solar panel manufacturers were engaging in dumping of solar panels in the United States, artificially depressing the price of solar panels.³⁰² The U.S. International Trade Commission issued a unanimous preliminary determination on December 2, 2011, that the Chinese solar panel imports were harming the U.S. solar manufacturing industry.³⁰³ The U.S. Department of Commerce agreed to take expedited action to determine whether duties should be applied to Chinese imports for all panels imported starting December 3, 2011.³⁰⁴ The Department of Commerce issued a preliminary ruling in March 2012 that Chinese panel manufacturers had engaged in a pattern of dumping and assessed duties on Chinese solar panel imports.³⁰⁵

These many challenges have continued to hammer solar panel manufacturers. Energy Conversion Devices, a solar panel manufacturer and

³⁰² Koch, *supra* note 293.

³⁰³ Matthew L. Wald, *Panel Says Chinese Imports Hurt U.S. Solar Firms*, N.Y. TIMES (Dec. 2, 2011), <http://www.nytimes.com/2011/12/03/business/energy-environment/chinese-imports-hurt-us-solar-companies-trade-commission-says.html>.

³⁰⁴ See Press Release, Coalition for American Solar Manufacturing, U.S. Department of Commerce Finds Massive Surge of Chinese Solar Imports (Jan. 30, 2012), *available at* <http://www.americansolarmanufacturing.org/news-releases/01-30-12-casm-critical-circumstances-release.pdf>; Keith Bradsher, *Trade War in Solar Takes Shape*, N.Y. TIMES (Nov. 9, 2011), <http://www.nytimes.com/2011/11/10/business/global/us-and-china-on-brink-of-trade-war-over-solar-power-industry.html> (describing investigation commenced by the Commerce Department, following petition by seven American solar manufacturers seeking tariffs be imposed on solar panels imported from China. Assessment is that the wholesale price of solar panels has dropped to \$1 to \$1.20/ watt of capacity vs. \$1.80 in January and \$3.30 in 2008). Keith Bradsher, *U.S. Solar Panel Makers Say China Violated Trade Rules*, N.Y. TIMES (Oct. 19, 2011), http://www.nytimes.com/2011/10/20/business/global/us-solar-manufacturers-to-ask-for-duties-on-imports.html?pagewanted=all&_r=0; Stuart Burns, *U.S. Solar Panel Producers Calling for Tariffs Against Chinese Manufacturers*, OILPRICE.COM (Nov. 14, 2011, 10:39 PM), <http://oilprice.com/Alternative-Energy/Solar-Energy/US-Solar-Panel-Producers-Calling-For-Tariffs-Against-Chinese-Manufacturers.html> (stating the Dep't of Commerce's time table for a preliminary decision).

³⁰⁵ INTERNATIONAL TRADE ADMINISTRATION, U.S. DEP'T OF COMMERCE, FACT SHEET, COMMERCE PRELIMINARILY FINDS DUMPING OF CRYSTALLINE SILICON PHOTOVOLTAIC CELLS, WHETHER OR NOT ASSEMBLED INTO MODULES FROM THE PEOPLE'S REPUBLIC OF CHINA (2012), *available at* <http://ia.ita.doc.gov/download/factsheets/factsheet-prc-solar-cells-ad-prelim-20120517.pdf>; Keith Bradsher & Matthew L. Wald, *A Measured Rebuttal to China over Solar Panels*, N.Y. TIMES, Mar. 20, 2012, <http://www.nytimes.com/2012/03/21/business/energy-environment/us-to-place-tariffs-on-chinese-solar-panels.html>. *But see* Nigam Arora, *U.S. Wimps Out, Refuses to Fight Chinese Solar Dominance*, FORBES (Mar. 21, 2012, 12:51 PM), <http://www.forbes.com/sites/greatspeculations/2012/03/21/u-s-wimps-out-refuses-to-fight-chinese-solar-dominance/> (lamenting that the imposed tariffs were far lower than hoped for).

project developer, filed for bankruptcy on February 14, 2012, before the Department of Commerce issued its ruling.³⁰⁶ After the imposition of tariffs, Abound Solar, another DOE loan guarantee recipient, filed for bankruptcy on June 28, 2012, and announced it will liquidate.³⁰⁷ AE Polysilicon, another manufacturer of an alternative polysilicon process, announced its shutdown and pending liquidation in May 2012.³⁰⁸ Undoubtedly, this casualty list of solar manufacturers will continue to grow until there is some improvement in the solar market.

2. Deteriorating Global Market Conditions

In addition to the anticompetitive dumping by Chinese panel manufacturers, U.S. solar panel manufacturers, as well as other global companies, have all struggled with the reduction or elimination of incentives for renewable energy in the European Union.³⁰⁹ European Union countries had been at the forefront of production incentives to spur growth of the renewable energy industry, with significant economic consequences for countries like Portugal, Spain, and most recently, Germany.³¹⁰ As governments ended these subsidies to REEGI, the supporting REI, such as solar panel manufacturers saw the market for their products collapse virtually overnight.³¹¹ Any remaining manufacturers then had to compete for the remaining market base. The uncertain outlook for solar manufacturers

³⁰⁶ See Martin LaMonica, *Solar Industry Bloodbath Leads to Another Bankruptcy*, CNET NEWS (Feb. 14, 2012, 11:29 AM), http://news.cnet.com/8301-11386_3-57377645-76/solar-industry-bloodbath-leads-to-another-bankruptcy/ (noting that ECD's subsidiaries both developed flexible silicon cells and developed solar projects, the manufacturing subsidiary was shut down in 2011).

³⁰⁷ See Caroline Humer et al., *Abound Solar Files to Liquidate in Bankruptcy*, REUTERS (July 3, 2012, 1:02 AM), <http://in.reuters.com/article/2012/07/02/us-aboundsolar-bankruptcy-idINBRE86118020120702>; Matthew L. Wald, *A 2nd U.S.-Supported Maker of Solar Panels Will Close*, N.Y. TIMES, June 28, 2012, <http://www.nytimes.com/2012/06/29/business/energy-environment/abound-solar-says-it-will-file-for-bankruptcy.html>.

³⁰⁸ See Marc Osborne, *Motech Pulls the Plug on AE Polysilicon Operations*, PV TECH (May 29, 2012), available at http://www.pv-tech.org/news/motech_pulls_the_plug_on_ae_polysilicon_operations.

³⁰⁹ See Gat, *supra* note 297.

³¹⁰ See generally *Study: Incentives Giving Boost to European Solar Sector*, EURACTIV (July 28, 2008), <http://www.euractiv.com/energy/study-incentives-giving-boost-eu-news-220297>.

³¹¹ *European Solar Incentive Cuts Initiate Global Photovoltaic Market Shift*, SOLARB Buzz (June 22, 2011), <http://www.solarbuzz.com/news/recent-findings/european-solar-incentive-cuts-initiate-global-photovoltaic-market-shift>.

generally given this regulatory uncertainty is evident by tracking the volatility of the stock of U.S. publicly traded solar firms.³¹²

E. Solyndra Investigations

Immediately after Solyndra's bankruptcy filing, the FBI raided Solyndra's offices on September 8, 2011, and executed search warrants against the homes of certain Solyndra executives, including CEO Brian Harrison and company founder Chris Gronet.³¹³ The DOE's Office of Inspector General had asked for the FBI's assistance to determine whether any improprieties existed with the loan guarantee to Solyndra.³¹⁴ The FBI has indicated it was investigating Solyndra to determine whether there was accounting fraud or misrepresentation of financial information to the federal government.³¹⁵ As of this writing, no charges have been brought against the company or any of its officers.

Following Solyndra's bankruptcy, and independent from the FBI criminal investigation, Solyndra's board engaged an independent officer to handle restructuring and liquidation. As part of his duties, the Chief Restructuring Officer, Todd Neilson, conducted an investigation to determine whether Solyndra engaged in wrongdoing.³¹⁶ Mr. Neilson's report was released in April 2012, and was filed with the bankruptcy court. The report concluded that neither Solyndra nor any of its officers had engaged in any illegal or improper activity as part of seeking to secure Solyndra's DOE loan guarantee commitment.³¹⁷

In addition to the FBI investigation, at least two Congressional committees and their subcommittees have held hearings and conducted

³¹² Compare *First Solar Ousts CEO, Shares Dive 24 Percent*, CNET NEWS (Oct. 25, 2011, 2:53 PM), http://news.cnet.com/8301-11128_3-20125518-54/first-solar-ousts-ceo-shares-dive-24-percent/ (stating that the Board of Directors ousted CEO of First Solar), with *Solar Stocks Soar on First Solar Deal*, YAHOO! FINANCE (June 12, 2012, 2:32 PM), <http://finance.yahoo.com/news/solar-stocks-soar-first-solar-183226369.html>.

³¹³ Sajid Farooq, *FBI Raids Solyndra's CEO, Founder's Homes*, NBC BAY AREA (Sept. 9, 2011), <http://www.nbcbayarea.com/news/local/FBI-Raids-Solyndras-CEO-Founders-Homes-129556623.html>.

³¹⁴ *Id.*

³¹⁵ See Seth Stern & Jim Snyder, *FBI Said to Be Probing Solyndra for Possible Account Fraud*, BLOOMBERG (Sept. 29, 2011), <http://www.bloomberg.com/news/print/2011-09-29/fbi-said-to-be-probing-solyndra-for-possible-accounting-fraud.html>.

³¹⁶ See Jacqueline Palank, *Trustee Brings FBI, Accounting Experience to Solyndra Probe*, WALL ST. J. BLOGS (Mar. 27, 2012, 12:23 PM), <http://blogs.wsj.com/bankruptcy/2012/03/27/trustee-brings-fbi-accounting-experience-to-solyndra-probe/>.

³¹⁷ Neilson Report, *supra* note 213, at 3, 4. For example, one finding of the report was that all legal and consulting fees were reasonable. *Id.* at 180–81.

investigations into Solyndra and the DOE LGP in general.³¹⁸ The House Energy and Commerce Committee (“HEC Committee”) chaired by Representative Fred Upton and its Subcommittee for Oversight and Investigations (“OI Subcommittee”) have held a number of hearings and published their findings on Solyndra.

The House Committee on Oversight and Government Reform (“OGR Committee”), chaired by Representative Darrell Issa, and its Subcommittee on Regulatory Affairs, Stimulus Oversight and Government Spending (“RASOG Subcommittee”), have also held hearings and conducted investigations regarding the DOE LGP. This committee’s hearings covered loan guarantee recipients other than Solyndra.

Much of the focus of these hearings has been to probe possible connections between the White House’s involvement in the review process to make a final loan guarantee commitment to Solyndra and significant political contributors to President Obama and Democratic Party interests who were connected with Solyndra. As a result of the Solyndra saga, some members of Congress even called for DOE Secretary Chu’s resignation.³¹⁹

1. Partisanship

Much of the media coverage of Solyndra has focused on the negative impact on the Obama Administration.³²⁰ Many reports have focused on whether loan guarantees were issued based on political contributions,

³¹⁸ One hearing was before the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce. See *Solyndra and the DOE Loan Guarantee Program: Hearing Before the Subcomm. on Oversight and Investigations of the H. Comm. on Energy and Commerce*, 112th Cong. (2011) (statements of Jeffrey Zients, Deputy Director, OMB; and Jonathan Silver, Executive Director, Dep’t of Energy Loan Programs Office), available at <http://archives.republicans.energycommerce.house.gov/hearings/hearingdetail.aspx?NewsID=8897>. The other was a full committee hearing of the Senate Committee on Energy and Natural Resources. See *Full Committee Hearing: Allison Report on DOE Loan Guarantee Program, Hearings and Business Meetings*, U.S. SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES, available at <http://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?ID=d0867c7a-9cca-4f12-8bb9-57d0fa02ab58>.

³¹⁹ Bonner R. Cohen, *Solyndra Scandal Widens, Chu Pressured to Resign*, HEARTLANDER (Nov. 19, 2011), <http://news.heartland.org/newspaper-article/2011/11/19/solyndra-scandal-widens-chu-pressured-resign>; Ben Geman & Andrew Restuccia, *Rep. Barton: Chu Could Be ‘Fall Guy’ on Solyndra*, THE HILL (Nov. 17, 2011, 2:15 PM), <http://thehill.com/blogs/e2-wire/e2-wire/194341-barton-chu-may-be-fall-guy-on-solyndra>.

³²⁰ Yuki Noguchi, *Solyndra Flop May Cost Taxpayers, Embarrass Obama*, NPR RADIO BROADCAST (Sept. 15, 2011), <http://www.npr.org/2011/09/15/140489033/solyndra-flop-may-cost-taxpayers-embarrass-obama>.

whether there was improper favoritism shown to Solyndra by the Obama Administration (often referred to as crony capitalism), highlighted the failure of government in serving as a venture capitalist, and on the failure of renewable energy to serve as an alternative to fossil fuel-based energy.³²¹ Heightened scrutiny of the DOE's program following the Solyndra debacle may have impacted the DOE's decision-making when selecting recipients for loan guarantee commitments.³²²

The tenor of dialogue in the Congressional investigations, hearings, press releases, and even news reports from the majority and minority positions on these committees reflected a deep partisan divide on the portrayal of what happened to Solyndra and who is to blame.³²³ The OGR and HEC Committees have been accused of conducting partisan politics with investigations and hearings on the DOE LGP. For example, the ranking OGR Committee member, Rep. Elijah Cummings, even asserted prior to the March 20, 2012, hearing that the OGR Committee had started eleven investigations based on "unsubstantiated allegations that proved inaccurate."³²⁴

Given the allegations of partisanship, this Article will avoid an undue focus on the substance of these proceedings. However, it will address Solyndra's restructuring in February 2011, and the DOE's analysis of its right to approve this restructuring. This matter was addressed in an OI Subcommittee hearing in November 2011.³²⁵ This Article will also briefly

³²¹ See, e.g., *Department of Energy "Junk Loans" and Cronyism—Intro*, GREEN CORRUPTION (Apr. 28, 2012), <http://greencorruption.blogspot.com/2012/04/green-corruption-department-of-energy.html#.UKam74Zx6Vo>; Marita Noon, *The Special Seven: Obama's Green-Energy Crony-Corruption Story, Part IV*, CONSERVATIVE ACTION ALERTS (Sept. 20, 2012), <http://www.conservativeactionalerts.com/2012/09/the-special-seven-obamas-green-energy-crony-corruption-story-part-iv/>.

³²² See Eric Wesoff, *Update: SolarCity and SolarStrong Lose to a Congress with Solyndra Fever*, GREENTECH MEDIA (Sept. 23, 2011), <http://www.greentechmedia.com/articles/read/Update-SolarCity-and-SolarStrong-Lose-to-Congress-and-Solyndra-Fever/> (SolarCity had planned to partner with military housing developers and install solar panels on as many as 160,000 rooftops to produce up to 371 MW of additional electric capacity, but was unable to reach the finish line to receive a conditional commitment from DOE).

³²³ See, e.g., *White House Lashes Out at Congress Over 'Partisan' Solyndra Investigation*, CNSNEWS (Nov. 10, 2011), <http://cnsnews.com/news/article/white-house-lashes-out-congress-over-partisan-solyndra-investigation>.

³²⁴ Jim Snyder, *Democrat Says Issa Hasn't Shown 'Scandal' in Energy Loans*, BLOOMBERG (Mar. 19, 2012, 3:05 PM), <http://www.bloomberg.com/news/2012-03-19/democrat-says-issa-hasn-t-shown-broad-scandal-in-energy-loans.html>.

³²⁵ See generally *The Solyndra Failure: Views from DOE Secretary Chu, Hearing Before the Subcomm. on Oversight and Investigations of the H. Energy and Commerce Comm.*, 112th Cong. (2011), available at <http://archives.republicans.energycommerce.house.gov/hearings/hearingdetail.aspx?NewsID=9090>.

address testimony given by Dr. Veronique de Rugy about loan guarantee programs before the RASOG Subcommittee in March 2012.³²⁶

2. Solyndra February 2011 Restructuring

The OI Subcommittee focused on the DOE's role in the Solyndra matter. One issue on which the Subcommittee focused was whether the DOE's approval of the terms of the Solyndra restructuring in February 2011 was within its legal authority, and whether the DOE could take such action without the approval of the Department of Treasury.³²⁷ The subcommittee staff report focused on language from the DOE's final rule in 2009, about Treasury's role in any loans made and changes to such loans.³²⁸

As detailed in Solyndra's Chapter 11 first day filings, all parties (secured lenders, the DOE, and existing equity investors) agreed to a restructuring in February 2011 that provided first priority security interests to existing investors serving as new lenders for \$69.3 million, plus accruing interest, costs and expenses (approximately \$75 million at the time of the bankruptcy filing).³²⁹ The FFB's loan was subordinated to this new \$69.3 million facility in right of payment and collateral liquidation. The effect of this new intercreditor arrangement meant that in the event that lenders sought payment from Solyndra by enforcement against Solyndra's assets, the first \$69.3 million in principal (plus associated interest and expenses) recovered from Solyndra and its assets would be applied to this facility first.³³⁰ After the new facility was paid off, FFB and the DOE could then recover the next \$150 million of collateral security, and then could

³²⁶ *The Obama Administration's Green Energy Gamble Part II: Were All the Taxpayer Subsidies Necessary?: Hearing Before the Subcomm. on Regulatory Affairs of the H. Comm. on Oversight and Gov't Reform*, 112th Cong. (2012) (testimony of Veronique De Rugy, Senior Research Fellow, Mercatus Center at George Mason Univ.) [hereinafter De Rugy Testimony], available at <http://oversight.house.gov/wp-content/uploads/2012/06/DeRugy-Testimony.pdf>.

³²⁷ Memorandum from the House Committee on Energy and Commerce, *The Solyndra Story*, 112th Cong. 2, 12–13 (2011) [hereinafter Solyndra Story Memo], available at <http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/20110914solyndra.pdf>.

³²⁸ H. SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS, MAJORITY STAFF REPORT, *THE SOLYNDRA FAILURE* 103, 105 (2012), available at <http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/20120802solyndra.pdf>.

³²⁹ See Declaration of W.G. Stover, Jr., *supra* note 274, at ¶¶ 16–24 (describing the February 2011 restructuring, the intercreditor priority arrangements among the lenders and the secured debt burden of the company).

³³⁰ See Neilson Report, *supra* note 213, at 177.

recover an additional \$385 million against the collateral security.³³¹ The final tranche of lenders could recover another \$186 million against the collateral security.³³² The total aggregate secured debt was about \$783 million.³³³ This debt burden proved to be crushing for Solyndra and it was not able to obtain additional financing to continue operations.³³⁴

It is not unusual in distressed situations for the parties involved, both secured and unsecured creditors and equity investors, to make hard decisions and compromise their positions (particularly creditors) to allow a business to continue operating. While secured lenders have the best position, they are often forced to make concessions, such as lending additional money, foregoing default interest, or permitting existing or additional security to be shared with other parties, in order to have equity investors contribute more money to a struggling business. Although lenders are not well positioned, they do not have a strong desire to foreclose on their security and become owners. Therefore, lenders must be thoughtful in determining when to maintain their security interests and when compromising may yield a better recovery in the long term. Lenders' decisions are often based on their view of whether a company can be turned around. Of course, there is no guarantee that even after a restructuring a business will be able to recover and prosper.

This Article does not propose to answer whether the DOE correctly interpreted its authorizing statute regarding its authority to agree to the Solyndra restructuring. Nor does this Article answer whether the DOE properly interpreted the role of Treasury as merely consultative. However, it should be noted that the DOE's interpretation of permissible collateral security to be taken in connection with a loan guarantee commitment, as well as the DOE's flexibility in amending the terms of any guaranteed financing as part of a restructuring or workout, remained consistent prior to and after Solyndra's restructuring and its bankruptcy.

The OI Committee staff report and hearing focused on a memorandum prepared by the LGP Office's chief counsel supporting the DOE's position on the Solyndra restructuring.³³⁵ It did not appear that any

³³¹ *See id.* at 128.

³³² *Id.*

³³³ *See id.*

³³⁴ *See* Declaration of W.G. Stover, Jr., *supra* note 274, at ¶¶ 16–22; *see also* Matthew Daly, *Solyndra Bankruptcy: Obama Administration Considered Bailout*, HUFFINGTON POST (Nov. 2, 2011, 11:28 PM), http://www.huffingtonpost.com/2011/11/02/solyndra-bankruptcy-obama-administration-bailout_n_1072737.html.

³³⁵ Memorandum for the General Counsel from Susan S. Richardson on Solyndra Restructuring (Feb. 15, 2011), *available at* <http://assets.nationaljournal.com/pdf/111014>

Congressional committee reports or hearings focused on the DOE's implementing regulations when trying to address the intent of the Title XVII statutory provisions, even though the committee's staff report directly referenced the DOE's final revised rule.³³⁶

The DOE revised its 2007 regulations interpreting § 1702(d) and other provisions of Title XVII in December 2009.³³⁷ The focus of the DOE's changes in this revised final rule included, among other things, revisions to the DOE's requirements for collateral sharing, as well as *pari passu* treatment for unsecured debt tranches and equity contributions.³³⁸ In the 2009 final rule summary, the DOE states its view on the statutory intent that "[s]ection 1702(d) addresses certain threshold requirements that must be met before the guaranty is made; and section 1702(g) addresses the Secretary's rights in the case of default of the loan."³³⁹ The DOE further interprets the statutory language in 1702(d) as not even requiring the DOE take a security interest in collateral:

First, it should be borne in mind that nowhere does section 1702 itself require that the Secretary receive a first lien on all project assets as a condition of his ability to make a loan guarantee. Instead the statute requires only that the Secretary's guaranteed obligation "not be subordinate to other financing." In fact, section 1702 does not require that the lender or the Secretary receive any collateral as a statutory requirement for making a loan guarantee.³⁴⁰

The DOE's explanations for the final rule in December 2009 are not dispositive as to statutory interpretation. However, they offer insight into the DOE's view as early as 2009 and provide the public and Congress with notice of how the DOE viewed the authorizing statute and how the DOE intended to interpret and implement the legislation. Thus, Congress

_SolyndraMemo1.pdf (interpreting § 1702(d)(3) of Title XVII to be a condition precedent to issuing loan guarantees, not an ongoing requirement).

³³⁶ See Solyndra Story Memo, *supra* note 327, at 2.

³³⁷ Loan Guarantees for Projects That Employ Innovative Technologies, 74 Fed. Reg. 63,544 (Dec. 4, 2009) (to be codified at 10 C.F.R. pt. 609).

³³⁸ *Id.*; see also Title XVII Paper, *supra* note 241, at 63, 64. Some of the comments of the PF authors were items that DOE updated in this December rulemaking to ensure DOE's regulations were consistent with the project finance market practice as well as applicable to structures used for renewable and clean energy transactions.

³³⁹ Loan Guarantees for Projects That Employ Innovative Technologies, 74 Fed. Reg. at 63,545 (Dec. 4, 2009).

³⁴⁰ See *id.*

had ample opportunity prior to the Solyndra restructuring to refine the DOE LGP authorizing legislation if the DOE's regulatory interpretation was inconsistent with Congress's view.³⁴¹

F. Distinguishing Solyndra—Manufacturing Risks

Despite the politically salacious tale the Solyndra story has offered, most DOE LGP loan guarantee recipients will not be “Solyndras,” because they are not of the same ilk. Solyndra, as a manufacturing company, faced different risks than many other loan guarantee recipients, which are generation projects.³⁴² As previously discussed, Solyndra faced significant market pressures in its capacity as a solar panel manufacturer.³⁴³ Missteps by Solyndra's management did not help matters.³⁴⁴ These market pressures on panel prices did not and do not harm REEGI projects. Ironically, the difficulties faced by all solar panel manufacturers, both in the United States and abroad, have been a boon to purchasers of solar panels—like solar power plants—who have benefitted from the precipitous drop in solar panel costs.³⁴⁵ This highlights just one of many schisms within the REI.³⁴⁶

One of the DOE's mandates was to provide broad support to manufacturing projects.³⁴⁷ The risks present in manufacturing projects are great on their own accord. Add to this the DOE's requirement to fund innovative projects for which there is no ready market, because a particular technology in the REI has not been commercialized yet.³⁴⁸ The risk inherent in this type of project is vastly greater than a REEGI project which can demonstrate firm offtake contracts for its generated power throughout the term of the loan guaranteed by the DOE.

³⁴¹ See *id.* at 63,549 (notifying Congress of the issuance of the final rule).

³⁴² See *Our Projects, Loan Programs Office*, DEP'T OF ENERGY, http://lpo.energy.gov/?page_id=45 (identifying the majority of recent recipients as generation projects).

³⁴³ See Gat, *supra* note 297 (discussing the market challenges that affected manufacturers of solar energy products).

³⁴⁴ See Chernova, *We Made Two Major Mistakes*, *supra* note 286.

³⁴⁵ See Russell Gold, *Wind, Solar Energy Still Face Big Hurdles—Solar Gains Traction, Thanks to Subsidies*, WALL ST. J., Mar. 31, 2011, at B1 (discussing general drop in pricing and consumer trends to install panels with assistance of federal and state subsidies in addition to reductions in panel prices. Utility scale developers have also benefitted from the drop in panel prices).

³⁴⁶ The diverse groups within the broader REI complicate the ability to craft a coherent framework of incentives even for just the REEGI to reach grid parity and long term sustainability without incentives, as I will discuss in a future work.

³⁴⁷ ARRA of 2009, § 406, 42 U.S.C. § 16516(a) (Supp. IV 2010).

³⁴⁸ *Id.* § 16513(a)(2).

1. Post-Solyndra Troubles

More DOE loan guarantee recipients have run into financial troubles, filed for bankruptcy, or simply undergone Congressional scrutiny since Solyndra's bankruptcy. The loan guarantee recipients that are in financial trouble or in bankruptcy are all similar to Solyndra in that they are manufacturing projects employing or developing innovative technologies.

Beacon Power Corporation filed a voluntary Chapter 11 petition on October 30, 2011.³⁴⁹ Beacon Power designs, develops, and produces fast-responding flywheel-based energy storage systems with the goal of aiding the reliability to electrical grids, particularly in connection with renewable energy resources.³⁵⁰ On the date of Beacon's bankruptcy filing, it listed \$72 million in assets and \$47 million in liabilities.³⁵¹ The list of its 20 largest unsecured creditors was comprised mainly of trade creditors with all but the three largest creditors owed less than \$100,000.³⁵² Beacon Power filed a motion to consolidate three affiliates into a single filing, but otherwise did not file significant first day motions.³⁵³ When Beacon Power filed for bankruptcy, its executives made a point to state that Beacon was not Solyndra.³⁵⁴ Beacon Power's business was attractive enough that it was able to find a buyer for most of its assets out of bankruptcy in February 2012.³⁵⁵ The DOE is expected to recover seventy percent of its loan guarantee.³⁵⁶ Beacon is similar to Solyndra in that it also researches and manufactures an innovative technology product. It differs from Solyndra,

³⁴⁹ Dawn McCarty, *Beacon Power, Backed by U.S. Loan Guarantees, Files Bankruptcy*, BLOOMBERG BUSINESSWEEK (Oct. 31, 2011), <http://www.businessweek.com/news/2011-10-31/beacon-power-backed-by-u-s-loan-guarantees-files-bankruptcy.html>.

³⁵⁰ *Id.*

³⁵¹ *Id.*

³⁵² Voluntary Petition, Consolidated List of Twenty Creditors Holding Largest Unsecured Claims, *In re* Beacon Power Corp. et al., No. 11-13450-KJC (Bankr. Del. 2011), available at http://www.stewartlaw.pro/site_files/documents/beacon_power.pdf.

³⁵³ *See id.* Beacon Power Corporation, Stephentown Holding LLC and Stephentown Regulation Services LLC sought to be combined into a single filing on Beacon Power's voluntary petition. Of the list of 20 largest unsecured creditors of the entity, Beacon listed, Beacon listed 18 trade creditors and two professional creditors, with just over half of the \$1.6 million owed to these creditors going to the trade creditors and the balance to professional creditors.

³⁵⁴ Martin LaMonica, *Beacon Power: We're Broke, But We're No Solyndra*, CNET NEWS (Nov. 1, 2011, 2:04 PM), http://news.cnet.com/8301-11128_3-20128637-54/beacon-power-were-broke-but-were-no-solyndra/.

³⁵⁵ Martin LaMonica, *DOE-Backed Beacon Power Finds Buyer Post-Bankruptcy*, CNET NEWS (Feb. 6, 2012, 2:49 PM), http://news.cnet.com/8301-11386_3-57372189-76/doe-backed-beacon-power-finds-buyer-post-bankruptcy/.

³⁵⁶ *Id.*

because it is not in the solar panel industry, which is under great stress globally. Its technology is also sufficiently unique and still marketable, so Beacon was able to find a turnkey buyer for the business.³⁵⁷

Abound Solar, another solar panel manufacturer, filed for bankruptcy on June 28, 2012, and announced it would liquidate.³⁵⁸ Abound Solar had ceased production at the manufacturing plant it had constructed and was working to create a next generation panel prior to filing for bankruptcy.³⁵⁹ Abound Solar is similar to Solyndra because it was in the same solar panel manufacturing industry and has also fallen victim to the price and trade wars for its product.

Outside the realm of direct loan guarantee programs, Fisker Automotive, an ATVM Program loan recipient, has also received significant attention as the DOE has suspended further draw-downs on its loan for failure to meet milestones.³⁶⁰ Some media reports have questioned whether Fisker would produce cars at the Delaware plant for which it received the DOE loan for construction.³⁶¹ While not a loan guarantee recipient, Fisker is similar to Solyndra in that it is a manufacturer. As an automaker, Fisker does not have guaranteed sales to mitigate the risks with building a manufacturing facility, and thus faces inherently greater risks than REEGI loan guarantee recipients. Fisker is, however, similarly situated to other ATVM loan recipients, each of which is an auto manufacturer.³⁶² Fisker's loan commitment represents six percent of the aggregate ATVM portfolio, based on Fisker's aggregate loan commitment.³⁶³ Based on the \$200 million actually advanced to Fisker, Fisker's loans represent 2.4 percent of the aggregate ATVM portfolio.³⁶⁴

In addition to projects in financial difficulty, the OGR Committee and RASOG Subcommittee have focused on other loan guarantee recipients during Congressional hearings and investigations.³⁶⁵ The Committee

³⁵⁷ *Id.*

³⁵⁸ See Humer et al., *supra* note 307; Wald, *supra* note 307.

³⁵⁹ Wald, *supra* note 307.

³⁶⁰ See Matthew Mosk, *Fisker May Never Build Electric Cars in US*, ABC NEWS: THE BLOTTER (May 30, 2012), <http://abcnews.go.com/Blotter/fisker-build-electric-cars-us/story?id=16458585#>.

³⁶¹ *See id.*

³⁶² *Our Projects*, Loan Programs Office, U.S. DEPT OF ENERGY, https://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013) (listing five auto manufacturers as the ATVM recipients).

³⁶³ *Id.*

³⁶⁴ See Mosk, *supra* note 360.

³⁶⁵ See *The Obama Administration's Green Energy Gamble Part II: Were All the Taxpayer Subsidies Necessary?: Hearing Before the Subcomm. on Regulatory Affairs of the H. Comm. on Oversight and Gov't Reform*, 112th Cong. (June 19, 2012) [hereinafter *Green Energy*].

and Subcommittee have asked questions about a number of projects, including ones owned or developed by First Solar, NRG, BrightSource Energy, Prologis, and Abengoa Solar.³⁶⁶ The subject matter, testimony, questioning, and commenting during these Congressional hearings has been wide-ranging. One recurring theme has been whether improper political favors were employed to secure loan guarantee commitments by certain recipients.³⁶⁷ These allegations and the integrity of the DOE LGP application process is beyond the scope of this Article. However, this Article would not be complete without referencing these inquiries and allegations.

2. REI vs. REEGI Loan Guarantees

The structure of and risks associated with REI loan guarantees and REEGI loan guarantees differ. Within the broad spectrum of REI projects the DOE LGP was directed to support, REEGI projects have a lower risk profile than general REI loan guarantees.³⁶⁸ The structure of REEGI projects, whether the DOE committed to the projects under the FIPP program or as innovative technology REEGI projects, did not possess the same risks inherent in supporting innovative technology projects, especially manufacturing projects.³⁶⁹ Consistent with traditional electricity generation project finance principles, REEGI projects are structured with firm multi-year power purchase agreements to creditworthy offtakers, such as utilities, for the electricity the projects generate.³⁷⁰ The LGP Office imposed the same or greater due diligence and lending requirements that exist in traditional project finance markets, thus reducing the risk profile for the DOE through project risk mitigation for successful applicants.³⁷¹

The different risk profiles between REI and REEGI loan guarantees highlight the inconsistency in the DOE's mission, as I described in greater detail below. The DOE was required to select projects that minimized the risks of default and provided reasonable prospects for repayment. Yet at

Gamble], available at <http://oversight.house.gov/hearing/the-obama-administrations-green-energy-gamble-part-ii-were-all-the-taxpayer-subsidies-necessary/>.

³⁶⁶ See *id.*; see also Alicia Mundy & Ryan Tracy, *Solar Firm's Big Push for U.S. Loan*, WALL ST. J., June 6, 2012, at A4 (describing the lobbying efforts by BrightSource Energy to seek approval for loan guarantee, including hiring of former Biden Chief of Staff and meetings with White House officials in an effort to seek approval by DOE).

³⁶⁷ See *Green Energy Gamble*, *supra* note 365.

³⁶⁸ FIPP Solicitation, *supra* note 176, at 5.

³⁶⁹ See Appendix. The FIPP Solicitation supported renewable energy generation system projects employing commercial technologies that were ready for construction, but not for the financial crisis.

³⁷⁰ See FIPP Solicitation, *supra* note 176, at 8.

³⁷¹ See Letter from David G. Frantz, *supra* note 184.

the same time, the DOE was required to support innovative technologies across a broad spectrum of technologies with few commonalities between them.³⁷² REEGI projects, because of their structures with fully contracted offtake contracts to mitigate project risk, generally offer much lower risk profiles when compared to non-REEGI projects in the DOE LGP portfolio, such as solar manufacturing projects.³⁷³ The DOE generally faces the lowest default risk on the most stable projects, such as projects employing commercial technologies. Yet, the DOE is required to support innovative technologies, defined as technologies not yet in commercial use, which are inherently riskier projects. If such projects were low risk, they would have been financed in the private markets and implemented.

V. DOE LOAN GUARANTEE PROGRAM ANALYSIS

A. *Loan Guarantees as a Policy Tool*

Loan guarantee programs provide a versatile policy option giving government the ability to provide targeted, directed support to a small subset of projects. Loan guarantees allow for (1) correction of a market distortion, whether the distortion is caused by a single or related series of events, (2) support of a nascent or struggling industry, (3) directed benefits to a specific population, or (4) encouragement of specific private investment.³⁷⁴

When policy makers employ loan guarantee programs, the programs are more likely to succeed if they receive (1) clear guidance for the scope of the program, (2) clear expectations of the results sought from the program, and (3) a reasonable time frame to implement the program.³⁷⁵ Although loan guarantee programs may be flawed as they have so far been implemented, there is little to support critics' claims that all loan guarantees are inherently flawed.³⁷⁶ In the case of the DOE LGP, policy makers did not adequately provide any of these three parameters. Given the lack of clear

³⁷² Energy Policy Act of 2005, Pub. L. No. 109-58 § 1703(b), 119 Stat. 594, 1120 (2005).

³⁷³ See HERBERT ALLISON, REPORT OF THE INDEPENDENT CONSULTANT'S REVIEW WITH RESPECT TO THE DEP'T OF ENERGY LOAN AND LOAN GUARANTEE PORTFOLIO 22, 71 (2012) [hereinafter INDEPENDENT CONSULTANT'S REPORT], available at http://www.whitehouse.gov/sites/default/files/docs/report_on_doe_loan_and_guarantee_portfolio.pdf.

³⁷⁴ See generally Joel Darmstadter & Joshua Linn, *Loan Guarantees Reconsidered*, RESOURCES FOR THE FUTURE (2011), available at <http://www.rff.org/Publications/WPC/Pages/Loan-Guarantees-Reconsidered.aspx>.

³⁷⁵ See *supra* Part IV.D.

³⁷⁶ See Jesse Jenkins et al., *Solyndra's Failure Is No Reason to Abandon Federal Energy Innovation Policy*, FORBES (Sept. 2, 2011, 7:33 PM), <http://www.forbes.com/sites/energy-source/2011/09/02/solyndras-failure-is-no-reason-to-abandon-federal-energy-innovation-policy>.

direction, the DOE was able to craft a successful DOE LGP project portfolio in spite of its contradictory and ambiguous guidance.

B. Post-Solyndra Lessons

As described above, loan guarantees can stimulate private investment to a particular area. The Solyndra experience offers a stark reminder that commercial risks exist in any industry and credit enhancements (whether publicly or privately provided) do not mitigate the underlying commercial risks. Just like a private actor providing a loan guarantee, where the government serves as guarantor, it reduces risk to the lender and permits the borrower to obtain financing. However, the loan guarantee itself does not reduce the underlying commercial risk of the borrower's business—indeed, if the venture were not risky a guarantor would be unnecessary. As discussed above, the defaults to date in the DOE LGP portfolio are more attributable to inherent market risk than fundamental failure of loan guarantees in general.³⁷⁷ The DOE loan guarantee recipients that have filed for bankruptcy to date were all manufacturing projects. Two of the three projects were solar panel manufacturers, an industry that has undergone significant contraction in the past several years.³⁷⁸

Loan guarantees offer policymakers significant flexibility and the ability to provide targeted support. By their nature, loan guarantees do not address commercial risks of the underlying business; rather, they serve to incentivize private lenders to provide financing to the targeted industry. Government then must identify its risk tolerance to the underlying commercial risks. The LGP sought applicants that were financially viable on a stand-alone basis in an effort to mitigate the underlying commercial risks.³⁷⁹ As the DOE's prior experience demonstrates, projects will fail where there are fundamental market failures, as the DOE experienced with its synthetic fuels projects.³⁸⁰ When the underlying market conditions changed, these businesses failed.³⁸¹

³⁷⁷ See *supra* notes 342, 343, and accompanying text.

³⁷⁸ See Gat, *supra* note 297.

³⁷⁹ The LGP Office, in issuing its solicitations, required applicants demonstrate acceptable credit ratings without giving effect to the proposed loan guarantee. See FIPP Solicitation, *supra* note 176, at 9.

³⁸⁰ See also MICHAEL GRAETZ, *THE END OF ENERGY: THE UNMAKING OF AMERICA'S ENVIRONMENT, SECURITY, AND INDEPENDENCE* 120 (2011) (describing implementation of the Energy Tax Act of 1978. The Energy Tax Act included subsidies for, solar power as well as synthetic fuels. The Department of Energy ran a loan guarantee program to develop innovative technologies from the late 1970s until the 1980s). See generally Herrick, *supra* note 117, at 259–60 (describing DOE's synthetic fuel loan guarantee program).

³⁸¹ See *supra* Part IV.D.2. In the syngas period, when government incentives for this area ended, various projects failed, including those with DOE loan guarantees. Today, loan

C. *Conflicting Statutory Intent*

The conflicting Congressional mandates provided to the DOE LGP are largely responsible for the delays in the DOE LGP implementation. The initial scope of the DOE LGP was overly broad when it was first authorized. As previously discussed the original program under Section 1703 covered ten broad technology categories and was designed to support inherently risky technologies on the cusp of commercialization.³⁸² Yet, the DOE LGP also was required to select projects that showed a “reasonable prospect of repayment.”³⁸³ In contrast, Section 1705 mandated the DOE fund “commercial” rather than “innovative” technologies—commercial projects that would save and create jobs.³⁸⁴ Neither the original mandate nor the new mandate came with much guidance as to which technologies or what levels of risk would be acceptable to promote the broad field of technologies.³⁸⁵ Given that the DOE had yet to issue a single loan guarantee by the time the ARRA was enacted, this timing was quite ambitious. The DOE had to hire staff, promulgate regulations, identify professionals to assist the DOE, and draft and issue solicitations seeking applications, all before even considering the applications it would receive.³⁸⁶ The DOE then had to select appropriate 1705 Program recipients by the sunset date in September 2011. Furthermore, under its statutory directives, the successful applicants under Section 1705 had to meet specific federal environmental, prevailing wage, and Buy American requirements that applicants would not have had to satisfy in the private markets.³⁸⁷

The DOE faced a difficult task in enunciating its mission. As the GAO consistently noted, the LGP Office did not establish clear methods to evaluate projects, either at the application stage or during the ongoing monitoring stage, nor did it create clear criteria to measure project

guarantees must act in concert with other government incentives for a period, because the REI is not yet self-sustaining. Loan guarantees will not enable industries to achieve financial viability but will serve to attract financing to projects.

³⁸² See Energy Policy Act of 2005 § 1703, 42 U.S.C. § 16513 (2006); *supra* note 149 and accompanying text.

³⁸³ *Our Mission, Loan Programs Office*, U.S. DEP'T OF ENERGY, http://lpo.energy.gov/?page_id=17 (last visited Jan. 30, 2013).

³⁸⁴ See *supra* notes 146–47 (defining commercial and new/significantly improved technology). It may be argued that technology loan guarantee programs are not the best suited to create jobs, however, this is beyond the scope of this Article.

³⁸⁵ See 10 C.F.R. § 609.1, § 609.2 (offering vague definitions of eligible technologies).

³⁸⁶ See *supra* notes 153–56, and accompanying text.

³⁸⁷ See *supra* notes 185–87, and accompanying text.

performance.³⁸⁸ It is hard to envision how the DOE could possibly come up with clear and concise criteria, given the breadth of types of technologies and differing stages of projects and technologies the DOE was required to support. In some of its assessments, GAO did note that the DOE would have difficulty learning from experience, as other agencies had done when developing their loan guarantee programs, because the DOE had to devote significant amounts of time to each project and there was little if any overlap between the types of projects the DOE was required to support.³⁸⁹ Ironically, in 2008 the GAO recommended the DOE look to Fannie Mae and Sallie Mae programs as examples for well-run loan guarantee programs.³⁹⁰

For the 1705 Program loan guarantees, the DOE had a limited window to request applications, review and approve them before the September 30, 2011 sunset date.³⁹¹ Certain types of lower-risk projects, such as infrastructure projects, by their nature take a long time to develop before they are ready for financing. A REEGI project might take several years conducting site research and permitting before a developer selects the final configuration for a project.³⁹² In addition to project development, the DOE's statutory requirements, such as NEPA review, could add anywhere from six to eighteen months of additional time to any given application.³⁹³ Because of the limited time available to implement the 1705 Program, the DOE naturally turned to applicants who had previously

³⁸⁸ See KEY STEPS NEEDED, *supra* note 153, at 27, 36; U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-07-798T, *supra* note 231 and accompanying text.

³⁸⁹ See GAO RECOMMENDATIONS, *supra* note 141, at 2.

³⁹⁰ See *id.* The GAO's recommendation for the DOE to examine Fannie Mae's loan guarantee program for its clear performance metrics and streamlined loan guarantee process was ironic. About three months after the GAO's report, Fannie Mae (the Federal National Mortgage Association) and its sister government sponsored enterprise, Freddie Mac (Federal Home Loan Mortgage Corporation) experienced massive losses and had to be taken over by the Federal government and placed into conservatorship.

³⁹¹ 1705, *Loan Programs Office*, U.S. DEP'T OF ENERGY, http://lpo.energy.gov/?page_id=41 (last visited Jan. 30, 2013).

³⁹² For example, for wind generation, developers set up testing equipment to measure wind speed in various locations and track results over any extended period of time, because wind can change seasonally. Likewise, solar projects must determine how much sun a location gets. Geothermal projects likely take the most time, as land options must be obtained, then test wells bored to assess whether a particular area has sufficient steam—much like exploration for any other underground natural resource. See, e.g., Joshua Moss, *Wind Energy in Michigan*, MICHIGAN POLICY NETWORK (May 6, 2012), http://www.michiganpolicy.com/index.php?option=com_content&view=article&id=1199:wind-energy-in-michigan&catid=39:energy-and-environment-policy-briefs&Itemid=138.

³⁹³ NEPA TASK FORCE REPORT TO CEQ, MODERNIZING NEPA IMPLEMENTATION 66 (2003), available at <http://ceq.hss.doe.gov/ntf/report/finalreport.pdf>.

applied under the 1703 Program to the extent these applicants also qualified under the 1705 Program, thus expediting the DOE's ability to review these existing applications.

In addition to the timing constraints, the significant costs to companies of application to the DOE LGP (in terms of time, money, and uncertainty) limited the number and type of applicants to the program.³⁹⁴ The applicants were self-selecting and had to be of significant enough size to bear these costs. A majority of the final projects were REEGI projects, whether funded as innovative technology projects or commercial technology projects under the partial guarantee FIPP solicitation.³⁹⁵

The LGP Office also supported manufacturing sector projects like Solyndra, Abound Solar, and Beacon Power. These were the largest commitments to manufacturing projects supported by the DOE LGP.³⁹⁶ As discussed above, while manufacturing projects were attractive because they most easily met the mandate for creating new jobs or protecting existing ones, they are inherently more risky. That risk comes from the fact that there is not a long-term offtake contract for the sale of manufactured goods—not necessarily from the underlying technology.³⁹⁷ However risky such projects might have been, the DOE was directed to support manufacturing ventures as well as REEGI projects.

Much of the continuing criticism of the DOE LGP is whether the DOE met its objectives. It may be easy to point to Solyndra as “proof” that the DOE has failed, but to do so is both unfair and unfounded. Unfair in that the DOE never received clearly defined goals from Congress.³⁹⁸ Unfounded in that the DOE LGP has been able to succeed in using federal commitments to attract private investment to and financing of the REI that otherwise might not have occurred absent DOE support.³⁹⁹

³⁹⁴ *Our Projects, Loan Programs Office*, U.S. DEPT OF ENERGY, http://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013) (listing only 2-1703 Program projects, 26-1705 Program projects and 5 ATVM projects approved for guarantees).

³⁹⁵ *See id.* Of the 33 projects guaranteed, at least half were generation projects. *See also*, FIPP Solicitation, *supra* note 176, at 5–8 (providing for generation projects' eligibility but excluding manufacturing projects).

³⁹⁶ *Our Projects, Loan Programs Office*, U.S. DEPT OF ENERGY, https://lpo.energy.gov/?page_id=45/ (last visited Jan. 30, 2013). In addition to Solyndra and Abound Solar, the LGP Office also supported two other solar manufacturers: 1366 Technologies, Inc. and SoloPower.

³⁹⁷ *See* INDEPENDENT CONSULTANT'S REPORT, *supra* note 373, at 22, 71 (discussing how generation projects lend themselves to steady offtake contracts).

³⁹⁸ *See supra* notes 144, 145, and accompanying text.

³⁹⁹ *See, e.g., Eligibility, Loan Programs Office*, U.S. DEPT OF ENERGY, https://lpo.energy.gov/?page_id=31 (last visited Jan. 30, 2013).

In spite of the fractured and disjointed directives for the DOE LGP, it has managed to produce a relatively stable loan portfolio to date, notwithstanding the criticism of the program. The DOE LGP has a loan portfolio heavily weighted with lower risk REEGI projects.⁴⁰⁰ The DOE provided significant support under the FIPP solicitation, in which the DOE provided eighty percent partial loan guarantees to lender applicants, thus sharing project risk with lenders.⁴⁰¹

1. Responses to Common Critiques of the DOE LGP

There have been many critics of the DOE LGP, especially post-Solyndra.⁴⁰² Some focus on the failures of Solyndra specifically,⁴⁰³ while others have broad critiques of loan guarantees. Still others are generally opposed to any government incentives, whether tax incentives, loan guarantees, or other forms of federal credit support to the REI.⁴⁰⁴

⁴⁰⁰ See *Our Projects*, Loan Programs Office, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=45 (last visited Jan. 30, 2013).

⁴⁰¹ FIPP Solicitation, *supra* note 176, at 8. It would be instructive to consider whether partial risk loan guarantee programs generally lower default rates more than comprehensive guarantee programs, perhaps because of additional private lender due diligence. Evaluating this would be complicated, given the different intent of various loan guarantee programs.

⁴⁰² See Naureen S. Malik & Cassandra Sweet, *Proposal Aims to Gut DOE Loan Program*, WALL ST. J., Mar. 30, 2011, <http://online.wsj.com/article/SB10001424052748703806304576232712438183564.html> (describing a Republican House Budget proposal seeking to cut the \$41 billion loan guarantee program included in the President's FY2012 budget. The article quoted Rob Gillette, then CEO of First Solar, "The DOE loan program provides an important financing 'bridge' at a time when the U.S. private debt markets have little to no experience financing first of their kind utility-scale solar projects." The CFO of NRG Energy, Inc. was quoted, "Without the federal loan guarantee program, private-sector capital earmarked for this and other clean-energy projects will stay on the sidelines.").

⁴⁰³ See, e.g., *The No More Solyndras Act (H.R. 6213)*, HOUSE ENERGY & COMMERCE COMMITTEE (Sept. 10, 2012), <http://energycommerce.house.gov/fact-sheet/no-more-solyndras-act-hr-6213>. Some members of Congress have recommended limiting or defunding the program in its entirety. As recently as July 2012, Congressman Upton introduced legislation he termed the "No More Solyndras Act." *Congressional Republicans Target Clean Energy Loan Guarantee Programs*, PLATTS (July 10, 2012, 2:45 PM), <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/ElectricPower/6453353>.

⁴⁰⁴ See Autumn Hanna, *Department of Energy: Loan Guarantee Program Overview*, TAXPAYERS FOR COMMON SENSE (Apr. 2011), available at C. As of the date of publication, groups prepared summaries and tables outlining the appropriations for the 1703 and 1705 Programs, as well as noting the differences between parties regarding continued support for the program. *But see* Jenkins et al., *supra* note 376 (arguing that Solyndra is a small part of the entire LGP portfolio, that the leverage the government has provided is essential to bridge the Valley of Death, and that we should redouble our efforts to support innovation lest the United States gets left behind).

Some of the most vocal critiques of the DOE LGP can be described as variations of the positions first set forth by Henry Hazlitt. Mr. Hazlitt wrote in 1946 of the dangers of government involvement in the private sector, focusing on the view that government investment distorts private investment, deprives government investment to other sources, and results in an improper reallocation of wealth.⁴⁰⁵

Critics of the DOE LGP generally repeat the same arguments Mr. Hazlitt noted in 1946. Mr. Hazlitt's *Economics in One Lesson* is a classic exposition of the Austrian School of Economics, a cornerstone for libertarian tenets, and an excellent book.⁴⁰⁶ There is certainly a basis for Hazlitt's arguments about credit diverting production.⁴⁰⁷ However, applying Hazlitt's theoretical critiques to this modern day program, over a half century after Hazlitt published his work, is not as straightforward as critics might suggest. The debate over the merits or pitfalls of loan guarantees for REI projects does not neatly fit into Mr. Hazlitt's theoretical example of government loan guarantees to a farmer who would not otherwise qualify for loans in the private market.⁴⁰⁸ Mr. Hazlitt assumes a market exists in which private lenders are available and are lending money to farmers, except for one farmer.⁴⁰⁹ In his example, the government elects to provide a loan guarantee subsidy to the one farmer who is unable to get financing from private capital.⁴¹⁰ The remainder of Mr. Hazlitt's analysis focuses on the effects of government action and its consequences on other parties, all in the name of helping the one farmer.⁴¹¹

This simple example does not fit the modern day DOE LGP. First, there is not an active and robust financing market absent government guarantees, or government intervention as a more general matter. For example, when the 1705 Program was implemented, there was virtually no access to private capital.⁴¹² Second, the REI is not a simple commodity where there is a liquid market and there are multiple participants most of whom have access to capital. In other words, one company (the farmer) does not necessarily fail where the remainder of companies in the broad industry (agriculture) thrive purely on private market and private capital

⁴⁰⁵ See generally HENRY HAZLITT, *ECONOMICS IN ONE LESSON* (21979) "Government 'encouragement' to business is sometimes as much to be feared as government hostility." *Id.* at 40.

⁴⁰⁶ See *id.* at 211.

⁴⁰⁷ *Id.* at 40.

⁴⁰⁸ *Id.*

⁴⁰⁹ *Id.* at 41-44.

⁴¹⁰ *Id.* at 44.

⁴¹¹ HAZLITT, *supra* note 405, at 44.

⁴¹² See Gat, *supra* note 297, and accompanying text.

investments. There is no traditional commodity market in the REI, meaning all borrowers look alike, nor is there great depth.⁴¹³ As discussed before, one difficulty in assessing the REI is the vast and stratified nature of the field. It is not realistic to compare a solar panel manufacturer to a utility scale wind farm electrical generating facility. For at least the 1703 Program, the very focus of the DOE LGP was to support projects that had not yet reached commercial viability; therefore, they were not likely to obtain bank financing.⁴¹⁴ Third, the markets today and government impact on participation in the market is different than it was in 1946.

The arguments against loan guarantees first used by Mr. Hazlitt and repeated in one form or another by current critics include (1) the government is not well suited to pick winners and losers,⁴¹⁵ (2) federal loan guarantees socialize costs and privatize gains,⁴¹⁶ (3) loan guarantees create moral hazards,⁴¹⁷ and (4) government capital crowds out private capital through a distortion of the market.⁴¹⁸

This Part briefly describes each argument and provides a short response.⁴¹⁹ The DOE LGP is not perfect, and may deserve some criticism

⁴¹³ See Daniela Pylypczak, *Which Solar Energy ETF Is Right for You? TAN vs. KWT*, COMMODITY HQ (Oct. 12, 2012), <http://commodityhq.com/2012/which-solar-energy-etf-is-right-for-you-tan-vs-kwt/>.

⁴¹⁴ See *Eligibility, Loan Programs Office*, U.S. DEPT OF ENERGY, https://lpo.energy.gov/?page_id=31 (last visited Jan. 30, 2013).

⁴¹⁵ See, e.g., De Ruyg Testimony, *supra* note 326, at 9; see also NPR, *Marketplace Report, with Guest Speaker David Frum*, Sept. 14, 2011, available at <http://www.marketplace.org/topics/commentary/its-not-easy-funding-green> (last visited Jan. 30, 2013) (stating that government is not good at playing venture capitalist because of the competing goals government has in addition to generating a positive return).

⁴¹⁶ See, e.g., De Ruyg Testimony, *supra* note 326, at 7.

⁴¹⁷ See J.W. Verret, *No, Dude, We Don't Need More Solyndras*, WASH. TIMES (Dec. 9, 2011), <http://www.washingtontimes.com/news/2011/dec/9/no-dude-we-dont-need-more-solyndras/>; see also J.W. Verret, *Energy Secretary Chu, I Told You So on Solyndra*, TRUTH ON THE MARKET BLOG (Dec. 10, 2011), <http://truthonthemarket.com/2011/12/10/energy-secretary-chu-i-told-you-so-on-solyndra/>; Marc A. Thiessen, *Forget Bain—Obama's Public-Equity Record Is the Real Scandal*, WASH. POST (May 24, 2012), http://www.washingtonpost.com/opinions/forget-bain-obamas-public-equity-record-is-the-real-scandal/2012/05/24/gJQAXnXCnU_story.html (chronicling the many failed government loan guarantees). *But see* Jill Fitzsimmons, *Marc Thiessen Distorts Success Rate of Clean Energy Investments*, MEDIA MATTERS BLOG (May 25, 2012, 5:25 PM), <http://mediamatters.org/blog/2012/05/25/marc-thiessen-distorts-success-rate-of-clean-en/186692> (responding that private venture capital loans fail frequently too).

⁴¹⁸ See De Ruyg Testimony, *supra* note 326, at 9.

⁴¹⁹ A full law and economics analysis of each of Hazlitt's arguments is beyond the scope of this Article, but no discussion of the DOE LGP would be complete without acknowledging the discourse and offering limited responses.

with respect to its execution. However, these theoretical critiques fall short of accurately describing the problems with the DOE LGP. They are inaccurate or fail to offer policy makers constructive feedback on redressing the DOE LGP's shortcomings.

a. Government Is Not Well Suited to Pick Winners and Losers

This first argument typically begins by stating that government is not properly suited to venture capitalism and goes hand-in-hand with the argument that government is not suited to pick winners and losers.⁴²⁰ This assertion misstates both the role of loan guarantees and of venture capitalists. Venture capitalists ("VCs") invest equity in businesses that cannot be supported by public shareholders and seek a significant risk-based return on investment. In return for the prospect of a higher return, VCs typically take greater risks than other investors, so will invest in a number of businesses, knowing some will fail.⁴²¹

Additionally, the government is not an investor. The DOE, in the role of guarantor, does not take equity risk, but rather backstops secured lenders in their financings to eligible businesses. If a business defaults, the DOE is subrogated to the rights of the secured lender and would stand ahead of all equity investors, including VCs.⁴²² Equating the government to VCs is an inaccurate characterization of the DOE LGP's role in these transactions.

The argument that government is not well suited to pick winners and losers covers several fronts. One aspect of this argument addresses the moral hazard issue discussed below, on whether improper influence may be exerted to obtain government subsidies. Another aspect of this argument is whether the government may apply different criteria than the private market in choosing winners and whether this is appropriate.⁴²³ The purpose of the DOE LGP, unfortunately, was not clearly stated in its organic legislation, which has made it difficult for the DOE to clearly define its mission. With a well-stated purpose, a loan guarantee program should be able to set clear criteria for awarding applicants, thus mitigating the

⁴²⁰ See De Rugy Testimony, *supra* note 326, at 9.

⁴²¹ Fitzsimmons, *supra* note 417.

⁴²² See Memorandum for General Counsel, *supra* note 335, at 1.

⁴²³ See Hans A. von Spakovsky, *Solyndra E-mail Explodes Myth of Nonpartisan Civil Service*, NATIONAL REVIEW ONLINE (Sept. 16, 2011, 3:07 PM), <http://www.nationalreview.com/corner/277485/solyndra-e-mail-explodes-myth-nonpartisan-civil-service-hans-von-spakovsky>; see also Daniel Foster, *Treasury Audit: Solyndra Was a Rush Job*, NATIONAL REVIEW ONLINE (Apr. 4, 2012, 11:59 AM), <http://www.nationalreview.com/corner/295266/treasury-audit-solyndra-was-rush-job-daniel-foster>.

risks Mr. Hazlitt first noted. It is not possible to have an infallible program. Time will tell whether the DOE LGP portfolio has been successful in picking winners and losers.

On a related note, another critic has suggested that the DOE LGP has created economic rent-seeking behavior and therefore is not efficient. J.W. Verret asserted,

As an example of the distortionary effects of government guarantees on the private market, the Department of Energy's generous \$40 billion loan to businesses working on alternative energy technology has caused much of the venture capital industry to focus on those firms able to obtain funding through negotiations with the government rather than on firms able to germinate profitable ideas.⁴²⁴

There are certainly arguments to be made about whether incentives for renewable energy are an efficient allocation of resources. However, it is worth highlighting that Professor Verret's commentary on loan guarantees suffers from inaccuracies in the popular press. The article on which he relies for his statement about the DOE refers to direct loans made by the DOE under the ATVM program, not loan guarantee commitments under the DOE LGP.⁴²⁵ Loans and loan guarantees are not the same and in any case, neither would be considered equity. Venture capital by its very nature is at-risk equity capital. To equate Solyndra's failure with rent-seeking behavior of venture capital firms seeking ATVM loans seems misplaced. Query whether venture capital firms choosing to support businesses that secure DOE ATVM loans as a barometer of likely success is an act of economic rent seeking, if they do not seek the loans for themselves, but rather agree to invest after the DOE agrees to lend.

b. Loan Guarantees Socialize Costs and Privatize Gains

Mr. Hazlitt argued that loan guarantees socialize costs and privatize gains.⁴²⁶ The argument is that government absorbs all the losses

⁴²⁴ See J.W. Verret, *The Bailout Through a Public Choice Lens: Government Controlled Corporations as a Mechanism for Rent Transfer*, 40 SETON HALL L. REV. 1521, 1525 (2010) (considering the implications of the TARP program's equity investment in a number of private sector businesses through the lens of public choice theory, proposing that these investments are fairly novel and pose significant opportunities for rent seeking by transferring politically conferred rents to interest groups).

⁴²⁵ Neil King Jr., *Venture Capital: New VC Force*, WALL ST. J., Dec. 15, 2009, <http://online.wsj.com/article/SB126074549073889853.html>.

⁴²⁶ HAZLITT, *supra* note 405, at 45.

in a downside scenario, i.e., when the loan guarantee is called, but the lender benefits from the gains on the upside.⁴²⁷ An extension to this argument is that the bureaucrat is willing to take more risks with taxpayers' money than private business would on its own and therefore takes on excessive risks.

The first element of this argument that costs are socialized—spread across the taxpayers—is correct, but the aggregate cost depends on the amount not recovered on any particular defaulted loan. The DOE LGP's loan guarantees are subrogated to the guaranteed lenders' security interests.⁴²⁸ To the extent there is a default on the loan and the DOE must pay on a loan guarantee, the DOE then gains the rights of the guaranteed lenders and can seek recovery from the borrower.⁴²⁹ Taxpayers bear losses to the extent the DOE is not able to make a full recovery on the loan. However, under OMB guidelines, the DOE is required to collect the CSC from each applicant under the 1703 Program equal to the net present value of the aggregate potential cost to the tax payer on a discounted cash flow basis of a potential loan default.⁴³⁰ This borrower pay requirement results in the borrower, not the taxpayer, bearing potential costs.

The second element of this argument is that gains are privatized.⁴³¹ Presumably, this refers to the benefit the private lender receives by making a virtually risk-free loan guaranteed by the government. This theoretical argument fails when actually applied to the DOE LGP, because pursuant to OMB Circular A-129 guidelines, the lender for one-hundred percent loan guarantees is the Federal Financing Bank.⁴³² Thus, in practice, one-hundred percent loans are therefore socialized gains, rather than privatized gains. Partial risk guarantees, such as the eighty percent FIPP solicitation, would result in privatized gains to lenders for the guaranteed portion of their loans.⁴³³ However, there are policy reasons that such guarantees may be beneficial, notwithstanding the privatized gains, such as the additional diligence provided by private lenders with money at risk in the transaction.

⁴²⁷ *Id.*

⁴²⁸ See Memorandum for the General Counsel, *supra* note 335.

⁴²⁹ Larry Parker & Mark Holt, CONG. RESEARCH SERV., RL33442, NUCLEAR POWER: OUTLOOK FOR NEW U.S. REACTORS CRS-11 (2007), available at <http://www.fas.org/sgp/crs/misc/RL33442.pdf>.

⁴³⁰ See *supra* note 207.

⁴³¹ See HAZLITT, *supra* note 405, at 45; De Ruyg Testimony, *supra* note 326, at 7.

⁴³² CIRC. A-129, *supra* note 116, at II3f.

⁴³³ See FIPP, *FIPP Hooray . . . ?*, *supra* note 189.

Another perspective of the privatized gains argument would state that the company receiving the benefit of the loan guarantee has privatized gains that it does not share with government. In the private market, a guarantor would likely receive an equity stake in exchange for providing a guarantee and that gain is not provided to the government.⁴³⁴ Setting aside whether the guarantee fee charged is sufficient,⁴³⁵ the privatizing gains argument overlooks the policy reasons to have loan guarantees—to promote growth and sustainability of technologies in clean and renewable energy with the goal of reducing greenhouse gas emissions and reducing dependence on foreign oil imports.⁴³⁶ When projects succeed, these broader policy purposes are advanced, not simply the gains made by the company's owners.

c. Loan Guarantees Create Moral Hazards

The argument is that beneficiaries of loan guarantees, lenders, have a moral hazard in that they are likely to take greater risks in the loans they make when they receive loan guarantees. As noted above, OMB has addressed this in its policies by having loans with one-hundred percent loan guarantees by made by the FFB, rather than fully guaranteeing private lenders.⁴³⁷

The moral hazard argument includes concerns that bureaucrats and politicians will be influenced to award government favors, such as loan guarantees as patronage. This argument has received the most widespread attention, with many allegations that supporters and fundraisers of President Obama were loan guarantee recipients or received special treatment, because of their status.⁴³⁸ Whether improper actions occurred under the DOE LGP is still under investigation.⁴³⁹ As of this writing, the author

⁴³⁴ See INDEPENDENT CONSULTANT'S REPORT, *supra* note 373, at 18.

⁴³⁵ In addition to the CSC that the DOE and OMB calculate, the DOE also charges applicants a separate guarantee fee.

⁴³⁶ See *Our Mission, Loan Programs Office*, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=17 (last visited Jan. 30, 2013).

⁴³⁷ STAFF OF H. COMM. ON OVERSIGHT AND GOVERNMENT REFORM, 112th Cong., REP. ON THE DEP'T OF ENERGY'S DISASTROUS MANAGEMENT OF LOAN GUARANTEE PROGRAMS n.105 (2012), available at <http://oversight.house.gov/wp-content/uploads/2012/03/FINAL-DOE-Loan-Guarantees-Report.pdf>.

⁴³⁸ See, e.g., Lachlan Markay, *Report: 80% of DOE Green Energy Loans Went to Obama Backers*, FOUNDRY (Nov. 14, 2011, 10:43 AM), <http://blog.heritage.org/2011/11/14/report-80-of-doe-green-energy-loans-went-to-obama-backers/>.

⁴³⁹ Press Release, H. Comm. on Energy and Commerce, Committee Leaders Probe DOE's Knowledge of Loan Recipient's Faulty Solar Panels—Now-Bankrupt Abound Awarded

is not aware of any individual or firm having been criminally charged or indicted for their involvement in the award of any loan guarantee under the DOE LGP.

There is always a risk that favoritism is a factor when an award is made. For the DOE LGP, the only way to mitigate this concern would be a clear and transparent review and approval process for loan guarantee applicants. As noted earlier, the review process by the LGP Office and then OMB was lengthy, uncertain, and not transparent. It would be beyond the scope of this Article to discuss whether improprieties occurred, but the review process may have needed significant improvement.⁴⁴⁰

Another element of the moral hazard argument could be that government involvement stifles private capital investment and finance. Where government guaranteed loans are available, lenders will flock to these and will avoid non-guaranteed loans, and in this manner may create a moral hazard for lenders to put risks on the government. Certainly, lenders will or should charge a lower interest rate to borrowers that have a better credit profile as a result of a guarantee. Since loan guarantees covering private lender loans require the lenders to hold twenty percent of the risk, such private lenders will be less likely to extend credit to disproportionately risky borrowers.⁴⁴¹

d. Loan Guarantees Crowd Out Private Capital

The argument is that when government injects capital in one sector through loan guarantees, the government's act of borrowing funds in the markets crowds out private investors' ability to borrow money in the markets, given the government's need to borrow funds.⁴⁴² However, it is worth contrasting this general argument of crowding out with the actual reality of timing and market consequences for federal loan guarantee commitments. First, the lender, not the guarantor, provides the loan commitment. Loan guarantees are not full loan commitments issued on the date of financial closing to a borrower.⁴⁴³ Thus, at the time of financial close for a guaranteed loan, whether the loan is made by a private lender or a government lender, the only party going to the market for capital would be the lender.

\$400 Million Loan Guarantee from Same Program as Solyndra, Oct. 10, 2012, *available at* <http://energycommerce.house.gov/press-release/committee-leaders-probe-does-knowledge-loan-recipients-faulty-solar-panels-%E2%80%93-now>.

⁴⁴⁰ See *supra* note 214 and accompanying text.

⁴⁴¹ See FIPP Solicitation, *supra* note 176, at 18.

⁴⁴² See De Ruyg Testimony, *supra* note 326, at 9.

⁴⁴³ See 2 U.S.C. § 661a(3), (4) (defining what a federal loan guarantee is).

The guarantor has a contingent liability, valued up to the face amount of the loan (plus interest, fees and expenses) owed to the lender.⁴⁴⁴ Upon a default, the lender may draw upon the guarantee. Following enactment of FCRA and the subsequent policy circulars issued by OMB, how the DOE and other agencies book loan guarantees changed.⁴⁴⁵ Now, the DOE does not book the entire amount of the loan as its contingent liability.⁴⁴⁶ Rather, at closing of the loan guarantee, the DOE books the CSC for the loan guarantee commitment, then the DOE revises its CSC estimate for each project annually.⁴⁴⁷ The crowding out argument posed by Mr. Hazlitt may be appropriate with respect to the CSC once a non-recoverable default arises, but the effect is a future crowding out of private capital at best.⁴⁴⁸

Mr. Hazlitt's economics lesson on government credit stated:

When the government makes loans or subsidies to business, what it does is to tax successful private business in order to support unsuccessful private business. Under certain emergency circumstances there may be a plausible argument for this, the merits of which we need not examine here. But in the long run it does not sound like a paying proposition from the standpoint of the country as a whole. And experience has shown that it isn't.⁴⁴⁹

Mr. Hazlitt noted that there are circumstances where credit programs, such as loan guarantees, have a place.⁴⁵⁰ However, he does not support permanent loan guarantee programs or similar federal credit programs.⁴⁵¹

⁴⁴⁴ See *supra* note 109.

⁴⁴⁵ CBO, ESTIMATING THE VALUE OF SUBSIDIES FOR FEDERAL LOANS AND LOAN GUARANTEES 1 (2004), available at <http://www.cbo.gov/Publication/15923>.

⁴⁴⁶ See CIRC. A-11, *supra* note 206, at 185.5.

⁴⁴⁷ *Id.*; see also *supra* notes 209–11.

⁴⁴⁸ Interestingly, when Mr. Hazlitt first made his argument on crowding out in 1946, most lenders to the federal government were likely domestic. Similarly, most investors in lenders and purchasers of U.S. Treasury securities were likely domestic investors. Today, with many U.S. Treasuries held by foreign sovereigns and foreign investors, the Hazlitt crowding out argument proposed by some critics may hold less weight—domestic lenders are not competing for investors with U.S. treasuries; it is a different audience of buyers. See *The Absorption Problem*, ECONOMICS INTERACTIVE, http://www.unc.edu/depts/econ/byrns_web/Economicae/Figures/Absorp_Equation.htm (last visited Jan. 30, 2013).

⁴⁴⁹ HAZLITT, *supra* note 405, at 47, 48.

⁴⁵⁰ *Id.* at 48.

⁴⁵¹ *Id.*

CONCLUSION

As a general matter, loan guarantee programs can provide a versatile policy option to provide targeted, directed support to a small subset of projects. Loan guarantees allow policy makers to (1) stimulate private investments in particular industries, (2) provide emergency stabilization to a particular sector following an incident, and (3) provide support to a specific population or for a specific type of activity.⁴⁵² However, the effectiveness of any particular loan guarantee program depends on how well the authorizing legislation was drafted and how effectively the agency is able to implement the regulations.

In the case of the DOE LGP, DOE has had mixed success during the program's brief tenure. Implementation of the DOE LGP has been challenging, because Congressional guidance was both overly broad in scope in its initial authorization and too limited in its emergency implementation phase. Conflicting goals for the program made it difficult for the DOE to navigate a clear path through its legislative mandates.⁴⁵³ However, the DOE has managed to create a relatively stable portfolio of projects notwithstanding Congress's lack of clear direction. With better direction, the DOE LGP may have been able to create a more carefully structured loan guarantee program for which performance measures had been developed.

Traditional critiques of loan guarantees may have merit as a theoretical matter, but are less effective when used to critique a specific program, such as the DOE LGP. Loan guarantees can serve as a useful credit enhancement tool to support the REI. However, loan guarantees cannot sustain the REI in isolation and must be one piece of a broader approach to developing, encouraging, and supporting the REI.⁴⁵⁴

⁴⁵² See *supra* note 374 and accompanying text. In my review of existing federal loan guarantee programs, I believe these programs can be divided into these three broad categories. Any further consideration of these categories and effectiveness of other loan guarantee programs is beyond the scope of this Article.

⁴⁵³ See *supra* notes 144, 145, and accompanying text.

⁴⁵⁴ See *supra* note 16.

APPENDIX

SOLICITATIONS ISSUED BY DOE UNDER THE 1703 PROGRAM, THE 1705 PROGRAM AND THE ATVM PROGRAM⁴⁵⁵

OMB No.	Solicitation No.	Program	Opening Date	Closing Date ⁴⁵⁶	Amount (in billions)	Technology
1910-5129	DE-PS01-06LG00001	1703	8/8/2006	11/6/2006	2B	⁴⁵⁷
Federal Loan Guarantees For Projects That Employ Innovative Technologies In Support Of The Advanced Energy Initiative						
	DE-FOA-0000007	1703	7/11/2008	12/2/2008	2B	⁴⁵⁸
Federal Loan Guarantees For Front End Nuclear Facilities, Amendment #1						
	DE-FOA-0000006	1703	7/11/2008	12/19/2008	18.5B	⁴⁵⁹
Federal Loan Guarantees For Nuclear Power Facilities, Amendment #1						
	DE-FOA-0000008	1703	9/22/2008	3/23/2009	6B	⁴⁶⁰
Federal Loan Guarantees For Coal-Based Power Generation And Industrial Gasification Facilities That Incorporate Carbon Capture And Sequestration Or Other Beneficial Uses Of Carbon And For Advanced Coal Gasification Facilities, Initial						
	DE-FOA-0000005	1703	10/29/2008	4/30/2009	10B	⁴⁶¹
Federal Loan Guarantees For Projects That Employ Innovative Energy Efficiency, Renewable Energy, And Advanced Transmission And Distribution Technologies, Amendment #2						

⁴⁵⁵ *Solicitations*, LOAN PROGRAMS OFFICE, U.S. DEP'T OF ENERGY, https://lpo.energy.gov/?page_id=58 (last visited Jan. 31, 2013) (listing solicitations issued by DOE under the 1703 Program, 1705 Program and ATVM Program. Solicitations are organized chronologically by the opening date.).

⁴⁵⁶ Closing date refers to latest Part ii Application deadline.

⁴⁵⁷ Ten Categories of technologies for this solicitation were: Biomass; Hydrogen; Solar; Wind & Hydropower; Fossil Energy Coal; Carbon Sequestration Practices and Technologies; Efficient Electricity Transmission and Delivery and Energy Reliability; Alternative Fuel Vehicles; Industrial Energy Efficiency Projects; Pollution Control Equipment, each employing New or Significantly Improved Technologies.

⁴⁵⁸ Front end nuclear facilities employing New or Significantly Improved Technologies.

⁴⁵⁹ Nuclear power facilities employing New or Significantly Improved Technologies.

⁴⁶⁰ Advanced coal based power generation, industrial gasification or advanced coal gasification facility employing New or Significantly Improved Technologies.

⁴⁶¹ Energy efficiency, renewable energy and advanced transmission and distribution technologies that constitute New or Significantly Improved Technologies.

OMB No.	Solicitation No.	Program	Opening Date	Closing Date	Amount (in billions)	Technology
		ATVM	11/12/2008	12/31/2008 ⁴⁶²	25B ⁴⁶³	464
Advanced Technology Vehicle Manufacturing Loan Program						
1910-5134	DE-FOA-0000132	1705	7/29/2009	10/26/2009	750M ⁴⁶⁵	466
Electric Power Transmission Infrastructure Investment Projects						
1910-5134	DE-FOA-0000140	All	7/29/2009	12/31/2010	8.5B ⁴⁶⁷	468
Federal Loan Guarantees For Projects That Employ Innovative Energy Efficiency, Renewable Energy, And Advanced Transmission And Distribution Technologies, Initial						

⁴⁶² See Interim Final Rule 10 C.F.R. § 611.101, at 73 Federal Register No. 219 at 66721, Nov 12, 2008 providing initial submission deadline. Subsequent applications will be considered at the end of each subsequent calendar quarter depending on availability of funds and authority.

⁴⁶³ DOE may not issue more than \$25B in principal amount of direct loans and the credit subsidy cost ("CSC") and administrative expenses may not exceed \$7.51B, which equates to a projected 30.04% default rate.

⁴⁶⁴ Automotive manufacturers and component suppliers to finance the cost (1) to reequip, expand, or establish manufacturing facilities in the U.S. to produce advanced technology vehicles and qualifying components and (2) for engineering integration performed in the United States for advanced technology vehicles and qualifying components.

⁴⁶⁵ There was no cap on the amount of loan guarantees that could be issued, however, the solicitations capped the aggregate amount of CSC for projects that received loan guarantees under this solicitation.

⁴⁶⁶ Conventional technology complex electric transmission systems projects meeting one of the following criteria: (1) new or upgraded transmission lines of at least 100 miles of 500kV or at least 150 miles of 345kV, (2) at least 30 miles of underwater cable, (3) high voltage DC component, (4) is a major interregional connector, (5) is designated a National Interest Electric Transmission Corridor under EPOA 2005, (6) is associated with offshore generation (open ocean wave energy, ocean thermal or offshore wind), (7) mitigates substantial reliability risk for a major population center, or (8) set of improvements for State or region that criteria in (1).

⁴⁶⁷ For Section 1703 Program recipients, up to \$8.5 billion was allocated for the aggregate commitment of loan guarantees issued under this solicitation. For Section 1705 Program recipients, there was no cap on the amount of loan guarantees issued, however, the solicitations capped the aggregate amount of CSC for projects to \$2.5 billion in Credit Subsidy Costs, with a sublimit of \$500 million for leading edge biofuels projects.

⁴⁶⁸ For Section 1703 Program—Category 1: Alternative Fuel Vehicles; Category 2: Biomass; Category 3: Efficient Electricity Transmission, Distribution and Storage; Category 4: Energy Efficient Building Technologies and Applications; Category 5: Geothermal; Category 6: Hydrogen and Fuel Cell Technologies; Category 7: Energy Efficiency Projects; Category 8: Solar; Category 9: Wind and Hydropower.

For Section 1705 Categories 2, 3, 5, 8, 9 qualified. For both programs, projects must employ New or Significantly Improved Technologies.

OMB No.	Solicitation No.	Program	Opening Date	Closing Date	Amount (in billions)	Technology
1910-5134	DE-FOA-0000166	1705	10/7/2009	1/6/2011	750M ⁴⁶⁹	470
Federal Loan Guarantees For Commercial Technology Renewable Energy Generation Projects Under The Financial Institution Partnership Program, Initial						
1910-0400	DE-SOL-0002197	1705	8/10/2010	1/31/2011	750M ⁴⁷¹	472
Federal Loan Guarantees For Projects That Manufacture Commercial Technology Renewable Energy Systems And Components, Initial						

⁴⁶⁹ There was no cap on the amount of loan guarantees issued, however, the solicitations capped the aggregate amount at \$750 million of CSC for projects that received loan guarantees under this solicitation.

⁴⁷⁰ Exclusively for Commercial Technology Renewable Energy Generation Projects, such as wind facility, closed-loop biomass facility, open-loop biomass facility, geothermal facility, landfill gas facility, trash-to-energy facility, hydropower facility, including incremental hydropower, solar facility, but not for manufacturing, transmission or leading edge bio-fuels projects.

⁴⁷¹ There was no cap on the amount of loan guarantees issued, however, the solicitations capped the aggregate amount at \$750 million of CSC for projects that received loan guarantees under this solicitation.

⁴⁷² Renewable energy manufacturing projects that produce commercial technology products for generation of electricity or thermal energy, have project costs greater than \$75 million, can obtain a credit rating of 'BB' or better from S&P or Fitch or 'Ba2' from Moody's, will create or retain jobs in the U.S., and meeting other criteria of Title XVII. FFB financing to be provided for these 100% loan guarantees.