

Business Requirements Specification

Unwarranted Storage Bid-Cost Recovery

Document Version: 1

Current Version Date: 3/4/2025

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Revision History

Date	Version	Description
3/4/2025	1.0	Initial Document Release.

Disclaimer and Understanding

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1 Introduction

1.1 Purpose

The purpose of this document is to capture and record a description of what the Users and Business Stakeholders of the project wish to obtain, by providing high level business requirements. This document establishes the basis for the agreement between the initiators and implementers of the project. The information in this document serves as input to determine the scope of projects and all Business Process Modeling and System Requirements Specifications efforts.

Business requirements are what must be delivered to provide value for the Users and Business Stakeholders. Systems, software, and processes are the ways (how) to deliver, satisfy or meet the business requirements (what).

1.2 Conventions

None

1.3 Background

- The CAISO proposes to modify the real-time bid cost recovery calculations for storage resources
 to consider other cost proxies in addition to the real-time energy bid cost in all real-time intervals,
 thus mitigating the risk of energy bids unduly inflating bid cost recovery payments. These cost
 proxies will ensure storage resources remain eligible for bid cost recovery but will reduce the
 potential for unwarranted bid cost recovery payment. These calculations will apply to all intervals.
 - For resources that are "dispatched up", the real-time energy bid cost component in the RT BCR calculation would be replaced by the minimum of the bid and the maximum of (RT DEB, RT LMP, and DA LMP).
 - For resources that are "dispatched down", the real-time energy bid cost component in the RT BCR calculation would be replaced by the maximum of the bid and the minimum of (RT DEB, RT LMP, and DA LMP).
 - In either case, the alternative of using the DA LMP is only applicable to storage resources with a DA Schedule.
- The phrase "dispatched up" or "dispatched down" is relative to the prior market.
 - A resource is dispatched up if the FMM dispatches a storage resource to increase its discharge or decrease its charge relative to its Day-Ahead Energy Schedule (DAES), or if the five-minute RTD market dispatches a storage resource to increase its discharge or decrease its charge relative to its FMM schedule.
 - A resource is dispatched down if the FMM dispatches the resource to decrease its discharge or increase its charge relative to the DAES, or if the five-minute RTD market

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dispatches a storage resource to decrease its discharge or increase its charge relative to its FMM schedule.

1.4 Scope

 Modify the formula used to calculate RT BCR for Limited energy storage resources (LESRs) to limit the opportunity for adverse financial outcomes and outsized operational costs in the FMM and RTD for intervals with and/or without a DA Schedule Energy (DASE) or Base Schedule Energy (BASE).

1.5 Acronym and Terms Definitions

Refer to Appendix-A – Acronym Definition

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2 Intellectual Property Ownership

Intellectual Property covers a broad array of information and materials, including written works, computer programs, software, business manuals, processes, symbols, logos and other work products. Determining ownership of Intellectual Property is very important in preserving the rights of the California ISO, and helps to avoid Intellectual Property infringement issues. In considering the business requirements or service requirements to be performed, the business owner of the project must determine Intellectual Property Ownership.

2.1 Checklist

All information in this document is the Intellectual Property (copyright, trademark, patent, and/or trade secret) of the California ISO.

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3 Details of Business Need/Problem

3.1 Description

Ви	siness Opportunity/Problem Statement:	
What:	The CAISO proposes to modify the real-time bid cost recovery calculations for storage resources to consider other cost proxies in addition to the real-time energy bid cost in all real-time intervals, thus mitigating the risk of energy bids unduly inflating bid cost recovery payments. These cost proxies will ensure storage resources remain eligible for bid cost recovery but will reduce the potential for unwarranted bid cost recovery payment. These calculations will apply to all intervals.	
	 For resources that are "dispatched up", the real-time energy bid cost component in the RT BCR calculation would be replaced by the minimum of the bid and the maximum of (RT DEB, RT LMP, and DA LMP). For resources that are "dispatched down", the real-time energy bid cost component in the RT BCR calculation would be replaced by the maximum of the bid and the minimum of (RT DEB, RT LMP, and DA LMP). In either case, the alternative of using the DA LMP is only applicable to storage resources with a DA Schedule. 	
Why do we have this opportunity/problem:	As a result, this BCR is compensating assets for bidding in a manner that deviates from their DAES, thus making them unfeasible.	
Who does this opportunity/problem impact:	Impacted Departments Market Participants Market Services Market Performance and Advanced Analytics Customer Readiness Policy Legal	

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4 Business Impacts

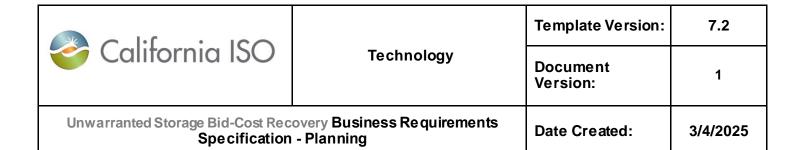
4.1 Business Practice Manual (BPM)

ВРМ	Description of Impact(s)	
Market Operations	 Update for MQS to revise the EEA for final bid prices for LESRs. 	

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4.2 Other

Impact		Des	scription (optional)
Market Simulation	Yes			
Market Participant Impact				
Impact	Ext	ernal Participant Type	Impacted?	Notes
	Dema	nd Response Entity	No	
	Finan	cial Entity	Yes	BCR Settlements Impact
	Forec (FSP)	ast Service Provider	No	
	Gover Agend	nment/Regulatory cy	Yes	Tariff Filing
		oility Coordination Customer	No	
	Sched (SC)	duling Coordinator	No	
	Transı	mission Owner (TO)	No	
	WEIM	l Entity	Yes	BCR Settlements Impact
	Adjac	ent BA	No	
	Other		No	
External Bid Publication	No			'
User Acceptance Testing (UAT)	Yes			
Operational Procedures	No	No		



Impact	Description (optional)
Customer Readiness Impact	
1. External Communication Needed	Yes
2. External Onboarding and Maintenance	No
External Training	Yes
 External Computer Based Training 	No
Policy Initiative	Yes

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5 Business Requirements

The sections below describe the Business processes and the associated business requirements involved in the project. These may represent high-level functional, non-functional, reporting, and/or infrastructure requirements. These business requirements directly relate to the high-level scope items determined for the project.

5.1 Business Process: Manage Market Quality System

5.1.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
USBCR- BRQ-01020	Save Backup Copy of EEA OE Original Final Bid Records for All LESRs	Core	MQS
	For LESRs within CAISO BAA, EDAM BAAs, and WEIM-only BAAs, System shall copy records of EEA of "OE" Energy Type with "F" Energy Bid type (F = Final) to "O" Energy Bid Type (O = Original Final).		
	Notes		
	This applies to going forward from Go-Live date and retroactive starting from configurable Tariff activation date of 12/1/2024.		
USBCR- BRQ-01040	Revise EEA OE Final Bid Price (non-Null) Records for LESRs in CAISO & EDAM BAAs – Incremental OE	Core	MQS
	For LESRs within CAISO BAA, EDAM BAAs, System shall revise the Bid Price (non-Null) of EEA records of "OE" Energy Type and "F" Energy Bid type (F = Final Bid) for each of FMM and RTD Real-Time Market Types for incremental OE (OE > 0) for a FMM/RTD market interval (respectively) for an EEA record • If Day-Ahead Schedule Energy (DASE) ≠ 0 for hour h encompassing the FMM/RTD market interval ○ Revised Final Bid Price = Min { Original Final Bid Price, Max (RT-DEB, RTD/FMM-LMP, DA-LMP) } • Else If (DASE = 0 for hour h encompassing the FMM/RTD market interval		

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
	 Revised Final Bid Price = Min { Original Final Bid Price , Max (RT-DEB , FMM/RTD-LMP) } 		
	Notes		
	 This applies to going forward from Go-Live date and retroactive starting from configurable Tariff activation date of 12/1/2024. 		
	 Refer to Demonstrative Example in Appendix-B: Formulas, Calculation Details, and Examples 		
USBCR- BRQ-01060	Revise EEA OE Final Bid Price (non-Null) Records for LESRs in CAISO & EDAM BAAs – Decremental or Zero OE	Core	• MQS
	For LESRs within CAISO BAA, EDAM BAAs, System shall revise the Bid Price (non-Null) of EEA records of "OE" Energy Type and "F" Energy Bid type (F = Final Bid) for each of FMM and RTD Real-Time Market Types for decremental or zero OE (OE ≤ 0) for a FMM/RTD market interval (respectively) for an EEA record • If DASE ≠ 0 for hour h encompassing the FMM/RTD market interval ○ Revised Final Bid Price = Max { Original Final Bid Price, Min (RT-DEB, FMM/RTD-LMP, DA-LMP) } • Else If (DASE = 0 for hour h encompassing the FMM/RTD market interval ○ Revised Final Bid Price = Max { Original Final Bid Price, Min (RT-DEB, FMM/RTD-LMP) }		
	Notes		
	 This applies to going forward from Go-Live date and retroactive starting from configurable Tariff activation date of 12/1/2024. Refer to Demonstrative Example in Appendix-B: Formulas, Calculation Details, and Examples 		
USBCR- BRQ-01080	Revise EEA OE Final Bid Price (non-Null) Record for LESRs in WEIM-Only BAAs – Incremental OE	Core	• MQS

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ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
	For LESRs within WEIM-Only BAAs, System shall revise the Bid Price (non-Null) of EEA records of "OE" Energy Type and "F" Energy Bid type (F = Final Bid) for each of FMM and RTD Real-Time Market Types for incremental OE (OE > 0) for a FMM/RTD market interval (respectively) for an EEA record (regardless of the value of BASE) • Revised Final Bid Price = Min { Original Final Bid Price, Max (RT-DEB, RTD/FMM-LMP) }		
	Notes		
	 This applies to going forward from Go-Live date and retroactive starting from configurable Tariff activation date of 12/1/2024. 		
	 The DA-LMP is not considered for WEIM-only LESRs in the Revised Final Bid Price formulation since WEIM-Only BAAs do not participate in DAM. Refer to Demonstrative Example in Appendix-B: Formulas, Calculation Details, and Examples 		
USBCR- BRQ-01100	Revise EEA OE Final Bid Price (non-Null) Records for LESRs in WEIM-Only BAAs – Decremental or Zero OE	Core	• MQS
	For LESRs within WEIM-Only BAAs, System shall revise the Bid Price (non-Null) of EEA records of "OE" Energy Type and "F" Energy Bid type (F = Final Bid) for each of FMM and RTD Real-Time Market Types for decremental or zero OE (OE ≤ 0) for a FMM/RTD market interval (respectively) for an EEA record (regardless of the value of BASE) • Revised Final Bid Price = Max { Original Final Bid Price, Min (RT-DEB, FMM/RTD-LMP) }		
	Notes		
	This applies to going forward from Go-Live date and retroactive starting from configurable Tariff activation date of 12/1/2024.		
	The DA-LMP is not considered for WEIM-only LESRs in the Revised Final Bid Price formulation since WEIM-Only BAAs do not participate in DAM.		

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ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
	 Refer to Demonstrative Example in Appendix-B: Formulas, Calculation Details, and Examples 		
USBCR- BRQ-01120	Do NOT Revise EEA OE Final Bid Price (Null) Records for LESRs in CAISO, EDAM and WEIM-Only BAAs	Core	• MQS
	For LESRs within CAISO BAA, EDAM BAAs or WEIM-Only BAAs, System shall NOT revise the Bid Price of EEA records (without Bid Price [i.e. Null]) of "OE" Energy Type and "F" Energy Bid type (F = Final Bid) for each of FMM and RTD Real-Time Market Types for a FMM/RTD market interval (respectively) for an EEA record. i.e. • Revised Final Bid Price = Original Final Bid Price = Null		
	Notes		
	 This applies to going forward from Go-Live date and retroactive starting from configurable Tariff activation date of 12/1/2024. 		
	 Settlements will replace the Null Bid Prices with FMM/RTD LMP for each FMM/RTD market interval (respectively) for these records, as it does currently in production. Refer to Demonstrative Example in Appendix-B: Formulas, Calculation Details, and Examples 		

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5.2 Business Process: <Market/Business Simulation>

This section shall provide a basis for the development of the Market/Business Simulation Scenarios. These requirements will provide guidance on the market participant impacts, inputs into the Scenarios, endpoints to the Scenarios and reasons for potential Scenarios. The guidance on market participant impacts shall be gathered from the requirements that impact rules, interfaces, applications/reports, new system processes, new/modified data models, and new user roles. The source and sink systems shall be determined through the development of the system context diagram and the web service requirements. The *Reason for the Potential Scenario* column will be to offer guidance regarding what potential scenarios, and their context, may be needed for this project. This section applies to all policy development projects, market enhancements, technology enhancements, operation enhancements, Western Energy Imbalance Market (WEIM) implementations, and Reliability Coordination (RC) service implementations.

In the Reason for Potential Scenario column, select one or more of the following reasons:

- **1. Rule Impacts**: Generalized changes in market rules, bidding rules, settlements rules, market design changes, or other business rules.
- **2. Interface changes**: Changes that impact templates (e.g., the Resource Adequacy (RA) supply plan), user interface (UI), and application programming interface (API) (e.g., retrievals of new shadow settlement data).
- **3. New application/report**: Changes that cause addition/modification of market software or reports, especially when market data input is required by the market participant.
- **4. New system process**: Modification of data flow in systems, especially if the new process requires the market participant to demonstrate proficiency prior to production.
- **5.** New/Modified model data: Addition or substantial modification of model data as a market solution or export provided by the ISO.
- **6. New user role**: The addition or modification of access permissions for a user role applied to specific business units within a WEIM entity or market participant organization (e.g., Load Serving Entity (LSE) as a Local Regulatory Authority (LRA) role). Scenarios are beneficial for market participants taking on a new function or process within their organization.

5.2.1 Business Requirements

ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
USBCR- MSIM-	ISO, EDAM and WEIM-Only SCs Submit DA and RT Energy Bids for LESRs	• SIBR	SIBRMRI-S	Rule Impacts New system
05020	Set up a scenario where SCs for resources within CAISO, EDAM and WEIM-Only BAAs submit DA nd		· WIIKI O	process

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ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
	RT energy bids for LESRs that can trigger the new revision rules for RT BCR Settlements.		• CMRI	
	Run DAM (IFM and RUC).			
	Run RTM (FMM and RTD).			
	Run MQS (T+1C)			
	Run Settlements (T+5B)			
	 Follow the results in sink systems to verify revised final bid prices are used in Settlements and published in CMRI. 			
	o CMRI			
	 Expected Energy Allocation Details 			
	 Settlements 			
	 RT BCR 			

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6 Appendices

6.1 Appendix-A – Acronym Definition

Acronym	Definition
A2A	Application-to-Application
ABC	Available Balancing Capacity
ACL	Access Control List
ADS	Automatic Dispatch System
AGC	Automatic Generation Control
AIM	Access and Identity Management
ALFS	Automated Load Forecast System
Anode	Aggregate Node
API	Application Program Interface
Apnode	Aggregate Pricing Node
AS	Ancillary Services
AUX	Auxiliary
B2B	Business-to-Business
ВА	Business Analyst
BAA	Balancing Authority Area
ВААОР	Balancing Authority Area Operations Portal
BCR	Bid Cost Recovery
ВРМ	Business Process Manual

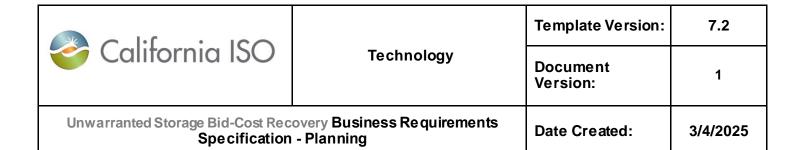


Acronym	Definition
BRS	Business Requirement Specifications
BS	Base Schedule
BASE	BAse Schedule Energy
BSAP	Base Schedule Aggregation Portal
BSC	Base Schedule Coordinator
BSSD	(WEIM) Base Schedule Submission Deadline
CAISO	California Independent System Operator
СВ	Convergence Bidding
СС	Commitment Cost
CCDEBE	Commitment Costs and Default Energy Bid Enhancements
CDN	Conformed Dispatch Notice
CIM	Common Information Model
CIP	Critical Infrastructure Protection
CIRA	Customer Interface for Resource Adequacy
CISO	California Independent System Operator
CLAP	Custom Load Aggregation Point
CMRI	Customer Market Results Interface
Cnode	Connectivity Node
COG	Constrained-Output Generator
СРМ	Capacity Procurement Mechanism
CRN	Contract Reference Number



Acronym	Definition
CRR	Congestion Revenue Rights
CRRS	Congestion Revenue Rights Settlements (aka CRR Clawback system)
CSS	Critical Systems Support
DA	Day-Ahead
DACA	Day-Ahead Contingency Analysis
DAES	Day-Ahead Energy Schedule
DAM	Day-Ahead Market
DART	Day-Ahead Reliability Tool
DASE	Day-Ahead Schedule Energy
DCPA	Dynamic Competitive Path Assessment
DEB	Default Energy Bid
DER	Distributed Energy Resource
DCC	Default Commitment Cost
DGAP	Default Generation Aggregation Point
DMLC	Default Minimum Load Cost
DMM	Department of Market Monitoring
DOP	Dispatch Operating Point
DOT	Dispatch Operating Target
DR	Demand Response
DRP	Demand Response Program
DSA	Dynamic Stability Analysis

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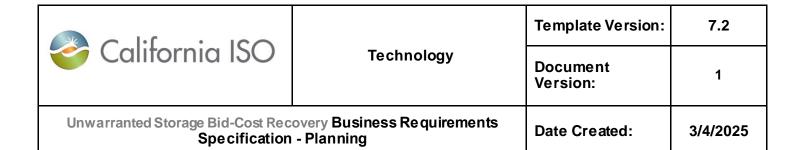
Acronym	Definition
DSTC	Default State Transition Cost
DSUC	Default Start Up Cost
EBC	Energy Bid Cost
ECIC	Energy Costs and Index Calculator
ED	Exceptional Dispatch
EDAM	Extended Day-Ahead Market
EDR	Enterprise Data Repository
EDRP	Enterprise Data Repository Production
EE	Expected Energy
EEA	Expected Energy Allocation
EESC	Energy Imbalance Market Entity Scheduling Coordinator
EFC	Effective Flexible Capacity
EMM	Enterprise Model Management
EMMS	Enterprise Model Management System
EMNA	Energy Management Network Application
EMS	Energy Management System
EOL	End Of Life
EPI	Electricity Price Index
ESP	Electronic Security Perimeter
ESR	Energy Storage Resource
ETC	Existing Transmission Contract

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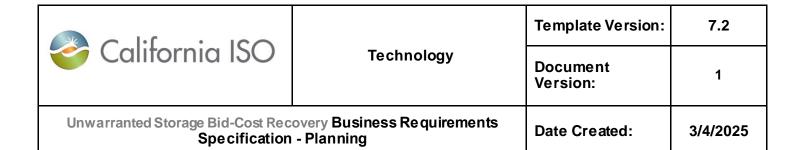
Acronym	Definition
ETSR	Energy Transfer System Resources
FDR	Forecast Data Repository
FERC	Federal Energy Regulatory Commission
FMCA	Fifteen-Minute Contingency Analysis
FMM	Fifteen-Minute Market
FMU	Frequently Mitigated Unit
FNM	Full Network Model
FODD	FERC Outgoing Data Depository
FRCT	Forbidden Region Crossing Time
FRD	Flexible Ramp Down
FRU	Flexible Ramp Up
GDF	Generation Distribution Factor
GHG	Green House Gas
GIP	Generator Interconnection Procedure
GMC	Grid Management Charge
GPI	Gas Price Index
GRDT	Generator Resource Data Template
GUI	Graphical User Interface
HASP	Hour-Ahead Scheduling Process
HAVGC	Heat Average Cost (for non-gas resources)
HR	Heat Rate

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Acronym	Definition
ICE	InterContinental Exchange
ICM	Infrastructure Contracts and Management
ID	Identifier
IFM	Integrated Forward Market
ISL	Intertie Scheduling Limit
ISO	California Independent System Operator
IOOC	Integrated Optimal Outage Coordination
П	Information Technology
пс	Inter-Tie Constraint
ITPD	Information Technology Product Development
ITS	Interchange Transaction Scheduler
ITSM	Information Technology Service Management
JOU	Joint Owned Unit
LACA	Look-Ahead Contingency Analysis
LAP	Load Aggregation Point
LDF	Load Distribution Factor
LEL	Lower Economic Limit
LESR	Limited Energy Storage Resource
LFR	Lower Forbidden Region
LF	Load Forecast
LMP	Locational Marginal Price

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Acronym	Definition	
LMPM	Locational Market Power Mitigation	
LOL	Lower Operating Limit	
LRA	Local Regulatory Authority	
LRL	Lower Regulation Limit	
LSE	Load Serving Entity	
LTCA	Long-Term Contingency Analysis	
MA	Market Analysis	
MAPP	Management Application for Post Processes	
MCI	Model and Contract Implementation	
MD	Manual Dispatch	
MDT	Minimum Down Time	
MDS	Maximum Daily Startups	
MF	Master File	
MLAC	Minimum Load Average Cost	
MLC	Minimum Load Cost	
MLHAVGC	Minimum Load Heat Average Cost (for non-gas resources)	
MLHR	Minimum Load Heat Rate	
MMA	Major Maintenance Adder	
MMAMLC	Major Maintenance Adder for Minimum Load Cost	
MMASUC	Major Maintenance Adder for Start Up Cost	
MMASTC	Major Maintenance Adder for MSG State Transition Cost	

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Acronym	Definition
MMG	Manage Markets & Grid
MMR	Manage Market & Reliability
MOS	Manage Operations Support & Settlements
MPM	market Power Mitigation
MQS	Market Quality System
MQSHISP	Market Quality System Historical Production
MRID	Master Resource IDentifier
MRI-S	Market Results Interface – Settlements
MRTU	Market Redesign Technology Upgrade
MSD	Market Settlement Dispute
MSSA	Metered Sub System Agreement
MSG	Multi-Stage Generator
MUT	Minimum Up Time
MV&A	Market Validation & Analysis
MVT	Market Validation Tool
N/A	Not Applicable
NA	Network Application
NDEB	Negotiated Default Energy Bid
NGR	Non-Generating Resource
NM	Network Model
NQC	Net Qualifying Capacity

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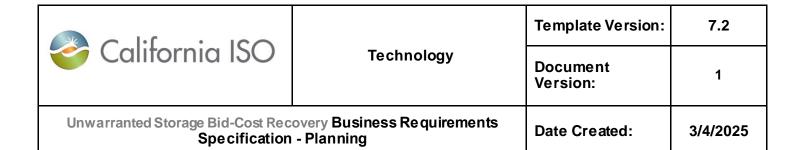
Acronym	Definition
NGR	Non-Generating Resource
OASIS	Open Access Same-time information System
OATI	Open Access Technology International
ос	Opportunity Cost
occ	Opportunity Cost Calculator
ODCP	On Demand Capacity Procurement
OE	Optimal Energy
OES	Operations Engineering Services
OMS	Outage Management System
ООМ	Out Of Market
отѕ	Operations Training Simulator
PAM	Program and Application Management
PBC	Power Balance Constraint
PC	Pre-Calculation
PCA	Price Correction Admin
PCT	Price Correction Tools
PDR	Proxy Demand Resource
PI	Plant Information
PIWS	Plant Information Web Services
PL	Participating Load
Pmax	Maximum Generation Capacity

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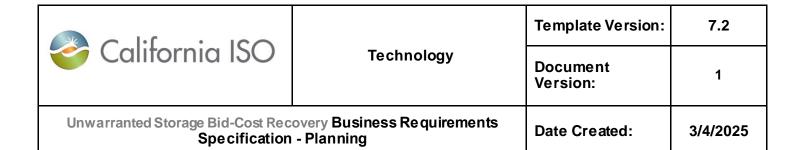
Acronym	Definition	
Pmin	Minimum Generation Capacity	
PMO	Program Management Office	
PNM	Public New Mexico	
Pnode	Pricing Node	
POC	Point Of Contact	
PRSC	Participating Resource Scheduling Coordinator	
PSH	Pump Storage Hydro	
PSTD	Power Systems Technology Development	
PSTO	Power Systems Technology Operations	
PTO	Participating Transmission Owner	
QRB	Quality Review Board	
RA	Resource Adequacy	
RC	Reliability Coordinator	
RC-BSAP	Reliability Coordinator - Base Schedule Aggregation Portal	
RCD	Reliability Capacity Down	
RCSA	Reliability Coordinator Service Agreement	
RCU	Reliability Capacity Up	
RDOT	Ramping Dispatch Operating Target (a continuous piecewise linear curve connecting consecutive <i>DOT</i> s using their mid-interval points, from RTD, RTCD, or RTDD runs, as applicable)	
RDRR	Reliability Demand Response Resource	
RDT	Resource Data Template	

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Acronym	Definition
RIG	Remote Intelligent Gateway
RIMS	Resource Interconnection Management System
RMR	Reliability Must Run
ROPR	Operating Reserve Ramp Rate
RR	Ramp Rate
RREG	Regulation Ramp Rate
RSE	Resource Sufficiency Evaluation
RSEE	Resource Sufficiency Evaluation Enhancements
RT	Real-Time
RTBS	Real-Time Base Scheduler
RTCA	Real-Time Contingency Analysis
RTCD	Real-Time Contingency Dispatch
RTD	Real-Time Dispatch
RTDD	Real-Time Disturbance Dispatch
RTPD	Real-Time Pre-Dispatch
RTM	Real-Time Market
RTUC	Real-Time Unit Commitment
RUC	Residual Unit Commitment
SADS	System And Design Specifications
SC	Scheduling Coordinator
SCME	Scheduling Coordinator Meter Entity

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Acronym	Definition
SE	Software Engineering
SIBR	Scheduling Infrastructure and Business Rules
SME	Subject Matter Expert
SOA	Service-Oriented Architecture
SOC	State Of Charge
SQMD	Settlements Quality Meter Data
SRS	System Requirement Specifications
SS	Self Schedule
STC	State Transition Cost
STF	Short-Term Forecast
STC	State Transition Cost
STT	State Transition Time
STUC	Short-Term Unit Commitment
SUC	Start Up Cost
SUE	Start Up Energy
SUF	Start Up Fuel
SURT	Start Up Ramp Time
SUT	Start Up Time
Т	Trading Hour
TBD	To Be Determined
TEP	Tucson Electric Power

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Acronym	Definition
TG	Tie Generator
TNA	Transmission Network Application
TOP	Transmission Operator Provider
TOR	Transmission Ownership Contract
TEE	Total Expected Energy
TTEE	Total Target Expected Energy (based on RDOT)
UAT	User Acceptance Testing
UEL	Upper Economic Limit
UFR	Upper Forbidden Region
UI	User Interface
UIE	Uninstructed Energy Imbalance
UL	User Limited
UOL	Upper Operating Limit
URL	Upper Regulation Limit
VER	Variable Energy Resource
VOM	Variable Operations & Maintenance
VOMC	Variable Operations & Maintenance Cost
WebOMS	Web-based Outage Management System
WEIM	Western Energy Imbalance Market
XML	Extensible Markup Language
XSD	XML Schema Definition

California ISO	Technology	Template Version:	7.2
		Document Version:	1
Unwarranted Storage Bid-Cost Recovery Business Requirements Specification - Planning		Date Created:	3/4/2025

Acronym	Definition
ZIL	Zero Impedance Line

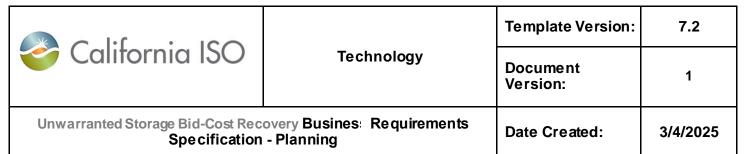


6.2 Appendix-B: Formulas, Calculation Details, and Examples

6.2.1 Demonstrative Example

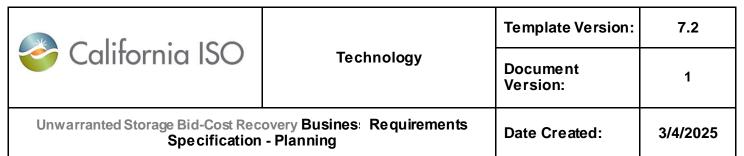
6.2.1 De	monstrative Exan	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:00	123456	RTD	F	OE	2.2705	369.09	\$39.30	\$21.29	\$101.73	\$101.73	\$838.02	\$230.97	\$48.34	\$789.68	\$182.62
2/1/2025	16:00	123456	RTD	F	OE	0.1667	368.89	\$39.30	\$21.29	\$101.73	\$101.73	\$61.48	\$16.95	\$3.55	\$57.93	\$13.41
2/1/2025	16:00	123456	RTD	F	OE	0.0833	368.99	\$39.30	\$21.29	\$101.73	\$101.73	\$30.75	\$8.48	\$1.77	\$28.97	\$6.70
2/1/2025	16:05	123456	RTD	F	OE	8.0750	369.09	\$39.30	\$20.15	\$101.73	\$101.73	\$2,980.40	\$821.43	\$162.75	\$2,817.66	\$658.69
2/1/2025	16:05	123456	RTD	F	OE	2.5540	384.39	\$39.30	\$20.15	\$101.73	\$101.73	\$981.73	\$259.81	\$51.47	\$930.26	\$208.33
2/1/2025	16:05	123456	RTD	F	OE	1.8408	384.49	\$39.30	\$20.15	\$101.73	\$101.73	\$707.78	\$187.26	\$37.10	\$670.68	\$150.16
2/1/2025	16:05	123456	RTD	F	OE	0.6422	384.69	\$39.30	\$20.15	\$101.73	\$101.73	\$247.06	\$65.33	\$12.94	\$234.12	\$52.39
2/1/2025	16:05	123456	RTD	F	OE	0.1667	368.89	\$39.30	\$20.15	\$101.73	\$101.73	\$61.48	\$16.95	\$3.36	\$58.12	\$13.60
2/1/2025	16:05	123456	RTD	F	OE	0.0833	368.99	\$39.30	\$20.15	\$101.73	\$101.73	\$30.75	\$8.48	\$1.68	\$29.07	\$6.80
2/1/2025	16:05	123456	RTD	F	OE	0.0083	369.19	\$39.30	\$20.15	\$101.73	\$101.73	\$3.08	\$0.85	\$0.17	\$2.91	\$0.68
2/1/2025	16:05	123456	RTD	F	OE	0.0083	376.79	\$39.30	\$20.15	\$101.73	\$101.73	\$3.14	\$0.85	\$0.17	\$2.97	\$0.68
2/1/2025	16:10	123456	RTD	F	OE	7.7166	369.09	\$39.30	\$21.70	\$101.73	\$101.73	\$2,848.10	\$784.97	\$167.48	\$2,680.62	\$617.49
2/1/2025	16:10	123456	RTD	F	OE	0.9269	384.39	\$39.30	\$21.70	\$101.73	\$101.73	\$356.30	\$94.29	\$20.12	\$336.18	\$74.17
2/1/2025	16:10	123456	RTD	F	OE	0.1667	368.89	\$39.30	\$21.70	\$101.73	\$101.73	\$61.48	\$16.95	\$3.62	\$57.86	\$13.34
2/1/2025	16:10	123456	RTD	F	OE	0.0833	368.99	\$39.30	\$21.70	\$101.73	\$101.73	\$30.75	\$8.48	\$1.81	\$28.94	\$6.67
2/1/2025	16:10	123456	RTD	F	OE	0.0119	384.49	\$39.30	\$21.70	\$101.73	\$101.73	\$4.56	\$1.21	\$0.26	\$4.31	\$0.95
2/1/2025	16:10	123456	RTD	F	OE	0.0052	369.19	\$39.30	\$21.70	\$101.73	\$101.73	\$1.90	\$0.52	\$0.11	\$1.79	\$0.41
2/1/2025	16:10	123456	RTD	F	OE	0.0051	376.79	\$39.30	\$21.70	\$101.73	\$101.73	\$1.94	\$0.52	\$0.11	\$1.82	\$0.41
2/1/2025	16:15	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$26.58	\$101.73	\$101.73	\$2,980.40	\$821.43	\$214.65	\$2,765.75	\$606.78
2/1/2025	16:15	123456	FMM	F	OE	2.8325	384.69	\$39.30	\$26.58	\$101.73	\$101.73	\$1,089.63	\$288.14	\$75.29	\$1,014.34	\$212.84

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Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:15	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$26.58	\$101.73	\$101.73	\$1,057.35	\$279.74	\$73.10	\$984.25	\$206.64
2/1/2025	16:15	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$26.58	\$101.73	\$101.73	\$1,053.87	\$278.90	\$72.88	\$980.99	\$206.02
2/1/2025	16:15	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$26.58	\$101.73	\$101.73	\$61.48	\$16.95	\$4.43	\$57.05	\$12.52
2/1/2025	16:15	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$26.58	\$101.73	\$101.73	\$30.75	\$8.48	\$2.22	\$28.53	\$6.26
2/1/2025	16:15	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$26.58	\$101.73	\$101.73	\$3.14	\$0.85	\$0.22	\$2.92	\$0.63
2/1/2025	16:15	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$26.58	\$101.73	\$101.73	\$3.08	\$0.85	\$0.22	\$2.86	\$0.63
2/1/2025	16:15	123456	RTD	F	OE	-0.7693	384.49	\$39.30	\$24.13	\$101.73	\$384.49	(\$295.80)	(\$295.80)	(\$18.57)	(\$277.23)	(\$277.23)
2/1/2025	16:15	123456	RTD	F	OE	-2.3554	384.69	\$39.30	\$24.13	\$101.73	\$384.69	(\$906.11)	(\$906.11)	(\$56.84)	(\$849.27)	(\$849.27)
2/1/2025	16:20	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$26.58	\$101.73	\$101.73	\$2,980.40	\$821.43	\$214.65	\$2,765.75	\$606.78
2/1/2025	16:20	123456	FMM	F	OE	2.8325	384.69	\$39.30	\$26.58	\$101.73	\$101.73	\$1,089.63	\$288.14	\$75.29	\$1,014.34	\$212.84
2/1/2025	16:20	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$26.58	\$101.73	\$101.73	\$1,057.35	\$279.74	\$73.10	\$984.25	\$206.64
2/1/2025	16:20	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$26.58	\$101.73	\$101.73	\$1,053.87	\$278.90	\$72.88	\$980.99	\$206.02
2/1/2025	16:20	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$26.58	\$101.73	\$101.73	\$61.48	\$16.95	\$4.43	\$57.05	\$12.52
2/1/2025	16:20	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$26.58	\$101.73	\$101.73	\$30.75	\$8.48	\$2.22	\$28.53	\$6.26
2/1/2025	16:20	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$26.58	\$101.73	\$101.73	\$3.08	\$0.85	\$0.22	\$2.86	\$0.63
2/1/2025	16:20	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$26.58	\$101.73	\$101.73	\$3.14	\$0.85	\$0.22	\$2.92	\$0.63
2/1/2025	16:20	123456	RTD	F	OE	-0.5694	369.09	\$39.30	\$26.04	\$101.73	\$369.09	(\$210.16)	(\$210.16)	(\$14.83)	(\$195.33)	(\$195.33)
2/1/2025	16:20	123456	RTD	F	OE	-2.0091	384.39	\$39.30	\$26.04	\$101.73	\$384.39	(\$772.28)	(\$772.28)	(\$52.33)	(\$719.95)	(\$719.95)
2/1/2025	16:20	123456	RTD	F	OE	-2.7483	384.49	\$39.30	\$26.04	\$101.73	\$384.49	(\$1,056.68)	(\$1,056.68)	(\$71.58)	(\$985.10)	(\$985.10)
2/1/2025	16:20	123456	RTD	F	OE	-2.8325	384.69	\$39.30	\$26.04	\$101.73	\$384.69	(\$1,089.63)	(\$1,089.63)	(\$73.77)	(\$1,015.86)	(\$1,015.86)
2/1/2025	16:25	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$26.58	\$101.73	\$101.73	\$2,980.40	\$821.43	\$214.65	\$2,765.75	\$606.78

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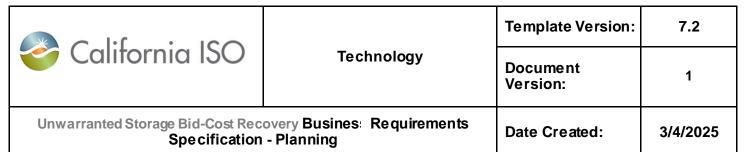
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2/1/2025	16:25	123456	FMM	F	OE	2.8325	384.69	\$39.30	\$26.58	\$101.73	\$101.73	\$1,089.63	\$288.14	\$75.29	\$1,014.34	\$212.84
2/1/2025	16:25	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$26.58	\$101.73	\$101.73	\$1,057.35	\$279.74	\$73.10	\$984.25	\$206.64
2/1/2025	16:25	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$26.58	\$101.73	\$101.73	\$1,053.87	\$278.90	\$72.88	\$980.99	\$206.02
2/1/2025	16:25	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$26.58	\$101.73	\$101.73	\$61.48	\$16.95	\$4.43	\$57.05	\$12.52
2/1/2025	16:25	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$26.58	\$101.73	\$101.73	\$30.75	\$8.48	\$2.22	\$28.53	\$6.26
2/1/2025	16:25	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$26.58	\$101.73	\$101.73	\$3.14	\$0.85	\$0.22	\$2.92	\$0.63
2/1/2025	16:25	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$26.58	\$101.73	\$101.73	\$3.08	\$0.85	\$0.22	\$2.86	\$0.63
2/1/2025	16:25	123456	RTD	F	OE	-0.2099	384.39	\$39.30	\$25.60	\$101.73	\$384.39	(\$80.67)	(\$80.67)	(\$5.37)	(\$75.30)	(\$75.30)
2/1/2025	16:25	123456	RTD	F	OE	-0.9732	384.49	\$39.30	\$25.60	\$101.73	\$384.49	(\$374.17)	(\$374.17)	(\$24.91)	(\$349.26)	(\$349.26)
2/1/2025	16:25	123456	RTD	F	OE	-2.2156	384.69	\$39.30	\$25.60	\$101.73	\$384.69	(\$852.33)	(\$852.33)	(\$56.71)	(\$795.62)	(\$795.62)
2/1/2025	16:30	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$23.13	\$101.73	\$101.73	\$2,980.40	\$821.43	\$186.74	\$2,793.66	\$634.70
2/1/2025	16:30	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$23.13	\$101.73	\$101.73	\$1,057.35	\$279.74	\$63.59	\$993.75	\$216.15
2/1/2025	16:30	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$23.13	\$101.73	\$101.73	\$1,053.87	\$278.90	\$63.40	\$990.47	\$215.50
2/1/2025	16:30	123456	FMM	F	OE	1.1667	384.69	\$39.30	\$23.13	\$101.73	\$101.73	\$448.81	\$118.68	\$26.98	\$421.83	\$91.70
2/1/2025	16:30	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$23.13	\$101.73	\$101.73	\$61.48	\$16.95	\$3.85	\$57.63	\$13.10
2/1/2025	16:30	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$23.13	\$101.73	\$101.73	\$30.75	\$8.48	\$1.93	\$28.82	\$6.55
2/1/2025	16:30	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$23.13	\$101.73	\$101.73	\$3.14	\$0.85	\$0.19	\$2.95	\$0.66
2/1/2025	16:30	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$23.13	\$101.73	\$101.73	\$3.08	\$0.85	\$0.19	\$2.88	\$0.66
2/1/2025	16:30	123456	RTD	F	OE	-0.0083	369.19	\$39.30	\$27.18	\$101.73	\$369.19	(\$3.05)	(\$3.05)	(\$0.22)	(\$2.83)	(\$2.83)
2/1/2025	16:30	123456	RTD	F	OE	-0.0083	376.79	\$39.30	\$27.18	\$101.73	\$376.79	(\$3.12)	(\$3.12)	(\$0.22)	(\$2.89)	(\$2.89)
2/1/2025	16:30	123456	RTD	F	OE	-0.0278	368.99	\$39.30	\$27.18	\$101.73	\$368.99	(\$10.25)	(\$10.25)	(\$0.75)	(\$9.49)	(\$9.49)

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		Template Version:	7.2
California ISO	Technology	Document Version:	1
Unwarranted Storage Bid-Cost Rec Specification		Date Created:	3/4/2025

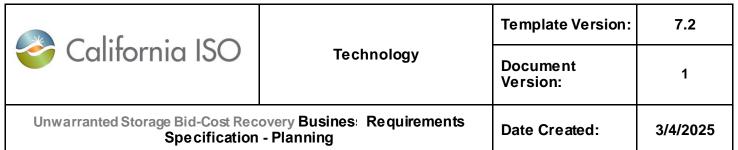
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Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:30	123456	RTD	F	OE	-1.1667	384.69	\$39.30	\$27.18	\$101.73	\$384.69	(\$448.81)	(\$448.81)	(\$31.71)	(\$417.10)	(\$417.10)
2/1/2025	16:30	123456	RTD	F	OE	-2.7413	384.39	\$39.30	\$27.18	\$101.73	\$384.39	(\$1,053.71)	(\$1,053.71)	(\$74.50)	(\$979.21)	(\$979.21)
2/1/2025	16:30	123456	RTD	F	OE	-2.7500	384.49	\$39.30	\$27.18	\$101.73	\$384.49	(\$1,057.35)	(\$1,057.35)	(\$74.74)	(\$982.61)	(\$982.61)
2/1/2025	16:30	123456	RTD	F	OE	-6.0235	369.09	\$39.30	\$27.18	\$101.73	\$369.09	(\$2,223.20)	(\$2,223.20)	(\$163.70)	(\$2,059.50)	(\$2,059.50)
2/1/2025	16:35	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$23.13	\$101.73	\$101.73	\$2,980.40	\$821.43	\$186.74	\$2,793.66	\$634.70
2/1/2025	16:35	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$23.13	\$101.73	\$101.73	\$1,057.35	\$279.74	\$63.59	\$993.75	\$216.15
2/1/2025	16:35	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$23.13	\$101.73	\$101.73	\$1,053.87	\$278.90	\$63.40	\$990.47	\$215.50
2/1/2025	16:35	123456	FMM	F	OE	1.1667	384.69	\$39.30	\$23.13	\$101.73	\$101.73	\$448.81	\$118.68	\$26.98	\$421.83	\$91.70
2/1/2025	16:35	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$23.13	\$101.73	\$101.73	\$61.48	\$16.95	\$3.85	\$57.63	\$13.10
2/1/2025	16:35	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$23.13	\$101.73	\$101.73	\$30.75	\$8.48	\$1.93	\$28.82	\$6.55
2/1/2025	16:35	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$23.13	\$101.73	\$101.73	\$3.08	\$0.85	\$0.19	\$2.88	\$0.66
2/1/2025	16:35	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$23.13	\$101.73	\$101.73	\$3.14	\$0.85	\$0.19	\$2.95	\$0.66
2/1/2025	16:35	123456	RTD	F	OE	-0.0083	369.19	\$39.30	\$26.52	\$101.73	\$369.19	(\$3.08)	(\$3.08)	(\$0.22)	(\$2.86)	(\$2.86)
2/1/2025	16:35	123456	RTD	F	OE	-0.0083	376.79	\$39.30	\$26.52	\$101.73	\$376.79	(\$3.14)	(\$3.14)	(\$0.22)	(\$2.92)	(\$2.92)
2/1/2025	16:35	123456	RTD	F	OE	-0.0427	368.99	\$39.30	\$26.52	\$101.73	\$368.99	(\$15.76)	(\$15.76)	(\$1.13)	(\$14.63)	(\$14.63)
2/1/2025	16:35	123456	RTD	F	OE	-0.0529	368.89	\$39.30	\$26.52	\$101.73	\$368.89	(\$19.52)	(\$19.52)	(\$1.40)	(\$18.12)	(\$18.12)
2/1/2025	16:35	123456	RTD	F	OE	-1.1667	384.69	\$39.30	\$26.52	\$101.73	\$384.69	(\$448.81)	(\$448.81)	(\$30.94)	(\$417.87)	(\$417.87)
2/1/2025	16:35	123456	RTD	F	OE	-2.7417	384.39	\$39.30	\$26.52	\$101.73	\$384.39	(\$1,053.87)	(\$1,053.87)	(\$72.70)	(\$981.17)	(\$981.17)
2/1/2025	16:35	123456	RTD	F	OE	-2.7500	384.49	\$39.30	\$26.52	\$101.73	\$384.49	(\$1,057.35)	(\$1,057.35)	(\$72.92)	(\$984.43)	(\$984.43)
2/1/2025	16:35	123456	RTD	F	OE	-6.1148	369.09	\$39.30	\$26.52	\$101.73	\$369.09	(\$2,256.91)	(\$2,256.91)	(\$162.14)	(\$2,094.77)	(\$2,094.77)
2/1/2025	16:40	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$23.13	\$101.73	\$101.73	\$2,980.40	\$821.43	\$186.74	\$2,793.66	\$634.70

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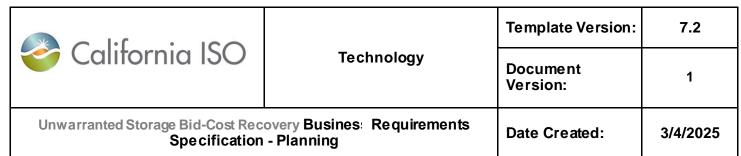
Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:40	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$23.13	\$101.73	\$101.73	\$1,057.35	\$279.74	\$63.59	\$993.75	\$216.15
2/1/2025	16:40	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$23.13	\$101.73	\$101.73	\$1,053.87	\$278.90	\$63.40	\$990.47	\$215.50
2/1/2025	16:40	123456	FMM	F	OE	1.1667	384.69	\$39.30	\$23.13	\$101.73	\$101.73	\$448.81	\$118.68	\$26.98	\$421.83	\$91.70
2/1/2025	16:40	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$23.13	\$101.73	\$101.73	\$61.48	\$16.95	\$3.85	\$57.63	\$13.10
2/1/2025	16:40	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$23.13	\$101.73	\$101.73	\$30.75	\$8.48	\$1.93	\$28.82	\$6.55
2/1/2025	16:40	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$23.13	\$101.73	\$101.73	\$3.14	\$0.85	\$0.19	\$2.95	\$0.66
2/1/2025	16:40	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$23.13	\$101.73	\$101.73	\$3.08	\$0.85	\$0.19	\$2.88	\$0.66
2/1/2025	16:40	123456	RTD	F	OE	-0.4537	384.39	\$39.30	\$26.42	\$101.73	\$384.39	(\$174.42)	(\$174.42)	(\$11.99)	(\$162.43)	(\$162.43)
2/1/2025	16:40	123456	RTD	F	OE	-0.6850	384.69	\$39.30	\$26.42	\$101.73	\$384.69	(\$263.51)	(\$263.51)	(\$18.10)	(\$245.41)	(\$245.41)
2/1/2025	16:40	123456	RTD	F	OE	-1.3613	384.49	\$39.30	\$26.42	\$101.73	\$384.49	(\$523.39)	(\$523.39)	(\$35.97)	(\$487.42)	(\$487.42)
2/1/2025	16:45	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$13.88	\$101.73	\$101.73	\$2,980.40	\$821.43	\$112.11	\$2,868.29	\$709.32
2/1/2025	16:45	123456	FMM	F	OE	2.8325	384.69	\$39.30	\$13.88	\$101.73	\$101.73	\$1,089.63	\$288.14	\$39.33	\$1,050.31	\$248.81
2/1/2025	16:45	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$13.88	\$101.73	\$101.73	\$1,057.35	\$279.74	\$38.18	\$1,019.17	\$241.57
2/1/2025	16:45	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$13.88	\$101.73	\$101.73	\$1,053.87	\$278.90	\$38.06	\$1,015.81	\$240.83
2/1/2025	16:45	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$13.88	\$101.73	\$101.73	\$61.48	\$16.95	\$2.31	\$59.17	\$14.64
2/1/2025	16:45	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$13.88	\$101.73	\$101.73	\$30.75	\$8.48	\$1.16	\$29.59	\$7.32
2/1/2025	16:45	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$13.88	\$101.73	\$101.73	\$3.08	\$0.85	\$0.12	\$2.96	\$0.73
2/1/2025	16:45	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$13.88	\$101.73	\$101.73	\$3.14	\$0.85	\$0.12	\$3.02	\$0.73
2/1/2025	16:45	123456	RTD	F	OE	-0.0083	369.19	\$39.30	\$26.49	\$101.73	\$369.19	(\$3.08)	(\$3.08)	(\$0.22)	(\$2.85)	(\$2.85)
2/1/2025	16:45	123456	RTD	F	OE	-0.0083	376.79	\$39.30	\$26.49	\$101.73	\$376.79	(\$3.14)	(\$3.14)	(\$0.22)	(\$2.92)	(\$2.92)
2/1/2025	16:45	123456	RTD	F	OE	-0.0427	368.99	\$39.30	\$26.49	\$101.73	\$368.99	(\$15.76)	(\$15.76)	(\$1.13)	(\$14.63)	(\$14.63)

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Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:45	123456	RTD	F	OE	-0.0529	368.89	\$39.30	\$26.49	\$101.73	\$368.89	(\$19.52)	(\$19.52)	(\$1.40)	(\$18.12)	(\$18.12)
2/1/2025	16:45	123456	RTD	F	OE	-2.7417	384.39	\$39.30	\$26.49	\$101.73	\$384.39	(\$1,053.87)	(\$1,053.87)	(\$72.63)	(\$981.24)	(\$981.24)
2/1/2025	16:45	123456	RTD	F	OE	-2.7500	384.49	\$39.30	\$26.49	\$101.73	\$384.49	(\$1,057.35)	(\$1,057.35)	(\$72.85)	(\$984.50)	(\$984.50)
2/1/2025	16:45	123456	RTD	F	OE	-2.8325	384.69	\$39.30	\$26.49	\$101.73	\$384.69	(\$1,089.63)	(\$1,089.63)	(\$75.04)	(\$1,014.60)	(\$1,014.60)
2/1/2025	16:45	123456	RTD	F	OE	-6.1148	369.09	\$39.30	\$26.49	\$101.73	\$369.09	(\$2,256.91)	(\$2,256.91)	(\$161.99)	(\$2,094.92)	(\$2,094.92)
2/1/2025	16:50	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$13.88	\$101.73	\$101.73	\$2,980.40	\$821.43	\$112.11	\$2,868.29	\$709.32
2/1/2025	16:50	123456	FMM	F	OE	2.8325	384.69	\$39.30	\$13.88	\$101.73	\$101.73	\$1,089.63	\$288.14	\$39.33	\$1,050.31	\$248.81
2/1/2025	16:50	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$13.88	\$101.73	\$101.73	\$1,057.35	\$279.74	\$38.18	\$1,019.17	\$241.57
2/1/2025	16:50	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$13.88	\$101.73	\$101.73	\$1,053.87	\$278.90	\$38.06	\$1,015.81	\$240.83
2/1/2025	16:50	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$13.88	\$101.73	\$101.73	\$61.48	\$16.95	\$2.31	\$59.17	\$14.64
2/1/2025	16:50	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$13.88	\$101.73	\$101.73	\$30.75	\$8.48	\$1.16	\$29.59	\$7.32
2/1/2025	16:50	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$13.88	\$101.73	\$101.73	\$3.08	\$0.85	\$0.12	\$2.96	\$0.73
2/1/2025	16:50	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$13.88	\$101.73	\$101.73	\$3.14	\$0.85	\$0.12	\$3.02	\$0.73
2/1/2025	16:50	123456	RTD	F	OE	-0.0083	369.19	\$39.30	\$25.59	\$101.73	\$369.19	(\$3.05)	(\$3.05)	(\$0.21)	(\$2.84)	(\$2.84)
2/1/2025	16:50	123456	RTD	F	OE	-0.0083	376.79	\$39.30	\$25.59	\$101.73	\$376.79	(\$3.12)	(\$3.12)	(\$0.21)	(\$2.91)	(\$2.91)
2/1/2025	16:50	123456	RTD	F	OE	-0.0278	368.99	\$39.30	\$25.59	\$101.73	\$368.99	(\$10.25)	(\$10.25)	(\$0.71)	(\$9.54)	(\$9.54)
2/1/2025	16:50	123456	RTD	F	OE	-2.7413	384.39	\$39.30	\$25.59	\$101.73	\$384.39	(\$1,053.71)	(\$1,053.71)	(\$70.16)	(\$983.55)	(\$983.55)
2/1/2025	16:50	123456	RTD	F	OE	-2.7500	384.49	\$39.30	\$25.59	\$101.73	\$384.49	(\$1,057.35)	(\$1,057.35)	(\$70.38)	(\$986.97)	(\$986.97)
2/1/2025	16:50	123456	RTD	F	OE	-2.8325	384.69	\$39.30	\$25.59	\$101.73	\$384.69	(\$1,089.63)	(\$1,089.63)	(\$72.49)	(\$1,017.14)	(\$1,017.14)
2/1/2025	16:50	123456	RTD	F	OE	-6.0235	369.09	\$39.30	\$25.59	\$101.73	\$369.09	(\$2,223.20)	(\$2,223.20)	(\$154.15)	(\$2,069.04)	(\$2,069.04)
2/1/2025	16:55	123456	FMM	F	OE	8.0750	369.09	\$39.30	\$13.88	\$101.73	\$101.73	\$2,980.40	\$821.43	\$112.11	\$2,868.29	\$709.32

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Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	мwн	Bid Price (Original)		FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:55	123456	FMM	F	OE	2.8325	384.69	\$39.30	\$13.88	\$101.73	\$101.73	\$1,089.63	\$288.14	\$39.33	\$1,050.31	\$248.81
2/1/2025	16:55	123456	FMM	F	OE	2.7500	384.49	\$39.30	\$13.88	\$101.73	\$101.73	\$1,057.35	\$279.74	\$38.18	\$1,019.17	\$241.57
2/1/2025	16:55	123456	FMM	F	OE	2.7417	384.39	\$39.30	\$13.88	\$101.73	\$101.73	\$1,053.87	\$278.90	\$38.06	\$1,015.81	\$240.83
2/1/2025	16:55	123456	FMM	F	OE	0.1667	368.89	\$39.30	\$13.88	\$101.73	\$101.73	\$61.48	\$16.95	\$2.31	\$59.17	\$14.64
2/1/2025	16:55	123456	FMM	F	OE	0.0833	368.99	\$39.30	\$13.88	\$101.73	\$101.73	\$30.75	\$8.48	\$1.16	\$29.59	\$7.32
2/1/2025	16:55	123456	FMM	F	OE	0.0083	376.79	\$39.30	\$13.88	\$101.73	\$101.73	\$3.14	\$0.85	\$0.12	\$3.02	\$0.73
2/1/2025	16:55	123456	FMM	F	OE	0.0083	369.19	\$39.30	\$13.88	\$101.73	\$101.73	\$3.08	\$0.85	\$0.12	\$2.96	\$0.73
2/1/2025	16:55	123456	RTD	F	OE	-0.4367	384.39	\$39.30	\$23.71	\$101.73	\$384.39	(\$167.88)	(\$167.88)	(\$10.35)	(\$157.52)	(\$157.52)
2/1/2025	16:55	123456	RTD	F	OE	-1.3507	384.49	\$39.30	\$23.71	\$101.73	\$384.49	(\$519.32)	(\$519.32)	(\$32.02)	(\$487.30)	(\$487.30)
2/1/2025	16:55	123456	RTD	F	OE	-2.3472	384.69	\$39.30	\$23.71	\$101.73	\$384.69	(\$902.93)	(\$902.93)	(\$55.65)	(\$847.28)	(\$847.28)