




EIM Process Overview – Facilitating Energy Transfer System Resources (ETSR)

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 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

TABLE OF CONTENTS

1.0	Purpose.....	4
2.0	ETSR Overview.....	4
2.1	ETSR Definition	4
2.2	How ETSR Base Schedules Submitted?.....	5
2.3	How are Static and Dynamic ETSR Limits submitted?	5
2.4	How is an ETSR dispatched?	6
3.0	Process Overview	6
3.1	Roles of Responsible Parties	6
3.2	Identifying ETSRs Process	6
3.3	Define ETSRs Process	7
3.4	Implement ETSRs Process	9
3.5	Testing ETSRs Process.....	9
3.6	Testing Scenarios	10
	Appendix A – EIM Entities ETSR Discussion	12

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

1.0 Purpose

The purpose of this document is to provide an overview of the process of identifying, defining, implementing and testing Energy Transfer System Resources (ETSRs) between a new EIM Entity and neighboring Balancing Areas (BA) that are already participating in the Western Energy Imbalance Market (EIM).

The California ISO (CAISO) will facilitate this process by bringing together the required parties for discussion at the appropriate times across the EIM implementation lifecycle. The goal of this process is for the onboarding EIM Entity and the neighboring EIM Entity to reach a consensus on:

1. Agreement on number of identified ETSRs as well as their types.
2. What tags to include as part of the base ETSRs.
3. How and when the base ETSRs should be scheduled in EIM.
4. How the base ETSR schedules should be updated within the hour.
5. How the limits for the dynamic/static ETSR should be calculated and provided.
6. Identifying any ETSR constraint that might require additional information.
7. How schedule data should be represented after-the-fact for settlements.

2.0 ETSR Overview

2.1 ETSR Definition

An Energy Transfer System Resource (ETSR) is the representation of how Energy Imbalance Market (EIM) facilitates transfer of energy from one EIM BA to another EIM BA for the purposes of tracking, tagging, and settlement. The EIM has defined three types of ETSR:

- Base ETSR – defined to represent the bilateral transactions between two EIM entities. Base ETSRs are not optimized, but are kept constant in the market unless modified by EIM entity through the EIM real-time interchange schedule interfaces (RTSI).
- Static ETSR – defined for the EIM transfers optimized only at the 15 minute level. Used only when dynamic transmission capability constraints apply in the ETSR contract path.
- Dynamic ETR – defined for the EIM transfer optimized at 5 minute level. Used for transmission capability rights that can be scheduled dynamically.

ETSR's are an aggregate of all supply resources at the EIM Balancing Authority Area (BAA) Default Generation Aggregation Point (DGAP) for that BAA.

Each ETSR has the following properties:

- Import/Export resource

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

- Associated with an intertie with another EIM BAA
 - The EIM Entity has made transmission rights available at that intertie
- Transmission availability using the Total Transmission Capacity (TTC) methodology or the Available Transmission Capacity (ATC) methodology, per tariff Section 29.17

2.2 How Are ETSR Base Schedules Submitted?

- CAISO does not see or read the E-Tag of the ETSR between two EIM Entity BAAs.
- Hourly Base Schedules are submitted for the Base ETSRs in the DA time frame and updated by T-55 before the operating hour, although technically they may be adjusted up to T-40.
- Real-time Interchange Schedules pre-hour for the ETSRs will also be submitted showing the most updated forward values for the base schedules. The values for the Real-time Intertie Schedules for the ETSRs will be 5-minute ramped values up to the end of the next hour.
- Real-time Interchange Schedules after-the-fact (RTSI ATF) for the ETSRs will also be submitted showing the final schedule values for the base schedules. The values for the RTSI ATF will be un-ramped 5-minute quantities to be used by CAISO Settlement System.
- Only one EIM Entity associated with the ETSR shall submit the Hourly Base Schedule, pre-hour RTSI, and the ATF RTSI.
- If gross inadvertent accumulation is occurring it may be an issue with ATF adjustments (tag failing, SC not submitting them, etc.)

2.3 How Are Static and Dynamic ETSR Limits submitted?

- Import and Export E-tags are put in by the EIM entity at least one day before the start of the operating day. By default, CAISO encourages the new onboarding entity to submit the E-tags with the partner EIM entity being the approver of the tag.
- Each EIM Entity submits the ETSR limit to/from its side of the intertie through an EIM Dynamic Limit interface, usually referencing the limit of the transmission profile of the ETSR tag, plus any other limiting factors that might affect the transfer.
- For ETSRs that are with the CAISO BA, only the EIM Entity will submit the ETSR limit.
- For ETSRs that are with the CAISO BA, the CAISO Curtailments may affect the limit the market uses for the ETSR.

Note: Further detail on Interchange Scheduling and Limits for ETSR are referenced in the EIM knowledge articles.

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

2.4 How Is an ETSR dispatched?

An ETSR is dispatched based on the following:

- Imbalance of energy
- Economic re-dispatch
- Limits of transfer
- Net scheduling limits on the energy transfer between BAs.
- Resources capability, in the market system, to back the energy transfer

For more information, see the EIM Business Practice Manual (BPM) section 11.1.5 at: [https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy Imbalance Market](https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy%20Imbalance%20Market)


3.0 Process Overview

3.1 Roles of Responsible Parties

Role	Description
Facilitator / EIM Market Operator (CAISO)	Facilitates the ETSR process as part of EIM implementation
Onboarding EIM Entity	Leading the identification, definition, testing, and implementation of ETSRs, and the submission of the energy limits of each of the defined static and dynamic ETSRs.
Neighboring EIM Entity	Participating in the definition, testing, and implementation of the ETSRs, and submitting the energy limit on each of the defined static and dynamic ETSRs.

3.2 Identifying ETSRs Process


The table below summarizes main deliverables and target milestones for identifying ETSRs with neighboring BAs. During these discussions it is important that the two EIM Entities (Neighboring and Onboarding EIM entity) come to a consensus on items listed in Appendix A. Note: It is important to note that the timing indicates the beginning of the effort, but does not dictate the completion of one deliverable prior to other deliveries starting.

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019


Deliverable	Description (specific to ETSRs)	Owner	Timing
EIM Entity Assessment	Document completed by the EIM Entity to provide CAISO with any information that will assist in the facilitation of ETSRs associated with this implementation.	Onboarding EIM Entity	T-18 Months
Project Implementation Plan	Include ETSR facilitation into the Project Implementation Plan.	CAISO and Onboarding EIM Entity	T-18 Months
Project Joint Integration Schedule	Include ETSR tasks in the Project Joint Integration Schedule.	CAISO and Onboarding EIM Entity	T-17 Months
Project Issues/Risks Tracker	Identify any specific issues and risks that might be associated with new ETSRs that will be defined.	CAISO and Onboarding EIM Entity	T-17 Months
System Impact Assessment	Identify any unique impacts associated with the ETSRs identified for this implementation.	CAISO	T-15 Months
EIM Activation Plan	Include ETSRs as part of the EIM Activation Plan.	CAISO and Onboarding EIM Entity	T-6 Months

3.3 Define ETSRs Process

Deliverable	Description	Owner	Timing
Initial ETSR discussions	Schedule an initial ETSR discussion with each neighboring EIM Entity where an ETSR will be defined.	Onboarding and impacted EIM entities	T-16 Months
Ongoing ETSR discussions	Continue to hold discussions with the appropriate parties until agreement is reached on the definition of the ETSRs, so that the responsible EIM Entity can submit the ETSRs to the California ISO.	Onboarding and impacted EIM entities	T-16 through T-12 Months

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

Deliverable	Description	Owner	Timing
Submission of Defined ETSRs in CAISO IRDT	Formalize the defined ETSR names and Interties associated with each for inclusion in the CAISO Market Model.	Onboarding EIM Entity and CAISO	T-12 Months
Decision about ETSR content and the pre-hour eTag submittal	The onboarding EIM Entity and the neighboring EIM Entities decide who will submit tags and other data (see Appendix A). Note: CAISO market operator is open to either option but having the Neighboring EIM Entity submits for new ETSRs is not typical because it makes the onboarding EIM entity dependent on the Existing Entity for market simulation and Parallel Operations for submitting base schedules and after-the-fact tags for proper settlement purposes.	Onboarding and impacted EIM entities	T-12 Months
Decision about after-the-fact ETSR schedule submission	If the ETSR is between an EIM and CAISO, the CAISO will approve the e-Tags corresponding to the ETSRs between the CAISO and the EIM BAA. Otherwise, the EIM BAA that is responsible for the submission of the eTag shall approve it. The BAA that approved ATF eTag will submit the ATF schedule values to Settlements.	Onboarding and impacted EIM entities	T-6 Months
Decision about the determination of the financial pricing aggregate node of ETSRs	The impacted EIM Entities need to determine the relationship between the EIM BAA DGAP prices and financial location (default values is 50% each)	Onboarding and impacted EIM entities	T-6 Months
Decision about the determination of the settlement of Base ETSRs	The impacted EIM Entities need to determine if the BASE ETSRs should receive a financial Settlement of the Imbalance Energy.	Onboarding and impacted EIM entities	T-6 Months
Checkpoint Meetings – if needed	Working and status meetings to evaluate and facilitate project implementation progress.	Onboarding and impacted EIM entities	As needed


 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

3.4 Implement ETSRs Process

Tasks	Task Description	Target Date
Task 1	Implement Agreed ETSR with Connectivity test	T-7 Months
Task 2	Verify awarded values during integration testing	T-6 Months
Task 3	Verify Market Sim scenarios	T-5 Months
Task 4	Activated at Parallel Operations and open transfer – compare EIM Base with both EIM Entities	T-2 Months

3.5 Testing ETSRs Process

Phase	Testing Description	Target Date
Connectivity	Ability to Ping CAISO system for the following Service: <ul style="list-style-type: none"> • EIMDynamicLimitData (EIMDL) • EIMRTInterchangeScheduleData (RTSI) 	T- 7 Months (Connectivity Testing Start Date Here)
Day in the Life	Submit/Update: <ul style="list-style-type: none"> • EIMDL • RTSI – PreHour • RTSI - ATF 	T-6 Months (DITL Testing Timeframe Start Date Here)
Market Simulation	Market Simulation time frame allows both the onboarding EIM entity and neighboring EIM Entity the ability to validate the base schedule MW and confirm submission. See below for details on market scenarios.	T-6 Months (Market Simulation Timeframe Start Date Here)
Parallel Operations	EIM Entities validate agreed upon tag inclusion of Base ETSRs and the tagging responsibilities during parallel operations.	T-4 Months (Parallel Operations Timeframe Start Date Here)

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

3.6 Testing Scenarios


Scenario Number	EIM Implementation “EIM Entity”	
1	Description	Base ETSR Schedule and review between the Onboarding EIM entity and the Neighboring EIM Entity
	ISO Actions	CAISO will load a canned bid set or stream bids, for non EIM entities, the CAISO will create base schedules based for interchange data, and demand forecast. For EIM entities CAISO will validate the schedules are balanced and feasible. CAISO will run Real Time markets and publish results. Publish Settlements Statements.
	EIM Entity Participant Actions	The onboarding EIM Entity will submit base schedules for base ETSRs. The neighboring EIM Entity will be able verify the submitted base schedule. The neighboring EIM entity will be able to review to confirm the base MW value. The onboarding will verify outcome Real Time results for base ETSRs.
	ISO Market Participant Actions	Review EIM GHG Shadow Prices, EIM Transfer Limits, EIM Transfer MW’s, Net EIM Transfer Net MW, EIM Transfer Shadow Price, EIM Entity Demand Forecast, EIM BAA dynamic NSI and EIM LMP’s on OASIS.
	Expected Outcome	No deviation from submitted base schedules for base ETSRs. DOT in ADS for Base ETSRs is equal to the submitted base schedules. Operator is not able to modify limits for base ETSRs (EIM/ETSR Detail display). Base ETSR LMP is calculated using following formula: Base ETSR LMP = FROM_Location LMP * Split_Ratio + TO_Location LMP * (1 – Split_Ratio).
	Anticipated Settlement Outcome	Primary: 64600, 64700, 64750 Secondary: 64770, 67740, 69850, 6478

Scenario Number	EIM Implementation “EIM Entity”	
2	Description	Restricted MW EIM Transfer limit for EIM Entity BA to EIM Entity BAA, demonstrating that the most constraining transfer limit between the onboarding EIM Entity and the neighboring EIM Entity is enforced.
	ISO Actions	CAISO to manually set EIM Transfer low/high limits to agree upon value. Energy Transfer limits will be set on all interties between two BAAs
	EIM Entity Participant Actions	Verify the agreed upon transfer limits are enforced.


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 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

Scenario Number	EIM Implementation “EIM Entity”	
	ISO Market Participant Actions	Review EIM GHG Shadow Prices, EIM Transfer Limits, EIM Transfer MW's, Net EIM Transfer Net MW, EIM Transfer Shadow Price, EIM Entity Demand Forecast, EIM BAA dynamic NSI and EIM LMP's on OASIS.
	Expected Outcome	EIM transfers from EIM Entity to EIM Entity are limited
	Anticipated Settlement Outcome	CC 64600, CC 64700, CC 491, CC 67740, CC 69850, and CC 64770

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

Appendix A – EIM Entities ETSR Discussion

1. EIM Entities Bilateral Trades – The EIM entities will need to identify existing bilateral transfers between the on boarding EIM Entity and the neighboring EIM entities to determine what tags need to be part of the EIM Base ETSRs, and if there is a need to have multiple EIM Base ETSRs for different bilateral trades.
 - a. The EIM entities should identify and agree on the list of tags that should be included as an EIM BASE limited for energy that is sourced from within either of the two entities - non optimized base transfer.
 - b. The EIM entities should identify and agree on the list of tags that should be included as an EIM Static ETSR and/or EIM Dynamic ETSR limited for energy that is sourced from within either of the two entities - optimized base transfer.
 - c. The EIM entities should identify and agree on the list of tags that should be included as an EIM Base ETSR limited for energy that is sinked or sourced from outside of either of the two entities (wheeled through first BA) and sinked and source within one of the BAs.
 - d. The EIM entities should identify and agree on the list of tags that should be included as an EIM Base ETSR limited for energy that is sinked or sourced from outside of either of the two entities (wheeled through second BA) and sinked and sourced outside both the BAs.
 - e. The EIM entities need to agree on whether the identified EIM Base ETSR should be defined as a settled or not to be settled in the market.
 - f. The EIM entities need to agree on any special business rules need to be accounted for based on Transmission Provider (TP) using the same defined tie that the EIM entities would use for transfer.
2. EIM Entities existing transfer rights – The EIM entities need to identify all transfer rights From and To each of the EIM BAs through each of the identified ETSRs, including any binding limit affecting multiple ETSRs, this will be the dynamic transfer amount and Inter Tie Transmission Constraint (ITC), respectively.
 - a. The EIM entities need to agree how they plan on calculating the available transmission limit for the ETSR based on the tags, and how they will account for counter flow.
 - b. Determine and agree how specific transmission outages impact the ETSR limits between the two EIM entities.
 - c. Determine if an ETSR is defined using jointly owned transmission of a non-EIM entity, how limits will be calculated.
 - d. Identify and agree with any third parties or entities that might be impacted or shared transmission that is used when defining an ETSR.
3. EIM Entities ETSR data Submit – The EIM entities need to agree on which entity will be responsible for:

 California ISO	Technology	Template Version:	1.0
		Document Version:	0
EIM Process Overview – Facilitating ETSRs		Date Created:	5/22/2019

- a. Submitting the eTags for Static and Dynamic ETSR.
 - i. For ETSRs between CAISO and an EIM entity, the EIM entity will always be responsible for submitting the eTag.
- b. Approving the eTags for Static and Dynamic ETSRs.
 - i. For ETSRs between CAISO and an EIM entity, the CAISO will always be responsible for approving the eTag.
- c. Submitting the Base Schedule for the EIM Base ETSR.
- d. Submitting the PRE HOUR for the EIM Base ETSR.
- e. Submitting the PRE HOUR updates for the schedules of the bilateral tags of the EIM Dynamic ETSRs, note: this is only applicable with the TTC methodology.
- f. Submitting the after-the-fact for the EIMBASE.
 - i. For ETSRs between CAISO and an EIM entity there will not be any EIM Base schedules.
- g. Submitting the after-the-fact for the transfer ETSR whether EIM Dynamic ETSRs or EIM Static ETSRs
 - i. Only one entity should submit schedules to the Market Operator, otherwise risk overwriting each other's data.
 - ii. For schedules between CAISO and an EIM Entity, the After-the-fact schedules are submitted by CAISO BA, the entity should not submit these.