



California ISO
Shaping a Renewed Future

Business Requirements Specification

Circular Scheduling Market Rule

Document Version: 1.0

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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 determining the scope of Information Systems projects and to all Business Process Modeling and System Requirements Specifications efforts.


These requirements will serve as the initial set of business unit requirements for the appropriate software application/systems development effort. It is understood that additional requirements and systems analysis may produce “To Be” Business Process Models, System Requirements Specifications, and Use Cases to serve as the set of requirements documents used by the development teams to buy, modify, or build the necessary software and hardware systems. The Business Unit(s) involved in the project will have an opportunity to review and approve all requirements documentation produced.

One class of circular scheduling involves the delivery of market import and export schedules by a single party that, possibly in combination with segments in multiple balancing authority areas (BAAs), have the source and sink in the same BAA. Because the power scheduled for export from the ISO would be returned on transmission outside the ISO back to the point where the import was originally scheduled into the ISO, these circular schedules would not produce an actual flow of power. However, a market participant could profit from the circular schedule by earning the price difference between the points at which the energy was scheduled to be imported to and exported from the ISO. The market participant could also profit from Congestion Revenue Rights (CRR) that are impacted by the circular schedule. Circular schedules have the potential to exacerbate unscheduled flows on the ISO interties by introducing market schedules across the interties that will not produce any actual flow of energy. The incorrect modeling of flows on the ISO'S interties, may produce a sub-optimal unit commitment. Circular schedules can also make it more difficult for ISO operators to manually manage congestion if needed in real time since the ISO may not get congestion relief (or a reduction in actual flows) if it has to curtail one or both parts of circular schedule.

The circular scheduling market rule initiative addresses development of market rules to alleviate operational concerns and market efficiency issues caused by the circular schedules. Specifically, the proposal:

1. Identifies one type of circular schedule.
2. Imposes settlement rules to reduce the financial incentive significantly to submit a circular schedule.
3. Applies the CRR claw-back rule to the circular schedule.

Under the proposal, other types of scheduling practices that could be construed as circular scheduling will be addressed through ongoing market monitoring and potential FERC enforcement.

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1.2 References


All references represent external requirements documents or stakeholder requests developed and submitted by the Business Units.

1. Policy-related documents, including the Draft Final Proposal and stakeholder comments are located on the “Circular Scheduling” Stakeholder Initiatives web page at:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/CircularScheduling.aspx>

2. FERC filings and orders, including Tariff Amendment on Settlement Rules for Circular Scheduling is located on the “Circular Scheduling” Stakeholder Initiatives web page at:


<http://www.caiso.com/informed/Pages/StakeholderProcesses/CircularScheduling.aspx>

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2. Details of Business Need/Problem

2.1 Description

| Business Opportunity/Problem Statement - | |
|--|--|
| What: | Establish automated settlement rules to remove financial incentives for creating circular schedules. This will alleviate operational concerns and market efficiency issues caused by circular schedules. |
| When: | Circular scheduling has been a potential problem since ISO start-up. |
| Why do we have this opportunity/problem: | <p>One class of circular scheduling involves the delivery of market import and export schedules by a single party that, possibly in combination with segments in multiple balancing authority areas (BAAs), have the source and sink in the same BAA.</p> <p>Circular schedules would not produce an actual flow of power. The ISO has operational and market concerns that can result from circular scheduling, including:</p> <ul style="list-style-type: none"> - These schedules have the potential to exacerbate unscheduled flows on the ISO's interties by introducing market schedules that will not produce any actual flow of energy. - Increasing congestion management costs that are imposed on other market participants. - Circular schedules can also make it more difficult for ISO operators to manually manage congestion if needed in real time. - Market participant could profit from circular schedules by earning the price difference between the points at which the energy was scheduled to be imported to and exported from the ISO. - The market participant could also profit from Congestion Revenue Rights (CRR) impacted by the its circular schedule. |
| Who does this opportunity/problem impact: | Market Participants; CAS, MQS, Settlements, Price correction systems; Legal |

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3. Business Process Impacts

3.1 High Level Business Process

3.1.1 Description

This initiative impacts the following business processes:


- **Manage Interchange Scheduling** – Modifications to CAS to enable identification of circular schedules for a single e-tag. Vendor (MCG) software is required to be modified.
- **Manage MQS** – Modify claw-back engine to define and include CRR claw-back value for circular schedules. Vendor (Siemens) software is required to be modified.
- **Manage Billing and Settlements** – Include a new settlement market rule to negate the incentive to submit bids that would lead to circular schedules.

3.2 Justification

One class of circular scheduling involves the delivery of market import and export schedules by a single party that, possibly in combination with segments in multiple balancing authority areas (BAAs), have the source and sink in the same BAA.

Circular schedules would not produce an actual flow of power. The ISO has operational and market concerns that can result from circular scheduling, including:

- These schedules have the potential to exacerbate unscheduled flows on the ISO's interties by introducing market schedules that will not produce any actual flow of energy.
- Increasing congestion management costs that are imposed on other market participants.
- Circular schedules can also make it more difficult for ISO operators to manually manage congestion if needed in real time.
- Market participant could profit from circular schedules by earning the price difference between the points at which the energy was scheduled to be imported to and exported from the ISO.
- The market participant could also profit from CRRs impacted by its circular schedule.

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4. 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.

It is to be noted that the ISO cannot articulate every possible trading scheme in its tariff. For scheduling practices that go beyond a specifically-defined pattern, the ISO believes that such conduct can be addressed through application of FERC's current policies for market monitoring and enforcement of FERC Rule 1c.2 (18 C.F.R. § 1c.2). Nevertheless a specific class of schedule can be defined based on objectively identifiable behavior, through a market rule applicable to the ISO's current market structure.

The ISO's proposal defines market rules regarding the circular schedules and establishes automated settlement rules to remove financial incentives for creating circular schedules. The settlement rule would apply only to schedules involving a single scheduling coordinator.

The major implementation efforts include:

1. Identify the circular schedules for the single SC with Single e-tagged schedule with source/sink in the same BAA (CAISO or any other BAA).
2. Exclude the loop schedule that has DC intertie segment; If the transmission segment on the DC intertie were excluded and the remaining energy schedules still include a closed loop of energy schedules between the ISO controlled grid and one or more BAAs, then the settlement rule will apply.
3. Exclude Pseudo-tie schedule; Delivery of energy from a pseudo-tie generating unit to the BAA with which the pseudo-tie becomes associated will not be subject to the proposed settlement rule. If after excluding the pseudo tie(s) from the circular schedule, the resulting hypothetical schedule would have an associated e-Tag reflecting a source and a sink in the same BAA, then the schedule is not excluded.
4. Exclude "Open intertie" or "isolated intertie" schedule; Delivery of energy during an "isolated intertie" or "open intertie" condition will not be considered a circular schedule. If after excluding the segment(s) which temporarily (a) serve a load or (b) deliver power from a generating unit that has become isolated from the BAA because of an outage; the resulting hypothetical schedule would have an associated E-Tag reflecting a source and a sink in the same BAA, then the schedule is not excluded.
5. Exclude the "Wheeling through" transactions; Transactions which include the use of the CAISO controlled grid for the transmission of energy from a resource located outside the CAISO controlled grid to serve a load located outside the transmission and distribution system of a participating Transmission Owner. If after excluding the segment(s) which involve a wheeling-through transaction, the resulting hypothetical schedule would have an associated E-Tag reflecting a source and a sink in the same BAA, then the schedule is not excluded.
6. Create circular scheduling payload with import and export schedules and MWs.
7. Build settlement rule that applies to a circular schedule, settle the Import to the ISO at the lower of LMPs at scheduling points for scheduled import and export MW quantities. Rules will be specified in this section of the document for market priority across market settlements and imbalance allocations.
8. Apply CRR claw-back rule to an SC that submits a circular schedule that contributes to congestion on a path for which that SC holds CRRs. CRRs on both the import and export paths subject to claw-back for the SC's schedule that is identified as circular schedule segment at import or export point. This has to be evaluated at the portfolio-level along with the virtual bids when the claw-back is imposed.
9. Monitor Multi-SC circular schedule through MAD process.

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Out of scope:

Multi-SC circular schedules and Individual but not linked e-tags that reveal circular schedules will not be addressed at automated settlement rule. They will be monitored by the ISO. The settlement rule would apply only to schedules involving a single scheduling coordinator.


4.1 Business Process: Manage Interchange Scheduling - CAS

A new business process has to be created within CAS to identify the specific class of circular schedules that can be defined based on objectively identifiable behavior. The CAS is expected to incorporate changes to its software to be able to create a new circular scheduling payload with import and export schedules and MWs. This new circular scheduling payload will be consumed by MQS and Settlements in the downstream.

The business process must include the following steps:

1. Identify the circular schedules for the single SC with Single e-tagged schedule with source/sink in the same BAA (CAISO or any other BAA).
2. Exclude the loop schedule that has DC intertie segment; If the transmission segment on the DC intertie were excluded and the remaining energy schedules still include a closed loop of energy schedules between the ISO controlled grid and one or more BAAs, then the settlement rule will apply.
3. Exclude Pseudo-tie schedule; Delivery of energy from a pseudo-tie generating unit to the BAA with which the pseudo-tie becomes associated will not be subject to the proposed settlement rule. If after excluding the pseudo tie(s) from the circular schedule, the resulting hypothetical schedule would have an associated e-Tag reflecting a source and a sink in the same BAA, then the schedule is not excluded.
4. Exclude "Open intertie" or "isolated intertie" schedule; Delivery of energy during an "isolated intertie" or "open intertie" condition will not be considered a circular schedule. If after excluding the segment(s) which temporarily (a) serve a load or (b) deliver power from a generating unit that has become isolated from the BAA because of an outage; the resulting hypothetical schedule would have an associated E-Tag reflecting a source and a sink in the same BAA, then the schedule is not excluded.
5. Exclude the "Wheeling through" transactions; Transactions which include the use of the CAISO controlled grid for the transmission of energy from a resource located outside the CAISO controlled grid to serve a load located outside the transmission and distribution system of a participating Transmission Owner. If after excluding the segment(s) which involve a wheeling-through transaction, the resulting hypothetical schedule would have an associated E-Tag reflecting a source and a sink in the same BAA, then the schedule is not excluded.
6. Create circular scheduling payload with import and export schedules and MWs.

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|--|------------------|---------------------------|-----------------------------------|
| CS-BRQ006 | <p>System shall pass the information on all identified circular schedules for use by downstream applications.</p> <p>Business Rule:</p> <p><i>System shall create a new payload for each identified circular schedule, including but not limited to –</i></p> <ul style="list-style-type: none"> (a) <i>Single E-Tag ID (“Tag Info”; Example – CISO_CCG000419WW01_CISO)</i> (b) <i>Import Resource ID / Tie Generator ID</i> (c) <i>Export Resource ID</i> (d) <i>Time Interval</i> (e) <i>Circular Scheduled MW</i> (f) <i>Circular Flag</i> | Core | PSTO | CAS, Integration |

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4.2 Business Process: Manage MQS – CRR Settlement Rule

The ISO proposes to adjust the revenue from the CRRs of a CRR holder where the Scheduling Coordinator representing that CRR holder has:

- (a) Submitted bids which results in a circular schedule; and
- (b) The resulting schedule(s) impacts the value of the CRRs in the DAM held by that CRR holder.

Such adjustment or CRR claw-back will occur if the following circumstances are all met:

1. A portion of the E-Tag that uses the ISO controlled grid relates to a schedule in the IFM.
2. The scheduled MW on the portion of the E-Tag using the ISO controlled grid has a positive PTDF on a congested transmission element, where that congestion is measured in the direction of the CRR; and
3. The CRR holder would receive payments from CRRs on the congested transmission element.

If such circumstances occur, the revenue adjustment will be a reduction in payments, or increase in charges, to the CRR holder equal to the additional net CRR revenue that otherwise would be earned from the congestion created by the circular schedule.


4.2.1 Business Requirements

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|--|------------------|---------------------------|-----------------------------------|
| CS-BRQ007 | <p>System shall have the capability to consume the new information, which identifies circular schedules with import & export schedules and MWs.</p> <p>Business Rule:</p> <p><i>System shall consume a new payload from CAS for each identified circular schedule, including but not limited to –</i></p> <ul style="list-style-type: none"> (a) <i>Single E-Tag ID (“Tag Info”; Example – CISO_CCG000419WW01_CISO)</i> (b) <i>Import Resource ID / Tie Generator ID</i> (c) <i>Export Resource ID</i> (d) <i>Time Interval</i> (e) <i>Circular Scheduled MW</i> (f) <i>Circular Flag</i> | Core | PSTO, PSTD | MQS, CRRS, CAS, Integration |

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|--|--------------------------------|---------------------------|-----------------------------------|
| CS-BRQ008 | <p>System shall have the capability to consume <u>corrections</u> to the new information (payload), which identifies circular schedules with import & export schedules and MWs.</p> <p>Business Rule:</p> <p><i>System shall consume corrections to the new circular schedule payload from CAS for each identified circular schedule.</i></p> | Core | PSTO, PSTD | MQS, CRRS, CAS, Integration |
| CS-BRQ009 | System shall identify the scheduled MW in IFM for all the segments that make up the circular schedule. | Core | PSTO, PSTD | CRRS |
| CS-BRQ010 | <p>Criterion for CRR claw-back</p> <p>System shall examine if the circular schedule satisfies <u>ALL</u> of the following conditions:</p> <ol style="list-style-type: none"> 1. A portion of the E-Tag that uses the ISO controlled grid relates to a schedule in the IFM. 2. The scheduled MW on the portion of the E-Tag using the ISO controlled grid has a positive PTDf on a congested transmission element; where that congestion is measured in the direction of the CRR; and 3. The CRR holder would receive payments from CRRs on the congested transmission element. <p>If <u>ALL</u> of the above conditions are true;</p> <p>The System will ensure that ISO imposes a reduction in payments, or increase in charges, to the CRR holder equal to the additional net CRR revenue that otherwise would be earned from the congestion created by the circular schedule.</p> | Core Tariff 11.2.4.7 | PSTO, PSTD | CRRS |
| CS-BRQ011 | <p>Mapping SCs and CRR Holders</p> <p>System shall create the list of all circular schedules and map each of the circular schedules for the time period, <i>t</i>, to the respective:</p> <ol style="list-style-type: none"> (a) Scheduling coordinators (b) CRR holders | Core | PSTO, PSTD | CRRS |

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|--|------------------|---------------------------|-----------------------------------|
| CS-BRQ012 | <p>MW Flow Contribution Due to Circular Schedules</p> <p>System shall compute the total MW flow contribution from all the segments of circular schedules of the entity CRR holder to the total MW flow on each binding constraint, <i>i</i> in IFM for the time period, <i>t</i>.</p> <p>Business Rule:</p> <p>The computation shall be performed as follows:</p> $F_{IFM\ i,t,k} = \sum_{j \in \{J\}_{k,t}} \max(SF_{IFM\ i,j,t}, 0) * \min(MW_{j,t,k}, CRR_Inj)$ <p>Where;</p> <p><i>i</i> = Binding constraint</p> <p><i>K</i> = An entity (SC) which owns a CRR portfolio</p> <p><i>t</i> = Time period for which the entity holds the CRR portfolio</p> <p><i>h</i> = Hour under consideration; $h \in t$</p> <p>$SF_{IFM\ i,j,t}$ is the positive PTFD of constraint <i>i</i> at node <i>j</i> during time <i>t</i> in the direction of CRRs; and</p> <p>$MW_{j,t,k}$ is the circular schedule of entity <i>k</i> during time <i>t</i></p> | Core | PSTO, PSTD | CRRS |

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|---|-------------------------------|--|-----------------------------------|
| CS-BRQ013 | <p>CRR Claw-Back Settlement Amount</p> <p>System shall compute the CRR claw-back settlement amount due to circular schedules for each of the entities holding CRR portfolio for the time period t.</p> <p>Business Rule:</p> <p>The computation is performed as follows:</p> $CBA_{IFM,i,t,k} = \sum_{j \in \{J\}_{k,t}} F_{IFM,i,t,k} \lambda_{IFM,t}$ <p>Where;</p> <p>$CBA_{IFM,i,t,k}$ is the claw back amount for circular schedules for constraint i for time period t,</p> <p>$\lambda_{IFM,t}$ is the shadow price in IFM of the congested element for time period t; and</p> <p>$F_{IFM,i,t,k}$ is the total MW flow contribution from all the segments of circular schedules of the entity CRR holder to the total MW flow on each binding constraint, i.</p> | Core | PSTO, PSTD | CRRS |
| CS-BRQ014 | System shall identify CRR claw-back settlement amount due to circular schedules, separately from CRR claw-back amount for convergence bids. | Core | PSTO, PSTD | CRRS |
| CS-BRQ015 | System shall pass the information on CRR claw-back settlement amount due to circular schedules for each of the entities holding CRR portfolio for the time period t , for use by downstream applications, including Settlements. | Core | PSTO, PSTD | CRRS, Integration, Settlements |
| CS-BRQ016 | <p>Price Correction Derived LMP</p> <p>The System shall not correct the export resource LMP for the exports that are identified as part of a circular schedule.</p> <p>Business Rule:</p> <p><i>This rule shall be implemented in MQS.</i></p> | Core Tariff 11.21.1 | PSTO, PSTD, Market Settlement Design and Configuration | MQS /MAPP, Settlements |

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4.3 Business Process: Manage Billing and Settlements – Circular Schedule Rule

The ISO’s proposal defines market rules for a specific class of circular schedules that can be defined based on objectively identifiable behavior. The proposal establishes automated settlement rules to remove financial incentives for creating circular schedules. The settlement rule would apply only to schedules involving a single scheduling coordinator.

A new business process has to be created within Settlements and must include the following steps:

1. Consume new payload from CAS, which identifies circular schedules with import & export schedules and MWs.
2. Build settlement rule that applies to a circular schedule, settle the Import to the ISO at the lower of LMPs at scheduling points for import and export for the MW in the market the schedule was awarded. Rules will be specified in this section of the document for market priority across market settlements and imbalance allocations.
3. Apply CRR claw-back rule to an SC that submits a circular schedule that contributes to congestion on a path for which that SC holds CRRs.


4.3.1 Business Requirements

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application (s) Impacted |
|-----------|---|------------------|--|------------------------------------|
| CS-BRQ017 | <p>System shall have the capability to consume the new information, which identifies circular schedules with import & export schedules and MWs.</p> <p>Business Rule: <i>System shall consume a new payload from CAS for each identified circular schedule, including but not limited to –</i></p> <ul style="list-style-type: none"> (a) <i>Single E-Tag ID (“Tag Info”; Example – CISO_CCG000419WW01_CISO)</i> (b) <i>Import Resource ID / Tie Generator ID</i> (c) <i>Export Resource ID</i> (d) <i>Time Interval</i> (e) <i>Circular Scheduled MW</i> (f) <i>Circular Flag</i> | Core | Market Settlement Design and Configuration | Settlements, Integration, CAS |

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|--|-----------------------------|--|-----------------------------------|
| CS-BRQ018 | System shall have the capability to consume <u>corrections</u> to the new information (payload), which identifies circular schedules with import & export schedules and MWs. Business Rule: <i>System shall consume corrections to the new circular schedule payload from CAS for each identified circular schedule.</i> | Core | Market Settlement Design and Configuration | Settlements, Integration, CAS |
| CS-BRQ019 | Settlement Rule: System shall settle the import portion of any circular schedule to lower of the - (a) LMP of the scheduling point for the import portion of the schedule in the market in which the import portion of the schedule was awarded. (b) LMP of the scheduling point for the export portion of the schedule in the market in which the export portion of the schedule was awarded. | Core Tariff 11.33 | Market Settlement Design and Configuration | Settlements |
| CS-BRQ020 | System shall apply the settlement rule irrespective of whether the import and export were scheduled in the same market or are split between the day-ahead market and HASP. | Core Tariff 11.33 | Market Settlement Design and Configuration | Settlements |
| CS-BRQ021 | Market Priority: The settlement rule shall be applied to the MWs of the import awarded in IFM first, then HASP, then real-time. | Core Tariff 11.33 | Market Settlement Design and Configuration | Settlements |

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|--|------------------|--|-----------------------------------|
| CS-BRQ022 | <p>Settlement Rule Implementation Procedure</p> <p>System shall follow the steps below for applying the settlement rule:</p> <ol style="list-style-type: none"> 1. Consume circular scheduling payload from CAS. 2. Determine the break down of the import schedule of Circular Schedule MW, by market. 3. Determine the break down of the export schedule of Circular Schedule MW, by market. 4. Perform prorata comparison of LMP at the point where import was scheduled to the LMP of the point where export was scheduled, using the market priority as in CS-BRQ-021: <p><i>The settlement rule shall be applied to the MWs of the import awarded in IFM first, then HASP, then real-time.</i></p> <p><i>Appendix A presents several possible scenarios that could occur and provides some examples to illustrate how to settle following the rules described in this section.</i></p> <p><i>Examples covered in Appendix A are:</i></p> <ul style="list-style-type: none"> - <i>All circular schedule (import/export) scheduled in the IFM and HASP; Import and export are the same, by market.</i> - <i>All circular schedule (import/export) scheduled in the IFM and HASP; Import and export are different, by market.</i> - <i>All circular schedule - import scheduled in the IFM and export scheduled in HASP.</i> - <i>An Import schedule serving both load and export.</i> | Core | Market Settlement Design and Configuration | Settlements |
| CS-BRQ023 | <p>Consume CRR claw-back settlement amount from CRRS</p> <p>System shall have the capability to consume the new information, on CRR claw-back settlement amount due to circular schedules for each of the entities holding CRR portfolio for the time period <i>t</i>.</p> | Core | Market Settlement Design and Configuration, PSTO, PSTD | Settlements, CRRS, Integration |

| ID# | Business Feature | Requirement Type | Business Unit(s) Affected | Potential Application(s) Impacted |
|-----------|---|--|--|-----------------------------------|
| CS-BRQ024 | <p>Apply CRR claw-back settlement amount from CRRS</p> <p>System shall apply CRR 'claw-back' rule for the SCs that hold CRRs on the paths that the circular schedule contributes to congestion. CRRs on both the import and export paths subject to claw-back for the SC's schedule that is identified as circular schedule segment at import or export point.</p> | Core Tariff 11.2.4.7 | Market Settlement Design and Configuration, PSTO, PSTD | Settlements, CRRS |
| CS-BRQ025 | <p>BCR Ineligibility for Resources in Circular Schedules</p> <p>The System shall ensure that a resource that has a schedule identified as a circular schedule shall not be a Bid Cost Recovery (BCR) eligible resource for any settlement interval that occurs during the time period covered by the circular schedule.</p> <p>This is applied to resources, which include generating units, system units, system resources, participating loads, and proxy demand resources, participating in circular schedules.</p> | Core Tariff <i>Appendix A, Master Definitions Supplement, Bid Cost Recovery (BCR) Eligible Resources</i> | Market Settlement Design and Configuration | Settlements |

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5. Appendix A: Circular Scheduling Market Rule Examples

This appendix provides numerical examples of four settlement scenarios that may arise in implementation of circular scheduling market rule.

5.1 Example 1: All circular schedule; Import/export scheduled in the IFM and HASP; Import and export are the same, by market.

| Example 1 | Market | DAM | HASP | RT (OA) | Circular Tag | DDEV/Meter |
|---------------|-----------------|-----------|-----------|-----------|--------------|------------|
| Import | | | | | | |
| | Schedule | 70 | 30 | 0 | 100 | 100 |
| | Price | 6 | 3 | 10 | | |
| Export | | | | | | |
| | Schedule | 70 | 30 | 0 | 100 | 100 |
| | Price | 5 | 2 | 15 | | |
| Load | | | | | | |
| | Schedule | 0 | | | | |
| | Price | 7 | | | | |


| Settlement | | MW | Price | Settlement |
|---------------|--|-----------|-----------|------------|
| Import | Circular IFM Import from IFM Export | 70 | 5 | 350 |
| | Circular IFM Import from HASP Export | 0 | 2 | 0 |
| | Circular HASP Import from IFM Export | 0 | 3 | 0 |
| | Circular HASP Import from HASP Export | 30 | 2 | 60 |
| | HASP Import Remainder Settlement | 0 | 3 | 0 |
| | OA STLMT | 0 | 10 | 0 |
| Total | | | | 410 |

| | | | |
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5.2 Example 2: All circular schedule; Import/export scheduled in the IFM and HASP; Import and export are different, by market.

| Example 2 | Market | DAM | HASP | RT (OA) | Circular Tag | DDEV/Meter |
|---------------|-----------------|-----------|-----------|-----------|--------------|------------|
| Import | | | | | | |
| | Schedule | 70 | 30 | 0 | 100 | 100 |
| | Price | 6 | 3 | 10 | | |
| Export | | | | | | |
| | Schedule | 60 | 40 | 0 | 100 | 100 |
| | Price | 5 | 8 | 15 | | |
| Load | | | | | | |
| | Schedule | 0 | | | | |
| | Price | 7 | | | | |


| Settlement | | MW | Price | Settlement |
|---------------|--|-----------|-----------|------------|
| Import | Circular IFM Import from IFM Export | 60 | 5 | 300 |
| | Circular IFM Import from HASP Export | 10 | 6 | 60 |
| | Circular HASP Import from IFM Export | 0 | 3 | 0 |
| | Circular HASP Import from HASP Export | 30 | 3 | 90 |
| | HASP Import Remainder Settlement | 0 | 3 | 0 |
| | OA STLMT | 0 | 10 | 0 |
| Total | | | | 450 |

| | | | |
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5.3 Example 3: All circular schedule; Import scheduled in the IFM and export scheduled in HASP.

| Example 3 | Market | DAM | HASP | RT (OA) | Circular Tag | DDEV/Meter |
|---------------|----------|------------|------------|-----------|--------------|------------|
| Import | Schedule | 100 | 0 | 0 | 100 | 100 |
| | Price | 6 | 3 | 11 | | |
| | | | | | | |
| Export | Schedule | 0 | 100 | 0 | 100 | 100 |
| | Price | 5 | 4 | 15 | | |
| | | | | | | |
| Load | Schedule | 0 | | | | |
| | Price | 7 | | | | |
| | | | | | | |

| Settlement | | MW | Price | Settlement |
|---------------|---------------------------------------|------------|-----------|------------|
| Import | Circular IFM Import from IFM Export | 0 | 5 | 0 |
| | Circular IFM Import from HASP Export | 100 | 4 | 400 |
| | Circular HASP Import from IFM Export | 0 | 3 | 0 |
| | Circular HASP Import from HASP Export | 0 | 3 | 0 |
| | HASP Import Remainder Settlement | 0 | 3 | 0 |
| | OA STLMT | 0 | 11 | 0 |
| Total | | | | 400 |

| | | | |
|--|-------------------|--------------------------|------------------|
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5.4 Example 4: An Import schedule serving both load and export.

| Example 4 | Market | DAM | HASP | RT (OA) | Circular Tag | DDEV/Meter |
|---------------|----------|-----------|-----------|-----------|--------------|------------|
| Import | | | | | | |
| | Schedule | 40 | 70 | 0 | 100 | 110 |
| | Price | 6 | 3 | 10 | | |
| Export | | | | | | |
| | Schedule | 70 | 30 | | 100 | 110 |
| | Price | 5 | 4 | 15 | | |
| Load | | | | | | |
| | Schedule | 0 | | 10 | | |
| | Price | 7 | | 25 | | |

| Settlement | | MW | Price | Settlement |
|---------------|--|-----------|-----------|------------|
| Import | Circular IFM Import from IFM Export | 40 | 5 | 200 |
| | Circular IFM Import from HASP Export | 0 | 4 | 0 |
| | Circular HASP Import from IFM Export | 30 | 3 | 90 |
| | Circular HASP Import from HASP Export | 30 | 3 | 90 |
| | HASP Import Remainder Settlement | 10 | 3 | 30 |
| | OA STLMT | 0 | 10 | 0 |
| Total | | | | 380 |