

## Scheduling Priorities and Export Schedules Overview

This knowledge article provides guidance related to scheduling priorities for export transactions in the CAISO market. *Please note this article does not replace or supersede the rules in the CAISO’s tariff or business practice manuals.*


### Types of Exports in CAISO Markets

The CAISO markets use defined market-scheduling priorities, as prescribed in the CAISO tariff, to determine the amount and sequence of exports the market must reduce in the day-ahead and real-time markets. This allows the CAISO to balance supply and demand while considering underlying transmission capabilities of the system. The principles for scheduling priorities are largely the same between the day-ahead and real-time markets.

### Day-Ahead Market

The day-ahead market optimally schedules exports in both the Integrated Forward Market (IFM) and the Reliability Unit Commitment (RUC) processes. Each of these two processes apply the same priorities. If RUC reduces an export previously cleared in the IFM process, the RUC schedule is now the reference quantity for tagging and real-time participation. Table 1 (below) lists the applicable scheduling priorities for the day-ahead market (both IFM and RUC) for all exports *and* the export leg of wheel transactions.

*Table 1: Scheduling priorities for the day-ahead processes*



#	Type	Requirement	Label/Identifier
D1	Economical	Bid with a specified price and quantity	ECON
D2	Low priority	Bid with quantity only -no price-	DALPT
D3	High priority	Bid with quantity only -no price- identifying a non-RA supporting resource or a resource on a RA plan to serve external load. For Exports of a wheel, transaction approved and registered 45 days in advance.	DAPT
		Selection of self-schedule type SS in the bid to have high priority	
D4	ETC/TOR	Bid with quantity -no price- under registered legacy contract or transmission ownership rights	ETC/TOR


Higher priority

### Real-Time Market

In the context of the real-time market, scheduling priorities apply to the sub-market clearing interties. The Hour-Ahead Scheduling Process (HASP) clears all hourly interties on an hourly basis, whereas the Fifteen-Minute Market (FMM) clears 15-minute resources. The FMM and/or Real-Time Dispatch (RTD) markets do not use scheduling priorities for hourly transactions because these transactions have already cleared HASP.

Table 2 (below) lists all scheduling priorities used in the real-time market, which are largely the same as those of the day-ahead market—with some minor differences.

*Table 2: Scheduling priorities for the real-time processes*



#	Type	Requirement	Label
R1	Economical	Bid with a specified price and quantity	ECON
R2	Low priority	Bid with quantity only -no price-	RTLPT
R3	Low priority	Bid with MW quantity only -no price- up to cleared MW in RUC	DALPT
R4	High priority	Bid with quantity only -no price- identifying a non-RA supporting resource or a resource on a RA plan to serve external load. For Exports of a wheel, transaction approved and registered 45 days in advance. Selection of self schedule type SS in the bid to have high priority.	DAPT/RTPT
R5	ETC/TOR	Bid MW quantity -no price- under registered legacy contract or transmission ownership rights	ETC/TOR

Higher priority

The main difference between day-ahead and real-time scheduling priorities is that for the real-time market, there are *two* groups of low priority exports. The lowest priority is assigned to price takers participating only in the real-time market (R2). A slightly higher priority is given to price takers or economical exports already cleared in the day-ahead market who roll their RUC schedules into the real-time market (R3). For any self-schedules above RUC schedules, the market assigns a lower priority (R2).

High priority exports also encompass two internally categorized groups. The first group involves direct bidders for high priority exports in real-time (RTPT), while the second group includes those cleared in the day-ahead market and then roll their RUC schedules into real-time. Both groups share an identical high priority status. For any self-schedules above the RUC schedule—or above its high priority quantity—the market assigns it the lowest priority (R2).

### **Market Clearing Process and Export/Wheel Reductions**

Market scheduling priorities are operationalized via distinct scheduling parameters (parameter prices), which are prescribed in the Tariff and the BPM for Market Operations. These parameter prices are greater than the bid cap to ensure they get used only until all economical bids are considered. Within the internal market clearing process and treatment of exports, several factors play a pivotal role in determining optimal schedules for exports and wheels.

### **Balance Between Supply and Demand**

Export or wheel-through transaction reductions are only necessary when there is a lack of sufficient supply to meet CAISO demand and exports—i.e., the balance between supply and demand will not be met with increasing demand and thus exports and demand need to be reduced. The clearing process begins by not clearing economical bids, then reduces low-priority exports, and then potentially high-priority exports. Strict adherence to scheduling priorities, from lowest to highest, occurs only in power balance conditions when supply cannot meet all demand and exports.

Even when the condition is only a power balance, the market uses the full functionality of locational marginal prices. Therefore, when the optimal solution requires reducing only a *portion* of a group of exports, the clearing process will take into account the locations of these exports (scheduling points) to differentiate which reductions produce the least-cost solution. In the absence of congestion, marginal losses—which are location specific—will be the main factor in determining which exports are reduced first among those of the same priority.

### **Congestion Management**

As an integral element within the locational marginal pricing framework, congestion management plays a crucial role in shaping the optimal schedules of all resources, including exports, in the CAISO markets. In addressing congestion, resources are dispatched incrementally to alleviate congestion, while other resources are dispatched decrementally to not exacerbate congestion. This congestion management approach leads to out-of-merit dispatches, prioritizing the dispatch of relatively more expensive resources before cheaper ones. This principle extends to exports with scheduling priorities as well. Export resources may also be reduced to manage congestion, even when supply is adequate to meet both demand and exports.

More significantly, export reductions prompted by congestion may not strictly adhere to scheduling priorities as their determination is predominantly influenced by the export's relative location to the congested constraint. It is conceivable that low priority exports could be curtailed prior to utilizing all economical bids or that certain high priority exports might be reduced ahead of low priority ones due to congestion.

Conversely, certain low-priority—or even economical—exports could receive full awards while other exports of higher priority are reduced. This out-of-sequence reduction can be caused by exports creating counter-flows that alleviate congested constraints, which in some cases can allow more imports to flow into the CAISO area. These schedules are not driven by limited supply conditions.

### **Wheel Reductions**

Wheel transactions are bid and cleared in balance, thus not introducing additional supply or demand on the system. Consequently, when the market clearing process schedules resources (including exports) for the specific conditions of limited supply, wheel transactions will not be subject to reductions. Wheel transactions come into play when supply constraints arise due to congestion on the interties they are scheduled on or if internal congestion is exacerbated by wheel-through transactions.

CAISO incorporates specific functionality to proportionally allocate restricted intertie capacity in situations where both the intertie capacity is limited and while the CAISO has a supply infeasibility.

Similar to exports, severe congestion on internal constraints can prompt the market clearing process to reduce wheel-through transactions, deviating from the standard priority sequence. This divergence is solely driven by their location and impact on the constraint.

### **Post-Market Processes**

After the completion of the HASP market, the final schedules are transmitted via the Automatic Dispatch System (ADS). These schedules encompass any export reductions, which participants can accept or decline.

Upon receipt of a CAISO real-time market award for an intertie, the Scheduling Coordinator must submit an e-Tag to formalize the scheduling of the award. Notably, with the introduction of new provisions in July 2023 as part of the Resource Sufficiency Evaluation (RSEE) Phase 2 Track 1, all economical and low-priority exports are required to be e-tagged as firm provisional energy (G-FP). This classification aims to provide the proper identification to involved parties with visibility of the provisional nature of economical or low-priority exports.

### **Acronyms**

<b>DAM</b>	Day-ahead Market
<b>RTM</b>	Real-time Market
<b>HASP</b>	Hour-Ahead scheduling process
<b>RUC</b>	Reliability unit commitment
<b>IFM</b>	Integrated forward market
<b>ETC/TOR</b>	Existing Transmission right/Transmission Ownership right
<b>RTD</b>	Real-time interval dispatch
<b>G-FP</b>	Firm provisional energy
<b>SS</b>	Self-Schedule
<b>RA</b>	Resource Adequacy
<b>FMM</b>	Fifteen minute market