Report of the Independent Consultant's Review with Respect to the Department of Energy Loan and Loan Guarantee Portfolio

January 31, 2012

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I. INTRODUCTION

A. The White House Mandate

The Chief of Staff of the White House requested that Herbert Allison review the Department of Energy's ("DOE") loan and loan guarantee programs for alternative energy projects and provide:

> (1) A report on the current status, credit characteristics, and risk of loss of DOE's portfolio of loans and loan guarantees provided to support alternative energy projects (hereinafter, "the Portfolio");
>
> (2) Recommendations for enhancing the monitoring, management, and oversight of DOE's loan and loan guarantee programs, and
>
> (3) Recommendations pertaining to early warning systems to identify and mitigate potential problems with individual loans or loan guarantees.

Mr. Allison was asked to complete the White House's mandate (the "Review") in 60 days once a team of independent advisers was assembled to assist in performing the work. Mr. Allison and the advisers collectively are referred to throughout this report as "the Independent Consultant."

B. The Portfolio

DOE operates two programs that provide loans or loan guarantees to support clean energy projects. The Title XVII program, established under the authority of Title XVII of the Energy Policy Act of 2005 ("EPAct") and the American Recovery and Reinvestment Act of 2009 ("ARRA"), provides loan guarantees for loans made to support certain types of clean energy projects. The Advanced Technology Vehicle Manufacturing program ("ATVM") was established by the Energy Independence and Security Act of 2007 ("EISA") to make direct loans to manufacturers of advanced technology vehicles. (Hereinafter, the Title XVII and ATVM programs are collectively referred to as "the Programs.")

The Independent Consultant conducted an evaluation of the Portfolio as of November 28, 2011. In total, 30 loans were evaluated, of which 25 were closed under the Title XVII Program and five were closed under ATVM (collectively, the "Evaluated Loans"). In general, the Evaluated Loans were structured as funding commitments, with limited or, in many cases, no funds drawn under the loans at closing. Borrowers have the ability to draw under the loans from time to time to fund specific project costs ("Eligible Costs") provided that they meet certain conditions precedent that vary among the individual loans.

To facilitate evaluation, the Independent Consultant grouped the Portfolio into three broad categories, each consisting of a distinctive project type and loan structure.

Utility-Linked Loans. The first category includes loan guarantees supporting utility-linked projects for the generation or transmission of alternative sources of energy (the "Utility-Linked Loans"). The Portfolio includes 20 Utility-Linked Loans.

Non-Utility-Linked Loans. The second category includes cellulosic ethanol projects, solar manufacturing companies, and small, start-up automotive manufacturing companies that comprise the non-utility-linked projects (the "Non-Utility-Linked Loans"). These loans on average are smaller than the Utility-Linked Loans and bear greater risk. The Programs include eight Non-Utility-Linked Loans, excluding loans made to Solyndra Inc. ("Solyndra") and Beacon Power Corporation ("Beacon"), which are both in bankruptcy.

Ford and Nissan Loans. The third category comprises the loans made to Ford Motor Company ("Ford") and Nissan North America, Inc. ("Nissan") (the "Ford and Nissan Loans"). The Ford and Nissan Loans are made to established corporate credits with structures typical of traditional secured corporate loans.

Table 1: *Summary of the Evaluated Loans as of November 28, 2011*

	Number	Total Loan Amount	Total Amount Drawn	% Drawn
(in $ millions)				
Utility-Linked Loans	20	14,404	3,145	22%
Non-Utility-Linked Loans	8	2,010	556	28%
Ford and Nissan Loans	2	7,355	4,598	63%
Total	**30**	**$23,769**	**$8,299**	**35%**

C. Evaluation of the Portfolio

The Independent Consultant was directed by the White House Chief of Staff to report on the current status of DOE's portfolio. The Independent Consultant reviewed detailed information about each project and formed its own view of the project's current status.

To evaluate the Portfolio, the Independent Consultant used two methodologies, detailed in the Report, that have distinctly different purposes.

The first is the "FCRA Methodology," which the DOE must use for budgeting purposes to comply with the Federal Credit Reform Act of 1990 ("FCRA"). It calculates the "Credit Subsidy Cost" that is budgeted to cover the risk of estimated shortfalls in payments from each loan. The Credit Subsidy Cost estimated by the DOE for each loan reflects DOE's assessment of each loan's credit quality.

The FCRA Methodology focuses on default risk and associated rates of recovery. These default and recovery rates are based on broad industry data provided by the rating agencies and

therefore are not representative of a portfolio of loans like those held by the DOE. For budgeting purposes, the FCRA Methodology estimates only the present value of the expected credit loss from the loan. This present value is a central estimate that assumes that the credit loss is accurate. It does not account for the possibility that the actual loss may be higher or lower than the estimate. If the eventual actual loss exceeds the Credit Subsidy Cost, that incremental loss is absorbed by the taxpayers pursuant to the permanent, indefinite budget authority under FCRA.

This budgeting approach is applied to the federal government's broad and diverse portfolio of loans and guarantees established through many programs that were created for a variety of purposes. In view of this diversity, variations over time in the individual estimates for each program tend to offset each other, thereby making FCRA's use of a central estimate for each program an appropriate mechanism for budgeting purposes.

The second methodology for evaluating the Portfolio, the "FMV Methodology," is used in the capital markets to estimate the reduction from the loan's face value that would result in a "fair market value" for the loan, that is, the price at which investors would receive what they believe to be an acceptable rate of return. The FMV Methodology is based on market data for the most comparable bonds and loans that exist in the market. It takes into consideration certain variables, such as liquidity, concentration, reinvestment, and other market risks, for which an investor would expect to be compensated through a discount in price. However, those risks do not apply to the government as long as it intends to hold the loans and guarantees for the long term.

Notwithstanding the differences in purpose of these two methods, the Independent Consultant believes it is beneficial to use the FMV Methodology in addition to the FCRA Methodology in assessing and evaluating the Portfolio and in developing recommendations regarding management, governance, and reporting described in the Report. The FMV Methodology provides additional insight into the future marketability of these loans and guarantees, into the financial incentives that sponsors and other parties have to invest in these projects, and into ways that DOE should manage the Programs to protect and enhance value to taxpayers over time.

Neither the FCRA Methodology nor the FMV Methodology can predict the eventual realized loss associated with any loan or with the Portfolio as a whole. The eventual loss will be the product of many factors, some unique to a particular loan, which the FCRA Methodology and the FMV Methodology can neither capture nor forecast today.

Furthermore, the present value estimates of cost under either the FCRA Methodology or the FMV Methodology fluctuate materially with changes in assumed long-term interest rates. For instance, if long-term interest rates on U.S. Treasuries were to rise significantly from today's historic lows, the Credit Subsidy Cost estimate as calculated under the FCRA Methodology, all other factors unchanged, would decline substantially.

Additionally, these methodologies assume that DOE is a passive bystander unable to act to reduce or mitigate risk in the Portfolio over time. To the contrary, DOE has robust tools for protecting itself against taking on elective risk. Since the middle of 2010, all new commitments for loans and guarantees contain strong covenants that give DOE powerful tools to control the

amount of additional risk it assumes. For instance, if projects do not meet covenants, DOE can elect to withhold funds or to require more protections and/or equity participation to compensate in part for additional risk. If it elected not to fund projects that are failing to meet covenants, it would potentially reduce the projected loss in the Portfolio.

In fact, there will be many such funding thresholds ahead, and DOE will therefore have many opportunities to protect itself against taking on elective risk. Currently, actual loan and guarantee amounts are only about one-third of total commitments, and almost half of the currently drawn amounts of Portfolio commitments are to Ford, rated by the Independent Consultant as investment grade.

As stated on page 31, DOE's latest re-estimate of credit subsidy for the Portfolio totals $2.9 billion. The Independent Consultant's comparable valuation applying the FCRA Methodology is $2.7 billion.

As described in greater detail on pages 33-35, the FMV Methodology, which calculates a different form of risk as described in the Report, estimates that investors would currently price the Portfolio at a discount to aggregate par value ranging from $5.0 billion to $6.8 billion.

The FCRA and FMV estimates are calculated for the full $23.4 billion of loan commitments. As noted above, only a third of the commitments are funded and some may never be funded, in full or in part, if some projects fail to meet requirements of their loan agreements, in which cases the estimates of credit subsidy would decline.

The FCRA and FMV projections of potential losses in the Portfolio unavoidably depend on many assumptions and will fluctuate over time. More important to the ultimate performance of the Portfolio will be DOE's management of it going forward. DOE must be an active manager continuously monitoring the projects, their market environments, and other identified risks to the Portfolio and seizing opportunities to contain taxpayers' exposure to loss.

D. <u>Current Management and Governance</u>

The White House Chief of Staff asked the Independent Consultant to provide recommendations for enhancing the monitoring, management and oversight of DOE's loan and loan guarantee programs.

The DOE's Loan Programs Office ("LPO") that directly manages the Programs combines several operational divisions (including Title XVII origination, portfolio management, credit, technology, and ATVM origination) with control divisions (credit and compliance). Some key positions in LPO are either vacant or staffed by acting heads and rely heavily on consultants and contractors.

Three committees oversee the Programs. Two consist of LPO staff members as well as managers from other departments within DOE.

The Independent Consultant identified several opportunities to strengthen the management of the program and enhance both the independence and the expertise of oversight

functions. The main recommendations related to management and oversight are summarized below:

Strengthen management

- DOE should assure long-term funding for its management and oversight of the Portfolio. Fees from borrowers will not be sufficient to cover these expenses once origination ceases. Compared to the potential for greater losses if the Portfolio is not managed closely and competently, the cost of adequate management and oversight will be small.

- DOE should fill key positions in management as soon as practicable.

- DOE should clarify authorities and accountabilities of managers. Lines of authority are not sufficiently clear. Delegation of authority should be more specific regarding the actions each organization may take and the limits of that authority.

Give more definition to key Program goals

- DOE should develop explicit objectives and standards of performance for managing the Portfolio during the construction phase of the projects and beyond.

- The Title XVII program's statutory standard of "reasonable prospect of repayment" is vague. DOE should provide clear guidance regarding the meaning of "reasonable prospect of repayment" so that the financial goal for managers is unambiguous.

- DOE should better define the desired balance between policy goals and financial goals.

Create independent risk management

- DOE should create a position of Chief Risk Officer ("CRO") to lead a Risk Management unit housing all DOE functions dedicated to monitoring the Programs, including the current Credit and Compliance functions. Significant risk decisions by LPO should be subject to prior concurrence of the CRO.

- The Risk Management unit should be separate from and independent of LPO. These two units should have different reporting lines to senior DOE management.

- Once the independent Risk Management department is established, DOE should abolish the Credit and Risk Committees.

Refine DOE oversight boards

- The role of the Credit Review Board ("CRB") should be broadened to include overseeing "enterprise" risks including credit, compliance, accounting, operational integrity, reporting, and protection of DOE's interests in defaults and bankruptcies.

- DOE should establish an interagency oversight board to review the Programs' governance and to advise the Secretary about broad policy, control and performance issues. This board could be modeled on similar boards overseeing other U.S. government loan programs.

Proactively protect the taxpayers' interest

- DOE should aggressively strengthen its position as lender or guarantor in cases where borrowers seek relief from requirements in the loan agreements. Given the novelty, complexity and scale of the projects and the exacting covenants in their loan structures, the Independent Consultant believes that many projects are likely to seek such relief at some point during the term of the DOE loan or loan guarantee.

- To strengthen its ability to protect the taxpayers' interest, DOE should define the tools it will use (e.g., seeking equity interests and stronger loan covenants) as well as the financial and policy goals it will pursue in negotiating with borrowers.

Reporting to the public

- DOE should implement a comprehensive communications plan, including a more robust website, to provide timely information to the public on the performance of the Program.

E. Early Warning System

The White House Chief of Staff requested that the Independent Consultant develop recommendations pertaining to early warning systems to identify and mitigate potential problems with individual loans or guarantees.

DOE should implement a comprehensive and consolidated Management Information Reporting System ("MIRS") that includes three categories of information:

- Trends affecting the markets and the regulatory environments in which the borrowers operate;

- The Status of every loan, borrower, contractor and offtake party that can affect each project; and

- The internal performance of the LPO and the Programs.

Senior managers, LPO, and Risk Management should jointly design the MIRS to be a shared resource for decision-making and performance measurement. The MIRS, if well designed and actively utilized, will prompt early action to manage emerging risks.

II. APPOINTMENT OF THE INDEPENDENT CONSULTANT AND TEAM; ASSIGNED TASKS; METHODOLOGY

A. Assigned Tasks and Deadlines

The Chief of Staff of the White House requested that Mr. Allison conduct a review of the current state of the Portfolio to be completed on or before January 28, 2012. Solely to provide funding for the Review, the Independent Consultant's work was conducted pursuant to written contracts with DOE. These contracts provided DOE with absolutely no rights to control, direct, or influence the Review, nor has DOE done so. Moreover, other than directing the tasks to be performed, the White House Chief of Staff did not control, direct, or influence the Review, nor did any other member of the executive branch.

As the White House Chief of Staff requested, the Review addresses three areas:

> (1) Analysis of the current state of the closed loan and guarantee portfolio under the Section 1703, Section 1705 and ATVM programs as of November 28, 2011;
>
> (2) Recommendations for enhancement to the Programs, if warranted and practical, to ensure effective monitoring and management of the current loan and guarantee portfolio; and
>
> (3) Recommendations, if needed, pertaining to early-warning systems to identify and mitigate potential concerns on a timely basis.

As part of the first task, the White House Chief of Staff requested that the Independent Consultant review and evaluate each Portfolio loan and loan guarantee to determine its current status, credit characteristics, and risk of loss. The Independent Consultant was requested to develop a risk rating and evaluation system for the Portfolio that is consistent with private sector best practices and to use that system to stratify the Portfolio by risk of default and loss.

The White House Chief of Staff requested as part of the second task that the Independent Consultant review the current Portfolio management practices, including governance and monitoring standards, with a particular focus on identifying opportunities to enhance the ongoing DOE monitoring activities.

As part of the third task, the White House Chief of Staff asked the Independent Consultant to develop and recommend an early warning system for identifying loans and/or guarantees to place on a watch list and to provide appropriate reporting mechanisms.

B. Qualifications of the Independent Consultant

Mr. Allison has served in a number of senior positions in the public and private sectors. Most recently, he was the Assistant Secretary of the Treasury for Financial Stability. He was named as President and Chief Executive Officer of Fannie Mae after Fannie Mae was placed into

conservatorship. Mr. Allison formerly was the Chairman, President and Chief Executive Officer of TIAA-CREF from 2002 until his retirement in 2008.

Mr. Allison conducted a comprehensive search for a financial firm and for a law firm to assist him in the Review and exercised his sole and independent judgment in choosing the advisers. Mr. Allison identified fifteen law firms and approximately half a dozen financial advisory firms. The principal selection criteria were institutional capacity, knowledge and experience in project finance and corporate finance, experience with U.S. government programs and procedures, and the absence of conflicts of interest.

After careful review, Mr. Allison selected and engaged Greenhill & Co., LLC, an investment bank, and Arnold & Porter LLP, a law firm. Mr. Allison also selected David Johnson, an experienced corporate finance executive, who previously served as Chief Financial Officer of Fannie Mae (after that company was placed into conservatorship by the U.S. government) and also served in the same capacity at Hartford Financial Services Group, and Cendant Corporation, to advise him. Each adviser was required to meet requirements for expertise and to comply with applicable standards, policies, and regulations prohibiting conflicts of interest.

Mr. Allison coordinated, supervised, and approved the work of the retained professional advisers and is solely responsible for the contents of the Report. The Report was specifically prepared at the request of the White House Chief of Staff and should not be relied upon by any other person.

C. The Independent Consultant's Methodology and Guiding Principles

The Independent Consultant exercised complete and absolute discretion in planning and carrying out the Review and in defining the information requested from DOE and other parties, subject to the limitations set forth in Section X of the Report.

In order to perform the assigned tasks within the sixty-day review period, the Independent Consultant developed and executed a work plan, including an analysis of voluminous documentation, and a targeted set of interviews of DOE and other U.S. Government personnel.

Documentation reviewed included, but was not limited to, the underlying legal and financial documentation of the loans and loan guarantees in the Portfolio, current and former DOE procedures and policies relating to the Programs, reports from the independent consultants to DOE, interagency presentations, rating agency reports, and information regarding the current status of each credit in the Portfolio. With respect to each credit, a standardized list of documents was requested and obtained.

DOE personnel were cooperative and responsive to the requests of the Independent Consultant. The Independent Consultant did not request documents from other agencies, given the time constraints.

The Independent Consultant developed loan valuation methodologies described more fully below and, relying on the documentation provided by DOE, conducted an extensive and iterative review of every credit in the Portfolio, including updated information about the operational and financial performance of the projects or manufacturing facilities underlying each credit.

The Independent Consultant also met on several occasions with DOE officials and with employees of a DOE contractor involved in the Programs to discuss policies, procedures, assessment of risk in the Portfolio, and views of specific credits and technologies. The Independent Consultant met with the Secretary of Energy ("the Secretary"), Deputy Secretary of Energy ("the Deputy Secretary"), DOE Inspector General, the Senior Advisor to the Secretary, the former head of LPO, the former Senior Advisor to the LPO Executive Director, and more than fifty DOE employees, contractors, and consultants. In addition, the Independent Consultant spoke with officials of the Department of the Treasury ("Treasury") and the Office of Management and Budget ("OMB") to develop an understanding of those agencies' respective roles in the Programs. A full list of the government officials and other individuals with whom the Independent Consultant met during the Review and a descriptive overview of materials received from DOE are set forth in Appendices B and C.

The Independent Consultant considered the relevant statutory and regulatory framework of the Programs. The Independent Consultant also reviewed DOE's management, governance, and information-reporting systems relating to the Portfolio, including recent changes directed by the Secretary.

The Independent Consultant adopted several guiding principles in conducting the Review. First, in keeping with the scope of the assignment, the Independent Consultant neither assessed nor formed any conclusions regarding national energy policy or other policy considerations. In addition, in order to encourage open discussion, the Independent Consultant interviewed current and former U.S. government officials with the understanding that while the Independent Consultant would consider and incorporate into the Report as deemed appropriate the views they expressed, the Report would not attribute these views to any particular individual. The Independent Consultant made clear that it would not in any way become involved in, or attempt to influence, DOE decision-making relating to the Portfolio, and the Independent Consultant did not do so. Finally, the Independent Consultant shared a draft of the Report with DOE and the White House shortly before its issuance to assure factual accuracy. To the extent DOE or the White House provided factual clarifications, that information is included in the Report.

In view of the strict deadline for completing the Report, the Independent Consultant evaluated only those loans and loan guarantees in the Portfolio that had closed as of November 28, 2011, although the Report incorporates information provided through the date of the Report. The Independent Consultant did not evaluate the loans to Solyndra and Beacon, which filed for Chapter 11 bankruptcy protection in October 2011 and November 2011, respectively.

While DOE continues to modify its loan monitoring and governance procedures, the Independent Consultant's description of DOE monitoring and governance procedures, and the recommendations for improvement, are based on the review of the documents, interviews, and

other information made available as of the date of the issuance of the Report. The Independent Consultant, in the time allowed to prepare this Report, was unable to assess the effectiveness of DOE's recent changes in its loan monitoring and governance procedures.

In reviewing the Portfolio, the Independent Consultant did not consult subject matter and market forecast experts for the various projects and technologies because it would have taken several weeks to identify experts in each of these areas, to screen them for conflicts of interest, and to move them through the U.S. government approval process necessary to engage them as subcontractors to the Independent Consultant. The Independent Consultant concluded that given the limitation of the Review to a sixty-day period, these practical constraints would have prevented these subject matter experts from contributing substantially and in a timely manner to the Review. However, the Independent Consultant did have access to information prepared by experts that DOE provided in response to the Independent Consultant's requests.

The Independent Consultant was provided access to confidential or proprietary business, technical, and financial information belonging to the U.S. government or other entities, subject to confidentiality agreements including but not limited to DOE plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. § 552a), data which have not been released or otherwise made available to the public, information relating to the Title XVII or ATVM programs, applications submitted to DOE, and other information submitted in response to solicitations made under the Title XVII or ATVM programs. The Independent Consultant has not disclosed any such confidential or proprietary information in the Report. In addition, the Independent Consultant has not disclosed information on individual credits in the Portfolio because of contractual confidentiality agreements binding the Independent Consultant and DOE.

III. ANALYSIS OF THE CURRENT STATE OF THE PORTFOLIO: LOAN EVALUATION AND STRATIFICATION BY RISK OF DEFAULT AND LOSS

To analyze the Portfolio's current status, the Independent Consultant reviewed the legal and regulatory framework of the Programs to understand how the Portfolio took shape. The Independent Consultant also reviewed the financial structures of the projects the Programs supported. With that background, the Independent Consultant performed the Review requested by the White House Chief of Staff.

A. Legal and Regulatory Factors That Shaped the Portfolio

i. Statutory basis and implementing regulations

DOE operates two programs that provide loans, loan guarantees, or grants to support clean energy projects. The Title XVII program, established under the authority of Title XVII of the EPAct, which was enacted in August 2005, provides loan guarantees for loans made to support certain types of clean energy projects under Section 1703 of the EPAct. The Title XVII program was modified in 2009 by ARRA, enacted in February 2009, which added Section 1705 of the EPAct. The addition of the Section 1705 program included an appropriation of funds that allowed DOE to pay the Credit Subsidy Cost of certain loan guarantees. Prior to ARRA, under the Section 1703 program, the recipients of Title XVII loan guarantees were required to pay the Credit Subsidy Cost, unless Congress appropriated funds for such costs, which it did not do until 2009.[1] DOE issued a first set of regulations governing the Title XVII program in October 2007 (10 C.F.R. Part 609), and released modifications to these regulations in 2009.[2]

The second DOE loan program, the ATVM program, was established by Section 136 of EISA, enacted in January 2008. Section 136 authorized DOE to create the ATVM program and to make a total of up to $25 billion in direct loans to manufacturers of advanced technology vehicles ("ATVs"), which are vehicles meeting certain specified fuel economy standards, or their associated components, that have their manufacturing facilities in the U.S. DOE released the regulations governing the ATVM program in November 2008.[3]

A separate but related program supporting clean energy projects was the cash grant program established by Treasury under Section 1603 of the ARRA (as amended by Section 707 of the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010). Under this program, Treasury could provide grants to persons and entities that either (1) placed certain types of alternative energy properties into service during 2009, 2010, and 2011 or (2) began construction of a specified energy property in 2009, 2010, or 2011.[4] Eligible alternative energy properties included wind facilities, closed-loop or open-loop biomass facilities, geothermal facilities, and equipment to produce, distribute, or use energy derived from alternative sources such as solar, geothermal, wind, fuel cells, or microturbines. Treasury was authorized to make grants in an amount up to 30 percent of the basis of the funded property as a substitute for the equivalent tax credits the projects' owners would have eventually received for making these investments.[5] Several of the projects receiving loans or loan guarantees under the Programs have applied for or received grants from Treasury under Section 1603, certain of the proceeds of which must be used to pay down a portion of the DOE-guaranteed loan, thereby reducing the DOE's overall exposure.

ii. Factors shaping the development of the Portfolio

The requirements and limitations that the statutes and regulations impose on the Programs shaped the development of the Portfolio in several ways. As summarized below, the legal constraints caused DOE to create a portfolio that consisted of:

- Innovative alternative energy projects employing technologies that had not reached commercial maturity and involved more risk than is typical for project and corporate debt financing;
- Loans and loan guarantees but, except in one case, no form of equity investment;
- Credits that DOE determined to meet statutory criteria of "reasonable prospect of repayment" and "financial viability";
- Credits of long tenor, approaching thirty years in some cases; and
- In the case of the Section 1705 credits, loans and loan guarantees that were required to close by the statutory deadline of September 30, 2011.

In addition:

- The fees that could be charged under the Programs were below market; and
- The solicitation process limited the pipeline of projects because it depended upon project sponsors proactively submitting proposals to DOE.

The effect of each of these factors on DOE's development of the Portfolio was as follows:

- The statutes and regulations require the Programs to support innovative projects employing technologies that have not yet reached commercial maturity.

DOE implemented the Programs to fulfill a perceived need for public programs to provide financing to alternative energy projects that had achieved deployment of a pilot facility but had not yet diffused, commercialized, and scaled-up the new technology. Both DOE and private observers of the alternative energy industry believed that many projects at this stage of development stalled or ended for lack of funding that would have been available for technologies that had proven their viability in one or more commercial-scale installations. Because both the Title XVII and the ATVM programs focus on providing support to projects involving innovative technologies that needed support to become commercialized and diffused through the marketplace, the supported projects inherently involve higher degrees of risk and uncertainty than projects that are typically financed in the banking and securities markets.

The EPAct focuses DOE's support on innovative, not-yet-commercial technologies. The EPAct requires that the loan guarantees made under the Title XVII program be awarded to projects that "employ new or significantly improved technologies as compared to commercial

technologies in service in the United States at the time the guarantee is issued."[6] The EPAct specifies that the types of projects eligible for loan guarantees included renewable energy systems; advanced fossil energy technology; advanced nuclear energy facilities; efficient electrical generation, transmission, and distribution technologies; efficient end-use energy technologies; and production facilities for fuel efficient vehicles, including hybrid and advanced diesel vehicles.[7]

Like the Title XVII program, ATVM is intended to support innovative technologies, specifically, those that improve automobile fuel efficiency. In the case of ATVM, DOE is authorized to make direct loans to automobile manufacturers and component suppliers to establish, reequip, or expand a facility located in the U.S. to manufacture "qualifying" ATVs and "qualifying" components for ATVs, or to perform engineering integration in the U.S. of qualifying ATVs and qualifying components.[8] ATVM was expanded in 2009 to include manufacturers of "ultra efficient vehicles" -- vehicles with a fuel efficiency of at least 75 miles per gallon.[9]

- The statutes and regulations specify the form of the support DOE could provide under the Programs, but are silent as to whether that support can include taking an equity stake in a project as consideration for the loans or loan guarantees.

The EPAct limits DOE to making loan guarantees under the Title XVII program with appropriated funds, and does not authorize DOE to use appropriated funds to purchase equity in a company. The EPAct and implementing regulations are silent as to whether DOE could take equity in consideration for its loan guarantees, for waiving covenants or as part of a loan workout.

ATVM differs from the Title XVII program in that the ATVM program provides direct grants and loans of federal funds, rather than loan guarantees, to the borrowers. Like the Title XVII implementing regulations, the ATVM implementing regulations are silent regarding the ability of DOE to take equity positions in borrowers or underlying projects.

- The statutes and regulations require the Programs to support projects that, in DOE's judgment, promise "a reasonable prospect of repayment" in the case of the Title XVII program and involve a "financially viable" borrower in the case of ATVM.

Under the Title XVII program, DOE is authorized to grant loan guarantees only in cases in which the Secretary determines there is a "reasonable prospect of repayment" of the guaranteed loan.[10] Neither the EPAct nor the Title XVII program's implementing regulations define the term "reasonable prospect of repayment."

An applicant for an ATVM loan is required to show, among other factors, that it would be "financially viable" in the absence of any additional federal funding for the proposed project.[11] Under the regulations, DOE determines whether a manufacturer is "financially viable" based on a review of financial metrics enumerated in the ATVM implementing regulations, such as the applicant's debt-to-equity ratio as of the date of the loan application, the applicant's earnings before interest, taxes, depreciation, and amortization ("EBITDA") for the applicant's

most recent fiscal year prior to the date of the loan application, and the applicant's debt-to-EBITDA ratio as of the date of the loan application.[12]

- The statutes provide for long-duration loans and loan guarantees.

The EPAct contemplates guarantees for long-term obligations in the Title XVII program; the term of the underlying loan guaranteed by DOE could be up to the lesser of 30 years or 90 percent of the projected useful lifetime of the physical asset financed by the loan.[13] DOE can make loans under ATVM with a term equal to the lesser of the projected life (in years) of the eligible project or 25 years.[14]

The fact that Title XVII guaranteed loans can have terms of up to 30 years and ATVM loans can have terms of up to 25 years means that many of DOE's commitments are of long duration. DOE will be responsible for managing the Portfolio for many years into the future, and this fact influences the Report's later recommendations with respect to management and governance.

- The statutes imposed certain deadlines on DOE's ability to make loans and loan guarantees.

Under the Title XVII program, projects receiving loan guarantees under Section 1705 were required to commence construction no later than September 30, 2011.[15] In addition, Section 1705 also included a sunset provision, under which DOE's authority to make loan guarantees under the Section 1705 authority expired on September 30, 2011.[16] Because ARRA was enacted in February 2009, DOE had less than three years to identify eligible projects, negotiate loan guarantee documentation, and close the transactions under its Section 1705 authority. Given the long lead times typical for innovative energy projects, this provision effectively limited the pool of potential projects to those that had progressed in conceptualization and development to the point where sponsors could complete the lengthy DOE application and negotiation process by September 30, 2011.

- The fees that could be charged under the Programs were below market.

The governing statutes set the fees that DOE could charge loan and loan guarantee recipients under the Programs. The EPAct provides that DOE can charge fees no higher than "sufficient to cover applicable administrative expenses" under the Title XVII program.[17] Under the ATVM program, DOE can charge for administrative costs up to $100,000 or 10 basis points of the loan.[18] These fees are higher for origination -- for which there are a number of administrative expenses -- than for the monitoring process. These provisions constrain the funding for monitoring and oversight.

- The solicitation process limited the pipeline of projects because it depended upon project sponsors proactively submitting proposals to DOE.

After the passage of the EPAct in 2005, DOE made an early decision to source loans for the Title XVII program through a formal solicitation process. DOE thereby limited itself to considering only projects submitted in response to the solicitation.

IV. SUMMARY OF THE INDEPENDENT CONSULTANT'S EVALUATION OF THE PORTFOLIO -- DESCRIPTION OF THE EVALUATED LOANS

The Independent Consultant conducted an evaluation of the closed loan and loan guarantee Portfolio under the Programs as of November 28, 2011. In total, there were 30 Evaluated Loans, of which 25 were closed under the Section 1705 portion of the Title XVII Program and five were closed under the ATVM program. As noted above, the Independent Consultant did not evaluate the loans to Solyndra and Beacon. Total exposure to Solyndra and Beacon as of November 28, 2011, was $567 million.

In general, the Evaluated Loans under the Programs were structured as funding commitments with limited, or in many cases, no funds drawn under the loan at closing. Borrowers have the ability to draw under the loans from time to time to fund the Eligible Costs provided that they meet certain conditions precedent that vary among the individual loans.

The 30 Evaluated Loans total $23.77 billion. As of November 28, 2011, $8.30 billion of proceeds or 35 percent of total funds committed had been drawn under the Evaluated Loans. Of the $23.77 billion in Evaluated Loans, $22.66 billion represents DOE's aggregate commitment, reflecting the fact that loans made under the Financial Institution Partnership Program ("FIPP")[19] are only up to 80 percent guaranteed.

The Independent Consultant grouped the Programs into three broad categories with each category representing a different project type and loan structure. The first category, the Utility-Linked Loans, all have a project finance structure, which is a common method of financing the construction of a long-lived asset, typically a discrete infrastructure asset such as a power plant. A more detailed description of project finance funding structures follows. The Utility-Linked Loans represent the greatest number of loans and loan guarantees under the Programs and the greatest aggregate commitment.

The second category comprises the Non-Utility-Linked Loans and includes cellulosic ethanol projects, solar manufacturing companies, and small, start-up automotive manufacturing companies. The Non-Utility-Linked Loan structures combine some elements of project finance loan structures and some elements of traditional corporate loan structures.

The third category comprises the Ford and Nissan Loans. The Ford and Nissan Loans were made to established corporate credits with loan structures typical of traditional secured corporate debt.

Utility-Linked Loans. The Portfolio includes 20 Utility-Linked Loans totaling $14.40 billion, of which $13.30 billion represents the DOE's aggregate commitment, taking into account the fact that the FIPP loans are only partially guaranteed. As of November 28, 2011, $3.15 billion of proceeds, or 22 percent of total Utility-Linked Loans funds committed, had been drawn. The Utility-Linked Loans category includes solar, wind, and geothermal generation, and electrical transmission projects.

Non-Utility-Linked Loans. The Portfolio includes eight Non-Utility-Linked Loans, excluding loans made to Solyndra and Beacon. The Non-Utility-Linked Loans represent

aggregate DOE commitments of $2.01 billion. As of November 28, 2011, $556 million of proceeds, or 28 percent of total Non-Utility-Linked funds committed, had been drawn.

Ford and Nissan Loans. The Ford and Nissan Loans represent aggregate DOE commitments of $7.36 billion. As of November 28, 2011, $4.60 billion of proceeds, or 63 percent, of total Ford and Nissan funds committed, had been drawn.

A. Characteristics of the Utility-Linked Loans

The Utility-Linked Loans are all structured as project financings. In addition, certain of the Non-Utility-Linked Loans incorporate many project-financing elements.

Unlike corporate financings, which typically support the consolidated assets of a corporation, a project financing supports the development and operation of a specific asset and relies on the cash generated by that asset alone for its repayment.

The borrower in a project financing is typically a special purpose project company whose only asset is the project itself. The project company is in turn owned by one or more project sponsors, which fund equity contributions that, along with the debt raised in the project financing, pay for the construction of the project. The project financing is structured such that the project loan is non-recourse to the project sponsors, meaning the lenders must look only to the project company and its assets for repayment. However, as described below, the various parties to and documentation supporting a project financing often provide certain forms of credit support to help ensure repayment in the event that the construction or operation of the project does not go as planned. The key parties and contracts in a project financing are listed below.

Project Company. The project company acts as the borrower in the project financing and owns the assets of the project.

Project Sponsor. The project sponsor owns the project company and funds equity contributions, which along with the debt raised in the project financing are anticipated to pay for the construction of the project. If the project sponsor is not rated investment grade, it typically provides a letter of credit to the project company to guarantee the funding of its equity commitment. The project sponsor often commits to fund a certain level of cost overruns in addition to the amount of its base equity commitment.

Engineering, Procurement, and Construction Contractor. The engineering, procurement and construction ("EPC") contractor agrees to design the project, procure necessary components and materials, and construct the project. Under a "full-wrap" EPC contract, the EPC contractor is legally and financially bound to deliver the finished project by a certain date and at a certain cost. Alternatively, some projects do not enter into a full-wrap EPC contract, but rather into separate agreements for engineering services, procurement of components and/or construction.

Operations and Maintenance Service Provider. The operations and maintenance ("O&M") service provider is responsible for the day-to-day operations of the project following the completion of construction. The O&M service provider often guarantees it will meet certain performance levels or face financial penalties.

Project Offtaker. The project offtaker agrees to purchase the output of the project for an extended period of time. The offtake agreement is intended to provide stable and predictable cash flow to repay the project loan. In the specific context of the Utility-Linked Loans, the output is typically electric power sold to an investment grade utility under a power purchase agreement ("PPA") for an extended period of time (20-30 years).

Credit Agreement. The credit agreement between the project company and the project lenders governs the extension and repayment of the project loan. The key terms and provisions in the credit agreement that provide protection to the lender and guarantor include:

- Provisions granting a security interest in all project assets and contracts;
- Conditions precedent to initial funding and each subsequent draw request (for example, a certification by the borrower that it has sufficient funds available to complete the project);
- Interest, costs, and fees paid to the lender;
- Representations and warranties (for example, stating that the borrower has complied with relevant laws, has the right to pledge its assets as collateral, etc.);
- Covenants (for example, agreements not to incur additional indebtedness except under certain circumstances, not to make expenditures in excess of budgets except under certain circumstances, etc.);
- Provisions for mandatory prepayments under certain circumstances (using, for example, proceeds from a Section 1603 cash grant, proceeds from performance liquidated damages received from the EPC contractor, etc.); and
- Provisions requiring the funding of debt service and maintenance reserve accounts.

Appendix E provides a more comprehensive and detailed list of the key documents typically included in a project financing.

B. Characteristics of the Non-Utility-Linked Loans

The Non-Utility-Linked Loans fall into three sub-categories, based on the type of project or company to which the loan has been committed.

Cellulosic Ethanol Project Loans. The loans to the cellulosic ethanol projects are structured effectively as project financings, with a special purpose project company, an EPC contract, a parent completion and performance guarantee, and offtake agreements for the cellulosic ethanol production. As such, lenders benefit from structural protections in the construction phase that are largely similar to those that support the Utility-Linked Loans. However, unlike the Utility-Linked Loans, these projects have offtake agreements with affiliates

of the project company and project sponsors rather than fixed-price agreements with a utility as is typical of Utility-Linked Loans.

Automotive Manufacturing Company Loans. These loans are provided to small start-up automotive manufacturing companies. Unlike the project financings, the loans have not been made to special purpose entities but rather are supported by the general corporate credit of the borrower. In all cases, the loans are secured by substantially all of the assets of the borrower and benefit from financial covenants. The borrowers can draw on the loans periodically provided certain milestones are met. Repayment of the loans is contingent on the borrower successfully executing its business plan.

Solar Manufacturing Company Loans. The solar manufacturing loans are to early-stage companies engaged in the business of manufacturing components for solar energy generation. The loans are supported by the general corporate credit of the borrower. In all cases, the loans are secured. Many of the loans have not yet funded or have only funded partially. In most of the solar manufacturing loans, the equity investor assumes the initial start-up risk before any portion of the DOE guaranteed loan is funded. The loan documents provide additional protection to the DOE in the form of conditions precedent that must be met at various stages prior to advances under the loans. These conditions precedent include:

- A certain amount of incremental equity contributions have been funded;
- Certain contract milestones (*e.g.*, for sale of the product) have been met;
- The latest milestone for gross profit margin milestone has been reached;
- The most recent required report from an independent engineer and/or market consultant has been provided and is acceptable;
- Permits to construct the current stage of the project have been received; and
- The borrower can demonstrate that sufficient funds are available to continue and complete construction.

If the companies do not meet the prescribed conditions precedent, the DOE is not obligated to advance additional funds to the borrower.

C. Characteristics of the Ford and Nissan Loans

The Ford and Nissan Loans resemble traditional corporate loans made to mature companies. The loans are supported by the general corporate credit of the borrower and the loan documentation contains customary loan covenants. In the case of Ford, the DOE guaranteed loan is split into two tranches: one secured by a junior lien on all the collateral pledged under Ford’s senior secured credit agreement and the other secured by a first lien on the assets purchased using the proceeds of both tranches. The Nissan loan is also required by statute to be secured by assets purchased with loan proceeds.

V. SUMMARY OF THE INDEPENDENT CONSULTANT'S EVALUATION OF THE PORTFOLIO -- RANKING OF THE EVALUATED LOANS

A. Introduction

The first step taken by the Independent Consultant to evaluate the Portfolio was to assess the risk of each loan. The second step was to rank the loans relative to each other according to their assessed risk. The third step was to translate those rankings into numerical scores that in turn were translated into credit ratings such as "BBB," "BB," and "CCC+," which are meant to be fair approximations of the debt ratings independent rating agencies would assign to the transactions as of the date of the Report. Each transaction's specific letter rating was used by the Independent Consultant as an input to its own evaluation of the Portfolio.

The Ford and Nissan Loans were not included in the ranking exercise because they are established corporate credits with current external credit ratings. As such, the Independent Consultant relied upon independent ratings from credit rating agencies. The Ford loans were rated in accordance with Ford's senior secured credit ratings. The Nissan loan was rated in accordance with its corporate credit rating.

DOE does not require borrowers to provide updated credit ratings on completed transactions. Therefore, the Independent Consultant performed a credit ranking and rating exercise with respect to the guaranteed loan transactions that closed before November 28, 2011 as a first step to conducting the evaluation of the Portfolio. The Independent Consultant did not rank loans made to Beacon and Solyndra.

B. Assessing the Credit Risk of Utility-Linked and Non-Utility-Linked Loans

In assessing the credit risk of each Utility-Linked and Non-Utility-Linked Loan, the Independent Consultant used nine fundamental categories of credit quality (the "Nine Criteria") listed below. Details regarding each of these criteria are provided in Appendix D.

- Project Sponsor;
- Technology;
- Capital Structure;
- Market and Off-take;
- Project Completion;
- Operation Cost and Performance;
- Infrastructure;
- Legal; and

- Legislative and Regulatory.

The Independent Consultant assigned each credit a numerical value ranging from 0 to 5 for each of the Nine Criteria, with 5 being the strongest, and then applied criteria weightings ("the Criteria Weightings") to the Nine Criteria in order to generate an overall numerical score for each transaction.

DOE used a similar approach to risk assessment using the Nine Criteria and a weighting methodology in its underwriting process for Utility-Linked Loans and most of the Non-Utility-Linked Loans. The Independent Consultant used the same Nine Criteria as did DOE because, in the opinion of the Independent Consultant, they comprise the salient factors for evaluating the credits and are substantially similar to the criteria that would be employed by private sector credit analysts for these types of loans. Areas where the Independent Consultant departed from the DOE's methodology are detailed below.

The Criteria Weightings applied to each category are summarized below. Bold figures indicate the departures from DOE's weightings of the criteria. Where weightings in one category are increased, the weightings of the other categories are decreased *pro rata*.

Table 2: *Criteria Weightings Applied to Each of the Nine Criteria*

	Utility-Linked	Non-Utility-Linked		
		Solar Manufacturing	Automotive Manufacturing	Cellulosic Ethanol
# of Projects	*20*	*3*	*3*	*2*
Project Sponsor	15.0%	13.2%	13.2%	12.5%
Technology	15.0%	13.2%	13.2%	12.5%
Capital Structure	15.0%	13.2%	13.2%	12.5%
Market and Off-Take	15.0%	**25.0%**	**25.0%**	12.5%
Project Completion	10.0%	8.8%	8.8%	8.3%
Operation Cost and Performance	10.0%	8.8%	8.8%	8.3%
Infrastructure	5.0%	4.4%	4.4%	4.2%
Legal	5.0%	4.4%	4.4%	4.2%
Legislative and Regulatory	10.0%	8.8%	8.8%	**25.0%**
Total	100.0%	100.0%	100.0%	100.0%

The Independent Consultant considered currently available information in determining the strengths and risks of each credit and attempted to evaluate the loans in a consistent manner. All transactions were evaluated as of the same point in time, in line with the Independent Consultant's intention to apply a consistent approach to evaluation across the Portfolio.

Utility-Linked Loans. The Independent Consultant relied upon the Nine Criteria for each of the Utility-Linked Loans, consistent with DOE's methodology. Criteria Weightings (across

the Nine Criteria) were not altered from the weightings used by DOE. In three cases, DOE factored in specific incremental criteria. In these cases, the Independent Consultant concluded that these factors were already captured in the Nine Criteria. As a result, it did not amend the Criteria Weightings.

Non-Utility-Linked Loans. The Independent Consultant relied upon the Nine Criteria to assess each of the solar manufacturing and cellulosic ethanol loans, consistent with DOE's methodology. The Independent Consultant also used the Nine Criteria in assessing each of the automotive manufacturing loans (excluding Ford and Nissan), a departure from DOE's approach to evaluating those loans. In these cases, DOE relied on projected financial ratios as a measure of credit quality. The Independent Consultant believes that the Nine Criteria better measure the credit quality of the early-stage auto manufacturing companies than do projected financials that rely on many assumptions.

In ranking the solar manufacturing loans, the Independent Consultant assumed that the borrower had met all conditions precedent and that DOE had made its first advance under each loan. The Independent Consultant believes that these are reasonable assumptions in evaluating the risk of the loans given that, if a solar manufacturing company does not meet certain conditions precedent, no funding of the loan will occur and DOE will have no exposure under the loan guarantee.

With respect to the Criteria Weightings used to assess the credit of the Non-Utility-Linked Loans, the Independent Consultant departed from DOE's approach. For the solar manufacturing loans, the Independent Consultant increased the Criteria Weightings related to market exposure. The Independent Consultant believes that market-related risk is especially significant for the solar manufacturing companies and that this risk had increased since the loans were originated. Criteria Weightings related to legislative and regulatory risk were increased for the cellulosic ethanol loans. The Independent Consultant determined that the legislative- and regulatory-related risk is especially significant for these loans, given the projects' reliance on the Renewable Fuel Standards ("RFS") mandate.

DOE did not have Criteria Weightings for the small, start-up automotive manufacturing loans, as DOE did not use the Nine Criteria to evaluate those loans. The Independent Consultant believes that the same Criteria Weightings applied to the solar manufacturing companies were appropriate for the small automotive manufacturing companies, with market-related risk being the most significant.

C. Ranking the Evaluated Loans According to Credit Risk

Once the Independent Consultant had assigned numerical scores based on the assessment methodology above, the Independent Consultant ranked the loans in order of their numerical ratings from high to low. Based on the Independent Consultant's experience with project financings, it considered the most credit-worthy transactions (those with the highest numerical scores) to be of low investment-grade credit quality (BBB) and the least creditworthy to be sufficiently risky to have equity-like investment characteristics. For the purposes of the evaluation, the Independent Consultant assumed that the weakest credit in the Portfolio would have a CC rating.

The evaluation process used a standard, consistent credit evaluation methodology to evaluate each transaction in the Utility-Linked and Non-Utility-Linked Loan portfolios from a credit perspective and then compared the transactions with one another. The objective was to establish a list that ranked the relative credit quality of the loans from highest to lowest.

The Independent Consultant translated each numerical score into a letter rating, with the top credits rated at the BBB level, down to the weakest credits, which were rated at the CC level. The table below was developed by the Independent Consultant and shows how numerical scores were translated to letter ratings at each discrete rating level. The DOE used a similar translation approach. However, DOE's translation of numerical scores into letter ratings was based on a different scale.

Table 3: *Mapping of Numerical Ranking to Letter Rating*

Mapping of Numerical Rating to Letter Rating			
Numerical Rating			Letter Rating
Low	–	High	
4.75	–	5.00	BBB+
4.50	–	4.75	BBB
4.25	–	4.50	BBB-
4.00	–	4.25	BB+
3.75	–	4.00	BB
3.50	–	3.75	BB-
3.25	–	3.50	B+
3.00	–	3.25	B
2.75	–	3.00	B-
2.50	–	2.75	CCC+
2.25	–	2.50	CCC
2.00	–	2.25	CCC-
1.75	–	2.00	CC+
1.50	–	1.75	CC
1.25	–	1.50	CC-
1.00	–	1.25	C
0.00	–	1.00	D

This risk rating and credit rating assignment exercise resulted in 17 of the credits receiving ratings that were either higher or lower than those assigned by DOE.

VI. THE INDEPENDENT CONSULTANT'S EVALUATION OF THE PORTFOLIO

A. Overview of the Independent Consultant's Evaluation Methodologies

Once the Independent Consultant had assessed the credit risk of each project and assigned a letter rating to each, the Independent Consultant used two distinct and non-comparable methodologies to quantify risk associated with the Portfolio: the FCRA Methodology and the FMV Methodology. The methods differ substantially from each other and are used for different purposes, as discussed below.

Notwithstanding their differences in method and purpose, the Independent Consultant believes it is beneficial to use both the FMV Methodology and the FCRA Methodology for assessing and evaluating the Portfolio and for developing recommendations regarding management, governance, and reporting. The FMV Methodology provides additional insight into the future marketability of these loans and guarantees, the financial incentives that sponsors and other parties have to invest in these projects, and the ways that DOE should manage the Programs to protect and enhance value to taxpayers over time.

The FCRA Methodology. The first methodology involved the calculation of credit subsidy costs for each loan in the Portfolio in accordance with FCRA. For credit programs that administer full or partial loan guarantees (such as the Programs), FCRA defines the cost of these programs as the estimated long-term cost to the government on a net present value basis, excluding administrative costs. An amount equal to this long-term cost is budgeted to cover the risk of estimated shortfalls in loan repayments and, as described previously, is referred to as the Credit Subsidy Cost. Prior to entering into a Loan Guarantee, the DOE is required to receive either an appropriation for the Credit Subsidy Cost or a cash payment of such cost directly from the applicant. DOE is also required each year to re-estimate the Credit Subsidy Cost for each loan that has had a disbursement. The Credit Subsidy Cost estimated by the DOE for each loan reflects DOE's assessment of each loan's credit quality. The Independent Consultant relied upon its own assessment of credit quality, using the ratings that were applied to each loan in the Portfolio, to develop its estimate of Credit Subsidy Cost. A summary of FCRA and how the Independent Consultant used this approach is detailed in the following section.

The FMV Methodology. The second methodology involved the calculation of an estimated "fair market" value ("FMV") for each loan in the Portfolio in a manner that the Independent Consultant believes would be used by parties buying similar loans in the market. Because the interest rates on the Evaluated Loans are set at or very near the Treasury's concurrent borrowing rates, the interest rates are significantly below market rates for comparable commercial loans. The FMV Methodology estimates the amount of discount to face value that investors would require in order to receive an acceptable total return. The Independent Consultant relied upon its assessment of credit quality, using the ratings that it applied to each loan in the Portfolio, to develop its own estimate of a fair market value discount for each loan. A summary of the FMV Methodology and how the Independent Consultant used this approach is detailed below.

Neither the FCRA Methodology nor the FMV Methodology can be used to predict the eventual realized loss associated with any loan or loan guarantee or the Portfolio as a whole. The

eventual loss will depend upon the outcomes of many factors, some unique to certain loans, that the FCRA Methodology and the FMV Methodology are not designed to capture and that cannot be predicted with confidence today. Furthermore, the present value estimates under either the FCRA Methodology or the FMV Methodology fluctuate substantially with changes in discount rates that are functions of assumed long-term interest rates. For instance, if long-term interest rates on U.S. Treasuries were to rise significantly from today's historic lows, the Credit Subsidy Cost estimate as calculated under the FCRA Methodology, all other factors unchanged, would decline substantially.

B. Description of the FCRA Methodology

Prior to entering into a loan guarantee, DOE is required to receive either an appropriation for the Credit Subsidy Cost or a cash payment of such cost directly from the applicant. In consultation with OMB and a third-party consultant contracted by DOE, LPO has developed a Credit Subsidy Cost estimation methodology that emulates the method used by OMB.

This Credit Subsidy Cost relies on a methodology developed in conjunction with OMB to determine the net present value of cash flows to and from the government resulting from either a direct loan from the government, or a government guarantee of a third-party loan. The model requires three inputs:

- Project credit rating
- Expected recovery rate in the event of a default
- Project principal and interest payment schedule

For direct government loans, the model applies a cumulative default rate to each scheduled principal and interest payment to produce a forecasted default amount. The default payments for a guaranteed loan are calculated by applying the historical default data for loans of that age and rating to the appropriate remaining principal balances. The default rates used are based on default data provided by Moody's and Standard & Poor's ("S&P"). The default curves applied to a particular project correspond to the project's credit rating, which is a letter credit rating determined by DOE, with input from OMB, based on a comprehensive risk rating methodology which takes into account all of the due diligence and analysis performed by DOE through the underwriting process. The letter credit rating is an approximation of the rating that would be assigned by a third-party credit rating agency.

The model then applies an expected recovery rate to the estimated defaulted cash flows. The expected recovery rate is the percentage of principal estimated to be recovered in the event of a default. That recovery rate is adjusted up or down by LPO, with input from OMB, taking account of project-specific risk factors.

The application of the default rates and expected recovery rates to the appropriate loan balance yields a forecast of cash flows to and from the government over the life of the loan. Those expected cash flows are then discounted using OMB's Credit Subsidy Calculator (CSC2). The CSC2 discounts the cash flows at relevant Treasury rates. The sum of the discounted cash

flows, net of disbursements for direct loans, is the Credit Subsidy Cost, which is expressed as a dollar amount. That dollar amount is then divided by the obligation amount, equal to the sum of all disbursements, to arrive at the Credit Subsidy Rate, which is expressed as a percentage.

C. Valuation Using the FCRA Methodology

The Independent Consultant considered the results of the FCRA analysis under two cases, one based on DOE's credit ratings for each loan as of early December 2011, and one based on the Independent Consultant's credit ratings for each loan.

DOE Annual Re-Estimate. The credit subsidies for each loan drawn as of September 30, 2011 were re-estimated by DOE as part of its normal annual budgeting process. Each loan subject to a re-estimate received a new letter rating from DOE that in turn was used as an input in the FCRA methodology to re-estimate its credit subsidy in early December 2011. If a re-estimate was not required for a loan because no funds had been drawn as of September 30, 2011, its credit subsidy at obligation was used.

Independent Consultant's Modified Credit Subsidy Calculation. The Independent Consultant asked DOE's third-party consultant (with DOE's acknowledgement) to recalculate the Credit Subsidy Cost for each of the 17 loans for which the Independent Consultant's credit rating differed from DOE's credit rating. All other inputs to the FCRA Methodology remained unchanged.

In its re-estimate of the Credit Subsidy Cost using the FCRA Methodology, the Independent Consultant did not make any changes to the recovery rate assumptions used by DOE. The Independent Consultant understands that the determination of a recovery rate for each loan resulted from subjective analysis and discussion between DOE and OMB on a loan-by-loan basis. The assumed recovery rate has a substantial effect on the Credit Subsidy Cost calculation. The Independent Consultant ran sensitivities on a small sample of the loans, re-estimating the Credit Subsidy Cost for recovery rates both above and below those chosen by DOE. The results of the sensitivity analysis using the small sample confirmed that changes to the recovery rate could have a meaningful impact on the credit subsidy calculation.

In order for the Independent Consultant to determine a recovery rate for each loan, the Independent Consultant would need to commission an appraisal of each of the underlying assets securing the loan. For the purposes of this report, the Independent Consultant did not have the time or budget to commission appraisals for each asset securing each loan in the Portfolio.

D. Results of Valuation Using the FCRA Methodology

Utility-Linked Loans. The Utility-Linked Loans portfolio comprises 20 loan guarantees with an aggregate principal value of $14.4 billion.

The initial Credit Subsidy Cost DOE calculated under the FCRA Methodology of each particular loan closed totaled $1.491 billion at the time of closure.

The Independent Consultant's re-evaluation of each Utility-Linked Loan's credit rating resulted in ten loans receiving ratings different from those assigned by DOE, some of which were lower and some of which were higher by one to two credit rating categories.

The factors that resulted in changed ratings varied among the loans, but in general included the Independent Consultant's independent views on the following factors:

- Financial strength and creditworthiness of project parties;
- Legal and regulatory changes since the loans closed;
- Technological and operational risks (based upon the projects' independent engineer reports); and
- Project progress to date.

In certain cases, the Independent Consultant's views on these factors were more positive and in other cases they were more negative than DOE's views. Overall, the Independent Consultant's reevaluation of the Utility-Linked Loan portfolio's creditworthiness resulted in a modestly lower average rating than had been assigned by DOE. Updated Credit Subsidy Costs for Utility-Linked Loans calculated using the FCRA methodology with DOE's credit ratings as of December 11, 2011 totaled $1.551 billion. Updated Credit Subsidy Costs calculated using the FCRA methodology with the Independent Consultant's credit ratings totaled $1.696 billion, a nine percent increase to DOE's FCRA re-estimate.

<u>Non-Utility-Linked Loans</u>. The Non-Utility-Linked Loans portfolio comprises eight loan guarantees with an aggregate principal value of $2 billion.

The initial Credit Subsidy Cost DOE calculated under the FCRA Methodology totaled $479 million at the time each particular loan closed.

The Independent Consultant's reevaluation of each loan's credit rating resulted in six loans receiving ratings different from those assigned by DOE, all of which were lower by one to three credit rating categories.

The factors that resulted in changed ratings varied among the loans, but in general included the Independent Consultant's independent views (which in certain cases were more positive and in certain cases more negative than DOE's views) on the following factors:

- Changes to market related risks; and
- Project progress to date.

Overall, the Independent Consultant's reevaluation of the Non-Utility-Linked Loans portfolio's creditworthiness resulted in a lower average rating than had been assigned by DOE. Updated Credit Subsidy Costs calculated using the FCRA methodology with DOE's credit ratings as of December 11, 2011 totaled $640 million. Updated Credit Subsidy Costs calculated

using the FCRA methodology with the Independent Consultant's credit ratings totaled $820 million, a 28 percent increase to DOE's FCRA re-estimate.

Ford and Nissan Loans. The Ford and Nissan loans have an aggregate principal value of $7.4 billion.

The initial Credit Subsidy Cost DOE calculated under the FCRA Methodology totaled $3.0 billion at the time the DOE made its loan commitments in 2009.

The Independent Consultant evaluated the existing credit ratings of Ford and Nissan, as well as information regarding the security package and ranking of the loans in each company's capital structure. The Independent Consultant raised the rating on the Ford loans by four categories from DOE's rating at re-estimation. The Nissan loan was left unchanged from DOE's rating at re-estimation.

Overall, the Independent Consultant's reevaluation of the Ford and Nissan portfolio's creditworthiness resulted in a higher average credit rating than had been assigned by DOE. Updated Credit Subsidy Costs calculated using the FCRA methodology with DOE's credit ratings as of December 11, 2011 totaled $753 million. Updated Credit Subsidy Costs calculated using the FCRA methodology with the Independent Consultant's credit ratings totaled $166 million, a 78 percent decrease to DOE's FCRA re-estimate of credit loss.

Table 4: *Results of the FCRA Methodology Calculations*

Portfolio	Total Principal	Total Principal + Capitalized Interest	At Origination Credit Subsidy Calculation		At Re-Estimate Credit Subsidy Calculation		Independent Consultant Modified Credit Subsidy Calculation	
			Credit Subsidy %	Implied Credit Subsidy Cost	Credit Subsidy %	Implied Credit Subsidy Cost	Credit Subsidy %	Implied Credit Subsidy Cost
(in $ millions)								
Utility-Linked Loans	14,073	14,404	11.5%	1,491	12.0%	1,551	13.1%	1,696
Non Utility-Linked Loans	1,972	2,010	24.3%	479	32.5%	640	41.6%	820
Ford and Nissan Loans	7,355	7,355	41.4%	3,045	10.2%	753	2.3%	166
Total	**$23,400**	**$23,769**	**22.5%**	**$5,016**	**13.2%**	**$2,944**	**12.0%**	**$2,682**

E. Characteristics of the FCRA Methodology

While the valuation of any long-term loan is necessarily an estimate, the Independent Consultant notes that the Portfolio has several characteristics that make it particularly challenging to value:

- Many of the projects employ novel technology and/or involve significant scale-up risk;

- The loans have tenors that are longer than those typically found in the marketplace, and therefore a small change in discount rates results in a relatively large change in valuation; and

- Many of the loans are to projects still in a construction phase, during which they have not yet demonstrated their capability to perform.

The FCRA Methodology requires an assessment of credit quality that is determined in part through an analysis of the financial forecasts associated with each loan. These forecasts are subject to numerous assumptions and actual results may differ materially from the forecasts. Furthermore, the projects are complex and fundamentally difficult to forecast. Inherent in the nature of the Programs is the financing of innovative projects at an earlier stage than that at which they would have been able to attract financing in the private market.

The FCRA Methodology focuses only on default risk and associated rates of recovery. It relies upon an assumed default rate for each loan that varies by credit rating (with lower rated loans having a higher risk of default) and time horizon (with payments further into the future having a higher risk of defaulting) and an assumed recovery rate in the event of such a default. Thus, the FCRA Methodology estimates only the present value of the expected credit loss from the loan. It assumes that that forecast is correct and does not account for the possibility that the actual loss may be higher or lower than the estimate. If the eventual actual loss exceeds the Credit Subsidy Cost, that incremental loss is absorbed by the taxpayer pursuant to the permanent, indefinite budget authority under FCRA.

The resulting estimate of defaulted cash flows, offset by associated recoveries, is discounted at the government's cost of funds (*i.e.*, a risk-free rate) to arrive at the Credit Subsidy Cost. It is important to note that the default rates are based on historical data compiled by the rating agencies over several decades, and therefore are not reflective of the specific nature of the loan guarantees in the Portfolio (*e.g.*, the particular industries involved, the unique degree of technology and scale-up risk, the illiquid nature of the loans from a trading perspective, and the longer than typical tenor for credits of these ratings).

As a result of these characteristics, the results from the legally required FCRA Methodology do not reflect the discounts from the loans' face values that investors would demand to bear the full set of risks involved in this particular Portfolio.

To be clear, while the results of the FCRA Methodology represent reasonable estimates of the expected credit cost of the loan guarantee at the current time, this valuation methodology, like the FMV Methodology discussed below, cannot be relied upon as a predictor of the eventual performance of the Portfolio.

F. Valuation Using the FMV Methodology

The Independent Consultant also conducted a fair market valuation of the Portfolio. To do so, the Independent Consultant assigned a range of discount rates to the estimated cash flows of each loan based on:

- Yields on the bonds of similarly rated issuers, adjusted for the particular characteristics and lack of liquidity of each loan;

- The Independent Consultant's independent credit rating for each loan (described above); and

- The anticipated weighted average life of each loan.

Each loan's DOE-estimated principal and interest payment schedule (provided to the Independent Consultant in early December 2011) was discounted using the assigned yield range that was developed based on yields for similarly-rated utility and industrial bonds as of January 2012, adjusted to reflect the Independent Consultant's experience with the market for project finance credit. In general, approximately 100 additional basis points were added to the market-observed yields to reflect differences between the loans in the Portfolio and the loans and bonds for which publicly available yield data could be obtained. Those differences include:

- Complexity of the projects and their loan documentation;

- Reduced trading liquidity; and

- The repayment pattern of the loan (*i.e.*, some major investors, such as insurance companies, prefer loans with a single maturity date rather than loans that gradually repay).

To reflect the speculative nature of the projects in the lower ratings categories, the Independent Consultant widened the range of yields applied as the loans' ratings declined, starting at a one percent range for the highest ratings category and expanding to a five percent range for the lowest ratings category.

The resulting range of present values of each loan was deducted from the loan's principal amount to arrive at an estimate of the range of economic values of the loan guarantee. Because the interest rates on the Evaluated Loans are set at or very near the Treasury's borrowing rate, those interest rates are significantly below market rates for comparable commercial loans. For an investor to earn a market rate of return from these loans, the investor would have to purchase them at a significant discount to their face value.

The yields for Ford were based on a combination of yield data on Ford's publicly traded debt as of January 2012. The yields for Nissan were based on similarly rated industrial bond indices.

The table below summarizes the range of yields applied to credits at each rating level.

Table 5: *Range of Yields Applied to Credits at Each Rating Level*

Letter Rating	FMV Discount Rate		
	Low	–	High
BBB+ BBB	6.5%	–	7.5%
BBB-	7.0%	–	9.0%
BB+ BB BB-	8.5%	–	11.5%
B+ B B-	9.5%	–	13.5%
CCC+ CCC CCC-	12.5%	–	17.5%
CC+ CC CC-	Case by Case Basis		
C	Case by Case Basis		
D	Not Applicable		

G. Valuation Results Using the FMV Methodology

Utility-Linked Loans. The Independent Consultant's fair market value analysis resulted in an aggregate discount of $3.5 billion to $5.0 billion to the total principal amount of the loans.

Non-Utility-Linked Loans. The Independent Consultant's fair market value analysis resulted in an aggregate discount of $707 million to $858 million to the total principal amount of the loans.

Ford and Nissan Loans. The Independent Consultant's fair market value analysis resulted in an aggregate discount of $716 million to $1.021 billion to the total principal amount of the loans.

The results of the Independent Consultant's fair market valuation methodology are summarized below.

Table 6: *Results of the FMV Methodology Calculation*

Portfolio	Total Principal	Total Principal + Capitalized Interest	Independent Consultant Fair Market Value	
			Implied Discount Low	Implied Discount High
(in $ millions)				
Utility-Linked Loans	14,073	14,404	3,547	4,961
Non-Utility-Linked Loans	1,972	2,010	707	858
Ford and Nissan Loans	7,355	7,355	716	1,021
Total	**$23,400**	**$23,769**	**$4,970**	**$6,839**

H. Characteristics of the FMV Methodology

The Independent Consultant notes that the purpose and calculation of the FMV Methodology differ from those of the FCRA Methodology. The Independent Consultant attributes this difference to the fact that the FCRA Methodology and the FMV Methodology measure different sets of risks.

The FMV Methodology is based on the returns that investors are observed to demand in the market at a specific point in time for bearing risks similar to those present in the Portfolio. As such, it reflects the full range of risks for which investors would demand to be compensated in a private market transaction at the time the analysis was conducted. That range of risks includes not only the risks described previously in the section on Characteristics of the FCRA Valuation Methodology (Section VI(E)), but additional risks, among which are:

- The risk that the estimate of credit loss may prove to be incorrect;
- The concentration risk in the Portfolio (see Section I, below);
- The reinvestment risk (the risk either that an investment may terminate earlier than its stated tenor and the rate of return for available alternative investments may be less than the rate of return of the original investment, or the risk that income from an investment can only be invested at a rate of return less than that offered by the original investment);
- The liquidity risk pertaining to the unusual nature of the loans in the Programs; and
- Other market risks for which an investor would expect to be compensated with additional price discount but which the government, uniquely, does not confront.

In addition, the FMV Methodology is based on market data for the most comparable bonds and loans that exist in the market. However, the distinctive characteristics of the loans in the Portfolio limit the comparability of the available market data to these loans. Furthermore, the market data fluctuate on a daily basis, making any valuation representative of only a single point in time.

The aggregate results of the FCRA Methodology represent reasonable estimates of the discount to face value that investors would require to purchase the Portfolio in the open market. However, as with the FCRA Methodology, the FMV Methodology cannot be relied upon to predict the eventual performance of the Portfolio.

I. Portfolio Concentration Risk

In evaluating the Portfolio, the Independent Consultant noted several risk exposures that span several loans. These include:

- Exposure to the price of photovoltaic ("PV") panels. The seven PV generation projects will benefit if their cost to acquire panels decreases but the three PV manufacturing projects will not benefit if competitors' prices decrease.

- State renewable power standards. Almost all the Utility-Linked Loans are supported by power purchase agreements from utilities seeking to satisfy state mandates to source large portions of their power from renewable sources. These loans are exposed to the credit of these utilities and to the continuation of their regulatory requirements to source this type of power even if its price is higher than power from alternatives.

- First Solar and Abengoa. At least three projects rely on First Solar, Inc. to produce their solar panels and three projects rely on the Spanish company Abengoa as their sponsor.

- RFS. Two projects rely on the Environmental Protection Agency's RFS2 cellulosic ethanol mandates to establish a market for their product.

VII. MONITORING AND GOVERNANCE OF THE PROGRAMS

The second task that the Chief of Staff assigned to the Independent Consultant was to make:

Recommendations for enhancement to the Programs, if warranted and practical, to ensure effective monitoring and management of the current loan and guarantee portfolio.

A. Statutes and regulations

The EPAct contains few requirements for monitoring and supervision of loan guarantees DOE granted under the Title XVII program. The monitoring and oversight language of the EPAct and implementing regulations is limited to clauses requiring recipients of guarantees to keep records and to provide access by the Secretary to the records to facilitate audit and governing actions for DOE to take in the event a borrower defaults on the underlying loan.[20]

The EISA does not provide any requirements regarding governance and monitoring of loans after closing. The ATVM program regulations require parties to an ATVM transaction to maintain records of the transaction and allow DOE access to any relevant records for the purpose of audit or examination.[21]

Neither the statutes nor the regulations governing the Programs specify internal or external oversight or reporting requirements. The statutes and regulations do not specify the types or frequency of audits or examinations DOE must perform, the specific events that should trigger an audit or examination, or other guidance related to oversight and monitoring of DOE loans or loan guarantees.

B. LPO monitoring and governance infrastructure as of October 2011

i. LPO structure

LPO, which manages the Programs, most recently codified the structure and management of the Title XVII program as it operated in October 2011 and the structure and management of the ATVM program in November 2009. LPO is headed by a single Executive Director who reports directly to the Secretary.[22] The LPO Executive Director "serves under the broad guidance of the Secretary of Energy."[23]

LPO analyzes and assembles the documentation that the Secretary uses to determine which projects receive loan guarantees under the Title XVII program and loans or grants under the ATVM program. LPO is also responsible (subject to the oversight described below) for the management of the Portfolio after these transactions have closed.

LPO is divided into several divisions responsible for specific aspects of the origination and monitoring/oversight processes:

The Loan Guarantee Origination Division ("LGPO-OD") is responsible for the origination and underwriting of guaranteed obligations under the Title XVII program. The LGPO-OD is responsible for moving projects through the application reviews, and for

processing and overseeing detailed due diligence. It is also responsible for developing and negotiating terms and conditions associated with the guaranteed obligation, developing and negotiating closing documentation, recommending approvals and rejections of loans and ultimately closing the loan guarantee.[24]

The ATVM Division is responsible for the origination of loans under the ATVM program, performing the due diligence, negotiation, and closings associated with ATVM loans, and making recommendations on loan decisions.

The Technical and Project Management Division ("TPMD") is responsible for providing technical analysis and input to the Title XVII and ATVM origination divisions. It supervises the work of independent engineers and technical experts retained to assist in the origination process.[25]

The Credit Division is responsible for performing the Credit Subsidy Cost estimation during the origination process for both the Title XVII and the ATVM programs. It generally implements, administers, and updates the credit policies and risk evaluation methodologies that LPO uses during origination and management of transactions.[26] The Credit Division also performs credit risk assessments and maintains the credit subsidy cash flow model that the Programs use to estimate the Credit Subsidy Cost of a loan or loan guarantee.[27] The Credit Division submits the Credit Subsidy Costs it calculates to OMB for approval.[28]

The Portfolio Management Division ("PMD") is responsible for managing Title XVII and ATVM transactions once they have received their first disbursement (*i.e.*, once the origination process is complete). This includes monitoring projects through the construction period, checking adherence to repayment schedules and loan covenants, and monitoring legal and regulatory activities. Some of the more important responsibilities described in the Programs' policies and procedures include:

- Managing the large number of post-closing decisions required over the life of a loan or guarantee. These include whether to authorize disbursements, modify or amend the terms of the transaction, waive the transaction terms, and in some instances, pursue workout or foreclosure. Even a transaction requiring no modifications or amendments can require monthly evaluations over time to determine whether conditions precedent had been met before the next tranche of loan proceeds was released to the borrower.

- Reviewing and re-rating projects periodically, in conjunction with the Credit Division, to update the risks associated with a project and enable LPO to update the valuation of the Portfolio on an ongoing basis for FCRA compliance.

- Administering the periodic reporting system for all projects, producing weekly, quarterly, semi-annual and annual reports on the status of Portfolio projects, both individually and as a group. The frequency, detail and distribution of the reports vary based on project status.

In carrying out its responsibilities, LPO's policies and procedures call for PMD to make a determination of whether a credit action or a development pertaining to a borrower is "material." LPO policies do not define what constitutes a "material" amendment or waiver. PMD personnel stated that the standard they use to determine whether an amendment or a waiver is material is whether the change involves DOE taking on additional risk. Other examples of material changes or credit actions include restructuring, pursuing foreclosure in the event of a default, and the disposition of assets.[29] This determination dictates whether a particular borrower or credit action will be scrutinized by the Risk Committee, the CRB, or the Secretary.

Another significant responsibility of PMD is managing a Watch List of projects that it has identified as higher risk (for reasons such as a breach of a covenant, falling behind schedule, or presence in an industry or market sector experiencing challenging market conditions). Projects on the Watch List are subject to heightened scrutiny. Among other responsibilities, LPO's policies and procedures call for PMD to review and reevaluate Watch List project risk ratings monthly and to hold weekly calls with Watch List borrowers.

LPO is currently staffed by 92 full-time equivalent employees, who are spread among the various divisions within LPO. In addition, LPO uses over 60 full-time contractors as consultants on different aspects of the program. The current LPO Executive Director holds that position in an acting capacity.

ii. Internal DOE oversight of the Programs and the LPO

There are several committees involved in overseeing credit transactions and the LPO. The Credit Committee is responsible for independently reviewing proposed loans and loan guarantees based on the information provided to it by the Title XVII and ATVM origination divisions, and making recommendations to the LPO Executive Director about whether the Executive Director should recommend to the CRB approval of the loans or loan guarantees to the borrower.[30]

The Credit Committee is chaired by DOE's Acting Chief Financial Officer. The other members of the Credit Committee are the PMD Director, LPO's Chief Counsel (non-voting), and three senior officials selected by the committee's chairperson.

The CRB is responsible for making the final recommendation to the Secretary about whether to provide a loan or loan guarantee to the borrower.[31] According to the DOE Title XVII Policies and Procedures, the CRB "serves a management and oversight function that is similar to that of a transaction approval group within an investment bank or commercial bank."[32] The CRB reports to the Secretary, who makes the final decision about whether to proceed with a transaction. The CRB fulfills this role for both the Title XVII and ATVM programs; the Programs do not have their own, separate CRBs.[33] The CRB is governed by the CRB Charter, most recently revised in December 2011.

The CRB consists of eight members and includes both political appointees and senior-level staff. Several of the CRB members have backgrounds in business, finance, and technology. The Deputy Secretary chairs the CRB.[34] The CRB's other members include the Under Secretary

of Energy, the Under Secretary of Energy for Science, the DOE's Chief Financial Officer ("CFO"), the Chief of Staff to the Secretary, the Senior Advisor to the Secretary of Energy (for Financial Matters), the DOE General Counsel, and other DOE employees appointed by the Secretary.[35]

iii. Recent changes to the Programs' management, monitoring, and governance

The Secretary directed a number of changes in management, monitoring, and governance of the Programs and the Portfolio during the Review. These changes are described below.

Structural Changes. The Secretary recently expanded the role of the CRB to include participating in monitoring transactions that have closed, and directed the creation of a new committee to oversee management of the Portfolio.

The CRB is now responsible for reviewing and making recommendations to the Secretary concerning decisions to be taken throughout the life of a loan, such as material modifications to transaction agreements, initial disbursements, and any disbursements to companies on the Watch List.

At the Secretary's direction, the DOE has also recently added a Risk Committee to the oversight and monitoring process. The Risk Committee is "intended to play a broad role in oversight of portfolio management" and to ensure that "the CRB and Secretary are appropriately informed respecting the portfolio as a whole, including significant or material actions or events affecting individual portfolio assets."[36] The Secretary has also charged the Risk Committee to work with LPO staff and company management "to understand the credit conditions in each loan" and to "review often rapidly changing external market conditions that bear on portfolio companies."[37] The Risk Committee's roles and responsibilities are specified in a Risk Committee Charter dated December 20, 2011.

The Risk Committee consists of at least seven members and is led by the chair of the Credit Committee. The other members of the Risk Committee include the PMD Director, the LPO Chief Counsel, the LPO Director of Credit, the Director of the LPO TPMD, the Director of the LPO Management Operations Division, and two members of the CRB, appointed by the Secretary to serve on the Risk Committee.[38] Therefore, each member of the Risk Committee is either a member of LPO or of the CRB. DOE also plans to include industry program experts as *ex officio* non-voting members.[39]

Both the Risk Committee and the CRB seek to make decisions by consensus. However, these bodies are permitted to make decisions by majority vote.[40]

Strengthening of the Disbursement Process. Approval of disbursement requests for DOE loans or loan guarantees requires multiple reviews. For a first disbursement or a disbursement to a project on the Watch List, these reviews can include PMD, the Risk Committee, the CRB, and the Secretary, before DOE approves the disbursement.

The Secretary has recently required DOE to take additional steps in determining whether to authorize a disbursement. These new processes include (1) increasing the use of internal DOE resources where the Department has technical and market expertise (such as in solar, biofuels and electric vehicles), (2) using consultants during the post-financial-close monitoring that are different from those used during the origination phase, and (3) engaging informal networks of industry participants and investors to gain additional market intelligence.[41]

Stricter Oversight of Watch List Projects and Material Changes to Projects. As part of the Secretary's enhancements to transaction monitoring, senior DOE leadership receives weekly briefings on Watch List transactions.[42] The Risk Committee also reviews projects on the Watch List weekly.[43] Finally, the CRB gives additional scrutiny to transactions on the Watch List in its regular monthly reviews of the Portfolio.[44] The Secretary has directed that he be informed of all major transactions involving Watch List companies that can affect company performance, including changing market conditions or changes in the competitive marketplace, and will review all material loan amendments, modifications and disbursements for companies on the Watch List, as well as initial disbursements.

Additional Review of Credit Subsidy Model Calculations. The Risk Committee and the CRB will review the inputs to the periodic recalculation of a loan or loan guarantee's Credit Subsidy Cost (as required by FCRA) and will include input from outside consultants in making these reviews.

LPO personnel informed the Independent Consultant that implementation of these revisions to the Programs and development of additional processes is ongoing.

VIII. RECOMMENDATIONS FOR STRENGTHENING THE PROGRAMS' MANAGEMENT AND OVERSIGHT

The White House Chief of Staff requested that the Independent Consultant review the current Portfolio management practices, including governance and monitoring standards, with a particular focus on identifying opportunities to enhance ongoing DOE monitoring activities.

A. Provide Long-Term Funding for the Programs

Because the Programs will extend up to thirty years, DOE must assure adequate funding to manage and oversee the Programs on a long-term basis.

Now that the September 30, 2011 deadline for new Section 1705 lending has passed, the focus of LPO appropriately has shifted from originating loans and guarantees toward managing the Portfolio.

This crucial activity will require staffing LPO for a long period because the Portfolio's loans and guarantees have maturity dates extending up to 30 years. Throughout the life of the Programs, issues affecting the Portfolio's value will continually arise and important decisions affecting the interests of taxpayers will have to be made. The pioneering nature of the projects' technologies heightens the importance of expertise and continuity among the managers and professionals in LPO and other supporting areas. Furthermore, successfully managing this Portfolio will take the commitment of experts with long-term perspectives. That will be best accomplished if employees are confident that LPO will be adequately funded. Therefore, taking steps in the near future to assure continued, adequate funding for managing, staffing and overseeing the Programs is critical to recruiting and retaining the talented personnel needed to administer the Programs.

Fees payable by borrowers in connection with origination and monitoring loans and loan guarantees are used to cover administrative expenses. DOE cannot unilaterally increase the fees on loans already in place. It is possible that, in the near term, additional fees will be received from the closing of pending applications. However, over the next several years, the total amount of fee income to DOE will decline when originations cease. Therefore, adequately funding the management and administration of the Programs will depend on obtaining additional budgeted and appropriated funds in the future.

The funds for operating the Programs are small relative both to the size of the Portfolio and to the potential reduction in loan repayments if the Portfolio is not actively and effectively managed over time.

B. Fill Key Positions in Management with Experienced Professionals

DOE should create a balanced mix of managers in LPO, including some who have experience in managing government programs and others with substantial private sector experience and skill in project management and finance.

Today, some key positions in LPO are occupied by acting directors relying on outside contractors to augment their expertise. At least one manager is acting head of several departments. The Acting Executive Director of LPO is an interim appointment and the position of Director of Credit is vacant.

The DOE has tried to fill those positions with permanent employees without success to date. The Independent Consultant believes that, by adopting the recommendations in this section of the Report, the DOE should be better able to fill the vacant positions with permanent, highly qualified individuals.

C. Clarify Authorities and Accountabilities of Managers

DOE should assign authorities for decision-making only to individual managers and never to committees where collective responsibility can obscure individual accountability.

The Secretary has ultimate authority over the Programs and accountability for their results. Delegated authorities for taking day-to-day actions and approving recommendations are distributed formally and informally among various executives and committees. For example, the CRB, rather than an individual officer, currently is authorized to approve recommendations to the Secretary. Although job descriptions and committee charters describe the authorities of each, managers and employees have indicated that, in practice, lines of authority have been less clear and the framework of management and governance is still evolving.

Delegation of authority should be more specific regarding the kinds of permitted actions each manager in the chain of command may take and any limitations on that authority. For example, the LPO Executive Director can bypass the CRB and take a matter directly to the Secretary for approval if, in the LPO Executive Director's judgment, the matter is urgent. The definition of "urgent" is left to the discretion of the LPO Executive Director. Another example is the authorization of the LPO Executive Director to handle "routine" waivers of covenants (for instance, when meeting a covenant will be delayed by a few days); all other waivers must have approval of the Secretary. That authorization seems imprecise and too restrictive; allowing the LPO Executive Director to approve some kinds of non-routine waivers up to a certain dollar limit could enhance timely decision-making and relieve the Secretary from having to decide matters that will not materially affect the Portfolio's value. Delegating such authority, however, requires clear policies to guide decisions by those assigned responsibility.

D. Establish and Effectively Communicate Clear Goals for Management

DOE should develop explicit objectives and standards of performance for managing the Portfolio during the construction phase of the projects and beyond.

Many challenging decisions will have to be made throughout construction and operation of the projects, such as whether to waive covenants of loan agreements for projects that are lagging their benchmarks, timetables or operating standards. The Title XVII program's statutory goal of "reasonable prospect of repayment" is vague and must be clarified so that managers can make decisions and recommendations within their authorities quickly and with confidence. DOE

should provide clear guidance regarding the desired balance between meeting policy objectives and managing recoveries.

E. Proactively Protect the Taxpayers' Interest

DOE should continually look for ways to strengthen its position as lender or guarantor without compromising the success of a project and the incentives of sponsors and counterparties to support that project.

In a positive development for taxpayers, LPO increased the number and rigor of the covenants and conditions precedent to funding construction in many of the projects it closed after mid-2010. These actions underscore both the importance and the feasibility of utilizing available protections in contracts at all project stages to mitigate risks to taxpayers.

The novelty, complexity and scale of the projects, coupled with the exacting covenants in their loan structures, likely will cause many projects to seek relief from some requirements in the loan agreements. In such cases, to strengthen its position as lender or guarantor, DOE might insist that sponsors issue warrants to DOE to purchase shares in return for waivers or extensions of covenants.

So that it can act both in a timely and consistent manner, DOE should establish written, clearly articulated policies governing the means it can use (for instance, are warrants to purchase shares an acceptable form of compensation?) and the financial and programmatic policy goals it will pursue in negotiations with borrowers.

DOE should assure that in addition to professional staff, LPO continues to retain independent outside experts in engineering, project finance, and other relevant disciplines to advise it on an ongoing basis.

F. Engage in Long-Range Strategic Planning for the Programs

DOE faces strategic choices as it determines how to manage the Portfolio over the life of the Programs.

Once projects have completed construction and begun commercial operation in the next several years, management of the Portfolio will require fewer resources but will still need continuous, expert oversight. This oversight is critical because future changes in projects and markets will precipitate adjustments to terms of loans and create new opportunities to sustain or enhance protections for taxpayers.

As it determines how to manage the Portfolio over the life of the loans, DOE can choose among several possible strategies. They include:

- Continuing to manage the Portfolio through a streamlined LPO, staffed with highly-qualified permanent employees;

- Outsourcing part or all of the day-to-day management of the Portfolio while maintaining robust monitoring and oversight. Financial institutions that currently

handle servicing and/or trustee work for commercial lenders (particularly in securitizations) could be retained to handle a substantial portion of current LPO activities once projects achieve operating maturity; and

- Selling or otherwise disposing part or all of the Portfolio over time. Once the projects supporting the borrowings are operating successfully, they should be more attractive to commercial investors than they are in the development phase.

One or more of these strategies might require enabling legislation.

G. Improve Reporting to the Public

DOE should provide clearer, broader information to the public on the progress and performance of the Programs and the Portfolio.

DOE should provide robust, regular reporting in accordance with a comprehensive communications plan including but not limited to a more informative, dedicated website. Of course, these disclosures must not violate the confidentiality of loan agreements and of proprietary information.

DOE already provides considerable information about the Programs, projects, guarantees committed and currently extended, and recent developments, but that information is dispersed across several Internet platforms and embedded alongside information from other programs. It should be consolidated and presented more clearly and comprehensibly to the public.

The information currently reported to the public should be supplemented by updates, at least quarterly, on amounts (and changes in amounts) of estimated credit subsidy to the aggregate Portfolio and its major components, using the FCRA Methodology as well as a “fair market value” method.

H. Strengthen and Restructure Internal Oversight of the Programs

DOE should create a new Risk Management department encompassing all DOE functions that monitor LPO and should appoint a highly experienced Chief Risk Officer (“CRO”) to head it. DOE should also reorganize oversight of the Program.

From the inception of the Programs, successive Secretaries have recognized the importance of establishing checks and balances to the activities of LPO so that the Programs benefit from independent perspectives, broader expertise and separation of control functions from the operations they monitor.

The Credit Division, largely reliant on contractors and consultants, evaluates exposures to loan losses and advises on credit decisions and loan structures. The Credit Review, Compliance, and Reporting subdivision of PMD focuses on adherence to laws, regulations and DOE policies in decision-making and operation of LPO. The Credit Division and PMD’s Credit Review, Compliance, and Reporting subdivision now reside within LPO.

To enhance the independence of the oversight function, DOE should create a new Risk Management department, headed by an experienced CRO, to house all DOE functions dedicated to monitoring LPO, and including those of the Credit Division and the Credit Review, Compliance, and Reporting subdivision.

The functions of the Risk Management department should include: assigning and regularly updating LPO's risk ratings and related evaluations of all loans and guaranties; representing DOE in developing credit subsidy calculations under the supervision of OMB; regularly reviewing and verifying reporting and record-keeping throughout LPO; supporting LPO and the CRB with independent analysis and advice; assessing operating systems and processes of LPO; and monitoring developments in energy markets as well as federal and state initiatives that could impact the Portfolio.

The charters of the Risk Management and LPO departments should require that significant decisions by LPO have prior concurrence of the CRO. Conversely, the CRO must be accountable for keeping LPO informed of Risk Management's findings in a timely manner. In cases where the CRO and the Executive Director of LPO differ on an issue within Risk Management's purview, they should jointly consult with the Secretary, who has the ultimate decision-making responsibility.

Risk Management's main role should be informing and advising LPO concerning actual and potential risks to the Portfolio. That role should not impinge on the authority and accountability of LPO for the performance of the Portfolio, but instead should add value by contributing independent expertise in evaluating risk. This "check and balance" should help produce broad, objective analyses of the Programs' goals, methods, risks and performance.

Senior managers within Risk Management should attend the regular meetings of LPO managers to assure continual communication and mutual understanding.

To bolster the independence of Risk Management from LPO, the two departments should have separate reporting lines to senior management. For example, the CRO could report to the CFO or to the Deputy Secretary, whereas the Executive Director of LPO reports directly to the Secretary.

DOE has created several committees to advise on credit decisions. The Credit Committee has focused mainly on credit risks in loans as they are originated and initially funded. Its role going forward, now that originations have ceased in the 1705 program, is unclear.

The recently formed Risk Committee is intended to play a role in general oversight of ongoing Portfolio management. The Credit Committee and the Risk Committee are both advisory and are charged to make recommendations to the LPO Executive Director, the CRB, and the Secretary for action.

The CRB, as noted earlier in the Report, has a function "similar to that of a board of directors of a banking organization." Its tasks include reviewing and approving policies, establishing standards for risk assumption, and recommending approval of transactions to the Secretary. It is chaired by the Deputy Secretary and is composed of senior DOE officials.

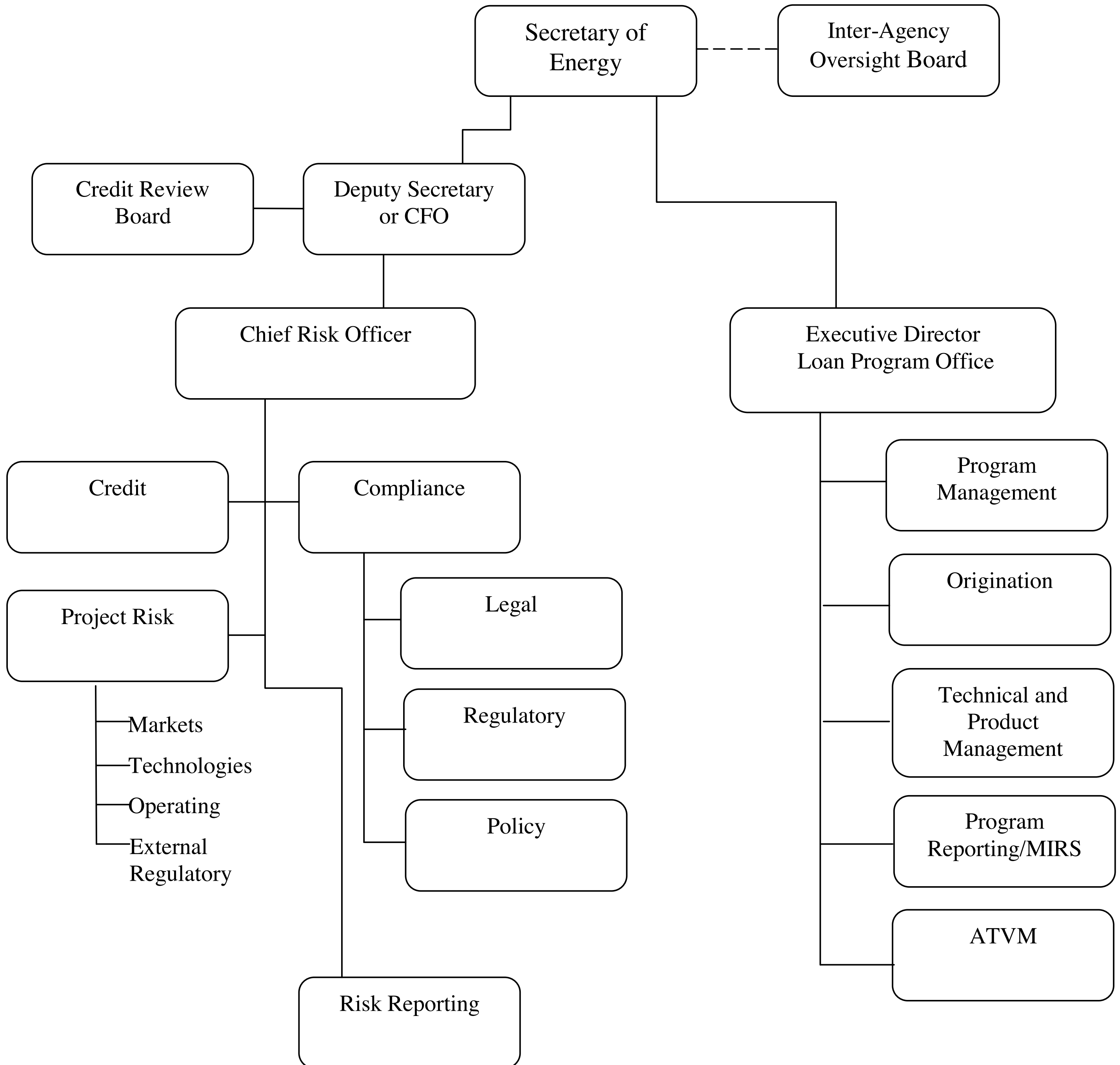
Although in the last six months DOE has significantly enhanced oversight of its credit exposures, the new structure involves multiple committees with overlapping memberships and, in some instances, without full independence from LPO. For instance, the membership of the Risk Committee overlaps those of the Credit Committee, the CRB, and LPO. Several managers in DOE believe that the existence of these multiple committees has slowed decision-making and caused uncertainty about how to navigate proposals toward decisions.

To clarify responsibilities, assure timely decision-making and reduce burdens on committee members, the Credit Committee and the Risk Committees should be abolished. Checks and balances will be more robust and applied more continuously by an independent Risk Management department that continually engages with the LPO and has authority to contest decisions and recommendations by LPO before they are implemented.

The CRB should continue to provide senior, independent oversight. Its role should be broadened to include overseeing "enterprise" risks including credit, compliance, accounting, operational integrity, reporting, and protecting DOE's interests in defaults and bankruptcies.

DOE should include in the CRB's membership some career-level experts from other government agencies with considerable expertise in matters pertaining to LPO's activities, including project finance and governance.

Figure 1: Proposed Structure of Program Management & Oversight



I. Establish External Oversight

Overall governance of the Programs would benefit from access to senior government officials of other departments and agencies who have knowledge of proven "best practices" across credit programs government-wide.

Laws enabling some major lending or capital programs in other areas of government include a requirement for interagency, advisory oversight of their governance. The Export-Import Bank's board includes the Secretary of Commerce and the U.S. Trade Representative, *ex officio*. The Overseas Private Investment Corporation ("OPIC") board includes representatives from six other federal agencies, including the Office of the U.S. Trade Representative, the Agency for International Development, and the Department of Labor. The statute establishing the Troubled Assets Relief Program ("TARP") mandated independent, monthly oversight by a Financial Stability Oversight Board chaired by the Chairman of the Board of Governors of the Federal Reserve System and including the Secretary of the Treasury, the Secretary of the Department of Housing and Urban Development, the Chairman of the Securities and Exchange Commission, and the Director of the Federal Housing Finance Agency. Those boards advise on broad policy, control and performance issues.

The Secretary could emulate that legally mandated "best practice" of other loan programs by creating a similarly constituted board to advise him on policy matters. Membership could include, at the under secretary or equivalent level, representatives from Treasury, OMB and at least two other federal departments or independent agencies that extend complex credit (for example, the Export-Import Bank, the Department of Agriculture, the Department of Transportation, or OPIC). The charter of the proposed interagency committee should clearly articulate the roles of the members and the overall role of the committee.

The multi-agency advisory board would benefit from additional members with private sector expertise in industries relevant to the Programs, such as electrical utilities, banking and venture capital. There are precedents for including private-sector representatives on advisory boards of federal agencies. For example, eight of the 15 members of the OPIC board come from the private sector.

Independent of the establishment of a multi-agency advisory board, the roles of the Treasury and OMB, which now interact with DOE on the Programs, should be clarified.

IX. THE ESTABLISHMENT OF A COMPREHENSIVE EARLY WARNING SYSTEM

The third task that the Chief of Staff assigned to the Independent Consultant was to make:

Recommendations, if needed, pertaining to early-warning systems to identify and mitigate potential concerns on a timely basis.

The Title XVII and ATVM statutes and implementing regulations do not specifically require DOE to maintain an "early warning system" to identify potentially troubled loans or loan guarantees and take mitigating actions.

The principal "early warning system" currently in place is DOE's process for identifying projects to be placed on the Watch List and subsequently monitoring their condition.

The Independent Consultant recommends that DOE: (i) develop a comprehensive management information system to provide key decision makers with information needed to make timely and informed decisions on an ongoing basis; (ii) establish a protocol for timely reporting of critical information; and (iii) incorporate lessons learned into policies, procedures, reporting, and decision-making.

A. Create a Comprehensive Management Information Reporting System

The early warning system should provide key decision makers with information needed to make timely and informed decisions. It should be built upon a Management Information Reporting System that highlights trends potentially affecting the creditworthiness of loans and guarantees, and that tracks progress toward addressing those trends.

The system and the reports it generates should: provide early notice of potential issues and problems bearing on the value of the Portfolio; focus management's attention and priorities on the most important factors determining performance; and furnish a basis for management decision-making and for communicating the Programs' status to senior officers of DOE and oversight bodies.

The reports should include a section covering external conditions affecting the Programs, such as trends in markets where the borrowers operate. Those trends should include changes in prevailing pricing, market shares of borrowers and key competitors, and products and technologies. This overview should also identify any prospective federal or state legislation that could affect subsidies and regulations influencing supply and demand for clean energy.

Another section of the reports should contain updates on every loan and borrower and on the overall condition of the Portfolio, highlighting:

- Variations from the project's expected performance that, if continued, could result in breaching loan covenants;

- Management's plans and timetables for correcting those variations, and progress to date;

- Changes in the management of projects;

- Changes in the performance and financial condition of EPC contractors, O&M providers; and suppliers that are responsible for completing the project, fulfilling performance guarantees or making payments required by off-take agreements;

- Trends in the Credit Subsidy Cost of the loan and in any other accepted measures of exposure to loss; and

- The overall condition of the Portfolio, including trends in Credit Subsidy Cost and in the incidence of significant waivers or modifications of loan covenants.

A third section of the reports should address the internal performance of LPO and the Programs, including:

- Compliance with DOE policies;

- Efficiency of LPO's operations;

- Trends in filling vacant positions;

- Turnover of managers and professionals;

- Progress against overall milestones and goals of the Programs;

- Progress of plans to reduce or mitigate risk in the Portfolio; and

- Performance in responding to findings of the Inspector General of DOE and the Government Accountability Office, to Congressional letters, and to inquiries from the public.

B. Establish a Protocol for Timely Reporting of Critical Information

LPO should have policies and accountabilities for timely reporting of significant events to senior management of DOE, to oversight bodies and to departments or officials outside DOE with a need to know.

LPO management should be evaluated in part on whether the focus and content of its reporting are informative and have proven effective in anticipating, preventing, or correcting identified deficiencies.

C. Incorporate Lessons Learned Into Policies, Procedures, Reporting, and Decision-Making

LPO should use the information it collects as part of the early warning system to inform future decisions regarding the Portfolio, including those related to disbursements, waivers, and amendments.

The policies, procedures, and information reported by the early warning system should appropriately be modified to incorporate these lessons learned.

X. LIMITATIONS OF THE REPORT

As part of this assessment and review, the Independent Consultant's work was affected by the limitations arising out of the Independent Consultant's unique status and the circumstances under which the Report was prepared.

- *Compressed Time Period for Review*. The Report was prepared over a sixty-day period beginning on November 28, 2011. Because of this abbreviated time period, the Independent Consultant's work plan necessarily omitted activities that might have provided further insights, such as a more detailed examination of each loan's performance and of the financial, operational, regulatory, and market demand risks facing each loan applicant; screening, retaining and consulting with subject matter experts regarding the promise and limitations of some of the cutting-edge technologies involved in utility-linked and in manufacturing projects; and more extensive examination of the loan origination and monitoring processes and practices that DOE followed for each of the loans. The Independent Consultant designed and executed a work plan and methodologies calculated to produce comprehensive, independent conclusions based on available facts.

- *Scope of Review*. Due to the limitations inherent in the scope of and time period allotted for the Independent Consultant's review of the Portfolio requested by the White House as noted above, the Independent Consultant was unable to fully obtain, and the Report does not contain, all of the information that may be required to evaluate any of the borrowers, other project participants, loans, assets, projects or other persons referenced in the Report. The Independent Consultant did not conduct any appraisals of any assets or liabilities of any of the borrowers or other project participants referred to in the Report. The Independent Consultant has assumed and relied upon the accuracy and completeness of information publicly available, supplied or otherwise made available regarding the Portfolio and the borrowers and other project participants for the purposes of the Report.

- *Current Status of the Projects and Portfolio*. The Report is necessarily based on financial, economic, market and other conditions as in effect on, and the information made available to the Independent Consultant as of, the date of the Report. It should be understood that subsequent developments will affect the analysis contained in the Report. Actual outcomes may differ materially from the evaluations provided in the Report.

- *Inherent Subjectivity of Judgments*. The Independent Consultant applied widely recognized financial models, financial analysis methods, principles of legal analysis, and available knowledge of the energy industry and of the financial markets to value and assess the risk profile of each loan in the Portfolio. The Independent Consultant also constructed customized methods of evaluation of the Portfolio to take account of the many distinctive contingencies embedded in the

contracts, construction and offtake phases, technologies and markets of the individual projects in the Portfolio. The Independent Consultant also drew upon knowledge of best commercial practices in making recommendations for improvements in management, governance, an early warning system, and reporting. Throughout the Report, the Independent Consultant has stated the methodologies, assumptions, and, where appropriate, uncertainties underlying the analysis. Reaching the conclusions set forth in the Report nevertheless and necessarily involved exercising a significant degree of subjective judgment.

- *Limits of Financial Models*. The Independent Consultant identified several Portfolio characteristics that make it particularly challenging to value, including the fact that many of the projects employ novel technology and/or involve significant scale-up risk, the loans have longer terms than those typically found in the marketplace, and therefore a small change in discount rates results in a relatively large change in valuation, and many of the loans are to projects still in the construction phase, which is riskier and harder to evaluate than is the operations phase.

- *Lack of Investigative Authority*. The Independent Consultant did not have subpoena authority or any other legal means to compel the production of documents and information from government agencies or from third parties. The Independent Consultant made requests for documents, interviews with relevant officials, and demonstrations of information technology tools used by DOE in connection with its monitoring of the Portfolio. While DOE provided substantial information and technical assistance in response to these requests, the Independent Consultant was not able to assess the extent of, or to require certification of, DOE's compliance with these requests, and did not have access to any form of legal compulsion to require additional assistance. Similarly, the Independent Consultant did not have legal authority to obtain access to confidential information of any of the participants in the various loan transactions, including the applicants, project sponsors, EPC contractors, O&M contractors, and offtaking utilities.

- *Existence of Concurrent Investigations*. Various other investigations and reviews were proceeding at the same time as the Review.

- *Review Based on a Single Point in Time*. The Independent Consultant performed the Review based on a snapshot of the Programs' operations at the time of the Review. At the same time as the Independent Consultant was undertaking the Review, the Secretary was implementing important changes to the Programs. Due to their nascency, the Independent Consultant has not seen the results of those changes or assessed their effectiveness. In fulfilling the mandate from the White House Chief of Staff, the Independent Consultant regarded the Review as an opportunity to recommend lasting changes in the Programs' structure and operation.

XI. ACKNOWLEDGEMENTS

The Independent Consultant wishes to acknowledge and thank the officials of DOE and other government departments for their openness, cooperation, and assistance during the Review.

APPENDICES

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Appendix A

Glossary of Terms

ARRA	American Recovery and Reinvestment Act of 2009
ATV	Advanced Technology Vehicle
ATVM	Advanced Technology Vehicle Manufacturing
Beacon	Beacon Power Corporation
CFO	Chief Financial Officer
CRB	Credit Review Board
CRO	Chief Risk Officer
Credit Subsidy Cost	Estimated long-term cost to the government on a net present value basis of a loan or loan guarantee
Criteria Weightings	Weightings given by the Independent Consultant to the Nine Criteria
CSC2	Credit subsidy calculator developed by OMB
Deputy Secretary	Deputy Secretary of Energy
DOE	Department of Energy
DSCR	Debt Service Coverage Ratio
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EISA	Energy Independence and Security Act of 2007
Eligible Costs	Project costs that borrowers may fund with loan proceeds under the Programs
EPAct	Energy Policy Act of 2005
EPC	Engineering, Procurement, and Construction
Evaluated Loans	The 30 loans and loan guarantees that the Independent Consultant evaluated in the Report
FCRA	Federal Credit Reform Act of 1990

FCRA Methodology	Models used by DOE and OMB to establish credit subsidies as part of the government budget
FIPP	Financial Institution Partnership Program
FMV	Fair market value
FMV Methodology	A methodology the Independent Consultant used to evaluate the Portfolio
Ford	Ford Motor Company
Ford and Nissan Loans	Loans made to Ford Motor Company and Nissan North America, Inc.
LDs	Liquidated Damages
LGPO-OD	Loan Guarantee Origination Division (for Title XVII program loan guarantees)
LPO	Loan Programs Office
MIRS	Management Information Reporting System
Nine Criteria	Criteria the Independent Consultant used to evaluate the credit risk of each loan
Nissan	Nissan North America, Inc.
Non-Utility-Linked Loans	Loans and loan guarantees to projects not linked to a utility, including cellulosic ethanol projects, solar manufacturing companies, and small, start-up automotive manufacturing companies
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OPIC	Overseas Private Investment Corporation
PMD	Portfolio Management Division
Portfolio	The portfolio of loans and loan guarantees issued by DOE under the Programs
PPA	Power Purchase Agreement
Programs	The Title XVII loan guarantee program and the ATVM loan and grant program
PV	Photovoltaic

Review	The review the Department of Energy's ("DOE") loan and loan guarantee programs for alternative energy projects undertaken by Herbert Allison at the request of the Chief of Staff of the White House
RFS	Renewable Fuel Standard
S&P	Standard & Poor's
Secretary	Secretary of Energy
Solyndra	Solyndra Inc.
TARP	Troubled Asset Relief Program
TPMD	Technical and Project Management Division
Treasury	U.S. Department of the Treasury
Utility-Linked Loans	Loans and loan guarantees to utility-linked projects for the generation or transmission of alternative sources of energy

Appendix B

Types of Documents Provided to the Independent Consultant by DOE

1. Policies and Procedures for the Title XVII and ATVM Programs
2. Loan Programs Office Governance Narrative
3. Loan Application, Closing and Post-Closing Monitoring Materials
4. Loan Documentation, including Credit Ratings and Credit Subsidy Calculations
5. Consultant Reports, Project Plan Timetables and Financial Projections
6. Loan Agreement Amendments, Waivers, and Modifications
7. Interagency Correspondence, Memoranda and Reports

Appendix C

Index of Meetings of the Independent Consultant

The Independent Consultant met with the individuals listed below, individually or in groups, on the stated dates.

U.S. Department of Energy

<u>November 28, 2011</u>

Steven Chu, *Secretary, Department of Energy*
Daniel B. Poneman, *Deputy Secretary and Chief Operating Officer, Office of the Deputy Secretary, Department of Energy*
Richard Kauffman, *Senior Advisor to the Secretary of Energy, Department of Energy*
Brandon Hurlbut, *Chief of Staff, Office of the Secretary, Department of Energy*

<u>December 1, 2011</u>

Richard Kauffman
Sean A. Lev, *Acting General Counsel and Deputy General Counsel for Environment and Nuclear Counsel, Office of the General Counsel, Department of Energy*
David G. Franz, *Loan Guarantee Program Director, LPO, and Acting Program Director, ATVM, Department of Energy*
Susan S. Richardson, *Chief Counsel, LPO, Department of Energy*
Frances I. Nwachuku, *Director, Projects and Portfolio Management, LPO, Department of Energy*
Dong Kwun Kim, *Chief Engineer, Technical and Project Management Division, LPO, Department of Energy*
Kimberly J. Heimert, *Attorney Advisor, LPO, Department of Energy*
Douglas Schultz, *Program Manager, Financial Institution Partnership Program and Senior Investment Officer, LPO, Department of Energy*
Jonathan Levy, *Deputy Assistant Secretary for the House, Congressional & Intergovernmental Affairs, Office of the Deputy Secretary, Department of Energy*
Jim McCrea, *Financial Consultant, LPO, Department of Energy*

<u>December 13, 2011</u>

Richard Kauffman
David G. Franz
Susan S. Richardson
Frances I. Nwachuku
Dong Kwun Kim
Robert Marcum, *Deputy Director, Portfolio Management Division, LPO, Department of Energy*
Kimberly J. Heimert
Jim McCrea

December 14, 2011

Jonathan Silver, *Former Executive Director, LPO, Department of Energy*
David A. Wilson, *Partner, Thompson Hine LLP*
John D. Adams, *Partner, McGuireWoods LLP*

December 14, 2011

Richard Kauffman
Dong Kwun Kim
Todd A. Shrader, *Director, Fossil Energy, Technical and Project Management Division, LPO, Department of Energy*
Kimberly J. Heimert
Scott Stephens, *Solar Manufacturing Project Manager, LPO, Department of Energy*
Robin Sampson, *Physical Scientist, LPO, Department of Energy*
Dr. Ramamoorthy Ramesh, *Sunshot Director, Office of Solar Energy Technologies Program, Department of Energy*
Minh Sy. Le, *Deputy Solar Energy Technologies Program Manager, Office of Solar Energy Technologies Program, Department of Energy*
Dr. Ranga Pitchumani, *Concentrating Solar Power Program Lead, Office of Solar Energy Technologies Program, Department of Energy*
Joseph W. Stekli, *Engineer, Concentrating Solar Power Program, Office of Solar Energy Technologies Program, Department of Energy*

December 16, 2011

Kimberly J. Heimert
Anthony Curcio, *Chief Operating Officer, Summit Consulting, LLC*
Brian Oakley, *Director, Scully Capital Services, Inc.*

December 20, 2011

Gregory H. Friedman, *Inspector General, Office of the Inspector General, Department of Energy*
John R. Hartman, *Office of the Inspector General*, *Department of Energy*
Deal teams on all transactions and senior LPO management

December 28, 2011 (Teleconference)

Susan S. Richardson
Frances I. Nwachuku
Robert Marcum
Kimberly J. Heimert

January 9-10, 2012

Richard Kauffman
Nick Whitcomb, *Acting Director, ATVM, Department of Energy*
Susan S. Richardson

Frances I. Nwachuku
Dong Kwun Kim
Robert Marcum
Douglas Schultz
Todd A. Shrader
Kimberley Heimert
Jason Gerbsman, *Supervisory Program & Management Analyst, ATVM, Department of Energy*
Jim McCrea
Morgan Wright
Brian Oakley

January 20, 2012

Richard Kauffman
Brandon Hurlbut
Morgan Wright

U.S. Office of Management and Budget

December 2, 2011

Jeffrey D. Zients, *Deputy Director for Management and Federal Chief Performance Officer, Office of the Director, Office of Management and Budget*
Boris Bershteyn, *General Counsel, Office of Management and Budget*
Courtney Timberlake, *Assistant Director, Budget Review, Office of Management and Budget*

U.S. Department of the Treasury

December 15, 2011

George Wheeler Madison, *General Counsel, Department of the Treasury*
Christian A. Wiedeman, *Deputy General Counsel, Department of the Treasury*
Mary John Miller, *Assistant Secretary*, *Assistant Secretary for Financial Markets and Under Secretary for Domestic Finance-Designate, Office of Domestic Finance, Department of the Treasury*
Gary Grippo, *Deputy Assistant Secretary, Deputy Assistant Secretary for Government Financing Policy, Office of Financial Markets, Department of the Treasury*
Judson Jaffe, *Environment and Energy, Office of International Affairs, Department of the Treasury*

Summit Consulting, LLC

December 19, 2011

Anthony Curcio
Brian Oakley
Scott Burroughs, *Senior Consultant, Summit Consulting, LLC*

Appendix D

Details of the Nine Credit-Ranking Criteria (the "Nine Criteria")

- Project Sponsor
  - Financial strength
  - Experience and track record in developing similar projects
  - Commitment to project (*e.g.*, as evidenced by parent guarantees of obligations, overrun commitments, completion guarantees, etc.)
  - Strategic value of project to sponsor
  - Quality / experience of management team
- Technology
  - Technology track record (*i.e.*, is the project based on an established technology, an emerging technology, or is it the first of its kind?)
  - Engineering and design (*e.g.*, modularity, flexibility)
  - Scale-up risk
  - Technology guarantees from sponsor or suppliers
  - Issues raised in independent engineer reports, and project's response
  - Special provisions in project documents (*e.g.*, provision of an equipment performance reserve or similar arrangement)
  - Financial strength and experience of those providing the technology
- Capital Structure
  - Ratio of debt and equity to total project costs
  - Forecast debt service coverage ratio ("DSCR") (including sensitivity to adverse changes in the financial model)
  - Tenor of loan(s)
  - Interest rate exposure
  - Funding profile of debt versus equity
  - Restricted payments provisions (*i.e.*, Limitations on equity distributions)
  - Debt service and operating reserves
  - Strength of conditions precedent to funding (including due diligence provisions)
- Market and Off-take
  - Certainty of sale of output (*i.e.*, is a buyer committed to buy the project's output for an extended time period corresponding to the tenor of the loan?)
  - Counterparty financial strength
  - Termination provisions
  - Competitiveness (*i.e.*, is the cost of the power delivered by the project higher than prevailing market rates, and how likely would the offtaker be to terminate the contract if given the opportunity?)
  - Ability to replace offtaker on similar or superior terms
  - Statutory support for off-take agreement (such as state Renewable Portfolio Standards) and degree of public support

- Project Completion
    - Experience and track record of contractor and other vendors
    - Financial strength of contractor and other vendors
    - Project timeline, including relative to milestones in project documents
    - Availability of equipment and labor
    - Protection from cost overruns (*e.g.*, contactor guarantees, fixed-price terms, overrun commitments from sponsor)
    - Status of permitting and regulatory approvals (necessary for completion of the project)
    - EPC contract terms (force majeure, acceptance testing, consequences of performance that is short of specifications)
    - Site condition
    - For projects under construction, any issues reported and the proposed response
    - Amount of contingency for cost overruns and change orders included in the project budget
    - Strength of sponsor completion guarantee
- Operation Cost and Performance
    - Predictability of operating costs (often a function of the maturity / experience with the technology)
    - Expected reliability of project equipment
    - O&M contract terms (*e.g.*, fee arrangements, availability guarantees, etc)
    - Financial strength and experience (particularly with project technology) of O&M contractor
    - Provisions in project documents (*e.g.*, O&M and/or maintenance reserves and their position in the cash flow waterfall)
- Infrastructure
    - General accessibility of site for construction and operations
    - Access to market (*e.g.*, transmission interconnection plans, need for transmission upgrades, schedule to complete, progress to date)
    - Availability of required resources (*e.g.*, process water, geothermal resource)
- Legal
    - Contractual framework (security interest, structure of cash flow waterfall, etc)
    - Intellectual property factors (particularly with respect to novel technology)
    - Site control
    - Organization (*e.g.*, Limitations on activities of the project entity, independent directors, etc.)
- Legislative and Regulatory
    - State and local political support
    - Risk of regulatory changes and protections for lenders
    - International trade law considerations

Appendix E

Key Documents in a Project Financing

Credit Agreement. The credit agreement between the project company and the project lenders governs the extension and repayment of the project loan. Project loans typically provide for a construction period, during which the loan may be drawn in installments to fund construction, and an amortization period, in which the project makes repayments of principal and interest. Payments are usually made quarterly. The payment schedule is often customized to the specific project's projections; for example, it may call for larger payments during seasonally stronger quarters and lower repayments in seasonally weaker quarters.

The repayment schedule (and indirectly, therefore, the size of the loan) is typically designed to meet a targeted DSCR. The DSCR is the ratio of available cash flow to required debt payments (principal and interest) over a given period of time. A higher DSCR represents a greater "cushion" against adverse changes in the project's financial performance. In addition, the final repayment is typically scheduled to occur prior to the end of the offtake agreement, providing a "tail" or cushion in the event that the loan becomes delinquent and requires more time than expected for repayment.

Other key terms in the credit agreement include:

- Conditions precedent to initial funding;
- Conditions precedent to each subsequent draw of funds from the loan facility (for example, a certification by the borrower that it has sufficient funds available to complete the project);
- Interest, costs, and fees;
- Representations and warranties (for example, stating that the borrower has complied with relevant laws, has the right to pledge its assets as collateral, etc.);
- Covenants (for example, agreements not to incur additional indebtedness except under certain circumstances, not to make expenditures in excess of budgets except under certain circumstances, etc.); and
- Provisions for mandatory prepayments under certain circumstances (for example, using proceeds from a Section 1603 cash grant, proceeds from performance liquidated damages received from the EPC contractor as described below, etc.).

These terms generally provide protection to the lender and guarantor (the government).

The credit agreement also requires the borrower to pay for an independent engineer selected by the lender to review and comment on the design of the project, the project's projections and technical aspects of the project documents. The independent engineer also

monitors progress during the construction period for the benefit of the project lenders, and provides input regarding the satisfaction of technical conditions precedent to requests for advances under the loan agreement.

Collateral Agency and Accounts Agreement and the Security Agreements. The collateral agency and accounts agreement and the security agreements together provide for the pledge of the assets constituting the project (generally, real property, equity interests in the project owned by the project sponsor and personal property, including contract rights and deposit accounts) and for the priority of entitlements to such assets in the event of a default.

The collateral agency and accounts agreement also contains provisions directing the flow of funds (the "cash flow waterfall") from revenues derived from the project to specified accounts and interest holders, and provides security to the lenders that the funds will be applied to protect the lender's priority and the continued operation of the project through the term of the loan. Such provisions include establishment and operation of reserve accounts for debt service, operations and maintenance and/or major maintenance, restricted payments provisions (i.e., under what conditions the project can distribute cash to its owners), and events of default and consequences of such events of default.

The cash flow waterfall varies depending on the nature of the project, but may include the following accounts (in an order of seniority usually similar to the following):

- Operating account, providing for the payment of expenses associated with operations of the project;
- Debt service payment account, providing for the payment of project loan principal and interest;
- Operating reserve account, providing a cushion to pay for day-to-day operating expenses in the event of an adverse change in the project's financial performance or a business interruption;
- Major maintenance reserve account, providing for cash to pre-fund infrequent, periodic, substantial cash needs for scheduled maintenance activities such as major overhauls;
- Debt service reserve account, analogous to the operating reserve account but for the protection of the project's ability to meet its principal and interest payments on the project loan in the event that an operating problem (or other event) either reduces the cash flow of the asset or prevents the operation of the project for a period of time; and
- Restricted payments account, from which distributions to the project's sponsor may be paid provided certain conditions are met.

Cash flow proceeds through the waterfall in order of the accounts; for example, if the debt service reserve account is not fully funded, no cash flows to the restricted payments account until the funding is fully restored.

EPC Contract. The EPC contract in a project financing is often a "full wrap" contract in which the contractor agrees to deliver to the project company a finished asset with certain guaranteed performance characteristics by a certain date at a fixed price. The consequence of a failure to do so on the part of the contractor is usually the payment of liquidated damages ("LDs") to the project.

The EPC may provide for LDs in a number of circumstances. These may include:

- Delay LDs, typically on a daily basis, for failure to complete construction by the guaranteed date;
- Capacity LDs, in the event that the finished project is not capable of the production capacity for which it was designed; and
- Performance LDs, in the event that the project fails to produce at least a certain level of output over a specified time period.

LDs may be subject to a cap, both in total and for specific causes. Capacity LD provisions are generally designed to "buy down" the project loan to restore the DSCR to its intended level. Delay and performance LD provisions are generally designed to at least cover LDs that the borrower itself may owe to the PPA counterparty (as described below) and to cover the cost of interest on the loan for the period of the delay.

The EPC contractor also provides warranties with respect to project hardware and its design and installation services. There may also be separate (and typically longer) warranties with respect to specific components of the project, either from the EPC contractor or directly from the original equipment manufacturer.

The obligations of the EPC contractor are typically guaranteed by the contractor's parent company.

As an alternative to the "full wrap" contract described above, some projects elect to effectively act as their own general contractor and to contract separately with multiple parties for the various materials and services required to construct the project. These agreements often have terms similar to a full wrap contract (e.g., fixed prices, performance guarantees) but extend only to the scope of the individual agreement, not to the project as a whole.

O&M Services Agreement. The O&M services agreement provides for a service provider to operate the asset on behalf of the project company in return for a fee. The service provider is often an affiliate of the project sponsor or, in some cases, of the EPC contractor. The O&M services agreement typically provides for the service provider to provide staffing, operation, preventive and scheduled maintenance, spare parts management, and other support services to the project.

The terms of the O&M services agreement may include performance guarantees (e.g., that the asset will be available for production for a guaranteed minimum percentage of possible production hours). There are typically bonus and penalty provisions associated with such guarantees (often effectively placing the service provider's fee at risk).

The O&M services contractor's parent often guarantees its obligations under the agreement.

Offtake Agreement. The offtake agreement provides for the sale of the project's output, typically for a period of time that extends beyond the expected final maturity of the project loan.

In the context of the DOE Loan Guarantee Program, the most common type of offtake agreement is a PPA under which the output of a generating facility is sold to a utility.

In general, terms of a PPA include:

- Amount of power to be sold, including:
  - A base contract quantity;
  - A guaranteed minimum to be delivered; and
  - The amount the utility is required to purchase;
- Price, which may be fixed, escalate, or adjust based on the time of day the power is delivered;
- Curtailment provisions (under which the utility is temporarily relieved of its obligation to purchase the power);
- A schedule for project development, including a guaranteed date by which the project will be commercially operational;
- Penalties, usually in the form of LDs, for failure to meet schedule milestones or output targets; and
- Events of default under which the PPA may be terminated.

The creditworthiness of the PPA counterparty is considered key in evaluating credit risk of the project in light of the importance of its ability to meet its purchase obligation over an extended period of time to support repayment of the project loan.

Appendix F

Statement of Conflicts

Herbert Allison

Mr. Allison made all required disclosures to the Contracting Officer of DOE. It was determined that Mr. Allison had no conflicts that would constrain his full participation in the Review.

David Johnson

In engaging Mr. Johnson, Mr. Allison required that Mr. Johnson have no conflicts of interest that would impair his independence or limit, in any way, his ability to render objective and impartial advice to Mr. Allison. In addition, DOE's contracting rules and regulations contain specific requirements governing organizational conflicts. To this end, Mr. Johnson has advised that he made all required disclosures, made all necessary representations, and has taken all necessary steps, as required by Mr. Allison and the Contracting Officer of DOE.

Greenhill & Co., LLC

In engaging Greenhill & Co., LLC ("Greenhill"), Mr. Allison required that Greenhill have no institutional conflicts of interest that would impair its independence or limit, in any way, its ability to render objective and impartial advice to Mr. Allison. In addition, DOE's contracting rules and regulations contain specific requirements governing organizational conflicts. To this end, Greenhill has advised that it made all required disclosures, made all necessary representations, and has taken all necessary steps, as required by Mr. Allison and the Contracting Officer of DOE.

Arnold & Porter LLP

In engaging Arnold & Porter LLP ("Arnold & Porter"), Mr. Allison required that Arnold & Porter have no institutional conflicts of interest that would impair its independence or limit, in any way, its ability to render objective and impartial advice to Mr. Allison. In addition, DOE's contracting rules and regulations contain specific requirements governing organizational conflicts. To this end, Arnold & Porter has advised that it made all required disclosures, made all necessary representations, and has taken all necessary steps, as required by Mr. Allison and the Contracting Officer of DOE.

ENDNOTES

[1] *See* Energy Policy Act of 2005 ("EPAct"), Pub. L. No. 109-58, § 1702(b), 119 Stat. 594, 1117-18 (2005).

[2] *See* Loan Guarantees for Projects That Employ Innovative Technologies, 72 Fed. Reg. 60,116 (Oct. 23, 2007) (to be codified at 10 C.F.R. pt. 609); Loan Guarantees for Projects That Employ Innovative Technologies, 74 Fed. Reg. 63,544, 63,545 (Dec. 4, 2009) (to be codified at 10 C.F.R. pt. 609).

[3] *See* Advanced Technology Vehicles Manufacturing Incentive Program, 73 Fed. Reg. 66,721 (Nov. 12, 2008) (to be codified at 10 C.F.R. pt. 611).

[4] *See* American Recovery and Reinvestment Act of 2009 ("ARRA") Pub. L. 111-5, § 1603(a), 123 Stat. 115, 364 (2009).

[5] *Id*. § 1603(b)(1), (2).

[6] *See* EPAct § 1703(a)(2).

[7] *Id*. § 1703(b).

[8] *See* Energy Independence and Security Act of 2007 ("EISA"), Pub. L. No. 110-140, § 136 (b), (d), 121 Stat. 1492, 1515-16 (2007).

[9] *See* Energy and Water Development and Related Agencies Appropriations Act of 2010, Pub. L. No. 111-85, § 312, 123 Stat. 2845, 2874-75 (2009).

[10] *See* EPAct § 1702(d)(1).

[11] *See* EISA § 136(d)(3).

[12] *See* 10 C.F.R. § 611.100(c) (2008).

[13] *See* EPAct § 1702(f).

[14] *See* EISA § 136(d)(4)(B).

[15] *See* ARRA § 406.

[16] *Id*.

[17] *See* EPAct § 1702(h).

[18] *See* EISA §136(f).

[19] DOE established the FIPP as part of its implementation of the section 1705 loan guarantee program. Under the FIPP, a financial institution or a group of financial institutions serving as lenders to alternative energy projects (the "Lender" or, in the case of a group of financial institutions, the "Lead Lender") applied to DOE for loan guarantees under the section 1705 program. *See* LOAN GUARANTEE PROGRAMS OFFICE, DEP'T OF ENERGY, LOAN GUARANTEE SOLICITATION ANNOUNCEMENT, FEDERAL LOAN GUARANTEES FOR COMMERCIAL TECHNOLOGY RENEWABLE ENERGY GENERATION PROJECTS UNDER THE FINANCIAL INSTITUTION PARTNERSHIP PROGRAM 6 (October 7, 2009). The Lender or Lead Lender was responsible for developing the financial structure of the project and for applying for the loan guarantee on behalf of the project

sponsors or developers. *Id*. at 7. The FIPP program further required Lenders to share a "significant amount," at least 20 percent, of the risk of the guaranteed loan on a pari passu basis (i.e., having equal treatment or equal rights of repayment). *See id*. at 7; EPAct § 1702(c).

[20] *See* EPAct § 1702(g); 10 C.F.R. §§ 609.17(a)(1), (2); 609.10(d)(18).

[21] *See* 10 C.F.R. § 611.109 (2008).

[22] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, TITLE XVII POLICIES AND PROCEDURES 3 (October 2011).

[23] DOE POSITION DESCRIPTION OF EXECUTIVE DIRECTOR, LOAN PROGRAMS OFFICE, ES-301-00.

[24] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, TITLE XVII POLICIES AND PROCEDURES 3 (October 2011).

[25] *Id*. at 3-4.

[26] *Id*. at 4; ADVANCED TECHNOLOGY VEHICLE MANUFACTURING LOAN PROGRAM OFFICE, DEP'T OF ENERGY, ATVM POLICIES AND PROCEDURES, SEC. V.3.3 AT 42-44 (2010).

[27] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, TITLE XVII POLICIES AND PROCEDURES 4 (October 2011).

[28] *Id*. at 162.

[29] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, RISK COMMITTEE CHARTER 3 (2011).

[30] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, TITLE XVII POLICIES AND PROCEDURES 5 (October 2011).

[31] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, TITLE XVII POLICIES AND PROCEDURES 5 (October 2011).

[32] *Id*.

[33] *See* DEP'T OF ENERGY, CREDIT REVIEW BOARD CHARTER ¶ 1 (December 2011).

[34] *Id*. ¶ 2.

[35] *Id*. ¶¶ 2-3.

[36] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, LPO RISK COMMITTEE CHARTER 1 (2011).

[37] *See* Memorandum from Secretary of Energy Steven Chu to White House Chief of Staff William M. Daley (Dec. 13, 2011) ("Secretary Chu Memo").

[38] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, RISK COMMITTEE CHARTER 1 (2011).

[39] *See* Secretary Chu Memo.

[40] *See* LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, RISK COMMITTEE CHARTER 2 (2011); Dep't of Energy, Credit Review Board Charter ¶ 4 (2011).

[41] *See* Secretary Chu Memo.

[42] *Id*.

[43] *Id*.

[44] *Id*.