Legislative and Regulatory Activities Division
Office of the Comptroller of the Currency
Mail Stop 9Q-11
400 7th Street, SW
Washington, DC 20219

November 7, 2014

RE: Docket ID OCC-2014-0021 (Federal Reserve System Docket No. OP-1497)

Agencies:

Please find attached comments in response to the above numbered docket, "*Community Reinvestment Act: Interagency Questions and Answers Regarding Community Reinvestment*." The attached comment set is submitted on behalf of more than 1,000 companies, representing a solar industry of 143,000 American workers across the United States. Note that the entirety of the attached comments may not reflect the opinion of every SEIA member company.

SEIA applauds the Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, and Federal Deposit Insurance Corporation for undertaking this timely review of critical aspects of the Community Reinvestment Act (CRA). In particular, we strongly endorse the final issuance of guidance affirming that renewable energy facilities and energy efficiency enhancements responsive to local needs are eligible for CRA consideration.

We do feel that further clarification in a number of key areas will increase the success of the CRA as intended by the Agencies. Our comments focus on CRA regulations 12 CFR __.12(g)(3) on economic development definitions in the context of renewable energy, energy efficiency and energy storage, and

12 CFR__.12(h) regarding community development loans for renewable energy, energy efficiency and energy storage purposes.

If you have any questions regarding the attached submission, please contact me directly at the coordinates below. Thank you for your consideration.

Sincerely,

Thomas P. Kimbis
Vice President for Executive Affairs & General Counsel
Solar Energy Industries Association (SEIA)
505 9th Street, NW – Suite 800
Washington, DC 20004
202-682-0556 (main)
202-469-3737 (direct)
tkimbis@seia.org

Docket ID OCC-2014-0021 (Federal Reserve System Docket No. OP-1497)

Stakeholder Comments from the Solar Energy Industries Association, Inc., (SEIA) on

"Community Reinvestment Act: Interagency Questions and Answers Regarding Community Reinvestment."

The below comments represent the aggregate comments of the stakeholders ("Stakeholders") listed at the end of this document on the above-referenced docket ("Proposed Q&A"). Comments submitted focus on two of the ten topics identified for clarification in the Proposed Q&A:

- III. A. "Economic Development" and
- III. B. "Community Development Loans."

The proposed questions and answers (Q&A) address definitions regarding economic development as stated in 12 CFR__.12(g)(3), including the "purpose test", intended to ensure that the activities of any financial institution acting under CRA promote economic development as CRA intends. According to existing Q&A in this area, the purpose test requires that activities "support permanent job creation, retention, and/or improvement for persons who are currently low- or moderate income, or support permanent job creation, retention, and/or improvement either in low- or moderate-income geographies or in areas targeted for redevelopment by Federal, state, local or tribal governments." We support the direction of the proposed Q&A that adds examples demonstrating economic development such as job or career training programs, small business creation, and technical assistance within CRA targeted geographies. However, due to the enormous and diverse economic benefits of renewable energy and energy efficiency activities to the intended beneficiaries under the CRA, we strongly encourage the addition of broader language and additional examples that clarify that such benefits qualify such activities for CRA consideration.

Specific Questions within the Proposed Q&A

10. Does the proposed revised guidance clarify what economic development activities are considered under CRA?

Permanent Jobs

The term "permanent," referenced twice in the above "purpose test" 12 CFR__.12(g)(3) language in reference to job creation, retention or improvement, is problematic in both its existence alone, as well as its interpretation, in ensuring that financial institutions are able to invest in low and middle income communities as the CRA intends.

Although the existing Q&A cite "support [of] permanent job creation" as a requirement, there is no substantial guidance on the nature of "permanent". For instance, a substantial number of the jobs created by the renewable energy and energy efficiency industries in low- or moderate-income geographies are craftsman and tradesman positions, such as carpenters, electricians, plumbers, and roofers. Although a particular renewable energy or energy efficiency project may not create a permanent, full-time craftsman or tradesman position, it may create thirty person-years of full time work, similar to the career length of a worker in a permanent position.

In addition, the very need for the CRA in the first place is because of the lack of sufficient private market forces to drive economic growth in designated areas as quickly as in other areas, if at all. Understanding the characteristics of the well-recognized market adoption curve developed by Everett Rogers, including its sequencing and timing, is of critical importance to the success of CRA activities that involve introduction of technologies or services to a given market.[1] The success of creating of a localized market for goods and services, especially those that involve the physical installation of equipment on

[1] *E.g.,* http://cancergrace.org/cancer-101/files/2014/08/technology-adoption-curve-Rogers.png

real property, is dependent upon "innovators" and "early adopters", as designated on the adoption curve.

CRA stimulates the demand for these goods and services by facilitating their introduction into regions by, in part, reliance on innovators and early adopters to choose these goods and services. Yet, depending on the size of the market and speed with which it matures, the initial projects in any given geography may begin with the creation of part-time, permanent jobs that mature into full-time, permanent jobs. CRA can help communities by incenting the first installation in a community that has no experience with solar energy technology or its benefits. According to a growing number of academic studies, a strong "neighborhood effect" is seen with solar energy system deployment in markets around the world: once a technology is adopted by one resident of a community, its acceptance rates among other members skyrockets.[2] In addition, there is a direct correlation between the increased adoption of renewable energy and energy efficiency products and services and the creation of permanent jobs. In fact, within the U.S. solar industry alone, there are more than 143,000 Americans employed in permanent positions.[3]

The phrase "permanent job" is itself somewhat antiquated. The labor market in the U.S. over the twentieth century grew famously fluid, despite some tightening of that fluidity in recent years.[4] Persons of low-and moderate incomes, or individuals in low-or moderate-income geographies or areas targeted by governments for redevelopment, change employers, job types, industries, and geographies during the course of their working lives like other Americans. As of January 2014, the median number of

[2] *E.g.,* http://joeg.oxfordjournals.org/content/early/2014/10/07/jeg.lbu036.abstract *and* http://www.academia.edu/8141230/Solar_energy_integration_in_urban_planning_GUUD_model
[3] *National Solar Jobs Census 2013,* The Solar Foundation, www.solarfound.org
[4] http://www.economist.com/news/finance-and-economics/21614159-americas-famously-flexible-labour-market-becoming-less-so-fluid-dynamics

years that U.S. wage and salary workers had been with their current employer was only 4.6 years, with significant drop-off in length of tenure for those who had not obtained a high school diploma.[5]

As written, it is unclear of whether a "permanent job" is one that must remain with the same employer, of the same type, in the same industry, or within the same geography to be considered "permanent." Nor is it specified for how long a period is necessary for a job to qualify as "permanent", or whether a hiatus in a job, such as for maternity leave or educational pursuits, disqualifies an individual's job from being "permanent".

Jobs come from sustainable product and service markets within any geography, regardless of income levels. In order to build a sustainable marketplace for renewable and energy efficient technologies, there must first be sufficient available capital at a low enough cost for developers to undertake projects. Currently, there is strong interest by the renewable energy and energy efficiency industries in building projects that bring private dollars, institutional knowledge, and jobs to low- and mid-income communities. To build a sustainable local or regional renewable energy or energy efficiency market, certain conditions are needed, such as:

- Awareness by energy purchasers of their renewable energy and energy efficiency options and the financial savings accompanying those options
- Ability to obtain routine service and warranty coverage on any renewable energy and energy efficiency installations
- Financing options that work for the purchaser, such as those that overcome the first cost of certain technologies or projects (e.g. energy efficiency or rooftop solar projects may require all funds to be paid upfront, while the energy savings accrue over time)

[5] *N.b.* Table 4: http://www.bls.gov/news.release/tenure.nr0.htm

Because institutions and those they serve generally proceed methodically, we tend to see modest initial investments, with fewer initial jobs created, prior to a more full investment and job creation impact once the market reaches strength. *Those initial projects may not alone create permanent jobs -- they may create a year-long construction job – but they are necessary to create a sustainable, permanent market in CRA-targeted geographies with permanent jobs.* This is a similar model to construction jobs in an economically-challenged area. Incentives are sometimes needed to motivate financial institutions to fund new construction projects in such areas where new build has not occurred for decades. Such construction jobs are temporary by nature, but can and will lead to permanent jobs if the economic development of the region continues. The same is true with renewable energy and energy efficiency projects.

Such vagaries of the term "permanent" prevent financial institutions and project developers from pursuing renewable energy and energy efficiency projects that could normally qualify for credit under and support the goals of the CRA. Clarification of the term "permanent" and the phrase "permanent job creation" would assist lenders and project developers in meeting the intended requirement and demonstrating economic development impact of an activity on intended beneficiaries or areas. Any definition, while still requiring lenders to meet the "purpose test" by proving economic development job creation, retention, and/or improvement, should be conceived in the context of a fast-evolving economy and fluid labor force in general, especially given the cyclical nature of construction and related positions.[6]

[6] The Agencies suggest a similar language revision within the Notice, due to the possible unintended consequences of focusing bank community development activities on the support of low-wage jobs, by proposing removal of the word "currently" from existing guidance under Q&A Sec. __.12(g)(3). Similarly, the Agencies could to re-examine the word "permanent" when referring to job creation, as it is both vague in meaning – creating uncertainty in how to achieve it – and dampening on the types of meaningful economic development that could be brought to communities and persons the CRA is designed to benefit.

We respectfully request that the Agencies clarify that, although activities that promote permanent job creation, retention, and/or improvement do suffice to meet the "purpose test" of Q&A Sec. __.12(g)(3), they are not the exclusive means of meeting the "purpose test" in demonstrating that a financial institution's activities promote economic development consistent with the intent of the CRA. The Agencies could then offer examples of how the banking community could meet the core requirement of the CRA of promoting economic development through the expected impact of the activity in supporting the development of a sustainable local market for goods or services which, in the case of renewable energy and energy efficiency, necessitates permanent jobs. One key example could illuminate that the "purpose test" may be satisfied by the creation of full-time jobs that last for the duration of the project period with a realistic expectation that the project creation will stimulate the demand for additional projects within that geographic market sufficient to consider such positions as permanent jobs.

Community Solar

The reference in the draft Q&A to "affordable housing or community facility" is unclear and in the case of "affordable housing" a circular reference. Given that affordable housing is already defined as "community development," the guidance provides little help as often renewable energy or energy efficiency projects in an affordable housing project require treating most or all of the energy or efficiency equipment or materials as part of either the physical structure of the housing and/or the federal income tax basis of the affordable housing tax credit.

Community solar provides an example of a new technology use that directly promotes the goals of the CRA when deployed in targeted CRA territories. In community solar, affordable housing projects or buildings, or individuals intended as beneficiaries under the CRA can have power bills lowered by a local solar installation not attached to a community building or facility. This installation nonetheless

serves the energy needs of the building's tenants, or the common areas of the affordable housing project or community facility and/or the broader low and moderate income area. Community solar can be financially attractive due to economies of scale by building one centralized local system for electricity production that provides power to the intended CRA beneficiaries rather than placing solar equipment on the roofs of multiple affordable housing projects. Wiring costs, racking for solar panels, and siting costs can all be cheaper than rooftop solar for certain projects. The community solar project remains local but "stand alone"– often in an unused lot or brownfield. In other cases, community solar allows those who otherwise could not benefit from cost-cutting solar power when rooftop solar is infeasible because of shading or other siting issues on particular community centers or housing projects. "Microgrid" systems are similar from a benefit perspective, with a mixture of distributed generation rooftop or groundmount systems, combined with storage technologies to keep targeted communities and their residents with power during electricity grid outages.

This treatment needs to be clear under the CRA guidance because of the nascent nature of such "stand alone" community and microgrid power systems, and the unfamiliarity with many bankers about their characteristics. Renewable technology, its deployment techniques, and lending have all changed dramatically in the last decade. It is these market and lending advancements that in turn require clarification. Accordingly, the guidance should clarify that regardless of whether the renewable energy or energy efficiency equipment or materials are physically part of, or separately apart from, the affordable housing or community facility, lending to a renewable energy company that provides renewable energy generating equipment under a lease, power-purchase agreement, energy services contract or otherwise, and whereby such affordable housing or community facility may obtain part or all of its energy needs and/or the needs of its residents or customers in the intended CRA beneficiary

community, such lending to a "stand alone" renewable energy or energy efficiency provider should be in and of itself eligible for CRA consideration.

Consistent with this express and necessary clarification as to stand alone renewable energy or energy efficiency providers, the providers of community renewables, e.g, "community solar" or "community wind" and/or "micro-grid" providers should also be listed as express examples of the kind of project and borrowings that this guidance authorizes and supports for CRA eligibility.

Also critical to include in the guidance on renewable energy systems is the eligibility of energy storage and conversion technologies. Although such technologies, such as batteries, flywheels, smart inverters, compressed air, thermal storage, fuel cells, power conditioners, salt systems, and other storage and conversion technologies do not generate electricity in the same manner as a renewable resource, these technologies can store and deploy energy as flexible capacity that enhances the efficiency of renewable resources and improves the quality of such energy so it is of higher value to the end consumer.

If a microgrid is not connected to the local electricity grid, and is relying on solar for power, there would be fluctuations in output depending on when the sun shined. Storage is an integral part of the solution since it can store electricity or heat generated from intermittent resources and dispatch them to the end consumer as needed. Storage technologies also allow for use of power or heat in a blackout or disaster, when low- and mid-income communities are often hit hardest due to weak infrastructure. In fact, energy storage can serve multiple purposes that other systems on the grid. Energy storage resources can provide numerous solutions for challenges to the electric grid—from generation services like arbitrage, ancillary services and renewables firming, to transmission and distribution services such as reducing circuit and line overload, enabling grid resiliency, and voltage support.

Brownfields

Brownfields are distressed lands, many the site of chemical or other environmental contamination, that cannot be used for normal residential or commercial development. Often, they are located in the same low- and moderate- income communities intended to benefit from the CRA. Each brownfield site represents a waste of a community asset, a non-productive property and net liability for the community. Fortunately, renewable energy technology, such as solar, when installed on otherwise burdened brownfield sites can create positive economic impact in low and moderate income areas by lowering the cost of power, increasing power stability and quality to low- and mid- income users, creating jobs, and increasing the local tax base.

Consistent with the need for "community" and "micro-grid" related borrowing, the Agencies should expressly clarify in the final Q&A guidance language that "brownfield" development of renewable energy projects in low and moderate income areas or that serve low or moderated income individuals, but are not physically attached to the low- or mid- income facilities, housing, or community centers, are eligible for CRA consideration.

Property Assessed Clean Energy (PACE)

Property Assessed Clean Energy (PACE) financing is a relatively recent innovation that, although it has faced stumbling blocks especially within the residential market segment, has enormous potential to drive renewable energy, energy efficiency and storage projects within CRA-focused geographic areas.[7] Dozens of states and municipalities have developed PACE programs or legislation. The largest obstacle to rapid uptake of PACE, especially in the residential market segment, has involved

[7] *See:* http://www.dsireusa.org/solar/solarpolicyguide/?id=26 for additional information.

lien prioritization as determined by the Federal Housing Finance Agency (FHFA).[8] Yet, even today, according to a national PACE organization, "[t]wenty-five programs now make PACE financing available in nearly 500 cities and towns in nine states and Washington, D.C. More than 250 PACE projects worth over $75 million have been completed; programs report a total pipeline of more than $250 million in project applications."[9]

In addition, the success of PACE programs could create a compounding effect on benefits to the intended beneficiaries of CRA. A renewable energy, energy efficiency and/or storage project could capitalize on the combination of federal–state/local policies through the Agencies' CRA lending incentives and state/local PACE program. The economic benefit that they can bring to those who benefit from the CRA is determined by the creativity of stakeholders in developing advanced lending and ownership structures, the willingness of state and local policymakers to develop PACE programs, and the assurance that PACE programs are not encumbered or slowed unintentionally by regulations of indirect relevance.

The reference to retention of lien position in the Community Development Loans section of the Proposed Q&A is redundant with existing practice and may lead to confusion over the ability of PACE programs to properly function within CRA-targeted areas. Therefore, while we agree that lending practices must be safe and sound, we respectfully request that the Agencies remove the language stricken in the excerpt below from Proposed Q&A in regard to Community Development Loans when drafting the final Q&A:

[8] *See: http://pacenow.org/setting-the-pace-2-0/#sthash.MuECw1uT.dpuf*
[9] *Ibid.*

"All loans considered in an institution's CRA evaluation, including loans that finance renewable energy or energy-efficient technologies, must be consistent with the safe and sound operation of the institution ~~and should not include features that could compromise any lender's existing lien position~~."

11. What information should examiners use to demonstrate that an activity meets the size and purpose tests described in the proposed revised guidance?

The intent of the CRA is to ensure that low- and mid-income persons and communities receive true and measurable economic benefits through lending practices. Keeping that congressional intent in mind, Agencies should direct examiners to look at direct and indirect economic impacts in their analysis of projects. Jobs are critically important, and allow individuals to generate income after an investment that obtains CRA credit has been completed, and are understandably an important metric for examiners. Yet, lending to projects may provide communities and individuals with other direct and indirect economic benefits that are very real, and have lasting impact, but must be measured with a more expansive set of metrics by CRA examiners.

Energy not only drives our national economy, it is necessary in every community's growth and in every residence in America today. For example, without electricity, learning through electronic tools or by the internet, including online education and training that allows many of today's workers to develop the skills to find jobs, would be impossible. Projects that lower an electricity bill, such as solar projects in the right conditions, may mean the difference between using a computer, monitor, printer, and associated electronic products needed for such distance learning or forgoing that opportunity. Energy efficiency also has a similar impact in lowering the costs of energy bills, allowing funds to be spent elsewhere; using the same example, lower heating bills through energy efficiency may allow a community center to purchase a faster computer with high-speed internet access necessary for operating large educational engineering, architectural, or visual arts tools.

The benefits are many from lowering the cost of a unit of energy (electric or thermal) from renewable energy, to cutting the amount of those units needed by low- and middle- income Americans through energy efficiency, to reducing the crippling cost of health impacts from heritage fossil fuels that pollute air and water. Luckily, there are both completed and ongoing studies across the nation looking to calculate these costs and develop common sets of benefits in order to help shape national and state energy policies.[10]

12. Does the proposed revised guidance help to clarify what is meant by job creation for low- or moderate-income individuals?

[Please see the response under Question 10 re: "**Permanent Jobs**."]

13. Are the proposed examples demonstrating that an activity promotes economic development for CRA purposes appropriate? Are there other examples the Agencies should include that would demonstrate that an activity promotes economic development for CRA purposes?

[Please see the response under Question 11 on direct and indirect benefits.]

While the proposed examples demonstrating that an activity promotes economic development for CRA purposes were, in the past, appropriate before the advent of commercially available and cost effective solar energy and other renewable energy or energy efficiency technologies, the examples should be refreshed by the provision of solar or other renewable or energy efficiency and/or storage technology project examples. Examples using these newer technologies and their applications are particularly helpful to lenders who are just beginning to explore their use in low- and mid-income

[10] Many analyses have been conducted in response to state level debates over the benefits and costs of distributed solar to the grid. These are helpful in understanding the greater value of solar, although focused on distributed solar. *See: A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation*, IREC (July 2013), this comprehensive report, http://michigan.gov/documents/mpsc/irecguidebook_448505_7.pdf; as well as a recent report before the Nevada Public Utility Commission, http://puc.nv.gov/uploadedFiles/pucnvgov/Content/About/Media_Outreach/Announcements/Announcements/E3%20PUCN%20NEM%20Report%202014.pdf

communities targeted by the CRA. Solar energy is one of the fastest growing industries in the U.S. today, despite an economic recession and slow recovery.[11] Federal guidance needs to stay current with the information lenders need to keep this growth going, creating jobs across the nation, not impede its growth in areas or for persons intended to benefit under the CRA.

The fast-evolving energy marketplace has finally caught up with the guidance of the Agencies, causing a critical need for the Agencies to address the needs of low and moderate income individuals not only today, at the time these Q&A are being considered, but what can be reasonably, even conservatively, expected during the time the current regulatory approval process and their lifespan as final guidance before the next revision cycle. Improvements in both energy efficiency and renewable energy technology and cost reductions continue to accelerate at an incredible rate.[12]

14. What information should examiners review when determining the performance context of an institution seeking CRA consideration for its economic development activities?

As stated above, the current regulations place too much emphasis on *permanent* job creation, which may have been an appropriate proxy for economic development in past years. Attached in the appendix are two jobs studies that represent the typical jobs make up of a large and smaller scale solar project. You will note that just as an affordable housing project has many up-front construction jobs which are then eliminated leaving far fewer residual permanent jobs, so too is the case with renewable energy projects. The ratio may be slight different, but the fact is the same, and in either case, the benefit to the community is real. For the CRA to remain relevant to the times and persons it serves, less

[11] http://www.renewableenergyworld.com/rea/news/article/2014/01/solar-jobs-growing-ten-times-faster-than-national-average-employment-growth

[12] *See* Lazard's Annual *Levelized Cost of Energy Analysis* – Version 8.0, demonstrating the competitive prices of solar and other renewable energy and energy efficiency technologies. http://www.lazard.com/PDF/Levelized%20Cost%20of%20Energy%20-%20Version%208.0.pdf (note: Slide 2)

emphasis should be given to jobs and more emphasis put on the direct and indirect, individual and public benefits of solar and other renewable energy and energy efficiency technologies.

16. Are there particular measurements of impact that examiners should consider when evaluating the quality of jobs created, retained, or improved?

As discussed above, there are universities, state and national efforts to determine the particular measurement of impact of renewable energy and energy efficiency on jobs created and other economic benefits. Much of the national discussion on this matter, in terms of solar energy deployment, takes place in the forum of "value of solar" (VOS) debates. Although VOS discussions are not precisely the same as the issues raised herein, they contain very similar categories of analysis, including certain subsets of measurements. VOS efforts seek to determine the value (costs and benefits) of adding solar – particularly retail distributed solar – to the current electric grid. The value may be to the ratepayer or to the utility, as well as other stakeholders. Some of those measurements can also be used in the CRA context to determine positive economic impact of solar project development to low- and mid-income residents and CRA-targeted communities.[13]

17. Should loans for renewable energy or energy-efficient equipment or projects that support the development, rehabilitation, improvement, or maintenance of community facilities that serve low- or moderate-income individuals be considered under the CRA regulations?

Yes. The Agencies have made significant process in the issuance of the draft Q&A and should be commended for consideration of this issue. There is little doubt that, for reasons mentioned throughout this response and its attachments, renewable energy and energy efficiency equipment and projects can

[13] *See: A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation*, IREC (July 2013), this comprehensive report, http://michigan.gov/documents/mpsc/irecguidebook_448505_7.pdf; as well as a recent report before the Nevada Public Utility Commission, http://puc.nv.gov/uploadedFiles/pucnvgov/Content/About/Media_Outreach/Announcements/Announcements/E3%20PUCN%20NEM%20Report%202014.pdf

have major economic benefits and improve the lives of those for whom the CRA is intended to benefit. The Agencies should publish in the final Q&A not only the information included in the draft Q&A, but also should supplement it with the information requested throughout this response to ensure the maximum impact on lender decisions simply through clarification.

This effort is all about clarity. *To provide greater clarity to lenders in reaching a lending decision, the Agencies should explicitly list in the final Q&A the types of technologies that qualify as "renewable energy technologies."* This list should not be meant as exhaustive, as new renewable energy technologies – even those using the same renewable energy sources – may emerge over time. We suggest the final Q&A reference "renewable energy" as defined in Executive Order 13514, with the additional specification of "(using technologies including but not limited to photovoltaics, solar heating and cooling, and concentrating solar power technologies)" after "solar".[14] As mentioned above, lending for energy efficiency and energy storage technologies and projects should also be included for CRA consideration.

[14] *Executive Order 13514* (Oct. 5, 2009) states in relevant part: " "renewable energy" means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project;"

Appendix A:

Solar Jobs Study for the Camilla Solar Farm Development Project

The Economic and Workforce Development Impacts of

The Camilla Solar Farm Development Project

Prepared for:

Solar Design and Development

By:

Richard Clinch, Ph.D.

Date:

April 2012

1.0 Introduction and Summary

Solar Design and Development retained Richard Clinch, PhD Director of Economic Research at the Jacob France Institute of the Merrick School of Business at the University of Baltimore (JFI) to analyze the economic[15] and workforce development implications of the development of the Camilla Solar Farm Development Project on the Georgia economy.[16] The two goals of this analysis are:

1. To prepare and present information on the economic and workforce development impacts resulting from the construction and operation of the Camilla Solar Farm Development Project; and
2. To analyze the impact of the construction and operation of the Camilla Solar Farm Development Project in terms of creating employment opportunities for low income residents in Georgia as a component of the use of New Market Tax Credits (NMTC) to support this project.

The Camilla Solar Farm Development Project will have the following impacts:

- The construction and operation of the Camilla Solar Farm Development Project will directly create 133.7 FTE construction-related jobs and partially support 2.8 FTE operational jobs maintaining and servicing the solar facility[17];
- The construction expenditures associated with the Camilla Solar Farm Development Project will generate $38.7 million in economic activity in Georgia, and when multiplier effects are included, create 344.1 FTE jobs earning $15.6 million in employee earnings;
- Once the Camilla Solar Farm Development Project is constructed and operational it will generate more than $2.4 million per year in electricity sales;
- The annual operations and maintenance spending on in-State labor, maintenance and equipment will support 2.8 FTE Solar Maintenance Technicians and when multiplier effects are included support 4.6 FTE workers statewide, earning $248,820 and increase economic activity in Georgia by $434,746. The facility will generate an estimated $187,500 in annual property taxes; and
- Seventy-nine percent (79%) of the direct and multiplier effect jobs created by the construction of the Camilla Solar Farm Development Project are low-skilled jobs accessible to low income residents, and an estimated 70% have access to retirement benefits and 76% have access to medical benefits. All of the direct jobs created by the operation of the solar facility will have access to benefits.

[15] This analysis does not assess the extent to which the Camilla Solar Farm Development Project competes with or substitutes for other development activity. Thus, this analysis measures the relationship between this development activity and the larger State of Georgia economy.

[16] The development is located in Mitchell County, Georgia; however, the National Renewable Energy Lab's (NREL) Jobs and Economic Development Impact (JEDI) model used is only available at the State level. As described in the Methodology Section below, this state-level model was used because it was created to analyze the impacts of the highly specialized solar and other renewable energy sector projects.

[17] The NREL-JEDI Model estimated jobs on a Full Time Equivalent (FTE) basis with one job equaling 1 FTE person year of 2,080 hours. The main economic impact of a solar facility is from its construction and a higher number of persons will be employed – but only on a part-time basis – on the construction site. Job impacts are presented on an FTE basis in order to better understand the actual number of jobs created on an annualized basis.

2.0 The Community Economic Impact of the Construction and Operation of the Camilla Solar Farm Development Project

The Camilla Solar Farm Development Project is a 15 MW solar facility that is proposed for development in Mitchell County, Georgia by Solar Design and Development. The construction and operational cost inputs to the modeling analysis for this project were provided by Solar Design and Development and included the following:

- For pre-development construction-related impacts, the input to the NREL-JEDI Model[18] modeling was the actual $42.4 million construction budget for the Camilla Solar Farm Development Project; and
- The annual operational impacts of the Camilla Solar Farm Development Project were estimated by the NREL-JEDI Model modeling based on the annual 15 MW capacity of the facility, with in-State operational expenditures and job creation estimated by the JEDI model based on the operational characteristics of similar facilities.

Based on these inputs, Richard Clinch, PhD used the NREL-JEDI Model to estimate the economic, employment and employee earnings impacts of the construction and operation of the Camilla Solar Farm Development Project on the Georgia economy.

Table 1

Camilla SFDP Facility

Construction and Operational Information

Item	
Project Development Cost	$48,024,510
Construction Cost	$42,402,867
Generation Capacity	15
Operational Revenue (2015)	$2,417,633
Annual Operating Costs	$487,500
Operational Job Creation	2.8

Source: Solar Design and Development

As presented in Table 2, the $42.4 million in construction expenditures associated with the construction of the Camilla Solar Farm Development Project will generate $38.7 million in economic activity in Georgia, create or support 344.1FTE jobs earning $15.6 million in employee earnings. A total of 133.7 FTE on-site, construction-related jobs are estimated to be created over the construction of the Camilla Solar Farm Development Project. It is important to note that the NREL-JEDI model only includes the amount of spending it estimates as likely to occur locally – in the market being studied. Because of the highly specialized nature of solar power plant construction, a large share of the machinery and equipment associated with the

[18] For a description of the model – see the Methodology Section below.

development of a project are likely to be imported from outside of the region, and are, therefore, not counted in the economic and job impacts analysis.

Table 2

Camilla SFDP Facility

Economic Impacts of Construction Expenditures

(Jobs and 2012$)

Construction Phase	Annual Jobs	Annual Earnings (2010$)	Annual Output (2010$)
Project Development and Onsite Labor Impacts	133.7	$7,156,142	$11,778,023
Construction and Installation Labor	59.7	$3,863,675	--
Construction and Installation Related Services	74.0	$3,292,467	--
Module and Supply Chain Impacts	123.7	$5,229,613	$16,010,000
Induced Impacts	86.7	$3,187,696	$10,948,086
Total Impacts	344.1	$15,573,451	$38,736,110
Average Employee Earnings per Job ($s)	$45,255		

Source: JEDI Model

The ongoing economic activity generated in the Georgia economy by the operation of the Camilla Solar Farm Development Project is presented in Table 3. Once the Camilla Solar Farm Development Project is constructed and operational it will generate approximately $2.4 million in electricity sales. The annual operations and maintenance spending on in-State labor and maintenance and equipment will support 2.8 FTE Solar Maintenance Technicians and when multiplier effects are included support 4.6 FTE workers statewide, earning $248,820 and increase economic activity in Georgia by $434,746. The facility will generate an estimated $187,500 in annual property taxes. It is again important to note that, as with construction impacts, the NREL-JEDI model only includes the on-site operational, maintenance, and support expenditures estimated as likely to occur in the region being studied.

Table 3

Camilla SFDP Facility

Economic Impacts of Operations

(Jobs and 2012$)

Operational Phase	Annual Jobs	Annual Earnings (2010$)	Annual Output (2010$)
Onsite Labor Impacts			
PV Project Labor Only	2.8	$167,186	$167,186
Local Revenue and Supply Chain Impacts	1.0	$51,161	$162,894
Induced Impacts	0.8	$30,473	$104,665
Total Impacts	4.6	$248,820	$434,746
Annual Property Tax Revenues	$187,500		

Source: JEDI Model

3.0 NMTC Impacts of the Construction of the Camilla Solar Farm Development Project

The NMTC program's goal is that funded projects will have a positive community development and economic impact on distressed communities. One of the key benefits tracked by the program is the number of jobs for low-income persons that are created or maintained. In the Community Impact portion of the NMTC funding application, applicants are asked to present the number of Jobs Created or Maintained by any predevelopment/construction and properties developed by QLICIs for planned investments. This analysis will present the results of the job impact estimates for the project presented above in a format applicable to the NMTC Program's goals.[19]

There is no generally accepted means of estimating the number of jobs held or that could be held by low-income individuals. This analysis, therefore, estimates the number of jobs created that is low-skill and therefore, accessible in terms of skills profiles to low income populations, who generally have lower levels of educational attainment and job skills. This was accomplished by using an occupational matrix based on U.S. Bureau of Labor Statistics (BLS) occupational employment developed by IMPLAN. This matrix allows for the estimation of the occupational profile of the jobs estimated by

[19] This is based on the 2010 NMTC application. Future applications may require different community impact calculations.

the IMPLAN model. Each of the occupations in the matrix has been coded according to the minimum level of education and/or training required to fill a position using BLS data (http://www.bls.gov/emp/empeted1.htm). This allows for the estimation of low-skilled jobs, which for the purposes of this analysis includes any occupation requiring less than an Associate's Degree.

As presented in Table 4, the construction and operation of the Camilla Solar Farm Development Project will create 114 FTE construction-related low-skilled jobs accessible to low-income individuals and, when multiplier effects are included, a total of 273 low-skilled jobs accessible to low-income individuals over the construction period. Because of the small number of jobs (just 2.8 FTE jobs) created by the Project's operational and maintenance spending, the low skilled analysis and occupational benefits analysis was not conducted for operational spending. However, the solar technicians involved in both the installation and the operational maintenance of solar facilities are open to lower skilled workers who complete specialized training at a community college or career school and will receive benefits.

Table 4

NMTC Impact Calculations

The Low-Skilled Jobs and Benefits Associated with the Jobs Created or Maintained by the Camilla SFDP Facility

Item	Project Development and Onsite Labor Impacts	Supply Chain and Induced Impacts	Total Jobs
Pre-Development or Construction	134	210	344
Low-Skilled Jobs	114	159	273
Estimated Jobs with Retirement Benefit	93	147	241
Estimated Jobs with Medical Benefit	104	158	262
Percentage of Jobs			
Low-Skilled Jobs	85%	75%	79%
Estimated Jobs with Retirement Benefit	70%	70%	70%
Estimated Jobs with Health Care Benefit	78%	75%	76%

Source: Richard Clinch, IMPLAN and U.S. Bureau of Labor Statistics

The CDFI Fund is also interested in the quality of the jobs to be created by investments. The data from the occupational employment analysis conducted were used to estimate the access to benefits for the jobs created, based on the BLS Employee Benefits in the U.S. Report[20], which presents data on benefits by summary occupation and industry. Estimates on the quality of jobs created by the Camilla Solar Farm Development Project were included in this community economic impact analysis, which found that 70% of the jobs created by the construction of the Camilla Solar Farm Development Project offer access to retirement benefits and 76% offer access to medical benefits. There is no way of estimating the number of jobs providing employee stock programs, but according to the ESOP Association[21] 10% of workers nationally have access to stock purchase plans.

[20] Data are for March 2011 – see http://www.bls.gov/ncs/ebs/sp/ebnr0017.pdf .
[21] http://www.esopassociation.org/media/media_statistics.asp

The results of the occupational analysis conducted for the construction of the Camilla Solar Farm Development Project are presented in Table 5, which presents an analysis of the jobs by level of education and training required, and Table 6, which presents a list of jobs created in the leading occupations for the construction of the project. Because of the small number (just 2.8) of FTE jobs created by the Project's operational and maintenance spending, an occupational analysis was not conducted – but the solar technician jobs supported by the project can be accessible to low income individuals who complete a specialized training course.

Table 5

Employment by Educational Level

For the Construction of the

Camilla SFDP Facility

Item	Project Development and Onsite Labor Impacts	Module and Supply Chain Impacts	Induced Impacts	Total	% of Total
Total	**133.7**	**123.7**	**86.7**	**344.1**	100%
First Professional Degree	0	2	2	3	1%
Doctoral Degree	0	0	1	1	0%
Master's Degree	0	1	1	2	1%
Degree plus work Experience	5	6	3	15	4%
Bachelor's Degree	14	20	8	43	12%
Associate Degree	0	4	4	8	2%
Postsecondary vocational award	1	7	5	13	4%
Work experience in a related occupation	20	9	6	34	10%
Long-term on-the-job training	39	6	3	48	14%
Moderate-term on-the-job training	43	30	14	87	25%
Short-term on-the-job training	11	38	42	90	26%

Note: Totals may not sum due to rounding.

Source: IMPLAN and U.S. Bureau of Labor Statistics

Table 6

Top 15 Occupations

For the Jobs Created by the Construction of

Camilla SFDP Facility

Occupation	Number of Jobs	Education Level
Carpenters	28	Long-term on-the-job training
Construction laborers	21	Moderate-term on-the-job training
First-line supervisors/managers of construction trades and extraction workers	14	Work experience in a related occupation
Office clerks, general	8	Short-term on-the-job training
Construction managers	8	Bachelor's degree
Retail salespersons	7	Short-term on-the-job training
Truck drivers, heavy and tractor-trailer	6	Moderate-term on-the-job training
Bookkeeping, accounting, and auditing clerks	6	Moderate-term on-the-job training
General and operations managers	6	Bachelor's plus experience
Executive secretaries and administrative assistants	6	Moderate-term on-the-job training
Cashiers, except gaming	6	Short-term on-the-job training
Secretaries, except legal, medical, and executive	6	Moderate-term on-the-job training
Laborers and freight, stock, and material movers, hand	5	Short-term on-the-job training
Civil engineers	5	Bachelor's degree
Janitors and cleaners, except maids and housekeeping cleaners	5	Short-term on-the-job training

Source: IMPLAN and U.S. Bureau of Labor Statistics

4.0 Methodology

This analysis used the National Renewable Energy Lab's (NREL) Jobs and Economic Development Impact (JEDI) model. Information about this model is available at http://www.nrel.gov/analysis/jedi/about_jedi.html. This model is available for free from the NREL, and can be regionalized. The NREL-JEDI model for Georgia was used in this analysis. The JEDI model can be used to estimate the economic impacts of constructing and operating power generation (including solar) and biofuel plants at the local (usually state) level.

JEDI estimates the number of jobs and economic impacts to a local area that could reasonably be supported by a power generation project, based on project-specific or default inputs (derived from industry norms). The JEDI model's data are based on interviews with industry experts and project developers. Economic multipliers contained within the model are derived from Minnesota IMPLAN Group's IMPLAN Professional model. Project specific total costs were used in this analysis, but they were distributed into specific areas using the JEDI model's defaults. The JEDI model' jobs, earnings, and output impact estimates are distributed across three categories:

- Project Development and Onsite Labor Impacts;
- Local Revenue, Equipment, and Supply Chain Impacts; and
- Induced Impacts.

The construction and operation of solar and other renewable energy projects is highly specialized. The JEDI model was used in this analysis because it is based on actual data on construction and operational expenditures associated with renewable power projects, while the more widely used economic models – such as RIMS II and IMPLAN – would include the construction and operation of renewable power projects in highly diversified sectors that would lack detailed information on actual spending patterns. The JEDI model is only available at the state level, while other models can be targeted geographically on a county or even zip code; however, it does contain more accurate, industry specific data on which to estimate impacts.

Appendix B:

Solar Jobs Study for the Camp Solar Farm Development Project

The Economic and Workforce Development Impacts of

The Camp Solar Farm Development Project

Prepared for:

Solar Design and Development

By:

Richard Clinch, Ph.D.

Date:

April 2012

5.0 Introduction and Summary

Solar Design and Development retained Richard Clinch, PhD Director of Economic Research at the Jacob France Institute of the Merrick School of Business at the University of Baltimore (JFI) to analyze the economic[22] and workforce development implications of the development of the Camp Solar Farm Development Project on the Georgia economy.[23] The two goals of this analysis are:

3. To prepare and present information on the economic and workforce development impacts resulting from the construction and operation of the Camp Solar Farm Development Project; and
4. To analyze the impact of the construction and operation of the Camp Solar Farm Development Project in terms of creating employment opportunities for low income residents in Georgia as a component of the use of New Market Tax Credits (NMTC) to support this project.

The Camp Solar Farm Development Project will have the following impacts:

- The construction and operation of the Camp Solar Farm Development Project will directly create 35.7 FTE construction-related jobs and partially support 0.7 FTE operational jobs maintaining and servicing the solar facility[24];
- The construction expenditures associated with the Camp Solar Farm Development Project will generate $10.3 million in economic activity in Georgia, and when multiplier effects are included, create 91.8 FTE jobs earning $4.2 million in employee earnings;
- Once the Camp Solar Farm Development Project is constructed and operational it will generate more than $640,000 per year in electricity sales;
- The annual operations and maintenance spending on in-State labor, maintenance and equipment will support 0.7 FTE Solar Maintenance Technicians and when multiplier effects are included support 1.2 FTE workers statewide, earning $66,352 and increase economic activity in Georgia by $115,932. The facility will generate an estimated $50,000 in annual property taxes; and
- Seventy-nine percent (79%) of the direct and multiplier effect jobs created by the construction of the Camp Solar Farm Development Project are low-skilled jobs accessible to low income residents, and an estimated 70% have access to retirement benefits and 76% have access to medical benefits. All of the direct jobs created by the operation of the solar facility will have access to benefits.

[22] This analysis does not assess the extent to which the Camilla Solar Farm Development Project competes with or substitutes for other development activity. Thus, this analysis measures the relationship between this development activity and the larger State of Georgia economy.

[23] The development is located in Mitchell County, Georgia; however, the National Renewable Energy Lab's (NREL) Jobs and Economic Development Impact (JEDI) model used is only available at the State level. As described in the Methodology Section below, this state-level model was used because it was created to analyze the impacts of the highly specialized solar and other renewable energy sector projects.

[24] The NREL-JEDI Model estimated jobs on a Full Time Equivalent (FTE) basis with one job equaling 1 FTE person year of 2,080 hours. The main economic impact of a solar facility is from its construction and a higher number of persons will be employed – but only on a part-time basis – on the construction site. Job impacts are presented on an FTE basis in order to better understand the actual number of jobs created on an annualized basis.

The Community Economic Impact of the Construction and Operation of the Camp Solar Farm Development Project

The Camp Solar Farm Development Project is a 4 MW solar facility that is proposed for development in Meriwether County, Georgia by Solar Design and Development The construction and operational cost inputs to the modeling analysis for this project were provided by Solar Design and Development and included the following:

- For pre-development construction-related impacts, the input to the NREL-JEDI Model[25] modeling was the actual $12.8 million construction budget for the Camp Solar Farm Development Project; and
- The annual operational impacts of the Camp Solar Farm Development Project were estimated by the NREL-JEDI Model modeling based on the annual 4 MW capacity of the facility, with in-State operational expenditures and job creation estimated by the JEDI model based on the operational characteristics of similar facilities.

Based on these inputs, Richard Clinch, PhD used the NREL-JEDI Model to estimate the economic, employment and employee earnings impacts of the construction and operation of the Camp Solar Farm Development Project on the Georgia economy.

Table 1

Camp SFDP Facility

Construction and Operational Information

Item	
Project Development Cost	$12,806,536
Construction Cost	$11,307,431
Generation Capacity	4
Operational Revenue (2015)	$644,702
Annual Operating Costs	$130,000
Operational Job Creation	0.7

Source: Solar Design and Development

As presented in Table 2, the $12.8 million in construction expenditures associated with the construction of the Camp Solar Farm Development Project will generate $10.3 million in economic activity in Georgia, create or support 91.8 FTE jobs earning $4.2 million in employee earnings. A total of 35.7 FTE on-site, construction-related jobs are estimated to be created over the construction of the Camp Solar Farm Development Project. It is important to note that the NREL-JEDI model only includes the amount of spending it estimates as likely to occur locally – in the market being studied. Because of the highly specialized nature of solar power plant construction, a large share of the machinery and equipment associated with the development of a

[25] For a description of the model – see the Methodology Section below.

project are likely to be imported from outside of the region, and are, therefore, not counted in the economic and job impacts analysis.

Table 2

Camp SFDP Facility

Economic Impacts of Construction Expenditures

(Jobs and 2012$)

Construction Phase	Annual Jobs	Annual Earnings (2010$)	Annual Output (2010$)
Project Development and Onsite Labor Impacts	35.7	$1,908,305	$3,140,806
Construction and Installation Labor	15.9	$1,030,313	--
Construction and Installation Related Services	19.7	$877,991	--
Module and Supply Chain Impacts	33.0	$1,394,563	$4,269,333
Induced Impacts	23.1	$850,052	$2,919,490
Total Impacts	91.8	$4,152,920	$10,329,629
Average Employee Earnings per Job ($s)	$45,255		

Source: JEDI Model

The ongoing economic activity generated in the Georgia economy by the operation of the Camp Solar Farm Development Project is presented in Table 3. Once the Camp Solar Farm Development Project is constructed and operational it will generate approximately $640,000 in electricity sales. The annual operations and maintenance spending on in-State labor and maintenance and equipment will support 0.7 FTE Solar Maintenance Technicians and when multiplier effects are included support 1.2 FTE workers statewide, earning $66,352 and increase economic activity in Georgia by $115,932. The facility will generate an estimated $50,000 in annual property taxes. It is again important to note that, as with construction impacts, the NREL-JEDI model only includes the on-site operational, maintenance, and support expenditures estimated as likely to occur in the region being studied.

Table 3

Camp SFDP Facility

Economic Impacts of Operations

(Jobs and 2012$)

Operational Phase	Annual Jobs	Annual Earnings (2010$)	Annual Output (2010$)
Onsite Labor Impacts			
PV Project Labor Only	0.7	$44,583	$44,583
Local Revenue and Supply Chain Impacts	0.3	$13,643	$43,438
Induced Impacts	0.2	$8,126	$27,911
Total Impacts	1.2	$66,352	$115,932
Annual Property Tax Revenues	$50,000		

Source: JEDI Model

6.0 NMTC Impacts of the Construction of the Camp Solar Farm Development Project

The NMTC program's goal is that funded projects will have a positive community development and economic impact on distressed communities. One of the key benefits tracked by the program is the number of jobs for low-income persons that are created or maintained. In the Community Impact portion of the NMTC funding application, applicants are asked to present the number of Jobs Created or Maintained by any predevelopment/construction and properties developed by QLICIs for planned investments. This analysis will present the results of the job impact estimates for the project presented above in a format applicable to the NMTC Program's goals.[26]

There is no generally accepted means of estimating the number of jobs held or that could be held by low-income individuals. This analysis, therefore, estimates the number of jobs created that is low-skill and therefore, accessible in terms of skills profiles to low income populations, who generally have lower levels of educational attainment and job skills. This was accomplished by using an occupational matrix based on U.S. Bureau of Labor Statistics (BLS) occupational employment developed by IMPLAN. This matrix allows for the estimation of the occupational profile of the jobs estimated by

[26] This is based on the 2010 NMTC application. Future applications may require different community impact calculations.

the IMPLAN model. Each of the occupations in the matrix has been coded according to the minimum level of education and/or training required to fill a position using BLS data (http://www.bls.gov/emp/empeted1.htm). This allows for the estimation of low-skilled jobs, which for the purposes of this analysis includes any occupation requiring less than an Associate's Degree.

As presented in Table 4, the construction and operation of the Camp Solar Farm Development Project will create 30.4 FTE construction-related low-skilled jobs accessible to low-income individuals and, when multiplier effects are included, a total of 72.7 low-skilled jobs accessible to low-income individuals over the construction period. Because of the small number of jobs (less than one FTE job) created by the Project's operational and maintenance spending, the low skilled analysis and occupational benefits analysis was not conducted for operational spending. However, the solar technician involved in both the installation and the operational maintenance of solar facilities are open to lower skilled workers who complete specialized training at a community college or career school and will receive benefits.

Table 4

NMTC Impact Calculations

The Low-Skilled Jobs and Benefits Associated with the Jobs Created or Maintained by the Camp SFDP Facility

Item	Project Development and Onsite Labor Impacts	Supply Chain and Induced Impacts	Total Jobs
Pre-Development or Construction	35.7	56.1	91.8
Low-Skilled Jobs	30.4	42.3	72.7
Estimated Jobs with Retirement Benefit	24.9	39.3	64.2
Estimated Jobs with Medical Benefit	27.7	42.3	69.9
Percentage of Jobs			
Low-Skilled Jobs	85%	75%	79%
Estimated Jobs with Retirement Benefit	70%	70%	70%
Estimated Jobs with Health Care Benefit	78%	75%	76%

Source: Richard Clinch, IMPLAN and U.S. Bureau of Labor Statistics

The CDFI Fund is also interested in the quality of the jobs to be created by investments. The data from the occupational employment analysis conducted were used to estimate the access to benefits for the jobs created, based on the BLS Employee Benefits in the U.S. Report[27], which presents data on benefits by summary occupation and industry. Estimates on the quality of jobs created by the Camp Solar Farm Development Project were included in this community economic impact analysis, which found that 70% of the jobs created by the construction of the Camp Solar Farm Development Project offer access to retirement benefits and 76% offer access to medical benefits. There is no way of estimating the number of jobs providing employee stock programs, but according to the ESOP Association[28] 10% of workers nationally have access to stock purchase plans.

[27] Data are for March 2011 – see http://www.bls.gov/ncs/ebs/sp/ebnr0017.pdf .
[28] http://www.esopassociation.org/media/media_statistics.asp

The results of the occupational analysis conducted for the construction of the Camp Solar Farm Development Project are presented in Table 5, which presents an analysis of the jobs by level of education and training required, and Table 6, which presents a list of jobs created in the leading occupations for the construction of the project. Because of the small number (less than 1) of FTE jobs created by the Project's operational and maintenance spending, an occupational analysis was not conducted – but the solar technician job supported by the project can be accessible to low income individuals who complete a specialized training course.

Table 5

Employment by Educational Level

For the Construction of the

Camp SFDP Facility

Item	Project Development and Onsite Labor Impacts	Module and Supply Chain Impacts	Induced Impacts	Total	% of Total
Total	**35.7**	**33.0**	**23.1**	**91.8**	100%
First Professional Degree	0.0	0.4	0.4	1	1%
Doctoral Degree	0.0	0.0	0.2	0	0%
Master's Degree	0.0	0.3	0.3	1	1%
Degree plus work Experience	1.4	1.7	0.8	4	4%
Bachelor's Degree	3.8	5.4	2.1	11	12%
Associate Degree	0.1	1.2	1.0	2	2%
Postsecondary vocational award	0.3	2.0	1.3	4	4%
Work experience in a related occupation	5.4	2.3	1.5	9	10%
Long-term on-the-job training	10.4	1.6	0.8	13	14%
Moderate-term on-the-job training	11.4	8.1	3.6	23	25%
Short-term on-the-job training	2.9	10.1	11.1	24	26%

Note: Totals may not sum due to rounding.

Source: IMPLAN and U.S. Bureau of Labor Statistics

Table 6

Top 11 Occupations

For the Jobs Created by the Construction of

Camp SFDP Facility

Occupation	Number of Jobs	Education Level
Carpenters	7	Long-term on-the-job training
Construction laborers	6	Moderate-term on-the-job training
First-line supervisors/managers of construction trades and extraction workers	4	Work experience in a related occupation
Office clerks, general	2	Short-term on-the-job training
Construction managers	2	Bachelor's degree
Retail salespersons	2	Short-term on-the-job training
Truck drivers, heavy and tractor-trailer	2	Moderate-term on-the-job training
Bookkeeping, accounting, and auditing clerks	2	Moderate-term on-the-job training
General and operations managers	2	Bachelor's plus experience
Executive secretaries and administrative assistants	2	Moderate-term on-the-job training
Cashiers, except gaming	2	Short-term on-the-job training

Source: IMPLAN and U.S. Bureau of Labor Statistics

7.0 Methodology

This analysis used the National Renewable Energy Lab's (NREL) Jobs and Economic Development Impact (JEDI) model. Information about this model is available at http://www.nrel.gov/analysis/jedi/about_jedi.html. This model is available for free from the NREL, and can be regionalized. The NREL-JEDI model for Georgia was used in this analysis. The JEDI model can be used to estimate the economic impacts of constructing and operating power generation (including solar) and biofuel plants at the local (usually state) level.

JEDI estimates the number of jobs and economic impacts to a local area that could reasonably be supported by a power generation project, based on project-specific or default

inputs (derived from industry norms). The JEDI model's data are based on interviews with industry experts and project developers. Economic multipliers contained within the model are derived from Minnesota IMPLAN Group's IMPLAN Professional model. Project specific total costs were used in this analysis, but they were distributed into specific areas using the JEDI model's defaults. The JEDI model' jobs, earnings, and output impact estimates are distributed across three categories:

- Project Development and Onsite Labor Impacts;
- Local Revenue, Equipment, and Supply Chain Impacts; and
- Induced Impacts.

The construction and operation of solar and other renewable energy projects is highly specialized. The JEDI model was used in this analysis because it is based on actual data on construction and operational expenditures associated with renewable power projects, while the more widely used economic models – such as RIMS II and IMPLAN – would include the construction and operation of renewable power projects in highly diversified sectors that would lack detailed information on actual spending patterns. The JEDI model is only available at the state level, while other models can be targeted geographically on a county or even zip code; however, it does contain more accurate, industry specific data on which to estimate impacts.