ORIGINAL NEW APPLICATION

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BEFORE THE ARIZONA CORPORATION COMMISSION

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E-01345A-09-0261

IN THE MATTER OF ARIZONA PUBLIC SERVICE COMPANY'S APPLICATION FOR APPROVAL OF CONCENTRATING SOLAR POWER PURCHASE AGREEMENT	DOCKET NO. E-01345A-09-_____ **APPLICATION**

Pursuant to the Renewable Energy Standard ("RES") Rules,[1] and consistent with the Company's Resource Plan,[2] Arizona Public Service Company ("APS" or "Company") seeks certain approvals associated with a Power Purchase Agreement ("PPA") to procure renewable energy from a proposed concentrating solar power ("CSP") resource ("Starwood Solar I" or "Starwood") from Starwood Solar I, L.L.C. ("Starwood Solar"), the project developer. The PPA will allow APS to procure the full output from the 290 megawatt ("MW") project for a thirty year period beginning June 30, 2013. This transaction reflects APS's perspective that renewable energy has a significant role in the Company's long-term resource plan to provide for its future energy needs. This is evidenced by the fact that with the addition of the Starwood PPA, APS is projected to double the RES Annual Renewable Energy Requirement[3] in 2014, effectively reaching compliance with the 2019 requirement five years early.

The successful development of Starwood Solar I is contingent upon several factors, including an Arizona Corporation Commission ("Commission") order in support of the PPA,

[1] A.A.C. R14-2-1801 through 1816. A.A.C. R14-2-1804(G) specifically allows for Commission preapproval of renewable energy contracts.

[2] APS's Resource Plan was filed with the Commission on January 29, 2009 (Docket No. E-01345A-09-0037).

[3] A.A.C. R14-2-1804(B). The Annual Renewable Energy Requirement for 2014 is 4.5% of a utility's retail sales; the 2019 requirement is 9%.

as well as the successful siting, permitting, interconnection, and financing of the project. The impact on the APS resource portfolio and the financial expense of the Starwood PPA, which is expected to be greater than $100 million per year or more than four billion dollars over its thirty-year term, are the reasons that APS is seeking a determination from the Commission that this transaction is appropriate and reasonable. Additionally, a Commission determination on this transaction is needed because under the current economic conditions, credit markets continue to be challenging, and more than ever, potential financiers are seeking assurances that there is regulatory support for projects before committing to the necessary debt and equity financing.

A. Description of the Project

The Starwood CSP plant will use parabolic trough solar technology and have six hours of thermal energy storage capability[4] to produce approximately 290 MW of capacity. The parabolic trough solar collector technology that Starwood will utilize is well established for use in power plant applications, and has been in commercial operation for over twenty years. Starwood is projected to provide approximately 900,000 megawatt hours ("MWh") of renewable energy for APS's customers each year. Operating at full capacity, it can meet the electricity needs of approximately 70,000 Arizona homes.

With its thermal energy storage capability, Starwood Solar I will provide capacity at the time of APS's system peak and operate at an average capacity factor of greater than 90% during those times when APS's customers most need electricity, from noon until 8:00 p.m. during the months of June through September. The ability to provide power during peak demand periods makes this an ideal technology for the APS system. The thermal energy storage capacity allows APS to maximize output during summer peak periods, which is of considerable value in the desert with its extreme summer temperatures and substantial air conditioning load.

[4] Thermal energy storage allows solar energy to be collected and stored for an optimized dispatch of the power plant to match the demand for electricity.

Assuming all necessary approvals, Starwood Solar I will be constructed south of Interstate 10 in the Harquahala Valley, approximately 75 miles west of metropolitan Phoenix. APS will take delivery of the renewable energy at the Delany Substation, a planned 500 kilovolt ("kV") facility a few miles from the Starwood site.[5] It is anticipated that approximately 1,000 workers will be needed to construct Starwood, and approximately 75 employees will be required to operate the plant after it becomes commercially operable in the summer of 2013.

B. Description of Project Developers

Starwood Solar I, L.L.C. is a special purpose entity formed to develop, construct and own Starwood Solar I, and is a wholly-owned subsidiary of Starwood Energy Group Global L.L.C. ("Starwood Energy"). In November 2007, Starwood Energy, a private equity firm located in Greenwich, Connecticut that focuses on energy and infrastructure investment, teamed with Lockheed Martin Corporation ("Lockheed Martin") to pursue utility-scale solar generation projects in North America. Lockheed Martin is an industry leader in the research, development, manufacture, and integration of advanced technology systems related to defense, aeronautics, communications, and electronics. Lockheed Martin will be the engineering, procurement, and construction contractor and provide operations and maintenance for the Starwood project.

Principals at Starwood Energy and its affiliates have significant experience in acquiring, financing, developing, managing, and operating both conventional and renewable power plants across the United States. They have developed or acquired 37 energy and infrastructure projects valued at more than $4.6 billion. Starwood Energy and Lockheed Martin have also assembled a team of industry expert consultants, advisors, and subcontractors to assist with legal matters, permitting, environmental issues, transmission, and other issues. Starwood Energy and Lockheed Martin have prepared a document

[5] The Delany Substation will be located three to four miles from the Starwood Solar I, depending on the plant's final location and design.

providing a description of the project, their team, and the significant economic benefits a project like Starwood brings to Arizona, which is attached as Exhibit B.

C. Power Purchase Agreement

Starwood Solar proposed this solar project in response to APS's 2008 Renewable Request for Proposal ("RFP"). The RFP was issued on June 5, 2008 seeking RES-eligible technologies with in-service dates no later than December 31, 2013. Projects were also required to produce a minimum of 35,000 MWh annually. In August 2008, APS received 51 qualifying proposals from 32 separate entities. More than 80% of the qualifying proposals were solar-based technologies. In May 2009, after completing a full evaluation and several months of negotiations, APS and Starwood Solar executed a thirty-year PPA for the full output of Starwood Solar I.

Over the term of the contract, the cost to APS is an approximate 8% premium over the cost of the conventional resource alternatives,[6] which is competitive with other renewable energy projects. The contract includes energy-based pricing, in which APS only pays for the energy that the plant actually produces at a fixed, on/off peak price with a modest annual escalation. The total notional value of the contract is more than $100 million per year, and more than four billion dollars over the thirty-year term of the contract. The PPA includes performance guarantees, damage provisions and termination rights, as typically found in long-term PPAs. There are also contractual provisions related to Commission approval, and APS is requesting that the Commission make its determination regarding this PPA by the November 2009 Open Meeting.[7]

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[6] This does not include the potential financial impact of avoided carbon emissions, which is difficult to estimate at the time. The 8% premium also does not include the impact of imputed debt, although imputed debt does place a measurable financial burden on the Company resulting in real costs that must be recovered in a future rate case. Had APS included imputed debt using the currently published Standard & Poor's methodology, the cost of the Starwood PPA would be an approximately 13% premium.

[7] A November 2009 decision allows for a <u>final</u> Commission order by the contractual date of January 31, 2010, after which the contract may be terminated. If Commission approval is delayed beyond January 31, 2010, the PPA also includes a term that allows Starwood Solar to provide a new contractual price to APS. If this provision is elected by Starwood Solar and accepted by APS, APS will continue to have fixed and certain pricing, and Starwood Solar will have a means to mitigate commodity cost exposure on the project.

A number of additional contract provisions are summarized in the attached Exhibit A. Because specific details of many of the contract's commercial terms are competitively confidential, the full contract will be provided to the Commission pursuant to an executed protective agreement. Commission Staff will also be provided economic analysis and other competitively confidential data that supports the agreement.

D. Benefits of Starwood Solar I

There are a number of factors that have influenced the Company's decision to pursue this CSP resource. As described at length in the Company's Resource Plan,[8] APS believes that the diversification of energy sources is critical to maintaining a reliable, cost-effective electric system. The Starwood PPA is consistent with the Three-Year Action Plan[9] set forth in the Resource Plan, which addresses APS's intention to add over 450 MW of new renewable resources in the 2013 to 2016 timeframe. Additionally, the Starwood PPA provides APS with a firm resource that will help the Company meet its customers' summer capacity needs, thereby eliminating the need to acquire additional peaking resources.

In addition, the long-term nature of the PPA and the associated fixed pricing schedule will provide APS's customers with significant price stability in the future. APS estimates that this project will reduce the Company's incremental natural gas consumption costs by approximately $55 million per year. This reduction in natural gas consumption provides the added benefit of acting as a hedge against natural gas price fluctuations.

APS recognizes that renewable energy will become more important under the prospects of carbon legislation. The Starwood transaction reduces the Company's exposure to the cost of compliance with future carbon legislation. APS forecasts that the energy procured by this PPA will help the Company avoid carbon dioxide emissions by an average of approximately 475,000 tons per year.

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[8] Docket No. E-01345A-09-0037. The APS Resource Plan represents APS's plans for meeting customers' load growth through 2025. It presents a vision for a balanced resource portfolio, relying on the increasing role of renewable resources. Through the measures described in the Resource Plan, APS would continue its commitment to exceed the goals of the RES, and through the year 2025, the Company anticipates delivering over 50 percent more renewable energy than would have been required by the RES.

[9] *See* APS Resource Plan, Section 1.2.c, paragraph 1.a.

Although APS anticipates materially exceeding RES targets over the next several years. Starwood Solar I is part of the Company's RES compliance strategy. With the addition of Starwood, and assuming all currently anticipated projects reach commercial operation, APS expects to reach the 2019 RES target (9% percent of the Company's retail sales) in 2014, five years early. As discussed in APS's 2009 RES Implementation Plan,[10] experience across the nation continues to indicate that there is still significant risk of project failure with new renewable generation projects. Planning to exceed the RES target so that the Company has a better chance of meeting the RES target if one or more projects fail is one approach APS utilizes to mitigate that risk. With this in mind, APS is seeking a Commission determination that the acquisition of renewable resources above the requirement of the RES is appropriate and in the public interest.

E. Requested Findings

The Starwood Solar I project provides a significant opportunity for APS to diversify its energy resources at a reasonable premium. Starwood would provide an important new renewable resource to the APS portfolio that will help meet critical summer capacity needs, add a long-term fixed-price energy source, reduce the Company's dependence on natural gas, and reduce the Company's exposure to carbon risk. However, because the financial commitment is over $100 million per year, or stated differently, more than $4 billion over the life of the contract, and the amount of renewable energy acquired will be beyond the requirements of the RES, APS requests the Commission make the following findings:

1. The Starwood PPA was selected through a fair and competitive procurement process.
2. The Starwood PPA provides energy that is an Eligible Renewable Energy Resource pursuant to RES Rule R14-2-1802.

[10] Docket No. E-01345A-08-0331.

3. The Starwood PPA is a reasonable means of complying with the long-term RES requirements. Furthermore, the acquisition of renewable resources above the requirements of the RES is in the public interest.
4. In any subsequent inquiry into the prudence of the Starwood PPA, the expense of renewable energy purchased under the PPA should not be deemed imprudent because the expense is greater than that of conventional generation, or because it exceeds the RES requirements.

RESPECTFULLY SUBMITTED this 22nd day of May, 2009.

PINNACLE WEST CAPITAL CORPORATION
LAW DEPARTMENT

By:_____
Deborah R. Scott
Attorney for Arizona Public Service Company

ORIGINAL and thirteen (13) copies
of the foregoing filed this 22nd day of
May, 2009, with:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

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Exhibit A

Summary of the Power Purchase Agreement between
Arizona Public Service Company and Starwood Solar I L.L.C.

Commercial Terms

- *Overview:* APS has agreed to purchase all energy produced by Starwood Solar I for a period of thirty (30) years after it begins commercial operation. The commercial operation date is currently expected to be June 30, 2013.

- *Output Contract:* APS will purchase the energy produced by the solar power plant, subject to certain limits on how much energy APS is obligated to accept.

- *Renewable Energy Resource:* Starwood Solar I will be a qualified solar electricity resource under Arizona law and the rules of the Arizona Corporation Commission ("Commission"). Energy produced by the solar power plant will generate Renewable Energy Credits for APS and count towards its renewable energy resource requirements.

- *Pricing:* Fixed on/off-peak pricing with modest escalation.

- *Contingencies:* Starwood Solar has the option to terminate the Agreement if it does not receive suitable financing within 120 days following the later of a Commission final order or January 31, 2010. There are also termination options related to receiving a final order from the Commission by certain dates.

Description of Solar Power Plant

- *Location:* Harquahala Valley in western Maricopa County, approximately 75 miles west of downtown Phoenix.

- *Delivery Point:* Delany 500 kV Substation (to be constructed).

- *Technology:* Parabolic trough solar technology with a thermal energy storage system designed to add up to six (6) hours of stored energy under normal solar conditions

- *Nameplate Rating:* 290 MW

- *Annual Output:* 900,000 MWh (approximately)

Summary of the Power Purchase Agreement between
Arizona Public Service Company and Starwood Solar I L.L.C.

Performance Guarantees and Collateral

- *Performance:* The Agreement includes certain performance guarantees designed to ensure Starwood is a reliable energy resource for APS and its customers. The performance guarantees include requirements that the plant meet a certain output and capacity each year for minimum annual output and minimum capacity. There are penalties for significant underperformance.

- *Financial Security:* The Agreement includes provisions for both pre-development and post-development security from Starwood Solar. Security provisions are included to protect APS and its customers from project failure both before and after construction of the plant.

STARWOOD
STARWOOD SOLAR I, LLC

Exhibit B

Arizona Public Service Company
Starwood Solar I ACC Application

1. Players and Roles

1.1. Legal Entity Overview

Starwood Solar I, LLC is a special purpose entity formed to develop, construct, own and operate the Starwood Solar I project, a 290MW concentrating solar thermal plant in Harquahala Valley, AZ. Starwood Solar I, LLC is a wholly owned subsidiary of Starwood Energy Group Global LLC, a private equity firm located in Greenwich, Connecticut, which focuses on energy and infrastructure investment.

1.2. Development Team

In the course of developing Starwood Solar I, Starwood Energy and Lockheed Martin, the engineering, procurement, and construction (EPC) contractor and O&M provider, have assembled a team of expert consultants, advisors, and subcontractors.

Development efforts are being coordinated by Nautilus Solar Energy, an affiliate of Starwood Energy and a leader in the development of distributed photovoltaic generation as well as utility scale solar. Project management and technical expertise are being provided by Optimal Results, LLC, who recently worked with Starwood Energy to complete the development and construction of the 120MW Midway Peaker Project in Firebaugh, California.

As EPC contractor, Lockheed Martin will continue to leverage industry support to bring additional expertise and proven technology to the project. Lockheed Martin has hired a former manager of the SEGS projects and has developed relationships with many of the suppliers that will be used on the project.

1.3. Starwood Background

Starwood Energy Group Global is a private equity fund headquartered in Greenwich, Connecticut that invests in energy and infrastructure projects throughout North America. Starwood Energy is an affiliate of Starwood Capital Group, a leading real estate private equity firm founded in 1991 with completed transactions representing over $20 billion in total value. Principals at Starwood Energy and its affiliates have significant experience in acquiring, financing, developing, managing, and operating both conventional and renewable power plants across the U.S., having developed or acquired 37 energy and infrastructure projects totaling more than $4.6 billion in value.

To date, Starwood Energy has committed to energy infrastructure transactions totaling $3.2 billion of enterprise value including the Neptune Regional Transmission System, a 660 MW undersea power cable connecting Long Island to New Jersey, CalPeak Power, LLC, a 260 MW portfolio of five natural gas-fired peaking power plants in California, Thermo Cogeneration Partnership LP, a 272 MW combined cycle plant and greenhouse steam-host located near Denver, and a minority interest in the Mead-Adelanto and Mead-Phoenix transmission lines. Starwood Energy also recently finished construction of a 120 MW simple cycle peaking facility near Fresno, California called the Midway Peaker Project.

In December 2008, Starwood acquired a 90% interest in Nautilus Solar Energy, a leading electric power generating company headquartered in Chatham, New Jersey that develops, constructs, finances, owns, and operates distributed solar generation. Nautilus currently owns seven operating solar power generation facilities with four more under construction.

1.4. Lockheed Martin Background

Lockheed Martin Corporation is an industry leader in the research, development, manufacture, and integration of advanced technology systems related to defense, aeronautics, communications, and electronics. Lockheed Martin has acted as lead contractor for numerous multi-billion dollar projects and has extensive power & control systems capabilities that are highly transferrable to solar trough technology.

In 2007, Lockheed Martin created a group within its Maritime Systems & Sensors group to focus exclusively on renewable energy generation, which includes Lockheed Martin engineers and solar industry experts, and a former manager of the Solar Energy Generating Systems (SEGS) projects in California. On April 22, 2009, Lockheed Martin unveiled its Solar System Test and Engineering Site (SolSTES), a full-scale solar trough demonstration plant which will allow Lockheed Martin to further refine its production metrics and experiment with an assortment of vendor products.

Lockheed Martin and Starwood Energy Group have agreed to jointly pursue utility-scale solar generation projects in North America. Under the agreement, Lockheed Martin is responsible for engineering, procurement, manufacturing and systems integration and will provide a turn-key, date-certain contract. Lockheed Martin reported total revenue of $42.7 billion in 2008 and is rated Baa1/A- by Moody's and S&P, respectively.

2. Project

2.1. Describe the plant, site and interconnection

Starwood Solar I will be constructed on two adjacent plots in Maricopa County, west of Phoenix, Arizona, totaling 1,880 acres. Both plots have been secured under land option agreements. The land is currently used for agricultural purposes and has access to water through on-site wells. The project will interconnect to the grid via the proposed Delany Substation.

The 290-megawatt (nominal) facility would consist of over 3,000 one-hundred meter parabolic troughs, two 145-megawatt steam turbine generators (STGs), a molten salt thermal energy storage system, cooling towers, evaporation ponds, a switchyard, and other associated plant equipment. The project would also require on-site and off-site improvements such as a natural gas pipeline and metering station (for the sole purpose of providing the required initial heat to the salt tanks at COD), storm water retention basins, telecommunications lines and road improvements, among others.

The project site arrangement would generally consist of a three-square mile, "L"-shaped arrangement of parabolic trough solar collectors surrounding a centrally located power block. The long segment of the "L" is orientated north to south, and the short segment of the "L" runs east to west. The power block facility, located where the segments intersect, would house the majority of electrical generation equipment and related systems, with the exception of the solar field. The solar collectors would be constructed in long rows across the project site and aligned side by side in a north-south orientation to allow the parabolic troughs to slowly rotate from east to west, tracking the movement of the sun. Adjoining the power block would be various support facilities including the administration and storage buildings. To the east of the power block would be impoundments to allow for the evaporation of treated wastewater discharged from the plant. Directly to the west of the power block would be a series of tanks containing molten salt for the thermal storage system.

Starwood Energy has drafted a permitting and environmental schedule, which includes major permits such as the CEC Application, an Aquifer Protection Permit, Maricopa County permits, and a Minor Source Title V Air Permit, all of which will be filed with the appropriate agencies on or before September 30, 2009.

2.2. Overview of the technology and operations

The basic process for solar electric power generation would be to utilize parabolic trough solar collectors to concentrate solar energy onto heat collection elements (HCE) that contain a fluid, referred to as heat transfer fluid (HTF). After being heated in the solar parabolic troughs, the HTF would be pumped through heat exchangers where it would heat water into superheated steam. In the next stage, the

steam would be converted into electricity utilizing two Rankine-cycle reheat steam turbine electric generators, which are housed in the power block facility. After the steam is cycled through the turbine, it would be processed through a condenser where it would be returned back to liquid form (water) and recycled through the system again to drive the steam turbine. Heat from the condenser would be processed through a separate fluid path through a cooling tower.

Starwood Solar I – Process Configuration

All or a part of the energy collected by the solar collector field may be placed in the thermal energy storage system by passing the HTF through heat exchangers that would absorb the heat from the HTF and store it in molten salt. The heat would then be returned to the HTF at a later time by transfer through the same power block heat exchangers, and power produced in the typical manner described above.

1. *Solar Collector Field.* The solar collector field requires the most geographical area for this project; over 3,000 Solar Collector Arrays (SCA) will be arranged. Each SCA is comprised of eight 12-meter long solar collector modules of highly reflective, thick glass mirrors mounted to precisely aligned aluminum space frames. The SCAs are mounted on pylons, which are bolted onto concrete footings, with the center pylon supporting the axis tracking actuator. The SCAs are oriented North to South and, via hydraulic actuator motors mounted at the center of the SCA, accurately track solar movement on one axis from east to west to maximize the daily collection of solar energy. The function of the SCA is to collect solar energy and concentrate it over eighty times onto the HCEs, which are located at the focal point of the parabolic mirror.

   The HCE, or solar receiver tube, is a four-meter long device, comprising a 70 mm stainless steel pipe coated with absorbing material at the center, surrounded by glass enclosure that provides a vacuum seal. HCE are welded together in a line on each 12-meter collector. The HTF is circulated through the HCE via the pressurized HTF distribution system, which is comprised of HTF pumps, expansion tanks and header pipes. Cool HTF enters on one side of the loop and is heated to 736 degrees Fahrenheit at exits from the other side. The Expansion Tanks provide for HTF expansion. Expansion tanks will be installed in the HTF Distribution Subsystem to provide venting of moisture and to create positive head pressure to the pump's input. The Expansion Tank includes a Foundation, HTF Nitrogen Blanketing System, and HTF Tank Heating System. The HTF Nitrogen Blanketing System is used to maintain positive pressure in the space in the tank to prevent air and moisture from entering the HTF distribution system. The HTF circulating Pumps are connected to the Cold Header. The Pumps move the HTF throughout the Solar Field and through the Power Block and TES. Adequate access and maintenance space around the pumps and other equipment is being incorporated into the facility arrangement.

2. *Steam Turbine Generator and Balance of the Plant.* The thermal energy from the solar collector field or thermal energy storage system would be transferred from the HTF to the steam generating system, and that steam output is used to drive twin turbines to produce 290 MWe gross. A solar superheater and solar reheater would be included in the steam generating system to maintain desired steam quality and, in turn, improve the efficiency of the HTF to steam interface. Twin STGs not only increase plant efficiency by allowing optimum power block sizing, they provide redundancy and a means to maintain power production during both scheduled maintenance and forced outage periods. Once the steam has expanded through the twin turbines, water-cooled condensers would return the steam to its liquid state so that it can be recycled throughout the balance of plant. Steam turbine drains are directed through feed water heaters to improve Rankine cycle and overall plant efficiency. The steam turbine provides the driving force to spin the generator, which converts the mechanical energy into electrical output. The STGs include the following items:

   - Governor systems
   - Steam admission system
   - Gland seal system
   - Lubricating oil system and associated coolers
   - Generator coolers
   - Acoustical enclosure

   Condensers will be used to maximize efficiency of the solar power plant. The Condenser subsystem includes the steam to water condenser, the mechanical draft cooling towers, the make-up water system, water purification and treatment facilities, and the blow-down system with evaporation pond.

   Before the water can be used in the steam power block and cooling towers, the water must be treated. Well water will be treated to remove dissolved solids and hardness prior to for cooling tower. Treated well water is then processed through a reverse osmosis (RO) system for use as cycle make-up and SCA mirror wash water. This subsystem requires storage tanks to hold the treated water for later use.

   Two chemical injection facilities will exist within the steam power block. The first water treatment is for the basic steam cycle. Steam cycle water is treated to minimize corrosion in the steam generator and condensate piping. The chemicals used in steam cycle water treatment can be injected in the deaerator.

   The second chemical injection subsystem is for the cooling tower. Cooling tower water treatment will be required to minimize corrosion and biofouling in the circulation water piping.

The Waste Water Treatment subsystem is used to store and process waste water. The components of this subsystem are storage tank, stripping system, and associated pumps and piping. An evaporation pond, complying with on-site environmental conditions and regulations is planned.

The Power Block contains two sources of Electrical Power Generation. The primary source is the high Power Generator mechanically connected to the Steam Turbines. As planned, each generator will be rated at a maximum gross power output of 167 MVA electrical. The output voltage of this generator is expected to be 13.8 KV, 60 Hz, with a Power Factor of 0.85 lagging or better.

Two MW diesel powered back-up generators are planned also to be included in the power block to supply internal plant power during emergencies when power may not be available from the grid. The diesel Back-Up Generators will connect to the 4.16 KV, 60Hz, Station Service Bus to supply up to 2 MW of power for distribution to plant equipment and facilities.

3. *Cooling Towers.* Wet cooled forced mechanical draft cooling towers will be used. These cooling towers are located northeast of the power block. The towers will be equipped with high efficiency drift eliminators. The cycles of concentration for the circulating water system will be determined subsequent to obtaining water quality for the make-up water source and associated water treatment system design.

4. *Thermal Energy Storage (TES) system.* The TES system components consists of heat exchangers, cold storage tanks operating a nominal temperature of 554 °F, hot storage tanks operating at a nominal temperature of 725 °F, nitrate salt circulation pumps, piping, TES Heating System, and the storage medium, a mixture of binary nitrate salts. The TES will collect energy to allow for the production of electricity in periods of inclement weather or shifting of production into the evening to better match energy delivery needs. The TES element is a two tank molten salt system that supports indirect thermal energy storage. TES is an indirect system because the fluid for the storage medium is different from the HTF circulated in the solar field. 60% sodium nitrate (NaNO3) and 40% potassium nitrate (KNO3). The TES has an insulated hot tank and an insulated cold tank designed to extract heat from the HTF by pumping the HTF from the solar field through one side of the oil-to-salt Heat Exchangers and molten salt from the cold tank through the other side, storing the heated molten salt in the insulated hot tank. During TES charging, heat is transferred through the set of heat exchangers from the HTF to molten salt and is stored for later use. The TES capacity will be equivalent to six (6) hours of full plant load. The notional TES design has multiple tanks and heat exchanger/pump trains, each set sized to hold just under 60 MWe (33,000 metric tons) of solar salt. There is an estimated total of 145,500 metric tons of solar salt required for the TES system.

The TES Hot and Cold tanks will be made of carbon steel and will be well insulated to store energy for up to one week. The TES tank size is estimated to be 52 feet in height and have a diameter of 128 feet. The tanks will allow venting and incorporate freeze prevention. Salt temperatures in the tank, salt flow and salt levels will be continually monitored. Pressure in the tank will be monitored. The TES system is also a source of heat for the HTF system to prevent freezing in the solar fields during short duration shutdowns on winter nights.

2.3. Financing

2.3.1. Sources for debt and equity and specifically Lockheed Martin

Starwood Energy expects to finance the project with a combination of project debt, tax equity, and sponsor equity. Despite the recent condition of credit markets globally, the project finance market remains open for high quality energy and infrastructure projects that have long-term contracts with credit counterparties. Starwood Energy has continually solicited feedback from its relationship lenders and believes the contemplated parameters of this financing are achievable. Tax equity will be provided by one or more commercial participants. Sponsor equity will be provided 100% by Starwood Energy and its investment affiliates.

2.4. Briefly describe construction process, sourcing, and timeline

Construction on the Starwood Solar I project is expected to begin with site mobilization during the summer of 2010. Initial construction will include office complexes for on-site procurement and construction management personnel, site layout, and laydown area for material storage. Solar field construction will be divided into three sectors each covering nearly one square mile with construction on the first sector beginning in the fall of 2010. Thermal Energy Storage construction will begin in January 2011 followed by the Balance of Plant and Power Block in mid-2011.

Following major construction completion in January 2013, the project will transition the start-up and commissioning phase. This phase will include the testing and final integration of all mechanical and electrical systems to support Commercial Operation Date in June 2013.

As the EPC, Lockheed Martin will be responsible for the project's procurement of all materials, construction, and services. Lockheed Martin Sourcing has global experience and purchases over $20 billion in materials, construction, and services every year. Lockheed Martin's will have a dedicated procurement team to support the project and it will be co-located with the project team. Typical project controls will be flowed down to each major subcontractor to insure technical and schedule requirements are met.

2.5. Potential economic impacts, including but not limited to job creation

The preliminary economic impact analysis, conducted using the RIMS II (Regional Input-Output Modeling System) model, indicates a significant impact by the proposed Starwood Solar I project on Maricopa County and the State of Arizona. It is estimated that during the period from 2010 to 2013 Starwood Solar I will create 950 construction jobs, 50 engineering jobs and 75 plant operating jobs. Including indirect job creation, the total job impact of the project is expected to be 7,724. A breakdown of expected job impacts is included below:

Total Job Impact					
	Construction	Engineering	Plant Operations	Jobs Based on Purchases	TOTAL
Project Jobs	950	50	75		1,075
Indirect Jobs	1,181	57	181	5,230	6,649
Total	2,131	107	256	5,230	7,724

The project has an estimated positive economic impact of $2.7 billion for years 2010 to 2013, which includes spending for construction, engineering, operation and purchases of goods and services to outfit and maintain the project.

Starwood Solar I will provide a major revenue source for the local communities, as well as support the State of Arizona. The estimated annual tax revenue impact from employees (direct and indirect) is $29.9 million.

Potential Economic Impact		
Total Peek Job Impact	Total Money Impact	Total Annual Tax Revenue Impact*
7,724	**$2.7 Billion**	**$29.9 Million**

**It should be noted that the projected economic impact does not include the anticipated tax revenue that will be generated from the sale of power produced during the life of the facility.*

Bradford T. Nordholm
Chief Executive Officer
Starwood Solar I, LLC