



July 26, 2016

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RE: Request for Proposals for Long-Term Contracts for Clean Energy Projects
RFP Issuance Date: March 31, 2017

Dear Ms. Judson, Ms. Glover, Mr. Waltman, Ms. DiDomenico, and Mr. Gromer:

PowerBridge, LLC, of Fairfield, Connecticut, an experienced developer of energy infrastructure, is pleased to submit the enclosed proposal for the development, construction, and operation of the Gravel Pit Solar Park – a 26 MW-AC solar development located in East Windsor, Connecticut – in response to the subject RFP.

The Granite Pit Solar Park will be sited on land that is currently used for the mining of gravel aggregate. As such, it is ideally suited for solar development, with minimal impacts to the environment (including prime farm land or core forest), the surrounding community, or the electric system. Backed by the demonstrated successful experience of PowerBridge in renewable energy and major energy infrastructure, the Project will represent a material step in helping the Commonwealth of Massachusetts to reach its clean energy goals.

Our designated contact for this RFP is Christopher Hocker. Please do not hesitate in contacting him at (203) 416-5590.

Sincerely,

Edward M. Stern
President & CEO

Christopher Hocker
Vice President, Planning

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PowerBridge, LLC

Proposal for the sale of Bundled Energy and RECs from:



**GRAVEL PIT
SOLAR PARK**

Gravel Pit Solar Park

in response to:

The Request for Proposals for Long-Term Contracts for Clean Energy Projects issued by Electric Distribution Companies in Massachusetts and Massachusetts Department of Energy Resources.

RFP Issuance Date: March 31, 2017

Submission Date: July 27, 2017

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SECTION 1: CERTIFICATION, PROJECT AND PRICING DATA

Powerbridge, LLC ("PowerBridge" or the "Company") has attached:

1. The executed Certification and Authorization Form as **Appendix 1-0**.
2. The completed CPPD Form for our fully compliant Base Proposal with a new 115 kV PTF interconnection as **Appendix 1-1**.
3. The completed CPPD Form for our Alternative Proposal, which includes a 23 kV distribution interconnection as **Appendix 1-2**.

These proposals are more fully described in the Sections that follow, but for the Alternative Proposal, the Company is willing to accept all economic impacts associated with the distribution interconnection, including, but not limited to, losses to the PTF.

We are submitting these proposals under the Bid Category "Clean Energy Generation from New Class I RPS Eligible Resources via Long Term Contract".

The full Excel versions of the CPPD forms are included on the applicable CD ROMs.

SECTION 2: EXECUTIVE SUMMARY

PowerBridge, LLC ("PowerBridge" or the "Company"), of Fairfield, CT, is pleased to propose the Gravel Pit Solar Park ("Project") in response to the Massachusetts Clean Energy Projects request for proposals (the "RFP").

The project is a new 26 MW-AC solar power generating facility located in East Windsor, CT on 2 parcels that total 223 acres. The center of the facility will be located at the following coordinates: [REDACTED]. The facility will employ solar crystalline photovoltaic technology, for which the fuel type is sunlight. The Project will interconnect in the manner described in the Base and Alternative Proposal below.

Unlike many other large solar projects in southern New England, the Gravel Pit Solar Park can be developed with a high level of local support because the proposed site is currently and has historically been mined for gravel aggregate. The development of the Project will cause gravel mining and the related heavy truck traffic to stop.

As our Base Proposal, PowerBridge offers a bundled price for all energy and renewable attributes produced by the Project of \$ [REDACTED] / MWh for the Project's first year of commercial operations (12/31/2019 COD), escalating annually at a fixed rate of [REDACTED] for the 20-year term of the contract, as detailed in the CPPD form attached as *APPENDIX 1-1*. This offer assumes a conforming interconnection at a to-be-built 115 kV PTF switchyard located on the Project site. We expect that Eversource will ultimately own the switchyard.

The Project can be more cost effectively interconnected to an existing 23kV bus (non-PTF) in the Barbour Hill substation, which is owned by Eversource. Although a 23kV interconnection would not conform with the requirements of Section 2.2.1.3 of the RFP (as it is not PTF), if the Project is connected to the existing 23kV bus it would meet all the performance requirements of the RFP, including ISO-NE's Capacity Network Resource Interconnection Standard. As an Alternative Proposal, PowerBridge offers to pass on the savings of interconnecting with the 23kV system by offering a price for this Alternative Proposal of [REDACTED] / MWh for the Project's first year of commercial operations (12/31/2019 COD), escalating annually at a fixed rate of [REDACTED] for the 20-year term of the contract, as detailed in the CPPD form attached as *APPENDIX 1-2*. The Company is willing to accept all economic impacts associated with connecting at 23 kV, including, but not limited to, losses to the PTF.

The Project is designed using industry-standard crystalline solar technology, allowing it to deliver [REDACTED] MWh per year directly into the southern New England bulk transmission system. In addition, the Project is expected to qualify for up to [REDACTED] MW¹ of ISO-NE qualifying summer capacity in ISO-NE's Connecticut zone, which the Company plans to sell into the Forward Capacity Market independently of this RFP. Details of the Project's summer and winter period output are provided in the AWS Truepower ("AWST") memorandum attached as *Appendix 2-1*. PowerBridge agrees to Guaranty the required 70% of P50 output levels during the Winter Peak Period, as more fully described in Section 13.5. A memo from AWST concerning the Winter Peak Period output values is also attached in *Appendix 2-1*, and more fully described in Section 13.5.

¹ ISO New England ultimately determines the amount of Qualified Capacity through the FCM qualification process, using numerous pieces of data. AWST analyzed projected output during the winter a summer peak reliability periods that weigh in the ISO's determine the winter and summer Qualified Capacity. The AWST-determined values are included here and in *Appendix 2-1*. PowerBridge will submit whatever ISO-NE deems as Qualified Capacity into the Forward Capacity Auction.

Based on the Schedule presented in Section 10 of this proposal, the Project will be brought into commercial operation on or before December 31, 2019.

A preliminary environmental assessment indicates the Project site consists primarily of a gravel pit, with some agricultural and forest areas. The Project layout was designed to avoid impacts to state and local regulated inland wetlands and watercourses, FEMA designated floodplain and Natural Diversity Database (NDDDB) areas that are generally associated with Ketch Brook. Please see Sections 6.3 and 6.4 for a more thorough description of zoning related to the Project site and surrounding areas.

The Company's Base and Alternative Proposal pricing are effective for the requested 270 days.

Utility-scale solar facilities can offer unique benefits to power buyers in southern New England. By producing significant quantities of clean energy during on-peak hours, utility-scale solar facilities can help to moderate system peak load and stabilize the grid. Located in a congested transmission zone between Hartford and Springfield, the Project is sited advantageously for the Massachusetts grid. This enhances the Project's economic impact on moderating system peak load, especially during hot, peak summer days. Additionally, utility-scale solar facilities qualify for participation in the ISO-NE forward capacity market. Unlike distant renewables, this installed capacity can be used to help power buyers meet their local reliability requirements.

Because of these benefits, utility-scale solar projects in southern New England are an essential component of a balanced portfolio of clean energy resources in the New England states.

The Project offers unmatched benefits to buyers of renewable energy. In addition to noncontroversial development due to superior siting, recent advances in technology have significantly reduced the cost of large-scale solar facilities. Since the Energy from this Project, to a large degree, will be displacing more expensive fossil generation, reductions in LMP are expected to result, as well as reductions to hazardous emissions. Although the Company has not directly commissioned studies, ISO-NE and others have discussed and debated the price suppression impact associated with renewables. The corresponding emission reductions will help the Commonwealth meet their requirements under the GWSA.

In addition, since this Project will be participating in the Forward Capacity Market, the associated capacity will help to off-set potential increases in Forward Capacity costs to ratepayers from known and expected retirements in the ISO-NE control area.

PowerBridge combines an extensive background in large scale energy infrastructure projects with recent successful experience in the development, financing, construction, and operation of a total of 1,320 MW of high voltage electric transmission facilities, representing an investment of approximately \$1.5 billion. Its project portfolio includes two 660-MW underwater and underground transmission facilities built between 2005 and 2013 -- the Neptune Regional Transmission System and the Hudson Transmission Project -- both of which are interconnections between the power grids in New Jersey and New York, completed on budget and ahead of schedule. In addition, many of the key personnel at PowerBridge have extensive backgrounds in the development, financing, and operation of renewable energy facilities, including wind, solar, geothermal, biomass, and small hydro.

This proposal meets the Eligibility Requirements and the Threshold Requirements of the RFP. Eligibility Requirements compliance are demonstrated as follows:

- **Eligible Bidder:** The Company is the owner of Project and is therefore an Eligible Bidder.

- **Eligible Proposal:** The Project has (i) not been selected in the previous RFP solicitations described in the RFP, and (ii) the Project is a Clean Energy Generation project that does not participate in the Commonwealth's Net Metering Program.
- **Eligible Bid Category:** The Project represents Clean Energy Generation from a New Class I RPS Eligible Resource and conforms with Section 2.2.1.3 of the RFP
- **Allowable Forms of Pricing:** The Pricing is fixed in year 1, which changes by a defined rate over time (fixed escalator of [REDACTED])
- **Bidder Disclosure of Affiliations and Affiliate Relationships:** The Company disclosed the affiliations requested in the RFP (Section 5)
- **Contract Term:** The Company proposes a Contract Term of 20 years, which is allowable under Section 2.2.1.6
- **Minimum Contract Size:** The 26 MWs AC Project and contract amount exceed the minimum size requirement of 20 MWs.
- **Capacity Requirements:** The Company has submitted a request into the ISO-NE interconnection queue as a Capacity Network Resource and agrees to remedy any issues identified in the overlapping impact analysis. The Company understands the Distribution Companies will not be purchasing this Capacity under long-term contract. We have detailed the amount of Capacity we expect to clear in the Forward Capacity Auction Qualification in Sections 3 and 4 of this response, and *Appendix 2-1*.
- **Interconnection and Delivery Requirements:** The Company understands and agrees to all requirements under Section 2.2.1.9 of the RFP and, given the location of the Project and preliminary analysis, expect no material constraints or curtailment associated with Energy delivery.
- **Proposal Completeness:** The Company has followed the instructions in Appendix B of the RFP and has provided all information in CPPD Form that was applicable to its bid and entered "NA" where information was not applicable. We have provided comments on the applicable Draft Contract (*Appendix 15-1*).
- **Bid Fees:** The Company has calculated and submitted the bid fee according to Section 1.10 of the RFP.

Threshold Requirements are demonstrated below:

- **Site Control:** The Company has the exclusive right to acquire the Project Site, as detailed in Section 6.2 below.
- **Technical Viability; Ability to Finance the Proposed Project:** The Company is developing the Project using Tier 1 solar equipment and has demonstrated it has the ability to finance and develop the Project.

The Company has access to sufficient equity capital to fully fund the development and equity portion of construction. The Company also has considerable experience in project financing, which will contribute to the Project's financial viability.
- **Experience:** The Company has built a highly-qualified team, which brings considerable experience in the development, construction, financing, and operation of large-scale energy infrastructure projects.
- **Providing Enhanced Electricity Reliability within the Commonwealth:** As described in Section 7, the Project will deliver power directly into the New England bulk power system via a

new interconnection substation on the Project property, which will provide enhanced electricity reliability within the Commonwealth.

- **Contribution to Reducing Winter Electricity Price Spikes:** The Company is guaranteeing the required 70% of delivery profile during the Winter Peak Period based on the highly consistent performance of solar power facilities. This will contribute to reduction in winter price spikes.
- **Avoid Line Loss and Mitigating Transmission Costs to the Extent Possible and Ensuring that Transmission Cost Overruns, if any, are not Borne by Ratepayers:** With respect to this RFP response, all transmission costs are included as part of our Project costs (transmission to Point of Interconnection is generator lead). As such we are only collecting revenue, and therefore incurring costs to Ratepayers if we are delivering MWhs. The Company is highly incented and experienced at ensuring transmission costs are managed properly and designed in such a way as to reduce losses. With respect to Abandonment Costs, the Company is not submitting a separate transmission project into this RFP, and do not believe this section applies to us. That said, the Company will not seek FERC or any other agency or authority abandonment costs inconsistent with Section 2.2.2.6.2.
- **Guaranteeing Energy Delivery in the Winter Months:** The Company commits to guaranteeing 70% of the energy in their delivery profile during the Winter Peak Period.
- **Adequately Demonstrate Project Viability in a Commercially Reasonable Timeframe:** As the developer of significant energy infrastructure in America, the Company is extremely well versed in what it takes to successfully achieve Commercial Operation. We have provided a reasonable project schedule to accomplish this in Section 10 of our response.
- **Contribution to Employment; Economic Development Benefits:** The Project will create new jobs and sources of revenue for the East Windsor area, as detailed in Section 13 along with other Economic Development Benefits.
- **Utilizing an Appropriate Tracking System to Account and Enable for GWSA Goals:** The Company has committed to utilizing the New England Power Pool Generation Information Tracking System ("NEPOOL GIS") to ease the tracking generation attributes for purpose of GWSA compliance.
- **Security Requirements:** The Company acknowledges that the required level of security is \$20,000 per MWh per hour of the Contract Maximum Amount, half of which is due at contract execution and half of which is due upon regulatory approval.
- **Unreasonable Balance Sheet Impacts:** The Company acknowledges and accepts the Distribution Companies' right to decline proposals that place an undue burden on their balance sheet.
- **Facilitate Financing of Clean Energy Generation:** The Company has demonstrated that it meets the definition of a Clean Energy Generation. As discussed in Section 5.1, the increased revenue certainty associated with a contract award in this RFP is the primary reason we are able to offer the competitive pricing included here and necessary to secure long-term financing.
- **Proposal Certification:** The Company acknowledges that this proposal and the prices contained herein are valid for a period of 270 days.

SECTION 3: OPERATIONAL PARAMETERS

3.1 Maintenance Outage Requirements

The Project is designed to be near fully available on a continuous basis and does not require complete outages as a part of scheduled maintenance. Solar PV facilities do not require major overhauls. Any maintenance required can generally be accommodated during the night or days when cloud cover limits solar production. Inverters are typically taken offline for planned maintenance 2-4 days per year, but maintenance is generally staggered to allow the overall plant available for generation.

3.2 Operating Constraints

Project operations are primarily constrained by the availability and magnitude of daylight (solar irradiance). Therefore, the Project's ability to operate is limited to daylight hours between sunrise and sunset.

Over a year, the Project is capable of generating power an average of twelve hours per day. The shortest period of daylight occurs on December 21 (approximately 9 hours, 9 minutes), and the longest period occurs on June 21 (approximately 15 hours, 13 minutes). In order to generate power, a minimum of approximately 40 watts per square meter of solar irradiance must be available to 'wake up' the Project's inverters. This threshold is normally crossed within an hour after sunrise and an hour before sunset.

With respect to snowfall, panels are pitched for optimum energy transfer from the panels, which also lends itself to the self-shedding of snow on the panels. Required inspections include plowing away ground build-up of snow or ice accumulations on the lower portions of arrays. This is typically done following heavy or sustained snowfalls.

3.3 Reliability

The Project will add to the diversity of generation sources for the region and is immune from the market volatility of fuel supply and pricing because the fuel source—sunlight—is free and naturally delivered. Further, system output is capable of being scheduled through the use of short-term solar forecasting. Preliminary studies suggest the Project can also help ease transmission constraints because of its location.

The Project will physically deliver Energy and Capacity into southern New England, and will have a demonstrable positive impact on the reliability of the southern New England energy system, especially during the peak summer period when the ISO-NE control area experiences its peak load. Preliminary engineering suggests that the Project's interconnection will require relatively few upgrades to support the injection of its full output.

3.4 Moderation of System Peak Load

The Project will have the capability of moderating system peak load requirements, primarily during the summer period when the Project's monthly production will reach a maximum. With regard to peak load requirements, summer peak loads are typically driven by extended hot and humid conditions, which are also relatively sunny in nature. Therefore, system production will tend to be greater on summer peak load days as compared to production on an average day; this attribute will ease peak load requirements and the associated transmission constraints.

The Project will help to moderate system peak load in southern New England by delivering energy and capacity into the grid, especially during the summer peak hours. The Project is an intermittent resource and will have a first- year estimated average hourly output during the summer period (June-September) from 1:00 to 6:00 pm of [REDACTED] MW. The first-year estimated average hourly output for the winter period (October-May) from 5:00 – 7:00 pm is [REDACTED] MW.

3.5 Development Stage of Project

The Project is in the development stage. The Company has acquired the necessary Option Agreements (the “Option”) that provide the right to acquire the site [REDACTED], as described in Section 6. The Company has completed the necessary interconnection requests, and has also internally assessed the permitting and construction feasibility, as discussed further in Sections 6, 7 and 8, respectively.

The Project can be in service by December 31, 2019 provided that it receives a fully executed and approved power purchase agreement (“PPA”) by or before June 29, 2018 , as detailed in Section 10.

SECTION 4: ENERGY RESOURCE PLAN

4.1 Energy Resource Plan

AWS Truepower ("AWST"), a recognized leader in renewable energy production science with over 70,000 MW of energy assessments in experience, was engaged to provide the energy assessment of the Project. AWST has provided a Memo of Support for the Gravel Pit Solar Park in *Appendix 4-1*.

The Project's estimated annual energy output was derived by AWST using Clean Power Research's SolarAnywhere satellite-modeled data set, which has been created with inputs from 1998 to 2013. This data has been widely vetted through both industrial and academic applications.

As detailed in the energy production estimates attached as *Appendix 4-2*, the Project is expected to deliver on average [REDACTED] MWh annually to the southern New England grid each year. Energy production is expected to decrease throughout the lifetime of the Project due to annual degradation of the modules. A typical degradation rate (<1% per year) was assumed based on the climatic conditions and the selected module technology. We have attached a 25 year estimated Energy Profile as *Appendix 4-3*.

AWST has provided a detailed description of the loss categories and methodology of calculation, which is attached in *Appendix 4-4*.

The Project will qualify for capacity to meet load obligations in ISO-NE's Connecticut zone. AWST also estimated the amount of qualifying capacity of the Project. The Project is expected to deliver approximately [REDACTED] Average Net MW during summer peak hours (June through September 1:00 until 6:00 pm). The methodology for this calculation is detailed in *Appendix 2-1*. The Project is expected to deliver somewhere near the [REDACTED] MWs of ISO-NE qualifying summer-period capacity. The Company plans to sell 100% the Project's qualifying capacity into the ISO NE's Forward Capacity Market (the "FCM"), as previously discussed in footnote 1.

4.2 Energy Delivery Plan

AWST estimated the annual and hourly energy production of the Project by first establishing a Typical Meteorological Year ("TMY") data set using the corresponding resource estimates referenced above to characterize the on-site meteorological conditions. The horizontal solar components from the TMY was used to calculate the Plane of Array (POA) irradiation for each hour of the year. Net energy production was then simulated for every hour of the TMY using PVsyst software.

As part of the energy simulation, loss factors were also computed for each hour of the year. These losses were grouped into four categories:

- Effective irradiation – horizon shading, near shading, incident angle modifier factor, and soiling. For this preliminary analysis, horizon shading, near shading from trees and power lines, and row-to-row shading were not considered. A generic soiling loss was applied appropriate for the region that accounts for snow cover of modules and dirt/debris.
- Photovoltaic conversion - initial light induced degradation, non-STC operation due to irradiance and temperature, module quality, and module mismatch.
- Electrical - DC wiring, inverter efficiency, inverter limitation, inverter de-rating, AC wiring, and transformer efficiency.

- Operational – system losses, including HVAC and auxiliary components, availability of system, availability of collection & substation, availability of utility grid, and PPA curtailment (assumed to be ■ for this analysis).

Our Year 1 Solar Energy Profile (P50 12x24) is attached as *Appendix 4-2*. Preliminary analysis indicates that curtailment is not an issue for this resource and the Company is willing to guarantee 70% of energy in this profile, during the Winter Peak Period, as stipulated in the RFP. We have also attached a long-term energy profile in *Appendix 4-3* and a more detailed description of losses in a memo from AWST in *Appendix 4-4*.

4.3 REC / Environmental Attribute Delivery Plan

Since the Project is located inside New England, delivering the attributes to the NEPOOL GIS is a relatively straightforward process. The Company agrees to deliver all environmental attributes to the Distribution Companies' GIS Account(s).

SECTION 5: FINANCIAL / LEGAL

5.1 Approach to Financing

PowerBridge is prepared to fund the development of the Project with cash on hand. Upon notification of bid selection, PowerBridge will form a special purpose company ("SPC") to own the Project. Upon the finalization of a definitive offtake agreement and receipt of all requisite permits, authorizations and approvals, the SPC will fund the construction of the Project through equity subscriptions from existing and potentially new investors and will raise non-recourse financing to fund the balance of the construction costs. We expect the final capital structure to be ■■■ debt and ■■■ equity.

PowerBridge has demonstrated its ability to raise equity capital and both construction and permanent debt financing for major energy projects from highly knowledgeable and experienced investors such as those listed below in Section 5.5.

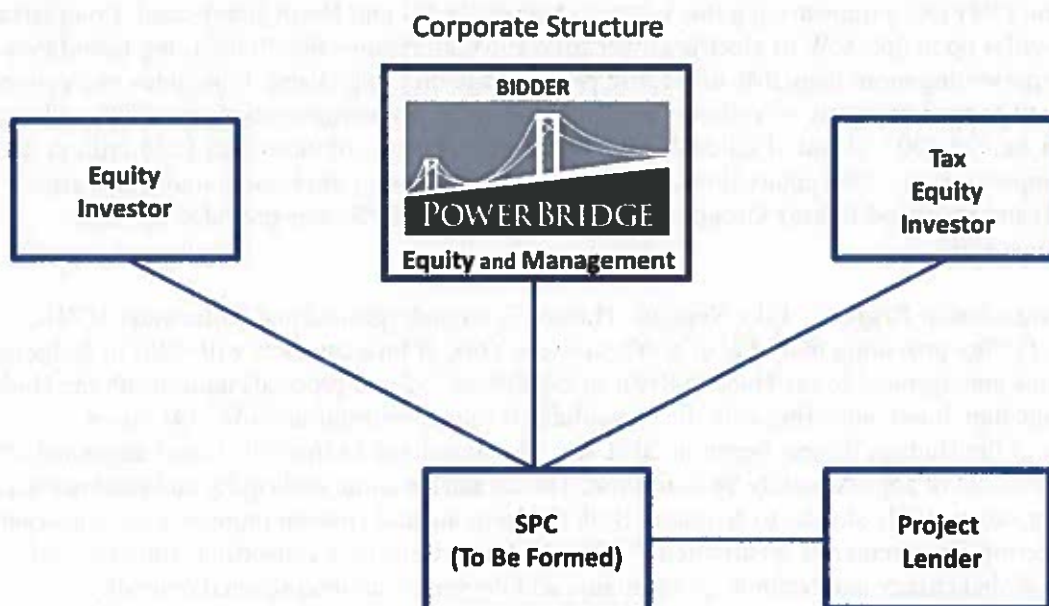
5.2 Respondent's Organization

PowerBridge is well positioned to develop a utility scale solar farm based on its extensive experience in managing the development, financing, construction, and ownership of large energy infrastructure projects.

Legal Status

The Bidder is PowerBridge, LLC, a Connecticut Limited Liability Company formed in 2005, with offices in Fairfield, CT. PowerBridge submits this Bid on behalf of itself. Substantially all of PowerBridge is owned by a trust for the benefit of the family of Edward M. Stern of Southport CT, who serves as its Chief Executive Officer.

An organization chart showing the ownership structure for the project from a finance and legal perspective is included below (equity and Project Lenders have not yet been finalized):



5.3 Financing Plan

Project development will be funded by PowerBridge with cash on hand. A Project Company to own the Project will be formed upon notification of bid selection, and upon the finalization of a definitive offtake agreement and receipt of all requisite permits, authorizations and approvals, the Project Company will fund the construction of the Project through equity subscriptions from existing and potentially new investors and will raise non-recourse financing to fund the balance of the construction costs.

The market for financing utility scale solar project is large, mature, and highly competitive. In 2014, the last year for which figures are available, the US invested a total of approximately \$8.9 billion in the finance of utility scale solar projects; that number is expected to have grown in 2015 and 2016.

The capital cost of the Project is estimated to be approximately [REDACTED] million. Equity will be provided by one or more subscribers (individuals or funds), while debt is likely to be provided by one or more regional banks that are active in solar energy financing in New England.

PowerBridge and its managers have extensive experience raising capital for infrastructure and renewable energy projects. Since 2005, PowerBridge has been responsible for the financing of \$1.5 billion of new electric transmission projects, while many of its key personnel were previously responsible for the financing of renewable energy and other electric power projects, with experience extending back nearly 30 years.

5.4 Financing Experience

As noted above, PowerBridge has been responsible for financing more than \$1.5 billion in electric transmission projects since 2005. These projects are:

Neptune Regional Transmission System – Neptune is an underground and undersea High Voltage Direct Current (“HVDC”) transmission line between Sayreville, NJ and North Hempstead, Long Island, NY, that provides up to 660 MW of electric power from PJM Interconnection to the Long Island Power Authority, representing more than 20% of electric power usage on Long Island. It includes two converter stations as well as approximately 67 miles of transmission cable. Construction began in 2005 and was completed in June of 2007, ahead of schedule and on budget. The cost of more than \$650 million was financed at approximately 20% equity through two major funds, Energy Investors Funds (now part of Ares Capital) and Starwood Energy Group. Debt, at approximately 80%, was provided by large institutional investors.

Hudson Transmission Project – Like Neptune, Hudson is an underground and underwater HVDC transmission facility providing 660 MW of power to New York. It interconnects with PJM in Ridgefield, NJ and extends underground to the Hudson River in Edgewater, NJ and proceeds underneath the Hudson River to Manhattan, interconnecting with the Consolidated Edison substation on W. 49th Street. Construction of the Hudson Project began in 2011 and was completed in June 2013, on budget and ahead of schedule at a cost of approximately \$850 million. The capital structure and equity and debt participants in Hudson are substantially similar to Neptune. Both the Neptune and Hudson projects were constructed on an Engineering-Procurement-Construction (“EPC”) contract basis by a consortium consisting of Siemens, the global energy and technology company, and Prysmian, an international company specializing in the manufacturing and installation of electric power cables.

TAQA GEN-X gas pipeline project - The TAQA Gen-X Pipeline is a recently completed .37 mile natural gas pipeline developed and built by PowerBridge for TAQA Gen-X, LLC, a joint venture between units of Abu Dhabi National Energy Co. and Morgan Stanley. Located in the town of Sayreville, New Jersey, the TAQA Gen-X Pipeline provides fuel from New Jersey Natural Gas (NJNG) to the 832 MW Red Oak generating plant, providing an alternate source of natural gas to the combined cycle electric generating facility.

In addition, principals of PowerBridge have been responsible for financing numerous renewable energy projects, both large and small, with experience extending back nearly 30 years. Ed Stern, President and CEO of PowerBridge, previously served as the President, Director, and CEO of Enel Green Power North America, Inc. ("EGP-NA"). This company is a major North American owner and operator of a diversified renewables portfolio that includes small hydro, wind, geothermal, and biomass facilities, and was formerly known as CHI Energy, Inc. prior to its acquisition by a unit of the Italian utility Enel.

5.5 Evidence of Financial Resources

As a privately held company, PowerBridge does not have audited financial statements. As noted above, PowerBridge has demonstrated its ability to access significant financial resources to complete the successful development and construction of large energy infrastructure facilities, totaling in excess of \$1.5 billion. The Company's relationship with sources of equity and debt capital for its projects include a wide range of institutions such as Ares Capital, Starwood Energy, CalPERS, Ullico, Northwestern Mutual, New York Life, Voya, Pacific Life, Sun Life, John Hancock, Societe Generale, DZ Bank, and MUFG.

5.6 Audited Financial Statements

As noted above, PowerBridge, as a private company does not have audited financial statements.

5.7 Respondent's Board of Directors

Edward M. Stern has sole decision-making responsibility for PowerBridge. Resumes for Mr. Stern and the PowerBridge development team can be found in *Appendix 11-2* and at <http://powerbridge.us/our-team/>.

5.8 Credit Support

Prior to financial closing, PowerBridge will provide the required Development Period Security using cash on hand. Post financial closing, it is anticipated that the Operating Period Security will be provided as a letter of credit from the lender(s) providing the debt financing.

As detailed in the redlined PPA attached as *Appendix 15-1* the Company agrees to provide (i) Development Period Security in the amount of \$20,000.00 per MWh per hour of Contract Maximum Amount to secure its obligations between the Effective Date of the PPA and the Project's Commercial Operations Date ("COD"), and (ii) Operating Period Security in the amount of \$20,000.00 per MWh per hour of Contract Maximum Amount.

5.9 Credit Issues

None.

5.10 Role of ITC

Subject to the receipt of a PPA on the schedule described in Section 10, the Project is expected to qualify for the federal Investment Tax Credit ("ITC"), described below. The market-accepted approach for monetizing the ITC is through a tax equity partnership.

The ITC is available for solar facilities that commence construction by or before December 31, 2019.

The Company's proposal assumes that the Project will qualify for a 30% ITC, subject to the receipt of a fully-approved, mutually-acceptable, PPA by or before June 29, 2018. Our proposed pricing assumes that 100% of the value of the ITC received by the Company, net of fees and transaction costs, is passed on to the ratepayers by reducing our capital account balance and allowing us to offer the proposed pricing.

5.11 Pending Litigation

None.

5.12 Life of the Proposed Project

The Company anticipates a minimum operating life of twenty-five years. From a depreciation perspective, the majority of the solar equipment costs are eligible for the ITC and would be considered 5 year MACRS depreciation. The interconnection costs would use 20 year straight line depreciation.

5.13 Project Financing Status

The Company has not yet entered into agreements for the financing of the Project, but plans to do so on a non-recourse basis, as is consistent with industry practice. The Company is confident in its ability to raise the equity capital required to fund the development of the Project from existing and potential new investors if the following requirements are met: (i) revenue certainty in the form of a firm offtake agreement such as a PPA, (ii) executable/executed engineering, procurement and construction ("EPC") contract(s), (iii) site control in the form of an exclusive option or to purchase and (iv) permits. Please see Memo of Support from D.E. Shaw in *Appendix 5.1*. Multiple potential suppliers have expressed interest in entering into EPC contracts and the Company has already obtained the required exclusive option for site control. The Company is highly confident in our ability to permit the Project, as detailed in Section 7. Therefore, the PPA is the most important element of securing financing for the Project.

5.14 Prior Sales

The Company has not executed agreements with respect to Energy, RECs, and/or capacity for the Project.

If the Company receives a fully executed PPA by or before 06/29/2018, the Company will use commercially reasonable efforts to participate in Forward Capacity Auction ("FCA") #14. If the Project clears as a winner in FCA #14, it is expected to receive a Capacity Supply Obligation for the period of June 2023 through May 2024.

5.15 Respondents Affiliated Entities

[REDACTED]



5.16 Bankruptcy

The Company has not (a) consented to the appointment of, or was taken in possession by, a receiver, trustee, custodian or liquidator of a substantial part of its assets, (b) filed a bankruptcy petition in any bankruptcy court proceeding, (c) answered, consented or sought relief under any bankruptcy or similar law or failed to obtain a dismissal of an involuntary petition, (d) admitted in writing of its inability to pay its debts when due, (e) made a general assignment for the benefit of creditors, (f) been the subject of an involuntary proceeding seeking to adjudicate that Party bankrupt or insolvent, (g) sought reorganization, arrangement, adjustment, or composition of it or its debt under any law relating to bankruptcy, insolvency or reorganization or relief of debtors.

5.17 Conflicts of Interest with Soliciting Parties

None.

5.18 Disputes with Soliciting Parties

None.

5.19 Disputes with Other Parties

None.

5.20 Investigations and Convictions

None.

5.21 Regulatory Approvals Required

Other than regulatory approvals required for the development of the Project and effectiveness of the PPA, PowerBridge is not aware of additional regulatory approvals.

5.22 Conformance with FERC

In the Base Proposal, the Project will interconnect with a to-be-built switchyard located on the Project site. In the Alternative Proposal, the Project will interconnect to the existing Barbour Hill substation which is owned by Eversource. The Company will not construct new transmission facilities other than those directly connecting the Project with the point of interconnection. The Company has applied for interconnection in accordance with Schedule 22 of FERC's interconnection tariff, and, in compliance with the Open Access Transmission Tariff ("OATT"), will pay all the costs associated with interconnection, including the cost of a required substation in the Base Proposal.

5.23 Affiliations with Distribution Companies

None.

SECTION 6: SITING, INTERCONNECTION, AND DELIVERABILITY

6.0 Project Introduction

The Project is designed as a 26 MW-AC solar power generating facility and will be located on approximately 223 acres of land which have been historically mined for gravel aggregate. The Project will be interconnected into the Eversource 115 kV transmission line that crosses the property via a transmission tap connecting into a 115/23kV dedicated substation to be constructed on the Project Site as part of the facility (Base Proposal).

6.1 Site Plan

The proposed project layout consists of a fixed-tilt, ground-mounted solar array utilizing a 340 watt panel size. Panel arrays will be spaced approximately 13 feet apart and will be accessed via 20-foot wide compacted gravel or paved roadways. The facility will be enclosed in safety fencing meeting National Electric Safety Code requirements. Associated equipment will include required transformers and inverters to convert the current and step up the voltage from the facility. In the Base Proposal configuration, the facility will be interconnected into the Eversource 115 kV transmission line that crosses the property via a transmission switchyard connecting into a 115/23kV dedicated substation to be constructed on the Project Site as part of the facility. See the project site plan attached as *Appendix 6-1*.

6.2 Site Control

[REDACTED] The Option Agreement controls 2 parcels [REDACTED] of land totaling approximately 223 acres in East Windsor, CT, as shown in *Appendix 6-2*. For reference, a redacted copies of the agreements giving PowerBridge site control are attached in *Appendix 6-3*.

No additional land rights are needed to develop, construct or operate the Project.

6.3 Project Site Zoning

In Connecticut, the Connecticut Siting Council ("CSC") has jurisdiction over any facility generating over 1 MW of electricity. In accordance with Connecticut General Statutes § 16-50k(a), the Company will file a petition with the CSC to receive a Declaratory Ruling to allow for the construction and operation of the Project. The CSC has previously granted Declaratory Rulings to other solar developments of similar size. The Company expects to receive approval within six months of a submitted petition.

The CSC will require that the Company consult with the Town of East Windsor, CT and attempt to adhere to the intent of the local zoning regulations. However, the CSC jurisdiction pre-empts local authority to approve or deny the project, and as such, the CSC is the permitting entity.

The recent passage of Public Act 17-218 by the Connecticut legislature added two more potential constraints for the siting of solar energy facilities: Prime Farmland and Core Forest. Applicants to the CSC must consult with the CT Division of Agriculture and the CT Department of Energy and Environmental Protection prior to filing with the CSC. Applicants need to demonstrate that the solar projects do not materially affect prime farmland or core forest.

Public Utility Facilities (not to be interpreted as infrastructure) are permitted uses within any town zone provided that the use meets the Special Permit provisions of Chapter VII and is approved by the

Commission (East Windsor Zoning Regulations as amended 7/8/2014). As depicted in *Appendix 6-2*, The Site includes 2 parcels [REDACTED] which have been historically mined for gravel aggregate. The Project site includes areas of active mining which include excavations, roads, sediment ponds, and processing areas; areas of restored mineland; agricultural fields; and a perennial watercourse (Ketch Brook) which is located in a ravine in the south east portion of the Project site. The reclaimed mineland supports some forest, as does the riparian corridor along Ketch Brook. The Project site is crossed by an Eversource transmission line right of way.

State and local regulated inland wetlands and watercourses, FEMA designated floodplain and Natural Diversity Database (NDDDB) areas at the Site are generally associated with Ketch Brook. The Project layout avoids impact to these resources.

The Project will require the following permits/licenses:

Permit Name:	Approximate duration:
• CSC petition for Declaratory Ruling	180 days
• CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities	60 days
• East Windsor Building Permit	30-60 days

The two large lots that comprise the Project Site lie within 3 different land use zones: M-1 (manufacturing), A-1 (agricultural/residential), and R-3 (single family residential) according to the Town of East Windsor Zoning Map dated 4/25/2012. The M-1 zone is generally associated with the rail corridor that abuts the Site on the west. The R-3 zone is generally associated with the street frontage on Apothecaries Hall Road, Windsorville Road and Wapping Road. The A-2 zone generally applies to the lot interiors.

The M-1, A-1, and R-3 zones have varying setbacks and buffer requirements as follows:

M-1:

- Front yard setback: 60'
- Side yard setback: 20'
- Rear yard setback: 30'

A-1:

- Front yard setback: 50'
- Side yard setback: 17.5'
- Rear yard setback: 30'

R-3:

- Front yard setback: 50'
- Side yard setback: 15'
- Rear yard setback: 40'

As the compiled parcels would likely be considered a corner lot having frontage to the north and to the east generally, no rear yard setbacks would be associated with the Project site. As the Town's Zoning Regulations do not contain language clarifying which setbacks would apply for development on a parcel containing multiple zones, the most stringent front and side yard setbacks, associated with the M-1 zone (60' and 20', respectively) have been applied to the concept layout.

6.4 Surrounding Areas

The Project site is situated in the southeastern portion of the Town of East Windsor, east of the Scantic River. The Project site is bounded on the north by Apothecaries Hall Road, on the east by Wapping Road, on the south by Ketch Brook, and on the west by a railroad right of way. Land use in the vicinity of the Site includes a mixture of residential developments, agricultural lands and open space. Generally, zoning is R-3 north and east of the site, south and southeast of the Project site is zoned A-1, and areas west of the railroad corridor are M-1, R-3 and A-2.

Environmental resources in the vicinity of the Project site include State and local regulated inland wetlands and watercourses, FEMA designated 1-percent annual chance floodplain and NDDB areas associated with Ketch Brook.

6.5 Interconnection Route Map

The Proposed Interconnection(s) are described in Section 6.12. A map of the proposed interconnect and surrounding area is attached as *Appendix 6.4*. For the Base Proposal, the interconnection will occur in the land controlled by Company in the Option Agreement. The Alternative Proposal anticipates using Eversource ROWs.

6.6 Interconnection Status

The Company has Submitted an interconnection request as a Capacity Network Resource. There are no ISO-NE studies available at this time. We have attached copies of the (i) Interconnection Request submittal as *Appendix 6-5* and the Pre-Feasibility Study in *Appendix 6-6*.

6.7 Electrical System Performance

The Project PV module arrays will generate and inject 26 MW-AC peak into the ISO-NE network at the new Eversource Switchyard connecting into a ring bus on a 115kV line between Barbour Hill and Enfield Substations. The solar energy generation will provide a bulk source of renewable power generation on the ISO-NE system. Due to the intermittent and daylight-dependent nature of PV generation, the power produced will largely be generated during daylight hours and peak at mid-day, when power demand is often greatest. Furthermore, solar generation most steadily generates at near peak output during the summer, the time when ISO-NE peak load demands are similarly at their peak. In addition, as detailed in *Appendix 2-1*, the Project is expected to provide an average of [REDACTED] net MWs during summer peak capacity hours.

6.8 Interconnection Analysis

Although the Company has not received I.3.9 approval, we have submitted a Interconnection Request as a Capacity Network Resource and have attached that request as *Appendix 6.5*. In addition, we have completed a Pre-Feasibility Study from Siemens and attached that as *Appendix 6-6*. This study was completed using the same assumptions as the ISO-NE model.

6.9 Alternative Interconnection Scenario

We are not proposing an interconnection scenario based on proposed ISO-NE interconnection process change.

6.10 Electrical Models

There are no other energy resources that will be supporting the proposed Project.

6.11 Electrical One Line Diagram

See the project One-line diagram attached as *Appendix 6-7*.

6.12 New Interconnection Facilities

Under the Base Proposal, the Project will interconnect at a to-be-built 115 kV PTF Eversource 115 kV Switchyard intercepting the existing 115 kV transmission line crossing the property. The Project will collect power from the power inverter pads at 34.5 kV delivering its generation to the Eversource switchyard through a 34.5/115 kV substation (please see *Appendix 6-4* and *Appendix 6-7*). Under the Alternative Proposal, the Project will collect power from the inverter pads and interconnect at an existing 23kV bus (non-PTF) in the Barbour Hill substation which is owned by Eversource.

6.13 Incremental Data Files (Projects that include Transmission)

Not Applicable.

6.14 Deliverability

Given the size of the Project, the point(s) of interconnection, and the Siemens Pre-Feasibility study we do not expect curtailment to be an issue.

6.15 Full Dispatch Capability

Given the size of the Project, the point(s) of interconnection and the Siemens Pre-Feasibility study we do not expect issues injecting the full nameplate of our project (26 MWs AC) onto the grid.

SECTION 7: ENVIRONMENT, PERMITS AND RPS CERTIFICATION

7.1 Required Permits

The Company has a proven record of responsibly engaging and working with the appropriate authorities to receive required permits for energy facilities.

The permitting of this Project is greatly streamlined by the CSC process. The CSC has already approved several other large scale solar farms within the state. Due to the current use, significant portions of the Project site areas are already clear of vegetation and direct wetland impacts will be avoided. As required under the CSC process, the Company will consult with the Town of East Windsor and attempt to adhere to the intent of the local Planning and Zoning regulations, and Inland Wetlands and Watercourses regulations. As summarized in Section 6.0, a new solar farm is not prohibited in any of the zones where the Project is located.

As explained below, the Project has been laid out so as to avoid areas of Prime Farmland and Core Forest that would likely be a constraint to solar development based on recently enacted Connecticut legislation.

The Project requires licensing and consultation as follows:

- State of Connecticut Siting Council Petition for a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not Required
- Required consultation
 - Town of East Windsor
 - CT DEEP Division of Forestry
 - Connecticut Department of Agriculture
 - CT State Historic Preservation Office
 - Federal Aviation Administration
- Environmental Studies
 - Tree Clearing Analysis
 - Carbon Debt Analysis
 - Inland Wetland Delineation
 - Wildlife and Wildlife Habitat Analysis
 - NDDDB Studies
 - Vernal Pool Survey
 - Surface and Groundwater Resources
 - Stormwater Runoff Analysis
 - Visual Simulations
 - Cultural Resources Survey
 - FAA Notice of Proposed Construction
 - Air Quality Analysis
 - Noise Impact Analysis
 - Public Health and Safety
- CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

- Town of East Windsor Building Permit

7.2 Permitting Timeline

The Company has begun permitting the Project and will commence major studies and submit applications following the receipt of a fully-approved, un-appealable PPA. Provided that the Company receives such a fully executed PPA by 06/29/2018, we expect that all permits will be received by 02/01/2019. A summary of timing of all required permits is provided below:

- The Company will submit an application to the Connecticut Department of Transportation (DOT) for an encroachment permit. Approval from DOT is expected within three to six months of application submittal.
- Petition to the Connecticut Siting Council for a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not required for the construction, operation, and maintenance of the Project in accordance with Connecticut General Statutes § 16-50k(a). There has been precedent set by previous large scale solar farms where the Connecticut Siting Council has expeditiously granted a Declaratory Ruling. The Company expects approval within two to six months of filing a petition. Consultation and required studies are anticipated to be completed within six months of submission.
- CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. Timeframe for approval is approximately 3 months.
- Town of East Windsor Building Permit: timeframe for approval is approximately 2 months.

7.3 Preliminary Environmental Assessment

The Company has prepared a preliminary environmental assessment of the Project during both construction and operation. Figures supporting this preliminary environmental assessment are included as *Appendix 6-2*.

Impacts During Site Development

Impacts during development generally are related to construction noise, fugitive dust emissions, and construction traffic. These potentially nuisance creating activities are also associated with the on-going gravel mining activities occurring on the Site, such that abutters are not likely to realize that a solar facility is under construction. Following construction, noise, dust and traffic will decrease appreciably from current conditions.

Site developments disturbing an area of five acres or more require registration under the CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities prior to commencing construction. For this site, it is anticipated that no surface stormwater runoff will leave the site, it will be collected within on-site basin areas. Further analysis of the on-site watershed areas will be performed as part of the final stormwater management plans to confirm this assumption.

Construction of the solar array is anticipated to take 6-8 months to complete. It is expected that the substation may take somewhat longer.

Transportation Infrastructure

Adjacent roadways are maintained by the Town of East Windsor. Driveways for the proposed facility will be sited in such a way as to maximize the safety of roadway users, and minimize traffic impacts and level of service ratings on these roads.

During construction, appropriate signage will be deployed to alert roadway users of potential hazards associated with construction equipment. Traffic safety details will be employed as warranted by conditions or as required by the Town.

Air Quality Impacts

It is expected that the Project will have minimal emissions of regulated air pollutants and greenhouse gases during construction and no emissions during operation. Therefore, an air permit is not required for the construction or operation of the solar facility.

Minor construction related impacts to air quality could include emissions produced by the operation of construction machinery or fugitive dust emissions, but such impacts would not be expected to be greater than the use of mining equipment that is currently taking place. In order to reduce and mitigate such potential impacts to air quality, exposed soils will be periodically sprayed with water as necessary during construction and that crushed stone aprons be installed at access road entrances for dust control. Additionally, the quantity of earth to be moved or disturbed during construction will be minimized to comply with state guidelines.

Access to Water Resources/Water Quality Impacts

The Project does not require access to a water supply.

Ground and surface water quality can also be affected by land management. Soil erosion and sedimentation can contribute to the degradation of surface water quality and may become a public nuisance if tracked onto area roadways or allowed to become airborne. Standard best management practices provided in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control will be incorporated in the Stormwater Pollution Control Plan and construction documents. Structural measures such as sediment traps, anti-tracking stone construction exits, erosion control blankets, hydraulically applied mulch, perimeter and intermediate sediment control silt fence and wattles will be employed during construction. Any sediment that gets past these treatments and is tracked off-Site during construction will be swept at the end of each work day. Disturbed areas associated with construction activities will be graded, covered with topsoil, and permanently stabilized with conservation grasses and legumes.

Long term grass cover will reduce the hazard of wind and water erosion by eliminating the periods when the soil surface is exposed after cultivation and seed bed preparation. Inputs of fertilizer and pesticides will also be reduced under grassland management. These factors can improve the quality of ground and surface waters.

Ecological and Natural Resources Impacts**Inland Wetlands and Watercourses**

The Connecticut Inland Wetland and Watercourses Act (IWWA) define wetlands as soil types that are poorly drained, very poorly drained, or alluvial in origin and any drainage class. The IWWA also defines watercourses to include rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private. Some resource areas meet the definition of wetland by soil type and watercourse such as a marsh or swamp. The approximate limits of State-regulated wetland areas are depicted on the

Site Constraints Map (*Appendix 6-2*) by the combination of two map units in the legend: the Poorly Drained and Very Poorly Drained Soils polygons and the Alluvial and Floodplain Soils polygons. Wetlands subject to federal jurisdiction under Section 404 of the Clean Water Act are represented by the Hydric Soil coverage which is generally coincident with the Poorly Drained and Very Poorly Drained Soils coverage.

Wetlands appear to be limited to resource areas associated with Ketch Brook in the southeastern corner of the property. This stream is deeply incised and the wetlands associated with this feature generally range between 100 and 300 feet in width.

In addition to the actual wetlands and watercourses, the Town of East Windsor's Inland Wetlands and Watercourses Regulations require permit applications for activities proposed within 150 feet. These regulated zones are referred to as upland review areas. The jurisdiction of the locally-enforced state-IWWA regulations are superseded by the CSC; however, layouts that generally conform to local practices may be better received by the community.

Earth removal operations in the pit have brought the floor elevation of the pit below that of the wetland and there is no discharge from the pit into wetland areas. The pit maintains an undisturbed buffer between the edge of excavation to Ketch Brook and its associated wetlands and it would be reasonable to maintain this existing buffer zone for the project. The Siting Council will determine the acceptable buffer zone to wetlands.

Several depressions in the gravel pit were observed to collect water. One site was pumped to a water truck for use in dust control. It is generally accepted that these features are not jurisdictional wetlands as long as the pit is active. Gravel pits often have reclamation plans that would eliminate these depressions. A conceptual layout for the solar program will require a grading plan due to the existing irregular topographic relief on the site. The current Conceptual Layout Map includes incorporation of some of these depressions in the stormwater management for the array Project.

The proposed project layout avoids impact to wetlands.

Public Act No. 17-218

The recent passage of PA 17-218 by the Connecticut legislature added two more potential constraints to be evaluated for the siting of solar energy facilities: Prime Farmland and Core Forest. Prime Farmland is assigned to certain soil map unit phases used during the completion of the cooperative soil survey in Connecticut. These data are maintained by the Natural Resources Conservation Service (NRCS) through their state and regional offices in charge of maintaining and updating the soil survey. Core Forest is defined in the PA 17-218, and was originally established at Center for Land Use Education and Research (CLEAR) at the UConn School of Agriculture and Natural Resources. Core forests are unfragmented forests with edge widths greater than 300 feet.

Prime Farmland As shown on the PA 17-218 Constraints Map there are significant areas of prime farmland soils mapped within active parts of the mining operation. Soil maps are infrequently updated and this is a common occurrence. There are two remaining active agricultural fields mapped as Haven and Enfield soils, 0 to 3 percent slopes that are prime farmland. These soils are notable for their thick mantle of wind deposited silt that is free from stones and gravel. These soils are fertile and have a relatively high moisture holding capacity. The value of these areas for protection under PA 17-218 may depend on whether these areas are slated to be lost to gravel mining operations. The pit is currently expanding northward into the larger farmland unit from the western side.

PA 17-218 will require written documentation from the Connecticut Department of Agriculture stating that the *project will not materially affect the status of such land as Prime Farmland*. The department is allowed to consult with the NRCS when making such determinations and approved plans for the continued operation of the gravel pit should be provided as evidence of the future status of the remaining undisturbed prime farmland units on the property.

Core Forest VHB used GIS coverage available from the CLEAR website to depict this constraint. Interestingly, some of the reclaimed gravel pit was identified as core forest in this mapping. The forest that has established is typically dominated by invasive species such as black locust (*Robinea pseudoacacia*) and autumn olive (*Elaeagnus umbellata*). The species composition and structure of these reclaimed woodland types should be described and provided to the Department of Energy and Environmental Protection when requesting written representation to the Siting Council that *the project will not affect the status of such land as core forest*. A design that limits removal of fringe and core forest to areas that have been previously mined may facilitate this representation.

The Project concept has been laid out to avoid all Prime Farmland and Core Forest areas that are outside of the limits of the active and reclaimed mine. Additional mapped Prime Farmland areas would only be utilized by the Project if mitigation measures were agreed upon with the Connecticut Department of Agriculture.

Floodplains

A narrow strip of 1% Annual Chance Flood Zone is mapped along Ketch Brook. This wetland resource should be avoided such that the Project will have no effect on Special Flood Hazard Areas.

The proposed project layout avoids impact to floodplain.

Sensitive Habitat

A CT DEEP NDDB polygon straddles Ketch Brook in the southern part of the project site. Ketch Brook is not visible from the proximate pit limits as the floor of the pit is much lower than the land adjacent to the brook. One would presume that if the proposed solar array were to be sited no closer to the polygon than the existing limits of the pit excavation the project would not represent a potential take of a species protected under the Connecticut Endangered Species Act (CESA). Coordination with the CTDEEP NDDB staff is required to better understand the implications of this potential constraint. This would involve initial consultation with the NDDB and may require the development of a conservation plan which provides a suggested scope for field investigations. A conservation program for the project may require certain areas to be avoided, time of year restrictions for certain project activities, training for construction staff and requirements for environmental monitoring during construction and/or after construction, and other measures.

Aquifer Protection Areas

A CT DEEP aquifer protection area (A42 Hunt 7/28/2015) is present in the northern portion of the site. Aquifer Protection Areas are delineated for active public water supply wells in stratified drift that serve more than 1000 people, in accordance with Sections 22a-354c and 22a-354z of the Connecticut General Statutes. Level B Mapping delineates a preliminary aquifer protection area, providing an estimate of the land area from which the well draws its water. Level A Mapping delineates the final Aquifer Protection Area, which becomes the regulatory boundary for land use controls designed to protect the well from contamination. As Level A Mapping is completed for

each well field and approved by DEEP, it replaces the Level B Mapping. Final Adopted Level A Areas are those where towns have land use regulations for them. However, neither the town's Zoning Regulations nor Wetlands Regulations have any language about additional precautions or development restrictions associated with these areas.

Stormwater

Drainage patterns and stormwater runoff are managed by the State of Connecticut through the implementation of the Connecticut Stormwater Quality Manual (CT Department of Environmental Protection, 2004) (the Stormwater Manual). The Stormwater Manual outlines the process for modelling existing and future runoff characteristics by evaluating such parameters as surface topography, vegetation, soil properties, surficial geology, drainage patterns and area. Taking these characteristics into account, the model can be used to determine existing runoff flow rates and volumes discharging from a site into receiving waters or "design points". A similar process is undertaken for the proposed future conditions to determine future runoff rates and volumes.

The Stormwater Manual requires that changes to runoff rates, volumes or patterns cannot be caused by any proposed developments, and consequently, if the analysis described above identifies a change to drainage patterns or an increase in the rate of stormwater runoff, project developers are required to mitigate these alterations. Mitigation alternatives include detention basins, infiltration systems, swales, etc.

The Company will prepare the requisite analyses in accordance with the CT Stormwater Manual. Under existing conditions, runoff within the gravel mine drains internally and is contained within the excavation. It is anticipated that future conditions will mimic existing conditions. Additionally, the proposed project will likely include the establishment of a permanent vegetative cover over the project Area, which will help naturally attenuate stormwater runoff and promote infiltration. The project will not result in increases to peak discharge rates, nor will it divert hydrology away from natural resources such as wetlands that rely on these hydrologic inputs to exist.

Land Use Impacts

The Project site parcels are zoned single family residential, manufacturing and residential/agricultural. The current land uses are, for the most part, inconsistent with these zoning designations. The proposed future condition with the solar facility will be similarly inconsistent with the designated zoning, however, the Town of East Windsor Zoning Regulations allow Public Utilities in any zoning district.

Cultural Resources

The Company will manage a cultural resources expert to perform a Phase 1A survey of the Project site. Phase 1A surveys typically include a contextual overview of the area's prehistory, history, and natural setting; a literature search to identify and discuss previously completed cultural resources surveys and previously recorded cultural resources in the region encompassing the study area; a review of readily available historic maps and aerial imagery depicting the study area in order to identify potential historic resources and/or areas of past disturbance; a pedestrian survey and photo-documentation of the Project site in order to determine its archaeological sensitivity; and preparation of the survey report. Based upon the findings of the report and consultation with the State Historic Preservation Officer, additional studies and mitigation may be required.

Based upon the current use of the Project site for gravel mining, it is anticipated that significant, intact cultural resources are not likely to be present within the proposed Project footprint.

Previous Site Use

The current use of the Project site is an aggregate mining operation. This environmental assessment did not identify any indication that the Site is subject to the Connecticut Transfer Act. Sections 22a-134 through 22a-134e of the Connecticut General Statutes (CGS), as amended by Public Acts 09-235 and 09-3, outline the requirements for regulated properties.

The Company will perform an ASTM Phase I Environmental Site Assessment and/or other appropriate due diligence prior to purchasing the property.

Noise Level Impacts

The CT DEEP has developed noise impact criteria that establish sound level thresholds deemed to result in adverse impacts. The CT DEEP's noise control regulations identify the limits of sound that can be emitted from specific premises and what activities are exempt. The noise control regulations (Title 22a, §§ 22a-69-1 to 22a-69-7) are contained in the Regulations of Connecticut State Agencies.

The proposed Project would be considered a Class C (Industrial) emitter and the adjacent residential uses would dictate the receptor zone as Class A. Sound levels for Class A zones are 55 a-weighted decibels during the daytime and 45 dBA during the nighttime. The Company will prepare an acoustic analysis to model existing ambient sound level, anticipated future sounds levels, and mitigative measures needed in order to comply with the CT DEEP noise criteria. Mitigation measures will be employed as necessary based upon the results of the analysis.

Aesthetic/Visual Impacts

The Company will engage a consultant to assist in the identification of sensitive receptors, the evaluation of potential visual impacts, the development of visual mitigation, and the development of visual images that document existing conditions and simulate proposed conditions. Company is committed to minimizing the visual impact to abutting properties and passersby.

It is anticipated that the past use of the Project site as a gravel mine and the irregular topography of the Site and adjacent areas will render the project less visible to abutters by providing natural screening.

Transmission Structure Impacts

The Project will connect into an existing transmission line that crosses the Project Site. Off-site transmission line impacts will not be required.

The proposed facility will require a new transmission tap into the existing 115kV transmission line. This tap will likely require the installation of mid-span tap structures. It is anticipated that the design and the construction of the tap will need to be performed in close consultation with Eversource.

Fuel Supply Access

Not Applicable.

7.4 Public Support

The Company is committed to continued stakeholder engagement and community outreach during the development, construction, and operations of the Project. The Company will meet with local and state (as

appropriate) agencies and elected officials. Additionally, as needed or requested, the Company will meet community groups, NGOs, and other stakeholders.

7.5 RPS Eligibility

Since the Project meets the definition of a New Renewable Generation Unit (as it begins commercial operations after 1997), it is located within the ISO-NE Control Area, and it generates electricity using solar photovoltaic it meets the definition of an eligible Class 1 resource² once it achieves COD. As such this Project also meets the definition of “Clean Energy Generation” in this RFP.

7.6 Attribute Tracking

The Company will utilize the NEPOOL GIS tracking system for attribute tracking, which will allow MA DEP to accurately measure progress toward meeting the Commonwealth’s goals. Company agrees to deliver the environmental attributes into the Distribution Companies’ NEPOOL GIS accounts.

7.7 Litigation and Other Matters Affecting Permitting

None.

² Per RPS Class 1 Regulations (225 CMR 14.00) - <http://www.mass.gov/courts/docs/lawlib/220-229cmr/225cmr14.pdf>

SECTION 8: ENGINEERING, TECHNOLOGY AND ACCESS TO EQUIPMENT

8.0 Project Definition

Recent technological advances that have greatly improved the efficiency of photovoltaic panels have made solar energy an extremely cost effective resource for lower irradiance states such as Massachusetts, Connecticut, and Rhode Island. Upon receipt of a fully-approved, un-appealable PPA, Company will execute an EPC contract with an experienced contractor to engineer, procure equipment, and construct the Project.

8.1 Preliminary Engineering Plan

8.1.1 Type of Generation Technology

Generation type is solar.

8.1.2 Major Equipment to be Used

The Project will consist of crystalline photovoltaic panels which deliver power to 12 power inverters and step up transformers distributed throughout the project. Each transformer will be daisy chained together on corresponding collector cable(s) delivering power to the interconnection switchgear and transformer. All equipment will be designed to meet National Electric Safety Code, Utility Interconnect Standard Requirements, federal, state, and local codes.

8.1.3 Manufacturer of Equipment

The Company will choose panels from a Tier 1 manufacturer with bankable warranties that are financeable and meet applicable requirements under the National Electric Safety Code. Inverters will be supplied by SMA America or equivalent, and transformers will be procured from a proven supplier with means and methods of meeting the inverter manufacturer requirements. We have provided the technical specifications of potential inverter options under consideration in *Appendix 8-1*.

8.1.4 Status of Acquisition

The Company will contract with a leading Engineering, Construction and Procurement firm to deliver the project. An order for solar panels and other electrical equipment will be placed following the financial close of the project which is expected 03/01/2019.

8.1.5 Contract for Equipment or Plan for securing/status of commercial arrangements

The Company has not yet contracted for any of the Project's components. Procurement will take place following the completion of permitting, as detailed in Section 10.

8.1.6 Equipment Vendors selected/considered

Inverters will be supplied by SMA America or equivalent, and transformers will be procured from a proven supplier with means and methods of meeting the inverter manufacturer requirements. All other vendors will be selected based on negotiations with Tier 1 suppliers. The Company will only be negotiating with vendors that meet strict code adherence.

8.1.7 History of Equipment Operations

The Company agrees to provide this information once all equipment is selected.

8.1.8 Procurement Strategy/Consideration Factors

A large and competitive market exists for the supply of solar panels, racking and inverters. Upon the completion of permitting, the Company will conduct a competitive process to select an EPC contractor who will be responsible for engineering, procuring and constructing the Project.

8.2 Key Equipment Suppliers under Consideration

The Company is only considering Tier 1 manufacturers of crystalline photovoltaic panels.

Equipment	Supplier
Panels	Tier 1 manufacturers
Inverters	SMA-US or Equivalent
Switchgear	ABB or Equivalent
GSU Transformers	ABB or Equivalent
Main Power Transformer	ABB or Equivalent

8.3 Equipment Performance History

Solar equipment is a well established technology. There are now 1.3 million solar installations across the United States³. This is in large part due to a recent trend in increasing efficiency and declining costs, making solar energy an effective technology throughout the U.S. The Company will be happy to provide historic details on Equipment Performance once equipment is secured.

8.4 Technology Readiness

Solar panels are a mature technology and have been used for years as a clean and renewable source of energy at both residential and utility scales. As of 12/31/2016, there are nearly 45 GW of cumulative solar capacity operating in the United States⁴. The Company intends to use the most advanced solar panels and inverters available to construct the Project to ensure it produces as designed.

8.5 Final Equipment Procurement

Lead times in the solar industry are much shorter than for other renewable technologies, usually in the range of 3 – 4 months. Upon receipt of a fully-approved, un-appealable PPA, and the necessary permits, Company will purchase long lead time equipment, including solar modules, racking and inverters. If the Company receives a fully executed PPA by 06/29/2018, we anticipate receiving permits and issuing purchase orders by 02/01/19, which will facilitate a 12/31/2019 COD, all subject to the receipt of a fully executed PPA by 06/29/2018.

³ Source: CNBC - <http://www.cnbc.com/2017/02/14/us-solar-installations-nearly-doubled-in-2016-and-broke-some-records.html>

⁴ Source: Solar Energy Industries Association - <http://www.seia.org/research-resources/solar-industry-data>

SECTION 9: OPERATIONS AND MAINTENANCE

9.1 O&M Plan

The Company will be the asset manager and will select an O&M contractor with proven experience in the successful and productive management of utility scale solar farms. The Company and the selected O&M contractor will monitor the Project to ensure it produces as designed. This includes 24/7 remote monitoring of system performance, including a live telephone support line for corrective action and a single point of contact for system maintenance and repair related issues.

The Company and the O&M contractor will provide all maintenance services necessary over the lifetime of the Project, this includes both preventative and emergency maintenance. Table 9.1 below is a list of the anticipated scheduled maintenance activities. This list will be adjusted following final agreement with the selected O&M contractor. Emergency issues will be considered a top priority and be remedied by the Company and the contractor as they are identified. The Company and the O&M contractor will coordinate with The Town of East Windsor police department and volunteer fire companies regarding emergency shutoff switches.

Table 9-1 Scheduled Maintenance Activities

Task	Frequency
On-site visual inspection	1 x per year or per manufacturer requirements
Mechanical and electrical inspection	1 x per year
Panel cleaning	1 x per year
Grass cutting and weeding	2 x per year between April and October
Snow removal	As needed between October and April
Perimeter fence inspection	1 x per year
Stormwater management area inspection	1 x per year

9.2 O&M Funding Mechanism

Capital for operations and maintenance reserves will be provided as part of the financing of the project. On-going operations and maintenance will be funded using cash from operations.

9.3 Equipment Warranty Terms

As part of the O&M Agreement, the Company will negotiate warranty and guarantee terms typical for utility scale solar farms. These terms will include, but are not limited to: guaranteed availability; liquidated damages; warranty term; and provision of O&M services.

9.4 Status of O&M Agreements

The Company anticipates executing an O&M agreement upon approval of a PPA and receipt of permits. The Company intends to select its O&M contractor based primarily on successful experience in the operation and maintenance of comparable solar facilities.

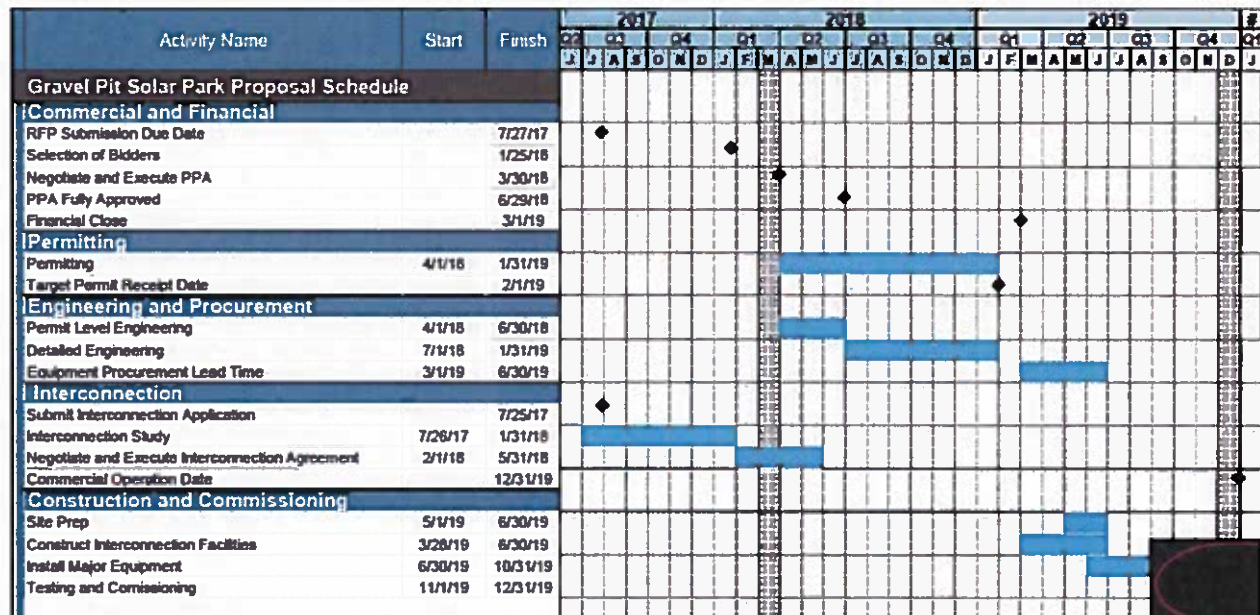
9.5 O&M Experience

The Company's extensive experience in all aspects of energy infrastructure projects is discussed in Section 5. PowerBridge is responsible for operations and maintenance of the Neptune and Hudson HVDC transmission facilities, through close oversight of its O&M contractor, Siemens. The Company will supplement this experience with the operations and maintenance expertise of the chosen O&M contractor for this project.

SECTION 10: PROJECT SCHEDULE

10.1 Critical Path Schedule

The Project schedule is listed below.



10.2 Status of Critical Path Items

The critical path for the completion of the Project is as follows:

- 1. Submit Permit Applications.** Upon receipt of an approved PPA, the Company will submit all of the required permit applications. The Company anticipates receiving final permits within 8 months. If the Company receives a fully executed PPA by 06/29/2018, we anticipate all permits will be received by 02/01/2019.
- 2. Complete Interconnection Process.** The Company has submitted an interconnection request for the Project, which is expected to be completed by or about 2/28/19.
- 3. Financing.** The Company anticipates closing under a financing agreement within one month of the receipt the latter of: a fully-approved PPA; an effective interconnection service agreement; and all required permits. If the Company receives a fully executed PPA by 06/29/2018, we anticipate Financial Close would occur by or about 03/01/2019.
- 4. Procure Long Lead Items.** Closely following Financial Close of the project, the Company will issue a final notice to proceed ("FNTP"), which will include procurement of long lead time items (panels, inverters, racking). If the Company receives a fully-approved, un-appealable PPA by 06/29/2018, FNTP is expected to commence on 03/01/2019 and long lead time items are anticipated to arrive by 06/30/2019.

5. Construction. The Company anticipates site preparation (clearing, grubbing, etc) to begin shortly following FNTF. Following the completion of the necessary site preparation, and the arrival of the major equipment, the Company will begin the major construction activities of the project. If the Company receives a fully executed PPA by 06/29/2018, construction activities will be complete by 10/31/2019 and commercial operations will commence by or before 12/31/2019.

SECTION 11: PROJECT MANAGEMENT / EXPERIENCE

11.0 Overview of Experience

PowerBridge is a highly experienced energy infrastructure developer, having successfully completed the development and financing of the Neptune Regional Transmission System and the Hudson Transmission Project, which together represent an investment of more than \$1.5 billion.

The Company's capital partners for equity and debt have extensive experience in the financing of a wide variety of energy-related technologies.

The Company is proud to have assembled a highly qualified team of professionals, many with over 25 years of experience in their related disciplines. Summary resumes of our team can be found in *Appendix 11-2* and at <http://powerbridge.us/our-team/>. The Company will leverage this team and the experience we have gained from completing the Neptune, Hudson, and TAQA Gen projects, as well as from extensive prior experience of its key personnel in the development, ownership, and operation of a diversified portfolio of renewable energy facilities.

11.1 Organizational Chart

As noted earlier, PowerBridge intends to form a special purpose entity ("SPE") to own the Project. PowerBridge will be the general partner or managing member of that SPE. Equity, including tax equity and debt will be sourced at the appropriate juncture in the development and financing process. A schematic of the anticipated ownership chart is shown in Section 5.2. A project organizational chart is attached in *Appendix 11-1*.

11.2 Experience of Project Participants

As noted previously, PowerBridge has been involved in developing, financing and operating projects with a total capital costs of in excess of \$1.5 billion. The Company will draw upon a highly qualified team of consultants, engineers, suppliers and contractors for this Project.

11.2.1 Development Phase

In addition to Company staff, the Company will use a team of development consultants comprised of individuals and organizations from the renewable energy and heavy infrastructure construction industries with considerable experience in engineering, technology, permitting and construction.

Key outside consultants which have been involved to support specific aspects of the Project's design and development to date, include:

Site Selection and Permitting: VHB
Environmental Surveys: GZA
Transmission Design: Mott McDonald
Energy Production: AWS Trupower

11.2.2 Construction Phase

The Company will contract with a leading Engineering, Construction and Procurement firm to deliver the Project.

For the purchase of the major generating equipment, only Tier 1 manufacturers of photovoltaic panels will be considered.

11.3 Existing Facilities

As this bid is for a new project that contains no existing facilities, it is not applicable.

11.4 Management Chart

The Company's execution team has an average of nearly 30 years of relevant experience including significant experience in the development, engineering, permitting, construction, finance, operations, maintenance and management of energy projects. A project management organizational chart for the execution of the Project, which includes the Company management, is attached as *Appendix 11-1*.

The Company is led by a veteran management team with extensive experience in developing renewable projects around the globe. A copy of Company's key team's resumes is attached as *Appendix 11-2*.

11.5 Prior Project Experience

The Company's management has developed and constructed a number of large and complex energy and infrastructure projects including those summarized in *Section 5.4*. Each of the Neptune Project and the Hudson Project are 660 MW HVDC projects interconnecting PJM and NYISO. The Neptune Project went commercial in June 2007, while the Hudson Project went commercial in June 2013.

As a reference contact for PowerBridge, please feel free to reach out to Gil Quiniones, President and CEO of New York Power Authority. Gil can be reached at gil.quiniones@nypa.gov.

11.6 Project Team

In addition to the significant experience of the Company team, as the development of the Project progresses, the Company will engage third party consultants to provide additional expertise. In the past, the Company has worked with such firms as:

Construction Period Lender: TBD, PowerBridge has extensive lender contacts

Operating Period Lender: TBD, PowerBridge has extensive lender contacts

Tax Equity: TBD, PowerBridge has extensive tax equity contacts

Financial Advisor: None, PowerBridge will handle internally

Risk Management and Insurance Advisor: Marsh & McLennan

Owner's Engineer: None, PowerBridge will handle internally

EPC Contractor: TBD from leading industry players

Environmental Consultant: VHB, GZA, ESS and others

Transmission Consultants: Mott MacDonald, Siemens PTI and others

Legal Counsel: Van Ness Feldman; Skadden Arps and others

11.7 ISO-NE Experience

PowerBridge has worked with ConEd Energy in PJM and the NYISO, and anticipates retaining ConEd Energy to act as Lead Market Participant in ISO-NE for this Project.

SECTION 12: EMISSIONS

12.1 Emissions Estimates

As a solar energy facility, the Project will have no emissions associated with power production. Construction of the Project will entail negligible emissions associated with on-site construction equipment.

Table 12-1: Projected Anticipated Emissions

Greenhouse Gases (all except methane) Expressed as Carbon Dioxide	Nitrogen Oxides (NO _x)	Sulfur Oxides (SO _x)	Carbon Monoxide (CO)	Particulate Matter (PM _{2.5})	Methane (CH ₄)
0	0	0	0	0	0

12.2 Emission Reduction Investments

Not Applicable.

12.3 Contribution to Massachusetts GWSA Goals

The Project is designed as a 26 MW-AC solar farm and, in terms of capacity, will be one of the largest solar farms in operation in New England. Additionally, because the Project is located in New England, it has the potential to greatly reduce Massachusetts emissions and contribute towards the goals outlined by the Commonwealth. It is estimated that the Project will produce █████ MWh of energy in the first year of its operation and, by the end of its useful life, will have generated over 1,000,000 MWhs of clean, zero-carbon energy. Through an analysis of each power plant currently operating in the State of Connecticut, the U.S. Environmental Protection Agency (EPA) has determined that one MWh of electricity produced with clean technology will displace nearly 1,063.1 lbs of CO₂ equivalents from power plant emissions in the state of Connecticut⁵. This is an annual emissions reduction of 22,690 metric tons of CO₂ equivalents. While not the entire answer, a solar farm of this scale presents a valuable piece of the solution to reducing greenhouse gas emissions. By the end of its useful life, the Project will have deferred more than 0.5 million metric tons

⁵ The EPA publishes calculations of emissions rates based on reported data from power plants nationwide. This data is then compiled and posted publicly. This compilation of data is referred to as the Emissions & Generation Integrated Database (eGrid). As part of this emissions calculation, the EPA calculates non-baseload estimates for CO₂, CH₄ and N₂O. Non-baseload emissions estimates refer to the generation that would be displaced through the addition of new renewable energy.

of CO₂ equivalents. Since the Project Commercial Operation Date is scheduled for December 31, 2019, these reductions will contribute to both the 2010 Clean Energy and Climate Plan for 2020, and the longer term goals found in the 2018 Global Warming Solutions Act.

SECTION 13: EMPLOYMENT, ECONOMIC DEVELOPMENT AND OTHER BENEFITS

13.1 Direct Job Creation

The Project will create a large range of jobs during each of the development, construction and operations phases. A predominance of those jobs will be based based in Connecticut and the surrounding areas of Massachusetts.

Development

During the development phase of the Project, jobs will be created in environmental and engineering consulting. Because the Project is located in Connecticut, a majority of these jobs will be based in New England.

Construction

There will be approximately 120 New England jobs created and employed by the project during the construction phase. The construction of the solar farm will include activities such as engineering, site clearing, pile driving, road installation, module installation, and electric wiring. These types of activities will create jobs for engineers, iron workers, electricians, carpenters, piledrivers and laborers, with an estimated hourly wage rate that is roughly twice the minimum wage.

Operation

The Project will retain approximately 5 New England jobs throughout its operation. These jobs will be in the operating and maintaining of the Project, and will employ, among others, operating engineers.

13.2 Indirect and Induced Job Creation

This Project will not only create over a hundred direct jobs, but also a large number of indirect jobs, a majority of which will be created from the supply chain during the construction phase of the project. It is estimated that the project will result in the creation of approximately 80 indirect jobs in the fields of electrical contracting, semi-conductor equipment manufacturing, and wholesale trade of electronic devices.

The Project will also create jobs associated with the induced impacts of the Project. These are jobs that are created as a result of the wages earned by individuals employed during the development, construction and operation of the project. It is estimated that approximately 50 New England jobs will be created by the induced impacts.

13.3 Other Economic Development Benefits

The Company will seek to establish a long-term Tax Agreement with the Town of East Windsor, CT, providing a steady stream of revenue to the Town for payments associated with two forms of taxes: (i) real estate taxes and (ii) tangible personal property taxes. Under East Windsor's current tax code, the Company will pay the Town of East Windsor annual real estate taxes of [REDACTED]. The Company anticipates establishing a Tax Agreement with the Town that values the tangible personal property of the solar farm at approximately [REDACTED]. For the Project, a first year payment to the town will be approximately [REDACTED]. Over the lifetime of the project, the Town of East Windsor will accumulate more than [REDACTED] in tax payments.

13.4 Benefits to Ratepayers/Other Factors

These other benefits would include LMP suppression due displacement of marginal fossil fuel technologies and health benefits associated the environmental emissions displaced.

13.5 Contribution to Reducing Winter Peak Load

PowerBridge agrees to guaranty 70% of P50 output during the Winter Peak Period as required in the RFP and as calculated on the CPPD forms included with Company's response. Company had AWS Truepower prepare an analysis of the Project's P50 and P99 levels of output during the hours in the Winter Peak Period. This analysis, which is attached as *Appendix 13-1*, found that the Project's P99 output during the first year Winter Peak Period (██████ MWhs) is higher than of the guaranteed quantity (██████ MWhs). We believe this should give the Soliciting Parties comfort that energy guaranteed, will in fact, be delivered during this critical time period.

SECTION 14: ADDITIONAL INFORMATION REQUIRED FOR TRANSMISSION PROJECTS

This is not applicable as we are not submitting a project under a Transmission related Bid Category.

SECTION 15: EXCEPTIONS TO FORM PPA

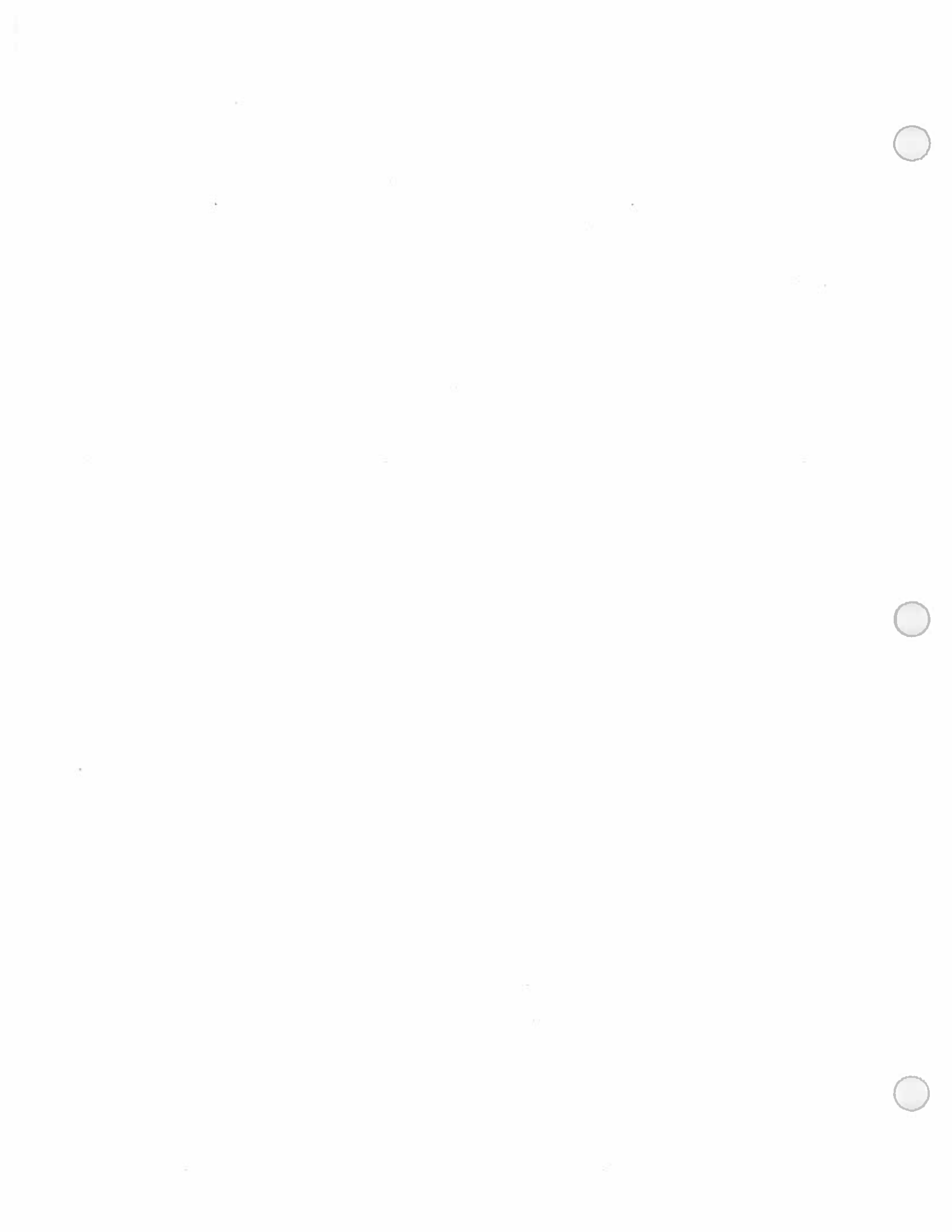
Please see *Appendix 15-1* for Company's proposed red-line of the draft PPA.



**GRAVEL PIT
SOLAR PARK**

Appendix 1-0:

Certificate and Authorization Form



Part II (a)
Proposal Certification and authorization (Appendix D)

A proposal will be considered incomplete unless all required signatures are provided.

The undersigned certifies that he or she is an authorized officer or other authorized representative of the Bidder, and further certifies that: (1) the Bidder has reviewed this RFP and all attachments and has investigated and informed itself with respect to all matters pertinent to this RFP and its proposal; (2) the Bidder's proposal is submitted in compliance with all applicable federal, state and local laws and regulations, including antitrust and anti-corruption laws; (3) the Bidder is bidding independently and that it has no knowledge of the substance of any proposal being submitted by another party in response to this RFP other than a response submitted by the bidder's affiliate of for a project where the Bidder is also a project proponent or participant, and notice of each such affiliated bid or project must be disclosed in writing with each of the Bidder's and affiliated bidder's proposal; (4) the Bidder has no knowledge of any confidential information associated with development of the RFP; (5) the Bidder's proposal has not been developed utilizing knowledge of any non-public information associated with the development of the RFP; (6) the Bidder has not obtained any confidential bidding-related information directly or indirectly from any of the Distribution Companies, in preparation of its bid; and (7) except as disclosed by the Bidder in the relevant portions of its response, the Bidder is not an Affiliated Company of any Massachusetts investor-owned electric Distribution Company and no Distribution Company which is seeking proposals pursuant to the RFP has a financial or voting interest, controlling or otherwise in the bidder or the bidder's proposed project.

Violation of any of the above requirements may be reported to the appropriate government authorities and shall disqualify the Bidder from the RFP process.

The undersigned further certifies that the prices, terms and conditions of the Bidder's proposal are valid and shall remain open for at least 270 days from the submission date.

The undersigned further certifies that he or she has personally examined and is familiar with the information submitted in this proposal and all appendices thereto, and based on reasonable investigation, including inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of the undersigned's knowledge and belief.

The undersigned understands that a false statement or failure to disclose material information in the submitted proposal may be punishable as a criminal offense under applicable law. The undersigned further certifies that that this proposal is on complete and accurate forms as provided without alteration of the text. The undersigned further understands and agrees to the provisions of this RFP related to confidential information, and consents to the limited exchange and sharing of confidential information related to the Bidder's proposal as described in this RFP, including with members of the



Bidder or Bidder's Authorized Representative

J. Christopher Hocker

Print or Type Name

Gravel Pit Solar Park

Project Title(s) as Submitted to the Soliciting Parties

Vice President, Planning

Title

7/26/17

Date

Part II (b)
Bidder and Contact Information

Contact Information For Project	
Name	J. Christopher Hocker
Mailing Address	PowerBridge, LLC 501 Kings Highway E., Ste. 300, Fairfield, CT 06825
Courier Address (If Different)	
Telephone Number	203-416-5590
Fax Number	203-416-5599
E-mail Address	chocker@PowerBridge.us

Alternate Contact (Optional)	
Name	Jeffrey Wood
Mailing Address	PowerBridge, LLC 501 Kings Highway E., Ste. 300, Fairfield, CT 06825
Courier Address (If Different)	
Telephone Number	203-416-5590
Fax Number	203-416-5599
E-mail Address	jwood@PowerBridge.us



**GRAVEL PIT
SOLAR PARK**

Appendix 1-1:

**CPPD Form 1: Base Case PTF Interconnection
CONFIDENTIAL**



GRAVEL PIT SOLAR PARK

REDACTED

THE UNIVERSITY OF CHICAGO
LIBRARY
1100 EAST 58TH STREET
CHICAGO, ILL. 60637





**GRAVEL PIT
SOLAR PARK**

Appendix 1-2:

**CPPD Form 2: Alternative Proposal Distribution
Interconnection
CONFIDENTIAL**





GRAVEL PIT SOLAR PARK

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THE
FEDERAL
BUREAU OF
INVESTIGATION
OF THE
DEPARTMENT OF JUSTICE

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**GRAVEL PIT
SOLAR PARK**

Appendix 2-1:

Memo of Seasonal Peak Output



Memorandum

To: PowerBridge, LLC
From: Peter Johnson, Project Manager at AWS Truepower, LLC, a UL Company
Date: July 21, 2017
Re: Gravel Pit Solar Park – Calculation Approach for Seasonal Hourly MW Capacities

This memorandum outlines the calculations of average net megawatt (MW) capacities for specific seasonal and hourly periods requested by PowerBridge, LLC at the Gravel Pit Solar Park, located in Connecticut.

The following time periods were evaluated:

- Summer (June-September) for the hours 1:00 PM to 6:00 PM
- Winter (October-May) for the hours 5:00 PM to 7:00 PM

Average net MW capacities were calculated for these time periods for a 26 MW_{AC} project based on the results of a preliminary energy analysis for an adjacent project completed in early April 2016.

The following steps were used for the calculation:

1. A Daylight Savings Time adjustment was applied using the dates expected in 2019: March 3 and November 3.
2. Hourly net energy values were used to represent available power, since kWh per hour = kW
3. Data averages were computed for the range of times and months listed above using criteria set in MS Excel.
4. The average net MW for each time period was converted to a percentage of the project's AC capacity.
5. The selected inverter allows for a night time disconnect to remove the impact of parasitic energy loss from the results provided below.

The results are provided in the table below.

Table 1. Seasonal Average Net MW and Percent of AC Capacity from Fixed-Tilt PV Project

Time Period	Average Net MW	Percent of Capacity	Median Net MW	Percent of Capacity
Summer	16.2	62.2%	16.8	64.5%
Winter	4.1	15.7%	2.0	7.7%





**GRAVEL PIT
SOLAR PARK**

Appendix 4-1:

Memo of Support AWST

24 July 2017

J. Christopher Hocker
VP of Planning
PowerBridge, LLC
501 Kings Highway East, Suite 300
Fairfield, CT 06825

RE: Support for PowerBridge's proposed Gravel Pit Solar Park

Dear Mr. Hocker:

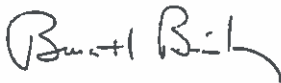
I am pleased to offer my fullest support for PowerBridge's proposal to bring clean, affordable renewable energy to Massachusetts with their planned 26 MW_{AC} solar photovoltaic (PV) project: Gravel Pit Solar Park.

My company, AWS Truepower LLC (a UL Company), is a 30+ year old firm that has provided technical consulting services to the renewable energy industry across New England and the rest of the country. Our President—Dr. Michael Brower—lives in Boston. Throughout our history, AWST has supported energy assessments, project investment decisions, and operational analyses on over 120,000 MW of renewable power. Our recent solar experience in Massachusetts, Connecticut, Vermont and New York includes third-party resource and energy production estimates, technical due diligence, and construction monitoring for photovoltaic projects totaling over 55 MW_{AC} of capacity.

PowerBridge's proposed Gravel Pit Solar Park project will bring high-quality jobs to the region in the near term, and it will also position Massachusetts and neighboring states for real, long-term sustainable job growth in the rapidly growing solar photovoltaic energy industry. PowerBridge's team is staffed with respected renewable energy professionals who have successfully sited, permitted, financed, deployed and operated solar, wind and other clean power projects across the country. Their team has consistently demonstrated an ability to work collaboratively with stakeholders and to deliver successful, cost-competitive projects.

We look forward to working with the stakeholders in Massachusetts to help realize this project and its accompanying benefits of clean and reliable power and sustainable, long-term economic development. PowerBridge has the passion, expertise and integrity to bring the Gravel Pit Solar Farm to reality.

Sincerely,



Bruce H. Bailey, Ph.D.
Chief Executive Officer – AWS Truepower
VP – Renewables, Energy and Power Technologies Division – UL LLC



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**GRAVEL PIT
SOLAR PARK**

Appendix 4-2:

**Year 1 Solar Delivery Profile
CONFIDENTIAL**



Net Energy 12X24 Matrix (First Year)

Hour	Month												Average (kWh)	Total (MWh)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	126	174	73	0	0	0	0	0	31	11
5	0	0	14	404	1255	1440	1259	493	141	0	0	0	419	153
6	0	97	1364	3427	4639	4548	4488	3044	2465	1830	337	0	2197	802
7	1874	3223	5909	8681	9701	9197	9793	7653	7312	6978	4295	1679	6368	2326
8	7204	8211	10484	13717	14439	13282	14791	12583	12264	12189	9288	6906	11288	4123
9	10629	12548	13714	18279	17355	15389	18255	16711	15839	15856	12075	10878	14796	5404
10	12576	14647	15460	19453	17696	16972	20138	19819	17690	17449	14029	13029	16579	6056
11	14003	14564	15955	18489	17913	17345	20155	21044	18204	18064	15210	14108	17094	6244
12	14411	13578	16321	17742	17302	17645	18898	20179	18501	16563	14615	13546	16616	6069
13	13744	14048	15774	17735	16243	16552	17107	17839	17068	14854	12498	12330	15479	5654
14	9943	11916	13800	14929	14501	13433	15662	15027	13925	10808	9321	9628	12737	4652
15	6789	8686	10172	10540	10578	10189	13286	11451	9694	7000	5069	4763	9016	3293
16	1831	4254	5252	6667	6632	6891	8255	6826	5051	2665	438	0	4561	1666
17	0	203	1299	1983	2774	3270	3429	2734	894	9	0	0	1390	508
18	0	0	0	119	726	1069	1000	426	0	0	0	0	280	102
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average (kWh)	3875	4416	5230	6340	6328	6141	6941	6493	5794	5178	4049	3620	5369	
Total (MWh)	2883	2967	3891	4565	4708	4422	5164	4831	4171	3852	2915	2693		47064



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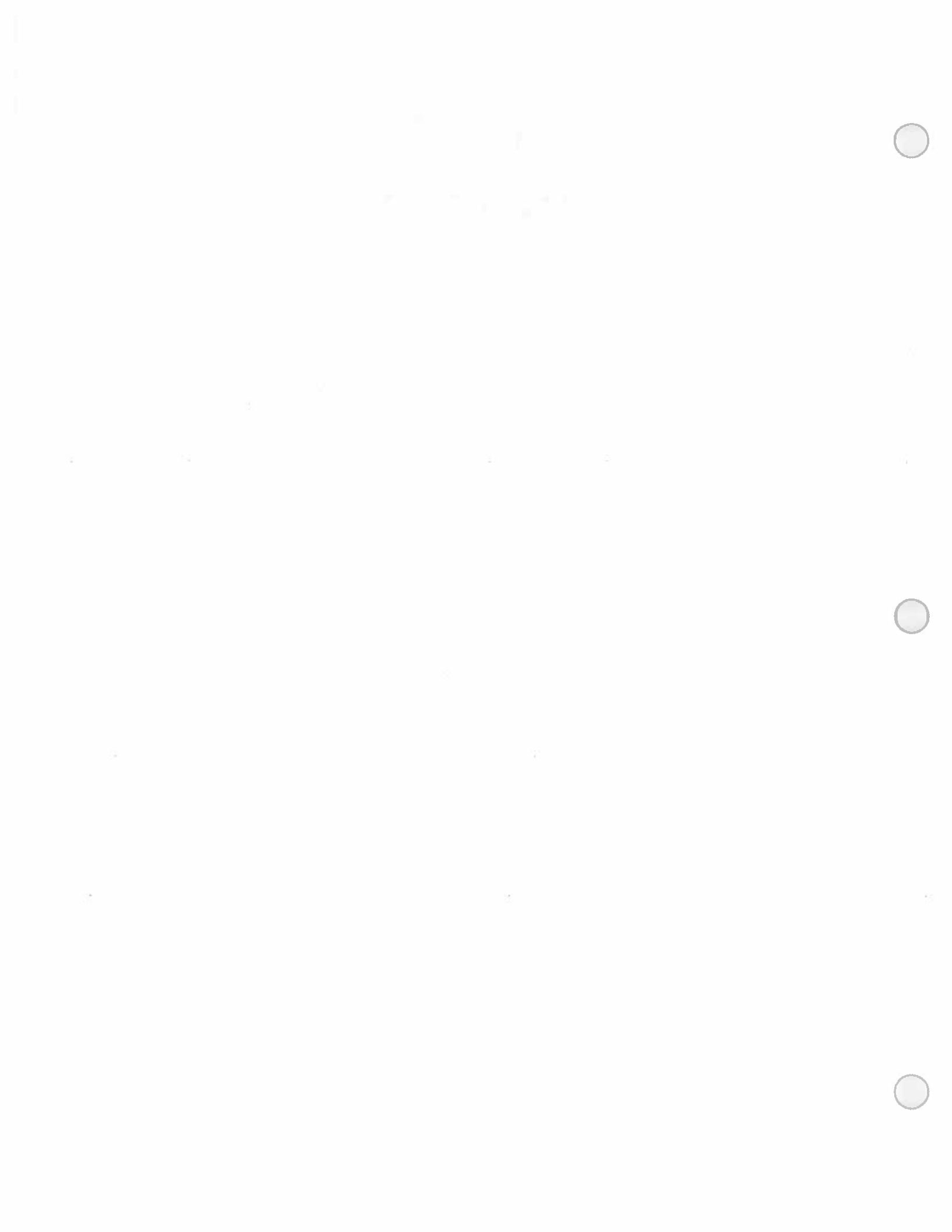
Appendix 4-3:

**Long Term Energy Profile
CONFIDENTIAL**



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REDACTED

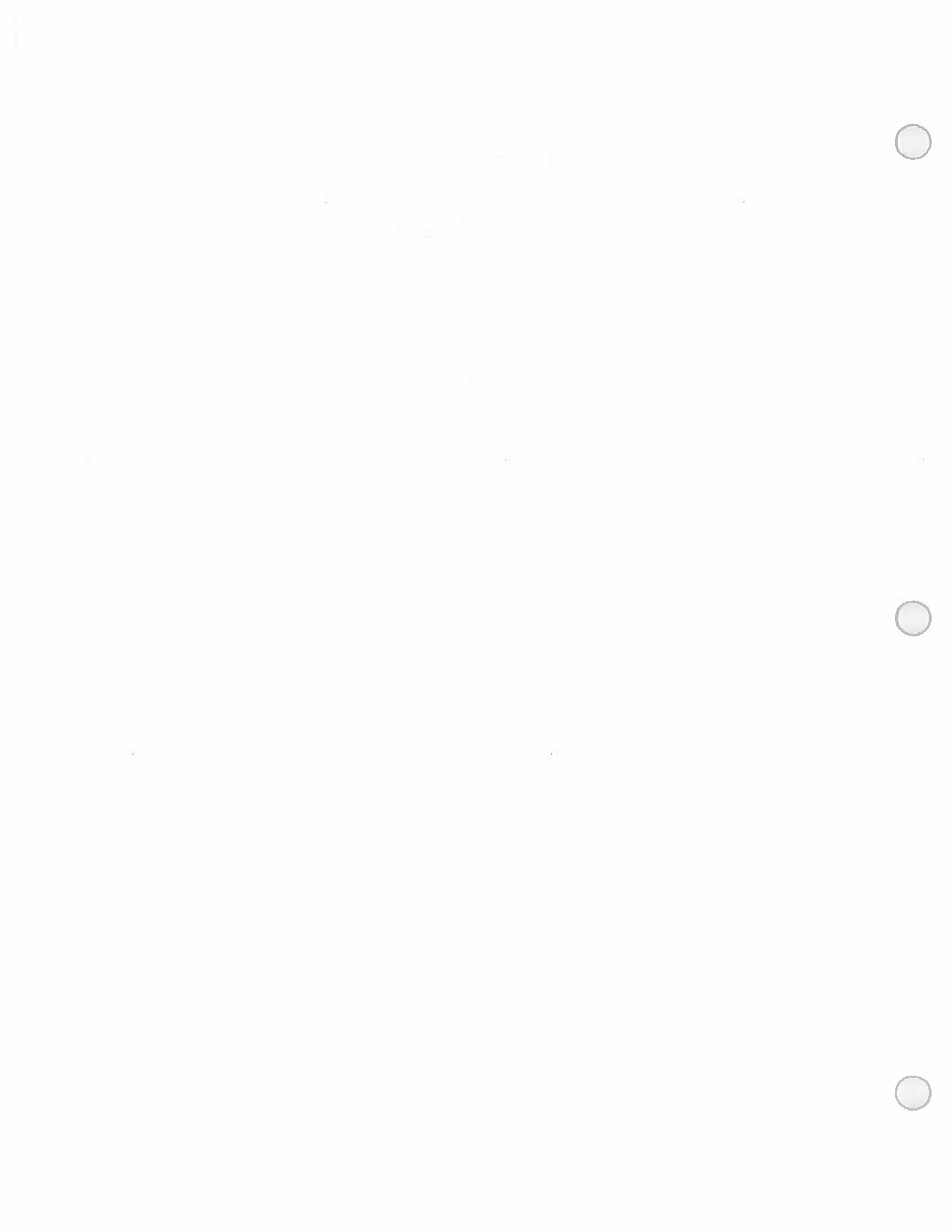




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Appendix 4-4:

Solar Loss Category Descriptions



AWST SOLAR LOSS CATEGORY DESCRIPTIONS

Effective Irradiation

Horizon Shading

This loss accounts for the decrease in radiation due to the horizon. Far objects or topography (i.e., hills and mountains) can result in a horizon line that may cause the project area to be shaded. The horizon line and position of the sun are used to estimate this loss on an hourly basis.

Near Shading

This loss accounts for the decrease in radiation caused by row-to-row and nearby obstacle shading. Array geometry and sun position are used to estimate this loss on an hourly basis. Trees and scattered brush throughout the project site are assumed to be removed so that they will not cast shadows on the modules.

Incident Angle Modifier Factor (Reflection)

The reflectance of the radiation off the surface of the module depends on the angle of incidence and varies seasonally and diurnally. The incident angle modifier (IAM) effect is assumed to obey Fresnel's Law and is modeled using the ASHRAE parameterization¹.

Soiling and Snow

This loss accounts for the collection of dirt and debris and, when relevant, snow cover on the array. Monthly soiling losses are estimated based on precipitation data from nearby available data sources. These data are used along with an estimated daily soiling rate and precipitation cleaning threshold to determine monthly soiling loss estimates. Snow accumulation, melting, and sliding are considered to estimate the snow loss based on regional snowy day data and hourly temperature profiles. When a cleaning schedule is provided, this is incorporated into the monthly loss estimates for soiling and snow.

Photovoltaic Conversion

Initial Light Induced Degradation - ILID

This loss accounts for the initial light induced degradation in power output that a PV module may experience after its first exposure to sunlight. Module power ratings established from flash tests will typically be adjusted to represent the stabilized power output after the initial degradation period.

Non-STC Operation (Irradiance Level and Temperature)

This loss accounts for energy lost due to operation at conditions other than standard testing conditions, including changes in performance due to irradiance and temperature. The thermal behavior of the modules is assumed to be a result of the incident radiation, ambient temperature, wind speed, and the thermal characteristics of the module.

¹ Standard ASHRAE 93-77, Methods of Testing to Determine the Thermal Performance of Solar Collectors, American Society of Heating, Refrigeration, and Air Conditioning Engineers, New York (1977)

Module Quality

This loss accounts for the deviation from the average effective module power output (i.e., average power magnitude) with respect to the manufacturer supplied ratings, which can be due to manufacturer tolerances used for module binning or varying operating conditions across the array. While PV modules are typically placed into power bins depending on flash test results; actual powers will depend on the bin range and the measurement accuracy of the manufacturer.

Module Mismatch

This loss accounts for the differences in electrical characteristics of the modules within an array (i.e., variation in module power) given the same environmental conditions due to manufacturer tolerances and operating conditions. When connected together, the modules do not operate at their individual peak efficiencies, but instead operate at the collective maximum power point. This loss is estimated based on the array configuration and the expected tolerances on module output. As the system ages, it is expected that mismatch loss will gradually increase by year 25 due to system degradation (material degradation and component/wiring degradation), increasing the impact of mismatch.

Electrical

DC and AC Wiring

This loss accounts for wiring losses on the DC and AC portions of the system. The DC wiring loss at STC conditions is estimated to be 1.0%. The distance between the inverters and the transformers is assumed to be small, so the AC wiring loss for this portion of the system was assumed to be negligible. The AC wiring loss between the transformers and grid interconnection point is estimated to be 1.0% at nominal conditions. Resulting losses are calculated on an hourly basis based on how the STC assumptions compare to the on-site conditions.

Inverter Limitation

This loss accounts for inverter clipping for operation above the nominal inverter power, nominal inverter voltage, operation outside of the maximum power point tracking window, and other applicable factors contributing to inverter limitation. This loss is based on the electrical characteristics of the inverter and the expected array operation.

Inverter and Medium-Voltage Transformer Efficiency

This loss accounts for the DC/AC conversion efficiency of the inverter and any associated medium-voltage transformer, if present. Based on the efficiency curve of the selected inverter and the operating conditions of the array, an annual efficiency loss due to the inverter and medium-voltage transformer is estimated.

External High Voltage Transformer Efficiency

This loss accounts for external (high-voltage) transformer efficiency and is composed of an iron loss in the magnetic circuit and copper loss in the windings and losses associated with transformer energization. Based on typical transformer characteristics, the core loss is estimated to be 0.1% and the copper loss is estimated to be 1.0% at nominal conditions. Transformer night disconnection was assumed. These assumptions are evaluated for the site's varying operating conditions to arrive at an annual estimate for transformer efficiency loss.

Transmission Line to Point of Interconnection (POI) Efficiency

This loss accounts for any transmission line losses from the project substation to the point of energy delivery per the Power Purchase Agreement (PPA). This loss factor may be defined by the developer based on a separate study or PPA terms (required for bankable energy analyses), or may be roughly estimated by AWS Truepower for preliminary energy analyses.

Operational

Tracking System Performance

This loss accounts for the possibility of tracker accuracy and downtime for motor failures and wind stow. While tracker availability is expected to be very high (99.99%), wind stow events, backtracking algorithm accuracy, and tracker accuracy are expected to result in a loss factor of 0.2% for N-S axis tracking projects. Fixed-tilt projects will not experience a tracking system loss (0.0%).

DC System Performance (Module/String Failures)

This loss accounts for undetected DC-system failures and underperformance related to maintenance routines. It is expected that some module failures, wiring failures, and underperforming modules. This impact is evaluated assuming that SCADA monitoring and a proactive O&M program will be implemented to minimize this impact. As the system ages, it is expected that these failures will increase in frequency; thus DC system performance loss is modeled to gradually increase by 1.0% by year 25.

Availability of System

Data reviewed by AWS Truepower shows that the typical solar plant is likely to average around 99% availability in long-term operation. AWS Truepower attributes availability losses based on the typical contractual availability for utility-scale projects, and non-contractual availability, primarily due to force majeure events, scheduled maintenance, unscheduled maintenance and repair delays. Sub-categories of availability are described below.

- **Availability of AC System (Inverters and Medium-Voltage Transformers):** This loss accounts for both forced and unforced unavailability related to the PV-System—for inverters & MV transformers unavailability. The assigned value for this configuration was 0.8%.
- **Availability of Collection, High-Voltage Transformer, and Substation:** This loss accounts for outages of the collection system and substation. It is typically assigned a value of 0.2%, which corresponds to three events per year during daylight hours of six hours average duration.
- **Availability of Utility Grid:** This loss accounts for outages of the utility grid. It is typically assigned a value of 0.1%, which corresponds to two events per year during daylight hours of approximately four hours average duration.

PPA Curtailment

This loss accounts for lost production due to power purchase agreement curtailment. If the solar plant is forced to curtail production, loss of revenue could result from the sale of energy and/or loss of production incentives. Typically, AWS Truepower does not have sufficient information to assign a value to this loss. Consequently, it is typically set to 0.0% unless loss data is supplied by the client.

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HVAC & Auxiliary Consumption

This loss accounts for the heating and cooling of the inverter enclosure (if any) and the power consumption of auxiliary components including tracking motors, data acquisition, electronics, and lighting. The auxiliary energy loss will be defined in next stages of the project since not enough information of components consumption was available. Furthermore, depending on project energy definitions, HVAC losses may not be considered part of the long-term energy estimate, but rather an operational expense included in the projects financial cash flow model. Therefore, for this study the HVAC & Auxiliary components loss is not included in the loss analysis.

Annual Performance Degradation

This loss accounts for the annual degradation of system performance. The annual degradation in system output is estimated based on module specifications provided by the manufacturer, industry typical values, the local climate, and AWST's experience with similar projects.

- **Material Degradation:** The material degradation rate represents degradation of the solar module material. The annual degradation in module output is estimated based on module specifications provided by the manufacturer, industry typical values, and AWST's experience with similar projects. The module supplier warrants that annual degradation will not exceed a certain amount in 25 years, resulting in a material degradation percentage per year. AWST assumes that actual degradation will be less than this warranted amount. The project-specific material degradation rate is estimated based on the site-specific climate (e.g., plane-of-array irradiance).
- **System Degradation:** The system degradation rate includes additional adjustments for system factors that are expected to impact the long-term energy output of the project:
 - **Inverter and Curtailment Loss Reclamation:** If relevant, inverter limitation loss and curtailment loss reclamation are assessed. As the DC array reduces in capacity, AWST expects these loss factors to also gradually reduce.
 - **DC System Performance Loss Increase:** DC system performance loss is expected to increase by 0.04% per year, cumulating to 1.0% in 25 years due to component/wiring failures, underperforming and broken modules, and other array-level events that may not be identified or addressed immediately by O&M activities.
 - **Mismatch Loss Increase:** As the DC array reduces in capacity, it is expected that mismatch losses will increase. An annual mismatch loss increase of 0.04% per year was assigned, cumulating to 1.0% additional mismatch loss by year 25.
- **Calculation Approach:** The degradation loss is calculated from year zero and was applied subtractively to the partial net energy at the point of the module in the system's energy flow. AWST considers the year-zero subtractive approach to be most appropriate when considering the physical realities of degradation and its impact on the system's energy. The system degradation rate is reported as the average year-to-year difference in net energy output over the evaluation period.





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Appendix 5-1:

Memo of Support D.E. Shaw

DE Shaw & Co

1166 Avenue of the Americas
Ninth Floor
New York, NY 10036

(212) 478-0000
FAX (212) 478-0100

July 24, 2017

RE: Proposal(s) by PowerBridge LLC ("PowerBridge") in response to Request for Proposals for Clean Energy Generation and Associated Environmental Attributes and/or RECs under Cost-Effective Long-Term Contracts, pursuant to Section 83D of Chapter 169 of the Acts of 2008 (the "83D RFP")

To Whom It May Concern:

The D. E. Shaw group is pleased to provide this letter with respect to the solar project(s) located in Connecticut being developed by PowerBridge in response to the 83D RFP.

The D. E. Shaw group is a global investment and technology development firm with more than 1,000 employees, approximately \$42 billion in investment capital as of April 1, 2017, and offices in North America, Europe, and Asia.

The D. E. Shaw group's U.S. growth and buyout private equity unit has extensive experience investing in power assets. The group currently manages several significant investments in renewable energy companies, including Deepwater Wind (which developed, built, and owns the Block Island wind farm---the first offshore wind farm in the U.S.) and Green Rock Energy (developer of clean coal solutions in Kentucky and Louisiana). Members of the group have worked on numerous other energy transactions over the past two decades. The team has deep relationships in the project finance lending space: since 2005, the team's renewable energy portfolio companies have raised over \$10 billion in senior secured project debt, corporate bonds, tax equity, cash equity, and other sources of funding.

The D. E. Shaw group has invested substantial resources to fund the development, construction, and operation of numerous renewable energy projects, including its current portfolio of more than 1,300 MWac of onshore wind and solar projects across 15 states. The D. E. Shaw group has a close working relationship with PowerBridge and we would welcome the opportunity to speak with you or your colleagues regarding the 83D RFP and the D. E. Shaw group's support for PowerBridge's development efforts.

If you have any questions, please do not hesitate to contact me at 212-478-0235.

Sincerely,



Name: Bryan Martin

Title: Managing Director,
Head of US Private Equity, and
CEO of D. E. Shaw Renewable Investments, L.L.C.

