EXHIBIT 1

BOARD OF COMMISSIONERS

AGENDA REQUEST & STAFF REPORT

MEETING DATE: October 28, 2024

SUBJECT: Public Hearing regarding Energy Wise Services Protest of Document No. 2024-811 Notice of Intent to Award a Contract for the Deschutes County Fair and Expo Center Solar PV System to E2 Solar LLC.

BACKGROUND:
Oregon Revised Statute (ORS 279C.527-528) requires that public entities spend 1.5% of the total contract price of a public improvement contract for new construction projects $5 million or greater on green energy technology or an alternative, regardless of funding source. Green energy technology includes solar technology such as photovoltaic systems. A photovoltaic (PV) solar technology system is proposed as part of the Courthouse Expansion project to comply with the 1.5% green energy technology requirement. Due to limitations of the Courthouse site and roof area the system is proposed to be constructed at the Deschutes County Fair and Expo Center.

On July 24, 2024 staff presented the Design-Build Findings of Fact and the Board approved Order No. 2024-028 exempting the Solar PV System project from competitive bidding and authorizing the use of design-build services of contracting for the Solar PV System.

On August 7, 2024 the Facilities Department issued a publicly advertised RFP for a Design-Build Contractor for the Solar PV Project in accordance with ORS 279C.400 – 279C.410. A copy of the RFP is attached hereto. The Facilities Department received seven (7) formal proposals by the 2:00pm deadline on September 11, 2024 and the proposals were reviewed by a scoring committee made up four (4) representatives from the Fair and Expo Center and the Facilities Department. Proposals were evaluated based on the following categories and ranked by their total score out of 100 points possible:

- Cover Letter (Pass/Fail)
- Proposed Responder's Project Team (20 points max.)
- Responder's Approach to Provide Solar and PV Related Services (20 points max.)
- Responder's Customer Service (20 points max.)
- Responder's Related Project Experience (20 points max.)
- Responder's References (10 points max.)
- Responder's Billing Rates/Fee Schedule (15 points max.)
- Exhibit C: Signature Sheet (Pass/Fail)

E2 Solar received the highest scoring by the committee during the evaluation process and is being recommended for award of the contract. A copy of the scoring summary for the selection process is attached.

On October 2, 2024 the Board considered the recommendation of the scoring committee at a regularly scheduled meeting. The Board voted 3-0 to approve Document No. 2024-811. Thereafter, on October 4, 2024, Deschutes County received a formal protest from Energy Wise Services of the Notice of Intent to Award, Document No. 2024-811. A copy of the protest letter is attached hereto.

In accordance with ORS 279B.405 and .410, the Energy Wise Systems protest is before the Board for consideration.

LEGAL CRITERIA:

1. **ORS 279B.405**

ORS 279B.405(4) states that the contracting agency (the Board) shall consider a protest if it is timely filed and contains the following:

(a) Sufficient information to identify the solicitation that is the subject of the protest;

(b) The grounds that demonstrate how the procurement process is contrary to law or how the solicitation document is unnecessarily restrictive, is legally flawed or improperly specifies a brand name;

(c) Evidence or supporting documentation that supports the grounds on which the protest is based; and

(d) The relief sought.

All four of the above criteria must be met. Energy Wise Services' protest contains sufficient information to identify the solicitation that is the subject of the protest. However, Energy Wise Solutions has not challenged the solicitation document as unnecessarily restrictive, legally flawed or as improperly specifying a brand name. Nor has Energy Wise Services presented grounds to demonstrate that the procurement process is contrary to law. The Board must decide if Energy Wise Services has met ORS 279B.405(4)(b).

Energy Wise Services' protest letter sets forth several factors which it states the County did not give sufficient weight to its proposal. These generally include that their proposal provides more value to the County in terms of simplicity, reliability, cost savings, and system size. The Board must decide if Energy Wise Services has met ORS 279B.405(4)(c) and (4)(d).

2. ORS 279B.410

ORS 279B.410 states, in relevant part:

(1) A bidder or proposer may protest the award of a public contract or a notice of intent to award a public contract, whichever occurs first, if:

> **(a)** The bidder or proposer is adversely affected because the bidder or proposer would be eligible to be awarded the public contract in the event that the protest were successful; and
>
> **(b)** The reason for the protest is that:
>
> > **(A)** All lower bids or higher ranked proposals are nonresponsive;
> >
> > **(B)** The contracting agency has failed to conduct the evaluation of proposals in accordance with the criteria or processes described in the solicitation materials;
> >
> > **(C)** The contracting agency has abused its discretion in rejecting the protestor's bid or proposal as nonresponsive; or
> >
> > **(D)** The contracting agency's evaluation of bids or proposals or the contracting agency's subsequent determination of award is otherwise in violation of this chapter or ORS chapter 279A.

(2) The bidder or proposer shall submit the protest to the contracting agency in writing and shall specify the grounds for the protest to be considered by the contracting agency.

The Board must consider whether the stated reasons for Energy Wise Services' protest are cognizable under ORS 279B.410(1)(b) and whether Energy Wise Services has specified the grounds for the protest in accordance with the statute. Energy Wise Services' protest letter does not allege that E2 Solar's proposal is nonresponsive, nor that the County failed to evaluate the proposals in accordance with the RFP materials. The County did not reject Energy Wise Services' proposal as nonresponsive; however, during the scoring process it was noted that the required Exhibit C: Signature Sheet was not included with their proposal. Energy Wise Services was not notified that their proposal was incomplete considering that their proposal was scored 6th out of the seven (7) proposals.

Energy Wise Services has not alleged that the County's evaluation of proposals is "otherwise in violation" of ORS 279B or ORS 279A.

3. ORS 279B.060(8)

ORS 279B.060(8) provides discretion to the Board in evaluating proposals submitted in response to an RFP. It states that a contracting agency (the Board) may evaluate proposals on any of the following bases:

(a) An award or awards based solely on the ranking of proposals;

(b) Discussions leading to best and final offers, in which the contracting agency may not disclose private discussions leading to best and final offers;

(c) Discussions leading to best and final offers, in which the contracting agency may not disclose information derived from proposals submitted by competing proposers;

(d) Serial negotiations, beginning with the highest ranked proposer;

(e) Competitive simultaneous negotiations;

(f) Multiple-tiered competition designed to identify, at each level, a class of proposers that fall within a competitive range or to otherwise eliminate from consideration a class of lower ranked proposers;

(g) A multistep request for proposals requesting the submission of unpriced technical submittals, and then later issuing a request for proposals limited to the proposers whose technical submittals the contracting agency had determined to be qualified under the criteria set forth in the initial request for proposals; **or**

(h) A combination of methods described in this subsection, as authorized or prescribed by rules adopted under ORS 279A.065 (Model rules generally).

The Board exercised its discretion to evaluate the proposals based solely on the ranking of proposals, consistent with ORS 279B.060(8)(a).

BUDGET IMPACTS:
Costs for the Solar PV Project are budgeted within the Courthouse Expansion project.

RECOMMENDED MOTIONS:
The Board has several options at the conclusion of the staff presentation and Energy Wise Services protest. The Board may:

- Hold the oral and written record open and continue the hearing to a date certain
- Close the oral record and hold the written record open to a date certain
- Close both the oral and written record and set a date certain for deliberations
- Close both the oral and written record and begin deliberations

If the Board decides to deny the protest, staff will prepare a proposed Order Denying Protest for Board signature. No revisions to Document No. 2024-811 will be necessary.

If the Board decides to grant the protest, staff will prepare a proposed Order for Board signature, which Order will include withdrawal of Document No. 2024-811. The Board's order granting the protest may direct dissemination of a new RFP for the Deschutes County Fair and Expo Center Solar PV System, or it may decide based on information presented in the

protest and at the public hearing to reconsider acceptance of the recommendation of the scoring committee and approve a new Notice of Intent to Award Contract.

ATTENDANCE:

Stephanie Marshall, Deschutes County Senior Assistant Legal Counsel
Lee Randall, Deschutes County Facilities Director
Eric Nielsen, Deschutes County Facilities Capital Improvement Manager
Wayne Powderly, Cumming Group

Request for Proposal
For
Solar PV System

Deschutes County Fairgrounds

Redmond, OR

Prepared by
Cumming Management Group
Owner's Representative

Issued August 7, 2024

CUMMING
Building Value Through Expertise

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GENERAL INFORMATION

Deschutes County (Owner), and their Owner's Representative Cumming Management Group, invites proposals from Solar PV Contractors (hereinafter Responder, Proposer, Vendor, company or contractor) to provide a **Design Build Solar PV System & Related Services** proposal at the Deschutes County Fairgrounds in Redmond. This project is a sub-tier project related to the new Deschutes County Courthouse Expansion project in Bend. As part of the Courthouse Expansion, that project is required to spend 1.5% of the total project cost in new Green Energy Technology. Because of the logistics of the courthouse site, it is not feasible to construct the solar system on that site so instead we will install the new PV system on the County owned buildings at the Fairgrounds in Redmond. The 1.5% will be approximately $640K.

A1.0 Project Overview

The scope of this project is to design, provide, and install a new PV solar system on the "Middle & South Sister" buildings of the Conference Center at the County Fairgrounds. Per Mayfield's feasibility study the system will be at least 191.5 kWDC system. (See Exhibit A for complete requirements). The goal is to maximize the size of the new solar system for the proposed budget.

A1.1 Funding

The project is funded by the County and State.

A1.2 Project Description – Deschutes County Fairgrounds Solar PV System

This project involves the design, procurement, and installation of a new solar photovoltaic system on existing buildings at the County Fairgrounds in Redmond. The size of the new system will be at least 191.5 kWDC and the cost of the system will be approximately $640K. The selected vendor will provide a solar pv system & related services as described in Section C. The goal is to maximize the size of the new solar system for the proposed budget.

B1.0 Schedule

Request for Proposal Issued:	August 7, 2024
Deadline for Clarifications/Questions:	August 21, 2024
Response to Questions:	August 28, 2024
Proposals Due:	**2:00pm, September 11, 2024**

B1.1 Clarifications/Questions

Any questions regarding this RFP shall be received by the Cumming Group office no later than **August 21, 2024.** Questions shall be addressed to Wayne Powderly, via email wayne.powderly@cumming-group.com.

B1.2 Submission Deadline

To be considered for this work, your submittal must be delivered to Cumming Group no later than 2:00pm September 11, 2024 electronically or via paper proposal to the Cumming Group office.

Delivery Address:
Cumming Group
Attn: Wayne Powderly
Wayne.powderly@cumming-group.com
2838 NW Crossing Drive, Suite 207
Bend, OR 97703
Phone Number: 458-836-8206

Proposers must not contact Deschutes County staff and/or employees, and/or their design team, directly. All correspondence shall be through Cumming Group., Deschutes County Owner's Representative.

C1.0 Scope of Services

Solar & Related Services are for the benefit of Deschutes County, focusing on quality, cost, and schedule benefits to save costs for Deschutes County in the completion of the Deschutes County Courthouse Expansion project and this new solar system at the County Fairgrounds. It is Deschutes County's intent to enter into an agreement with the selected Vendor for solar and related services to meet the scope of work identified in this RFP. The selected vendor will furnish all planning and design services, project management, materials, labor, and equipment, and will be responsible to warehouse, distribute, deliver, and install all solar equipment and materials as scheduled with the Owner for installation for the project. Scope of services to be provided (but not limited to):

1. Provide a management team member for this contract.
2. Compliance with building, fire, and accessibility codes.
3. Compliance with Occupational Safety and Health Administration (OSHA)
4. Support architectural design team and Deschutes County.
5. Provide and prepare cost estimates and cost assessment.
6. Provide solar system installation, shipment coordination, and delivery monitoring.
7. Responsible for removal and recycling of all packing material and debris.
8. Handling/resolving manufacturer's errors and/or damaged products.
9. Providing installation follow-up for adjustments, fine-tuning and touch-ups
10. Providing specification binders to Owner (including warranties) at the end of the project including O&M documentation.
11. Confirm to labor used to complete installation at the Job Site complies with all BOLI requirements for the vendors labor.
12. Provide all solar scope as described in Exhibit A. Additional spec requirements:
    A) Solar panels to have at least 25 year product, performance, and labor warranties
    B) Solar panels to have annual degradation rates of .25% or less, and 25 year performance at 90% or above.

C) Inverters, and associated equipment, to have 25 year product and labor warranties.
D) Solar panel size to be 430 watt maximum.

C1.1 Additional Services (may include the following but is not to be proposed)

1. Alterations to existing electrical systems
2. Master service agreement

C1.2 Project Timeline

See Exhibit B for proposed project schedule of the Courthouse Expansion. This solar project will run concurrently with the courthouse expansion project. The anticipated timeline for completion of the Deschutes County Courthouse Expansion project is Spring 2026. A complete solar system must be delivered & installed no later than early Spring 2026.

D1.0 Submission Requirements

Please provide the information specified below. Additional information is welcome but not required. The Proposal shall include pictures, charts, graphs, tables, and text the proposer deems appropriate to be part of the proposer's response. Resumes of the proposed key team individuals, along with a cover letter, table of contents, front and back covers, and blank section/numerical dividers, etc. Please provide concise responses where possible.

All proposals must be in 8 ½" x 11" format, with a readable text font **not smaller than 10 points.** Please provide **one (1) electronic version.** Proposals should be submitted via email to Wayne Powderly at wayne.powderly@cumming-group.com. Hard copies are optional, but not required. If you choose to submit a hard copy in addition to the electronic copy, please provide one (1) copy in 8 ½" x 11" format, stapled (no binders), delivered to the address provided in section B1.2.

The information shall be succinct. Confirmation of vendors experience is the goal for this section.

D1.1 Information Required

1. Cover Letter

a. Proposer's name, address, telephone number, email, and website.

b. Provide a single point of contact (include title) with phone number and email address.

2. Proposed Responder's Project Team

a. Please provide the following information for proposed individuals assigned to work with Deschutes County. This section should be no more than one (1) single-sided page.
   1) Team members' name(s)
   2) Relevant credentials (education, degree, professional registrations, etc.)
   3) Role/responsibility on the project (Manager, space planner, logistics, e.g.)

4) Brief summary of team members' experience that is directly relevant to the Deschutes County Fairgrounds Solar PV project. Include project name, size, location, budget, and year completed.

Note: Please indicate if team member's experience/project occurred at another vendor/dealership. The Responder's proposed team members shall remain the same for the project duration unless approved through written request to Owner's Representative.

3. Responder's Approach to Provide Solar PV System & Related Services

Describe the Responder's proposed Approach for providing the requested services. Include the following:

a. Plan to achieve the scope of work objectives
1) Stakeholder and design team engagement by the Vendor
2) Solar design selection process recommendations

b. Proposed contract terms. Details on contract requirements are included in Section F: Insurance & Contracting of this RFP. Deschutes County will need to be added by rider as additionally insured.

4. Responder's Customer Service

a. Plan to resolve manufacturer's errors and damaged product

b. Delivery/Installation management plan

c. Training and Maintenance program

5. Responder's Related Project Experience

a. Project Profiles: Provide experience in the successful completion of similar solar projects in scope, size, and focus that best illustrates the Responder's experience and capabilities.

6. Responder's References

a. Provide references from three (3) Owners (for whom you have completed projects) or two (2) Owners and one (1) Consultant to be used as references for this project. References must currently be in business. References should be from projects similar to the Deschutes County Fairgrounds Solar PV project, or in size and scope.

b. Include the following reference contact information:
1) Name and Title
2) Business/Cell Number (current)

3) Email Address

Note: The Owner will check these references and/or may check with other references associated with the past work of your company. The Owner will evaluate this information and any other independently obtained references that can provide background on your company. The results obtained from these and any other reference checks will be assessed in determining the final selection of the Vendor.

D1.2 Submission Format

1. Cover Letter
2. Responder's Project Team
3. Responder's Approach to Provide Solar System & Related Services
4. Responder's Customer Service
5. Related Project Experience
6. Responder's References
   a. Two (2) Owners
   b. One (1) Consultant, etc.
7. Attachments
   a. Exhibit C: Signature Sheet
   b. Exhibit D: Billing Rates/Fee Schedule.

Note: Please Submit all attachments as PDFs or as copies of the original file. Proposer's information must be presented in format order noted above.

E1.0 Evaluation Overview

A select scoring committee will evaluate submissions based on the criteria identified in the RFP. All sections of the proposal will be evaluated based on the scoring sheet, see Exhibit E. The review process is intended to allow Deschutes County Review Committee to select the most qualified Vendor for the Deschutes County Fairgrounds Solar PV project that can provide the best value in terms of cost, schedule, and scope of services.

E1.1 Evaluation Process

Deschutes County is planning to use a one-step process to select a vendor for the Deschutes County Fairgrounds Solar PV project. See Exhibit E for the scoring evaluation of each section of the proposal. Deschutes County may determine that an interview is necessary to define the Vendor that will provide the best value for the project.

E1.2 Final Selection

After the evaluation is completed, the selection committee and Owner's Representative will make a recommendation on award of the Contract. If Deschutes County and the apparent successful Proposer are unable to reach agreement, Deschutes County will negotiate with the second-best value Proposer.

F1.0 Contracting with Selected Vendor

1. The proposer will specify the term of the proposed contract. Include a tentative contract commencement date. Contract term must at least be through the successful delivery of all terms and conditions contained in this request.

2. The successful proposal and all terms and conditions contained in this Request for Proposals will be made part of the contract.

3. The management of this contract for Deschutes County will be the direct responsibility of Cumming Group.

4. The contract may be cancelled by either party, upon written notice delivered by Certified Mail 10 days prior to the chosen cancellation date.

5. In the event that the Vendor fails to carry out or comply with any of the terms and conditions of the contract, Deschutes County reserves the right to demand remedy of any failure or default within ten (10) days. In the event that the Vendor fails to remedy the failure or default within the specified period, Deschutes County shall have the right to cancel and terminate the contract without additional notice.

F1.1 Insurance and Bond Requirements

Insurance Requirements

Contractor shall secure, at Contractor's expense, and keep in effect during the term of any contract, **Worker's Compensation Insurance** in compliance with ORS 656.017 (with a limit of no less than $500,000 per accident for bodily injury or disease), which requires subject employers to provide Oregon worker's compensation coverage for all their subject workers.

Contractor shall secure, at Contractor's expense, and keep in effect during the term of any Contract, occurrence form **Commercial General Liability** insurance for the protection of Contractor, Deschutes County, its agents, and employees. Coverage shall include personal injury, bodily injury (including death), and broad form property damage, including loss of use of property, occurring in the course of or in any way related to Contractor's operations, in an amount not less than One Million dollars ($1,000,000.00) combined single limit per occurrence and in an amount not less than Two Million dollars ($2,000,000.00) aggregate for General Liability.

Combined single limit of not less than One Million dollars ($500,000.00) for each accident for

bodily injury and property damage for owned, leased or hired vehicles for **Automobile Liability Insurance.**

Umbrella Liability: Contractor will provide and maintain commercial general liability (Occurrence Basis) insuring it against claims for personal injury, bodily injury or death, and property damage. Such insurance will be written with an insurer licensed to do business in the state of Oregon, will name Deschutes County as additional insured, and contain a waiver of subrogation endorsement in favor of Deschutes County. The initial limits of liability of all such insurance will be not less than $1,000,000 per occurrence and $2,000,000 general aggregate.

Notice of cancellation or change
There shall be no cancellation, material change, reduction of limits, or intent not to renew the insurance coverage(s) without 30 days written notice from the Contractor or its insurer(s) to Deschutes County.

Certificates of Insurance
As evidence of the insurance coverage required by this Contract, the Contractor will be required to furnish acceptable insurance certificates to Deschutes County as additional insured prior to issuance of a Notice to Proceed. The certificate will specify all of the parties who are Additionally Insured. Insuring Companies or entities are subject to Deschutes County acceptance. If requested, complete copies of insurance policies, trust agreements, etc. shall be provided to Deschutes County. The Contractor shall be financially responsible for all pertinent deductibles, self-insured retentions, and/or self-insurance.

G1.0 Project Public Status BOLI

The parties understand that the prevailing wage requirements in ORS 279C.800 to 279C.870 apply to the Project and that, for purposes of prevailing wage requirements, the Project is a "public works" pursuant to ORS 279C.800. Vendor shall confirm their labor costs for on-site work comply with BOLI requirements for Spring 2024.

G1.1 Vendor Subcontractors Selection and Contracting

Deschutes County shall have discretion on what selection process is best able to perform the work, based on price and other relevant factors. The selection need not be based solely on price. Deschutes County reserves the right not to competitively procure any aspect of the Project if, in Deschutes County's sole discretion, it is in the best interest of the Project.

G1.2 MBE / WBE / ESB / DV Participation

Deschutes County requires its Contractors to use good faith efforts in the solicitation of minority, women, and veteran-owned businesses as well as emerging small businesses for the Project and will maintain records of such efforts and the actual usage of such businesses.

G1.3 Workforce Training and Hiring

Deschutes County is committed to increasing work opportunities and is supportive of industry wide fair employment practices for Workforce Training and Hiring programs. Deschutes County and Cumming Group encourage programs and efforts to actively recruit and train a diverse workforce.

G1.4 Non-Discrimination

Neither Deschutes County nor the Proposer shall discriminate on the provision of the proposed products or services in connection with this RFP on the basis of age, race, color, national origin, religion, sex, sexual orientation, disability, qualified disabled veteran status, qualified veteran of the Vietnam era status, or any other category protected by law.

G1.5 Drug and Alcohol Policy for Work on Deschutes County Campus

Deschutes County is committed to maintaining an alcohol and drug-free workplace. Deschutes County does not tolerate the manufacture, distribution, dispensing, possession or use of any controlled substance, illegal substance, marijuana and/or its derivatives, or alcohol. Deschutes County is also committed to its employees, local businesses and the general public to operate safely and prudently. Consistent with this commitment, Deschutes County has affirmed a policy that the use or possession of alcohol and/or drugs by employees, vendors, and contractors and/or sub-contractors in the workplace is prohibited.

Contractor shall see that only properly qualified Personnel are employed in performing the Work and that strict discipline and good order among Personnel is enforced at all times. Contractor shall see that any Personnel who have been convicted of a felony involving violence, alcohol and/or drugs within 3 years of the date of the Purchase Order are not assigned to perform any of the Work without the prior written consent of Deschutes County. If, at any time, it is discovered by Deschutes County or Contractor that any Personnel (i) has failed to comply with any of the above prohibitions; (ii) is incompetent, insubordinate, careless, or disorderly, or (iii) violated any Company policies, while under previous employment, the Personnel shall be immediately removed from the Work and not assigned to perform any part of the Work.

Marijuana: Deschutes County considers marijuana to be a controlled substance. Deschutes County operates in accordance with the Federal Drug Free Workplace Act regulations, which recognizes marijuana as a controlled substance under federal law. Smoking or ingestion of marijuana or marijuana products is prohibited while a contractor, agent and sub-contractors are on the premises of job site.

G1.6 Tobacco Policy

Deschutes County facilities, including the Fairgrounds, is a smoke-free facility. On the sites, smoking must take place on the street and no tobacco litter (cigarette butts) can be left behind. The same rules apply for vaping and e-cigarettes.

Tobacco: For the purpose of the policy, "tobacco" is defined to include: cigarettes, cigars, pipes and any other smoking product; dip, chew, snuff and any other smokeless tobacco product; and nicotine delivery devices, such as e-cigarettes.

G1.7 Submission Notice

All proposals submitted in response to this RFP shall become the property of Deschutes County and may be utilized in any manner and for any purpose by Deschutes County. ***Be advised that proposals and all documents submitted in response to this RFP are subject to public disclosure as required by applicable state and/or federal laws.*** If you intend to submit any information with your proposal which you believe is confidential, proprietary, or otherwise protected from public disclosure (trade secret, etc.), you must separately bind and clearly identify all such material. The cover page of the separate binding must be red, and the header or footer for each page must provide as follows: "Not Subject to Public Disclosure". Where authorized by law, and at its sole discretion, Deschutes County will endeavor to resist disclosure of properly identified portions of the proposals.

G1.8 Obtaining Consents and Releases, Continued Cooperation

Deschutes County shall use its best efforts, as soon as possible, through a letter agreement with contractor, to obtain Deschutes County's release from liability under the Contracts it has for turning over the project to Deschutes County. The contractor shall provide all documentation requested by Deschutes County that is required in a timely manner without delay.

G1.9 Errors and Omissions

Should the Proposer discover any material ambiguity, conflict, discrepancy, omission, or other error in this RFP, please immediately notify Deschutes County's Owner's Representative (Cumming Group) in writing of such discovery with a request of modification or clarification of this RFP and cite the specific paragraph in question.

Deschutes County solely reserves the right to determine the materiality of such discovery or question. If, in the opinion of Deschutes County, such discovery or question may cause an ambiguity in the bid responses, Deschutes County shall issue an Addendum to amend the RFP, extend the RFP due date if necessary, and/or provide answers to questions received in writing or clarifications to remove the ambiguity. Otherwise, Deschutes County reserves the right to negotiate minor exceptions, irregularities, or errors in the RFP and/or the bid responses.

G1.10 Incurred Proposal Preparation Cost

Deschutes County and their agents for this project are not liable for any cost incurred by proposer in the preparation and presentation of their submittals. This RFP shall not commit Deschutes County to enter into any agreement to pay any expenses incurred in preparation of any response to this RFP and/or interview, or to procure or contract for any supplies, goods, or services. Deschutes County reserves the right, without liability to Deschutes County, to cancel this RFP and to reject any proposal that does not comply with this RFP.

G1.11 Legal Jurisdiction

This Assignment and Assumption Agreement shall be interpreted under the laws of the State of

Oregon.

Jurisdiction and venue for any claims or disputes arising from this Assignment and Assumption Agreement shall be the Court of Deschutes County for the State of Oregon; provided, however, if a claim or dispute must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver by the State of Oregon of any form of defense or immunity.

Deschutes County Fairgrounds

Solar PV System RFP

Addendum #1

8/28/24

The purpose of this addendum is to publish the answers to questions received from interested proposers prior to the questions/clarification's deadline of 8/21/24

Questions and Responses are as follows.

1. Can we schedule a site visit for my electrician to look at the electrical room and get on the roof?

   ANSWER: Yes, we have scheduled a non-mandatory site visit for anyone interested on September 5th at 9am.

2. The RFP states the goal is to install as much PV as possible for the budget of $640K. Do you want that proposed solar capacity outlined in the Proposal?
   ANSWER: Please provide a summary description of the size of system you can provide for the set budget of $640K.

3. If the SE facing tilted roofs on the Conference Center (South and Middle Sister buildings) are filled up and there is still room in the budget for more solar, do you prefer installing some on the flat roof between the two buildings (ballasted system, estimated 5-6 psf added) or over on the North Sister?

   ANSWER: If that occurs we will likely use the flat roof between South and Middle Sister. We will discuss further after the solar contractor has been selected.

4. Warranty on inverters required stated in the RFP is 25 years. Is an extendable warranty up to 20 years acceptable or is 25 years required?

   ANSWER: It is a goal of this project to have a good quality, long lasting system from a manufacturer with a proven track record. It is our understanding that the specs described in C1.0.#12 of the RFP are available on the market. If you cannot provide products that meet these requirements please clarify exactly what you intend to use and what their specs are.

5. There is a design provided by Mayfield in the RFP (that does not meet the RFP requirements for the system), but it is understood this is a Design/Build contract. Can the solar contractor propose an alternative interconnection method other than designed in the Mayfield design with the step-up transformer and 480V inverters system?

   ANSWER: If you deviate from the specified requirements in the RFP you must state why you are deviating and describe in detail what you are proposing.

6. Can you add to the list one months electrical bill for the 2 Conference Centers, the First Interstate Building and the Arena. Was the First Interstate Building that looks like it has an existing solar system on it looked at for additional solar? If you can't send an electrical bill (a bill would be best) can you give us a $/kwh rate not including any base meter fee or any KW demand costs for each building, and what if any yearly escalator we might use in electric rates if we want to propose more.

   ANSWER: I will try to get a copy of a recent electrical bill of the South/Middle Sister building before our site walk on Sept 5th. The arena/first interstate building is not included in this project.

7. Has a structural engineer determined how much weight the flat and sloped roof can hold of the Conference Center. It wouldn't make sense to spend time money and effort to bid on something, pay the bond... and then find out the roof isn't strong enough. This should be paid by the county before the bid. For the flat roof, a typical solar system weighs around 4.2 lbs/ft2, for sloped roofs about 2.2 lbs/ft2.

   ANSWER: The County will coordinate with the structural engineer to make sure the roof has the capacity for a new solar system.

8. The solar module (panel) restrictions are very tight and would mean a very small handful of solar panels would be approved. Even some that are at 90% output in 25 years, are not less than .025% drop in efficiency per year.

   ANSWER: See answer to #4 and #5 above.

9. A 25 year product warranty on the solar panel or inverter doesn't mean that much as many companies go out of business in 25 years. As we have replaced 11 solar panels out of about 45,000 installed over the last 14 years, I don't put much stock into very long warranties, the same goes for the inverters.

   ANSWER: See answer to #4 and #5 above.

10. Solaredge is the main inverter company that has a 25 year warranty, stock price has gone from a high of $362 a few years ago to $23.66 today. Most string inverter companies have a 10 year warranty, I would suggest rather than paying extra to gamble on any company will be around in 25 years, one could simply

buy extra inverters, that way no matter what happens to the company one would be set for the life of the solar system.

ANSWER: See answer to #4 and #5 above.

11. Assuming one puts in higher than the 191 kw, can we place an alternate bid with modules that are less than 90% output in 25 years output, the typical ones are 83-84% in 25 years, but maybe $35,000- $40,000 less expensive. Basically it could make sense to take off some of the restrictions and see what best deals one can get from the bidders.

ANSWER: See answer to #4 and #5 above.

12. Under the "Request for Proposal" section C1.0, 12. I cannot find a Solar panel with a 25 year product and labor warranty. Typically, the product warranties are 10 to 12 years. Also, I cannot find a module with a 0.25% annual degradation. Most are 0.45% to 0.50%.

ANSWER: See answer to #4 and #5 above.

13. The Mayfield report uses Q.Peak 480W. They have a 0.45% degradation rate - typical. They also only have a 12 Year product warranty.

ANSWER: See answer to #4 and #5 above.

14. The Inverters are shown to require 25 year warranty under section C. Solaredge can only be extended to 20 years max. Other inverter brands are only 15 years max.

ANSWER: See answer to #4 and #5 above.

15. On the Request for Proposal document under C1.0 Scope of Services, 12, D it states the Solar panel size to be 430 watt maximum. The mayfield report uses Q.Peak 480W modules. Can we propose larger wattage modules beyond the 430W limit or will that lower our score?

ANSWER: See answer to #4 and #5 above.

EXHIBIT A

July 27, 2023

Deschutes County Fairgrounds PV Feasibility Study

3800 SW Airport Way, Redmond, OR 97756

Contents

Appendix A – Site Plan

Appendix B – Single-Line Diagram

Appendix C – Helioscope Report

Appendix D – PV & Inverter Datasheets

Appendix E – Xendee Report

Appendix F – RFP System Description & Needs

Glossary and Acronyms

Alternating Current (AC)
A type of electrical current that is usable in buildings and for appliances.
Annual Solar Energy Offset (%)
Solar energy savings as a percentage of annual energy cost.
Automatic Transfer Switch (ATS)
Used for generators to automatically switch the load from utility to the generator
Azimuth Angle
The angle between true south and the point on the horizon directly below the sun.
Battery Energy Storage System (BESS)
Technology and equipment used to store electricity for use at a later time.
Direct Current (DC)
Electrical transmission and distribution that must be converted to Alternating Current for use in a building.
Distributed Energy Resources (DER)
Small-scale energy resources usually situated near sites for electrical use.
Green Energy Technology (GET)
Referring to the Oregon legal requirement for public entities to allocate 1.5% of the budget of large construction projects to renewable energy.
Gigawatt Hour (GWh)
One billion watt hours, a unit of measurement of a quantity of energy.
Net Metering
A solar incentive that allows utility customers to generate surplus solar energy that is sent back onto the grid for a billing credit at the retail utility rate.
Overcurrent Protection Device (OCPD)
Operation and Maintenance standards for a specified system
Operation and Maintenance (O&M)
Operation and Maintenance standards for a specified system
Photovoltaic (PV) Array
A renewable energy system that connect multiple solar PV modules and inverters to generate electricity.
Point of Interconnection (POI)
The location where a solar PV array connects to the utility grid.

Executive Summary

The Deschutes County Fairgrounds, owned and operated by Deschutes County, is a campus complex located at 3800 SW Airport Way, Redmond, OR 97756. The fairgrounds is a key cultural center in central Oregon, and a large capacity special events venue. Due to the 1.5% GET requirement, the County is presently compelled to make an investment in renewable energy on the order of $600,000.00.

The County has engaged Mayfield Renewables to complete a solar feasibility study of the arena, auditorium, and conference center facilities on the fairgrounds campus. The aim of this study is to generate a concept rooftop PV system design that meets the GET requirements while maximizing financial return over its lifetime. Our analysis includes an evaluation of the site to identify construction and electrical interconnection hurdles. This report provides substantial information that can be used for bid documents, bid specifications, and is the foundation for engineered drawings, construction, commissioning and performance validation. If goals, loads, tariff rates, equipment or construction logistics change over time, edits can easily be made to the concept design to adjust for a smooth successful implementation.

The following goals and benchmarks were used during the system modeling:

- Create and analyze a base model of electrical energy consumption and PV generation with the greatest possible financial return
- Analyze past utility records to generate synthetic load profiles and verify utility rate structure
- Develop a concept system design with a guaranteed maximum price of $600,000, including schematic drawings (Site Plan, Single-Line Diagram) and data sheets for major components
- Provide final report as deliverable
- Project lifespan is 25 years, typical of PV
- Provide written system description for RFP
- Analyze feasibility of battery storage, either now or in the future

Based on our analysis, Mayfield presents a 191.5 kWDC rooftop PV system on the conference center facility that will offset 70% of annual electrical load at that meter. This concept design utilizes reliable and widely available equipment with multiple equivalent market alternatives, and represents an elegant design that maximizes return on investment compared to other options examined. If desired, the conference center and auditorium are capable of supporting additional PV capacity, beyond our concept design. The arena, while electrically capable of supporting additional PV capacity, is not recommended. Our modeling suggests suboptimal financial return for installation on this larger facility, due to a less favorable utility rate structure that cannot be modified.

Site Information & Limitations

2.1 Site Description & Existing Electrical System

The Deschutes County Fairgrounds is located at 3800 SW Airport Way, Redmond, OR 97756. There are nineteen Pacific Power electrical services on the premises, including three under consideration for this study:

Table 1: Electrical Service Summary

Site Name	Meter Number	Rate Schedule	Service Type	Service Size (A)	Xfmr Size (kVA)	*Annual GWh demand
Indoor Arena	85868373	30-135	480Y/277	3,000	1,000	0.671
Conference Center (Middle & South Sister)	85868371	28	208Y/120	3,000	750	0.414
Auditorium (North Sister)	75456300	28	208Y/120	2,000	300	0.299

** Estimated from Pacific Power utility bills, May 22 - Jan 23, and Mar 23 - May 23*

Figure 1. Deschutes County Fairgrounds, annotated site map

Roof area suitable for additional PV is plentiful, totaling roughly 50,000 sq ft. All three buildings under consideration have 2/12 pitch standing seam metal roof areas oriented at 135° azimuth, and the auditorium has a similar section of roofing with an azimuth of 225°. In addition, the conference center has an area of low-slope roof acting as a bridge between the Middle and South Sisters sections, a portion of which is free of obstruction.

Figure 2. Available roof space with suitable PV tilt and azimuth; purple areas indicate possible PV locations

The indoor arena facility meter (#85868373) is billed per rate schedule 30, and is a 3,000A, 480Y/277V service fed by a 1,000 kVA General Electric transformer. A 100A breaker in the main panel acts as the POI for the existing 65 kW PV system on the east section of its main south-facing roof plane, installed in 2013 by E2 Solar. The arena roof has adequate, unobstructed space sufficient for the addition of up to roughly 450 kWDC of PV. Estimated annual load at this facility is 671 MWh, which exceeds rooftop PV capacity.

The conference center meter (#85868371) is billed per rate schedule 28, and is a 208Y/120V service fed by a 750 kVA transformer. It also has a 3,000A Siemens main distribution panel that serves ten subpanels. Four 225A breaker spaces exist at the bottom of the bus–see site limitations section for more information. This roof has adequate, unobstructed space sufficient for the addition of up to approximately 250 kWDC of PV. Estimated annual load at this building is 414 MWh, which exceeds its PV capacity.

Similar to the conference center, the auditorium's meter (#75456300) is billed per rate schedule 28, and is a 208Y/120V service. It is fed by a 300 kVA transformer, and has a 2,000A Siemens main distribution panel. The auditorium roof has adequate, unobstructed space sufficient for the addition of up to 150 kWDC of PV. Estimated annual load at this building is 299 MWh, exceeding its solar generation capacity.

2.2 Site Limitations

Free breaker space in the main distribution panel allows a newly installed PV breaker to act as the interconnection point between a new PV system and the utility grid. Space at the bottom of the main busbar makes possible–generally speaking–the interconnection of a larger solar system, as compared with breaker space higher up the bus. However, the size and configuration of the available breaker space are important factors.

While roof space is plentiful, some electrical constraints must be considered. The auditorium (North Sister) has the smallest electrical service at 2,000A, and lacks suitably configured available breaker space. A supply-side PV interconnection could circumvent this limitation in the main switchboard, however.

The arena's larger main panel has available breaker space, making either a supply-side or load-side connection feasible. However, because the arena's underlying rate schedule (30) provides a lower base electricity charge than the schedule that applies to the conference center and auditorium, the potential financial return of solar PV at this location is significantly less favorable. In the course of our investigation, Pacific Power confirmed that the underlying rate schedule cannot be changed. For this reason, the arena should be the last option considered for net metered PV, when optimizing for return on investment.

While there are four free 225A breaker spaces located in the conference center's main panel opposite the 3,000A service disconnect, they are not ideal for interconnection of a larger PV system. While it would be technically feasible to host up to four smaller PV systems, each with its own breaker disconnect, this would require as many inverters, PV AC disconnects, and drawing sets. However, as at the auditorium, a single PV interconnection is possible as a supply-side connection between the meter and main OCPD.

Methodology

The following outlines the methodology and data used to model and optimize the system to meet the goals and performance requirements for the installation of a PV system at the Deschutes County Fairgrounds. The study utilized Xendee optimization software to inform the system architecture and multiyear financial model. Helioscope software was used for PV system annual production based on design power losses and system degradation.

3.1 Electrical kWh Load Profile

As the foundation of any optimization, due diligence must be taken in creating an accurate load profile to ensure precise modeling that determines lowest net present cost while meeting project goals. Key aspects in data collection are outlined below:

- Deschutes County provided past Pacific Power electricity bills for the three meters under consideration in this study. Bills were provided for the period spanning May 2022 through May 2023, except for February, 2023.
- From these data, Mayfield constructed a synthetic load profile for the arena and conference center buildings. A medium office NREL end-use load profile in an ASHRAE 5B climate type (cool-dry, similar to Boulder, CO) was selected and scaled to represent electrical demand at the conference center. For the arena, we constructed a custom load profile to reflect a more variable special events schedule.

3.2 Tariff Rate Structure

The arena is on the schedule 30 tariff rate, and the conference center and auditorium are on schedule 28. It is assumed that electricity purchased from Pacific Power will have an escalation rate of 4% per year. Since demand charges are fees associated with infrastructure, such as improvements and maintenance of transmission and distribution lines, these demand rates still remain and are also assumed to have an annual escalation rate of 4%.

Below are base electricity rates ($/kWh) and demand rates ($/kW) for Pacific Power schedules 28 and 30:

Table 2: Pacific Power rate schedules 28 & 30

Tier	Base - sch. 28	Demand - sch.28	Base - sch. 30	Demand - sch.30
1	0.08915	7.5	0.05707	11.98
2	0.07875	6.9	0.05603	13.53
3	0.07837	6.55	0.05565	12.73
4	-	6.35	-	-

3.3 Pacific Power – Utility

Mayfield Renewables coordinated with Pacific Power to ensure that there are no infrastructural hurdles or regulations that would prevent the installation of an additional net metered PV system at the Deschutes County Fairgrounds. No such hurdles were identified during our investigation. Net metering occurs under schedule 135, which allows a maximum export of 2 MW at each meter. Meters at the same property may be virtually aggregated, and net metering credit at one meter can therefore be applied to multiple meters–including meters with differing underlying base rate schedules. However, our analysis of building load and PV generation potential indicate that aggregation will not be required to maximize financial return, even if all roof space on all facilities is fully utilized.

3.4 System Parameters

Xendee and Helioscope modeling of PV system designs was performed with the following parameters:

Equipment:

- Modeled with Hanwha Q Cells, Q.Peak DUO XL-G10.2 480W modules and SolarEdge SE66.6KUS and SE100KUS three phase 480Y/277V inverters
  - Datasheet (Appendix D), warranty degradation, production levels and efficiency used in Helioscope (Appendix C)
- Helioscope production report imported into Xendee
- 16.6 degree tilt angle for flush-mounted subarrays on 2/12 pitch standing seam roof sections with azimuth of 135°

Project:

- Project lifespan: 25 years
- Electrical export allowed
- Cost of installation ($/W) on the two facilities analyzed:
  - $3.125/W for conference center
  - $3.000/W for arena
- $0.40/kW annual maintenance cost (module cleaning)
- 30% ITC eligibility (using IRA direct pay)
- No MACRS eligibility
- Electricity rate inflation: 4%
- Financing discount rate: 5%

- Assumed a partial cash purchase for multi year financial model

Final System Architecture

Utilizing Helioscope and Xendee, Mayfield designed a 191.5 kWDC system architecture to meet project goals while taking into account solar resource, electricity prices, installation costs, total capital expense, operating and maintenance expense, and equipment degradation. Several iterative designs and analyses led to our suggested system architecture on the conference center facility. Our optimization took into account product availability, and reflects a realistic and robust design:

- 191.5 kWDC / 166.6 kWAC PV system
- (399) Hanwha Q Cells, Q.Peak DUO XL-G10.2 480W modules
  - Flush mount racking tilted at 16.6 degrees
- (1) SolarEdge SE100KUS string inverter, 480VAC 3p
- (1) SolarEdge SE66.6KUS string inverter, 480VAC 3p
- (202) SolarEdge P1100 optimizers, one per two modules in series
- (1) 225 kVA 208Y-480Δ step up transformer

See single line diagram (Appendix B) and system layout (Appendix A) for bid-ready design package.

4.1 Product Description:

Our chosen PV modules and inverters are Tier 1 products, widely available from any EPC. Equivalent Tier 1 alternatives exist, and should be considered and evaluated based on RFP responses. High quality Hanwha Q cell modules have a module efficiency of 21.6%, a 12-year product warranty and 25-year linear performance warranty down to 86%. SolarEdge 480VAC 3p inverters and P1100 optimizers are capable of module level monitoring, have a 20 year extendible warranty, and can be configured for use with SolarEdge Data Logger, an environmental data acquisition system.

4.2 Point of Interconnection:

Because insufficient breaker space exists in the conference center main switchboard, a supply-side connection between the meter and main OCPD will be required. The meter CT is currently located inside the main panel. While a connection within the panel itself is possible, it would require further engineering analysis. Alternatively, the existing utility meter CT can easily be moved, and a connection made outside of the main panel chassis.

4.3 Consumption Offset & PV Export:

Our 191.5 kWDC flush mounted PV system design is mounted on three roof planes, all oriented at 16.6° tilt and 135° azimuth (SE). The system is estimated to produce a total of 287.7 MWh annually, offsetting 70% of the conference center's estimated annual consumption of 414 MWh. PV export is the anticipated export of the renewable resource to the grid that is not consumed by the facility at the time of production. However, this is credited to the account and then used at a later time or date, therefore not negatively affecting return on investment. The total anticipated electricity export is 88,791 kWh onto the utility grid.

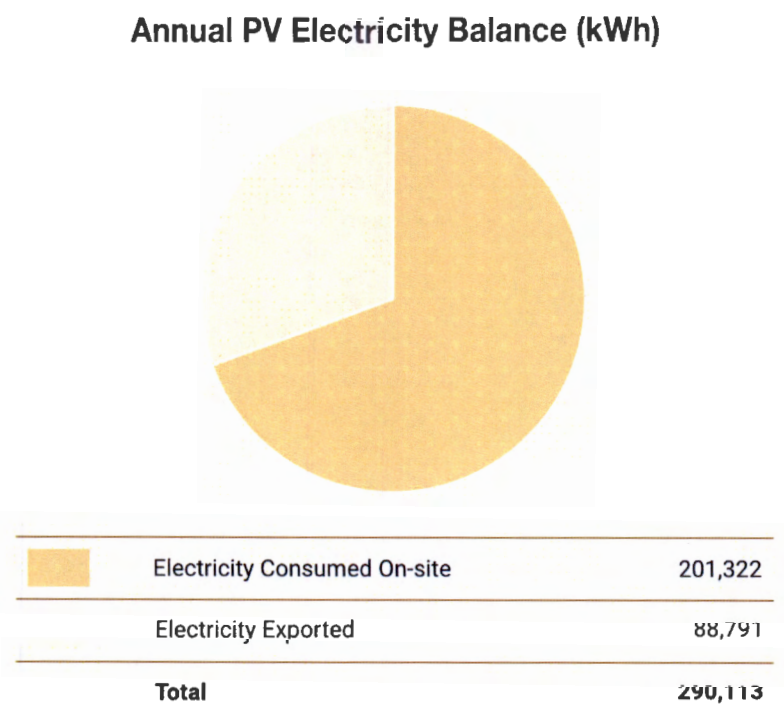

Figure 3. PV power direct consumption vs. credited power export

Multiyear Financial Model

5.1 Capital Expense and Operating Expense:

Deschutes County's financial goals in pursuing an additional PV system for the fairgrounds facilities revolve around the 1.5% GET requirement, whereby the County is presently required to allocate $600,000 for renewable energy infrastructure. Mayfield Renewables worked backwards to produce a quality PV system design based on years of engineering experience that meets this target project budget while maximizing financial return over the system lifetime.

The total estimated capital expense of $600,438 includes all PV related site prep, prevailing wage labor, bond, insurance, soft costs, engineering, materials, equipment, and operation & maintenance expenses, but excludes cost of money for financing. O&M consists of annual PV module cleaning, estimated at $1,000 per year.

5.2 System Parameters for Multiyear Financial Model:

To accurately portray a multiyear financial model the following set points were included in the analysis:

- Upfront Cash Purchase Assumed
- Project Life: 25 years
- Cash Flow Discount Rate: 5%
- PV degradation: 0.7%/yr
- Annual Demand Rate Escalation: 4%
- Annual Energy Charge Escalation: 4%

5.3 Multiyear Financial Model:

The below graph shows the multiyear financial analysis with revenue streams over the 25-year project lifespan. In the investment year (year zero), the capital expense is $600,000. Revenue streams begin immediately in year one, including (rounded to thousands of dollars):

- Energy export: $7,000.00
- Demand charge savings: $2,000.00
- Electrical charge savings: $18,000.00
- Federal ITC Direct Pay: $180,000.00

Modeled financial returns over the 25 year project lifespan result in:

- System payback in 13 years
- IRR of 6.38%
- NPV of discounted cash flows of $75,000.00 at end of system lifetime.
- Total operating expense savings of $977,490.00 over 25 years, or 44.5% annually

	Investment Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
Revenue Increase: Electricity Sales	0	7	7	7	7	7	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5
Savings: Utility Demand Charges	0	2	2	2	2	2	2	3	3	3	4	4	4	5	5	6	6	7	7	8	9	10	11	11	12	13
Savings: Utility Energy Charges	0	18	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	35	36	37	39	40	41	43
Savings: DER Maintenance Costs	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Total OPEX Savings	0	26	26	27	28	29	29	30	31	32	34	35	36	37	38	40	42	43	45	47	49	51	53	54	57	59
CAPEX difference for Solar PV	-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total CAPEX Difference	-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal ITC Credit	0	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Incentives Difference	0	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Annual Cash Flow (Non-discounted)	-600	206	26	27	28	29	29	30	31	32	34	35	36	37	38	40	42	43	45	47	49	51	53	54	57	59
Net Annual Cash Flow (Discounted)	-600	196	24	23	23	22	22	22	21	21	21	20	20	20	20	19	19	19	19	19	18	18	18	18	18	17
Net Present Value	-600	-405	-381	-358	-335	-312	-290	-269	-248	-227	-206	-186	-166	-146	-126	-107	-88	-69	-51	-32	-14	5	23	40	58	75
Cumulative Cash Flow (Non-discounted)	-600	-395	-369	-342	-314	-285	-256	-225	-194	-162	-128	-93	-57	-20	18	58	100	143	188	235	284	334	387	442	498	557
Cumulative Cash Flow (Discounted)	-600	-376	-334	-295	-258	-224	-191	-160	-131	-104	-79	-55	-32	-11	9	28	46	63	78	93	107	120	132	144	154	165

Figure 4. Detailed project cash flow projections

Annual Electricity Charges

Tariff	Energy Category	Consumption [kWh]	Rate [$/kWh]	Energy Charge [$]
28	PTOU1 - tier1	213,295.54	-	19,015.30
28	Exports	88,790.75	-	-6,958.53
Energy Subtotal [$]				12,056.77
Reference [$]				36,963.18
Savings [$]				24,906.41

Tariff	Demand Category	Demand [kW]	Rate [$/kW]	Demand Charge [$]
28	noncoincident - tier1	50.00	-	4,500.00
28	noncoincident - tier2	44.48	-	895.17
28	noncoincident - tier3	0.00	-	0.00
28	noncoincident - tier4	37.24	-	1,276.03
Demand Subtotal [$]				6,671.20
Reference [$]				8,167.35
Savings [$]				1,496.15

Figure 5. Annual electricity charges

5.4 Comparison with Arena

Our modeling of a similar sized PV system on the arena produced less favorable financial results. Model parameters remained largely unchanged, with several small adjustments:

- A smaller installation cost of $3.00/W, because the array exists on a single roof plane
- A therefore slightly larger system size of 200 kWDC
- Lower base electrical rates, as a result of enrollment in Pacific Power schedule 30

Modeled financial returns for the arena over the 25 year project lifespan can be compared with results for the conference center, above:

- System payback in 19 years
- IRR of 2.69%
- NPV of discounted cash flows of -$109,020.00 at end of system lifetime.
- Total operating expense savings of $618,450.00 over 25 years, or 15.77% annually

Table 3: Side-by-side comparison of financial return for four modeled system architectures

Installation Location	PV Size (kW)	BESS Size (kWh)	Duration (yrs)	Yrs to Payback	IRR	Lifetime NPV	Lifetime OPEX Offset	Annual OPEX Offset
Conference Center	191.5	-	25	13	6.38%	$75,000	$977,490	44.50%
Arena	200	-	25	19	2.69%	-$109,020	$618,450	15.77%
Conference Center (w/ BESS)	90	440	15	N/A	-1.94%	-$192,110	$336,720	33.94%
Arena (w/ BESS)	124	330	15	N/A	-7.53%	-$295,860	$194,280	11.72%

Feasibility of Battery Storage

Our concept PV design does not exceed the annual electrical consumption of the Pacific Power electric meters of the auditorium, arena, and conference center. This means that all of the energy generated by solar contributes to the financial return of the system. A battery system, in the absence of time of use rate schedules geared towards energy arbitrage, can only generate revenue by offsetting demand charges. Demand charges account for roughly 20% of Deschutes County Fairgrounds' electricity costs, making a battery storage system less financially potent than PV alone. If energy resilience–the ability to use electricity during a grid outage–is not a primary goal, we do not recommend pursuing battery storage.

Electrically, adding battery storage to a PV system is feasible at all three facilities. Based on our preliminary modeling in Xendee, a $600,000 investment in solar plus battery storage at the conference center with a targeted four hour resiliency window would result in a system architecture of approximately 90 kWDC PV and 110kW/440 kWh of battery storage. A key difference with our PV optimizations is the project lifetime, which is limited to 15 years due to the shorter lifespan of battery technology. The project would result in the following financial metrics:

- No system payback during 15 year battery lifetime
- IRR of -1.94%
- NPV of discounted cash flows of -$192,110.00 at end of system lifetime
- Total operating expense savings of $336,720.00 over 15 years, or 33.94% annually

A similar alternative investment at the arena would result in a system architecture of roughly 124 kWDC PV and 80kW/330 kWh of storage. The project would result in the following financial metrics:

- No system payback during 15 year battery lifetime
- IRR of -7.53%
- NPV of discounted cash flows of -$295,860.00 at end of system lifetime
- Total operating expense savings of $194,280.00 over 15 years, or 11.72% annually

Determining optimal battery storage system size would require a detailed load analysis (e.g. one month of measurements using eGauge system, or similar) and a formal interview of the Deschutes County team to identify granular storage-related goals. These activities are outside of the scope of the present study, but could be the subject of further investigation.

Final Comments

7.1 Construction Hurdles

Mayfield does not expect major construction hurdles that would prevent installation of rooftop solar on the fairgrounds conference, auditorium, or arena. However, EPCs should take note of several site conditions that could impact particulars of the final system design and construction process. As mentioned above, the interconnection will need to be a supply-side connection. This will require coordination with Pacific Power to shut off power during installation, so that the solar can be safely connected to the service.

Additionally, the lack of available wall space in the main electrical rooms means that PV inverters must be mounted elsewhere. Our design for the conference center suggests a shaded area on the southwest-facing exterior wall (see system layout, Appendix A). Selected inverters must be rated for outdoor installation, and manufacturer specifications and warranty requirements should be followed.

Finally, a structural engineering analysis should be completed for all roof sections on which solar will be installed. The engineer may find that structural reinforcement is required on some, or all, roof sections for PV installation. Structural analysis and reinforcement costs will increase the price-per-watt of the project. The low-slope section of the conference center is not utilized in our concept design layout, but may be utilized for additional PV deployment at the discretion of Deschutes County and the selected EPC. If this is a barrier to increasing system size, more favorable economics may be achieved by instead placing the additional PV capacity on the auditorium.

7.2 Conclusion

This report provides an optimal PV preliminary design to meet Deschutes County's project goals. A 191.5 kWDC PV system on the rooftop of the Deschutes County Fairgrounds conference center facility provides maximal financial return while satisfying the County's required 1.5% GET investment in renewable energy. The preliminary system design demonstrates a robust possible architecture using readily available high quality electrical components. The attached single line diagram, array layout, equipment spec sheets, and RFP system description, when incorporated into a formatted RFP, provide the detail necessary to successfully solicit bids from qualified contractors. Mayfield Renewables is capable of providing fully engineered permit and construction drawings, owner's representative services, and commissioning services.

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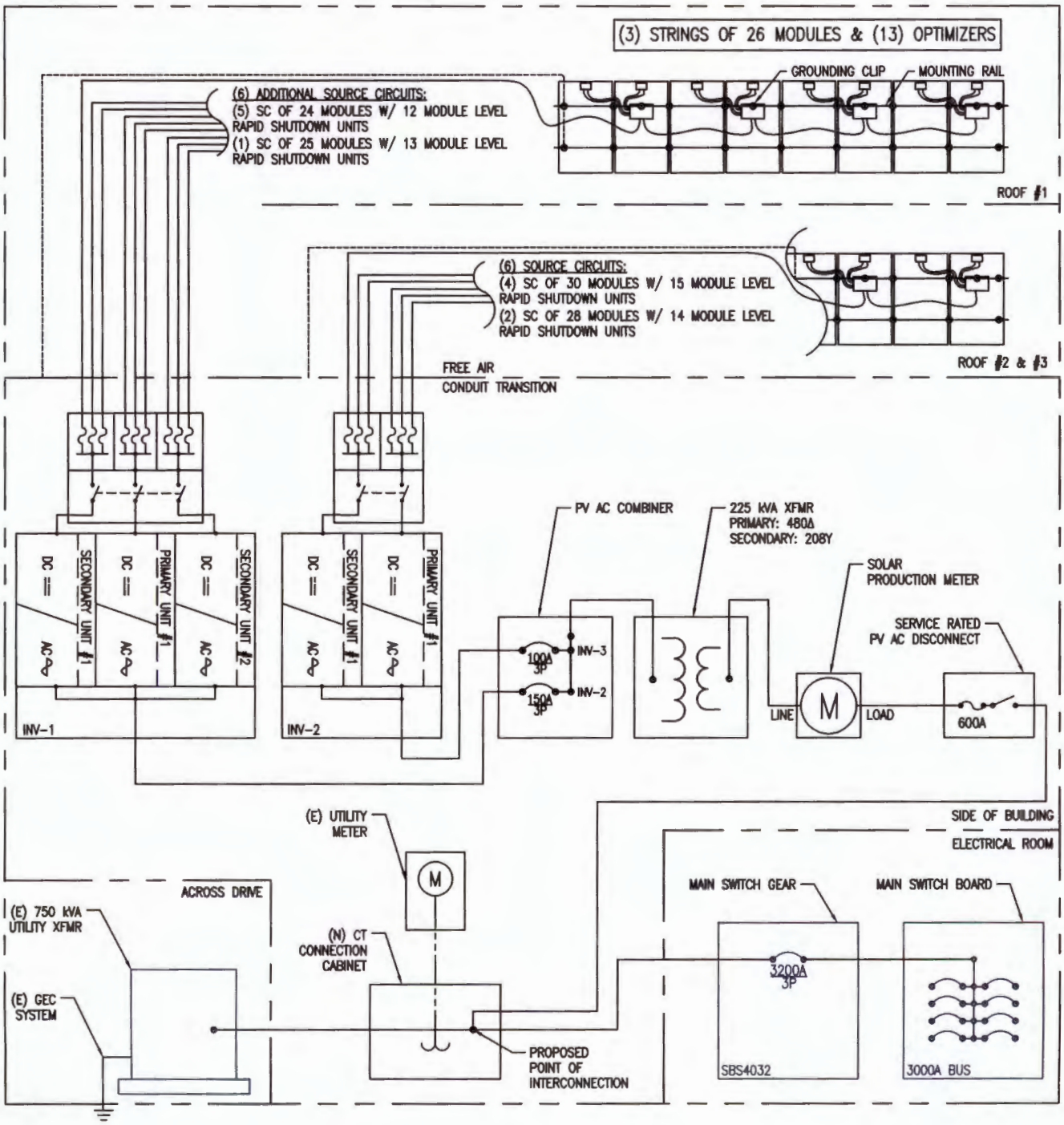
APPENDIX A:
Site Plan


ROOF ARRAY #1
4'-0" FIRE SETBACK
(E) UTILITY TRANSFORMER
EXTERIOR PV AC DISCONNECT
PV PRODUCTION METER
PV STEP DOWN XFMR
PV AC COMBINER
PV INVERTERS #1 & #2
ROOF ARRAY #2
4'-0" FIRE SETBACK
ROOF ARRAY #3

APPENDIX B:
Single-Line Diagram


(3) STRINGS OF 26 MODULES & (13) OPTIMIZERS
GROUNDING CLIP
MOUNTING RAIL
(6) ADDITIONAL SOURCE CIRCUITS:
(5) SC OF 24 MODULES W/ 12 MODULE LEVEL RAPID SHUTDOWN UNITS
(1) SC OF 25 MODULES W/ 13 MODULE LEVEL RAPID SHUTDOWN UNITS
ROOF #1
(6) SOURCE CIRCUITS:
(4) SC OF 30 MODULES W/ 15 MODULE LEVEL RAPID SHUTDOWN UNITS
(2) SC OF 28 MODULES W/ 14 MODULE LEVEL RAPID SHUTDOWN UNITS
ROOF #2 & #3
FREE AIR CONDUIT TRANSITION
PV AC COMBINER
225 kVA XFMR PRIMARY: 480Δ SECONDARY: 208Y
SOLAR PRODUCTION METER
SERVICE RATED PV AC DISCONNECT
DC
AC
SECONDARY UNIT #1
PRIMARY UNIT #1
SECONDARY UNIT #2
INV-1
INV-2
100A 3P
150A 3P
INV-3
INV-2
LINE
M
LOAD
600A
SIDE OF BUILDING
ELECTRICAL ROOM
(E) UTILITY METER
ACROSS DRIVE
(E) 750 kVA UTILITY XFMR
(N) CT CONNECTION CABINET
(E) GEC SYSTEM
PROPOSED POINT OF INTERCONNECTION
MAIN SWITCH GEAR
MAIN SWITCH BOARD
3200A 3P
SBS4032
3000A BUS

APPENDIX C:
Helioscope Report

Middle Sister - SolarEdge JCK Deschutes County Fairgrounds, 3800 SW Airport Wy, Redmond, OR 97756

Report

Project Name	Deschutes County Fairgrounds
Project Address	3800 SW Airport Wy, Redmond, OR 97756
Prepared For	Deschutes County
Prepared By	Mayfield Renewables ryan@renewableassociates.com

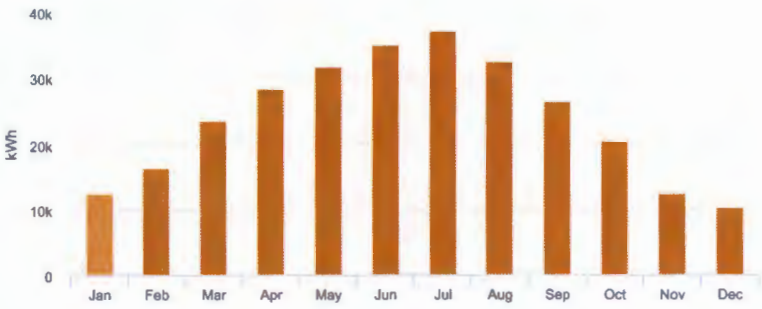
Mayfield Renewables

System Metrics

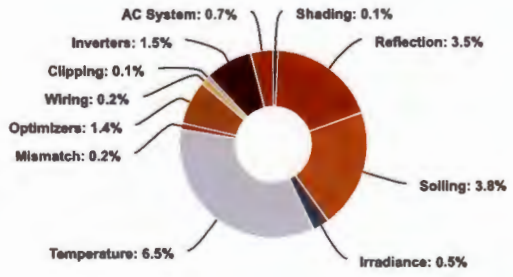
Design	Middle Sister - SolarEdge JCK
Module DC Nameplate	191.5 kW
Inverter AC Nameplate	166.6 kW Load Ratio: 1.15
Annual Production	287.7 MWh
Performance Ratio	82.7%
kWh/kWp	1,502.3
Weather Dataset	TMY, 10km Grid (44.25,-121.15), NREL (prospector)
Simulator Version	33103f8da6-e6c8ceaa45-5f8813fc95-b4f1a4023a

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,650.5	
	POA Irradiance	1,817.0	10.1%
	Shaded Irradiance	1,814.3	-0.1%
	Irradiance after Reflection	1,751.1	-3.5%
	Irradiance after Soiling	1,683.8	-3.8%
	Total Collector Irradiance	**1,683.8**	**0.0%**
Energy (kWh)	Nameplate	322,405.8	
	Output at Irradiance Levels	320,735.8	-0.5%
	Output at Cell Temperature Derate	300,033.3	-6.5%
	Output After Mismatch	299,444.5	-0.2%
	Optimizer Output	295,245.5	-1.4%
	Optimal DC Output	294,654.4	-0.2%
	Constrained DC Output	294,250.2	-0.1%
	Inverter Output	289,831.3	-1.5%
	Energy to Grid	**287,726.7**	**-0.7%**
Temperature Metrics			
	Avg. Operating Ambient Temp		9.9 °C
	Avg. Operating Cell Temp		28.2 °C
Simulation Metrics			
	Operating Hours		4708
	Solved Hours		4708

Condition Set

Description	Condition Set 1											
Weather Dataset	TMY, 10km Grid (44.25,-121.15), NREL (prospector)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	**Rack Type**		**a**		**b**		**Temperature Delta**					
	Fixed Tilt		-3.56		-0.075		3°C					
	Flush Mount		-2.81		-0.0455		0°C					
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	2	2	2	2	3	5	5	6	6	3	2	2
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	0.75%											
Trackers	**Maximum Angle**						**Backtracking**					
	60°						Enabled					

Module Characterizations	**Module**	**Uploaded By**	**Characterization**
	Q.Peak DUO XL-G10.2 480 (Hanwha Q Cells)	HelioScope	Spec Sheet Characterization, PAN
Component Characterizations	**Device**	**Uploaded By**	**Characterization**
	SE66.6KUS (SolarEdge)	HelioScope	Spec Sheet
	SE100KUS (SolarEdge)	HelioScope	Spec Sheet
	P1100 (SolarEdge)	HelioScope	Mfg Spec Sheet

Components

Component	Name	Count
Inverters	SE66.6KUS (SolarEdge)	1 (66.6 kW)
Inverters	SE100KUS (SolarEdge)	1 (100.0 kW)
AC Panels	1 input AC Panel	2
AC Home Runs	500 MCM (Copper)	2 (5,777.3 ft)
Strings	10 AWG (Copper)	14 (1,201.5 ft)
Optimizers	P1100 (SolarEdge)	202 (222.2 kW)
Module	Hanwha Q Cells, Q.Peak DUO XL-G10.2 480 (480W)	399 (191.5 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	13-31	Along Racking
Wiring Zone 2	-	13-31	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 2	Flush Mount	Portrait (Vertical)	16.67°	135.3°	0.0 ft	1x1	223	223	107.0 kW
Field Segment 3	Flush Mount	Portrait (Vertical)	16.67°	134.68228°	0.0 ft	1x1	154	154	73.9 kW
Field Segment 4	Fixed Tilt	Portrait (Vertical)	10°	134.04517°	2.7 ft	1x1	22	22	10.6 kW

Detailed Layout

APPENDIX D:
PV & Inverter Datasheets

powered by Q.ANTUM DUO Z

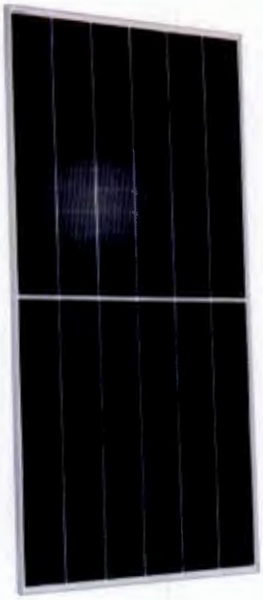
Q.PEAK DUO XL-G10.2

475-495

ENDURING HIGH PERFORMANCE

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2020

Q CELLS Yield Security



BREAKING THE 21% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.6%.

LOW ELECTRICITY GENERATION COSTS

Higher yield per surface area, lower BOS costs and up to 80 watts more module power than standard 144 half-cell modules.

ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT

Inclusive 12-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168 h)

[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

Ground-mounted solar power plants

Engineered in Germany

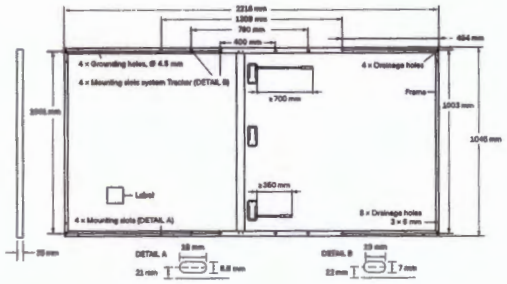
Q CELLS

PRELIMINARY

MECHANICAL SPECIFICATION

Format	2216 mm × 1045 mm × 35 mm (including frame)
Weight	26.5 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 700 mm, (–) ≥ 350 mm*
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4; IP68

*Long cables (+) ≥ 1450 mm, (–) ≥ 1450 mm for landscape installation are available upon request.

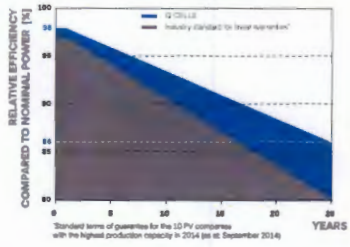


ELECTRICAL CHARACTERISTICS

POWER CLASS				475	480	485	490	495
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)								
Minimum	Power at MPP[1]	P_{MPP}	[W]	475	480	485	490	495
	Short Circuit Current[1]	I_{SC}	[A]	11.24	11.26	11.29	11.31	11.34
	Open Circuit Voltage[1]	V_{OC}	[V]	53.58	53.61	53.64	53.68	53.71
	Current at MPP	I_{MPP}	[A]	10.66	10.71	10.76	10.81	10.86
	Voltage at MPP	V_{MPP}	[V]	44.54	44.81	45.07	45.33	45.59
	Efficiency[1]	η	[%]	≥ 20.5	≥ 20.7	≥ 20.9	≥ 21.2	≥ 21.4
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]								
Minimum	Power at MPP	P_{MPP}	[W]	356.4	360.1	363.9	367.6	371.4
	Short Circuit Current	I_{SC}	[A]	9.05	9.07	9.09	9.12	9.14
	Open Circuit Voltage	V_{OC}	[V]	50.53	50.56	50.59	50.62	50.65
	Current at MPP	I_{MPP}	[A]	8.39	8.43	8.47	8.52	8.56
	Voltage at MPP	V_{MPP}	[V]	42.49	42.72	42.94	43.17	43.39

[1]Measurement tolerances P_{MPP} ± 3 %; I_{SC}; V_{OC} ± 5 % at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

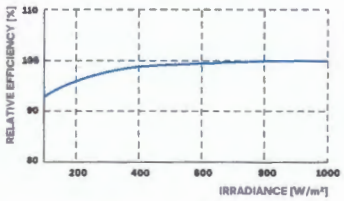
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.5 % degradation per year. At least 93.5 % of nominal power up to 10 years. At least 86 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.34	Nominal Module Operating Temperature	NMOT	[°C]	43 ± 3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 1
Max. Design Load, Push / Pull		[Pa]	3600 / 1600	Permitted Module Temperature on Continuous Duty	–40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 2400		

QUALIFICATIONS AND CERTIFICATES

IEC 61215:2016;
IEC 61730:2016.
This data sheet complies with DIN EN 50380.

Certification in process.

www.tuv.com
ID 1111220277

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com

Engineered in Germany

INVERTERS

Three Phase Inverters with Synergy Technology

For the 277/480V Grid

SE66.6K / SE100K

Specifically designed to work with power optimizers

- Easy two-person installation – each unit mounted separately, equipped with cables for simple connection between units
- Balance of System and labor reduction compared to using multiple smaller string inverters
- Independent operation of each unit enables higher uptime and easy serviceability
- No wasted ground area: wall/rail mounted or horizontally mounted under the modules (10° inclination)
- Built-in module-level monitoring with Ethernet or cellular GSM
- Fixed voltage inverter for superior efficiency (98.1%) and longer strings
- Integrated Connection Unit with optional integrated DC Safety Switch – eliminates the need for external DC isolators
- Built-in RS485 Surge Protection, to better withstand lightning events
- Advanced safety features - integrated arc fault protection and rapid shutdown
- 135% DC oversizing, enabling higher energy production

solaredge.com

solaredge

/ Three Phase Inverter with Synergy Technology
For the 277/480V Grid
SE66.6K / SE100K

	SE66.6K	SE100K	
OUTPUT			
Rated AC Power Output	66600	100000	VA
Maximum AC Power Output	66600	100000	VA
AC Output Voltage — Line to Line / Line to Neutral (Nominal)	480 / 277		Vac
AC Output Voltage — Line to Line Range; Line to Neutral Range	432 - 528 / 249.3 - 304.7		Vac
AC Frequency	50/60 ± 5		Hz
Maximum Continuous Output Current (per Phase) @277V	80	120	A
Grids Supported — Three Phase	3 / N / PE (WYE with Neutral)		V
Maximum Residual Current Injection[1]	250 per unit		mA
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes		
INPUT			
Maximum DC Power (Module STC), Inverter / Unit	90000 / 45000	135000 / 45000	W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage	1000		Vdc
Operating Voltage Range	680 - 1000		Vdc
Maximum Input Current	2 x 40	3 x 40	Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	350kΩ Sensitivity per Unit[2]		
Maximum Inverter Efficiency	98.1		%
European Weighted Efficiency	98		%
Nighttime Power Consumption	< 12		W
ADDITIONAL FEATURES			
Supported Communication Interfaces[3]	RS485, Ethernet, GSM plug-in (optional)		
RS485 Surge Protection	Built-in		
Rapid Shutdown	Optional[4] (Automatic upon AC Grid Disconnect)		
Cable Covers	Ordered separately with part number: DCD-SGY-COVER-LP (for SE66.6K) DCD-SGY-COVER-HP (for SE100K) ; Dimensions (H x W x D) – 314.3 x 343.7 x 134.5 mm		
CONNECTION UNIT			
DC Disconnect (optional)	1000V / 2 x 40A	1000V / 3 x 40A	
STANDARD COMPLIANCE			
Safety	IEC-62109, AS3100		
Grid Connection Standards[5]	VDE-AR-N-4105, G59/3, AS-4777,EN 50438 , CEI-021,VDE 0126-1-1, CEI-016, BDEW		
Emissions	IEC61000-6-2, IEC61000-6-3 , IEC61000-3-11, IEC61000-3-12		
RoHS	Yes		
INSTALLATION SPECIFICATIONS			
Number of units	2	3	
AC Output Cable	Cable gland — diameter 22-32; PE gland diameter 10-16	Cable gland — diameter 30-38; PE gland diameter 10-16	mm
DC Input[6]	6 strings, 4-10mm² DC wire, gland outer diameter 5-10mm / 3 MC4 pairs per unit	9 strings, 4-10mm² DC wire, gland outer diameter 5-10mm / 3 MC4 pairs per unit	
AC Output Wire	Aluminum or Copper; L, N: Up to 70, PE: Up to 35	Aluminum or Copper; L, N: Up to 95, PE: Up to 50	mm²
Dimensions (H x W x D)	Primary Unit: 940 x 315 x 260; Secondary Unit: 540 x 315 x 260		mm
Weight	Primary Unit: 48; Secondary Unit 45		kg
Operating Temperature Range	-40 to +60[7]		°C
Cooling	Fan (user replaceable)		
Noise	< 60		dBA
Protection Rating	IP65 — outdoor and indoor		
Mounting	Brackets provided		

(1) If an external RCD is required, its trip value must be ≥ 300mA per unit (≥ 600mA for SE66.6K; ≥ 900mA for SE100K)
(2) Where permitted by local regulations
(3) Refer to Datasheets -> Communications category on Downloads page for specifications of optional communication options: http://www.solaredge.com/groups/support/downloads
(4) Inverter with rapid shutdown part number: SE100K-RWRP0BNU4; Available for SE100K
(5) For all standards refer to Certifications category on Downloads page: http://www.solaredge.com/groups/support/downloads
(6) The DC input type, MC4 or glands, and DC switch depends on the part number ordered. Inverter with glands and DC switch P/N: SExxK-xx0P0BNG4, inverter with glands and without DC switch P/N: SExxKxx 0P0BNA4, inverter with MC4 and with DC switch P/N: SExxK-xx0P0BNU4, inverter with MC4 and without DC switch P/N: SExxK-xx0P0BNY4
(7) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf

CE RoH

Power Optimizer

P605 / P650 / P701 / P730 / P800p /
P801 / P850 / P950 / P1100

POWER OPTIMIZER

PV power optimization at the module level

The most cost-effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- High efficiency with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses, and combiner boxes, and over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module level monitoring
- Module level voltage shutdown for installer and firefighter safety
- Use with two PV modules connected in series or in parallel

Power Optimizer

P605 / P650 / P701 / P730 / P801

Power Optimizer Module (Typical Module Compatibility)	P605 (for 1 x high power PV module)	P650 (for up to 2 x 60-cell PV modules)	P701 (for up to 2 x 60/120-cell PV modules)	P730 (for up to 2 x 72-cell PV modules)	P801 (for up to 2 x 72/144 cell PV modules)	
INPUT						
Rated Input DC Power(1)	605	650	700*	730**	800	W
Connection Method	Single input for series connected modules					
Absolute Maximum Input Voltage (Voc at lowest temperature)	65	96		125		Vdc
MPPT Operating Range	12.5 – 65	12.5 – 80		12.5 – 105		Vdc
Maximum Short Circuit Current per Input (Isc)	14.1	11	11.75	11**	12.5***	Adc
Maximum Efficiency	99.5					%
Weighted Efficiency	98.6					%
Overvoltage Capacity	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER						
Maximum Output Current	15					Adc
Maximum Output Voltage	80					Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF						
Safety Output Voltage per Power Optimizer	1 ± 0.1					Vdc
STANDARD COMPLIANCE						
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety)					
RoHS	Yes					
Fire Safety	VDE-AR-E2100-712:2013-05					
INSTALLATION SPECIFICATIONS						
Compatible SolarEdge Inverters	Three Phase Inverter SE16K & larger					
Maximum Allowed System Voltage	1000					Vdc
Dimensions (W x L x H)	129 x 153 x 52 / 5.1 x 6 x 2	129 x 153 x 42.5 / 5.1 x 6 x 1.7		129 x 153 x 49.5 / 5.1 x 6 x 1.9		mm / in
Weight	1064 / 2.3	834 / 1.8		933 / 2.1		gr / lb
Input Connector	MC4(2)					
Input Wire Length	0.16 / 0.52			0.16 / 0.52, 0.9 / 2.95(3)		m / ft
Output Connector	MC4					
Output Wire Length	Portrait Orientation: 1.4 / 4.5	Portrait Orientation: 1.2 / 3.9	-	Portrait Orientation: 1.2 / 3.9		m / ft
	-	Landscape Orientation: 1.8 / 5.9		Landscape Orientation: 2.2 / 7.2		
Operating Temperature Range(5)	-40 to +85 / -40 to +185					°C / °F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 – 100					%

* For P701 models manufactured after work week 06/2020, the rated DC input is 740W.
** For P730 models manufactured after work week 06/2020, the rated DC input is 760W and the maximum Isc per input is 11.75A.
*** For P801 models manufactured in work week 40/2020 or earlier, the maximum Isc per input in 11.75A.
(1) The rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed.
(2) For other connector types, please contact SolarEdge.
(3) Longer input wire lengths are available for use with split junction box modules. For 0.9m/2.95ft order P730-xxxLxxx.
(4) For ambient temperatures above +70°C / +158°F, power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter(5)(6)(7)(8)		230/400V Grid SE16K, SE17 SE25K*, SE33.3K*		230/400V Grid SE27.6K*		230/400V Grid SE30K*		277/480V Grid SE33.3K*, SE40K*		
Compatible Power Optimizers		P605	P650, P701, P730, P801	P605	P650, P701, P730, P801	P605	P650, P701, P730, P801	P605	P650, P701, P730, P801	
Minimum String Length	Power Optimizers	14	14	14	14	15	15	14	14	
	PV Modules	14	27	14	27	15	29	14	27	
Maximum String Length	Power Optimizers	30	30	30	30	30	30	30	30	
	PV Modules	30	60	30	60	30	60	30	60	
Maximum Continuous Power per String		11250		11625		12750		12750		W
Maximum Allowed Connected Power per String(8) (Permitted only when the difference in connected power between strings is 2,000W or less)		13500		13500		15000		15000		W
Parallel Strings of Different Lengths or Orientations		Yes								
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers								

* The same rules apply for Synergy units of equivalent power ratings that are part of the modular Synergy Technology Inverter.
(5) P650/P701/P730/P801 can be mixed in one string only with P650/P701/P730/P801. P605 cannot be mixed with any other Power Optimizer in the same string.
(6) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string.
(7) For SE16K and above, the minimum STC DC connected power should be 11KW.
(8) To connect more STC power per string, design your project using SolarEdge Designer.

Power Optimizer

P800p / P850 / P950 / P1100

Power Optimizer Module (Typical Module Compatibility)	P800p (for up to 2 x 96-cell 5" PV modules)	P850 (for up to 2 x high power or bi-facial modules)	P950 (for up to 2 x high power or bi-facial modules)	P1100 (for up to 2 x high power or bi-facial modules)	Unit
INPUT					
Rated Input DC Power(1)	800	850	950	1100	W
Connection Method	Dual input for independently connected	Single input for series connected modules			
Absolute Maximum Input Voltage (Voc at lowest temperature)	83	125			Vdc
MPPT Operating Range	12.5 – 83	12.5 – 105			Vdc
Maximum Short Circuit Current per Input (Isc)	7	14.1*		14.1	Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.6				%
Overvoltage Capacity	II				
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER					
Maximum Output Current	18				Adc
Maximum Output Voltage	80				Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF					
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3				
Safety	IEC62109-1 (class II safety)				
RoHS	Yes				
Fire Safety	VDE-AR-E2100-712:2013-05				
INSTALLATION SPECIFICATIONS					
Compatible SolarEdge Inverters	Three Phase Inverter SE16K & larger			Three Phase Inverter SE25K & larger	
Maximum Allowed System Voltage	1000				Vdc
Dimensions (W x L x H)	129 x 168 x 59 / 5.1 x 6.61 x 2.32	129 x 162 x 59 / 5.1 x 6.4 x 2.32			mm / in
Weight	1064 / 2.3				gr / lb
Input Connector	MC4(2)				
Input Wire Length	0.16 / 0.52	0.16 / 0.52, 0.9 / 2.95, 1.3 / 4.26, 1.6 / 5.24(3)	0.16 / 0.52, 1.3 / 4.26, 1.6 / 5.24(3)	0.16 / 0.52, 1.3 / 4.26(3)	m / ft
Output Connector	MC4				
Output Wire Length	Portrait Orientation: 1.2 / 3.9			2.4 / 7.8	m / ft
	Landscape Orientation: 1.8 / 5.9	Landscape Orientation: 2.2 / 7.2			
Operating Temperature Range(4)	-40 to +85 / -40 to +185				°C / °F
Protection Rating	IP68 / NEMA6P				
Relative Humidity	0 – 100				%

* For P850/P950 models manufactured in work week 06/2020 or earlier, the maximum Isc per input is 12.5A. The manufacture code is indicated in the Power Optimizer's serial number.
Example: S/N SJ0620A-xxxxxxxx (work week 06 in 2020)

(1) The rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed.

(2) For other connector types, please contact SolarEdge.

(3) Longer input wire lengths are available for use with split junction box modules.
For 0.9m/2.95ft order P801/P850-xxxLxxx. For 1.3m/2.95ft order P850/P950/P1100 -xxxXxxx. For 1.6m/5.24ft order P850/P950-xxxYxxx).

(4) For ambient temperatures above +70°C / +158°F, power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter[6][7][8]		230/400V Grid SE16K, SE17K	230/400V Grid SE25K*	230/400V Grid SE27.6K*	230/400V Grid SE30K*	230/400V Grid SE33.3K	277/480V Grid SE33.3K*, SE40K*	
Compatible Power Optimizers		P800p, P850, P950	P800p, P850, P950, P1100	P800p, P850, P950, P1100	P800p, P850, P950, P1100	P800p, P850, P950, P1100	P800p, P850, P950, P1100	
Minimum String Length	Power Optimizers	14	14	14	15	14	14	
Maximum String Length	PV Modules	27	27	27	29	27	27	
	Power Optimizers	30	30	30	30	30	30	
	PV Modules	60	60	60	60	60	60	
Maximum Continuous Power per String		13500	13500	13950	15300	13500	15300	W
Maximum Allowed Connected Power per String[8] (Permitted only when the difference in connected power between strings is 2,000W or less)		1 string – 15750	1 string – 15750	1 string – 16200	1 string – 17550	2 strings or less – 15750	2 strings or less – 17550	W
		2 strings or more – 18500	2 strings or more – 18500	2 strings or more – 18950	2 strings or more – 20300	3 strings or more – 18500	3 strings or more – 20300	
Parallel Strings of Different Lengths or Orientations		Yes						
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers						

* The same rules apply for Synergy units of equivalent power ratings that are part of the modular Synergy Technology Inverter.

(5) P800p/P850/P950/P1100 can be mixed in one string only with P800p/P850/P950/P1100.

(6) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string.

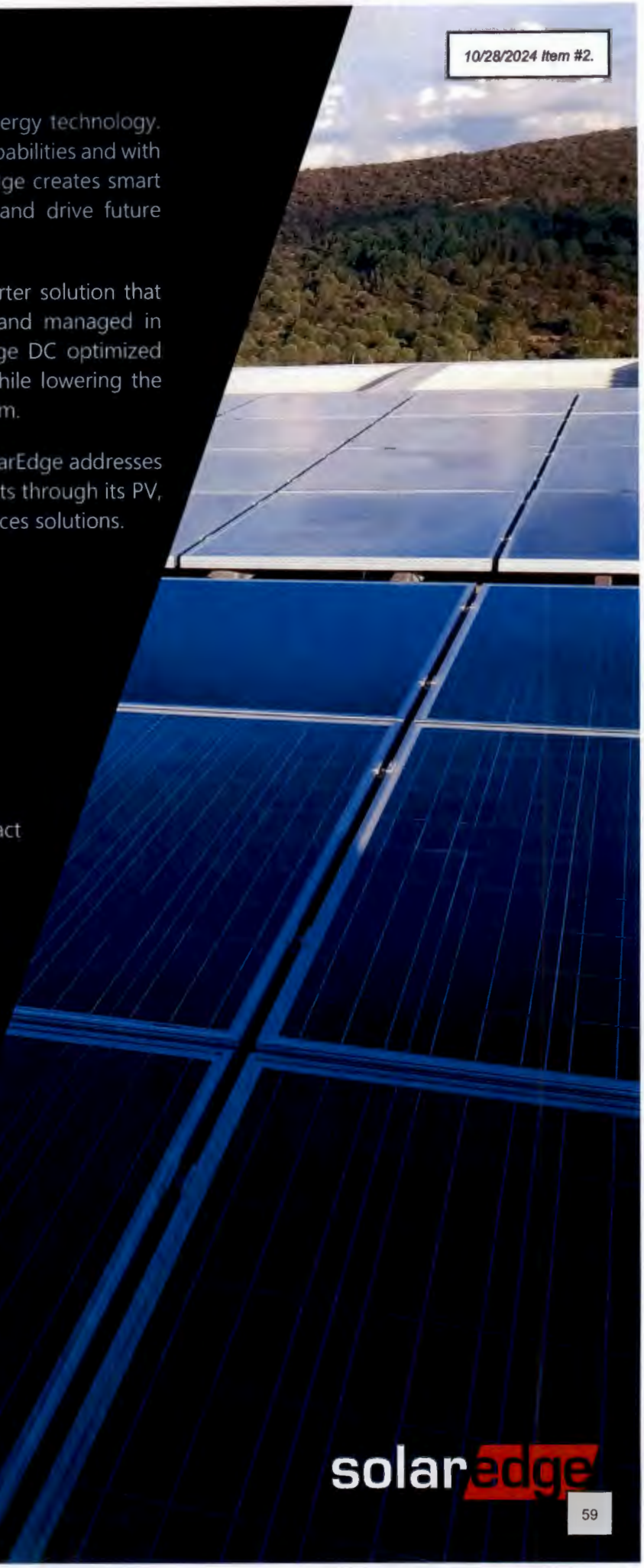
(7) For SE16K and above, the minimum STC DC connected power should be 11KW.

(8) To connect more STC power per string, design your project using SolarEdge Designer.

SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.



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SolarEdge
www.solaredge.com/corporate/contact

solaredge.com

Cautionary Note Regarding Market Data and Industry Forecasts: This brochure may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.

CE

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APPENDIX E:
Xendee Report

Results Report for

Deschutes County Fairgrounds - Conference Center

XENDEE

XENDEE

Prepared by **Zach Snyder**

Created on **Thursday, July 27, 2023**

Table of Contents

3.37%
Internal Rate of Return

XENDEE

Model Input

Deschutes County Fairgrounds - Conference Center

3800 SW Airport Wy, Redmond, OR 97756, USA

Objectives

Minimize cost.

Financing

Interest Rate	**0.00 %**
Investment Tax Credit	**Yes**
MACRS	**Yes**

Energy Costs

Energy Price	**N/A**
Avg. Natural Gas Cost	**N/A**
Avg. Diesel Fuel Cost	**N/A**
Reference LCOE	**$0.11 / kWh**

Demand Charges

Peak TOU Rate	**N/A**
Non-Coincident	**N/A**

Demand Characteristics

Peak Demand	**96 kW**
Annual Consumption	**415 MWh**
Schedulable EV	**N/A**

Financial Indicators for Investment

$-203,020
Project NPV (at year 12)

$-69,720
Project NPV (at year 25)

16 Years
Payback Period

Impact

$600,440
Upfront Capital Cost

-10.5%
Annual Cost Reductions

68.3%
Emission Savings

XENDEE

Project:	Deschutes County Fairgrounds - Conference Center	Date:	7/25/2023
Address:	3800 SW Airport Wy, Redmond, OR 97756, USA	Equations:	163,997
Analysis:	191.5 kW - Final	Runtime:	27 seconds

	Total Annual Energy Costs (dollars in thousands)	Total Annual CO_2 Emissions (metric tons)
Reference	$47	239
Investment scenario (incl. annualized capital costs and electricity sales)	$51.9	76
Total Savings (%) (incl. annualized capital costs and electricity sales)	-10.5 %	68.3 %

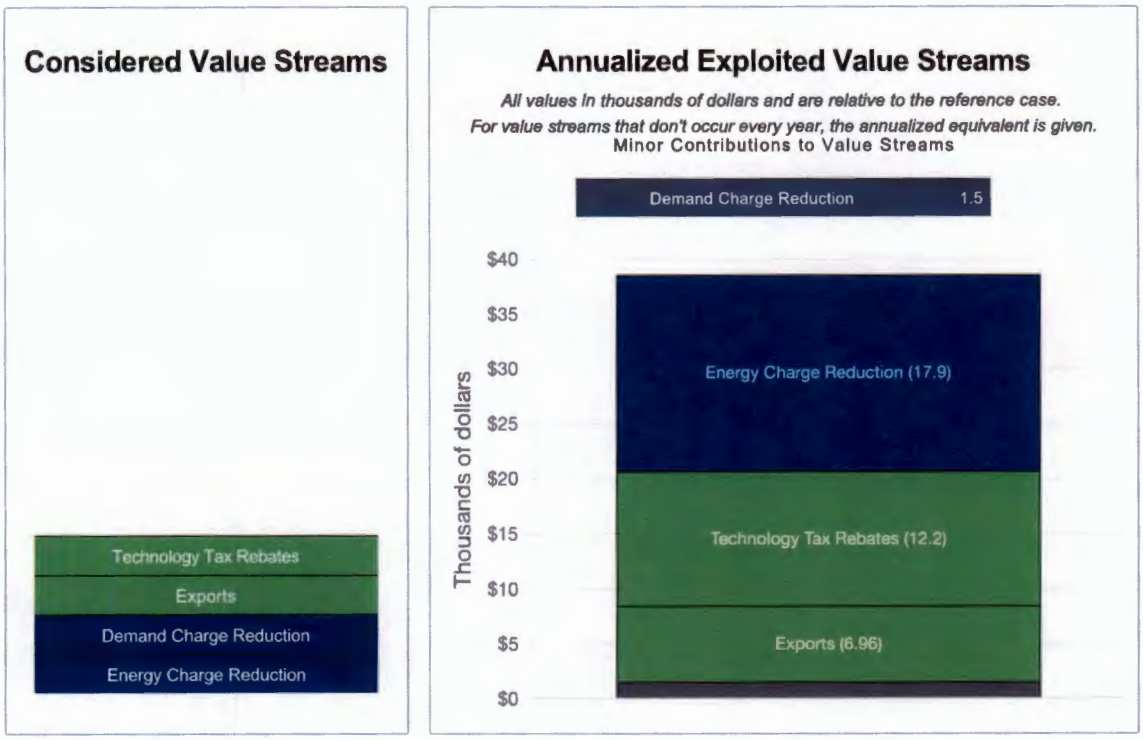
Result	Value
Interest Rate	0.00 %
OPEX Savings (%)	54.3%
Generation-Based Levelized Cost of Electricity ($ / kWh)	$0.1031
Load-Served Levelized Cost of Electricity ($ / kWh)	$0.1252
Simple Project Break-Even Year	More than 20 years
Detailed Project Break-Even Year	17 years
Simple Project Payback Period	More than 20 years
Detailed Project Payback Period	17 years
Xendee Project Savings to Investment Ratio	1.06
NPV at End of Project (dollars in thousands)	$-70
IRR at End of Project	3.4%

Type	Total New Capacity	Technology (New Capacity)
	192 kW	Solar PV (192 kW)

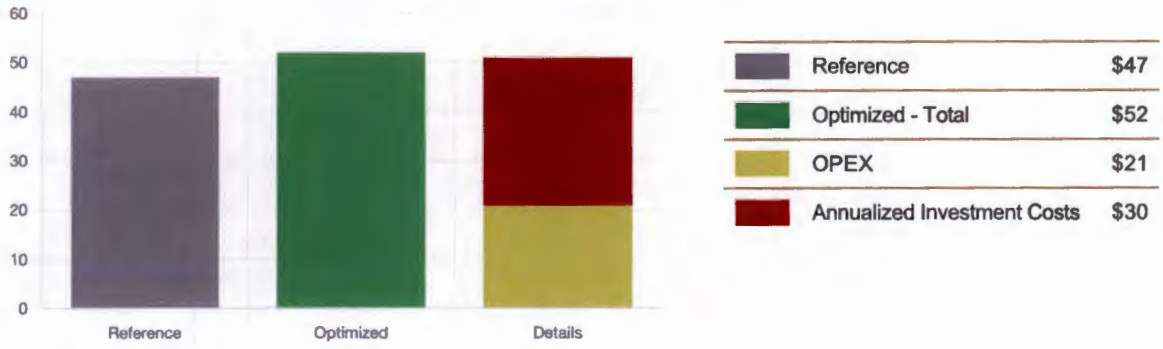
Summary

Provided in this section is an overview of projected annual costs and savings over a twenty-year period. Annualized Energy Costs summarizes the annualized operational and investment costs of the optimized microgrid, and the Costs and Savings Projection (Non-Discounted) presents costs as upfront investment capital, yearly operational expenses, and accumulated savings based on results from the year optimized.

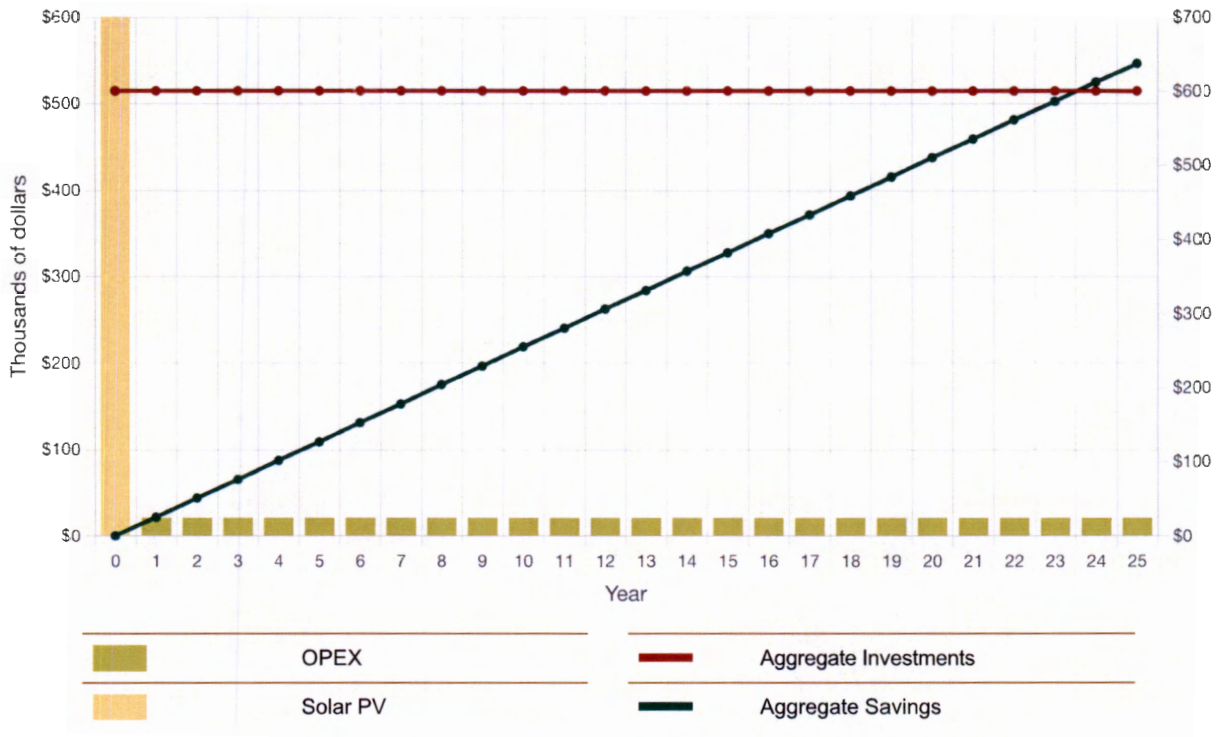
Value Streams



Annualized Energy Costs



Costs and Savings Projection (Non-Discounted)

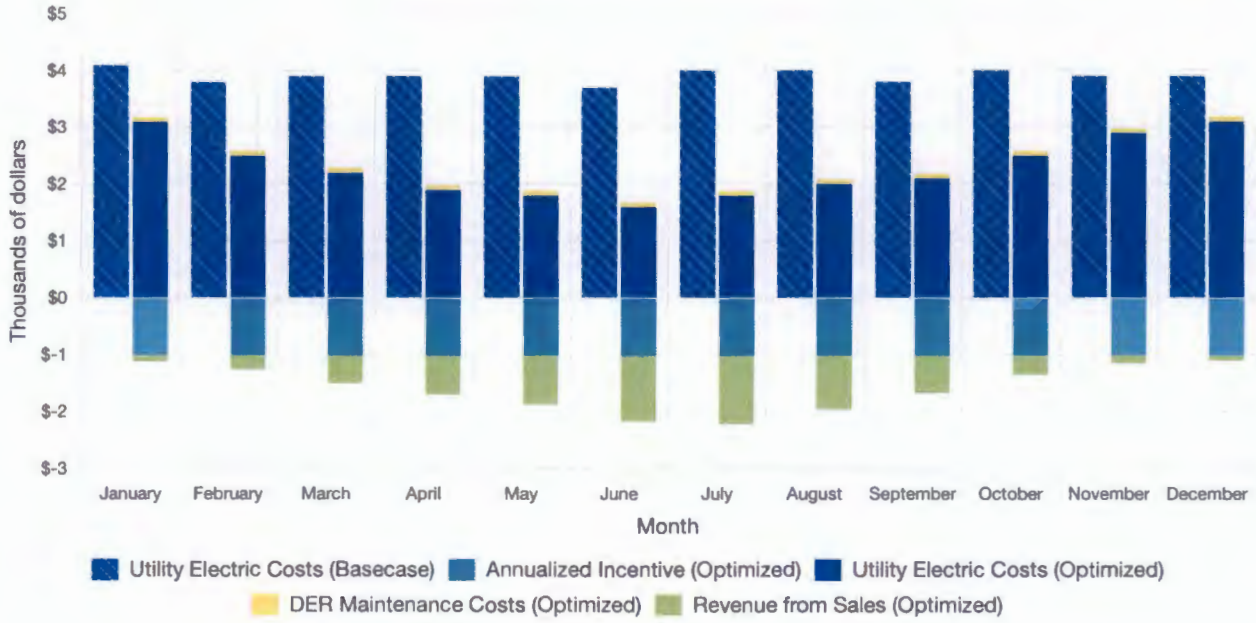


This is a non-discounted projection of the project costs and savings that assumes no changes in operation over time. Use the multi-year optimization feature to examine changes in investment and savings over time.

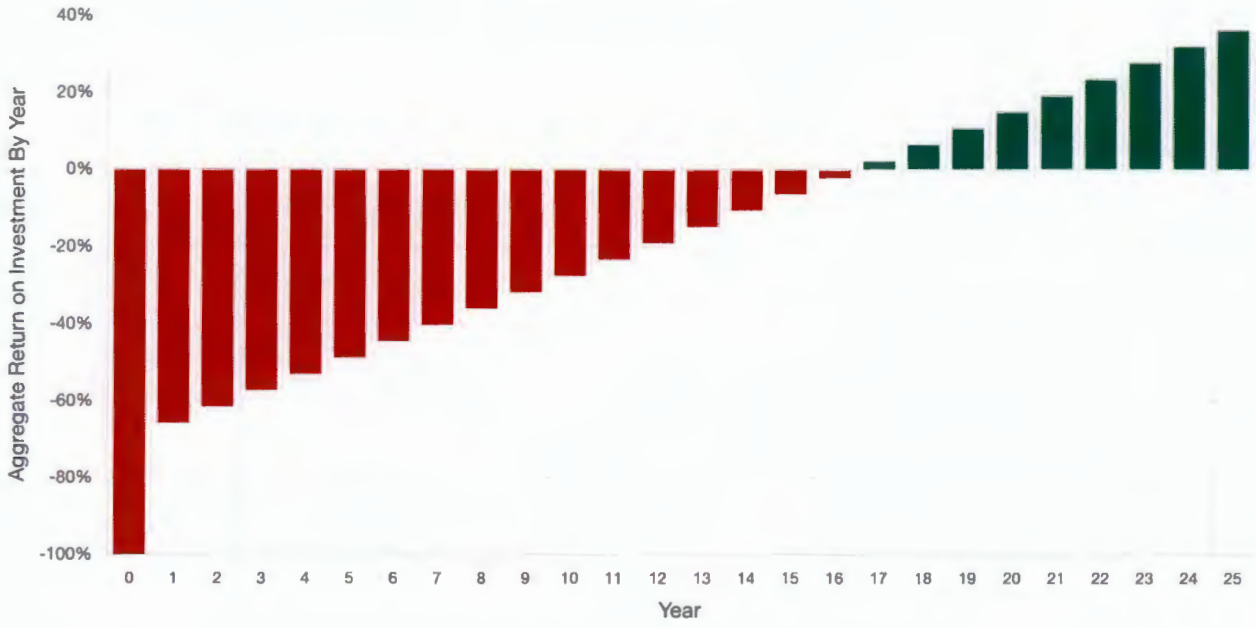
Financial Data

Primary financial indicators are provided in this section to facilitate assessing project returns. Return on investment (ROI), Net Present Value (NPV), and Internal Rate of Return (IRR) are calculated and graphed for each year leading out to twenty years from project implementation, providing insight on returns at different timelines. Also included is a detailed cash flow table.

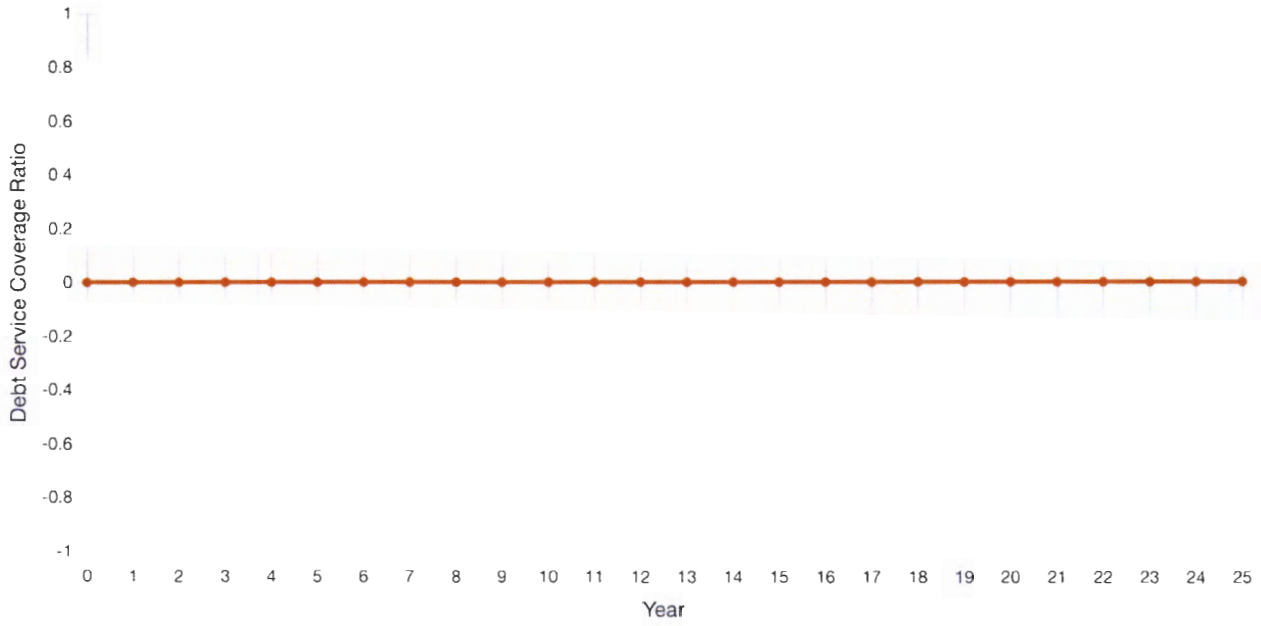
Microgrid Cost Breakdown



Xendee ROI



Debt Service Coverage Ratio



Detailed Cash Flow: Cost

(thousands of dollars)

The cost cashflow table below displays the **costs to run the system,** not relative to any reference. The lines shown are the costs that the solution is subject to. A positive value is a revenue while a negative is a cost. The sum of the individual cost terms is used to calculate the system **net present costs.**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Electricity Sales	0	7	7	7	7	7
Utility Demand Charges	0	-7	-7	-7	-7	-7
Utility Energy Charges	0	-19	-19	-19	-19	-19
Utility Contract Costs	0	-2	-2	-2	-2	-2
DER Maintenance Costs	0	-1	-1	-1	-1	-1
Total OPEX Costs	0	-21	-21	-21	-21	-21
CAPEX for Solar PV	-600	0	0	0	0	0
Total CAPEX costs	-600	0	0	0	0	0
Federal ITC Credit	0	180	0	0	0	0
Total Incentives	0	180	0	0	0	0
Net Annual Cost (*Non-discounted*)	-600	159	-21	-21	-21	-21
Net Annual Cost (*Discounted*)	-600	151	-19	-19	-18	-17
Net Present Cost	-600	-449	-469	-487	-505	-522
Cumulative Cost (*Non-discounted*)	-600	-442	-463	-485	-506	-528
Cumulative Cost (*Discounted*)	-600	-421	-420	-419	-416	-413

	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Electricity Sales	7	7	7	7	7	7
Utility Demand Charges	-7	-7	-7	-7	-7	-7
Utility Energy Charges	-19	-19	-19	-19	-19	-19
Utility Contract Costs	-2	-2	-2	-2	-2	-2
DER Maintenance Costs	-1	-1	-1	-1	-1	-1
Total OPEX Costs	-21	-21	-21	-21	-21	-21
CAPEX for Solar PV	0	0	0	0	0	0
Total CAPEX costs	0	0	0	0	0	0
Federal ITC Credit	0	0	0	0	0	0
Total Incentives	0	0	0	0	0	0
Net Annual Cost (*Non-discounted*)	-21	-21	-21	-21	-21	-21
Net Annual Cost (*Discounted*)	-16	-15	-15	-14	-13	-13
Net Present Cost	-538	-553	-568	-582	-595	-607
Cumulative Cost (*Non-discounted*)	-549	-571	-592	-614	-635	-657
Cumulative Cost (*Discounted*)	-410	-406	-401	-396	-390	-384

	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17
Electricity Sales	7	7	7	7	7	7
Utility Demand Charges	-7	-7	-7	-7	-7	-7
Utility Energy Charges	-19	-19	-19	-19	-19	-19
Utility Contract Costs	-2	-2	-2	-2	-2	-2
DER Maintenance Costs	-1	-1	-1	-1	-1	-1
Total OPEX Costs	-21	-21	-21	-21	-21	-21
CAPEX for Solar PV	0	0	0	0	0	0
Total CAPEX costs	0	0	0	0	0	0
Federal ITC Credit	0	0	0	0	0	0
Total Incentives	0	0	0	0	0	0
Net Annual Cost (*Non-discounted*)	-21	-21	-21	-21	-21	-21
Net Annual Cost (*Discounted*)	-12	-11	-11	-10	-10	-9
Net Present Cost	-619	-631	-642	-652	-662	-671
Cumulative Cost (*Non-discounted*)	-678	-700	-721	-743	-764	-786
Cumulative Cost (*Discounted*)	-378	-371	-364	-357	-350	-343

	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23
Electricity Sales	7	7	7	7	7	7
Utility Demand Charges	-7	-7	-7	-7	-7	-7
Utility Energy Charges	-19	-19	-19	-19	-19	-19
Utility Contract Costs	-2	-2	-2	-2	-2	-2
DER Maintenance Costs	-1	-1	-1	-1	-1	-1
Total OPEX Costs	-21	-21	-21	-21	-21	-21
CAPEX for Solar PV	0	0	0	0	0	0
Total CAPEX costs	0	0	0	0	0	0
Federal ITC Credit	0	0	0	0	0	0
Total Incentives	0	0	0	0	0	0
Net Annual Cost (*Non-discounted*)	-21	-21	-21	-21	-21	-21
Net Annual Cost (*Discounted*)	-9	-9	-8	-8	-7	-7
Net Present Cost	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cumulative Cost (*Non-discounted*)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cumulative Cost (*Discounted*)	-335	-328	-320	-313	-305	-298

	Year 24	Year 25
Electricity Sales	7	7
Utility Demand Charges	-7	-7
Utility Energy Charges	-19	-19
Utility Contract Costs	-2	-2
DER Maintenance Costs	-1	-1
Total OPEX Costs	-21	-21
CAPEX for Solar PV	0	0
Total CAPEX costs	0	0
Federal ITC Credit	0	0
Total Incentives	0	0
Net Annual Cost (*Non-discounted*)	-21	-21
Net Annual Cost (*Discounted*)	-7	-6
Net Present Cost	[illegible]	[illegible]
Cumulative Cost (*Non-discounted*)	[illegible]	[illegible]
Cumulative Cost (*Discounted*)	**-290**	**-283**

Detailed Cash Flow: Savings

(thousands of dollars)

The Savings cashflow table below displays the **savings the system produces relative to the reference.** The lines shown are the savings that the solution creates. A positive value is a savings while a negative is a loss. The sum of the individual savings terms is used to calculate the system **net present value** of the system.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue Increase: Electricity Sales	0	7	7	7	7	7
Savings: Utility Demand Charges	0	2	2	2	2	2
Savings: Utility Energy Charges	0	18	18	18	18	18
Savings: DER Maintenance Costs	0	-1	-1	-1	-1	-1
Total OPEX Savings	0	26	26	26	26	26
CAPEX difference for Solar PV	-600	0	0	0	0	0
Total CAPEX Difference	-600	0	0	0	0	0
Federal ITC Credit	0	180	0	0	0	0
Total Incentives Difference	0	180	0	0	0	0
Net Annual Cash Flow (*Non-discounted*)	-600	206	26	26	26	26
Net Annual Cash Flow (*Discounted*)	-600	196	23	22	21	20
Net Present Value	-600	-405	-382	-359	-339	-319
Cumulative Cash Flow (*Non-discounted*)	0	-395	-369	-344	-318	-293
Cumulative Cash Flow (*Discounted*)	0	-376	-335	-297	-262	-229

	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Revenue Increase: Electricity Sales	7	7	7	7	7	7
Savings: Utility Demand Charges	2	2	2	2	2	2
Savings: Utility Energy Charges	18	18	18	18	18	18
Savings: DER Maintenance Costs	-1	-1	-1	-1	-1	-1
Total OPEX Savings	26	26	26	26	26	26
CAPEX difference for Solar PV	0	0	0	0	0	0
Total CAPEX Difference	0	0	0	0	0	0
Federal ITC Credit	0	0	0	0	0	0
Total Incentives Difference	0	0	0	0	0	0
Net Annual Cash Flow (*Non-discounted*)	26	26	26	26	26	26
Net Annual Cash Flow (*Discounted*)	19	18	17	16	16	15
Net Present Value	-300	-281	-264	-248	-232	-217
Cumulative Cash Flow (*Non-discounted*)	-267	-242	-216	-191	-165	-140
Cumulative Cash Flow (*Discounted*)	-200	-172	-146	-123	-102	-82

	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17
Revenue Increase: Electricity Sales	7	7	7	7	7	7
Savings: Utility Demand Charges	2	2	2	2	2	2
Savings: Utility Energy Charges	18	18	18	18	18	18
Savings: DER Maintenance Costs	-1	-1	-1	-1	-1	-1
Total OPEX Savings	26	26	26	26	26	26
CAPEX difference for Solar PV	0	0	0	0	0	0
Total CAPEX Difference	0	0	0	0	0	0
Federal ITC Credit	0	0	0	0	0	0
Total Incentives Difference	0	0	0	0	0	0
Net Annual Cash Flow (*Non-discounted*)	26	26	26	26	26	26
Net Annual Cash Flow (*Discounted*)	14	14	13	12	12	11
Net Present Value	-203	-190	-177	-164	-153	-142
Cumulative Cash Flow (*Non-discounted*)	-115	-89	-64	-38	-13	13
Cumulative Cash Flow (*Discounted*)	-64	-47	-32	-18	-6	6

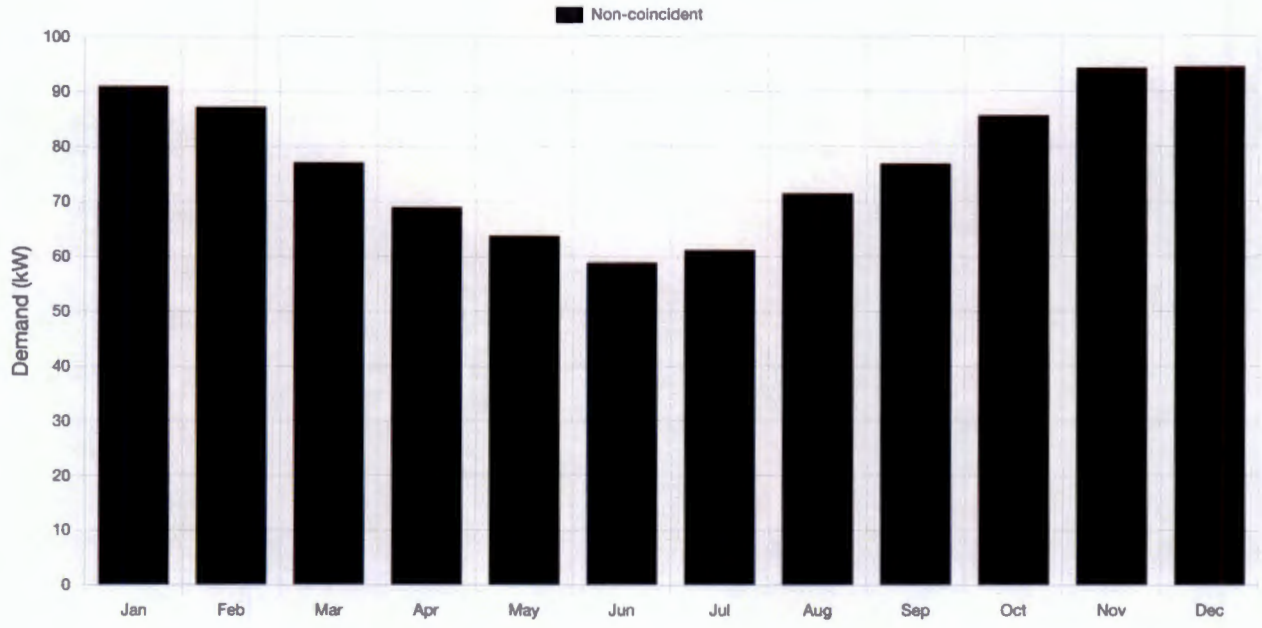
	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23
Revenue Increase: Electricity Sales	7	7	7	7	7	7
Savings: Utility Demand Charges	2	2	2	2	2	2
Savings: Utility Energy Charges	18	18	18	18	18	18
Savings: DER Maintenance Costs	-1	-1	-1	-1	-1	-1
Total OPEX Savings	26	26	26	26	26	26
CAPEX difference for Solar PV	0	0	0	0	0	0
Total CAPEX Difference	0	0	0	0	0	0
Federal ITC Credit	0	0	0	0	0	0
Total Incentives Difference	0	0	0	0	0	0
Net Annual Cash Flow (*Non-discounted*)	26	26	26	26	26	26
Net Annual Cash Flow (*Discounted*)	11	10	10	9	9	8
Net Present Value	**-131**	**-121**	**-111**	**-102**	**-93**	**-85**
Cumulative Cash Flow (*Non-discounted*)	**38**	**64**	**89**	**115**	**140**	**166**
Cumulative Cash Flow (*Discounted*)	**16**	**25**	**34**	**41**	**48**	**54**

	Year 24	Year 25
Revenue Increase: Electricity Sales	7	7
Savings: Utility Demand Charges	2	2
Savings: Utility Energy Charges	18	18
Savings: DER Maintenance Costs	-1	-1
Total OPEX Savings	26	26
CAPEX difference for Solar PV	0	0
Total CAPEX Difference	0	0
Federal ITC Credit	0	0
Total Incentives Difference	0	0
Net Annual Cash Flow (*Non-discounted*)	26	26
Net Annual Cash Flow (*Discounted*)	8	8
Net Present Value	**-77**	**-70**
Cumulative Cash Flow (*Non-discounted*)	**191**	**217**
Cumulative Cash Flow (*Discounted*)	**59**	**64**

Utility Data

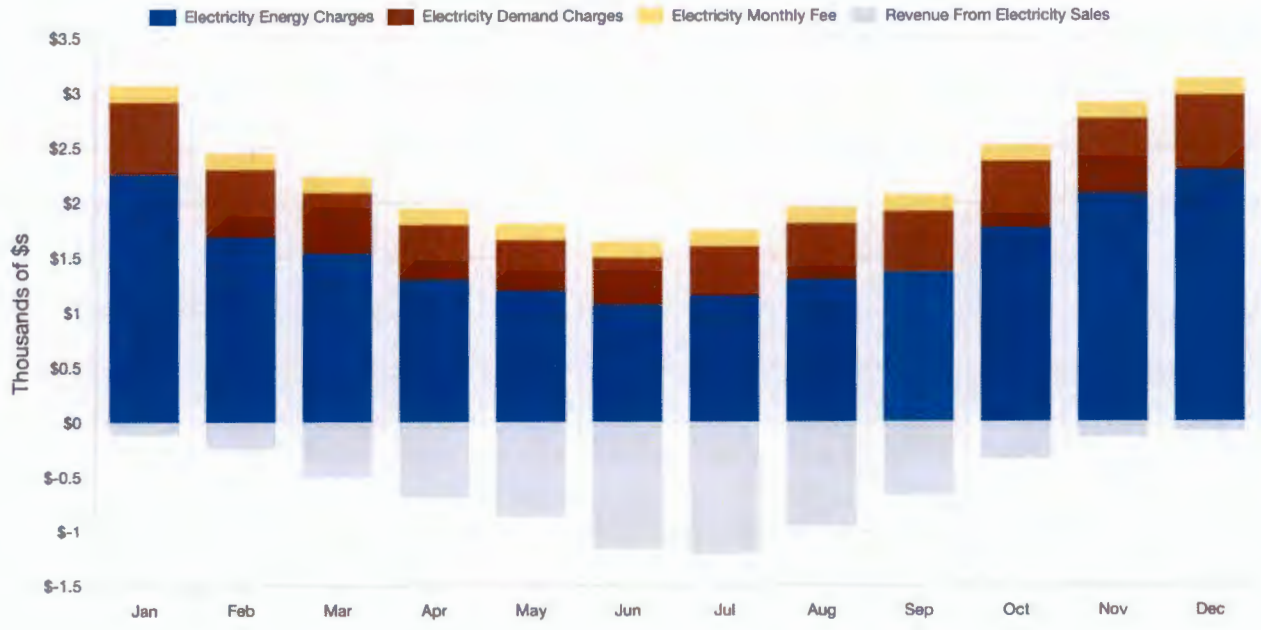
This section provides a summary of electricity and fuel utility purchases. Monthly breakdowns of energy consumption [kWh], demand by time-of-use period [kW], and total charges [k$] are included.

Monthly Demand (kW)



Monthly Energy Consumption (kWh)

Monthly Utility Charge Breakdown



Utility Billing Period

Billing for Annual

Annual Summary of Charges

Electricity Energy Charges [$]	12,056.77
Electricity Demand Charges [$]	6,671.20
Electricity Monthly Fee [$]	1,836.52
Total [$]	20,564.49
Reference [$]	46,967.05
Savings [$]	26,402.56

Annual Fuel Charges

Fuel Category	Consumption [kWh]	Rate [$/kWh]	Fuel Charge [$]
Fuel Subtotal [$]			0.00
Reference [$]			0.00
Savings [$]			0.00

Annual Electricity Charges

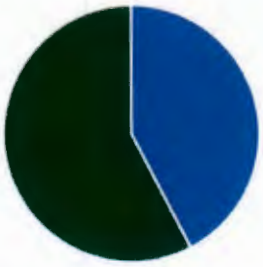
Tariff	Energy Category	Consumption [kWh]	Rate [$/kWh]	Energy Charge [$]
28	PTOU1 - tier1	213,295.54	-	19,015.30
28	Exports	88,790.75	-	-6,958.53
Energy Subtotal [$]				12,056.77
Reference [$]				36,963.18
Savings [$]				24,906.41

Tariff	Demand Category	Demand [kW]	Rate [$/kW]	Demand Charge [$]
28	noncoincident - tier1	50.00	-	4,500.00
28	noncoincident - tier2	44.48	-	895.17
28	noncoincident - tier3	0.00	-	0.00
28	noncoincident - tier4	37.24	-	1,276.03
Demand Subtotal [$]				6,671.20
Reference [$]				8,167.35
Savings [$]				1,496.15

Energy Balance and Technology Investments

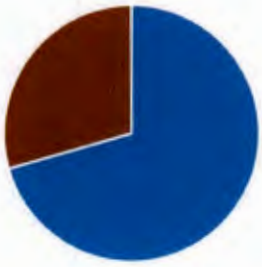
This section provides data on system energy demand and portfolio technologies. Included are details on total annual demand for each end-use modeled, share of demand met by utility purchases and on-site DER assets, total capacities of existing and new DER assets, and upfront investment costs.

Annual Electricity Balance (kWh)



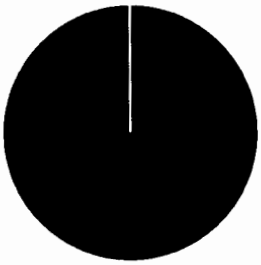
Total annual electricity purchase (kWh)	213,296
Total annual on-site generation from renewables (kWh)	290,113
Total	**503,409**

Utility Balance (kWh)



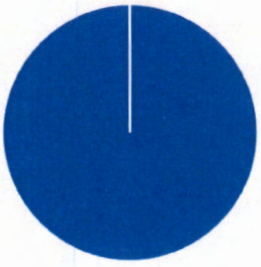
Total annual electricity purchase (kWh)	213,296
Total annual electricity exports (kWh)	88,791

Aggregated Demand (kWh)



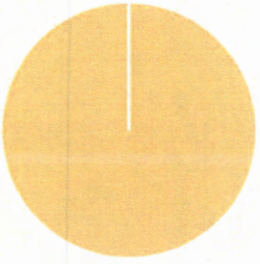
Electricity-Only Demand	414,018

CO_2 Emissions (metric tons)



Electricity	126
Total	**126**

Generation Technologies (kWh)

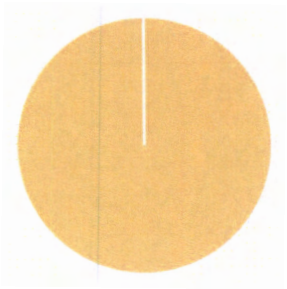


New Solar PV (kWdc)	192
Total	**192**

Tech	Used / Available Space (ft^2)	%
Solar PV	10,849 / 50,214	21.60%

Tech	Capacity Factor
Solar PV	17.29%

Investments

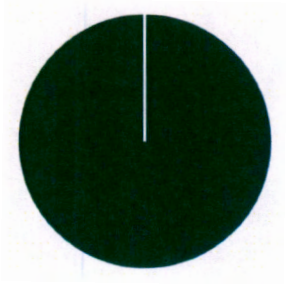


New Solar PV	$600,438
Total	$600,438

Annual PV Electricity Balance (kWh)

Electricity Consumed On-site	201,322
Electricity Exported	88,791
Total	290,113

CAPEX Breakdown ($)

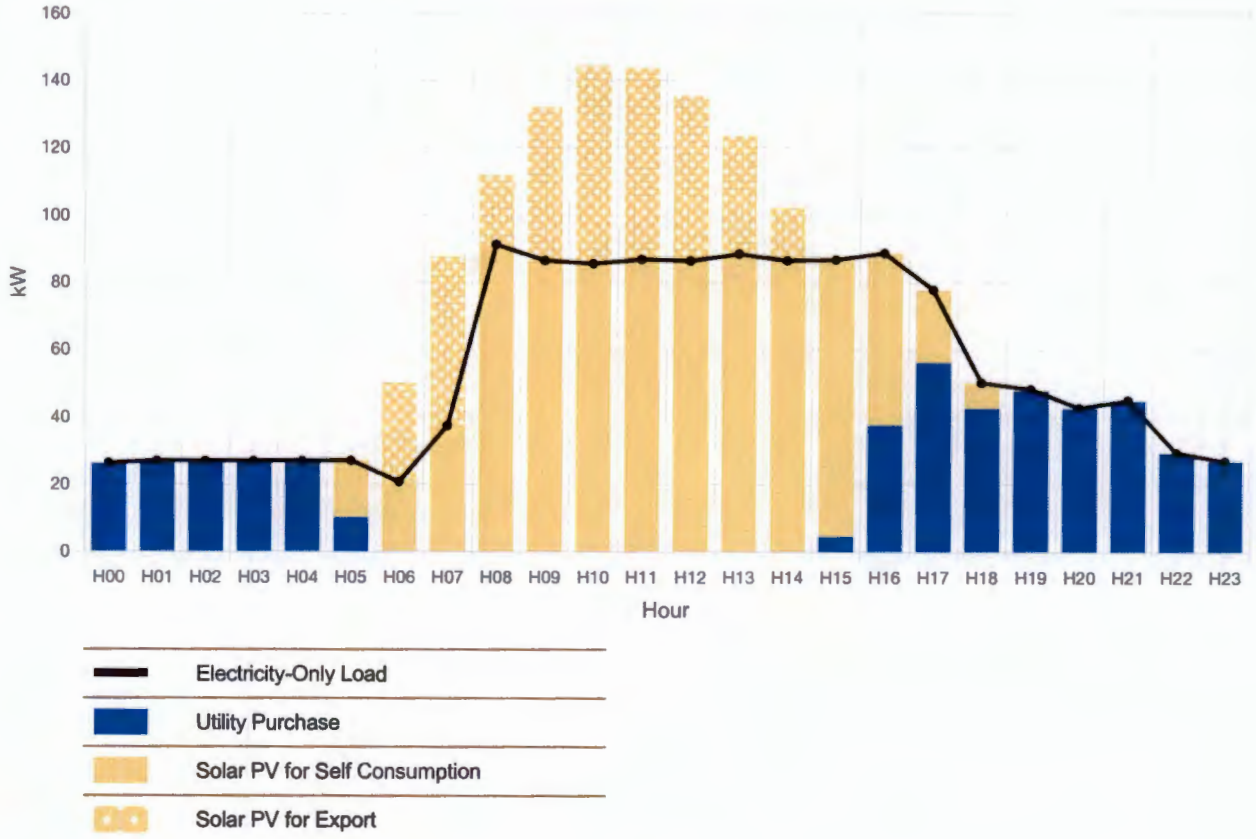


Total Paid Upfront	$600,438
Total	$600,438

Electricity Dispatch

The following dispatch curves show the optimal system operation to meet all electricity loads on a selection of modeled days. Electricity dispatch shows both the electricity-only loads and any electricity used to operate cooling and/or refrigeration technologies. System operation includes on-site generation and storage dispatch, utility purchases, and load management strategies.

Electricity Dispatch for July, Week



* Axes NOT Scaled on Dispatch Graph By Data Across All Months / Day Types

Operation Summary

This section provides a summary of generator operation and monthly on-site generation.

Monthly On-Site Generation (kWh)

APPENDIX F:
RFP System Description & Needs

Solar PV System Minimum Equipment and Construction Requirements

General

1. Provide and install a rooftop Photovoltaic (PV) energy generation system for Deschutes County (Buyer) at the *Deschutes County Fairgrounds Conference Center*, located at *3800 SW Airport Way, Redmond, OR 97756.*
2. All power generation and transmission equipment must be UL listed for its designed use.
3. Construction must comply with current adopted 2021 Oregon Electrical Specialty Code and 2022 Oregon Structural Specialty Code, which encompasses:
    a. 2021 International Building Code (IBC) and International Existing Building Code (IEBC)
    b. 2020 National Electric Code (NEC)
    c. All other relevant state and national codes
4. There must be a minimum 10-year warranty for all materials and workmanship.
5. System integrator is responsible for conducting all required building, utility, and rebate inspections; system integrator must complete all construction and documentation in a manner necessary to pass such inspections, and the work must be conducted in accordance with industry standard best practices.
6. System integrator must possess a current state electrical or limited renewable energy contractor license from the Oregon Construction Contractors Board to perform the work being proposed.
7. This work is anticipated to begin _____ and be completed by _____

Solar PV Modules

1. System modules shall be UL61730 listed and CEC-listed.
2. System modules must have a 10-year warranty on a minimum of 90% nameplate energy production and 25-year warranty on a minimum of 80% nameplate energy production.
3. All warranties must be documented in advance and be fully transferable to Buyer.
4. The PV system should provide up to 200 kWDC using below specified module equipment (or approved equivalent):
    a. BNEF Tier 1 and UL Listed
    b. Minimum efficiency: 20%
    c. Minimum wattage: 450WDC STC
5. In order to allow flexibly increasing the contracted PV system size during design phase, bidders should include a dollar-per-Watt ($/W) add-on price for additional installed generation capacity beyond their proposed system size; this add-on price should take into consideration site conditions, available space, electrical compatibility of equipment, and other pertinent factors.

Racking

1. Racking components shall be UL2703 listed and electrically and structurally compatible with the selected PV system modules and the roofing material to which they will attach or rest upon.
2. Racking components shall be produced by one of the following specified manufacturers, or an approved alternative:
    a. Unirac
    b. IronRidge

Inverter

3. Inverters shall be UL1741 and CEC-listed with an efficiency of 95% or higher
4. Inverters must carry a minimum 10-year warranty.
5. All warranties must be documented in advance, and be fully transferable to Buyer.
6. Inverters must be from one of the following specified manufacturers, or approved equivalent:
    a. SolarEdge
    b. Solectria
    c. Chint Power Systems

Balance of System Equipment

1. The PV system shall include, at a minimum, one fused DC disconnect and one fused AC disconnect for safety and maintenance concerns.
2. String combiner boxes must include properly-sized fusing, and all metal equipment and components must be bonded and grounded as required by 2021 Oregon Electrical Specialty Code.
3. All system wiring and conduit must comply with applicable local code and NEC stipulations.
4. Wall penetrations must be sealed in compliance with NEC and National Fire Protection Association (NFPA) regulations.
5. All wiring materials and methods must adhere to industry-standard best practices.
6. Material requirements:
    a. Fasteners and hardware throughout the system shall be stainless steel or material of equivalent corrosion resistance.
    b. Racking components shall be anodized aluminum, hot-dipped galvanized steel, or material of equivalent corrosion resistance.
    c. Unprotected steel not to be used in any components.

Interconnection

1. System interconnection must comply with 2021 Oregon Electrical Specialty Code and Utility regulations and must be approved by the local Utility and the Authority Having Jurisdiction (AHJ)'s Building Department before any PV system construction is begun.
2. The interconnection point shall be a supply-side connection, unless the System Integrator is able to demonstrate AHJ approval of a load-side connection.
3. Supply-side connection(s) shall be made between the CT meter and main switchgear overcurrent protection device.
4. All placards required by Buyer, the AHJ, the Utility, and/or state solar initiative program must be provided and installed according to Buyer and 2021 Oregon Electrical Specialty Code guidelines.

Monitoring and Reporting Systems

1. System must include real-time PV production monitoring provided to Buyer at no additional annual subscription cost.
2. Proposals must include internet hosting of monitoring with online access for Buyer personnel and touchscreen kiosk or video monitor for public display of data; furnishing and installation of kiosk or display equipment is Buyer's responsibility, and shall not be included in proposals.
3. System integrator must work with the Buyer to determine the best location and technique for monitoring communications interconnection.

4. System integrator will be responsible for providing all required monitoring communications and power wiring and conduit, with Buyer guidance on approved locations.

System Design and Permitting

1. For each site, within 90 days of contract being signed, Respondent shall create a construction plan set which includes at a minimum:
    a. Site overview
    b. Detailed array layout with stringing configuration
    c. Mounting and racking details
    d. Details of electrical conduit routing and location of electrical enclosures; conduit support details; and enclosure mounting details
    e. Electrical single-line diagram
    f. Monitoring plan
    g. Construction project plan with timeline
2. All proposed system designs and construction techniques must be approved by the AHJ.
3. A building permit is required for each system and must be obtained through normal permitting processes by Respondent.
4. Respondent shall obtain structural PE stamp verifying the integrity of the existing facility to handle additional weight load of proposed PV system.
5. Respondent shall obtain electrical PE stamp verifying the integrity and code compliance of proposed PV system and interconnection with facility.
6. Roof-mounted array layouts shall be designed to provide adequate setback distances between the array boundary and the roof edge, as required by 2021 Oregon Electrical Specialty Code and the AHJ; system layout must allow convenient access to existing roof HVAC equipment and vents.
7. Final array layouts shall be designed to avoid shading from 9am to 3pm annually. If this shading requirement cannot be strictly met, Respondent shall specify the predicted solar availability (TSRF) and performance losses. TSRF at all locations of the array must exceed 80%.
8. Wire loss in DC circuits to be < 1.5%.
9. Wire loss in AC circuits to be < 1.5%.

Construction

1. Integrator shall prepare, maintain, and abide by a Site Safety Plan to include, at a minimum, all applicable Occupational Safety and Health Administration (OSHA) workplace safety and Personal Protective Equipment (PPE) requirements.
2. Construction work shall be designed to minimize impact to facility operations. Integrator shall develop a construction plan for site access, staging, and equipment storage and obtain approval from the Buyer prior to beginning construction.
3. All asphalt, concrete, landscaping, and other areas that are disturbed during construction shall be remediated and returned to original condition, or equivalent condition as approved by the Buyer.
4. After completion of work, site shall be left clean and free of any dirt or debris that may have accumulated during construction. All construction equipment, spoils, and other construction byproducts shall be removed from the site.
5. All electrical enclosures and equipment shall be installed to be readily accessible to qualified personnel only.

6. All visible conduits and electrical equipment shall be painted or aesthetically dressed per Buyer specifications, as allowable by equipment manufacturer guidelines.
7. Location of existing underground utilities must be marked by USA/Dig Alert or equivalent private service prior to any underground work.

Documentation and Process Control

In addition to construction requirements listed above, system integrator will be required to:

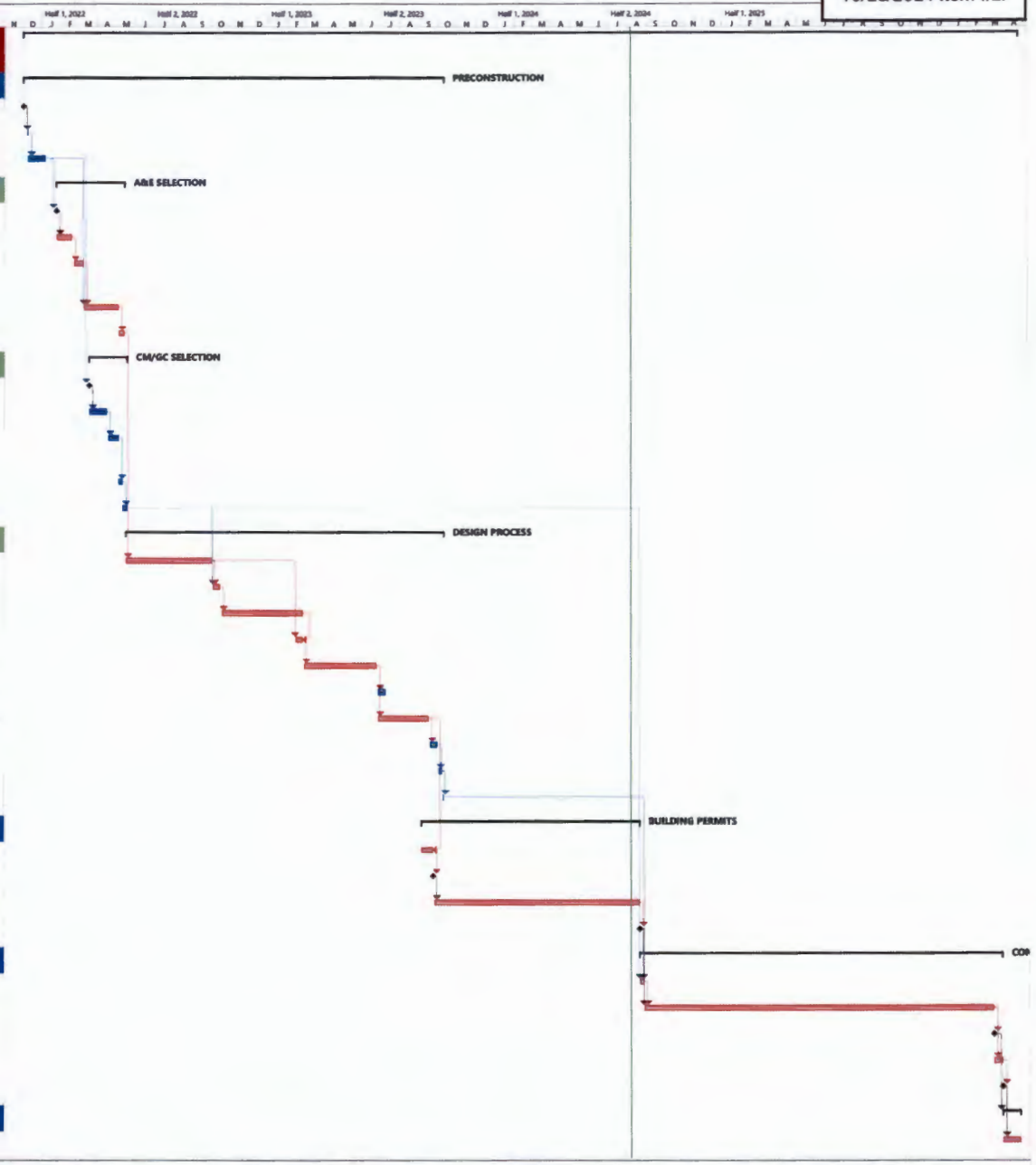
1. Apply for and receive interconnection approval from the local Utility for proposed PV systems.
2. Obtain Solar rebates and/or Renewable Energy Credits (if applicable).
3. Provide Operations & Maintenance training to Buyer staff and prepare press releases and a ribbon-cutting ceremony at Buyer request.
4. Provide an add-on for 20 years of system maintenance (at Buyer's sole discretion, priced separately), with annual reports of system performance and consistent oversight of system monitoring.
    a. Respondent shall be required to respond to system downtime within 48 hours of first occurrence of incidence. If corrective action is not immediately feasible, Respondent shall notify Buyer of action plan and timeline for execution.
    b. Respondent shall be required to respond to warranty related issues not affecting production within 5 days of notification.
5. Provide As-Built drawings of PV system, which must include finalized module layout and stringing chart.

EXHIBIT B

DESCHUTES COUNTY FACILITIES

DCCH - Prelim Schedule - 8.6.24 - WP

ID	WBS	Task Name	Duration	Start	Finish	Predecessors	Successors
1	DESCH1	DESCHUTES COUNTY COURTHOUSE EXPANSION PROJECT	1143 days	Thu 12/2/21	Mon 4/20/26		
2	DESCH1-1	PRECONSTRUCTION	483 days	Thu 12/2/21	Mon 10/9/23		
3	DESCH1-1.1	Contract Notice to Proceed	0 days	Thu 12/2/21	Thu 12/2/21		4FS+4 days
4	DESCH1-1.2	Project Kickoff Meeting	1 day	Wed 12/8/21	Wed 12/8/21	3FS+4 days	5
5	DESCH1-1.3	Site Due Diligence	20 days	Thu 12/9/21	Wed 1/5/22	4	10,7,13
6	DESCH1-1.4	A&E SELECTION	86 days	Mon 1/24/22	Fri 5/13/22		
7	DESCH1-1.4.1	RFP for Design Architect Posted	0 days	Mon 1/24/22	Mon 1/24/22	5	8
8	DESCH1-1.4.2	A&E Firms Response to RFP	19 days	Mon 1/24/22	Thu 2/17/22	7	9FS+1 day
9	DESCH1-1.4.3	Deschutes County & PlanB Evaluate A&E Proposals & Interview Candidates	12 days	Mon 2/21/22	Tue 3/8/22	8FS+1 day	10
10	DESCH1-1.4.4	A&E Firm Negotiations and Candidate Selection	40 days	Wed 3/9/22	Tue 5/3/22	9,5	11
11	DESCH1-1.4.5	Deschutes County Approval of A&E Candidate	8 days	Wed 5/4/22	Fri 5/13/22	10	19
12	DESCH1-1.5	CM/GC SELECTION	43 days	Fri 3/18/22	Tue 5/17/22		
13	DESCH1-1.5.1	RFP for CM/GC Posted	0 days	Fri 3/18/22	Fri 3/18/22	5	14
14	DESCH1-1.5.2	CM/GC Candidates Response to RFP	20 days	Fri 3/18/22	Thu 4/14/22	13	15FS+1 day
15	DESCH1-1.5.3	Deschutes County & PlanB Evaluate CM/GC Proposals & Interview Candidates	12 days	Mon 4/18/22	Tue 5/3/22	14FS+1 day	16
16	DESCH1-1.5.4	CM/GC Firm Negotiations and Candidate Select	5 days	Wed 5/4/22	Tue 5/10/22	15	17
17	DESCH1-1.5.5	Deschutes County Approval of CM/GC Candida	5 days	Wed 5/11/22	Tue 5/17/22	16	35,20
18	DESCH1-1.6	DESIGN PROCESS	366 days	Mon 5/16/22	Mon 10/9/23		
19	DESCH1-1.6.1	Programming Phase	100 days	Mon 5/16/22	Fri 9/30/22	11	20,22
20	DESCH1-1.6.2	CM/GC Programming Phase Budget Check	10 days	Mon 10/3/22	Fri 10/14/22	19,17	21
21	DESCH1-1.6.3	Schematic Design Phase	95 days	Mon 10/17/22	Fri 2/24/23	20	22FF
22	DESCH1-1.6.4	CM/GC Schematic Design Phase Estimate	10 days	Mon 2/13/23	Fri 2/24/23	21FF,19	23
23	DESCH1-1.6.6	Design Development Phase	85 days	Mon 2/27/23	Fri 6/23/23	22	24,25
24	DESCH1-1.6.7	CM/GC DD Phase Estimate	10 days	Mon 6/26/23	Fri 7/7/23	23	
25	DESCH1-1.6.8	Construction Documents Phase	60 days	Mon 6/26/23	Fri 9/15/23	23	26,30FF+5 days
26	DESCH1-1.6.10	CM/GC Develop Final GMP Estimate Based on	10 days	Mon 9/18/23	Fri 9/29/23	25	27
27	DESCH1-1.6.11	PlanB Verify Final GMP Estimate Based on Con	5 days	Mon 10/2/23	Fri 10/6/23	26	28
28	DESCH1-1.6.12	Client Board Approval - Construction GMP	1 day	Mon 10/9/23	Mon 10/9/23	27	36
29	DESCH1-2	BUILDING PERMITS	251 days	Mon 9/4/23	Mon 8/19/24		
30	DESCH1-2.2	Permit Application Preparation	15 days	Mon 9/4/23	Fri 9/22/23	25FF+5 days	31
31	DESCH1-2.3	Permit Submittal to The City of Bend Building Dep	0 days	Fri 9/22/23	Fri 9/22/23	30	32
32	DESCH1-2.4	Permit City Review Process	236 days	Mon 9/25/23	Mon 8/19/24	31	33
33	DESCH1-2.5	Building Permit Issued	0 days	Mon 8/19/24	Mon 8/19/24	32	35,36
34	DESCH1-3	CONSTRUCTION	415 days	Tue 8/20/24	Mon 3/23/26		
35	DESCH1-3.2	Mobilize on Site	5 days	Tue 8/20/24	Mon 8/26/24	33,17	36
36	DESCH1-3.3	Building Construction of Deschutes County Courth	400 days	Tue 8/27/24	Mon 3/9/26	35,28,33	37,38
37	DESCH1-3.4	Substantial Completion	0 days	Mon 3/9/26	Mon 3/9/26	36	40
38	DESCH1-3.5	Punchlists / Owner Acceptance	10 days	Tue 3/10/26	Mon 3/23/26	36	41,39
39	DESCH1-3.6	Final Completion, Occupancy	0 days	Mon 3/23/26	Mon 3/23/26	38	41
40	DESCH1-4	PROJECT CLOSE OUT	20 days	Tue 3/24/26	Mon 4/20/26	37	
41	DESCH1-4.1	Contract Closeout	20 days	Tue 3/24/26	Mon 4/20/26	38,39	



Project: DCCH - Prelim Schedul
Date: Tue 8/6/24

Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Critical · Critical Split · Progress · Manual Progress

PRELIMINARY PROJECT SCHEDULE

Deschutes County Courthouse Expansion Project

Page 1 of 1

CUMMING GRO

Exhibit C

SIGNATURE SHEET

The undersigned hereby proposes to furnish, within the time specified, the several items and/or services hereinbefore listed, to be delivered in accordance with the foregoing specifications hereto attached.

SIGNATURE FOR INDIVIDUAL (signed by individual)

Address _____ X_____

City/State_____ _____

Zip _____ Tel _____ FAX_____

Email _____

SIGNATURE FOR PARTNERSHIP (signature of one partner required)

Name of Partners: (please print) Name of Partnership:

_____ _____

_____ Address _____

_____ City/State/Zip_____

_____ Tel _____ FAX _____

X_____ Email _____

SIGNATURE FOR CORPORATION (as indicated)

Address _____ _____

(Corporate Name)

City/State/Zip _____

Tel _____ FAX _____ X_____

(Signature of Officer or Agent)

_____

(Typed or Printed NAME and TITLE of Officer or Agent)

Are you a resident as defined in ORS 279A.120? _____ Yes _____ No

"Resident bidder" means a bidder that has paid unemployment taxes or income taxes in this state during the 12 calendar months immediately preceding submission of the bid, has a business address in this state and has stated in the bid whether the bidder is a "resident bidder" pursuant to this subsection.

RECEIPT ACKNOWLEDGED OF ADDENDA: #1 _____ #2 _____ #3 _____ #4_____

EXHIBIT D: BILLING RATES/FEE SCHEDULE

HOURLY RATES			
Name	*Role*	*Rate / HR*	*Overtime*

Vendor Team			
	Account/Project Manager		

EXHIBIT E

DESCHUTES COUNTY FAIRGROUNDS SOLAR PV PROJECT
PROPOSAL SCORE CARD - RFP FOR SOLAR PV & RELATED SERVICES

COMPANY NAME:

Refer to pages 3 through 7 of the RFP, "Section C: Required Solar PV Services", "Section D: Submission Requirements," and "Section E: Evaluation Criteria"

SCORING - by _____

EVALUATION CRITERIA	POINTS
Cover Letter a. Proposer's name, address, telephone number, email, & website b. Point of Contact with phone number and email	(Pass/Fail)
Proposed Responder's Project Team a. Team members' name(s) b. Relevant credentials c. Role/responsibility on the project d. Summary of team members' experience that is directly relevant to the Fairgrounds Solar Project.	(Max Points 20)
Responder's Approach to Provide Solar PV & Related Services a. Plan to achieve the scope of work objectives 1) Stakeholder & design team engagement 2) Solar design selection process recommendations. b. Proposed contract terms. (Details on contract requirements are included in "Section F: Insurance & Contracting" of the RFP)	(Max Points 20)
Responder's Customer Service a. Plan to resolve manufacturer errors and damaged product. b. Delivery/Installation management plan c. Training and Maintenance program	(Max Points 20)

EVALUATION CRITERIA	POINTS
Responder's Related Project Experience a. **Project Profiles:** Provide experience in the successful completion of similar projects in scope, size, and focus that best illustrate the Responder's experience & abilities.	(Max Points 15)
Responder's References a. Three (3) Owners / Two (2) Owners & one (1) Consultant	(Max Points 10)
Responder's Billing Rates/Fee Schedule	(Max Points 15)
Attachments a. Exhibit C: Signature Sheet	(Pass/Fail)
OVERALL PROPOSAL	(Max Points 100)

RANKING

A select scoring panel will evaluate submissions based on the criteria identified in the RFP. The panel will meet & discuss proposers' strengths and weaknesses, and determine a ranking based on which bid package will provide the best value for the project in terms of cost, schedule, and coverage of the required scope of services.

PROVIDE VENDOR RANKING:

1)
2)
3)

Responders often would like to know how they could improve or better respond to RFP's in the future; please provide "hits" and "misses" comments that specifically address the submission items, response, etc. This information could be used if a "debrief" is requested by the responder.

	HITS
1	
2	

3	
4	
5	
6	
7	
8	

	MISSES
1	
2	
3	
4	
5	
6	
7	
8	

Deschutes County Fairgrounds - Solar PV

9/19/2024

	Points	E2 Solar				Sunlight Solar				Energy Wise				A&R Solar				Pure Energy				Power Northwest				Elemental Energy				Capstone Solutions - LATE			
Cover Letter	P/F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
Project Team	20	18	20	18	18	18	18	16	18	10	11	10	15	18	19	15	16	17	18	15	17	18	19	13	17	16	17	15	16				
Approach	20	18	16	18	18	17	15	15	17	14	15	13	17	17	18	16	17	16	15	10	16	18	18	12	16	16	12	10	15				
Customer Service	20	18	18	18	18	10	17	16	18	16	15	15	18	12	16	15	17	10	10	10	15	18	18	15	17	14	17	15	16				
Related Project Experience	15	14	11	13	15	12	13	14	15	12	15	13	12	13	12	13	12	12	5	13	13	14	14	12	12	16	10	12	12				
References	10	10	10	10	10	10	10	10	9	10	7	10	10	10	8	10	10	10	5	10	10	10	8	10	9	10	6	10	10				
Billing Rates/Fee Schedule	15	14	15	15	15	14	15	13	12	10	10	14	13	15	15	10	12	12	5	10	13	14	15	10	11	12	12	15	14				
Attachments - Signature Sheet	P/F	P	P	P	P	P	P	P	P	F	F	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
Overall	**100**	**92**	**90**	**92**	**94**	**81**	**88**	**84**	**89**	**72**	**73**	**75**	**85**	**85**	**88**	**79**	**84**	**77**	**58**	**68**	**84**	**92**	**92**	**72**	**82**	**84**	**74**	**77**	**83**	**0**	**0**	**0**	**0**
Average Score		92				85.5				76.25				84				71.75				84.5				79.5				0			
Position		1				2				Incomplete				4				6				3				5				LATE			

Deschutes Co. Fairgrounds solar bid
Energy Wise Services
Peter Greenberg
nrgwiseservice@gmail.com
541-905-2271
www.energywiseservices.com

Greetings,

I would like to protest the intent to award for Document No. 2024-811, a Notice of Intent to Award Contract to E2 Solar.

The paperwork says there are 7 days from the day of the Commissioners meeting, 10/2 to protest.

I asked for a copy of the scoring and a copy of the winners proposal. As the bid is not based on cost, I can't determine if my bid is better than that of E2 Solar or not. I was refused the paperwork I asked for until a contract is signed. That could be after the 7 days period. I did hear on the recording of the Commissioners meeting that the size of the system is 310 kw. My proposal was 356 kw.

The Mayfield study for the bid is outdated and only talked about 190 kw, prices have dropped over the years. In addition the inverter and the modules he proposed didn't meet the qualifications of the "design build".

The solar panels I have proposed along with the racking will qualify for an extra 10% or about $65,000 of free federal money, this is in addition to the 30% of the project cost thru the federal Inflation Reduction Act. The solar panel manufacturer is in the process of building a factory to manufacture solar cells that will meet requirements of the IRA additional grant some time next year (well within the timeline outlined in the bid-before the courthouse is finished). As I am the first customer in the state to use this particular racking, I wonder if E2 Solar will have products that are eligible for this extra 10% of free money.

The bid called for inverters with a 25 year warranty. The only inverters that I know of that have this are microinverters. I would not recommend using them as it puts a lot of electronics that can fail underneath difficult to get to areas in a harsh environment.

I offered a warranty on the output of the system where I would pay for any lost energy between the time a part failed and when we would fix it.

I offered a spare inverter, so any change could be done very quickly.

With the string inverter I have proposed and my design there would be no need to put any electronics under the solar panels, which would be needed in any other proposed system that did not offer the products I would use. The inverter I have proposed can easily be changed (less than 1 hr), if the inverter failed and the manufacturer went out of business, one can use a number of other inverters. If Solaredge fails and goes out of business, there is no other alternative other than to take up all of the solar panels and modify the system which would be very expensive.

My proposal includes 10 years of once a year washing of the solar panels and systems check as well as daily monitoring for the first 10 years of the energy output.

With what looks like a minimum of $250,000 (at 4% Pac Power annual rate increase) plus the extra IRA funds and the other benefits, I would like to see how the E2 Solar bid is better.

Peter Greenberg

October 3, 2024

		My bid w/ Solis inverters			E2 solar w/ Solaredge 480v? inverters	
			356.5 kw DC		310 kw	
Year	Solar panel output	4% inc/yr Pac Power	Initial kwh produced	Earnings/yr	Initial kwh produced	Earnings/yr
1	100%	0.10	518,534	$51,853	468,455	$46,846
2	98.00%	$0.104	518,534	$52,849	468,455	$47,745
3	97.68%	$0.108	518,534	$54,781	468,455	$49,490
4	97.35%	$0.112	518,534	$56,784	468,455	$51,300
5	97.03%	$0.117	518,534	$58,860	468,455	$53,175
6	96.71%	$0.122	518,534	$61,011	468,455	$55,119
7	96.39%	$0.127	518,534	$63,242	468,455	$57,134
8	96.07%	$0.132	518,534	$65,554	468,455	$59,223
9	95.75%	$0.137	518,534	$67,950	468,455	$61,388
10	95.43%	$0.142	518,534	$70,434	468,455	$63,632
11	95.12%	$0.148	518,534	$73,009	468,455	$65,958
12	94.80%	$0.154	518,534	$75,678	468,455	$68,369
13	94.49%	$0.160	518,534	$78,445	468,455	$70,869
14	94.18%	$0.167	518,534	$81,313	468,455	$73,460
15	93.87%	$0.173	518,534	$84,285	468,455	$76,145
16	93.56%	$0.180	518,534	$87,366	468,455	$78,929
17	93.25%	$0.187	518,534	$90,560	468,455	$81,814
18	92.94%	$0.195	518,534	$93,871	468,455	$84,805
19	92.63%	$0.203	518,534	$97,303	468,455	$87,905
20	92.32%	$0.211	518,534	$100,860	468,455	$91,119
21	92.02%	$0.219	518,534	$104,547	468,455	$94,450
22	91.71%	$0.228	518,534	$108,369	468,455	$97,903
23	91.41%	$0.237	518,534	$112,331	468,455	$101,482
24	91.11%	$0.246	518,534	$116,437	468,455	$105,192
25	90.80%	$0.256	518,534	$120,694	468,455	$109,038
				$2,028,387		**$1,832,489**
						this doesn't include up to 2% drop for transformer
			Difference	$195,898		
				no transformer needed		

Deschutes Co. Fairgrounds solar bid

Energy Wise Services
Peter Greenberg
nrgwiseservice@gmail.com
541-905-2271

Greetings,

My name is Peter Greenberg, thank you for allowing me the time to discuss the recent solar bid. Let me introduce myself, I have 14 years experience in the solar business, we have installed approximately 14,000 kw and over 45,000 solar panels. We own approximately 150 solar systems, have installed 20 new solar products and have a good idea of what works and what doesn't. In addition I was a firefighter paramedic for 11 years first as a volunteer with Corvallis, then as a paid professional with Albany.

I realize it is difficult to know about every type of industry and product. The County had a study by Mayfield,a very good consultant, yet the bid didn't follow most of what they suggested. Their study is now out of date with regards to cost and the materials they suggested would not qualify by the very strict requirements in the bid.

If as stated, the intent of the bid was to maximize the size of the solar system, this was not done, because you did not pick the bid with the largest solar system size. The scoring was very subjective and there was little consideration to which bid offered the best value to the County. There was no explanation of how the points were determined.

This was supposed to be a design build bid, but with the very tight specs, it was extremely limited to the products that could be used. With the wealth of experience of companies in the industry, one should have simply asked the solar contractors for their best recommendation for the largest system that would give the most value to the County.

Some of the issues, I see problems with are:

1. There were 7 days from the day of the Commissioners meeting and the signing of the Intent to Award, 10/2 to protest the awarding of the contract. Typically when one is bidding on price, awards are open immediately after handing them in. In this case we were not bidding on price, instead, from what I understood to be the best value to the County, the bids were not immediately open to the public. I am certainly not a lawyer, but it seems clear to me and common sense would suggest that there is nothing to hide or gain to the county by not sharing this information. ORS 192.311 **states, Proposals are not required to be open for public inspection until after the notice of intent to award a contract is issued**. Your lawyer said that did not pertain and there was a different statute for road building and engineering that said bids did not need to be disclosed. Whatever the case, there were many faults with the bid process.
   I was told to file a Request for Records Request, I did that and got a link to the other proposals 7 days and 4 hrs after the Co. meeting on the bid. I heard on the recording of

the Commissioners meeting that the size of the winning system is 310 kw. My proposal was 356 kw.

2. The Mayfield study for the bid is outdated and only talked about 190 kw, prices have dropped over the years. In addition the inverter and the panels proposed didn't meet the qualifications of the "design build" bid.

3. In A1.0 of the RFP, it states, "The goal is to maximize the size of the new solar system for the proposed budget." This didn't appear to be the case, as my bid was by far the largest system and had other benefits.

4. Extra money for the county. The solar panels I have proposed along with the racking will qualify for an extra 10% or about $65,000 of free federal money, this is in addition to the 30% of the project cost thru the federal Inflation Reduction Act. My bid was the only one to offer that.

5. The bid called for inverters with a 25 year warranty. The only inverters that I know of that have this are microinverters, it is very rare to see microinverters in larger commercial projects. Regardless of their long warranty, no solar installers I know of would recommend installing almost 800 microinverters under solar panels, as no one would buy something that goes under solar panels that can last 25+ years or longer without this warranty. Microinverters or any electronics can fail and as they are underneath solar panels they can be costly to get to and replace.. In fact none of the bidders other than the winner, included these types of inverters. Elemental Energy, one of the bidders and an excellent long time solar company in Oregon, have got to be the Kings of Enphase microinverters, being a large user of them for many years, they did not put these in their bid. All of the other bidders except mine and the winners proposed Solaredge (string) inverters. As in the Enphase microinverter, Solaredge also only operates with a proprietary device under all of the solar panels that can and do fail. I do not recommend these either. I feel using a proprietary product that cannot be substituted with any other and relying on it to be perfect for decades is not the best value for a customer and can cause major issues and expense if the products fail and the company goes out of business.

Uniquely, my bid proposed an inverter that can be easily replaced with other brands, if the inverter fails and the manufacturer goes out of business, the inverter can easily be changed in an hour or 2. There are no electronics under the solar panels with my bid, which can and do fail and provide added risk with little benefit. If the Enphase or Solaredge inverters that all the other bidders proposed fail and the manufacturer goes out of business, there is no other alternative other than to take up all of the solar panels and modify the system which would be very expensive, cost easily over $150,000 to take out the micro inverters or optimizers, replace the inverter with a type I proposed and then reinstall all of the solar panels.

6. I offered by far the best and longest labor and production warranty where I would pay for any lost energy between the time a part failed and when we would fix it. My proposal includes 10

years of once a year washing of the solar panels and systems check as well as daily monitoring for the first 10 years of the energy output which no one else offered.

7. Large long term financial difference. Figuring in a 4% Pacific Power yearly rate increase (which has been much more the last few years), the depreciation in output of the solar panel I offered and the system size difference, my bid would provide almost $346,000 in savings over the winning bid over 25 years, including the extra $65,000 from the IRA funds. My system is much less prone to risk of product failure and offers the simplest fix if the product manufactures go out of business.

8. The Meyers Berger solar panels that are in the winners bid do have a very high output after 25 years. Unfortunately the company is close to bankruptcy. Their stock traded at $175.40 at the beginning of the year. As of 10/12/2024 they were at $1.76. Solar panels are basically a commodity, to put large stock in a 25 year warranty and not consider the long term financial status of the manufacturer or energy savings over the life of the system, makes little sense to me. The solar panels I have proposed are US made, they are close to finishing a factory in So. Carolina. Next year they will qualify for a Made in America IRA bonus, along with the racking I proposed, which would mean an additional $65,000 to the county through the Inflation Reduction Act. No other proposal offers this.

9. The winner's bid has wages priced below prevailing wages. The Materials Handler rate in Region 4 from the July 2024 BOLI wages is $36.47, E2 has $32 for an installation technician, this rather than what I have as simply BOLI mandated wages should disqualify their bid altogether. Why scoring wages was part of the scoring is a mystery to me. It makes no sense to score billing rates and fees in a fixed price bid.

10. There was too much significance placed on the scoring, which was very subjective, rather than the best value for the County. To score a 10 on references from one person and a 7 from another is practically meaningless. Contrast this with savings of almost $350,000 more from bid to the winnders. To put scoring on one's team is mostly irrelevant, as one can see from anyone's list of projects that all of the companies are capable of doing this project. With the deadline to finish being before the Courthouse project is done, whether one finishes in 3 weeks or 5 weeks makes little difference.

11. I don't understand the scoring for Approach. I scored less than the winning team, yet my approach is more practical, saves more energy and money, uses less equipment that can fail, and offers services that others don't offer over 10 years.

12. Scoring on Team is included, who cares what the team is as long as the job gets done, good materials are used and the project is approved by the AHJ and the ETO.

13. Adding additional connections and electronics thru microinverters under 800 solar panels simply adds more to the risk of failure of equipment than not having it. The majority of failures are caused by faulty cabling and connections, which are factors that can occur in any electrical system. Enphase has a decent reputation but with no national reporting system on inverter

failures, there is no way of knowing what is happening with failures. Enphase stock from 2014 to 2020 never went above $10. All of a sudden after the rapid shutdown code changes they pushed, they rose to $319 in November 2022. From Dec. 2022 to then 10/21/2024 they went from $319 to about $90.17. Solaredge the inverter and optimizer everyone but me and E2 bid on went from $83, 5 yrs ago to $360 a few years ago after the code change to $17.13 today

Peter Greenberg
Energy Wise Services

	356.5 kw DC, EWS				310.44 kw, E2		
Year	[illegible]	[illegible]	[illegible]	[illegible]	Meyers Berger initial kwh	Meryes Berger depreciation	Earnings/yr
1	100%	0.1057	518,294	$54,786	446,219	100%	$47,168
2	98.00%	$0.110	518,294	$55,838	446,219	98%	$48,073
3	97.68%	$0.114	518,294	$57,879	446,219	97.75%	$49,869
4	97.35%	$0.119	518,294	$59,995	446,219	97.50%	$51,731
5	97.03%	$0.124	518,294	$62,189	446,219	97.25%	$53,662
6	96.71%	$0.129	518,294	$64,462	446,219	97.00%	$55,665
7	96.39%	$0.134	518,294	$66,819	446,219	96.75%	$57,742
8	96.07%	$0.139	518,294	$69,261	446,219	96.50%	$59,897
9	95.75%	$0.145	518,294	$71,793	446,219	96.25%	$62,131
10	95.43%	$0.150	518,294	$74,418	446,219	96.00%	$64,449
11	95.12%	$0.156	518,294	$77,139	446,219	95.75%	$66,852
12	94.80%	$0.163	518,294	$79,959	446,219	95.50%	$69,345
13	94.49%	$0.169	518,294	$82,882	446,219	95.25%	$71,930
14	94.18%	$0.176	518,294	$85,912	446,219	95.00%	$74,611
15	93.87%	$0.183	518,294	$89,052	446,219	94.75%	$77,391
16	93.56%	$0.190	518,294	$92,308	446,219	94.50%	$80,274
17	93.25%	$0.198	518,294	$95,682	446,219	94.25%	$83,264
18	92.94%	$0.206	518,294	$99,180	446,219	94.00%	$86,365
19	92.63%	$0.214	518,294	$102,806	446,219	93.75%	$89,581
20	92.32%	$0.223	518,294	$106,564	446,219	93.50%	$92,915
21	92.02%	$0.232	518,294	$110,460	446,219	93.25%	$96,374
22	91.71%	$0.241	518,294	$114,498	446,219	93.00%	$99,960
23	91.41%	$0.251	518,294	$118,684	446,219	92.75%	$103,679
24	91.11%	$0.261	518,294	$123,023	446,219	92.50%	$107,535
25	90.80%	$0.271	518,294	$127,520	446,219	92.25%	$111,535
Totals over 25 yrs				$2,143,112			$1,861,996

	Silfab, EWS	Meyers B, E2
System size in kw	356.5	310.44
Initial kwh/yr savings	518,294	446,219
25 yr savings (at 4% yr PP incr)	$2,144,104	$1,861,996
Savings over 25 years over E2	$282,108	
Cost after ETO	$639,845	$639,845
Federal IRA	-$191,954	-$191,954
Federal IRA bonus	-$63,985	$0
Net cost	$383,907	$447,892
25 yr savings, net	$1,760,197	$1,414,105
Savings over E2 between energy and bonus IRA	$346,093	
Advantage with EWS	Uptime warranty, spare 60 kw inverter, washing for 10 years, much less risk of inverter mfg. failure	
	same as above but with free EV pickup with battery backup	

Deschutes County Fairgrounds - Solar PV

9/19/2024

	Points	E2 Solar				Sunlight Solar				Energy Wise				A&R Solar				Pure Energy				Power Northwest				Elemental Energy				Capstone Solutions - LATE			
Cover Letter	P/F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
Project Team	20	18	20	18	18	18	18	16	18	10	11	10	15	18	19	15	16	17	18	15	17	18	19	13	17	16	17	15	16				
Approach	20	18	16	18	18	17	15	15	17	14	15	13	17	17	18	16	17	16	15	10	16	18	18	12	16	16	12	10	15				
Customer Service	20	18	18	18	18	10	17	16	18	16	15	15	18	12	16	15	17	10	10	10	15	18	18	15	17	14	17	15	16				
Related Project Experience	15	14	11	13	15	12	13	14	15	12	15	13	12	13	12	13	12	12	5	13	13	14	14	12	12	16	10	12	12				
References	10	10	10	10	10	10	10	10	9	10	7	10	10	10	8	10	10	10	5	10	10	10	8	10	9	10	6	10	10				
Billing Rates/Fee Schedule	15	14	15	15	15	14	15	13	12	10	10	14	13	15	15	10	12	12	5	10	13	14	15	10	11	12	12	15	14				
Attachments - Signature Sheet	P/F	P	P	P	P	P	P	P	P	F	F	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
Overall	**100**	**92**	**90**	**92**	**94**	**81**	**88**	**84**	**89**	**72**	**73**	**75**	**85**	**85**	**88**	**79**	**84**	**77**	**58**	**68**	**84**	**92**	**92**	**72**	**82**	**84**	**74**	**77**	**83**	**0**	**0**	**0**	**0**
Average Score		92				85.5				76.25				84				71.75				84.5				79.5				0			
Position		1				2				Incomplete				4				6				3				5				LATE			