2023 Non-Inverter Based Energy Storage Resources
Request for Information (RFI)

I. Purpose and Scope

Salt River Agricultural Improvement and Power District (SRP) is a community-based, not-for-profit organization providing affordable water and power to more than 2 million people in central Arizona. SRP has been serving the Valley for more than a century to meet the needs of customers and to help the Phoenix area develop into one of the nation's most vibrant regions. As a community-based not-for-profit water and energy utility company, SRP acts in the best interest of the people it serves and strives to help build a better future for Arizona.

SRP's service territory is experiencing explosive growth. Maricopa County is one of the fastest growing counties in the nation. This significant growth, increasing interest from large customers in serving their energy needs with carbon-free resources, and SRP's commitment to reducing carbon intensity are driving a need to add significant carbon free resources to our generation portfolio. SRP aims to reduce its carbon intensity by 65% by 2035 and by 90% by 2050 and plans to significantly increase its solar and battery energy storage capacity in order to meet these goals. However, SRP is also interested in alternatives to traditional battery storage in terms of grid support and safety.

To continue providing reliable and renewable power to customers, as well as meet our 2035 and 2050 goals, SRP requests information from vendors of non-inverter based long-duration energy storage (LDES) technologies and/or LDES technologies that have mechanical inertia. SRP aims to improve understanding of the performance and costs associated with these types of long duration energy storage technologies. SRP will use the results of this RFI planning purposes and will inform our approach to a subsequent Request for Proposals (RFP) that may be issued in mid to late 2024 for pilot LDES projects with a targeted commercial operation date (COD) of 2027-2028.

II. Eligible Technologies

- SRP is requesting information for demonstration projects at least 5 MW in size, up to 50 MW. SRP will consider proposals including larger projects, but it is unlikely that SRP will include projects larger than 50 MW in the subsequent RFP. SRP may consider projects over 50 MW under different future procurement efforts.
- Eligible storage technologies must be non-inverter based or have mechanical inertia.
- SRP will also consider technologies that can be paired with existing gas or steam turbines. However, for the purposes of the demonstration project, it is assumed the respondent would provide an entire new system including the turbine.

- SRP desires a target duration of 10 hours at the rated discharge capacity but will consider LDES technologies that can provide between 8 and 12 hours.
- SRP is primarily interested in power purchase agreement options for the future RFP but will only require a capital cost estimate, as well as operating and maintenance costs, for the purposes of this RFI.

III. Project Information Requested

Please provide as many details as possible in response to the questions listed below:

Company and Technology Background

1. Company description and relevant experience with large utility-scale renewable energy or energy storage projects.
2. Provide a description of the technology proposed.
3. Explain the reasoning behind the current targeted rated size and duration for a demonstration project of your technology.
    a. If building a larger future project (i.e., 300 MW), describe the method used to scale up. Would multiple units of the demo size be used, or would larger units than the demonstration scale need to be built?
4. Describe the technology commercialization plan and timeline?
5. Describe how completing a pilot of this size fits into the commercialization plan for the technology. Are there aspects of the technology that need to be demonstrated at this scale to move to larger scale installations?
6. Describe the maturity and locations for the technology's supply chain of major components.
7. Does your technology qualify for Domestic Content under the Inflation Reduction Act?
8. List any applications for Department of Energy funding submitted and if you were awarded.
9. Describe previous pilot projects deployed with the proposed energy storage technology.
    a. Provide details on the size and completeness of the projects, length of time in operation, summary results from the testing, lessons learned, and gaps identified / addressed.
    b. List any references including site locations and contact information for each site.
    c. Explain how previous lessons learned will provide a sufficient basis for the engineering for the proposed pilot.
    d. Explain how this pilot will help resolve outstanding design issues and further the development of the technology.
10. Please provide brief backgrounds for key company leadership.
11. If applicable, describe any relationships or projects with EPC firms or project developers.

Technology Performance Information

1. Please fill out the performance data spreadsheet file (2023 LDES RFI – Proposal Data Sheet.xlsx) with the performance details for the proposed demonstration project to the extent known.
2. Are there performance characteristics in the performance data sheet that still need to be determined from field testing?
3. Describe any operational risks due to limited field testing.
4. Describe any restrictions or derates around ambient conditions if known.
    a. What are the operational humidity and temperature ranges of the technology?
    b. What are the restrictions or derates this pilot will help define or verify if not known?
5. Describe any operational constraints or performance impacts around different states of charge (e.g., decreased round trip efficiency at low state of charge).
6. What is the estimated lifetime of your system, assuming full daily cycling?
    a. What are the major components that limit the system life, or that dictate the need for major maintenance?
    b. What are the end-of-life criteria, in terms of remaining capacity and efficiency?
7. Provide a description of subsystems, components, and/or other auxiliary power usages that must remain in operation during "standby operation" when the primary Energy Storage system is not charging or discharging.
8. Describe the range of potential standby losses in terms of loss of charge over a 24-hour period based on system state of charge or ambient conditions if it varies based on these factors.
9. Describe any emergency power requirements for the system to ensure safe operation should the primary point of interconnection go offline.
10. Describe the system’s black start capabilities.
11. What is the system’s response time (seconds) from 0 kW to 100% Effective Capacity?
    a. If applicable, describe any differences between cold versus hot start times.
12. What are the personnel requirements for the proposed project?
    a. Please describe the different roles required.

Proposal Information

1. SRP does not have a specific location-based requirement for the projects but suggests the following options. The first two are SRP owned sites and further details are provided on these sites in Appendix B.
    a. SRP Copper Crossing Energy and Research Center (CCERC)
    b. SRP Coronado Generation Station (CGS)
        i. The CGS site qualifies for a bonus Coal Community Investment Tax Credit (ITC) and would be the preferred location if that site would be appropriate for your technology.
    c. Other sites identified and planned for development by respondent. If proposing an alternate site, please provide details on the location, site control, interconnection location and delivery options to the SRP transmission system.
2. Interconnection. For the CCERC and CGS sites, assume the pilot would interconnect behind the existing site interconnection.
    a. If selecting the CCERC site:
        i. The projects cannot exceed an interconnection size of 20 MW for discharge capacity or 30 MW of charging capacity.
        ii. Only assume the costs to step up the generation voltage to 34.5 kV. SRP will need to design the interconnection and estimate costs later as part of the future RFP.
    b. If selecting the CGS site:
        i. The project cannot exceed 50 MW discharge capacity. Please note in the proposal the charging capacity needed.
        ii. SRP has not yet determined the interconnection voltage for this site. Only assume the costs to generate at the proposed project system voltage and exclude costs of a step-up transformer.
    c. If proposing an alternate site, please provide details on the interconnection size and timing if an interconnection application has already been submitted. For comparison to other proposals, please separate the interconnection costs for that site from the estimated costs below.
3. Size of Project. Please specify the following:
    a. Effective Net Capacity (MW) – the capacity at which the system can discharge continuously for the rated duration, net of any auxiliary loads.
    b. Peak Net Capacity (MW) – the maximum capacity at which the system can discharge continuously for at least 1 hour, net of any auxiliary loads.
    c. Discharge duration – Target 8 to 10 hours of discharge. If your technology demonstration would be better suited at a longer duration, please indicate the proposed duration, and provide an explanation for the different size.
4. Availability. Please provide an estimated % availability for the demonstration project, excluding any time needed for planned or scheduled maintenance. Please provide details on the expected planned maintenance and schedule for major overhauls if needed.

5. Dispatch. Assume SRP would have full dispatch control for up to one full cycle per day as shown in Appendix A, excluding any days needed for maintenance. The proposed schedule is intentionally asymmetrical with a 9-hour charging time and a 10-hour discharging time to leverage daytime solar energy and meet high system demand hours. SRP would plan to dispatch the demonstration project daily to gain information on the operational life and degradation rates in the Arizona climate. Alternative charging and discharging schedules may occasionally be used for testing alternative use cases or if needed for system reliability purposes. Please describe if the proposed charging and discharging schedule would create operational issues. **Note the Net Effective Capacity should be determined as the discharge rate at which the system can discharge continuously for the rated duration, so the charging rate will likely be higher than the Net Effective Capacity.**
6. COD. SRP is targeting a COD in 2027-2028, assuming an RFP issued mid to late 2024, but understand different technologies have different development and construction timelines. What is the estimated time for design and construction (in months) to build your proposed project once contracts are executed with SRP?
7. How much land (acres) is required for your current system at the proposed size, including space for construction laydown and any maintenance equipment once operational? How many of these acres are just for the energy storage system itself?
8. Estimated Costs.
    a. Required: Capital cost ($) and O&M costs
        i. Provide the total estimated fixed ($/kW-yr) and variable O&M ($/MWh) on a levelized basis over the proposed life, assuming daily cycling.
        ii. If the proposed technology can utilize an existing gas or steam turbine, please provide the cost for the turbine portion of the project separately from the storage portion of the project. For the purposes of the RFI, it is assumed the respondent will provide the turbine for the demonstration project.
    b. Optional: Power Purchase Agreement ($/kW-month), flat over a proposed term, minimum 20 years, with longer terms up to 30 years allowed.
        i. Assume includes all O&M under one full cycle per day use profile as noted in the Charge/Discharge Chart below.
        ii. Assume SRP provides charging energy at no cost and the discharging energy is provided back to SRP at no cost.
        iii. While SRP would provide a low-cost land lease if using the CCERC or CGS sites, exclude any assumed land lease cost for the purposes of this RFI.
        iv. Include assumed ITC level.

Safety and Decommissioning

1. Describe any environmental impacts and/or permitting risks associated with the project and the associated mitigation plans.
2. Describe the end-of-life/decommissioning plan for the system and any associated disposal related issues, including hazardous materials and estimated fraction of the system that could be recycled.
3. What are the safety issues and associated safety measures provided/recommended for the technology?
4. Describe any safety certifications that are applicable to the proposed technology and if they have been completed or not completed yet.

IV. Schedule

The RFI process will proceed according to the following schedule:

1)	RFI Issue Date	October 3, 2023
2)	Pre-Bid Information Due from Bidders	October 17, 2023
	a. Notice of Intent to Respond	
	b. Executed Non-Disclosure Agreement	
3)	Virtual Pre-Bid Meeting	October 19, 2023
4)	RFI Due Date	December 22, 2023

V. Proposal Content and Submission Instructions

A. The Non-Inverter Based Energy Storage RFI consists of the following documents which bidders must review to prepare their proposal:
   a. 2023 LDES RFI.docx (this document)
   b. 2023 LDES RFI – Proposal Data Sheet.xlsx
   c. Non-Disclosure Agreement (see **Attachment B**)
   d. Notice of Intent to Respond (see **Attachment C**)

VI. Questions

Prospective Respondents shall direct inquiries and questions to the following email address: Innovation@srpnet.com.

VII. Submission

Respondents shall submit an electronic response to Innovation@srpnet.com before 4:00 PM (Arizona time) on Friday, December 22, 2023.

Please note the email attachment has a size limit of 35MB. SRP will make special file transfer arrangements for files that are larger than 35MB.

VIII. Confidentiality

The Nondisclosure Agreement entered into shall govern the confidentiality requirements of the RFI. A Nondisclosure Agreement is included with this RFI (see **Attachment B**). Edits to the Nondisclosure Agreement will not be accepted.

The Nondisclosure Agreement must be signed and submitted with the Notice of Intent to Respond on or before 5:00 PM (Arizona time) on Tuesday, October 17, 2023.

Upon receipt, SRP will execute the Nondisclosure Agreement and return one copy to the bidder's listed contact information.

Appendix A

Charging and Delivery Periods

SRP expects to typically charge and discharge the storage system daily in the manner shown in the table below, at the rates needed to fully charge and discharge the system every cycle. Note in the proposal if the system will not be able to achieve this schedule and propose an alternate schedule to illustrate the changes needed to fully charge and discharge the system as close as possible to this schedule. The high importance discharge hours noted in the table should not be changed. SRP may elect to change this schedule depending on the system needs and/or for testing different use cases, within the operating limits of the energy storage system.

Hour Ending

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Jan								x									x							
Feb							x											x						
Mar							x											x						
Apr						x													x					
May						x													x					
Jun						x													x					
Jul						x													x					
Aug						x													x					
Sep						x												x						
Oct							x											x						
Nov							x											x						
Dec								x									x							

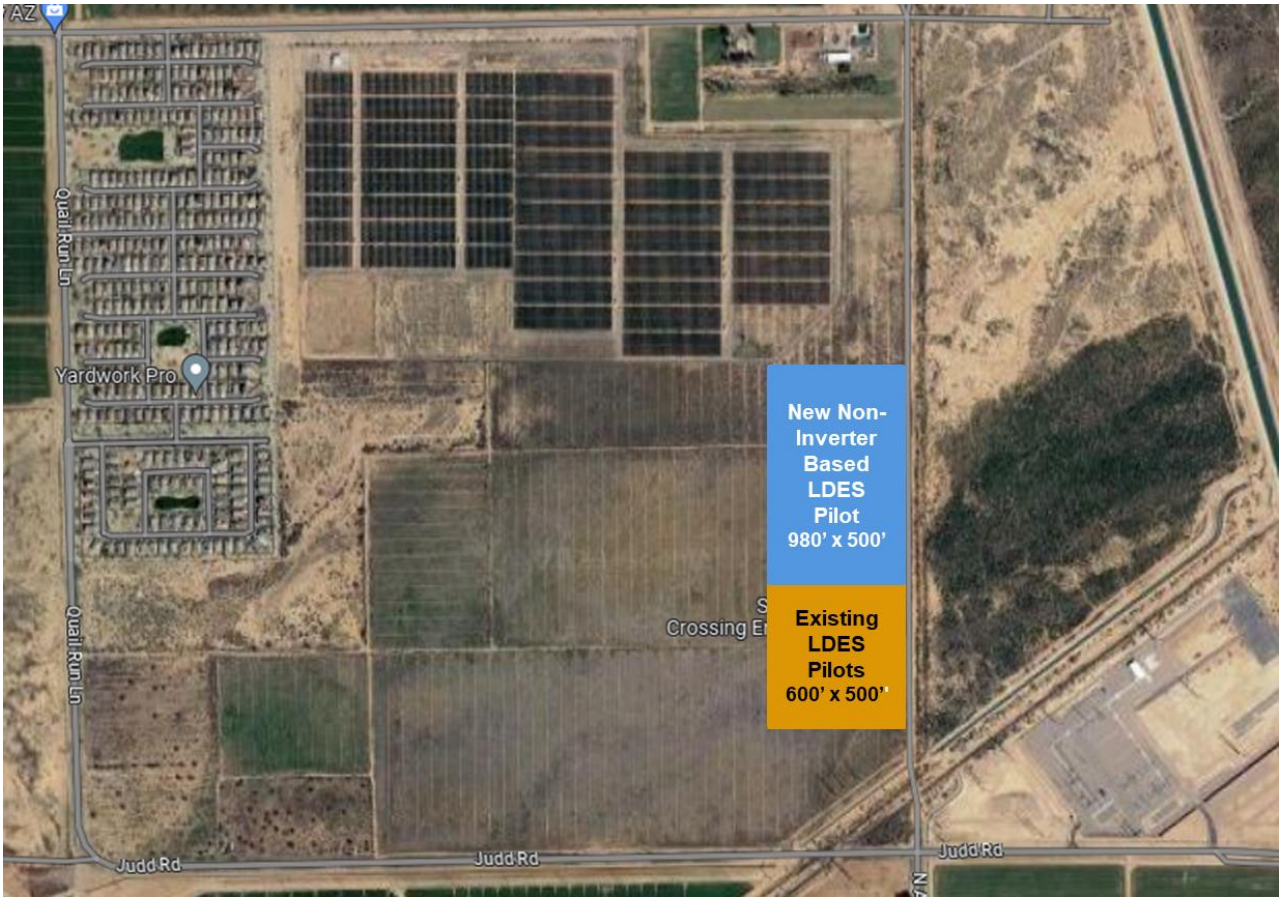
Idle
Charge
Discharge
Discharge - Importance High
x sunrise/sunset

Appendix B

SRP Site Descriptions

Copper Crossing Energy and Research Center (CCERC)

The CCERC is located adjacent to the existing Abel Substation on West Judd Road and the Copper Crossing Solar Ranch on West Bella Vista Road in Florence, Arizona. Currently, the site hosts a 20 MW solar plant. Development underway at the site will feature generating resources needed to support and enable SRP's transition to a lower carbon resource portfolio, including up to 55 MW of solar PV, two flexible natural gas turbines with a total output of less than 99 MW, and at least one 5MW/10hr LDES demonstration pilot. The gas turbines, solar and LDES pilot will be brought online in stages from mid-2024 through the end of 2025. The picture below illustrates the area available for a non-inverter based LDES technology project at this site for the purposes of this RFI.



Coronado Generating Station (CGS)

SRP owns and operates CGS, a coal-fired generating station located near St. Johns, in eastern Arizona. It has a capacity of 762 MW, from one 382 MW-unit and one 380 MW-unit and uses the Powder River Basin as a fuel source. Plant construction began 1975, with Unit 1 completed Dec. 31, 1979, and Unit 2 completed Oct. 1, 1980. SRP has announced this plant will retire no later than the end of 2032. The picture below illustrates potential areas available for locating the LDES project for the purposes of this RFI.

Attachment A

Submittal Checklist

Please complete all items on the checklist list below:

Pre-Submittal Information

The following information must be submitted to Innovation@srpnet.com before 5:00 PM (Arizona time) on Tuesday, October 17, 2023.

1. Signed Nondisclosure Agreement (see **Attachment B**)
2. Notice of Intent to Respond (see **Attachment C**)

Request for Information Response

Each RFI response must be submitted to Innovation@srpnet.com as instructed in Section VII before 4:00 PM (Arizona time) on Friday, December 22, 2023.

Attachment B

Nondisclosure Agreement

THIS MUTUAL NONDISCLOSURE AGREEMENT (this "Agreement") is executed this ____ day of _____, 2023, between Salt River Project Agricultural Improvement and Power District, an agricultural improvement district organized and existing under the laws of the State of Arizona ("SRP"); and _____, a _____ ("Company").

RECITALS

For the purpose of furthering a potential business relationship between them with respect to a possible project proposal in response to SRP's Non-Inverter Based Energy Storage Resources Request for Information (the "Purpose"), SRP and Company (collectively, the "Parties" and individually each a "Party") have determined to establish terms governing the use and protection of certain information one Party ("Owner") may disclose to the other Party ("Recipient").

TERMS AND CONDITIONS

Accordingly, for good and valuable consideration, the receipt and sufficiency of which are acknowledged, the Parties agree as follows:

1. "Confidential Information" means information of an Owner, in whatever form transmitted, which relates to the above-identified subject matter, including business and technical information and data, or which, although not related to such subject matter, is nevertheless disclosed as a result of the Parties' discussions in that regard, provided that such information is marked "Confidential" by Owner. "Confidential Information" shall also include information relayed orally or visually, provided such information is substantially similar to the subject matter of the information contained in material marked "Confidential" and produced contemporaneously by the Owner.

2. Recipient shall keep confidential all Confidential Information which has been or will be provided to it by Owner, including the fact that discussions regarding the Purpose are taking place. Recipient shall not, without the prior written consent of Owner, disclose any of the Confidential Information in whole or in part to any third party (except as otherwise provided in this Section 2). Recipient may use Confidential Information of Owner only for the Purpose and shall protect such Confidential Information from disclosure to others, using the same degree of care used to protect its own proprietary information of like importance, but in any case, using no less than a reasonable degree of care. Recipient may disclose Confidential Information received hereunder to its directors, employees and consultants, and its affiliates' directors, employees and consultants (collectively, "Representatives"), who, in all such cases, have a need to know for the Purpose, and who are bound to protect the received Confidential Information from unauthorized use and disclosure. Recipient shall be responsible for any breach of this Agreement by any of its Representatives.

3. The restrictions of this Agreement on use and disclosure of Confidential Information shall not apply to information that: (i) is in the possession or control of Recipient at the time of its disclosure hereunder; (ii) is, or becomes publicly known, through no wrongful act of
Recipient; (iii) is received by Recipient from a third party free to disclose it without obligation to Owner; (iv) is developed independently by Recipient; or (v) is lawfully required to be disclosed to any governmental agency or is otherwise required to be disclosed by law; provided, however, that the

Recipient shall notify Owner, as soon as reasonably practical, of any order or request to disclose Confidential Information, or that such an order is being sought, or request has been made, so that the Owner may have an opportunity to take appropriate action to maintain confidential handling of such information.

4. Company understands that, as a political subdivision of the State of Arizona, SRP may be subject to certain disclosure requirements under the Arizona public records law (A.R.S. § 39-101, et seq.). Provided that SRP complies with the procedural requirements of Section 3 above, and notwithstanding any other provision of this Agreement, SRP may release Company's Confidential Information to a third party in response to a public records request submitted by such party.

5. Confidential Information disclosed under this Agreement (including information in computer software or held in electronic storage media) shall be and remain the property of Owner. All such information in tangible form shall be destroyed upon written request by Owner provided, however, that Recipient may retain copies of any Confidential Information (including Confidential Information stored on electronic, magnetic or similar media) in accordance with policies and procedures implemented in order to comply with legal and regulatory recordkeeping requirements. Recipient will keep such retained copies confidential as provided herein and will use them solely for the purpose of recordkeeping compliance. No licenses or rights under any patent, copyright, or trademark are granted or are to be implied by this Agreement.

6. The Parties agree that, in the event of a breach or threatened breach of the terms of this Agreement, the Owner shall be entitled to an injunction prohibiting any such breach. Any such relief shall be in addition to and not in lieu of any appropriate relief in the way of money damages. The Parties acknowledge that Confidential Information is unique and that disclosure in breach of this Agreement will result in irreparable injury to the Owner.

7. Owner shall not have any liability or responsibility for errors or omissions in, or any business decision made by Recipient in reliance on, any Confidential Information disclosed under this Agreement.

8. In no event, whether based upon contract, indemnity, warranty, tort (including negligence), strict liability or otherwise will either Party be liable to the other party for indirect, incidental, consequential, special, punitive or exemplary damages arising out of any breach of this Agreement (even if such Party has been advised of or could have reasonably foreseen the possibility of such damages).

9. This Agreement shall become effective as of the date it is signed by both Parties and shall automatically expire one year thereafter; provided, however, either Party may terminate this Agreement upon 30 days prior written notice to the other Party.

10. The obligations contained herein with respect to the Confidential Information shall survive and continue for a period of one year after expiration or termination of this Agreement.

11. The term "affiliate" means any person or entity controlling, controlled by, or under common control with a Party.

12. This Agreement may be executed in two or more original or facsimile counterparts (including portable document format (.pdf) or an electronic or digital signature), each of which shall be deemed an original and all of which together shall constitute but one and the same instrument.

13. This Agreement: (i) is the complete agreement of the Parties concerning the subject matter hereof and supersedes any prior non-disclosure or similar agreements (whether oral or written) with respect to further disclosures of such subject matter; (ii) shall not be construed to create any obligation on the part of any Party to retain the services of or to compensate each other in any manner, except as may be set forth by a separate written agreement duly executed by the relevant Parties; (iii) may not be amended or in any manner modified except in writing signed by the Parties; and (iv) shall be governed and construed in accordance with the laws of the State of Arizona without regard to its choice of law provisions. Any action, suit or proceeding arising out of or relating to this Agreement shall be prosecuted in a court of competent jurisdiction in Maricopa County, Arizona, and the Parties irrevocably submit to the jurisdiction of any such court. Each Party hereby expressly waives any rights that it may have to a trial by jury with respect to any suit or proceeding brought by or against it or any of its affiliates relating to this Agreement or the subject matter of this Agreement. If any provision of this Agreement is found to be unenforceable, the remainder shall be enforced as fully as possible, and the unenforceable provision shall be deemed modified to the limited extent required to permit its enforcement in a manner most closely representing the intention of the Parties as expressed herein.

IN WITNESS WHEREOF, each of the Parties hereto has caused this Agreement to be executed as of the date set forth above by its duly authorized representative.

Salt River Project Agricultural Improvement and Power District

By:_____ Its: Manager, Innovation & Development
Jerald “Chico” Hunter

_____

By:_____ Its: _____

Attachment C

Notice of Intent to Respond

Please complete the fields below and return to SRP by October 17, 5:00 PM (Arizona time) with the signed NDA if you intend to respond to the RFI.

Company Information

Company name: _____
Technology: _____

Contact Information

Primary Contact Name: _____
Title: _____
Email: _____
Phone Number: _____

Secondary Contact Name: _____
Title: _____
Email: _____
Phone Number: _____