



**SECOND ENERGY STORAGE PROCUREMENT TARGET
ADOPTION UNDER ASSEMBLY BILL 2514 FOR THE CITY OF
RIVERSIDE TO ACHIEVE SIX (6) MEGAWATTS OF ENERGY
STORAGE BY THE END OF YEAR 2020**

Riverside Public Utilities

City Council
September 26, 2017

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LEGISLATIVE BACKGROUND

1. AB 2514 mandates all California electric utilities to evaluate and adopt an Energy Storage Procurement Target (ESPT).
 - a) Initiate proceeding for determining the appropriate ESPT by March 1, 2012.
 - b) Adopt an ESPT by October 1, 2014.
 - c) Submit the first ESPT Compliance Report to the California Energy Commission (CEC) by January 1, 2017.
 - d) Reevaluate the ESPT by October 1, 2017.
 - e) Submit the second ESPT Compliance Report to the CEC by January 1, 2021.

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LEGISLATIVE BACKGROUND (CONT)

2. Pursuant to AB 2514, PUB initiated the proceeding for determining the appropriate ESPT on February 17, 2012.
3. PUB and Council approved and adopted an ESPT of 0MW on September 5, 2014 and September 23, 2014 respectively.
4. RPU submitted the first ESPT Compliance Report to the CEC indicating efforts in investigating viable energy storage options on December 12, 2016.



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WHAT IS ENERGY STORAGE?

What is Energy Storage?

- a) Commercially available technology that is capable of absorbing energy, storing it for a period of time, and discharging it at a later time.
- b) All-in-cost of the various energy storage technologies remains to be high despite the recent downward movement on pricing on some of the storage options and affordability continues to be a significant barrier to the proliferation of energy storage



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BENEFITS OF ENERGY STORAGE

1. Integration of intermittent renewable resources.
2. Substituting fossil fuel-powered peaking plants.
3. Deferring distribution and transmission system upgrades.
4. Improving overall reliability on the electric system.



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ENERGY STORAGE ANALYSIS

1. Staff actively participated in the Southern California Public Power Authority (SCPPA)'s Energy Storage Working Group (ESWG).
2. Through the ESWG RPU:
 - a) Acquired in depth energy storage study report from DNV-GL which provided methodologies for evaluating cost-effectiveness.
 - b) Released an energy storage Request for Information. Responses showed a gradual decline in costs from 3 years ago.
 - c) Procured analytical software through SCPPA from Navigant Consulting which aided in modeling the financial feasibility of storage options.



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POTENTIAL VIABLE APPLICATIONS

1. Improving Reliability of the Local Grid.
2. Utility-Scaled Storage Option.
3. Ice-Bear Pilot Program.
4. California Independent System Operator (CAISO) Ancillary Services Pilot Project.



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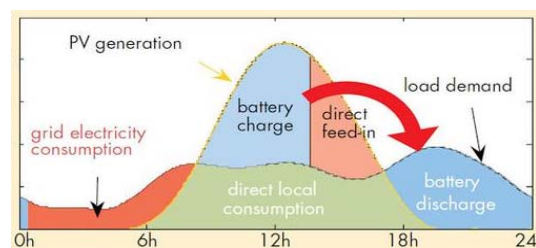
Improving Reliability of the Local Grid

Potential Project: 3-4 MW battery storage located at the Tequesquite Landfill Solar Project

Issue: Solar penetration in Riverside is nearing 30 MW and is expected to grow, increasing the need to protect RPU's distribution system against voltage fluctuations and other potential power quality issues caused by intermittent solar production.

Benefits:

1. Avoiding investment in distribution upgrades.
2. Mitigating voltage fluctuations and reducing distribution system losses.
3. Improving power quality and local system reliability.



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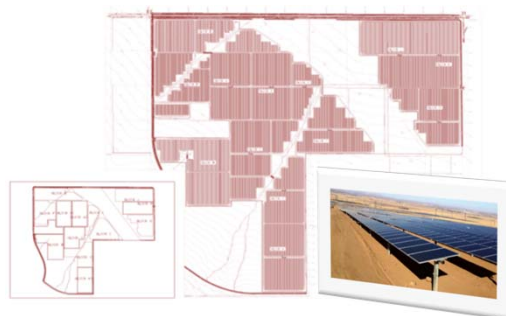
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Utility-Scale Storage Option

Potential Project: Existing Antelope DSR Solar Project has the option to add up to 12 MW Energy Storage on site.

Benefits:

1. Land is already allocated and the counterparty will fund up to \$182k for any permitting and interconnection modifications.
2. Utility-scale offers the advantage of economy of scale – reducing the cost of installation.



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Ice Bear Pilot Program

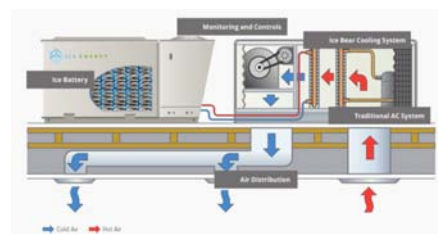
Potential Project: Current agreement approved in 2015 establishes a 5 MW thermal energy storage pilot program

How it works:

1. Unit makes ice during off-peak hours.
2. Air blows over the ice during the day to replace a typical A/C unit.

Benefits:

1. Peak Load Reduction.
2. Relief to RPU's distribution peak system loading.
3. RPU customer's receive the benefit of improved energy efficiency and reduced energy consumption.



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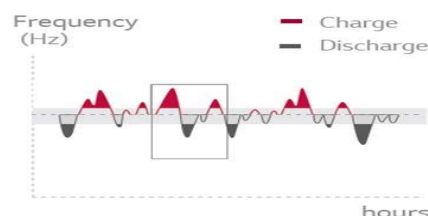
CAISO Ancillary Services Pilot Project

Production Cost Modeling Software: Used to study the cost-effectiveness of owning and operating battery storage in the CAISO. Preliminary results for battery storage designed to provide Ancillary Services, particularly frequency regulation, in the CAISO market look promising.

Potential Project: 1-2 MW battery storage Pilot Project located at the Riverside Energy Resource Center (RERC).

Benefits:

1. Provide RPU valuable experience in owning and operating a battery storage system in the CAISO.
2. Produce real operational and CAISO financial settlement data that staff can analyze to determine the true cost-effectiveness of such a system.

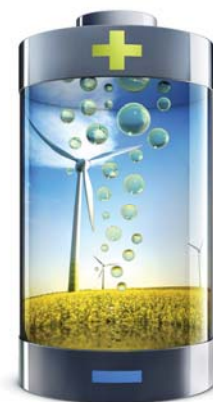


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SUMMARY OF FINDINGS

1. Energy storage technologies have slowly matured while costs gradually decrease.
2. Grid conditions have dramatically changed with increased renewable penetration.
3. Industry perspective has shifted in favor of energy storage.
4. Potential viable applications for RPU are still being vetted for need and cost-effectiveness.
5. Adopting a 6 MW ESPT will allow RPU to remain a leader among POU's in promoting and advancing California's energy storage agenda AND ensuring RPU continue to provide clean and reliable energy to its customers.



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Recommendations

That the City Council:

1. Approve the second Energy Storage Procurement Target adoption under Assembly Bill 2514 for the City of Riverside to achieve six (6) megawatts of energy storage by the end of Year 2020; and
2. Approve the submission of the adopted second Energy Storage Procurement Target to the California Energy Commission by October 1, 2017.



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