U.S. Department of Energy
Office of Inspector General
Office of Audits and Inspections

Audit Report

The Department of Energy's Loan Guarantee to Abound Solar Manufacturing, LLC

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MEMORANDUM FOR THE SECRETARY

FROM: Rickey R. Hass
Deputy Inspector General
for Audits and Inspections
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "The Department of Energy's Loan Guarantee to Abound Solar Manufacturing, LLC"

BACKGROUND

The goal of the Department of Energy's Loan Guarantee Program (Program), as defined in the *Energy Policy Act of 2005*, is to provide Federal support, in the form of loan guarantees to spur commercial investments in clean energy projects that use innovative technologies. The *American Recovery and Reinvestment Act of 2009* (Recovery Act) temporarily expanded the Program by providing loan guarantees for certain renewable energy projects that commenced construction on or before September 30, 2011. The Recovery Act also appropriated Federal funds to cover the credit subsidy, funds used to protect the Government against possible shortfalls in loan repayments. As of December 2013, the Program had approximately $15 billion in outstanding loan guarantees and $34 billion in remaining loan guarantee authority.

The Department's Credit Review Board, which is responsible for reviewing a loan's terms and conditions and making a determination regarding the risk of repayment, recommended the conditional approval of a loan guarantee to Abound Solar Manufacturing, LLC, (Abound) in July 2010. In December 2010, the Program issued the loan guarantee to Abound for up to $400 million to construct and commission thin-film photovoltaic solar panel manufacturing facilities in Colorado and Indiana capable of annually producing up to 840 megawatts of clean renewable energy. While the loan was funded by the Federal Financing Bank, the Program was responsible for loan underwriting and approval, the subsequent loan servicing and monitoring, and the credit subsidy to reimburse the Federal Financing Bank for any losses on the loan.

In September 2011, Abound failed to meet certain milestones and the Program suspended funding to the project. Subsequently, Abound filed for bankruptcy in July 2012. Prior to the filing, the Department had approved the disbursement of approximately $70 million in loan funds to Abound. Given the significant amount of funding and financial exposure on loan guarantees, we initiated this audit to examine the circumstances surrounding the Program's approval and administration of the loan to Abound.

RESULTS OF AUDIT

Our audit revealed that Abound's failure to meet its project milestones and its subsequent bankruptcy occurred as a result of a combination of market conditions and technical issues that negatively impacted its operations. These issues included dramatic changes in the solar panel market that resulted in downward price pressures and performance shortfalls in Abound's solar panels that negatively affected its sales and delayed its expansion plans. The Department had identified and evaluated these types of market and technical risks prior to the loan approval and issuance, concluding that, despite these risks, there remained a reasonable prospect of repayment of the loan. Additionally, the Department established mitigation measures prior to issuing the loan to address these risks, such as instituting technical and financial performance metrics prior to allowing the recipient to drawdown loan funds. However, subsequent to loan closure, market conditions further deteriorated and technical issues continued, resulting in Abound's failure to meet requirements of the loan and its ultimate bankruptcy.

Although the Department had identified, considered and taken steps to mitigate the market and technical risks, and had reduced the financial exposure to the project by suspending funding when Abound did not meet its project milestones, our audit identified several weaknesses in the Department's administration of the Abound loan. Specifically, we found the Program had not:

- Consulted with the Board concerning a material change in the credit subsidy subsequent to the Board's recommendation to approve the loan. Specifically, the Program lowered its recovery rating estimate, the potential recovery in the event of default, from 38 percent to 8.3 percent prior to loan closing. This change increased the credit subsidy from $71 million to $96 million, an increase of $25 million in taxpayer funds appropriated under the Recovery Act. The reduced recovery rate was significantly lower than the rate presented to the Board at conditional commitment[1] in July 2010; however, the Board was not made aware of the reduction even though it substantially impacted the credit subsidy amount for the transaction. This is significant because according to the Program's policies and procedures, the role of the Board is to determine if there is a reasonable prospect of loan repayment and make recommendations to the Secretary on whether to approve a loan guarantee.

- Resolved the conflicting opinions of its advisors regarding Abound's ability to overcome technical issues. In January 2011, 1 month after issuing the loan, the Program learned that Abound's solar panels were underperforming by as much as 15 percent. As a result, Abound reported that its second largest customer returned $2.2 million of product and cancelled other orders in December 2010, the same month the loan was issued. While the Program's Independent Engineer believed that Abound's plans to address the issues were achievable and the project funding should continue, the Program's internal solar expert recommended that the Program not approve additional disbursements at that time

[1]A conditional commitment represents a term sheet offered by the Department and accepted by the applicant with the understanding of the parties that if the applicant satisfies required terms and conditions, the Department and the applicant will execute or finalize a loan guarantee agreement.

based on the number, severity, and frequency of Abound's product and quality control issues. One of the most significant of these issues was the potential for panels to spark or catch fire. Despite the technical shortfalls and the solar expert's concerns regarding Abound's quality control, the Program allowed the project to continue without reconciling the conflicting opinions of the Independent Engineer and the solar expert. In particular, the Program had not verified the proposed engineering solutions or the sufficiency of Abound's long-term quality control and testing programs.

- Adequately documented the assumptions in the financial modeling used to support loan approval and monitoring. Program officials stated that assumptions used in the models fully considered deteriorating market conditions, overcapacity in the solar panel industry and Abound's technical performance issues. However, we were unable to verify the Program's assertion because the results of key/critical discussions that led to assumptions used in the models were not formally documented as part of the Program's official records.

- Conducted ongoing, formal financial and industrial analyses as part of its monitoring activities for the loan as required by the Program's policy manual. Specifically, we found no evidence that these types of analyses were regularly performed during Abound's disbursement period or that the Program used available financial data to determine whether Abound was meeting the financial provisions of its loan.

Contributing Factors

The issues that we identified occurred because the Program had not established comprehensive policies, procedures and guidance for awarding, monitoring and administering loans. Specifically, we noted a lack of guidance in the areas of the Board's reconsideration of loans, the processes for resolving differences in professional opinions among the Program's technical experts, the nature and timing of financial and industrial analysis, and the management of distressed loans. For example, the Program had not developed guidance for determining the materiality of events occurring subsequent to conditional commitment that warrant reconsideration of the loan by the Board. Additionally, at the time this loan was being administered, the Program had not developed and implemented a comprehensive records management system necessary to capture the results of its decision making process or monitoring efforts.

The need for transparency within the Program was identified in previous Office of Inspector General reviews. In particular, in our report on *The Department of Energy's Loan Guarantee Program for Clean Energy Technologies* (DOE/IG-0849, March 2011) we found that the Program had not adopted a records management system that imposed structure, consistency and discipline in the development and retention of loan documentation. While the Program had taken steps to design and implement such a system, it had not been fully developed or implemented at the time of our audit. Finally, we discovered that the monitoring of the loan was adversely affected by staffing issues. In particular, we noted that the individual assigned to monitor the Abound loan had no prior loan management experience and limited background in project finance and financial statement analysis.

Impact and Path Forward

As a result of the issues we identified, it did not appear that the Program had adequately managed the risks associated with the Abound loan. To its credit, the Program had made a number of improvements since it executed the loan guarantee to Abound. For example, the Program hired additional staff for its Portfolio Management function and developed a number of procedures for ongoing monitoring. In addition, the Program established a Risk Committee to be responsible for reviewing and making recommendations regarding significant or material actions or events affecting individual portfolio assets.

While we recognize its continued efforts to improve, it is imperative that the Program thoroughly consider project risks and closely monitor the ongoing performance of its loan recipients. This is especially important given that the Program is faced with the challenge of balancing the goal of operating a $15 billion loan guarantee portfolio in innovative technologies that are inherently risky with the *Energy Policy Act of 2005's* mandate to ensure a reasonable prospect of repayment. With approximately $34 billion in remaining loan guarantee authority and over $15 billion in assets to be monitored, we believe the Department has an opportunity to implement needed program enhancements and internal controls designed to increase the likelihood of a successful outcome. As such, we have made recommendations designed to improve the Department's implementation of the Program.

MANAGEMENT REACTION

Management did not agree that the identified weaknesses existed in the administration of the Abound loan. However, after extensive review and analysis of management's assertions, we concluded that weaknesses, as previously noted, existed in the LGPO's administration of the Abound loan. Despite its position with regard to our conclusions, management generally concurred with the report's recommendations and indicated that it would take or had already, implemented actions to address them. We consider management's comments responsive to the report's recommendations. Management's official comments are included in Appendix 4. Management also provided additional technical comments, which have been addressed in the body of the report.

Attachment

cc: Deputy Secretary
Chief of Staff
Executive Director, Loan Programs Office

REPORT ON THE DEPARTMENT OF ENERGY'S LOAN GUARANTEE TO ABOUND SOLAR MANUFACTURING, LLC

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THE DEPARTMENT OF ENERGY'S LOAN GUARANTEE TO ABOUND SOLAR MANUFACTURING, LLC

Background

The Department of Energy's (Department) Loan Guarantee Program (Program), authorized under the *Energy Policy Act of 2005*, provides Federal support, in the form of loan guarantees, to spur commercial investments in clean energy projects that use innovative technologies. Under the terms of the *Energy Policy Act of 2005*, the Program is mandated to provide loan guarantees for innovative projects, which are inherently more risky by nature, while also ensuring that there is reasonable prospect of repayment by the borrower. The *American Recovery and Reinvestment Act of 2009* (Recovery Act) temporarily expanded the Program by providing loan guarantees for certain projects that commenced construction on or before September 30, 2011. The Recovery Act also appropriated Federal funds to cover the credit subsidies, a cost or assessment used to protect the Government against the risk of potential shortfalls in loan repayments.

For instances in which the Program guarantees 100 percent of the loan obligation, the loan is funded by the Federal Financing Bank. While the Federal Financing Bank is the lender, the Program is responsible for loan underwriting and approval, the subsequent loan servicing and monitoring, and the credit subsidy to reimburse the Federal Financing Bank for any losses on the loan. In particular, the Program ensures that all requirements for loan disbursements have been satisfied and approves requests for loan disbursements. In addition, as required by its March 2009 credit policies and procedures, the Program monitors project performance during the construction and operational stages and processes requests for changes or waivers to loan terms.

Between September 2009 and June 2013, the Program executed 26 loan guarantees with a value of approximately $16 billion. To date, three recipients filed for bankruptcy with potential losses estimated to cost taxpayers over $600 million. In addition, other loan recipients have experienced financial or technical difficulties which could jeopardize the success of the projects.

Abound Solar Manufacturing, LLC, (Abound) applied for a loan in February 2009, to support the development of eleven manufacturing cells at two facilities that would produce photovoltaic solar modules using an advanced technology. Specifically, its existing facility in Longmont, Colorado, would house three production cells, and a second facility proposed for construction in Tipton, Indiana, would house eight additional cells. Together, these facilities would have the capability to produce up to approximately nine million solar panels annually. At full operating levels, the Abound facilities were expected to produce 840 megawatts of photovoltaic panels each year. Additionally, the project was expected to directly create more than 2,500 jobs during construction and 1,500 permanent manufacturing and technical jobs. Further, it was expected to have a ripple effect in the solar industry by creating additional jobs in companies that install photovoltaic systems, manufacture components, construct solar projects and manufacture equipment to build out each of the two sites.

In July 2010, the Department's Credit Review Board, which is responsible for reviewing a loan's terms and conditions and making a determination regarding the risk of repayment, recommended that the Secretary conditionally approve a loan guarantee to Abound for up to $400 million. The conditional commitment[1] contained financial and technical performance requirements to mitigate risk to the Department. The Department executed the Abound loan guarantee and made the first loan disbursement in December 2010. In September 2011, Abound defaulted on its loan terms when it failed to meet financial and construction milestones as a result of ongoing technical issues. The Program then suspended funding to the project and Abound subsequently filed for bankruptcy in July 2012, with an outstanding loan balance of over $70 million, including accrued interest.

Market Conditions and Technical Issues

Our audit revealed that Abound's failure to meet its project milestones and its subsequent bankruptcy occurred as a result of a combination of market conditions and technical issues that negatively impacted its operations. These issues included dramatic changes in the solar panel market that resulted in downward price pressures and performance shortfalls in Abound's solar panels that negatively affected its sales and delayed its expansion plans. The Department had identified and evaluated market and technical risks prior to conditional commitment and loan closing, concluding that, despite these risks, there remained a reasonable prospect of repayment on the loan. Additionally, the Department established mitigation measures to address these risks, such as instituting technical and financial performance metrics prior to allowing loan draws. However, subsequent to loan closure, market conditions and technical issues continued to deteriorate, resulting in Abound's failure to meet requirements of the loan; the Department's suspension of funding during February and March 2011, to evaluate Abound's performance problems; and Abound's ultimate bankruptcy. A summary of events affecting the Abound loan default is included in Appendix 1.

Administration of Abound Loan

Although the Department had identified, considered and taken steps to mitigate the market and technical risks and had reduced the financial exposure to the project by suspending funding when Abound did not meet its project milestones in September 2011, our audit identified several weaknesses in the Department's administration of the Abound loan. Specifically, we found the Program had not:

- Consulted with the Board concerning a material change in the credit subsidy subsequent to the Board's recommendation to approve conditional commitment;

- Resolved the conflicting opinions of its advisors regarding Abound's ability to overcome technical issues;

[1] A conditional commitment represents a term sheet offered by the Department and accepted by the applicant with the understanding of the parties that if the applicant satisfies required terms and conditions, the Department and the applicant will execute or finalize a loan guarantee agreement.

- Adequately documented the assumptions in the financial modeling used to support loan approval and monitoring; and

- Conducted ongoing, formal financial and industrial analyses as part of its monitoring activities for the loan.

Credit Review Board

We found that Program had not consulted with the Board concerning a material change in the credit subsidy for the loan subsequent to the recommendation to approve conditional commitment. Specifically, the Program lowered its recovery rating estimate, the potential recovery in the event of default, from 38 percent originally presented to the Board at loan commitment to 8.3 percent prior to loan closing and did not consult with the Board concerning the reduction. The Program's policies and procedures require Board reconsideration when there are material changes to the terms and conditions of a loan. Additionally, Program officials asserted that a loan could be resubmitted to the Board if the key credit characteristics of the transaction materially changed.

The Program asserted that the reduction in the estimated recovery rate was not required to be brought to the Board's attention because it was not a change in the terms and conditions of the loan and was not reflective of an actual change in credit characteristics of the transaction. Instead, the Program claimed that the change in the estimate only reflected a change in methodology for modeling liquidation scenarios. However, in our opinion, this was a significant change because the rating represents the potential recovery in the event of default and was a factor in calculating the credit subsidy associated with the loan. In fact, this change increased the credit subsidy from approximately $71 million to over $96 million in Recovery Act funds, an increase of $25 million or 35 percent. By not presenting material changes in credit characteristics to the Board, the Department is at risk that the Board's crucial role, recommending whether loans should be made and determining the terms and conditions needed to protect the Government's interest, could be circumvented.

Conflicting Opinions of Advisors

The Program could not provide evidence that it had resolved differing professional opinions or addressed concerns of its experts about Abound's ability to correct technical issues that threatened the success of the project. To address its technical shortfalls, Abound made modifications to its manufacturing process in February 2011, which negatively impacted project plans and delayed construction. Once known, the Program suspended Abound's ability to access loan funds. While the Program's Independent Engineer believed that Abound's plans to address the issues were achievable and the project funding should continue, the Program's internal solar expert recommended the Program not approve additional disbursements at that time based on the number, severity, and frequency of Abound's product and quality control issues.

Further, we found that the internal solar expert had previously expressed concerns to the Program regarding deficiencies in Abound's quality control. Specifically, 1 month prior to the on-site visit, the solar expert, following a presentation by Abound on its technical issues and proposed fixes, concluded that a multi-month verification program was appropriate before proceeding with the expansion of the Colorado facility beyond executing its proposed corrections on one line.

Despite the technical shortfalls and the identified concerns regarding quality control, the Program approved the restart of disbursements in April 2011, without reconciling the conflicting opinions of the Independent Engineer and the solar expert. We also noted that the Program had not verified the efficacy of Abound's proposed engineering solutions or the sufficiency of its long-term quality control and testing programs before allowing the project to proceed. In particular, although the Independent Engineer identified actions that had to be completed by Abound prior to approval of changes, we found that a number of activities necessary to address the actions had yet to be initiated at the time the restart of disbursements began and therefore could not be reviewed or verified. In addition, the Independent Engineer had not verified the adequacy of Abound's quality assurance/control and product testing programs, which were necessary for it to achieve steady state operations prior to replicating lines. The purpose of these programs was to ensure that reliable products were being manufactured and would consistently meet customer expectations. This was especially important because the Program's solar expert noted that a quality control program was essential and should be clearly defined and under control prior to increasing production volume and replicating lines. Because the success of Abound's business plan was based on its ability to replicate its manufacturing lines and ramp up quickly, ensuring adequate quality assurance/control and testing programs were in place was crucial for the success of the project.

In response to our review, the Program stated that there were not differences of opinion between the two experts regarding Abound's technical issues but instead asserted that the differences were related to funding decisions. In addition, Program officials asserted that the two assessments had different scopes and the internal solar expert's concerns were addressed within the Independent Engineer's report and through internal discussions. While we recognize that the overall conclusions of the two experts differed regarding whether to continue funding at that time, we believe that the funding recommendations directly correlated to their perception of Abound's ability to successfully overcome its technical shortfalls and, as previously indicated, the internal solar expert had serious doubts regarding Abound's commitment to addressing recurring issues. Further, we also noted that the Independent Engineer's report did not fully cover all of the issues identified by the internal solar expert. For example, it did not address concerns related to module certification or staffing. Finally, as indicated earlier, the results of key discussions were not captured by the Program, and therefore, we could not verify the outcome of internal discussions.

Further, we identified several other instances in which concerns were expressed regarding Abound's performance; however, there was no documentation demonstrating that the concerns were addressed and funding to the project continued during this period. In particular, an informal review conducted in June 2011, by the Program's financial advisor noted that there was no sustained improvement in the average watts per panel between April and June 2011, and production remained well below expectations established when the loan was issued. During the same time period, a Program technical official expressed concerns regarding the amount of Abound's shipments versus its production, and the Program's solar expert concluded that Abound was not converging on required production or panel power to achieve the next technical metric for disbursement. However, the Independent Engineer's report covering the same time period contradicted the officials' assertions, and indicated that Abound was on track. As with the previous example, while there was no evidence demonstrating how the issues were resolved, it appeared that the Program unilaterally relied on the Independent Engineer's judgment and funding continued.

In response to our review, the Program indicated that Abound had achieved significant technical progress during this period, including in panel power. Specifically during that time period, Abound reported improvements in key technical metrics, including stabilized panel power, panel yield, production, and panel costs. The Program also stated that subsequent to the period cited, Abound achieved significant further progress and generally executed on product and process development in accordance with the conclusions identified previously in the Independent Engineer's Report. While Abound may have made some improvements during the period, we noted that the Program's financial advisor concluded that Abound was not where it needed to be to receive funding for its third manufacturing line. It is important to note that average watts per panel and production were key technical metrics established by the Program that Abound had to meet in order to receive additional disbursements. In addition, we found that Abound had lowered its projections on these critical parameters on three occasions during the disbursement period. Therefore, even if there was some improvement, the project was not in line with the project plan/technical roadmap approved at closing.

Financial Modeling Assumptions

Our review found that the Program had not always adequately documented the assumptions in the financial modeling used to support loan approval and monitoring. The Program's policies and procedures required changes to assumptions used in its models to be documented; however, we were unable to confirm that all of the issues we identified were fully, and formally, considered prior to the loan closing in December 2010, due to a lack of documentation. In particular, we were unable to verify specifically how assumptions used in the models addressed a deteriorating market and overcapacity conditions in the solar panel industry, and problems with Abound's solar panel technical performance between conditional commitment in July 2010, and loan closing in December 2010. For example, we were unable to verify how the assumptions used in the financial models fully considered:

- Changes in solar panel market. Specifically, the solar panel market had undergone a number of dramatic changes such as downward price pressure on solar modules and reductions in incentives/subsidies in Europe (a key market for Abound). The Program concluded that the combination of these factors affected solar panel manufacturers' ability to raise capital and called into question the long-term health of the solar panel market. Because Abound needed to raise a significant amount of equity during the course of the loan to complete the project, these factors could have a significant impact on the success of the project.

- Performance shortfalls in Abound solar panels. In October 2010, the Department became aware that Abound's solar panels were underperforming by 6 percent below expectations. In response, Abound revised its technical projections and delayed ramp up of its production lines to make process changes, which pushed out completion of the project and the time period until it would reach positive cash flows by up to 12 months. Because the success of Abound's business plan was heavily dependent on its ability to ramp up production quickly to achieve economies of scale, delays this early in the project could have had long term implications and would have been hard to overcome. Abound also revised its technical roadmap and pushed out its target of reaching 80 watt modules from the end of 2010 to the end of 2011 or early 2012. This was significant because Abound's primary competitor was already producing and selling 76 watt modules at the end of 2009.

- Increased risk of overcapacity in the market. A market assessment received by the Program in November 2010, estimated that there would be 45 to 50 percent overcapacity in global production for the next 3 to 5 years. In addition, the report identified that a number of major photovoltaic solar manufacturers had announced plans to expand capacity by approximately 10 gigawatts between 2010 and 2012, which would double global production capacity. These updated projections were concerning because the Program indicated that the addition of 4.5 gigawatts or more in added capacity posed a significant risk to the project and the photovoltaic market was already experiencing periods of overcapacity.

Loan officials stated that the Program adopted a more conservative approach than its independent advisors for certain factors such as average sales prices and yield. While we were able to verify the advisors' projections, Program officials were unable to provide an explanation or any documentation supporting how updated assumptions considered the deteriorating market conditions and capacity issues, and Abound's technical performance problems. In addition, although Program officials stated that assumptions used in the models were fully vetted, we were unable to verify the Program's assertion because the results of key/critical discussions were not formally documented as part of the Program's official records.

Financial and Industrial Analysis

The Program could not provide evidence that it had conducted ongoing, formal financial and industrial analysis during the disbursement period, as required by Program policies. In particular, while the Program had identified the risk that market prices could fall below levels assumed in projections as significant, it continued to move forward with the project without fully evaluating significant financial and market changes that subsequently occurred. According to market reports conducted in 2011, the first half of the year experienced a decline in panel prices as additional capacity came on line and demand weakened in Europe due to policy changes, issues that were both previously predicted in the market and credit analyses. Notably, panel prices dropped by almost 40 percent. In addition, the reports noted that ongoing reductions in government subsidies in Germany contributed to declining prices leaving the industry with significant unsold inventories and substantial excess capacity. Signs of these deteriorating conditions were evident in monthly and quarterly operational reports that Abound submitted to the Program.

While there was no evidence of ongoing, formal financial analyses conducted by the Program in the files we reviewed, our analysis of reports from January to September 2011, noted that

Abound's production exceeded shipments by approximately 22 percent, as shipments were almost 30 percent below budget. Further, gross margin percentage fluctuated significantly during the period. This was important because funding under the loan's terms and conditions for the third manufacturing line was dependent on Abound meeting a set gross margin percentage, a metric that Abound was unable to attain. The terms of the loan also required Abound to maintain certain levels of cash reserves, a defined equity contribution position and a defined debt to project cost ratio.

In response to our review, the Program noted that financial and industry analyses were being performed. However, officials also stated that the focus during this period was largely on monitoring of the technical metrics of the project because the company's performance was primarily based upon resolution of production issues as well as execution of its technical roadmap. The Program asserted that only limited financial modeling and analyses could be meaningful at the time based upon the limited level of sales during the build-out phase and it was never expected that gross margin would provide a meaningful measure of financial performance. While the Program asserted that analyses were being performed during this period, we found no evidence of ongoing analyses in the files provided. In addition, we recognize that sales would be limited during the construction phase, however, it should be noted that the Program established gross margin percentage as its financial metric because it provided an indication of Abound's overall financial health.

Program Internal Controls

The issues we identified occurred because the Program had not established an adequate system of controls. Specifically, the Program had not fully developed policies and procedures for awarding, monitoring and administering loans. Additionally, the Program had not developed and implemented a comprehensive records management system necessary to capture the results of its decision making process or monitoring efforts. Finally, the Program had not adequately staffed its Portfolio Management function.

Policies and Procedures

The Program had not fully developed policies and procedures for awarding, monitoring and administering loans. For example:

- Although the Program had a policy requiring Board reconsideration when there were material changes to the terms and conditions of a loan, we found that the Program had not established any guidance for determining the materiality of events occurring subsequent to conditional approval warranting reconsideration of a loan by the Board. We acknowledge that there is a considerable amount of judgment involved in making the determination on whether an event negatively affects a project. However, without clear guidance for determining what changes warrant loan reconsideration by the Board, the Department is at risk that the Board's crucial role, recommending whether loans should be made and determining the terms and conditions needed to protect the Government's interest, could be circumvented.

- The Program had not developed formal processes for resolving differences of professional opinion to ensure transparency in making decisions. We identified several instances in which there were differences of opinion or in which concerns were raised regarding Abound's performance. However, we could not determine how the issues were addressed due to a lack of documentation. Without a policy, the Department cannot demonstrate that it fully evaluated risks associated with the project.

- The Program had not developed detailed guidance describing the type and frequency of financial and marketing analyses which were required as part of loan monitoring. We concluded that the lack of such policies and procedures was a contributory cause for the lack of evidence in the files that these types of analyses were conducted during Abound's disbursement period or that the Program used available data to trend the financial condition of the company.

We also noted that the Program's policies and procedures indicated that projects could be placed on "credit watch" when an event or deviation from an expected trend had occurred and monitoring efforts would be increased. Although this option was available, the Program did not have a formal process in place to put a loan on a "watch list" outside of the annual reporting cycle and did not describe the additional monitoring procedures that would be applied to projects on the watch list. Despite ongoing technical and financial problems encountered by Abound, which should have warranted increased scrutiny, it was not placed on such a list until September 2011 when it failed to meet construction and financial milestones.

Records Management System

The Program had not developed and implemented a comprehensive records management system necessary to capture the results of its decision making process. We were unable to confirm that the changes in circumstances between conditional commitment and loan closing were fully and formally considered due to a lack of documentation. In addition, we were unable to verify the Program's assertion that the solar expert's concerns were resolved through internal discussions because the results of deliberations were not recorded. The need for transparency within the Program was identified in previous Office of Inspector General reviews. In particular, in our report on *The Department of Energy's Loan Guarantee Program for Clean Energy Technologies* (DOE/IG-0849, March 2011), we found that the Program had not adopted a records management system that imposed structure, consistency, and discipline in the development and retention of loan documentation. In response to the report, the Program acknowledged the need to develop and implement a sound records management system to enhance the transparency of the decision-making process and developed a records management policy.

Additionally, the Program had not developed a comprehensive records management system to capture the results of monitoring efforts. Due to a lack of documentation supporting the Program's decision to continue loan disbursements, we were unable to determine whether the Program had fully evaluated the impact of ongoing technical shortfalls and changes in market conditions. The Program was in the process of developing database requirements for a records management system for its Portfolio Management Division when the Abound loan was issued. Certain modules of the system were up and running in May 2011, however, the modules were not fully functional.

Staff Qualifications

Weaknesses in the financial and marketing monitoring of Abound occurred during a period when the Program was just establishing its Portfolio Management Division, which limited the availability of qualified staff. In fact, the Division only had three employees overseeing loans — a newly hired Director and two support contractors who had been transferred from other groups within the Program. Additionally, based on a review of qualifications and internal email correspondence, it did not appear that the contractor assigned as the Portfolio Manager for Abound possessed the skill-set needed to effectively monitor financial and technical performance. Specifically, we found that this individual had no prior loan management experience and had a limited background in project finance and financial statement analysis, yet he was assigned to manage a number of loans totaling over $2 billion. There was no evidence in the files we reviewed for Abound that financial or industrial analyses, two key responsibilities of a Portfolio Manager, had been conducted. Further, we noted that prior to leaving the Program, the Portfolio Manager indicated that he had not completed credit reports for loans under his purview because he found it to be "a very difficult exercise." During a discussion with Program officials concerning the Portfolio Manager's performance, an official indicated that the individual did "what he was capable of doing."

In response to our review, the Program stated that the Portfolio Manager was supported by an experienced team and was not solely relied upon for exercising professional judgment in the loan servicing and monitoring of the project. Officials stated that decisions related to the project were made by senior and experienced management of the Program. However, during the course of our review, we found no evidence of any formal financial or market reviews being performed, either by the Portfolio Manager or other Program officials, between loan closing and the event of default. We were unable to verify the Program's assertions because there was no evidence of formal reviews and the results of discussions were not captured.

Subsequent Events

In October 2011, the White House Chief of Staff requested an independent review of the Department's loan and loan guarantee programs for alternative energy projects. The purpose of the review was to report on the status of the portfolio and make recommendations for improvement. In particular, the independent reviewer was tasked with making recommendations for enhancement to ensure effective monitoring and management of the current loan and loan guarantee portfolio. In addition, the independent reviewer was asked to make recommendations, if needed, pertaining to early warning systems to identify and mitigate potential concerns on a timely basis.

We noted that the independent consultant's report, released in January 2012, identified a number of areas for improvement similar to those outlined in our report. In particular, we noted that the review identified several areas in which policies and procedures were lacking or vague, and terms such as "material" or "urgent" were not defined. In addition, the report identified the need for an early warning system for timely identification and reporting of significant events. In response to the report, the Department indicated that it had taken a number of actions. For example, the Program asserted it had improved its processes in areas such as monitoring, loan administration, and reporting to take into account industry best practices. Also, the Program indicated that it had upgraded electronic systems to better automate and standardize data so it could be reviewed and acted upon in a timely manner.

Additionally, we noted that the Program had made a number of other improvements since it executed the loan guarantee to Abound. For example, the Program hired additional staff for its portfolio management function and developed a number of procedures for ongoing monitoring. In addition, the Program established a Risk Committee to be responsible for reviewing and making recommendations regarding significant or material actions or events affecting portfolio assets. Further, the Program implemented a database for capturing the results of its monitoring efforts.

While the Program had made improvements, we determined that additional actions are needed to address matters discussed in this, and prior Office of Inspector General reports. Although the Program had developed some policies for ongoing monitoring, we found that not all aspects of portfolio management were covered. In particular, the Program had not yet developed policies related to distressed loan management, loan restructuring, and bankruptcy monitoring. The need for policies in these areas was identified in previous Office of Inspector General efforts. For example, in our report on *Loan Guarantees for Innovative Energy Technologies* (DOE/IG-0777, September 2007), we found that the Program had not promulgated procedures relating to loan defaults. Given the fact that three loan guarantee recipients have filed for bankruptcy and a number of other recipients are experiencing difficulties, we believe policies in these areas are crucial to the success of the Program.

Further, the Program has been, and continues to be, the subject of Congressional interest. Notably, in October 2012, the Congressional Committee on Oversight and Government Reform, based on its ongoing inquiries into the Program, concluded that decisions made by the Program appeared to have been influenced by external parties. Our review of email correspondence confirmed that during the period Abound was under consideration, it was apparent the Program operated under an environment of internal and external pressures to move the loan process along and increase the number or rate of issued loans.

Path Forward

As a result of the issues we identified, it appeared that the Program did not adequately manage the risks associated with the Abound loan. We recognize that the Program is faced with the challenge of balancing the goal of operating a $15 billion loan guarantee portfolio in innovative technologies that are inherently risky with the *Energy Policy Act of 2005's* mandate to ensure a reasonable prospect of repayment. We also recognize that many of the actions taken by the Program in regard to the Abound loan, such as continued funding and waiver of defaults, were made in an attempt to salvage the project.

In light of the recent bankruptcies in the Program, estimated to cost taxpayers over $600 million, and the significant amount of funding at risk, it is imperative that the Program thoroughly consider project risks and closely monitor the ongoing technical and financial performance of its loan recipients. This is especially important because the Program has approximately $34 billion in remaining loan guarantee authority and over $15 billion in loans remaining to be monitored, with loan periods of up to 30 years.

RECOMMENDATIONS

Given the significant amount of loan authority remaining, as well as the size of the Program's portfolio of loans, the Department has an opportunity to ensure a successful path forward. Therefore, we recommend that the Executive Director, Loan Programs Office:

1. Evaluate processes for approving and monitoring loan guarantees to ensure changes to projects are fully analyzed and results are documented;

2. Finalize and implement policies and procedures for ongoing monitoring of loans including procedures relating to distressed assets and loan defaults;

3. Develop formal processes for resolving differences of professional opinion including documentation requirements, which would provide transparency into the Program's decision making process;

4. Develop guidance on materiality and the types of events that require resubmission to the Board to ensure that changes are presented to the Board for consideration prior to final loan issuance; and

5. Ensure that positions are staffed with qualified individuals and properly supervised.

MANAGEMENT COMMENTS AND AUDITOR RESPONSE

Management generally concurred with our recommendations and indicated that it would take or had already implemented actions to address them. Management stated that it analyzed changes to projects as part of its due diligence and monitoring processes. Additionally, management stated that it had developed and implemented policies and procedures for monitoring loans. Further, management indicated that it would develop procedures on documentation requirements evidencing resolution of differing opinions. In addition, management stated that it would further develop its process for making a determination on materiality to ensure that the results are documented and also develop guidance on when the determination should be subject to further review by management for concurrence. Finally, management stated that it continues to recruit and hire qualified personnel of the highest caliber.

We consider management's comments responsive to the report's recommendations.

Management disagreed with several of the report's findings. The following discusses management's disagreements with our findings and our responses.

Management Comment:

Management disagreed with our conclusion that the Program should have consulted with the Board regarding the change in the credit subsidy. Management stated that the change in credit subsidy was a result of discussions with the Office of Management and Budget on the appropriate methodology for valuing collateral and its recommendations regarding how a recovery should be calculated for budgetary and accounting purposes. Management asserted that the change in credit subsidy did not reflect a change in the risk of the transaction or its credit characteristics, and therefore was consistent with the Board's recommendation, requiring no further consultation.

Auditor Response:

We concluded that the final recovery rate used to calculate the credit subsidy represented a material change from the credit characteristics previously presented to the Board. Specifically, the final 8 percent recovery rate used to calculate the credit subsidy was materially different than the 38 percent rate originally presented to the Board, representing a 78 percent decrease in the estimated value of the assets available as collateral on the loan. Additionally, this change increased the credit subsidy — the cost used to protect the Government against the risk of estimated shortfalls in loan repayments — from approximately $71 million to over $96 million, putting an additional $25 million of taxpayer funds appropriated by the Recovery Act at risk.

Management Comment:

Management also disagreed with our conclusion that differing professional opinions were not addressed and resolved. Management asserted that the Independent Engineer's report directly responded to nine of the eleven issues raised by the internal solar expert and encompassed the two other remaining issues at a high level in the report's conclusions.

Auditor Response:

While the Independent Engineer's report touched upon some of the solar expert's areas of concern, as noted in the report, it did not fully cover all of the issues identified by the internal solar expert. In particular, it did not address concerns related to module certification, soiling of panels, the stability of Abound's process of record, delays in reporting deviations from plan, or staffing shortfalls. In addition, we recognize that the overall conclusions of the two experts differed regarding whether to continue funding at that time. However, as noted in the report, we concluded that the funding recommendations directly correlated to the experts' differing perceptions of Abound's ability to successfully overcome its technical shortfalls. Of particular concern was the internal solar expert's statement that he had serious doubts regarding Abound's commitment to addressing recurring issues. More importantly, as noted in the report, this was not the first time the solar expert had raised concerns about Abound's performance and ability to correct technical issues.

Management Comment:

Additionally, management disagreed with the finding that it had not always adequately documented the assumptions in the financial modeling used to support loan approval and monitoring. In particular, management noted that the highlighted issues regarding the solar panel market and panel performance issues were specifically addressed and documented prior to loan closing.

Auditor Response:

We acknowledge that the Program revised its financial model assumptions between conditional commitment and loan closing to account for changes in business and market conditions. For example, it lowered the projected sales prices. In addition, we recognize that the Program obtained updated reports from its independent advisors and adopted a more conservative approach than its advisors for certain factors such as average sales prices and yield. However, as noted in the report, Program officials were unable to provide us documentation supporting how the updated assumptions fully considered factors such as the deteriorating market conditions and capacity issues. In particular, we considered the Program's conclusion that photovoltaic solar panel manufacturers may not be able to raise equity in light of weakened market conditions concerning because Abound needed to raise a significant amount of equity during the course of the loan. Additionally, although the initial market report commissioned by the Program had assessed the potential risk for industry overcapacity to impact Abound as low, an updated market assessment issued in November 2010, estimated there would be 45 to 50 percent overcapacity in production globally for the next 3 to 5 years. Further, although Program officials stated that assumptions used in the models were fully vetted, we were unable to verify their assertion because the results of key/critical discussions were not formally documented as part of the Program's official records.

Management Comment:

Finally, management asserted that financial and industry analyses were being performed as financial and business information was received from the company. Management indicated that during the 9-month period following loan closing, industry analysis was being done through outside advisors, the Program's Technical and Project Management Division, and the Independent Engineer. Management stated that it routinely reviewed the financial model and the expectations established at loan closing and compared these expectations against actual results prior to disbursements and had prepared credit reports.

Auditor Response:

As noted in the report, the Program could not provide evidence that it had conducted ongoing, formal financial and industrial analysis during the disbursement period. The audit team reviewed documentation available from the Program's portfolio management database, as well as files and email correspondence maintained for the portfolio manager overseeing Abound during the disbursement period and found no evidence of ongoing, formal financial or industrial analyses conducted by the Program during that period. Additionally, as noted in the report, when the

Portfolio Manager responsible for monitoring the loan to Abound left the Program in September 2011, he indicated that he had not completed credit reports for loans under his purview. Therefore, the first formal credit report for Abound was not prepared until after the new project officer took over and Abound was already in default.

Management's official comments are included in Appendix 4. Management also provided technical comments that have been addressed in the body of the report, where appropriate.

ABOUND TIMELINE OF EVENTS

Date	Event
February 2009 – June 2010	**Application:** Abound Solar Manufacturing, LLC, (Abound) submitted an application for a loan to construct and commission thin-film photovoltaic solar panel manufacturing facilities in Colorado and Indiana capable of annually producing up to 840 megawatts of clean renewable energy. The Department of Energy's (Department) Loan Guarantee Program (Program) had conducted approximately 14 months of due diligence activities during which it identified a number of financial, technical and market risks and established corresponding mitigation measures. The Program's credit assessment identified that the project was speculative and included significant credit risk. Specifically, the Program rated the loan at a risk of 2.96 out of 5.0, which was designated an "adequate" risk. Despite the risks identified, the Program concluded that there remained a reasonable prospect of repayment on the loan. The assessment recognized that the project's capacity for repayment relied on favorable business conditions, achievement of technical milestones, and market penetration.
July 2010	**Conditional Loan Approval:** The Program presented the loan to the Department's Credit Review Board, which is responsible for recommending approval of a conditional commitment. Subsequently, the Board recommended that the Secretary conditionally approve the loan guarantee. While the Board recommended approval, according to its minutes, members requested that the Program continue to monitor market conditions. The approved loan terms identified certain conditions that had to be met before loan closure, including meeting minimum technical metrics, funding equity and working capital accounts, and obtaining all required governmental, regulatory, environmental and other permits and approvals.
September 2010	**Program Identifies Dramatic Changes in Photovoltaic Module Market:** An annual review of another solar manufacturing project (Solyndra, Inc.) conducted by the Program noted that the photovoltaic module market had undergone dramatic changes which resulted in downward price pressure on solar modules. The review also indicated market risk had been heightened due to the reduction of incentives/subsidies in Europe (a key market for Abound). The Program concluded that the combination of these factors affected photovoltaic module manufacturers' ability to raise capital and called into question the long-term health of the photovoltaic solar module market. Because Abound needed to raise a significant amount of equity during the course of the loan in order to complete the project, these factors could have a significant impact on the success of the project.

October 2010	**Program Identifies Performance Shortfalls in Abound Solar Panels:** An Independent Engineer's report submitted to the Program noted Abound's solar panels were underperforming by 6 percent below expectations. According to the report, Abound was evaluating several process changes to address the shortfalls, which the Independent Engineer expected to be in place by the first quarter of 2011. Abound modified its panel efficiency ratings to reflect lower observed field performance. This action placed financial pressure on Abound as it resulted in lower sales prices, and the need to issue rebates to existing customers at a cost between $2 and $3 million. Abound also revised its technical projections and delayed ramp up of its production lines to make process changes, which pushed out completion of the project and the time period until it would reach positive cash flows by up to 12 months. Because the success of Abound's business plan was heavily dependent on its ability to ramp up production quickly to achieve economies of scale, delays this early in the project could have long-term implications and be hard to overcome. Abound also revised its technical roadmap and pushed out its target of reaching 80 watt modules from the end of 2010 to the end of 2011 or early 2012. This was significant because Abound's primary competitor was already producing and selling 76 watt modules at the end of 2009.
November 2010	**Program Identifies Increased Risk of Overcapacity in the Market:** Although the initial market report commissioned by the Program had assessed the potential risk for industry overcapacity to impact Abound as low, an updated market assessment issued in November 2010, estimated that there would be 45 to 50 percent overcapacity in production globally for the next 3 to 5 years. Further, the updated report lowered the projections for the compound annual growth rate of photovoltaic solar panels through 2020 from 12.5 percent to approximately 5.6 percent, a reduction of more than 55 percent. Finally, the report identified that a number of major photovoltaic solar manufacturers had announced plans to expand their capacity by approximately 10 gigawatts between 2010 and 2012, which would double global production capacity. These updated projections were concerning because the Program indicated that the addition of 4.5 gigawatts or more in added capacity posed a significant risk to the project and the photovoltaic market was already experiencing periods of overcapacity.
November 2010	**Credit Rating Agency Lowers Recovery Rating Estimate:** A final credit rating prepared by an outside credit rating agency lowered Abound's recovery rating estimate, the potential recovery in the event of default, from 60 percent to 45 percent. The 25 percent reduction was based on what the agency perceived to be Abound's sensitivity to downward pressure in panel pricing, technical shortfalls, and its inability to achieve expected conversion efficiency gains during the 18-month period it had reviewed. The agency noted that Abound's expectations for product performance had decreased significantly, it had been unable to achieve the expected product enhancements outlined in its application, and it had drastically lowered its technical projections during the period it was under review by the Program. In addition, Abound's average sales price assumptions were significantly below those in its application, and the credit agency expected further price pressures in the market over the next 3 to 5 years as new technologies scaled up and achieved competitive manufacturing costs. Although the credit rating agency's final recovery rating was 45 percent, the Program had previously used a more conservative rate of 35 percent in its financial and credit analysis supporting its presentation to the Board.

December 2010	**Loan Guarantee Executed:** The conditions established by the Board at conditional commitment had been met. Further, the Program had conducted additional due diligence to assess the changes in market conditions and technical issues that had occurred since the conditional commitment in July 2010, and indicated that it took them into account when conducting its financial and credit analyses prior to closing. Program officials stated that the changes in circumstances and outlook between conditional commitment and loan closing were analytically reviewed using industry best practices including updating financial models and developing sensitivity analyses. Based on these analyses, the Program had not considered the changes in market conditions or technical shortfalls to be material. In regard to changing market conditions, the Program stated that its original financial model assumptions had already been conservative. In regard to technical issues, based on the Independent Engineer's assessment, the Program concluded that the panel performance issue was temporary in nature and was not expected to have a significant impact on the project's ability to repay the loan. Further, Program officials told us that the requirements for disbursements outlined in the approved terms and conditions served to limit exposure if Abound was unable to achieve its business plan. Based on input from independent advisors and its analyses, the Program made the determination that there was still a reasonable prospect of repayment. We noted that the Program drastically reduced its recovery rating estimate for the loan to Abound from 38 percent to 8.3 percent at loan closing. The Program stated that the reduction was due to a change in methodology for modeling liquidation scenarios and was not reflective of the changing credit characteristics of the transaction. However, the change in recovery estimate resulted in an increase in the credit subsidy allocated to the loan from approximately $71 million to approximately $96 million, an increase of approximately $25 million or 35 percent.
January 2011	**Program Identifies Larger Panel Underperformance than Previously Reported:** The Program learned that Abound's photovoltaic solar panels were underperforming by as much as 15 percent versus the 6 percent reported prior to closing. As a result, Abound reported that its second largest customer returned $2.2 million of product and cancelled other orders for December 2010, estimated at over $3.8 million or 11 percent of Abound's expected revenue for 2010.
February 2011	**Program Suspends Funding:** To address shortfalls, Abound made modifications to its manufacturing process in February 2011, which negatively impacted project plans and delayed construction. The Program temporarily suspended disbursements from February to March 2011, to evaluate the problems outlined in Abound's year-end report, as well as its revised plans to address the issues.
March 2011	**Program Conducts On-site Evaluation:** The evaluation, performed by the Independent Engineer, Federal Technical Lead, and the solar expert, highlighted the ongoing problems encountered by Abound and confirmed that the technical shortfalls identified prior to loan issuance were still occurring. In addition, the review found that the process changes were not fully effective and would take longer to implement, further impacting the construction schedule. Additionally, the evaluation raised concerns regarding the immaturity of Abound's quality control and testing programs. Further, the Program learned that Abound's technical problems included the potential for fires from sparks generated by panel materials, which had led to a 10-day shutdown of Abound's production. We found no evidence in the information we reviewed indicating that the Program was aware of this issue prior to closing. The Program's Independent Engineer had previously identified several actions that Abound had to successfully complete in order for it to recommend approval of proposed changes to the Program. During the on-site visit, the Independent Engineer, along with the Federal Technical Lead and solar expert, assessed Abound's progress toward completing the actions. Based on its assessment, the

	Independent Engineer concluded that Abound's plans to address the issues were achievable and the project funding should continue. However, the Program's internal solar expert recommended additional disbursements not be approved at that time based on Abound's deficiencies. A report prepared by the solar expert identified a number of significant issues indicating Abound had major problems and noted that Abound did not have an adequate grasp of the severity of its status. In addition, the report noted that the solar expert's biggest concern was insufficient attention to product quality and poor quality control, which became a major factor in the eventual failure of the company.
April 2011	**Program Restarts Funding:** Based on the Independent Engineer's recommendation, the Program restarted loan disbursements.
June 2011	**Program Determines Lack of Improvement in Panel Performance:** An informal review conducted by the Program's Financial Advisor noted there was no sustained improvement in the average watts per panel between April and June 2011, and production remained well below expectations established when the loan was issued. Additionally, the advisor noted, at that point in time, Abound was not close to achieving metrics for its next loan advance in early September 2011. In particular, as of June 2011, Abound's average watts per panel was about 5 percent below and production was averaging about half of what would be required for the next disbursement. Despite the negative trend in Abound's performance, the Program continued to disburse funding to the project.
August 2011	**Abound Revises Project Plans:** Technical issues and quality problems continued to plague the project through August 2011, when Abound again revised its project plans and lowered projections citing unresolved performance issues as the cause. Notably, Abound reduced its sales projections by 33 percent and expected cash flow from operations by 60 percent. In addition, Abound once again revised its technology roadmap by pushing out its target of achieving 80 watt modules to the end of 2012, and delaying the production ramp of its second manufacturing line.
September 2011	**Program Suspends Funding:** Abound defaulted on its loan terms when it failed to meet financial and construction milestones as a result of its performance issues, and the Program suspended funding to the project. As a result, the Abound loan was placed on "credit watch." The Program's policies and procedures indicated that projects could be placed on "credit watch" when an event or deviation from an expected trend had occurred and monitoring efforts would be increased.
May 2012	**Abound Submits Restructuring Plan:** Between October 2011 and February 2012, the Program granted four waivers to the default and allowed Abound to use equity funds from restricted accounts to continue the project in an effort to overcome technical shortfalls. Following the fourth waiver, Abound informed the Program that it was unable to meet loan requirements and lacked sufficient funds to achieve project completion, which under the terms of the loan, resulted in default. Abound also indicated that it was uncertain as to whether additional equity could be raised in time to avoid bankruptcy or liquidation. As a result, Abound submitted a restructuring plan to the Program and requested permission to use funding from project accounts in an effort to sell the company. The Program approved the plan; however, the sale was unsuccessful.
July 2012	**Abound Files for Bankruptcy:** In July 2012, Abound filed for bankruptcy, indicating that it lacked sufficient funds to continue and was unable to raise additional capital to complete the project.

OBJECTIVE, SCOPE AND METHODOLOGY

OBJECTIVE

The objective of the audit was to examine the circumstances surrounding the Department of Energy's (Department) Loan Guarantee Program's approval and administration of the loan to Abound Solar Manufacturing, LLC, (Abound).

SCOPE

This audit was conducted from October 2012 to April 2014, at Department Headquarters in Washington, DC. The audit was conducted under the Office of Inspector General Project Number A13PT008.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed applicable Federal and Department regulations related to the Program;

- Reviewed the Program's policies and procedures for evaluating applications, assessing project risks, approving loan guarantees, and records management;

- Reviewed loan guarantee documentation maintained by the Program, as well as internal e-mail correspondence regarding the loan guarantee to Abound covering the period February 2009 through July 2012;

- Reviewed technical, legal and market assessments submitted to the Program by its independent advisors;

- Analyzed conditions for loan closing identified in the terms and conditions at approval, and the conditions to those identified in loan agreement to determine whether the requirements had been modified;

- Analyzed monthly and quarterly reports for calendar year 2011 submitted to the Program by Abound;

- Interviewed Program officials to gain an understanding of the loan guarantee review and monitoring processes and to determine the level of interaction with independent advisors; and

- Interviewed independent advisors to determine their responsibilities in support of the Program.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Accordingly, we assessed internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. We assessed performance measures in accordance with the *GPRA Modernization Act of 2010* and concluded that the Department had established performance measures related to the Loan Guarantee Program. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. Finally, we conducted an assessment of computer-processed data relevant to our audit objective and found it to be reliable.

An exit conference was held with management officials on April 2, 2014.

PRIOR REPORTS

- Special Report on *Inquiry into the Procurement of Law Firm Services and Management of Law Firm-Disclosed Organizational Conflicts of Interest by the Department of Energy's Loan Programs Office* (OAS-RA-12-14, August 2012). This audit identified opportunities to improve transparency over the Loan Programs Office's management of organizational conflict of interest waiver requests. Specifically, the review noted that the Loan Programs Office had not deployed a tracking system for managing law firm waiver requests and had not documented, in an organized system of records, the rationale for denying or approving waiver requests.

- Audit Report on *The Department of Energy's Loan Guarantee Program for Clean Energy Technologies* (DOE/IG-0849, March 2011). This audit revealed that the Loan Guarantee Program could not always demonstrate, through systematically organized records, how it resolved or mitigated relevant risks prior to granting loan guarantees. Decision documents summarizing the process did not always describe the actions taken by officials to address, mitigate and/or resolve risks. In addition, loan origination files were not maintained in the Program's official electronic information repository, which according to Federal regulations was to contain key documentation to support actions as part of the loan guarantee process. The report noted that the Program had not adopted a records management system that imposed structure, consistency and discipline in the development and retention of loan documentation.

- Audit Report on *The Department of Energy's Loan Guarantee Program for Innovative Energy Technologies* (DOE/IG-0812, February 2009). This report found that while the Program had developed and implemented some key programmatic safeguards, it had not completed a control structure necessary to award loan guarantees and to monitor associated projects. Specifically, the review found that the Program had not finalized policies and procedures, formally documented portions of its applicant reviews, and formalized procedures for disbursing loan proceeds.

- Special Report on *Loan Guarantees for Innovative Energy Technologies* (DOE/IG-0777, September 2007). This report concluded that there were a number of steps that should have been taken to foster the success of the Program. These included finalizing a staffing plan, developing risk mitigation strategies, implementing and executing a monitoring system, and promulgating liquidation procedures.

MANAGEMENT COMMENTS

Department of Energy
Washington, DC 20585

FEB 1 1 2014

MEMORANDUM FOR: Rickey R. Hass, Deputy Inspector General for Audits and Inspections, Office of Inspector General

FROM: Peter W. Davidson
Executive Director, Loan Programs Office

SUBJECT: Office of Inspector General Report, The Department of Energy's Loan Guarantee to Abound Solar Manufacturing, LLC

This memorandum constitutes the response of the Loan Programs Office (LPO) to the subject Office of the Inspector General's (OIG) draft audit report.

While we generally agree with the OIG's recommendations, as further discussed below, LPO disagrees with several of the findings and assertions made in the draft audit report. The LPO conducted and documented rigorous and extensive due diligence in connection with the loan guarantee for Abound Solar Manufacturing, LLC (Abound). This included numerous processes that are in place to meet the statutory mandate to ensure a reasonable prospect of repayment. The bankruptcy of Abound was not reasonably foreseeable at the time of loan closing, and LPO took all appropriate action to maximize the value of the company and taxpayer recovery. Although we agree that improvements can continue to be made to documentation procedures, LPO specifically takes issue with the following:

LPO should have consulted with the Credit Review Board (CRB) regarding a change in the credit subsidy. The change in credit subsidy did not reflect a change in the risk of the transaction or its credit characteristics and therefore the transaction was consistent with the CRB recommendation, requiring no further consultation. As noted by OIG, the increase in credit subsidy resulted from a change in the recovery rate assumed. This change reflected the outcome of discussions between LPO and the Office of Management and Budget (OMB) to develop an appropriate methodology for valuing collateral in manufacturing transactions, such as Abound, where liquidation was the assumption used in the credit subsidy model. These discussions were not about greater inherent risk in the transaction. Under the Federal Credit Reform Act (FCRA), OMB, not the Department of Energy (DOE) has statutory authority for determining the credit subsidy. For every loan guarantee approved by DOE, OMB provides recommendations regarding credit subsidy inputs, and any differences between DOE and OMB often do not reflect changes in the risk of the transaction but rather OMB's assessment of how a recovery should be calculated for budgetary and accounting purposes.

LPO did not resolve conflicting opinions of its technical advisors. LPO disagrees that differing professional opinions were not addressed and not resolved. The Independent Engineer's Report (IE Report) directly responded to nine of the eleven issues raised by the internal solar expert and encompassed the two other remaining issues at a high level in the IE Report's conclusions.

LPO did not adequately document the assumptions in the financial model. LPO disagrees with the finding as well as the assertion that OIG could not confirm that all issues were fully and formally considered prior to loan closing due to a lack of documentation. In particular, LPO notes that the highlighted issues regarding the solar panel market (including overcapacity) and panel performance issues were specifically addressed and documented prior to loan closing. Documentation included updated independent market and engineering reports, an updated financial model (that incorporated the findings from the experts' reports), the discussions of those updates in memoranda and management and inter-agency presentations, and a closing certificate that documented no material difference in the financial projections.

The changes in the solar market were incorporated in both the independent market report and the assumptions in the financial model. Specifically, the updated financial model took a 30% discount off the projected panel prices from the market report to account for uncertainties in the market, such that the price projections in the updated financial model were approximately 10% lower than the June 2010 projections. Additionally, the updated engineering estimates of both panel production and performance were incorporated in the updated financial model as reflected in an overall reduction in watts produced of 29% in 2011, 35% in 2012, 31% in 2013 and 6% in 2014 relative to the June 2010 projections.

LPO had not conducted ongoing, formal financial and industrial analyses as part of its monitoring activities. Financial and industry analyses were being performed as financial and business information was received from the company as well as to support decision making for post-issuance requests. During the nine-month period following loan closing, industry analysis was being done through outside advisors, LPO's Technical and Project Management Division (TPMD), and the Independent Engineer (IE). LPO routinely reviewed the financial model and the technical, market, and financial expectations established at loan closing and compared these expectations against actual results prior to disbursements. LPO also prepared credit reports dated August 2011, November 2011 and February 2012. Since the period covered by the draft audit report, LPO has formalized processes for conducting and documenting formal financial and industrial analyses.

Please note that additional technical comments and factual corrections and clarifications are attached hereto as Appendix 1.

The OIG draft report contains five recommendations for action. LPO generally concurs with the recommendations, most of which constitute standard industry practice that LPO has already implemented. With respect to OIG's third recommendation, LPO will evaluate whether a formal process for resolving differences of opinions is warranted, but agrees that it will develop procedures on documentation requirements evidencing resolution of differing opinions. With respect to OIG's fourth recommendation, while LPO does not believe that additional specific guidance on materiality is necessary, LPO believes that it can further develop the process for making a determination on materiality to ensure that the results are documented and also develop guidance on when the determination should be subject to further review by management for concurrence. For further discussion of our responses to the recommendations please see Appendix 2.

In closing, we thank the OIG staff for their work. LPO remains committed to continually improve program operations.

IG Report No. DOE/IG-0907

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4. What additional actions could the Office of Inspector General have taken on the issues discussed in this report that would have been helpful?

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