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New Energy:

The Effects of Regulatory Reforms on the U.S. Department of Energy Loan Guarantee Program

Greg W. Durham
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Abstract

Congress enacted the U.S. Department of Energy (DOE) Loan Guarantee Program (LGP) in 2005 to foster the deployment of innovative energy technologies. The LGP is intended to provide private energy companies with easier access to the debt financing they need to commercialize their product. The program, however, has been very slow to act on its mandate, failing to issue a single loan guarantee during the four years following its 2005 passage into law. This stagnation was due to a variety of factors that have generated criticism and doubt regarding the program's potential for success.

This paper focuses on the Obama Administration's efforts to reform and administer the DOE Loan Guarantee Program. First, this paper investigates the shortcomings of the LGP and analyzes potential improvements or reforms. Next, it explores those reform measures that have been implemented by the Obama Administration. Finally, this paper evaluates the impact of reform measures on the LGP by analyzing its ability, post-reform, to attract applicants and issue loan guarantees.

From the above analysis, this paper provides evidence to show that reform measures have improved the LGP, yet the impact of those reforms is unevenly distributed between the two subsections of the program. Through an investigation of the potential sources of these lopsided results, this paper argues that the primary barrier to success of the LGP is the credit subsidy cost. In their efforts at reform, administrators of the LGP have made great improvements to the program. Yet where uncertainty over the credit subsidy cost remains, there will be continuous difficulties felt on the part of applicant firms, and continuous setbacks for the Loan Guarantee Program.

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The Center for International Environment and Resource Policy (CIERP) was established in 1990 to support the growing demand for international environmental leaders. The Center provides an interdisciplinary approach to educate graduate students at The Fletcher School. The program integrates emerging science, engineering, and business concepts with more traditional subjects such as economics, international law and policy, negotiation, diplomacy, resource management, and governance systems.

The Energy, Climate, and Innovation Program (ECI) advances policy-relevant knowledge to address energy-related challenges and opportunities, especially pertaining to climate change. ECI focuses particularly on how energy-technology innovation can be better harnessed to improve human-well being, and the role of policy in the innovation process. Although ECI's outlook is global, we concentrate mainly on energy and climate policy within, and between, the United States and China. We also focus on how these countries influence the international negotiations on climate change, and the role of technology in the negotiations.



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Chapter I: Introduction

This paper investigates the progress of the Department of Energy (DOE or the Department) Loan Guarantee Program (LGP) in light of operational reforms put in place to improve the program's functionality. The LGP was created to assist energy companies in securing financing for projects that deploy innovative energy technologies. The progress of the program, however, has been extremely slow due to legal, regulatory, and administrative challenges. At the outset of the Obama Administration, changes were made to the LGP with the intent of eliminating problem areas so that the Loan Guarantee Program may fulfill its original intent.

Specifically this research will answer the following questions:

1. What reforms to the Loan Guarantee Program has the Department of Energy enacted, and why?
2. How, and to what degree, do those reforms affect the ability of the LGP to attract applicants and issue guarantees?

The former will be undertaken for the important purpose of providing insight into the nature of the reforms. In doing so, it will also illuminate what the DOE hopes to achieve through the implementation of those reforms.

The legislation governing the Loan Guarantee Program inherently limits the changes that the Department of Energy can make. Administrators must work within this limited set of options when making the strategic moves they hope will reinvigorate the program. The investigation of how, and to what degree, reform measures affect the ability of the program to attract applicants and issue guarantees will illustrate whether reforms contributed to producing the effective financial incentive for energy technology commercialization that the LGP was intended to be.

The model for this investigation is a policy analysis. The problem under evaluation, as previously discussed, is the lack of progress in the implementation of the Loan Guarantee Program. The DOE faces the challenge of working from a flawed regulatory starting point in its efforts to meet targets that Congress, the Department, and the President have set for the LGP. The problem facing the DOE, therefore, is discerning the regulatory reforms that are crucially needed and implementing them so as to maximize the potential of the program. This analysis investigates those reforms and their subsequent impact.

By analyzing the Administration's actions regarding the LGP, and the subsequent ability of the program to attract applicants and issue guarantees, this paper provides evidence that suggests there is one particular issue, the credit subsidy cost, which is the Achilles heel of the program. It is then argued that, in their efforts at reform, administrators of the LGP have made great improvements to the program. Yet where uncertainty over the credit subsidy cost remains, there will be continuous difficulties felt on the part of applicant firms, and continuous setbacks for the Loan Guarantee Program.

Chapter II: Innovating Energy

To place the problems facing the Loan Guarantee Program in context, it is useful to review the background of energy technology innovation policy in the United States. This chapter provides a background of the process of energy technology innovation and a discussion of the unique circumstances facing private firms interested in commercializing innovative energy technologies. It concludes with a brief discussion of the record of LGP as an energy technology innovation policy.

UNITED STATES ENERGY POLICY

At the outset of his presidency, Barack Obama set the national goal of generating 25 percent of electricity from renewable sources of energy by the year 2025. To achieve this goal the United States must triple its use of renewable energy sources from its 2007 level. This is a monumental task of science and industry that requires the action at every point in the spectrum of the technological innovation process.

Private companies attempting to commercialize innovative energy technologies in the United States face an uphill battle. Strong incumbent industries, unsure regulatory environments, global market fluctuations, high costs of demonstration, and high inherent risk can hinder the deployment of new energy technologies by producing an uncertain market for investment. Experts have termed the phenomenon resulting from factors inhibiting the commercialization of new energy technologies as, “the valley of death,” due to the high rate of failure experienced in the industry (Gallagher and Sagar 2004).

Despite these encumbrances, energy technology innovation is an exceptionally important aspect of United States federal policy. Combating climate change, ensuring energy supply security, strengthening the United States’ global technological competitiveness, and maintaining price stability for the domestic economy are all driving forces behind U.S. energy technology innovation policy. The weight of all of these issues on the energy sector is changing with great urgency the priorities that have traditionally dictated United States energy policy.

Historically, energy policy happens slowly, making it hard to see today the changes that are taking place. Nevertheless, amongst the individuals and institutions that construct U.S. energy policy, newer issues like climate change and the sustainability transition have restructured values that frame the energy debate. As Vaclav Smil explains in his formative work *Energy at the Crossroads*, nonrenewable fuels “overwhelmingly” energized the United States in the twentieth century (Smil 2003). Furthermore, consumption of that fossil fuel-based energy has greatly increased. Between 1900 and 2000 the per capita supply of fossil fuel energy more than tripled in the United States in spite of comparable population growth (Smil 2003). This trend has remained consistent into the twenty-first century. As of 2007 the United States still relies on fossil fuels, including oil, coal, and natural gas, for 85 percent of its total energy

consumption (Energy Information Administration 2008).

Don E. Kash and Robert W. Rycroft, in their book *U.S. Energy Policy: Crisis and Complacency*, provide a balanced history of federal energy policy during this era. Kash and Rycroft present U.S. energy policy during the early twentieth century as lacking comprehensive structure. The reality that we know today of a nation-wide policy regime comprising all things “energy” was not yet part of the legislative picture. Its predecessors were fuel-based policies that each focused independently on a particular source of energy, be it coal, oil, natural gas, electric generation, or, later, nuclear power. The level of government involvement varied with the nature of production and distribution requirements surrounding each fuel. Coal, for instance, was very much a private enterprise with little government regulation. In contrast, nuclear resided on the other end of the spectrum as a fuel source almost entirely regulated by the federal government. As the authors describe them, the purposes of these independent policies were to ensure the maintenance of a set of values that transcended each fuel type. Those ideas included the abundance of the fuel source, its continued cost-effectiveness, and its contribution to national security (Kash and Rycroft 1984).

Throughout the 1970s, political discord in the oil-rich Middle East resulted in two separate U.S. energy crises, exposing for the first time the nation’s great energy vulnerability. Henry Lee, in his chapter “Oil Security and the Transportation Sector” for the book *Acting in Time on Energy Policy*, writes that it was during this era that the notion of “energy security” first arose as a codification of the negative macroeconomic ramifications of supply shortages (Lee 2009). As Lee explains, the United States responded to energy security fears by issuing the first, albeit symbolic, call for energy independence, and the introduction of the Strategic Petroleum Reserve. As Anthony Owen describes in an article in the *Energy Journal*, it was during this same period that the environmental movement ignited the nation’s awareness of the fragility of nature and put issues like pollution control in the realm of energy policy for the first time (Owen 2004).

ENERGY TECHNOLOGY INNOVATION POLICY AND THE LGP

Energy technology innovation policy also grew in its importance during this era. Energy technology innovation is defined by the National Commission on Energy Policy (NCEP) as being comprised of six interrelated stages, including fundamental research; applied research; development of a practical operating device; demonstration to test the product in its operating environment; early deployment at a small scale to increase learning and drive down price; and widespread deployment in the market place based on experience generated from early deployment and market signals (National Commission on Energy Policy 2004). In their 2004 report *Ending the Energy Stalemate: A Bipartisan Strategy to Meet America’s Energy Challenges*, the NCEP argues that overcoming the energy challenges faced by the United States in the twenty-first century will require increased efforts in all six of these stages. This effort must do no less than

achieve the development and deployment of a new generation of energy technologies superior to those existing today.

Congress enacted the U.S. Department of Energy Loan Guarantee Program (LGP) in 2005 with the conclusions of the NCEP report in mind. The LGP was created to foster the deployment of innovative energy technologies by providing private energy companies with easier access to the debt financing they needed to commercialize their product. By enabling the Federal Government to intervene in the capital market as a guarantor of loans, the Loan Guarantee Program is intended to strengthen the ability of energy technologies to overcome the valley of death, and achieve what the legislation refers to as “general use”. By reducing risk to private lenders, the LGP greatly increases the ability of energy companies to secure debt financing. In the private lending market, risk is monetized as a cost to the lender. Simply stated, by providing the full faith and credit of the United States government, the Loan Guarantee Program is essentially reducing the cost of financing by greatly increasing the probability that the lender will see that return. Without this support by the federal government, clean and innovative energy technologies face barriers substantial enough to suffocate their existence in the market.

The Loan Guarantee Program, however, has been very slow to act on this mandate. So slow, in fact, that the Department of Energy failed to issue a single loan guarantee during the four years following the program’s 2005 inaction. This stagnation was due to a variety of factors related to fundamental weaknesses in the regulatory structure of the program. The regulatory structure is the combined result of the Department’s interpretation of the law passed by Congress requiring the LGP. From the law, DOE produced regulations, or “rules”, which govern how the administration of the program is to proceed. Critics have raised numerous complaints including prohibitive upfront costs to applicants, unnecessarily complex or inhibitive application and review processes, and obstructive financing requirements.

Issues outside of the regulatory structure of the LGP have also been cited as barriers to the program’s success. Within DOE, a lack of capacity with which to carry out the LGP was present from the very beginning. Governance issues, such as seats of authority in multiple public agencies, and an absence of effective communication between the administrators and the applicants, have been recognized as points of difficulty as well. Such weaknesses generated criticism and doubt in the program’s potential for success that have only increased as the years have ticked by.

In 2009 a unique set of events brought new life to the Loan Guarantee Program. The election of President Barack Obama ushered into the White House a presidential administration that was more progressive on energy policy than any in the past thirty years. The Administration was also immediately confronted with a catastrophic economic crisis. As a result of its existing mandate, the Loan Guarantee Program had the potential to serve the Administration’s priorities on both energy policy and the economy, and was thus a policy tool of great interest. Upon entering office, President Obama made a new commitment to the program. The passage of the

American Reinvestment and Recovery Act of 2009 (ARRA), or the Stimulus Package as it is often referred to, gave new life to the LGP, positioning it as one of the Obama Administration's key tools for achieving both its energy policy and economic goals.

Chapter III: Law and Implementation

President George W. Bush signed The Energy Policy Act of 2005 (EPAAct2005) into law on August 8, 2005. Title XVII, Section 1703 of the EPAAct2005 established the Loan Guarantee Program (LGP or 1703) to be administered by the U.S. Department of Energy.

This chapter will discuss in detail the original legislative formulation of the Loan Guarantee Program starting with the Energy Policy Act of 2005. It will then proceed from the law to outline the initial implementation of the program to show how, and in what form, the LGP was initially set up within the Department of Energy as a functioning program.

ELIGIBILITY

Section 1703 of the EPAAct2005 granted authority to the Department of Energy to issue loan guarantees for private sector energy projects that meet the specifications set forth in the legislation. The law specifically states that these projects must “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued” (Energy Policy Act of 2005). It identified ten categories of energy technologies that are eligible to be considered for guarantees under the program. These technology categories include the following:

- Renewable energy systems
- Advanced fossil energy technologies
- Hydrogen fuel cell technologies
- Advanced nuclear energy facilities
- Carbon capture sequestration practices and technologies,
- Efficient electrical generation, transmission, and distribution technologies
- Efficient end-use energy technologies
- Production facilities for fuel-efficient vehicles
- Pollution control equipment
- Crude oil refineries

The delineation of eligibility is one of two factors to the legal construction of the LGP that are key points of influence on the program's reach and functionality. Eligibility defines the scope of the program by defining not only the acceptable technology categories, but also the innovative stage they must inhabit, the purposes they must serve, the geographic location of the project, and its required commercial viability. The eligibility criteria are a large chunk of the restrictions within which the LGP must administer the program. The fulfillment of all eligibility criteria is necessary for the success of an applicant project, and the exclusivity they create defines the mandate of the LGP; thus they are of fundamental importance.

Technological Eligibility

The EAct 2005 dictates that the 1703 program only consider projects that employ new or significantly improved energy technologies. The LGP defines this category primarily by excluding what it considers "commercial technologies" in general use in the market place. The term "general use" is defined as any technology that is being utilized in three or more commercial projects in the United States that have been in operation for a period of at least five years (Office of the Chief Financial Officer, Department of Energy, 2009). Considering the extensive length of time required for deploying new energy technologies, this definition of commercial technologies greatly limits the pool of potential applicants to the program.

Title XVII defines clean energy technologies simply as those that avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases. The LGP establishes the satisfactory fulfillment of this requirement by placing the burden of proof on the applicant firm. As part of each application, the LGP requires that the applicant firm submit a technical description of the full extent of the project's compliance with this clean energy mandate, as well as demonstrate methods for measuring and verifying that compliance as the project moves forward.

Whether or not a project employs a clean and innovative technology has been identified by DOE as the primary consideration of the 1703 program. There are a host of other requirements however, which applicants and the program administrators must contend with. The applicant project not only must be innovative but also commercially feasible. It must deploy a technology in supply, and with demand, sufficient enough to ensure its future commercial availability and viability in the United States. It must comply with all applicable environmental requirements including the completion of an Environmental Impact Statement, as dictated by the National Environmental Policy Act of 1969. The project must not be for the purposes of research, or demonstration, but rather a deployable technology that has been tested thoroughly and is ready for the commercial market. It must be a project that is based in the United States and one that will produce U.S. jobs in compliance with the Davis-Bacon Act of 1931 (Office of the Chief Financial Officer, Department of Energy, 2009). For the great majority of these considerations the onus rests with the applicant firm to demonstrate full compliance

through its application. The DOE carries the responsibility of judging that compliance during due diligence.

Financial Eligibility

Another primary consideration that LGP administrators are required by law to take into account is that of the taxpayer. Tens of billions of taxpayer dollars are at stake in the Loan Guarantee Program. Per the U.S. Credit Reform Act of 1990, it is a legal requirement that the financial viability of loan guarantee be assured in the interest of providing maximum protection to the Federal Government from the risk of default. The law states that “no guarantee shall be made unless the Secretary determines that there is reasonable prospect of repayment of the principal and interest on the obligation by the borrower” (Energy Policy Act of 2005).

In taking into account financial viability of applicant firms the Department must consider:

- The probability that the project will generate adequate revenues to service the project’s debt obligations over the life of the guarantee;
- The amount of equity commitment to the project by the applicant;
- Other sources of Federal or non-Federal government assistance to the project;
- The safeguards provided to the Federal Government by the applicant in the form of collateral or other assurances of payment;
- The level of risk associated with the project including market risk, legal risk, regulatory risk, and technology risk;
- The ability of the applicant firm to successfully operate the project (Office of the Chief Financial Officer, Department of Energy, 2009).

In testimony before the U.S. Senate Committee on Energy and Natural Resources, Jonathan Silver, Executive Director of the LGP, identified other key characteristics that the DOE looks for when evaluating an applicant project’s viability. In general, these factors showed that LGP administrators value simplicity in both the financial and technical aspects of the projects, strong proven leadership in the firm executing the project, and proven resources in terms of the supply chain for operational materials crucial to the project’s operation (Silver 2010).

The establishment of eligibility by the LGP takes an amount of time and effort proportionate to that which it was given in the original legislation. Documentation of eligibility comprises the bulk of the substantial application materials required by the LGP. On the side of the DOE, the determination of eligibility comprises the first two stages of the application process – In-Take and Due Diligence – which precede any formal discussion of the terms of the guarantee. The determination of that eligibility on the part of the Loan Guarantee Program is accomplished through an extensive process

requiring a host of varying expertise including project finance, engineers, and legal and policy experts.

Whereas the delineation of eligibility is an obviously important influence on a selective application-based program, the other key factor within the legislative construction of the Loan Guarantee Program is initially less apparent, but has had a profound influence on the operation of the program.

THE CREDIT SUBSIDY COST

During the formulation of the bill, Congress chose to provide two options through which to cover the costs of the program. Costs in this instance are those typical to any venture public or private, which can be generally considered overhead costs or administrative costs. Costs also include one that is distinctive to loan guarantee programs. This cost is known as the credit subsidy, or subsidy cost. During the formulation of the Section 1703 Loan Guarantee Program the government chose a unique method for funding the associated subsidy costs.

The U.S. Credit Reform Act of 1990 requires that loan guarantee programs incorporate the cost of subsidies linked with new loans. The reasoning behind this has everything to do with reducing risk to the government. By issuing guarantees the Federal Government is taking on the long-term risk associated with the loan. Though for accounting purposes the guaranteed amount is not reflected in the government's budgetary statements, it is nevertheless a long-term financial obligation. To reduce the government's exposure to that obligation, it extracts a fee from the recipient of the guarantee that is the monetized equivalent to the risk that the government has assumed. The credit subsidy cost is technically defined as the net present value at the time the Loan Guarantee Agreement is executed of cash flows from payments by the government (for defaults and delinquencies, interest rate subsidies, and other payments) minus estimated payments to the government (for loan origination and other fees, penalties, and recoveries) (Department of Energy 2011).

Simply put, the credit subsidy is the government's best estimate of the money it will owe on a particular project in the event that the project enters into default. Calculating this amount involves an estimation of the monetary value of assets and payments that the government expects to recover from the project in default. Recoveries can include both tangible and intangible assets as well as cash payments.

The purpose of the credit subsidy cost is to provide the government with a reserve fund to insure it against the risk of default on a particular project. Theoretically, the credit subsidy requirement produces a transaction in which the recipient of the loan guarantee pays upfront the exact amount that it would owe the government in the event of default, and in return receives the full faith and credit of the United States Government. For some government credit programs, such as those administered by

the Small Business Administration, this is a relatively simple calculation that is easily replicated. As will be seen here, however, when the project complexities increase, so too does the difficulty involved with the formulation of the credit subsidy cost.

Legally, this credit subsidy cost falls on the guarantor. Federal law dictates that a loan guarantee cannot be issued unless the appropriate subsidy cost has been paid. There are two ways, however, that payment can be made. Either the recipient of the guarantee pays, or Congress appropriates funding through a budgetary measure. Congressional budgetary appropriations are the traditional approach taken in Federal credit programs run by the U.S. Government. This is known as the “government pays” approach and its use is virtually universal among government loan guarantee programs.

The Borrower Pays Approach

In the instance of the 2005 Energy Policy Act, however, two related factors influenced Congress to stray from the traditional approach of a government appropriated credit subsidy. The intentions of Senator Pete Domenici (R, NM), one of the original and most ardent backers of the Title XVII Loan Guarantee Program, represents the first factor. As Chairman of the Senate Committee on Energy and Natural Resources during the formulation of the bill, Senator Domenici exercised considerable influence on the formulation of the LGP. His intentions for the Loan Guarantee Program were for it to be of primary benefit to the nuclear power industry and other major utilities including coal fired power plants (Frantz 2010). The idea was to provide a boost to the long idle U.S. nuclear industry, and spur efforts to commercialize clean coal technologies such as carbon capture sequestration (CCS) and integrated gasification combined cycle (IGCC). The companies that utilize these technologies typically have a large market capitalization and operate at such a scale that the credit subsidy cost — which is typically 5%-10% of the guarantee — was considered affordable relative to the worth of the loan guarantee.

From the U.S. government’s side of the transaction, however, these costs were very much a material consideration. If the targets of the program were to be multi-billion dollar nuclear and advanced fossil fuel projects, then the combined credit subsidy costs of multiple projects could easily run into the billions of dollars themselves. In 2004-2005 when the bill was being written, there was a limited willingness on the part of Congress and President Bush to put in place a program requiring such funding. Therefore, the decision was made to forego Congressional appropriations and rely on the private sector to put up the required credit subsidy (Frantz 2010).

As it is written into the Title XVII legislation, this “borrower pays” approach requires that the loan guarantee cannot be issued until “the Secretary [of Energy] has received from the borrower a payment in full for the cost of the obligation and deposited the payment into the Treasury” (Energy Policy Act of 2005). When the credit subsidy cost is added to the administrative fees charged by the Department of Energy for processing applications, one has what is from the government’s standpoint a budget neutral program.

IMPLEMENTING THE LGP: 2006-2008

In August of 2006, exactly one year to the day after the passage of Title XXVII in the EAct2005, The Department of Energy officially issued the first solicitation for applications under the program. The 2006 solicitation was issued as a “mixed technologies” solicitation, which invited applications from all eligible technology categories as they are defined in the Title XXVII (U.S. Department of Energy Loan Guarantee Program Office 2006). The fact that it took an entire year to issue this call for applications was due to more than just the typical bureaucratic tempo of the U.S. government and much to do with the typical discord of the U.S. Congress.

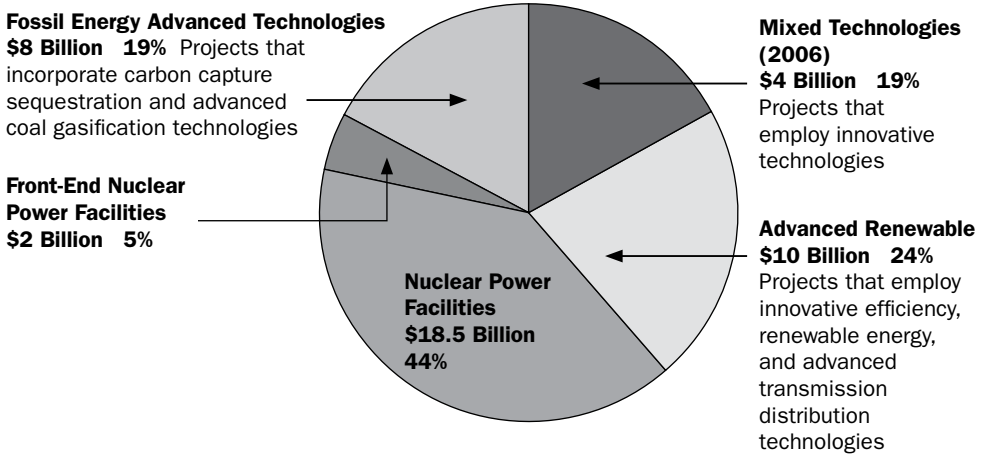
Despite its structuring as a budget neutral program, DOE officials decided that authorizing legislation from Congress was required for the program to formally begin accepting applications for guarantees. In spite of the successful passage of the EAct2005, however, by the summer of 2006, Congress had issued no such authorization. DOE was thus faced with the options of waiting for Congress to act on its behalf or moving forward with the program and run the risk of legal backlash. The Department chose the latter. In the face of threats that it was violating the Anti-Deficiency Act by working on a non-authorized program, the Department of Energy issued the 2006 mixed technologies solicitation. DOE officials decided that it could legally move forward on the LGP by issuing an initial solicitation that requested only “pre-applications” from interested firms (Frantz 2010). Over the next eight months, DOE received 143 pre-applications.

It was not until April of 2007, when authorization was finally issued under the Continuing Appropriations Act for 2007, that DOE could legally act on the pre-applications it received from the August 2006 solicitation. The legislative authorization by Congress also provided administrative expense funding, which enabled DOE to begin staffing the program. Up until that point the LGP had no designated staff, and was being run out of the office of the Chief Financial Officer with assistance from the Department of the Treasury. In August of 2007, two years after the passage of the EAct2005, the search for a head administrator for the LGP concluded when David Frantz was hired as Director of the program. Between August and October of that year, LGP administrators issued the Final Rule governing the 1703 program, per the 2007 Appropriations Act. They also invited 16 of the original 143 pre-applicants to submit full applications under the guidelines of that Final Rule (Frantz 2010).

In 2008 the LGP issued five new solicitations for applications shown in Figure 1 below. In accordance with the report language accompanying the Consolidated Appropriations Act 2008, each solicitation identifies the technology type and dollar amount available for that solicitation, as well as the specific deadlines and fees required of applicants.

As Figure 1 shows, these solicitations covered the full range of technology sectors eligible to receive guarantees, and when added to the 2006 mixed technologies solicitation, totaled \$42 billion in potential guarantees. Of that \$42 billion, 68 percent was devoted to the advanced coal and nuclear technologies that were originally intended to be the primary beneficiaries of the bill.

Figure 1. DOE Loan Guarantee Program Solicitations and Amounts as of FY2008



Source: Loan Guarantee Program Office Office of the Chief Financial Officer U.S. Department of Energy, FY 2008 Implementation Plan Loan Guarantee Program Title XVII, Energy Policy Act of 2005, Implementation Plan (Washington DC: United States Department of Energy, 2008), 2

By the end of 2008 the Loan Guarantee Program was operating at its fullest capacity to date. Over the latter half of that year the LGP would increase staffing from zero to 18 full-time federal employees and 11 contractors for a total of 29 individuals dedicated to the program. It had received 11 of the requested 16 full applications from the initial pool of 143 pre-applicants submitted under the 2006 mixed technologies solicitation, and made moving those projects through due-diligence its “highest priority” (Frantz 2009).

Despite this progress, by the end of 2008, the Loan Guarantee Program was under considerable pressure. It had been almost three years since the passage of the EAct2005 first set forth the parameters of the program and it had not yet achieved that all-important goal of issuing a guarantee. To the energy industry stakeholders this indicated uncertainty. For many of the applicants, the DOE guarantee was an absolute necessity for their project to move forward. They put sizeable amounts of time and money into the application process, and without a concrete example of success it was hard for them to see the light at the end of the tunnel. The intricacies of the program’s development from 2005 to 2008, outlined in the previous pages, provided little solace. What it came down to was that the longer the DOE took to issue guarantees, the greater the anxiety on the part of the program’s various stakeholders. That anxiety was manifested in criticisms and commentary writ large, much of it justifiably aggravated at a delay that was rapidly approaching the four-year mark. The remainder of this study will be an investigation of those criticisms, and their effect on the implementation of the program.

Chapter IV: Stagnation

Much of what has been said and written over the past four years directly concerning the implementation of the DOE Loan Guarantee Program can be categorized into three groups. These groups are distinguishable by their respective priorities in regards to the program. Independent government monitoring agencies, such as the United States Government Accountability Office (GAO), have analyzed the LGP from the standpoint of their fiduciary responsibilities to the taxpayer. Private sector elements such as trade groups on behalf of their industry, and corporate law firms on behalf of their clients, as well as the environmental NGO community, have provided analysis and recommendations from the standpoint of the applicant businesses maneuvering through the program. Caught in the middle of these interests are the DOE officials responsible for administering the program in a manner that satisfies all constituencies, as well as the law itself.

The stakeholders in the Loan Guarantee Program generally take positions on the program that reflect two important, yet contradictory components of its mandate. As Timothy Newell of the U.S. Renewables Group put it when testifying before the Senate Committee on Energy and Natural Resources, “[t]he way in which Congress structured the LGP created a paradoxical situation. On the one hand, Congress has established the Loan Guarantee Program to incentivize innovative technologies. On the other hand, it requires a reasonable prospect of repayment...” (Newell 2010).

Mr. Newell is simply highlighting the reality that innovative technologies are by their very nature risky investments, and with any risky venture one takes on a greater probability of losses in return for a potentially higher reward. A small number of private equity firms, like Newell’s U.S. Renewables Group, specialize in taking on exactly that kind of risk in the interest of producing a long return on energy investments. The Government, however, is neither an expert nor a private entity, and in the case of the LGP, is restricted in its actions by not only a host of laws and regulations, but also the 300 million investors that make up the American public. In the LGP the government must take on risk in accordance with its mandate to support the commercialization of innovative energy technologies. At the same time, the program must try to avoid risk in the interest of fulfilling its fiduciary responsibilities to the taxpayer. To the point of near mutual exclusivity, the criticisms that are levied against the program arise from parties interested in furthering one or the other of those mandates.

GOVERNMENT ACCOUNTABILITY

The Government Accountability Office (GAO) has been one of the more prominent voices on behalf of the program’s responsibilities to taxpayers. The GAO has monitored the activities of the DOE in regard to the Loan Guarantee Program through a series of reports that chronicle the path of the program since its inception. As directed by Congress, the GAO’s mandate in these reports is to evaluate the funding, monitor

financial risk to tax payers, and management of the program. The general tone of its reports over the course of the program has been one at odds with the decisions made by DOE administrators. It has levied criticism on the DOE for what it sees as a prioritization of the realization of the energy initiatives that spurred the inception of the program over the establishment of mechanisms to properly account for, and measure the effectiveness of, the LGP.

In its first review of the LGP issued in February of 2007, the GAO critically reported that rather than implementing procedural structures to ensure the proper management and success of the program, the DOE was soliciting preapplications from potential projects. Despite the fact that the DOE had not yet issued a single guarantee, the GAO repeatedly charged the Department with ignoring monitoring and evaluation efforts in favor of establishing processes that would most speedily issue guarantees. The GAO concluded its report with several recommendations to the DOE, including:

- The establishment of final program regulations that protect the government's interests, manage risk, and ensure that borrowers are aware of program requirements;
- The establishment of policies and procedures for selecting lenders and loans, and for monitoring them once the guarantees have been issued;
- The establishment of policies and procedures for estimating subsidy and administrative costs;
- The establishment of policies and procedures to properly account for loan guarantees (U.S. Government Accountability Office 2007).

These recommendations were basically repeated with urgent criticism a year and a half later in the GAO's second major review of the program. The GAO stated:

DOE has not sufficiently determined the resources it will need or completed detailed policies, criteria, and procedures for evaluating applications, identifying eligible lenders, monitoring loans and lenders, estimating program costs or accounting for the program-key steps that GAO recommended DOE take over a year ago....The GAO suggests Congress consider limiting loan guarantee commitments DOE can make until it has put adequate controls in place (U.S. Government Accountability Office 2008).

In the time between these two reports the DOE answered the GAO by issuing the Final Rule defining the eligibility requirements, the application process, and the selection criteria for the program. During the same period, they also worked with the Office of Management and Budget (OMB) to put in place standard mechanisms for estimating and determining the credit subsidy cost. Congress in turn chose to expand, rather than limit, the Department's authorization level for issuing loan guarantees.

In its most recent audit of the Loan Guarantee Program conducted in early 2010, the GAO again highlighted what it saw as critical shortcomings of the LGP, while acknowledging that the Department had made "substantial progress" in constructing

an operational loan guarantee program (U.S. Government Accountability Office, 2010). The 2010 report focused primarily on the need for the LGP to establish performance goals and the maintenance of consistent operating techniques across the spectrum of applicants. In its evaluation, the GAO urgently insisted that the LGP was not achieving optimal performance due to its failure to establish quantifiable evaluation processes and corresponding performance goals, which together can sharpen the program's vision of its progress. As was previously discussed, the LGP has well-defined mandates to aid in the commercialization of innovative clean energy technologies, spur job growth, and protect the taxpayer while doing so. In addition, DOE officials, including Secretary of Energy Steven Chu, have explicitly linked the LGP to the Department's more specific goals of doubling renewable energy generation by 2012 and committing loan guarantees to two nuclear energy power facilities (Energy Washington Week 2009). The GAO insisted however, that these departmental goals are few and too general in nature, to influence the decision-making process of LGP administrators. The report called on the DOE to put in place sector-specific metrics that reflect the full range of the program's authorized activities and represent the complete spectrum of policy goals for the LGP, such as job creation. Furthermore, the GAO noted that the LGP had not established any mechanism for evaluating its progress on even those broad goals that had been set forth. The GAO insisted that the "DOE lacks the foundation to assess the program's progress, and more specifically, to determine whether the projects it supports with loan guarantees contribute to achieving the desired results" (U.S. Government Accountability Office, 2010).

The 2010 GAO report also highlighted instances where the LGP had been inconsistent in its interactions with applicant firms. It reported that the LGP had sometimes issued conditional commitments — tentative loan guarantee agreements pending a final review — without having all the necessary documentation in hand. It also cited treatment of nuclear projects, such as extensions on deadlines to submit crucial application documentation, which it deemed preferential and inconsistent relative to other technology sectors. The report called for better communication between the LGP office and applicant firms throughout the application process. Specifically, it suggested the establishment of an appeals process for the applicants that have been rejected by the LGP, as well as a mechanism for eliciting feedback from firms as they move through the process. In its response to the GAO's report, the DOE agreed that improvements could be made on all points but it offered no specific promises (U.S. Government Accountability Office, 2010).

In their own words the DOE has emphasized its priorities clearly. In early 2009 David G. Frantz, Director of the Loan Guarantee Program Office, offered testimony to the Senate Committee on Energy and Natural Resources, in which he repeatedly emphasized the urgency of the LGP first and the need for deliberation second. Mr. Frantz stated that the DOE would simplify, and streamline the application and evaluation process in the interest of shortening the cycle from application to issuance. He cited Secretary Steven Chu's recognition of urgency, and determination to move quickly to implement the program while praising the LGP staff for moving

expeditiously in their work (Organizing for America 2010). It was quite clear early on that, under Secretary Chu, the DOE has committed itself to fully realizing the massive potential of the LGP. Given the protracted development of the program, it was less clear exactly how that would be accomplished.

THE PRIVATE SECTOR CRITIQUE

No stakeholder in the LGP has emphasized its urgency more than the private sector entities dealing with the program. One symptom of the delays in the program's progress has been a steady stream of criticism and recommendations from private sector stakeholders attempting to capitalize on the program. Different industries involved with the LGP obviously voice some differing needs with regards to the program's guidelines. They are largely universal, however, in their general call for greater flexibility in the rules governing the LGP to better meet the needs of this complex sector.

Table 1 details many of the specific reforms that have been recommended by private sector entities. It includes recommendations made by attorneys practicing in the law firms of Latham and Watkins, and Hunton and Williams, and industry groups including the American Wind Energy Association, the Geothermal Energy Association, the National Hydropower Association, the Solar Energy Industries Association, the Nuclear Energy Institute, the Biomass Power Association, and the United States Clean Heat and Power Association. Table 1 details the issues raised by these groups by identifying the regulatory issue area, the barriers that its current implementation creates, and recommendations for reform. The results are that, counter to the GAO's conclusions, private sector groups feel the LGP regulations are more concerned with the financial viability of the applicant company than the viability of the technology itself.

Table 1. Issue areas and potential DOE loan guarantee reforms. This table presents potential barriers to the success of the LGP and the proposed solutions.

Issue	Criticism	Recommendation
Credit subsidy fees	Poses significant upfront costs on applicant company. An unknown cost during application process that could be as much as 30 percent of the guaranteed amount.	Where the credit subsidy cost is not paid with federal funds (e.g., for projects that are not eligible under the Temporary Program), provide more transparency with respect to the level of the credit subsidy cost and consider allowing the cost to be payable over the life of the guaranteed loan.
Application fees	100% now required upfront regardless of approval. Significant cost to applicant.	Allow all application fees to be remitted later in the application process when applicants have more certainty regarding their potential for success.
Solicitation timelines	Often too short given the great volume of information required.	Allow all applications to be submitted on a rolling basis
Preliminary credit assessment	Required as part of application process for projects in excess of \$25 million. For companies with technologies untested in financial markets a positive credit rating often depends on the promise of loan guarantee.	Eliminate or replace with a more useful analysis and other supplemental application requirements, or adjust such requirements to be closing conditions.
Collateral sharing agreements	Subtler collateral rights — rights of lenders providing non-guaranteed financing to the applicant company — are subverted to DOE making it harder for company to acquire other loans.	Allow flexibility in DOE determination of collateral sharing agreements.
Equity contributions	Significant cash equity contributions are required, which places small companies with high debt/equity ratio at a disadvantage.	Include “in-kind contributions” in definition of equity.
Qualified financing structures	DOE only recognizes debt obligations as qualifying for guarantees ruling out many forms of financing structures popular for renewable energy projects	Include equity driven financing structures such as sale-leaseback, lease pass-through, and partnership flip that take advantage of renewable energy tax credits.

Amortization schedule	Non-guaranteed portions cannot be repaid on shorter amortization schedule than guaranteed portion (shorter of 30 years or 90 percent of project assets useful life) limiting options for funding project costs not covered by guarantee.	Allow the non-guaranteed portion of a project's debt obligation to be repaid on a shorter amortization schedule than the guaranteed portion.
Environmental compliance	Mandatory environmental assessments are required of applicant projects.	Accept environmental assessments that have already been conducted for a given project.
Technical Staffing	Dedicated staffing levels are insufficient to meet demand and lack in technical expertise required to evaluate complex application materials.	Increase full time staffing to include expertise in the engineering, financial, and legal aspects involved in executing the LGP
Transparency of Application Review	Federal Procurement guidelines restrict productive communication between applicant and LGP.	Institute measures to provide more frequent and effective two-way communication with applicant firms during the application processes including communication on the likelihood of approval.
Electronic Filing	All applications materials must be submitted through mail and in hard copy slowing review considerably.	Allow electronic filing of application materials rather than hardcopy filing only

Source: Jennifer F. Massouh, George D. Cannon, Suzanne M. Logan and David L. Schwartz, "Real Promise or False Hope: DOE's Title XVII Loan Guarantee," *Electricity Journal*, 2009: 53-64. Ted J. Murphy, David S. Lowman, and Laura Ellen Jones, "ARRA Energy Appropriations: The Temporary DOE Loan Guarantee Program," *Hunton and Williams Renewable Energy Quarterly*, 2009: 3.

As the LGP developed and it became apparent that changes were needed, the DOE was faced with the complicated task of identifying potential reforms that will contribute to the successful implementation of the program, but that will not expose the government to unnecessary risk. The options open to the LGP are broad and have varying likelihoods of being adopted. An administrative issue, such as incorporating a rolling application process rather than a solicitation-oriented method, may be relatively simple to implement when compared to more technical issues such as expanding the base of eligible financing structures. The difference lies in both the measure's effect on the status quo and the department's power to unilaterally make the change.

As Table 2 illustrates the reforms recommended to the program by private sector stakeholders can be categorized and analyzed based on common characteristics. These categories include administrative issues such as fees and deadlines, capacity improvements such as staffing, communication and transparency improvements, and alterations to rules governing the acceptable financial structuring of projects.

Table 2. LGP Reforms. This table presents categorized LGP reforms proposed by the private sector.

Administrative	Financial	Capacity	Communication & Transparency
Administrative Fees	Credit Subsidy Fee	Technical Staffing	Open application process
Solicitation Timelines	Structuring aspects		Transparency of Application Review
Environmental compliance	Equity contributions		
Electronic Filing	Amortization schedule		
Environmental Impact Statement	Preliminary credit assessment		

Potential Finance Related Reforms

The financial issues listed in Table 2 are the most intricate from the perspective of administrators due to the differing needs of different technologies. The optimal collateral sharing agreement for a solar panel manufacturing plant, for example, may be entirely different from that of a nuclear power plant or a power transmission line. The differing financial intricacies of various technology types results in demands on the Loan Guarantee Program that are as diverse as they are complex.

At a very basic level, however, these financial issues can be seen as resulting in one way or another from the powerful dichotomy created by the differing needs of small versus large firms. As was previously discussed, many of the provisions dictating the administration of the LGP were written in anticipation of applicants being primarily large-cap firms with balance sheets deep enough to absorb a costly application process. As the scope of the program was broadened from nuclear and fossil-based utilities to include more nascent technology sectors such as solar, wind, and efficiency projects, the needs of the constituencies it was intended to serve also broadened. The program regulations, however, did not. Sectors primarily composed of emerging growth companies were invited into the program, but they were required to play by the same rules as corporations operating on a scale with orders of magnitude larger than their own.

The EPOA of 2005, for instance, requires the commitment of a significant cash equity investment on the part of applicant firms. The government naturally wants firms to have a substantial amount of their capital committed to the project as both a performance incentive and a show of economic viability, though the requirement that this contribution be made in cash equity is quite restrictive when it comes to small companies with low capital reserves. As Massouh et al., point out, smaller scale renewable firms typically leverage assets such as tax credits or intellectual property instead of equity to finance their early development. These are standard

practices in the project finance industry, and the fact that they are excluded by the cash equity requirement, prevents the LGP from considering projects that are following standard private sector practices (Massouh, Cannon, Logan and Schwartz, 2009). The consequences manifested themselves immediately in the form an absence of demand on the part of small-cap firms, and continuous recommendations to amend the LGP in order to meet the needs of its more diverse applicant pool. The needs of smaller energy firms interested in taking advantage of the program would quickly become one of the largest voices calling for the reform of the LGP.

Similarly, the implementing regulations of the LGP restrict the program’s support by allowing only debt obligations to be guaranteed by the DOE. Often these small-scale renewable energy companies obtain financing founded on equity-based leverage rather than debt leverage by, again, taking advantage of tax credits and other front-end growth incentives provided to the industry. These financing structures are typically more complex than debt transactions and carry names such as sale-leaseback, partnership flip, and lease pass-through. They are nonetheless considered standard financing structures by the private sector, and the fact that they are excluded from consideration in the LGP, prevents the program from considering reasonable projects.

As Timothy Newell pointed out in his testimony to the Senate Committee on Energy and Natural Resources, there are a number of requirements placed on applicants that, when aggregated, create a cost burden large enough to push small companies out of the program. These include application fees and credit rating reports, which add amounts of time and money to the application process considered disproportionate to the size of the guarantee requested by the applicant. As Mr. Newell points out, the minimum cost of obtaining a credit rating is \$175,000. A credit rating is required of all projects over \$25 million whether or not that project is eventually approved for a guarantee. As Table 3 shows, fees charged renewable energy projects by the program add further costs to this group. Though the facility fee and maintenance fee are graduated fees that accrue as the project progresses thorough the application process, the application fees are charged upfront and must be paid in cash.

Table 3. Fees for Renewable Energy Projects. This table shows fees charged to an applicant firm pursuing a loan guarantee for a renewable energy project.

Loan Guarantee Amount	Application Fee	Facility Fee	Maintenance Fee
\$0 — \$150,000,000	\$75,000 Part I: \$18,750 Part II: \$56,250	1% of the guaranteed amount	Between \$50,000 and \$100,000 per year
Above \$150,000,000 — \$500,000,000	\$100,000 Part I: \$25,000 Part II: \$75,000	\$375,000 + 0.75% of the guaranteed amount	Between \$50,000 and \$100,000 per year

Source: Kenneth Hansen and Shunko Rojas, “Heavy Demand for DOE Loan Guarantees,” *Project Finance Newswire* (Chadborne & Parke LLP), November 2008: 18.

Outshining all of these in their ability to produce uncertainty and contention from the private sector, is the credit subsidy fee. As with other fees, the credit subsidy is contentious because it poses a substantial cost to applicants. In fact, it will likely be the largest single cost to each applicant. Throughout the life of the LGP there has existed a high level of uncertainty surrounding the formulation of credit subsidy cost. It is a process that is conducted behind closed doors, and one over which applicant firms have virtually no control. This combination of great uncertainty with high cost is disquieting for firms moving through the application process.

THE ROLE OF OMB

The contention surrounding the credit subsidy cost begins with the fact that the Loan Guarantee Program does not actually control the process through which it is formulated. Even though DOE is the administering agency for the LGP, The Office of Management and Budget (OMB) is responsible for implementing the Federal Credit Reform Act. The Federal Credit Reform Act mandates that OMB be responsible for calculating the credit subsidy cost for all government loan guarantee programs. The reality of depending on another Federal agency for this crucial aspect of the program has produced its own set of problems and delays.

The most striking delay was the fact that for the first four years of the LGP there was no official process in place for determining the credit subsidy. Part of this was due to the sluggish progress of the program in general, though the unique nature of the LGP was also a contributing factor. As Michael D. Scott, Managing Director at the investment firm Miller Buckfire & Company, explained in his testimony for the Senate Committee On Energy and Natural Resources, nearly all previous iterations of government loan guarantee programs have featured a high volume of guarantees issued at relatively low-dollar amounts, with appropriated funding to cover the credit subsidy cost (Scott 2010). These operating realities permitted the OMB to make a series of simplifying assumptions in their determination of the credit subsidy cost; assumptions that cannot be applied in the case of the LGP. The LGP features a smaller number of uniquely complex projects seeking very sizeable loan guarantees when compared to previous government loan guarantee programs. This set of characteristics leads to a great deal of variability from one project to another, and because the applicant is ultimately footing the bill there is little tolerance for assumptions where precision may reduce cost.

In 2009 the OMB and DOE agreed to a model for calculating the credit subsidy cost. Unfortunately that model has never been made public, though estimates state that it could run up to 30% of project costs for renewable energy, advanced transmission, and energy efficiency projects (Massouh, Cannon, Logan and Schwartz, 2009). Because it is essentially a prediction, there is a great deal of subjectivity to the determination of the risk posed by a particular project. Consumer demand, technological performance, and market stability are just a few of the factors that must be taken into account making it particularly difficult for applicant firms to accurately anticipate what they

will owe. DOE does provide the applicant with its own estimate of the subsidy cost late in the review process. The estimate, however, is strictly unofficial and is calculated after applicants have already invested a substantial amount of time and money into their applications. The official calculation by OMB is part of the closing process for each particular loan guarantee and must be paid in full before DOE can close on the guarantee. The most substantial, and potentially game-changing cost faced by applicants is not a known quantity until literally the last possible moment in the application process.

As this discussion has shown, there is both great need and great potential for reform in the LGP. The issues facing administrators are complex and each potential reform carries its own set of consequences. Administrators must grapple with paradoxical mandates of the program and multiple sets of stakeholders whose demands are as diverse as they are urgent. The next section will discuss the reforms that were implemented under the leadership of the Obama Administration, the reasoning behind them, and their potential impacts on the LGP.

Chapter V: Revitalizing the Program

This section will discuss changes made to the LGP under the leadership of President Barack Obama and Secretary of Energy Steven Chu beginning in February of 2009. Reforms are discussed in three categories: those made as part of the Temporary Program, those that affect Section 1703 as well as the Temporary Program, and operational reforms such as staffing, communication, and transparency. This discussion will show that substantial progress has been made toward an improved Loan Guarantee Program, though where it remains in play, the credit subsidy cost is still the primary barrier to the success of the program.

THE SECTION 1705 TEMPORARY PROGRAM

In February of 2009, as a response to an economy in recession, the Obama Administration essentially created a new Loan Guarantee Program by amending Title XVII of the EAct 2005 under the American Recovery and Reinvestment Act (ARRA). This amendment established a “Temporary Program” with an expanded mandate to include loan guarantees for rapidly deployable renewable energy and electric power transmission projects.¹ To accompany the Temporary Program, or “Section 1705” referring to its

¹The DOE when referencing the ARRA amendment to Title XVII of the EAct2005 uses the titles “Temporary Program” and “1705 program” interchangeably. This standard will be followed for the purposes of this paper.

placement in the legislation, Congress appropriated \$6 billion to cover subsidy costs of loan guarantees issued under the Temporary Program, estimated to support more than \$60 billion in guarantees (Massouh, Cannon, Logan and Schwartz, 2009).

Creating the Temporary Program was an enormous step toward the improvement of the LGP for a number of reasons. Whereas the 1703 program was created with the institutional framework of a large energy company in mind, the Obama Administration specifically designed the 1705 program to cater to the needs of the smaller-scale companies that populate the clean energy technology sectors. The appropriation of funding to cover the credit subsidy costs set the Temporary Program dramatically apart from the 1703 program. It eliminated the largest cost of participation for applicant firms and added a much needed level of predictability and stability to the program. Eliminating the credit subsidy also eliminated the institutional bias it created, and ensured that the program would work within the capacities of the sectors it was intended to serve.

The appropriation of credit subsidy costs was also a big win for the program’s administrators. Since being brought on as Director, David Frantz had made known the difficulties created by the cost-neutral approach taken for the 1703 program. Eliminating that provision also eliminated what LGP administrators saw as the most substantial barrier to their work (Frantz 2010).

As Figure 4 shows, the Temporary Program was specifically designated for the renewable energy, electricity transmission, and biofuel projects that were the most adversely impacted by the structure of the original 1703 program. Sectors typically composed of capital-intensive projects, such as nuclear and advanced fossil, which would require a disproportionate share of the credit subsidy appropriation were excluded.

Table 4. Section 1703 and Temporary Program Eligibility Comparison.

Section 1703 Eligible:	Temporary Program (Section 1705) Eligible:
Only available to Projects that: <ul style="list-style-type: none"> • Avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and • Employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued. 	Projects must be of commercial scale and must commence construction not later than September 30, 2011, in the following categories: <ul style="list-style-type: none"> • Renewable energy systems, including incremental hydropower, which generate electricity or thermal energy, and facilities that manufacture related components. • Electric power transmission systems, including upgrading and reconditioning projects
No Appropriations for Credit Subsidy Costs	\$6 billion Appropriation credit subsidy cost applicable only to Section 1705 Projects

Source: *Energy Policy Act of 2005* (United States Government, 2005). *American Reinvestment and Recovery Act of 2009* (Washington DC: U.S. Government Printing Office, 2009).

Also important to the new 1705 program was the requirement that the technology be a “commercial” technology to be eligible for the program. This requirement is in direct contrast to the 1703 program, which explicitly disqualified commercial technologies in favor of those that it considered “new or significantly improved.” The purpose of this reform was to widen the eligible applicant pool for the program, and it was a direct acknowledgement of the operational realities of the program’s primary constituency. There are many types of biofuel, geothermal, or solar technologies that have diffused enough into the market to be considered commercial technologies yet still struggle against succumbing to the valley of death. The solar industry in particular has a long history of demand instability due in large part to the fickle commitment of political administrations. The Production Tax Credit, for instance, which is a key demand incentive for the renewable energy industry, was allowed to expire three times between 1999 and 2004 alone (Union of Concerned Scientists 2009). Over the decades this has created a prolonged period of emergence for the sector in which it has maintained the type of risk profile that would be associated with a newer technology.

As Table 4 also indicates, the Temporary Program gains its name from the fact that a hard deadline exists in the program. To be eligible, a project must commence construction no later than September 30, 2011. This deadline is intended to force the program to accept only “shovel-ready” projects in the interest of near-term job creation, and reflects the broader economic stimulus purposes of the ARRA. The September 2011 deadline is a Sunset Provision that not only serves as an eligibility criterion but also a hard stop to Temporary Program. LGP administrators are thus tasked with the significant goal of distributing a monumental amount of loan guarantees, while ensuring the safety of the taxpayer, all in a relatively short amount of time.

Despite the significant commitment of the Obama Administration, shown by the creation of the Temporary Program, at the beginning of 2009, administrators of the LGP still faced major obstacles to the implementation of both loan guarantee programs. Though the ARRA amendment to Title XVII was a substantial improvement, it still left many issues that had so greatly encumbered the implementation of that program unresolved in the hands of Secretary Chu. Nevertheless, Secretary Chu has been vigorous in his support and commitment to the program. Over the course of his first year on the job he oversaw further substantial changes to the core of the Loan Guarantee Program.

REFORMS TO SECTION 1703

The first and most swiftly implemented reform to the 1703 program was not a reform in the traditional sense at all. After the passage of the ARRA, Secretary Chu chose to allow all programs that applied under Section 1703, but were now eligible for the Temporary Program, to be transferred to that program. This move quickly created a portfolio of projects for the Temporary Program that were already progressing in various stages through the application pipeline. Furthermore, by permitting these programs to take

advantage of the appropriated subsidy it did not punish those early applicants who had been struggling with the 1703 program.

Secretary Chu also oversaw a review of the regulatory structure governing the LGP. As a result of that review, on December 4, 2009, the DOE issued a new Final Rule that amended the regulations implementing the 1703 program in two important ways. It is worth noting here that these stipulations also apply to the Temporary Program.

The first reform implemented as part of the 2009 Final Rule dealt with collateral sharing agreements. The original interpretation of Title XVII, regarding collateral sharing, was derived from two specific provisions in the legislation. One required that the Secretary's guaranteed obligation "not be subordinate to other financing" (Office of the Chief Financial Officer, Department of Energy, 2009). With regard to property acquired, the other stated that the rights of the Secretary pursuant to the guarantee shall be superior to the rights of any other party. These two provisions were interpreted early on to refer to an agreement that must be secured as a condition of making a guarantee, which granted the DOE a first lien on all project collateral.

According to private sector stakeholders, this interpretation made it difficult for projects to receive financing supplementary to that which is covered by the guaranteed obligation. According to industry representatives, an outright first lien on all project assets as part of an intercreditor agreement created a financing environment that was both atypical and unattractive to nongovernment financing entities. Because the LGP is limited in many instances to guarantees covering, at most 80 percent of project costs, this provision was widely problematic.

The DOE was able to reform this regulation because it was a provision in the legislation that allowed some room for interpretation. In the new interpretation DOE recognized that neither provision mentions collateral or explicitly equates the condition of "superiority" of rights with a requirement that the DOE maintain a first lien on that collateral. In the new rule DOE concluded that "the statute requiring receipt of a first lien on all project assets is not one that it was legally compelled to adopt, and was not correct. A first lien on all project assets is better understood as one element that the Secretary may require for a particular project, but is not compelled by the statute to require [emphasis added]" (Office of the Chief Financial Officer, Department of Energy, 2009).

The second major reform implemented in the December 4th Final Rule also was intended to provide more flexibility to projects seeking complementary financing to augment a loan guarantee. Specifically, the DOE altered the requisite amortization schedule for non-guaranteed obligations to allow for shorter amortization schedules on project-related financing. Prior to this reform the LGP required any non-guaranteed portion of a guaranteed obligation to be re-paid on a pro rata basis that is not on a shorter amortization schedule than the guaranteed portion (Office of the Chief Financial Officer, Department of Energy, 2009). In their explanation of the rule change the DOE acknowledged that this requirement effectively ruled out many financing options which the DOE considered "appropriate financing arrangements."

It is important to remember that during the passage of the Temporary Program and the initial formulation of these reforms, the LGP had still not issued a single guarantee. This was a crucial time for the program. In light of this, it makes sense that both the reform to collateral sharing, and the alteration of the amortization requirements, afforded the LGP and Secretary increased flexibility to make decisions on a case-by-case basis pursuant to the dual mandates of the program. The DOE was explicit in its explanatory notes that these changes resulted from consultation with industry representatives and their own experiences implementing the program. Their goal through these changes was to produce a more “workable” program that could finally achieve that which it was intended to (Office of the Chief Financial Officer, Department of Energy, 2009).

OPERATIONAL REFORMS

A vital yet often underemphasized component to the successful implementation of the Loan Guarantee Program is capacity. No matter how perfect the legislation, the program will go nowhere without qualified individuals operating within an administrative infrastructure capable of handling the work required. The application materials for each project submitted to the LGP are both voluminous and extremely complex. Furthermore, that complexity is highly varied due to the diversity of technology sectors eligible under the program guidelines. The application requirements issued by the LGP explicitly call for a minimum of thirty separate categories of documentation (Office of the Chief Financial Officer, Department of Energy, 2009). Many of these categories, such as the credit assessment, environmental impact statement, market analysis, and project operations description, are dense and specialized in themselves. Proper review requires that the LGP establish a detailed understanding of the programmatic, technical, and financial aspects of each individual application. By 2010 the program was receiving these applications by the hundreds while rapidly approaching the September 2011 deadline.

Staffing the Program

Both private and public sector stakeholders are surprisingly silent on this issue in their myriad critiques, though it has been abundantly apparent from the beginning that the LGP was severely understaffed relative to the work required. As was previously stated, the program unofficially began its operations in late 2005 under the auspices of the office of the Chief Financial Officer at DOE. It did not have a single fully dedicated employee, however, until August of 2007. One year later that number had increased to 18. Most of the members of this initial cadre of hires came from a background in project finance, with many having been recruited from the private sector via the Overseas Private Investment Corporation (Frantz 2010). Though project finance is a central substantive area of the program, its skill set is by no means sufficient to cover the numerous expertise required to fully review even a single application. DOE augmented its capacity in 2008 by hiring 11 contract employees and issuing a “call for experts,”

which solicited technical assistance on an ad hoc basis in the legal, engineering, and environmental compliance aspects of the program.

The program's staffing woes changed dramatically with the passage of the Temporary Program as part of the ARRA in 2009. From within the \$6 billion appropriation, \$35 million was specifically allocated to cover the administrative costs of the program. DOE dedicated this money to two major operations areas, both of which had a sizable impact on capacity.

The first and largest investment of the \$35 million went to staffing. By late 2010 the LGP had increased its full-time staffing by almost five fold, to 83 fully dedicated federal employees. Its contracted employees, which are subject-matter experts brought in on a temporary basis to support specific solicitations, increased by an order of magnitude, from 11 to over 100 (Frantz 2010). Structurally, these staffing increases included the establishment of an in-house chief council's office and an in-house chief engineer's office. This afforded the LGP its own dedicated department of professional project finance attorneys and engineers with the deep and diverse technical expertise required of the program.

As the size of the program grew, so too did the attention it received. In 2009, shortly after the implementation of the Temporary Program commenced, the Obama Administration chose to place a political appointee at the helm of the LGP. David Silver was hired in November of that year to serve as Executive Director of the LGP. In addition to program management, Silver is the main point of interagency contact and serves as the face of the program to Congress and the Press.

To effectively utilize the substantially increased staffing, administrators reorganized the staff based on technical expertise relevant to technology sectors into what it called "technology domain groups." As David Frantz explained, these capacity improvements improved not only the technical expertise present in the program office, it improved the functioning of the LGP at a foundational level. The increased capacity "greatly facilitated both our technical feasibility and technical eligibility investigations, but also our ability to manage on a continuing basis our projects, because we now have our own engineers and don't have to rely on the Department's laboratories and field organizations" (Frantz 2010).

The Online Application Portal

Staffing was not the only major capacity upgrade that the LGP implemented with the \$35 million administrative allocation. The program also dramatically improved its website, and while this may initially seem superficial, the new website served as much more than a source for information. DOE recognized that if they effectively utilized the web they could drastically improve the application process. By incorporating new functionalities into the website, LGP administrators were able to have a strong impact on the efficiency of the entire program.

One of the main priorities for the revamping of the program's website was the creation of an online application portal for completing and submitting applications electronically. This investment was made for the expressed purposes of decreasing the time it takes to receive and process applications, and increasing the Loan Guarantee Program's ability to communicate effectively with applicants.

Prior to the creation of the online application portal, submissions were made in hard copy by mail. The complexity of the documentation and the multiple steps of the application process did not easily facilitate a one-off submission. Changes or additions to an application could thus cause weeks of delay for a particular project. With the launch of the online application portal applicants could upload application materials to the website and have them in the hands of LGP administrators in less than a day. Problem areas could now be addressed, discussed, and resolved in near real-time. In addition to electronic submission capabilities, the online application portal includes detailed step-by-step process instructions to guide applicants through the application process.

With the addition of the Temporary Program, time became an increasingly precious commodity in the Loan Guarantee Program. LGP administrators have attributed the launching of the online application portal with dramatic reductions in the time it takes to process applications. The process of initial review, which is the first stage of the application process and includes a preliminary determination of eligibility, was reduced from taking on average 2-3 months to less than 10 days (Silver 2010). In late 2010 the website was awarded the Gold Award for Excellence in Business Process Management & Workflow, making DOE the first Federal agency to receive such recognition in the 17 year history of the award (Department of Energy Loan Guarantee Program, 2011). As Timothy Newell of the U.S. Renewables Group stated in his Senate testimony in September of 2010, the focus on improving the capacity of the LGP has produced results:

Not too long ago, we would have expected to wait at least three months for approval by DOE of a Part 1 loan guarantee application. Last month, our most recent Part 1 application was reviewed and approved in only six working days. That is progress you can measure (Newell, 2010).

Given the slow initial pace of the LGP, the progress it has made since the passage of the ARRA in 2009 is reason for optimism. It has been shown in this discussion that the Obama Administration and program leadership addressed components critical to the functionality of the LGP, including obstructive financing requirements and shortfalls in capacity, and to an extent, the credit subsidy cost.

This section should also impart the importance of committed leadership to the success of the program. Secretary Chu and President Obama have made very clear their belief in the importance of the Loan Guarantee Program and desire to see it succeed (Obama 2011). Though it is not easily quantifiable, their leadership, enthusiasm, and commitment to the program have provided a key impetus necessary to overcome

obstacles and institute much needed reforms.

The Loan Guarantee Program represents an unprecedented amount of taxpayer money to be specifically dedicated to the development of clean energy technologies. This commitment by the President has the potential to provide consistent means and motivation for the successful reform of the program. Even with the reforms discussed here, however, it will be a formidable challenge for the DOE to meet its goals. There has been little talk and less action on the part of DOE in the way of project reforms since the issuance of the 2009 Final Rule. While it is certainly possible, as time progresses it seems less likely that substantial new reforms will be undertaken in the near-term. It is important to note that besides the collateral sharing and amortization schedule reforms discussed here, the 1703 program remains unchanged. If they hope to fully implement the 1703 program, administrators must rely on increased capacity and their ability to identify and process project applications that can meet the terms of the 1703 program.

The coming section will discuss the effects of changes that have been made to the Loan Guarantee program. This discussion will include a comprehensive analysis of the demand for the program on the part of the private sector through the submission of applications, and the successful processing of those applications in the form of guarantee obligations. As will be seen, the uphill battle faced by the 1703 program was not easily won.

Chapter VI: Impact

It is worth reiterating here that, during the four years between August of 2005, when the Loan Guarantee Program was signed into law, and September of 2009, the Department of Energy issued zero loan guarantees under the LGP. Between September of 2009 and February of 2011 the LGP has made a conditional commitment, or closed, on nineteen separate projects totaling \$16.5 billion in guarantees. Thirteen of these projects were finalized in 2010 alone, with two more conditional commitments announced in the first month of 2011.

Taken at face value, this comparison makes a strong case for the success of the Obama Administration's efforts toward reforming and implementing the Loan Guarantee Program. Only months after taking office, it would seem, administration officials were able to turn a chronically static government program into what DOE itself calls "one of the largest and most productive energy project financing operations in the world..." (DOE Loan Guarantee Programs, 2011).

Taking into account the discussion of implemented reforms from the previous chapter, it can be concluded that, relative to its prior state, the Obama Administration's efforts

on the Loan Guarantee Program have been substantial. From the very beginning of their time in office, the Obama Administration made the LGP an integral component of its energy and economic policy goals. This is evident in their acquisition of significant funding, as well as concentrated leadership, and attention toward reforming the program. Their efforts produced results in the form of noteworthy additions to the energy landscape of the United States. The nineteen programs finalized by the LGP (detailed in Table 5 and Appendix 1) include the world's largest wind farm, two of the world's largest solar thermal electricity generation facilities, and what will be the first new nuclear power plant to be built in the United States since 1977 (DOE Loan Guarantee Programs, 2011). Their actions, and these results, indeed support the contention that the Obama Administration has finally shaped the Loan Guarantee Program into the effective policy mechanism it was originally intended to be.

Upon closer inspection, however, the above argument is overly simplified. To extract the true impact of reform efforts one has to ask; which program?

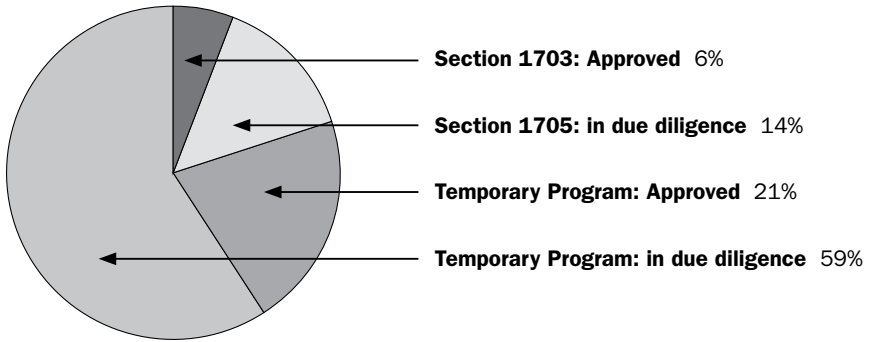
The final section of this paper will illuminate the weaknesses still present in the LGP through a comparison of the state, and progress of the 1703 and 1705 programs. This comparison will show that the developments in the LGP since 2009 can be predominantly ascribed to the section 1705 Temporary Program. The 1703 program, on the other hand, has enjoyed only limited and precarious success. Most importantly, however, this section will discover the reason for the lopsided results between the two programs. Through an examination of several potential explanations, it will be shown in the following discussion that the ultimate source of the uneven success of the program is the credit subsidy fee.

COMPARING IMPACT: 1705 VS. 1703

As of December 2010 the Loan Guarantee Program had received 397 completed applications, submitted through 9 separate solicitations. All but three of these solicitations have closed. Of the nineteen projects approved for guarantees by the LGP as of February 2011, fifteen have been issued through the Temporary Program while only four have successfully traversed the 1703 program (DOE Loan Guarantee Programs, 2011). In its pipeline, the LGP currently has 52 projects in due diligence. Of these projects, 42 are being considered for the 1705 program while only 10 are seeking approval through the 1703 program. These two sets of figures represent the bulk of the work currently being performed by LGP administrators.

As Figure 2 illustrates, when we combine approved or conditionally committed projects with projects currently in due diligence, the numbers reveal that 80 percent of the application activity in the LGP, has been conducted under the Temporary Program. This reality exists despite the fact that the 1703 program has been in operation years longer than the Temporary Program, and is operating with over \$50 billion in loan guarantee authority.

Figure 2. Proportionality of Section 1703 and 1705 Temporary Program Projects Approved or in Due Diligence



Source: David Frantz, interview by Gregory W. Durham (December 3, 2010)

Such an uneven distribution of the past and current application activity in the LGP belies the contention that the rapid pace of approvals since 2009 is a sufficient indicator that the program as a whole is on sure footing. It does nothing, however, to indicate the source of this disproportionality. By analyzing potential explanations drawn from the major differences of the two programs, the reality illustrated in Figure 2 can be systematically addressed. Though multiple factors may contribute in some way, it will be here that the ultimate source of the relative success of the two programs is the differing requirements relating to the credit subsidy cost.

THE SUNSET CLAUSE OF THE TEMPORARY PROGRAM

One might argue that it is the ticking clock of the Temporary Program's September 2011 deadline that is driving the focus of administrators toward that program at the exclusion of the 1703 program. Indeed, LGP administrators have made it standard practice to channel all eligible projects through the Temporary Program, even if the application was originally filed under Section 1703. One could easily see how this practice could result in a 1703 program that has been essentially sidelined by administrators, as eligible applications are passed on expeditiously to the Temporary Program.

This analysis fails to take into account the perspective of the applicant firm, a perspective that is significantly shaped by the presence of the requisite credit subsidy fee. Just as LGP administrators have an obvious incentive to spend the appropriated funding before time runs out, applicant firms have a short window within which they can bank the substantial savings generated by the government-pays approach of the 1705 program.

Though cost is certainly the primary component, applicant firms are also drawn to the 1705 program because it allows them to avoid the contention and uncertainty that

surrounds the formulation of the credit subsidy cost. As was previously discussed, there is no one-size-fits-all amount that can be applied across all projects. Before a firm can pay the credit subsidy fee, they must first endure a formulation process involving multiple government agencies, and multiple stages of negotiation. Though the LGP estimates the credit subsidy cost prior to its formulation by the Office Management and Budget, there can be no prior certainty of the actual amount.

The cloud over the LGP created by this operating environment is consistently present in the volumes of documents produced by private sector stakeholders over years. Grievances with the credit subsidy fee also consistently come to light in what can be seen as the program's most actionable public forum, congressional hearings. In the transcript of the most recent (September 23, 2010) hearing on the Loan Guarantee Program, held by Senate Committee on Energy and Natural Resources, the credit subsidy fee is explicitly mentioned over 250 times. This hearing featured testimony by members of the Committee, industry representatives from all LGP technology sectors, the financial sector, and Executive Director Jonathan Silver. Nearly all references to the credit subsidy were with regard to the difficulties it creates. In one particularly glaring example, Michael D. Scott, of the investment banking firm Miller Buckfire & Co, devoted over one-third of his 24-page testimony to a detailed discussion of the calculation of the credit subsidy fee in relation to his industry's concerns with the present method being employed by OMB. That such a diverse group of stakeholders would devote so much attention to one issue during Congressional testimony, speaks volumes about the urgency of the matter, and the benefits that can be gained from avoiding it altogether.

The removal of the credit subsidy fee from the requirements of the Temporary Program creates an obvious incentive for eligible projects to shun the 1703 program. The appropriation of the credit subsidy fee means that the applicant firm is freed of not only a substantial monetary expenditure, but also the expenditure of the time, stress, and uncertainty created by the secretive and sometimes obstinate nature with which the OMB calculates the fee. In his own testimony during the September 23rd hearing, Jonathan Silver recognized this incentive in stating that:

Although we have, under 1703, the \$18.5 billion in renewables authority, there has been very little demand for renewables loan guarantees under that program. This may, in part, reflect the ability of renewable projects to apply for a guarantee under 1705 (Silver 2010).

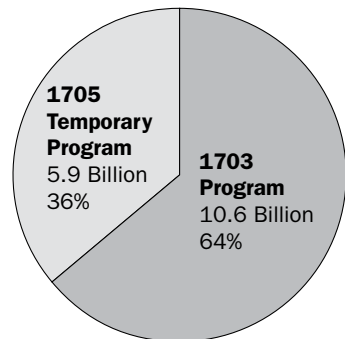
It is thus not sufficient to say that the lingering deadline in the 1705 program is responsible for the abovementioned discrepancy between the two programs. LGP administrators indeed have an incentive to focus on the Temporary Program, but this is only half the equation. Without willing applicants, program officials have only idle hands. It is the presence of the credit subsidy fee that creates strong incentives on the applicant side to avoid the 1703 program at all costs.

PROJECT CHARACTERISTICS

One might also cite the inherent differences of the eligible technology types, and the specific project characteristics they require, as a significant contributor to the disparity illustrated in Figure 2. When one subtracts the technology types eligible for the 1705 program from the whole of those eligible for both programs, one is essentially left with the nuclear and advanced fossil sectors representing the 1703 program. It could be reasoned that these technology types are unique in that large companies doing exceedingly complex capital-intensive projects generally represent them. It is possible that the nature of the projects under consideration for the 1703 program simply require a different review process than those of the 1705 program, and could account for the varying results.

This argument is furthered when one compares Figure 2 to Figure 3 below. Figure 3 illustrates an inverse relationship in the respective programs between the total number of projects approved, and the total value of those projects. Though only four of the nineteen total guarantees have been offered commitments under the 1703 program, their total project costs represent 64 percent of the roughly \$16.5 billion in guarantees made as of February 2010. The fact that so few projects can have such an impact could be seen as evidence that the discrepancy in the success of the two programs is in fact an illusion, and that the 1703 program is performing relatively well.

Figure 3. 1705 & 1703 Program Approved Loan Guarantees in Billions USD



Source: David Frantz, interview by Gregory W. Durham (December 3, 2010)

Upon closer inspection, however, one finds that the projects approved under Section 1703 are not the proportionately larger equivalents to those that have been approved through the 1705 program. First, the majority of them are not any larger in terms of project cost than the average 1705 approved project. Secondly, there is a lingering component of uncertainty in these approvals that is both strikingly consistent, and directly related, to the presence of the credit subsidy fee.

Table 5 lists the four projects approved under the 1703 program as they are described on the DOE Loan Guarantee Program’s website. First, it is worth noting that one project accounts for 78 percent of the total loan guarantee amounts approved under the 1703 program thus far. The Georgia Power Company project — with an \$8.33

billion loan guarantee obligation — involves the construction of two new nuclear reactors that, if successful, will be the first new nuclear power plant built in the U.S. in three decades. The remaining three projects include a uranium enrichment facility, a carbon manufacturing facility, and a manufacturing facility for energy efficient glass windowpanes. In terms of monetary value and technological complexity, these three projects are all equivalent to the spectrum of projects that have been approved under the 1705 program.²

Table 5. Approved Loan Guarantees Under Section 1703 Program

Project	Loan Guarantee Amount	Date of Agreement	Status
Georgia Power Company	\$8.33 Billion	February 2010	Conditional Commitment
AREVA	\$2 Billion	May 2010	Conditional Commitment
Red River Environmental Products, LLC	\$245 Million	December 2009	Conditional Commitment
SAGE Electrochromics Inc.	\$72 Million	March 2010	Conditional Commitment

Source: DOE Loan Guarantee Programs, “DOE Loan Guarantee Programs,” The Financing Force behind America’s Clean Energy Economy, 2010 1-January, http://lpo.energy.gov/?page_id=45 (accessed February 12, 2011).

THE UNCERTAINTY OF CONDITIONAL COMMITMENTS

The detrimental influence of the credit subsidy cost can be seen here in the Status column of Table 5. All projects approved under Section 1703 remain conditional commitments, meaning that DOE and the applicant firm have not yet successfully completed the crucial step of final closing. For comparison, in the 1705 program, 8 out of the 15 projects approved have closed. Four of those seven that remain conditional commitments are relatively recent, having been approved no later than October 2010, with three having been approved in the first two months of 2011.

The fact that these projects are still conditional commitments is much more than a mere technicality. Similar to purchasing a home, the closing of the loan guarantee is the most important step of the process, and often the most precarious. The fact that all of these projects have been approved for an extended period of time — from 9 months to well over a year — but are not yet closed, is an interesting pattern. The fact that the determination and payment of the credit subsidy fee is a primary component of closing, however, is more than mere coincidence.

²For a list of all projects approved by the Loan Guarantee Program see Annex 1.

Due to the sensitive nature of the negotiations between DOE and the applicant firms, there has been effectively no public communication on the specific status of these projects. It is therefore difficult to say with certainty why none have closed. Drawing evidence from related sources, one can make a strong case for the detrimental impact of the credit subsidy fee on these projects.

The most poignant example of the impact of the credit subsidy on the 1703 program is that of the 1,600 megawatt Calvert Cliffs nuclear power project. This example is particularly informative of the status of the four approved 1703 projects because, for a time, Calvert Cliffs was one of them. In May of 2009, the project, headed by Constellation Energy and its partner Unistar Nuclear Energy, was selected by the LGP to proceed through the final stages of due diligence with the intent of reaching a conditional commitment. If approved, it would cover \$7.5 billion in project costs for the construction of a new nuclear reactor at an existing nuclear power plant in Lusby, Maryland.

The closing on the guarantee never came, however. In October of 2010, after a nearly three-year application effort, Constellation Energy abruptly and unilaterally announced that it had abandoned negotiations with the LGP, and totally withdrew the Calvert Cliffs project from consideration under the Loan Guarantee Program. In a letter announcing their decision to pull out of the LGP, Chair of Constellation Energy, Michael Wallace, pointed blame squarely at the credit subsidy cost.

In light of the significant and ongoing uncertainty created by the Office of Management and Budget's inability to address significant problems with its methodology for determining the project's credit subsidy cost and the unreasonably burdensome conditions a loan guarantee under this approach would require, we regret to inform you that Constellation Energy does not see a timely path to reaching a workable set of terms and conditions that would be economically reasonable and statutorily justifiable (Wallace 2010).

In support of its unprecedented actions, Constellation Energy would go on to reveal that the OMB and the LGP had requested a credit subsidy fee payment of 11.6 percent of the total guaranteed obligation (roughly \$880 million). For comparison, nuclear energy representatives outside of the Calvert Cliffs project stated that they were expecting an amount closer to 1 percent (Mufson 2010). Per the stipulations of the LGP, this sum was required upfront before closing and could not be part of the guaranteed obligation. In a statement that directly contradicts Congress' original rationale behind the borrower-pays approach, Mr. Wallace concluded that the credit subsidy cost "would clearly destroy the project's economics, or the economics of any nuclear project for that matter" (Wallace 2010).

Since Constellation Energy abandoned the program, the debate surrounding the credit subsidy cost and its impact on the LGP has been renewed among industry officials and journalists. There has been near silence, however, on the part of government. Besides a short statement released by the LGP, stating that they hope to renew their cooperative

efforts toward reaching an agreement on the guarantee, DOE has said nothing about Constellation's decision. The OMB has also made no attempt to answer the criticism generated by the incident, and has declined to offer testimony at Congressional hearings regarding the program (Senate Committee on Energy and Natural Resources, 2010).

Though the exact reasons preventing the closing of the four remaining approved 1703 projects cannot be known, the Calvert Cliffs example illustrates very clearly the precarious state of these projects. It also strongly reinforces the fact that a conditional commitment is not the equivalent of a closed guarantee obligation. The Calvert Cliffs project had everything in its favor. It was an experienced, large-cap applicant firm that supposedly had the resources to succeed in the 1703 program. As it moved through years of review within the LGP, the project benefited from a strong commitment on the part of government. DOE officials, LGP administrators, and powerful congressional representatives, including then House Majority Leader Steny H. Hoyer (D-Md.), all had an expressed stake in the success of the application (Mufson 2010). Despite deep resources and support, it was all undone at the last minute by the credit subsidy fee. There is no discernable reason why this cannot happen to the remaining four projects, or those yet to come.

In this light, the success of the 1703 program is a fragile one that cannot be placed on equal footing with the Temporary Program. After seven years of effort, the 1703 program has still not successfully closed a loan guarantee. The Temporary Program, on the other hand, has closed eight in the two years since it commenced. Furthermore, as is shown by the three projects approved in the first two months of 2011, the Temporary Program is rapidly moving forward. In contrast, the 1703 program has produced no news since Constellation Energy abruptly abandoned it.

The reason for the varying progress of the two programs is, quite simply, money. Due to the presence of the credit subsidy fee, the 1703 program is walking a very fine line between the value of the loan guarantee that it provides and the cost of obtaining it. That cost is also born out in the added time and uncertainty created by the process through which the fee is formulated.

During the course of its reform efforts the Obama Administration secured billions in funding, expanded the qualifying financial structures, expanded the scope of eligible technologies, and greatly increased the capacity of the program. As can be seen from the above discussion, however, of the major differences between the two programs, only the credit subsidy cost can fully account for the great discrepancy of results. Though other factors affect both programs in important ways, the credit subsidy fee is responsible for creating the incentives that have fueled both the growth of the 1705 program and the continued stagnation of Section 1703. The four 1703 programs receiving conditional commitments show that there is potential for success. That success, however, has not yet been proven, and the example of the Calvert Cliffs nuclear project now hangs ominously over it.

Chapter VII: Conclusion: New Energy?

In this paper it has been shown that as a result of the Obama Administration's efforts there are now two faces to the Department of Energy Loan Guarantee Program: one dynamic and thriving; the other unproven and vulnerable. Through a detailed analysis of the evolution of the regulatory framework and operational realities influencing the LGP, it was shown here that the Administration has shaped the program into an energy project finance organization that is indeed providing new energy to America.

To garner the source of that energy, the portfolio of implemented reforms was used as a foundation from which to analyze actions taken by LGP administrators and applicant firms regarding the submission of applications, due diligence, project approvals, and final closings. It was shown through this analysis that the fruit of the Obama Administration's reform efforts was born primarily by the newly implemented section 1705 Temporary Program, while the 1703 program remained essentially dormant.

Finally, through the analysis of interviews with LGP administrators, as well as key documents and events regarding the program, evidence was provided to show that the differing ability of the 1703 and 1705 programs to attract applications and produce guarantees is predominantly due to the lingering presence of the credit subsidy fee.

Appendix I

1705 Program Approved Loan Guarantees

Project	Type	Loan Guarantee Amount	Date of Agreement	Status
Abengoa Solar, Inc.	Solar Generation	\$1.45 billion	July 2010	Closed
Abound Solar	Solar Manufacturing	\$400 million	July 2010	Closed
AES Corporation	Battery Storage	\$17 million	July 2010	Closed
Beacon Power Corporation	Energy Storage	\$43 million	Aug 2010	Closed
BrightSource Energy, Inc.	Solar Generation	\$1.4 billion	Feb 2010	Conditional Commitment
Nevada Geothermal Power Company, Inc.	Geothermal	\$78.8 million	Sept 2010	Closed
Kahuku Wind Power, LLC.	Wind Generation	\$117 million	July 2010	Closed
Nordic Windpower USA, Inc.	Wind Manufacturing	\$16 million	July 2009	Conditional Commitment
Solyndra Inc.	Solar Manufacturing	\$535 million	Sept 2009	Closed
US Geothermal, Inc.	Geothermal	\$102.2 million	June 2010	Conditional Commitment
Caithness Shepherds Flat	Wind Generation	\$1.3 billion	Oct 2010	Closed
LS Power Associates (ON Line)	Transmission	\$350 million	Oct 2010	Conditional Commitment
Agua Caliente	Solar Generation	\$967 million	Jan 2011	Conditional Commitment
Diamond Green Diesel	Advanced Biofuels	\$241 million	Jan 2011	Conditional Commitment
SoloPower	Solar Manufacturing	\$197 million	Feb 2011	Conditional Commitment

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