Managing Interconnections
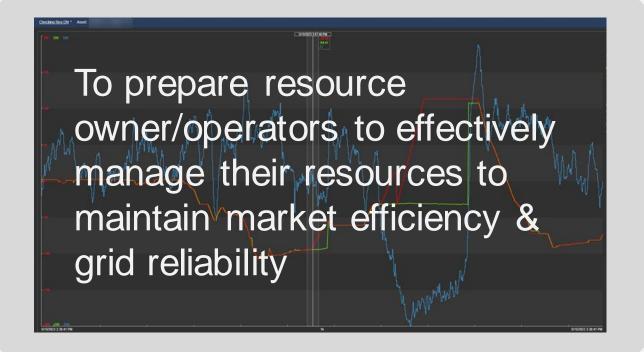
Welcome

Our presentation will begin shortly.

Today's Trainer:
Heidi Holmberg Carder, Lead Customer Education Trainer

Why are we here?

To prepare resource owner/operators to effectively manage their resources to maintain market efficiency & grid reliability

It requires a partnership to ensure the safety and reliability of the grid!

What Will I Be Learning?

- What are the basics of interchange?

- What are the basic e-tagging requirements?

- How do we treat interchange priorities and wheel throughs?

- What's coming up for interchange and e-tagging?

- What notifications inform the interconnection of system events?

Housekeeping

Keep yourself muted to minimize background noise

Unmute to ask verbal questions or write questions in the chat pod

Raise your hand using WebEx interactivity tools

What's next?

- This training is being recorded

- Recordings and presentations will be posted on the [ISO Learning Center](#) within 3 business days

- Questions gathered during this course will be collected and turned into a comprehensive Q&A guide after the conclusion of the 4 training course series

- The Interchange & E-Tagging computer based training course will be updated and republished soon!

- This is the third training in a series focused on efforts to create a Resource Owner/Operator training track – stay tuned!
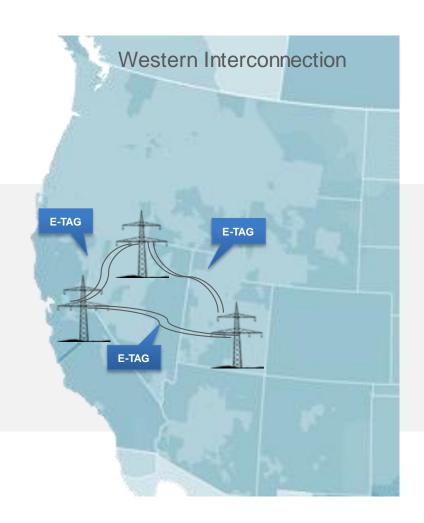
Foundational Information

What are the basics of Interchange Scheduling & e-tagging?

What is interchange scheduling & e-tagging?

Western Interconnection

Interchange scheduling is the plan to transfer physical energy or capacity between Balancing Authority Areas (BAAs) through interconnection points

- An electronic tag (e-tag) must be submitted to track every intertie the energy goes through

- E-tags contain specific information on the SC, type of energy, contract info, etc.

- Each transmission line reserved between the BAs must be identified

California ISO

E-Tagging in the ISO markets

Day-Ahead	Real-Time

Day-Ahead

- Submitted to schedule:
  - Physical energy
  - Capacity

- Used for
  - ancillary service bids
  - energy schedules,
  - energy self schedules

- E-Tags in day-ahead are optional, but due by 15:00 if submitted

- DA RUC auto adjustments of energy profile occur at 15:30 (down direction, only if MW value exceeds RUC award)

Real-Time

- Created for:
  - FMM economic bids
  - economic hourly block bids with intra-hour option

- Transmission profile updated by T-40

- Energy profile updated by T-20 minutes before the applicable FMM interval

- WEIM transactions are Energy Transfer System Resources (ETSR) not individual tags

Accuracy is the responsibility of the SC

E-tags must adhere to specific rules and requirements

1. Tag Info
2. Market Path
3. Physical Path
4. Misc. Info
5. Transmission Allocation
6. Current Energy

All e-tag should contain a single resource of Transaction ID or Resource ID at the associated scheduling point with ISO Market awards

Transaction ID

SC05_AMARGOSA_1_SN001-AMARGO-I-P-F-DECM01

Scheduling Coordinator ID (SCID)	Intertie Scheduling Point	ISO Transmission Path	Direction, Bid Type, Energy Type	Purchasing Selling Entity Identifier

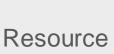Every Transaction ID has the five elements you see here. This is an example of a non-specific resource physical import bid.

The Transaction ID must be provided in the OASIS field of the Transmission Allocation section of the e-Tag. Any incorrect, extra, or missing element(s) will result in an e-Tag adjustment to zero (loss of binding award) before the e-Tag is scheduled to flow, with no exceptions.

All e-tag should contain a single resource of Transaction ID or Resource ID at the associated scheduling point with ISO Market awards

Resource ID

ABCE_ELDORADO230_I_F_XXXXXX

Scheduling Coordinator ID (SCID)	ISO Transmission Path	Direction, Energy Type	Resource ID Identifier

Every Resource ID has the five elements you see here. This example is for Scheduling Coordinator ABCE's import to the ISO.

The Resource ID must be provided in the Misc Info field of the Physical Path section of the e-Tag. Any incorrect element(s), extra element(s), or missing element(s) will result in an e-Tag adjustment to zero (loss of binding award) before the e-Tag is scheduled to flow, with no exceptions.

Timeline for tagging

1 Submit e-Tags on time to comply with NERC timetables and policies.

2 Submit Pre-Schedule e-Tags on the day prior to the start of the transaction after the Day-Ahead Market publishes to ensure correct CAISO_PRIORITY_TYPE.

3
- Auto-adjustments of e-Tags occur at 15:30 PPT on the day prior to the start of the transaction, or a minimum of 60 minutes after the Day-Ahead Market publishes.
- Day-Ahead Residual Unit Commitment (RUC) adjustments are made on both import and export transactions.
- Adjustments are in the down direction only. The tag will only be adjusted down if the MW value of the Energy Profile exceeds the DA RUC award.

4 After HASP results are published, submit the Intertie Transmission Profile for a fifteen-minute market (FMM) economic bid (EB15MIN) by 40 minutes prior to the start of the first FMM interval of the hour (T-40); submit the Energy Profile by 20 minutes before each binding interval.

5 After HASP results are published, submit the Intertie Hourly Transmission Profile by 40 minutes prior to the start of the first interval of the next hour's market, and the Energy Profile by 20 minutes prior for the following export bid types:
- Self-scheduled hourly block bid (SSHB).
- Self-scheduled Variable Energy Resource bid (SSVER)
- Economic hourly block bid (EBHB)
- Economic hourly block single change bid (EBHBCHG)

6
- Auto-adjustments of e-Tags occur at xx:20 each hour after the HASP results have published.
- Adjustments are in the down direction only. The tag will only be adjusted down if the MW value of the Energy Profile exceeds the HASP Energy Award.

California ISO

Key points

- All ISO interchange market awards require an e-tag for energy flow and settlement

- All e-tags should contain a single Resource ID or Transaction ID at the scheduling points with Market awards

- Follow the timing

- Always check your market award ID against your e-tag ID in CMRI before submitting to prevent mistakes

California ISO

Overview

July 2023 Emergency Events
Treatment of Export and Wheeling Transactions

Balancing Authority Area (BAA) dynamics

British Columbia

Alberta

California ISO

Baja California

WECC
Balancing Authority Areas (generalized)

- All Balancing Authorities (BAs) must adhere to NERC and FERC rules regarding exports, firmness of transmission and load management

- Energy transfer transactions are prioritized between BAs during strained grid conditions

- Similar to all other BAs the ISO will clear low priority transactions once it has served its own native load and there is sufficient supply

The California ISO is one of 39 Balancing Authorities in the Western Interconnection

As a Balancing Authority, the ISO adheres to these requirements to balance supply and demand

Important distinction between low priority and high priority exports

Low Priority

Considered opportunity sales sourced from the ISO's pool of resources that the ISO can support once it has met its own load requirements

High Priority

Supply from the ISO that is not already contractually committed to serve ISO load

ISO Tariff Section 34.12.4.3 describes three categories of LPT Exports

Low priority exports may not be feasible during strained grid conditions

California ISO

Treatment of wheel through transactions on the ISO system

ISO provides low and high priority wheel-through service to allow entities to transfer energy through the ISO's transmission system from one BAA to another
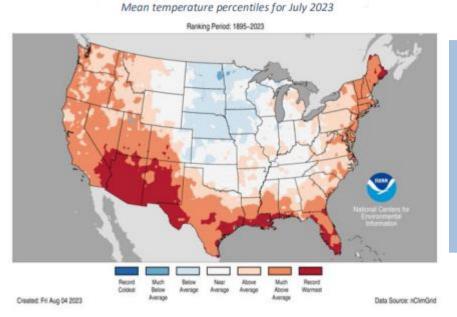
High priority wheels
- Requires demonstration of need to wheel through the ISO system based on external contractual commitment at least 45-days in advance of the month

- Receive treatment equal to the ISO's native load

Without required demonstration the wheel is considered low priority

Summer 2023, extreme heat conditions in the desert southwest

Mean temperature percentiles for July 2023

Ranking Period: 1895-2023

Created: Fri Aug 04 2023

National Centers for Environmental Information

Data Source: nClimGrid

Record Coldest · Much Below Average · Below Average · Near Average · Above Average · Much Above Average · Record Warmest

- Record heat in the DSW
- Unprecedented demand outside CA
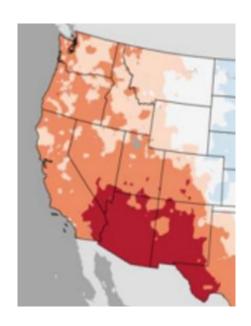- Western energy supply stretched thin

- Transmission Congestion
- Challenges for Grid Operators

Despite improved supply conditions from prior years, extreme heat put a strain on the grid in the month of July

Emergency declarations and actions taken in July 2023 during high demand conditions
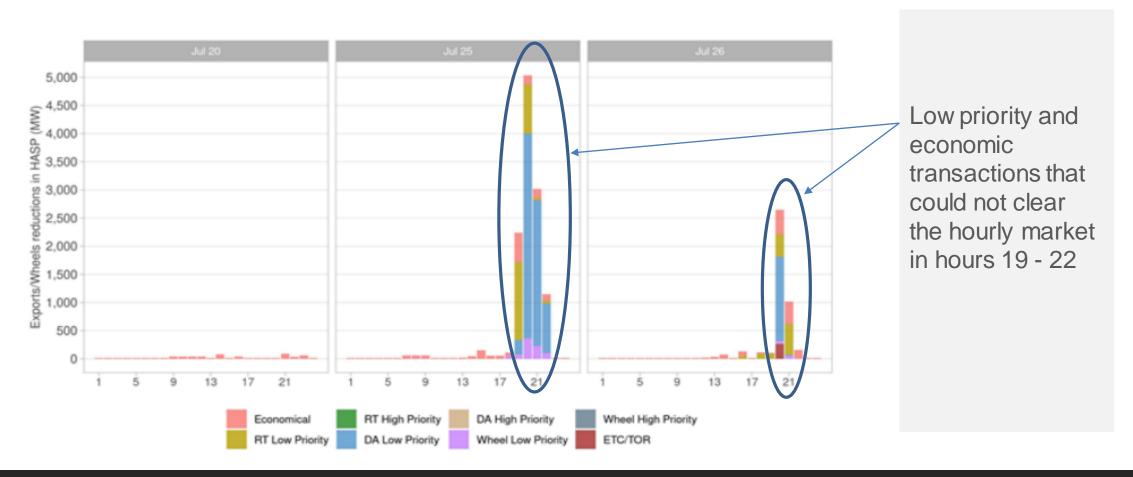

- July 20 - An Energy Emergency Alert 1 (EEA1) was declared for the ISO BAA on the evening of July 20 resulting in a demand response event

- July 25 – An Energy Emergency Watch was declared as solar power diminished

- July 26 – An Energy Emergency Watch was declared due to similar system conditions as July 25

The ISO honored all high-priority exports and wheels during each of the emergency events

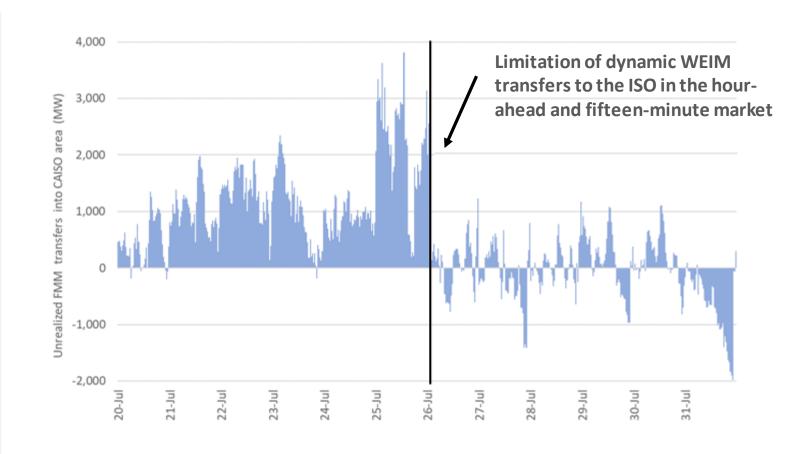# Due to tight supply conditions, the RT Market could not clear all low priority transactions

Low priority and economic transactions that could not clear the hourly market in hours 19 - 22

Legend:
- Economical
- RT Low Priority
- RT High Priority
- DA Low Priority
- DA High Priority
- Wheel Low Priority
- Wheel High Priority
- ETC/TOR

All high priority exports and wheel-through transactions were honored

On July 26, the ISO limited reliance on imports from the WEIM

Reliance on WEIM transfers into the ISO BAA were limited to minimize the risk of supply not materializing starting on July 26
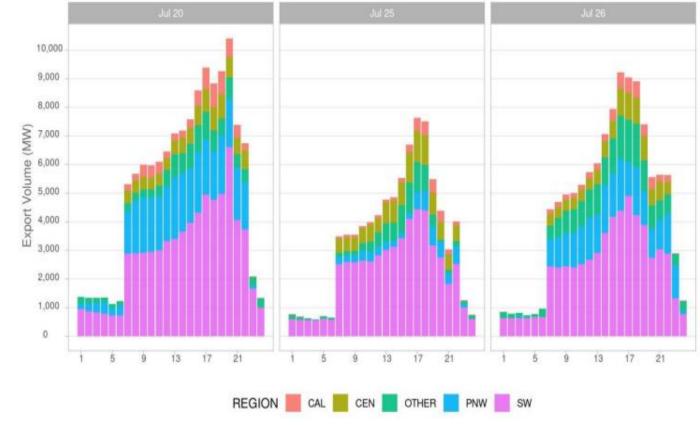

Limitation of dynamic WEIM transfers to the ISO in the hour-ahead and fifteen-minute market

Limiting incoming WEIM transfers was necessary to manage uncertainty

California ISO

The ISO was able to support a large volume of exports and wheels

Unprecedented high volume of exports cleared in July

Exports during peak hours were double of those in summers of 2021 & 2022 during strained system conditions
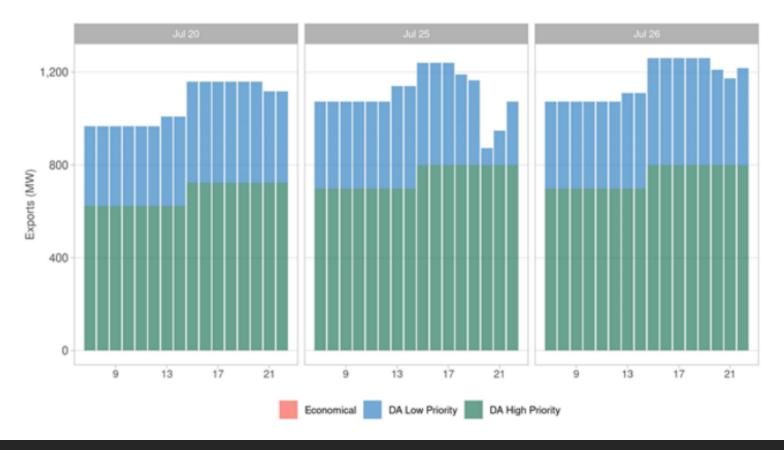

Breakdown of ISO exports by sinking BAA July 20, 25 & 26

Market cleared an unprecedented 9,000 MW of exports at various times in July

During this critical time period, the ISO was still able to clear up to 1,200 MW of wheel-through transactions

Significant volume of low priority transactions were supported
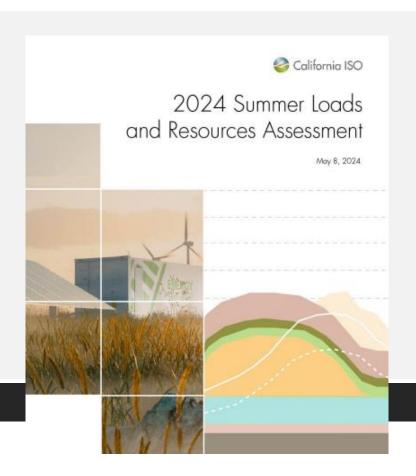
To summarize…

The interconnected nature of the grid coupled with the high demand from the desert southwest put a strain on the system

Coordination and communication with our customers and stakeholders was critical in maintaining grid reliability

Increased regional coordination through an optimized regional market is essential to effectively leverage resources across the West

Detailed July market performance report was published in September

Summer-Market-Performance-Report-for-July-2023.pdf (caiso.com)

Annual Summer Loads and Resources Assessment helps prepare for summer system operations to maintain grid reliability

California ISO

2024 Summer Loads and Resources Assessment

May 8, 2024

- evaluates expected 2024 summer supply and demand conditions for the California Independent System Operator (ISO) balancing authority area (BAA)

- indicates continued improvement in resource availability for the upcoming summer driven by accelerated resource development

Available on the Reports and Bulletins webpage on www.caiso.com

Initiatives

Learning Activity

- Where are we at with interchange & e-tagging initiatives?

- What are the main considerations?

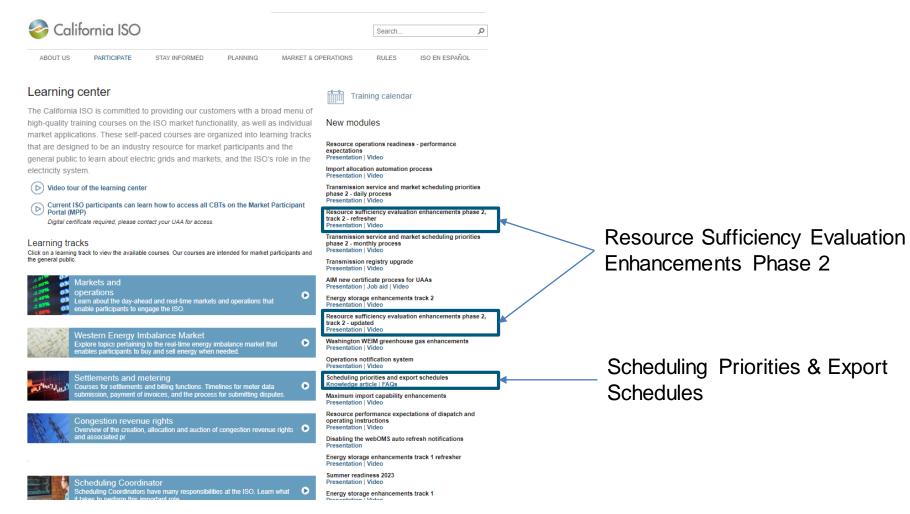# WEIM Resource Sufficiency Evaluation Enhancements Phase 2 Track 2

System	High Level Changes
MF	• Definition and Submission of Resource-Specific Capacity Test Failed-to-Start Rule Exemption Flag via GRDT • Make Resource-Specific Capacity Test Failed-to-Start Rule Exemption flag accessible to downstream systems.
ITS	• Clarification of Post-HASP Block Hour Low-Priority Export • Consume DAM Resource-Specific Market Priority Types and Resource-specific RUC Energy Awards from RUC. • Consume All Resource-Specific Market Priority Types from RTM. • SCs shall be required to submit Misc Info field Prior Type attribute for "Firm Provisional Energy (G-FP)" e-tags to identify RTECON, DAECON, RTLPT, DALPT. • SCs shall be required to submit Misc Info field Prior Type attribute for "Firm Energy (G-F)" e-tags to identify RTPT, DAPT. • Validate submitted export e-Tags against data received from RUC and RTM to approve/deny and adjust (if warranted) the submitted e-Tags.
Market	• Access Resource-Specific Capacity Test Failed-to-Start Rule Exemption flag from MF. • Exempt Specific Resources from Capacity Test Failed-to-Start Rule/Functionality. • Clarification of Post-HASP Block Hour Low-Priority Export • Broadcast All Resource-specific market priority types to ITS (from RTM).

ADS	• Clarification of Post-HASP Block Hour Low-Priority Export
	  • Consume Resource-Specific Market Priority Types and their Associated MW Data from RTM.
	  • Publish Resource-Specific Market Priority Types and their Associated MW Data.
	  • Include Resource-Specific Market Priority Types in ADS Query Functionality.

Release User Group meeting project info

WEIM Resource Sufficiency Evaluation Enhancements Phase 2 Track 2 – Training Resources

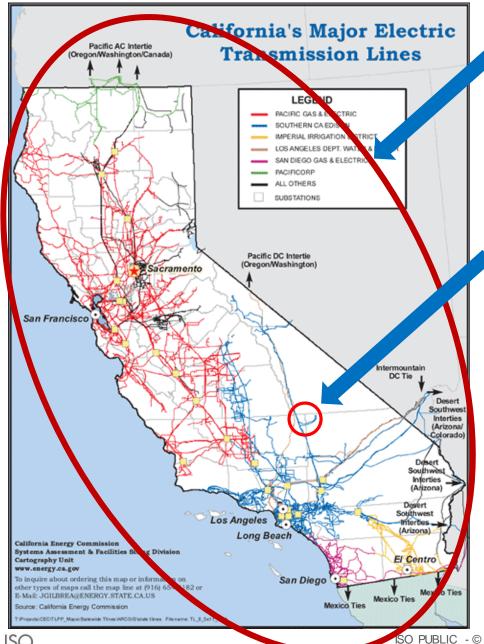Resource Sufficiency Evaluation Enhancements Phase 2

Scheduling Priorities & Export Schedules

Emergency Response

How does it work?

California's Major Electric Transmission Lines

Being short on energy (**Flex Alerts, EEAs**) affects the whole system.

A **Transmission Emergency** affects only a particular location based on transmission lines, flows, and equipment.

It's possible to have one or both alerts at the same time.

Operational considerations during emergency conditions

- Available Generating Capacity
- Reserves for ups, downs and forecast changes
- Reserves for the loss of biggest unit
- Customer Load

Notifications sent as appropriate based on system conditions

Emergency Alert Levels
Flex Alert
Restricted Maintenance Operations
Transmission Emergency
EEA Watch
EEA 1
EEA 2
EEA 3*
EEA 3 – Firm Load Interruption*

Being short on energy (**Flex Alerts, EEAs**) affects the whole system.

A **Transmission Emergency** affects only a particular location based on transmission lines, flows, and equipment.

It's possible to have one or both alerts at the same time.

coordination of both voluntary and mandatory load interruption programs

Subscribing and Unsubscribing

If you **would like to be removed** from the EA notification distribution list:

– Submit a CIDI ticket requesting to be removed from the distribution list

If you **would like to be added** to the EA notification distribution list:

– Submit a CIDI ticket with **"EA request for addition"** in the Subject field requesting to be added

There will be a new process for subscribing to notifications on the new ISO website

Additional Resources – Operational Procedures

NERC Standards
- COM-002-4 - Operating Personnel Communications Protocol
- EOP-011-1 – Emergency Operations

RC West Procedures
(https://www.caiso.com/rules/Pages/OperatingProcedures/Default.aspx)
- RC0410 – System Emergencies

CAISO BA Procedures
(https://www.caiso.com/rules/Pages/OperatingProcedures/Default.aspx)
- 4420 – System Emergency
- 4410 – Emergency Assistance
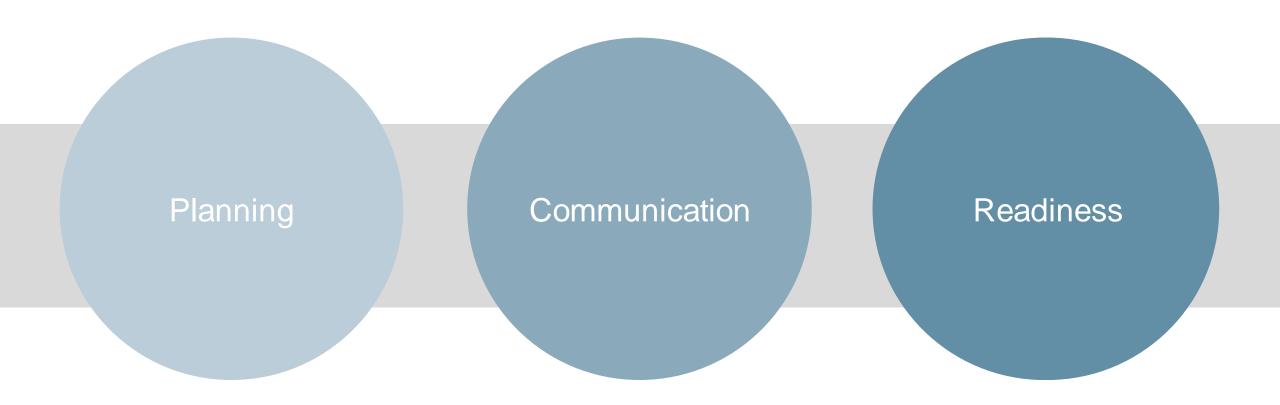- 4510 – Load Management
- 4510A

Wrap Up

Summary, Q&A

Advanced collaboration and coordination ensures preparedness for summer conditions

Planning

Communication

Readiness

Resource Operations Readiness Training

Training Goal: to prepare customers in advance of summer to meet ISO expectations for successful resource management, especially during tight conditions.

These courses build on concepts shared during the May 1st Resource Interconnection Fair.

✓ Resource Performance Expectations May 7th	✓ Battery Performance Expectations May 15th	✓ Managing Intertie Transactions May 16th	WEIM Resource Performance Expectations May 22nd

- Dispatch/Operating instruction response
- Hybrid resource management
- Outage cards completion
- Flex Alerts/EEA response

- Resource capabilities
- Correct Nature of Work
- Off-Grid Charging Indicator
- Physical management requirements

- Wheel-through concepts
- Export priority
- Tagging expectations
- Flex Alert/EEA

- Assistance Energy Transfer
- Demand Response process for WEIM

Register today at: https://caiso.regfox.com/resource-operations-readiness-training-series

Contact CustomerReadiness@caiso.com with questions.

Share this information with your staff!

New reference guide to help Resource Owner/Operators find important information

Includes helpful links such as:

- Training Resources

- Knowledge Articles

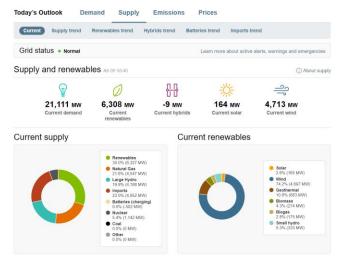- Policies & Procedures

- New Resource Implementation Documents

Available on the ISO Learning Center under the Market and Operations Learning Track

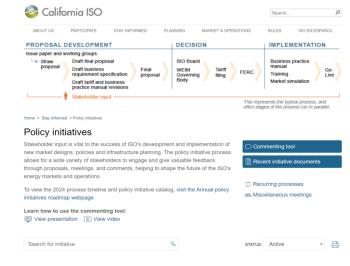California ISO - Learning center (caiso.com)
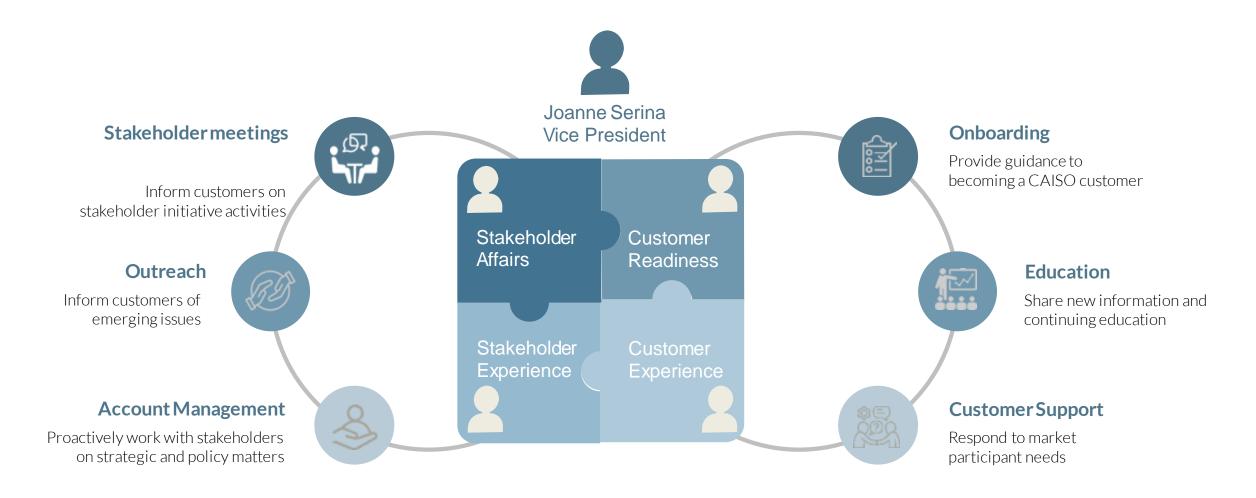
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Stakeholder Engagement & Customer Experience

Joanne Serina
Vice President

Stakeholder meetings
Inform customers on stakeholder initiative activities

Outreach
Inform customers of emerging issues

Account Management
Proactively work with stakeholders on strategic and policy matters

Stakeholder Affairs

Customer Readiness

Stakeholder Experience

Customer Experience

Onboarding
Provide guidance to becoming a CAISO customer

Education
Share new information and continuing education

Customer Support
Respond to market participant needs

California ISO

Thank you for your participation!

For more detailed information on anything presented, please visit our website at: www.caiso.com or send an email to: CustomerReadiness@caiso.com.

For resource specific questions or concerns, please submit a CIDI ticket.