



CAISO Intra-Hour Scheduling Pilot Program, Version 4

Effective: 10/09/13

Bonneville Power Administration - Transmission Services (BPA) and California Independent System Operator (CAISO) are conducting a joint pilot program (Pilot) to evaluate the use of intra-hour scheduling on the California-Oregon Intertie. This pilot program is intended to help facilitate the export of energy from Wind Facilities located in BPA's Balancing Authority Area into the CAISO Balancing Authority Area. If successful, the BPA-CAISO Pilot program will provide better scheduling and balancing flexibility for variable energy resources such as wind.

The Pilot, which is limited to 200 MW of wind project participation began in October 2011 . In 2012, BPA, the CAISO, and participants agreed to continue the pilot until BPA implements 15 minute scheduling and the CAISO implements it proposed 15 minute market. These are expected to occur in mid-2014.

The Pilot uses dynamic e-Tagging and communication to facilitate intra-hour schedule changes. Participants submit dynamic e-Tags hourly to export power from their Wind Facilities to California. BPA uses the dynamic e-Tag to create a schedule with the CAISO. During the operating hour, participants update their e-Tag for the second half hour of the hour to reflect an intra-hour schedule change (either to increase or decrease). BPA adjusts the schedule accordingly. Because the schedule is only changing at prescribed times, ramp rates and during ramp periods, the intra-hour transactions do not affect [Dynamic Transfer Capability](#)¹ (DTC) on the BPA system. Thus, while these transactions will be effected through the use of dynamic e-Tags they are not subject to the [Dynamic Transfer](#)² Operating and Scheduling Requirements Business Practice.

Version 4 revises the introduction to make clear that the pilot program will continue until BPA implements 15 minute scheduling and the CAISO implements it proposed 15 minute market.

¹The capability of the transmission system to accommodate continuous ramping of a resource (s) over a pre-determined range, such that the control of the electrical output of such resources(s) can be varied from moment to moment by an entity other than the host utility/host Balancing Authority Area operator.

²A term that refers to methods by which the control response to load or generation is assigned, on a real-time basis from the Balancing Authority to which such load or generation is electrically interconnected (native Balancing Authority) to another Balancing Authority (attaining Balancing Authority) or other controlling entity on a real-time basis. This includes Pseudo-Ties, Dynamic Schedules, and dynamic arrangements within the BPA Balancing Authority Area.

A. Eligibility and Applicability Criteria

1. Each **Participant**¹ must have control of a **Wind Facility**² located in the BPA Balancing Authority Area.
2. Each Participant must be a Certified Scheduling Coordinator in the CAISO.
3. Each Participant must have responded to the Notice of Interest posted by BPA on January 13, 2011 and have been selected as a participant. Initially three Participants will be allowed. Participation may be expanded during pilot program.
4. Each Participant must sign participant agreements with BPA and the CAISO.
5. Initially, participation is limited to an aggregate of 200 MW. Each Participant will be allocated a portion of the 200 MW limit. The MW limit and allocations may be modified during the pilot program with a 30 day notification period unless in the opinion of BPA the 30 day notice would compromise system reliability
6. No DTC is required to participate in the pilot program.

B. Procedures for Submitting Intra-Hour Schedules

1. Participants must meet the following requirements:
 - a. Prior to the hour the Participant must submit a dynamic e-Tag for the hour.
 - b. The hourly e-Tag must be submitted in accordance with the [Scheduling Transmission Service Business Practice](#).
 - c. The hourly e-Tag must use firm transmission reservations on all BPAT transmission segments.
 - d. The **Transmission Profile**³ of the hourly e-Tag must represent the maximum schedule for the hour and may not be adjusted during the hour.
 - e. The **Energy Profile**⁴ of the hourly e-Tag must represent the desired schedule to be

¹An entity that operates a Wind Facility or other Variable Energy Resource within BPA's Balancing Authority Area and that has signed a Supplemental Service Agreement agreeing to supply or purchase Supplemental Services for that Wind Facility.

²A collection of individual wind generating turbines operated as a single generation resource with a common point of interconnection to BPA's transmission system.

³The maximum amount of firm reserved capacity set aside to cover the Energy Profile. The data on the e-Tag related to the hourly Transmission Demand.

⁴The data on the e-Tag related to the hourly interchange schedule.

ramped between XX:50 and XX:10.

- f. During the hour, the Participant may submit an Intra-Hour **Schedule Request**¹ to adjust the Dynamic e-Tag.
2. The Intra-Hour Schedule Request must be submitted in accordance with the Intra-Hour Scheduling Business Practice.
 - a. The Intra-Hour Schedule Request must not change the Transmission Profile of the e-Tag.
 - b. The Intra-Hour Schedule Request will represent the desired schedule to be ramped in between XX:25 and XX:35.
 3. Only one dynamic intra-hour e-Tag is permitted per hour for each participating Wind Facility.

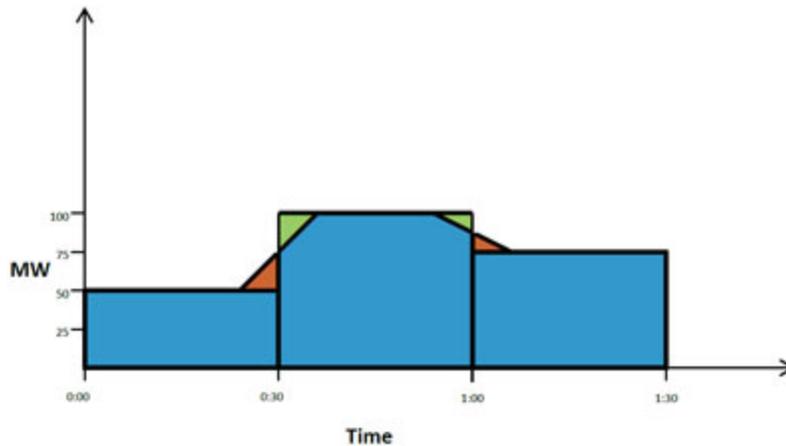
C. After the Hour Accounting

1. After the hour, BPA will calculate the integrated MWh value of the **Dynamic Schedule**² for each half hour. For ramping periods, any MW in excess of the e-Tag Energy Profile will be allocated to the adjacent, higher MW period.

Example: In the illustration below, the blue areas represent the e-Tag Energy Profile. The red triangles represent the MW in excess of the e-Tag energy profile and the green triangles represent the Dynamic Schedule that is less than the e-Tag Energy Profile. The red areas will be allocated to the green areas when calculating the integrated MWh value. The result will be an integrated MWh value that closely reflects the intra-hour request.

¹Changing the schedule for energy delivery between generation and load by means of an e-tag creation or market level adjustment.

²A telemetered reading or value that is updated in real time and used as a schedule in the Automatic Generation Control (AGC) and the Area Control Error (ACE) equation and the integrated value of which is treated as a schedule for interchange accounting.



2. After the hour, BPA will automatically update the e-Tag with the sum of the two half hour integrated MWh values rounded to the nearest whole MWh.
3. Generation Imbalance accounting for generators participating in the Pilot is calculated in accord with the [Ancillary and Control Area Services Rate Schedule](#) and the [Generation Imbalance Service Business Practice](#). When there has been an intra-hour change to the schedule, the 30 minute schedules will be calculated as follows:
 - a. For the first half of the hour, the 30 minute integrated MWh value from XX:00 to XX:30 will be used for the schedule component of the Generation Imbalance calculation.
 - b. For the second half of the hour, the first 30 minute integrated MWh value from XX:00 to XX:30 will be subtracted from the hourly e-Tag MWh value to determine the schedule component of the Generation Imbalance calculation.

D. Additional Information

Related Business Practices

- Intra-Hour Scheduling
- Requesting Transmission Service
- Scheduling Transmission Service
- **Generation Imbalance Service¹**

Version History

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| Version 4 | 10/09/13 Version 4 revises the introduction to make clear that the pilot program will continue until BPA implements 15 minute scheduling and the CAISO implements it proposed 15 minute market. |
| Version 3 | 05/10/12 Version 3 removes the reference to the Pilot Program (Phase III) in B.2 and updates the title of the Intra-Hour Scheduling Business Practice under Related Business Practices in Section D. |
| Version 2 | 05/01/12 Version 2 updates the calculation of an intra-hour change to the 30 minute scheduling in step C.3.a-b. |
| Version 1 | 10/07/11 New business practice. |

¹The Generation Imbalance component of Variable Energy Resource Balancing Service (VERBS).