



Grid West

RRG Technical Seminar

Layer 1 Draft – Last Updated on November 1, 2004

As posted November 9, 2004

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The agenda for the October 14 Technical Seminar is:

Subject	Time
Introduction	8:30am – 8:45am
TSLG Assignment	8:45am – 9:00am
Design Overview	9:00am – 10:00am
Break	10:00am – 10:15am
Day-in-the-Life	10:15am – 11:30am
Lunch	11:30am – 12:30pm
Module Overview	12:30pm – 2:00pm
Break	2:00pm – 2:15pm
Example Situations	2:15pm – 3:00pm
Question & Answer	3:00pm – 3:30pm

- Introduction
- TSLG Assignment
- Design Overview
- Day-in-the-Life
- Module Review
- Example Situations
- Question & Answer

The objectives of the October 14 Technical Seminar are:

- Introduce the “First Layer” of the Beginning State design to members of the RRG
- Describe services offered by Grid West and show the improvements that they offer to identified problems
- Obtain feedback on the proposed market design

To make the best use of our time today, we have established the following ground rules:

- Today is a review of the “First Layer” only.
- We will take questions at the end of each section.
- We ask that attendees save detailed questions until the end of the seminar.
- Attendees may also submit written questions to the TSLG by October 18. Responses to those questions will be posted on the Grid West website.
- A follow up conference call will be held on October 25.

A number of transmission challenges have been identified:

- Difficulty managing unscheduled electricity flows over transmission lines leading to increased risks to electric system reliability due to unexpected real-time operational requirements;
- Lack of clear responsibility and incentives for planning and implementing transmission system expansion, which may lead to inadequate transmission capacity;
- Inability to monitor wholesale electricity markets, identify market power abuse or provide mitigation and accountability;
- Difficulty in reconciling physical available transmission capacity with that available on a contractual basis, resulting in inefficient utilization of existing transmission and generation capacity;
- Transaction and rate pancaking, i.e. contracting, scheduling, and paying for the fixed costs of multiple transmission segments on a volumetric basis to complete a power sale, resulting in inefficient utilization of generation; and
- Competitive advantage of vertically integrated transmission owning utilities over competing generation owners causing inefficient utilization of generation and potentially a proliferation of control areas and greater operational complexity.

Source: "Regional Representatives Group, Regional Transmission Problems and Opportunities List", August 14, 2003.

Solutions to these problems must also meet a challenging set of regional conditions:

- Existing Transmission Rights – Grid West needs to maintain existing transmission rights whether arising from contracts or from native load service obligations.
- Scheduling Flexibility - Participants currently have the ability, under their contractual rights, to update some of their schedules up to 20 minutes prior to the Operating Hour (without financial consequences).
- Hydroelectric System Complexity
 - Opportunity cost-based dispatch, affected by non-power constraints
 - Hydro operations have consequence, either immediately or in the future
 - Marginal hydro is used for regulation and load-following while thermal tends to be base loaded

Given the current transmission conditions and challenges, several “burning questions” exist:

- Is the Beginning State feasible? Can it stand alone and is it adaptable?
- Will it free up additional transmission capacity?
- Can the Beginning State create new opportunities and preserve existing rights?
- Will the Beginning State lower the cost of supplying imbalance energy and reserves?
- Will Grid West participants benefit from regional coordination?

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The principles that guided the Platform Group's work were:

1. The proposed Beginning State should be a clear improvement over the existing situation and respond to the problems and opportunities identified by the RRG.
2. Each stage of the proposal should be workable in itself. The stages should not create significant new problems at the same time they try to address old ones.
3. Each stage should allow further evolution of solutions to remaining problems, as well as changes in circumstances, with some indication of the expected direction of that evolution today, and subject to review of the desirability of moving forward. Stages should not become obstacles to further steps that the region supports.

The RRG developed the Regional Platform to address many of the challenges highlighted earlier. The platform highlights the following features:

- Regional Network Service
- Reconfiguration Service (Transmission Rights Auctions)
- Redispatch Service (Inc/Dec Market)
- Voluntary Control Area Consolidation
 - Reserve Market Service
 - Real-Time Energy Market Service

The TSLG was assigned the task of developing a conceptual market design to confirm the feasibility of the platform group proposal:

- A layered approach – “broad rather than deep”
- Divided work into logical parts - five modules:
 - Module 1 – Transmission Service (Previously discussed)
 - ✓ **Module 2 – Transmission Rights Administration**
 - ✓ **Module 3 – Scheduling, Operations, and Settlement**
 - ✓ **Module 4 – Reserves**
 - Module 5 – Cost Estimate (Future Layer)
- Also included an analysis of cost drivers of RTOs/ISOs

TSLG Assignment

Key Definitions

The following terms are used throughout the Beginning State design:

- **Geographic Area** – The portions of the provinces of Alberta and British Columbia and the states of Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming that are electrically within the Western Interconnection, together with any additional geographic territory within the state of California that is encompassed by the control areas of the Bonneville Power Administration, PacifiCorp, and Sierra Pacific Power Company.
- **GWF (Grid West Footprint)** – Those portions of the Grid West Geographic Area encompassed by the Control Areas of Transmission Owners have executed a Transmission Agreement with Grid West. (see Grid West Managed Transmission System)
- **Member** – An individual or an entity that has chosen to become a member of the Grid West corporation under the terms of its bylaws, which confer rights and impose obligations on those who choose to become members, in particular the right to participate in member voting processes. Members vote (by class) to choose the Member Representative Committee (MRC). The MRC in turn has the power to elect and remove Trustees.



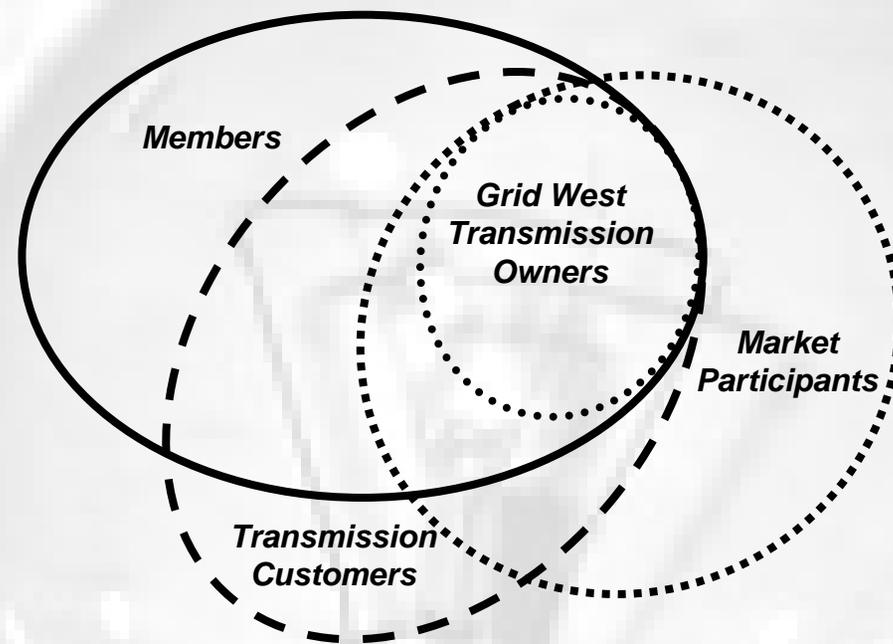
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Grid West

Figure 1
Relationship Diagram



TSLG Assignment

Key Definitions

The following terms are used throughout the Beginning State design:

- **AFC (Available Flowgate Capacity)** – Uncommitted capacity on a flowgate (a line or set of lines with a combined rating, i.e. a “rated system path”). The committed capacity is the sum of the flow components calculated using power utilization factors (also called power distribution factors or generation shift factors) applied to committed injection-withdrawal rights.
- **Bid** – The submission of a request to purchase at or below a given price.
- **Offer** – A request to sell at or above a given price.
- **CCA (Consolidated Control Area)** – A voluntary consolidation of electric power systems bounded by interconnection (tie-line) metering and telemetry. It controls generation to maintain its interchange schedule with other control areas and contributes to frequency regulation of the interconnection, with operational services provided by Grid West.

TSLG Assignment

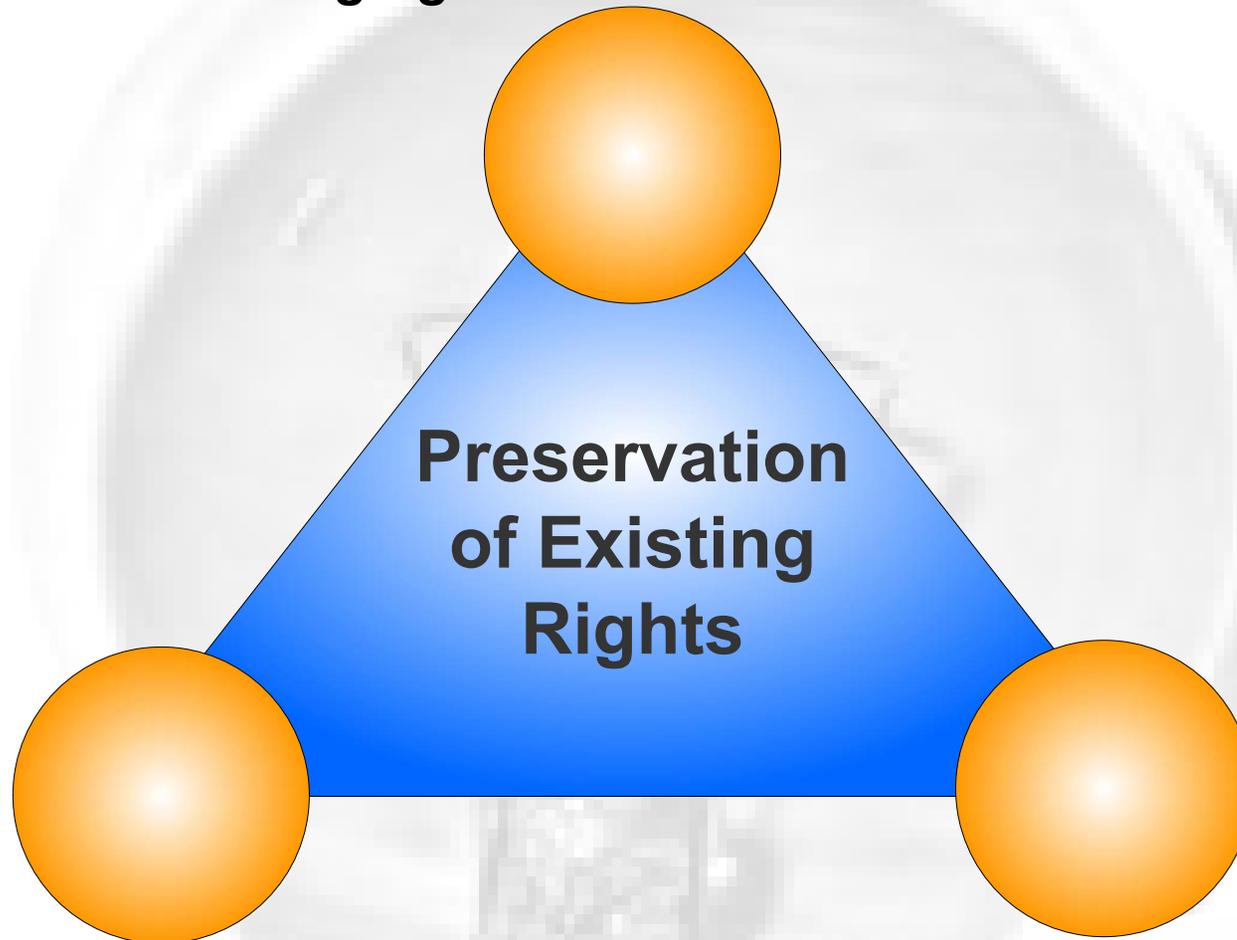
Key Definitions

The following terms are used throughout the Beginning State design:

- **Inc/Dec (Incremental and Decremental) Offers** – Offers submitted in either a Day-Ahead Redispatch Market or a Real-Time Energy Market to indicate willingness to increase (inc) or decrease (dec) a resource output for a given offer price.
- **IWR (Injection-Withdrawal Right)** – The right to submit a day-ahead Injection-Withdrawal Schedule.
- **RCS (Reconfiguration Service)** – A Grid West transmission rights service that provides for acquisition of IWRs either from AFC or from transmission rights released by sellers, through annual, monthly, intra-monthly auctions and daily auctions.

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The number one principle of the Beginning State design is the preservation of existing rights:



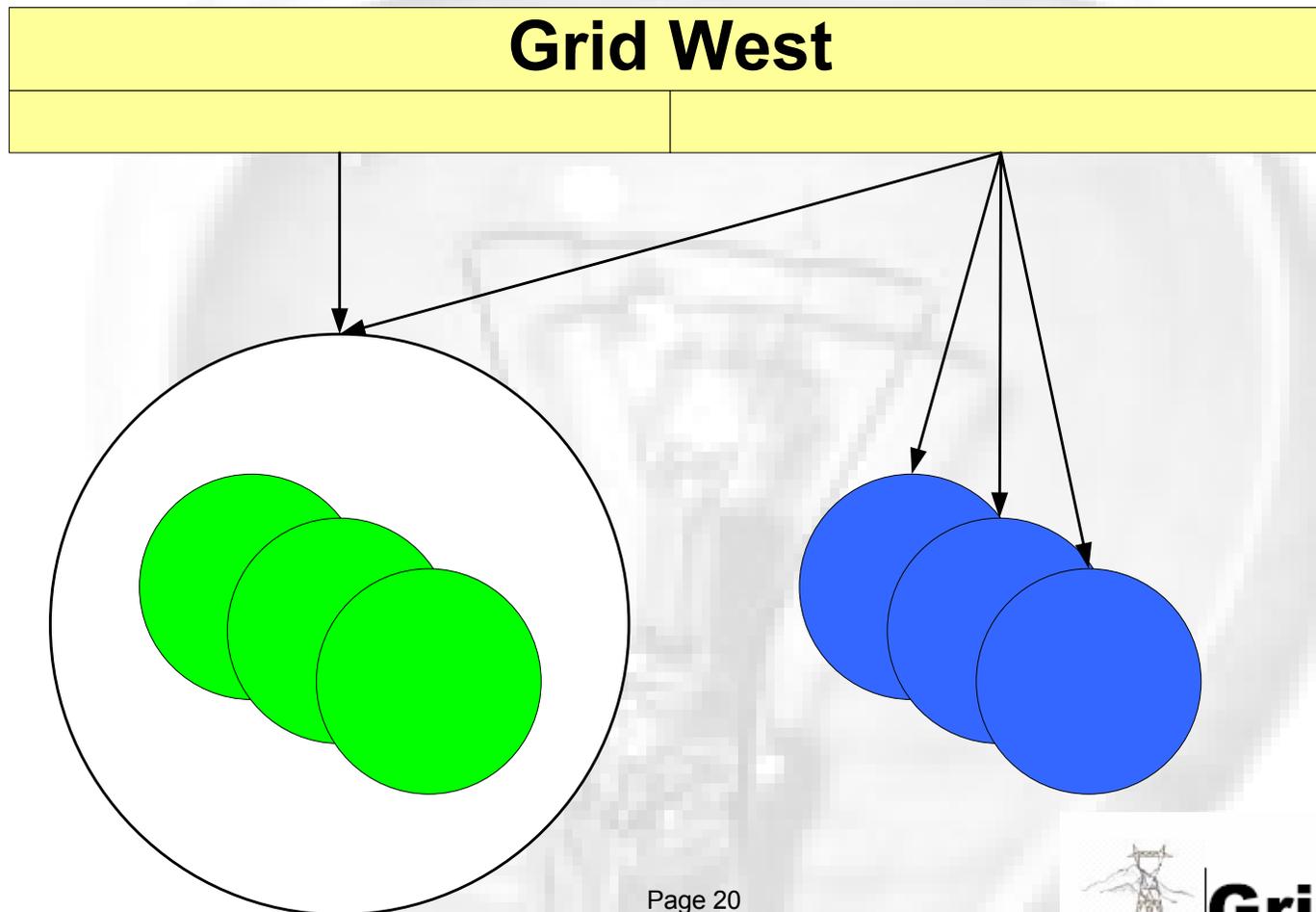
The Regional Proposal contains the following design boundaries....

- Participants submit balanced schedules
- Control area consolidation is voluntary
- Existing business practice flexibility must be maintained unless better alternatives can be presented
- Existing Rights can be voluntarily traded through the Regional transmission reconfiguration services
- All region-wide markets are voluntary

Design Overview

The RRG Services Model

The following RRG Service Model defines the Grid West services that are to be provided to the Consolidated Control Area and to the greater Grid West Region:



Design Overview

Consolidated Control Area Assumptions

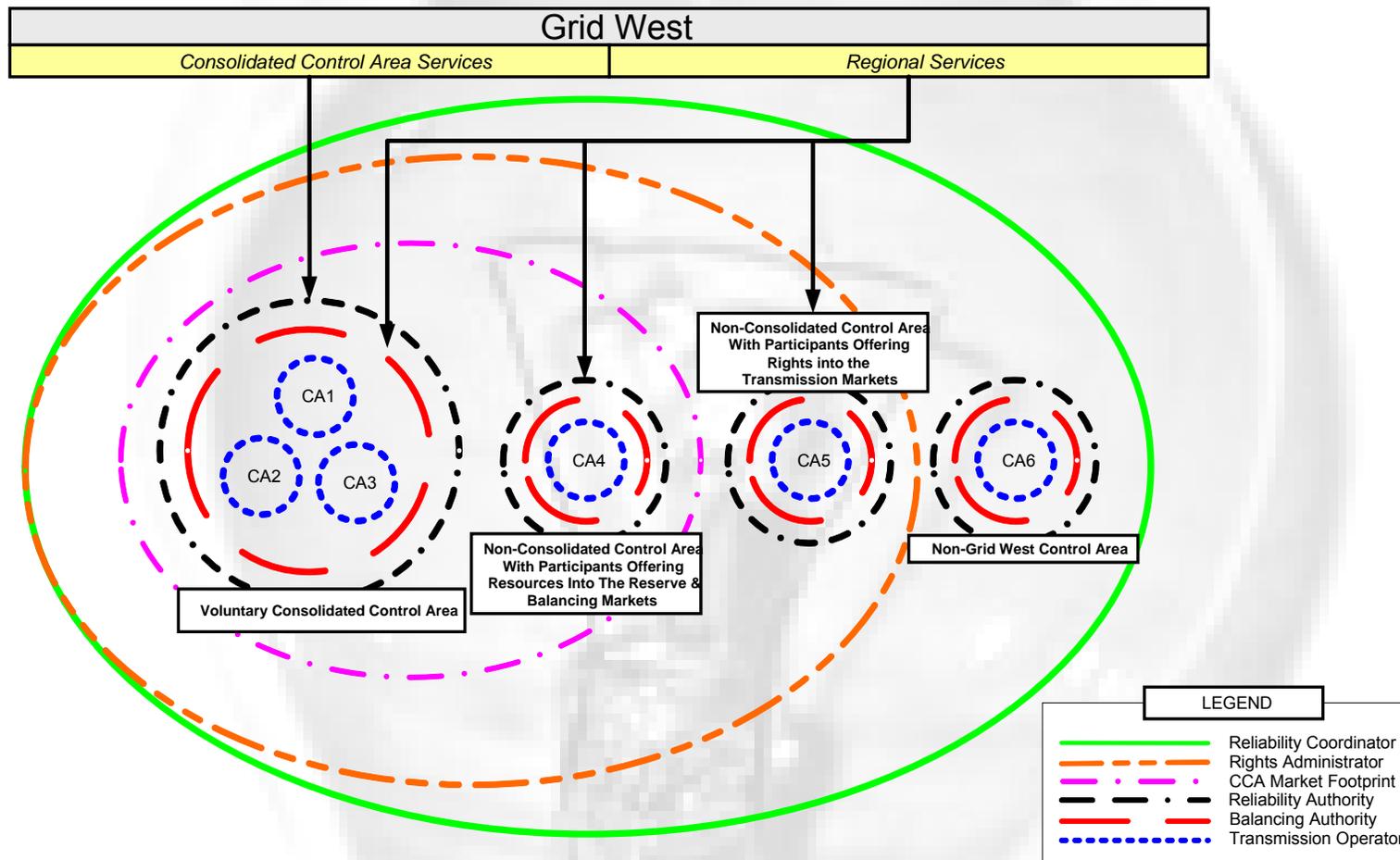
However, the Regional Proposal provides little detail regarding the Consolidated Control Area. So what can we assume at this point?

- Control areas may decide to voluntarily consolidate (we assume that at least two will do so)
- Grid West will provide both regional and Consolidated Control Area (CCA) service
- Certain services (e.g. Reserves Market, Real-Time Energy Services, etc.) in the Beginning State will be provided to the Consolidated Control Area only
- Where possible, resources located within non-consolidated control areas can voluntarily offer to sell into the markets that were formed for the CCA
- Grid West will act as both the Reliability Authority and Balancing Authority for the CCA within the overall perspective of the PNSC, whose function may be enhanced in the future
- Control Areas that choose not to consolidate will serve as the Balancing Authority of their areas
- The division of duties for the Reliability Authority role between the PNSC, Grid West, and the control areas is yet to be resolved

Design Overview

The RRG Services Model

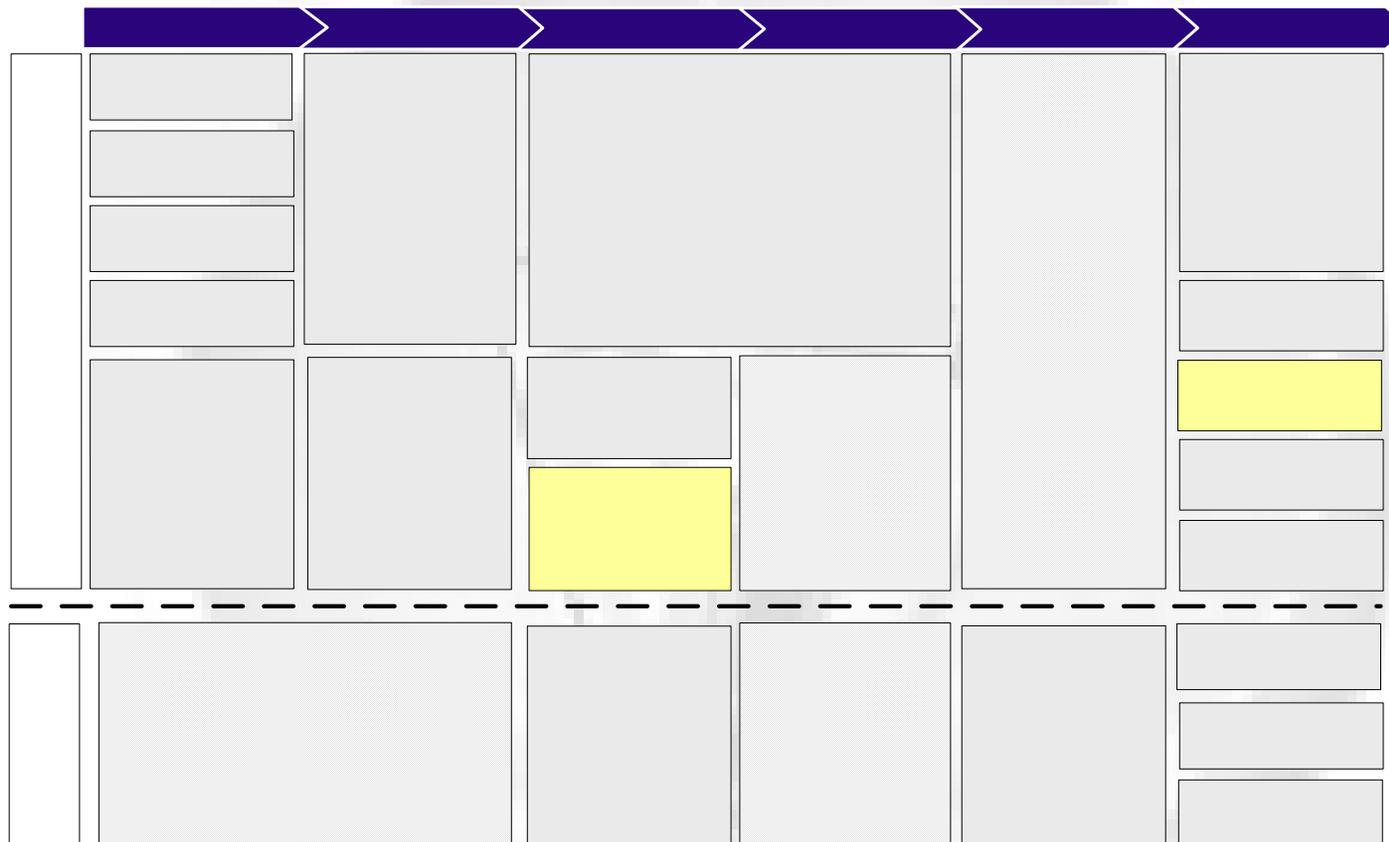
The following RRG Service Model defines the Grid West services that are to be provided to the Consolidated Control Area and the non-Consolidated Control Areas.



Design Overview

Grid West Functions

Given the services that are to be provided region wide and on a consolidated control area basis, we developed a high-level functional framework for Grid West:



The TSLG looked at the feasibility of a Day-Ahead Redispatch service given the identified design boundaries:

- The RRG Proposal envisioned a region-wide day-ahead Redispatch Service.
- Some participants currently have the right to adjust their schedules up to 20 minutes prior to the Operating Hour without financial consequence.
- The value of a Day-Ahead redispatch market is greatly reduced if it is not accompanied by a financial and/or a physical commitment.
- The desire to maintain scheduling flexibility and the need for a day-ahead financial commitment are competing interests that led to the current sequencing approach.
- Participants can buy/sell transmission rights in the Day-Ahead reconfiguration market.
- Resources are re-dispatched as a part of the Real-Time Energy Market within the Consolidated Control Area

Design Overview

Redispatch Service

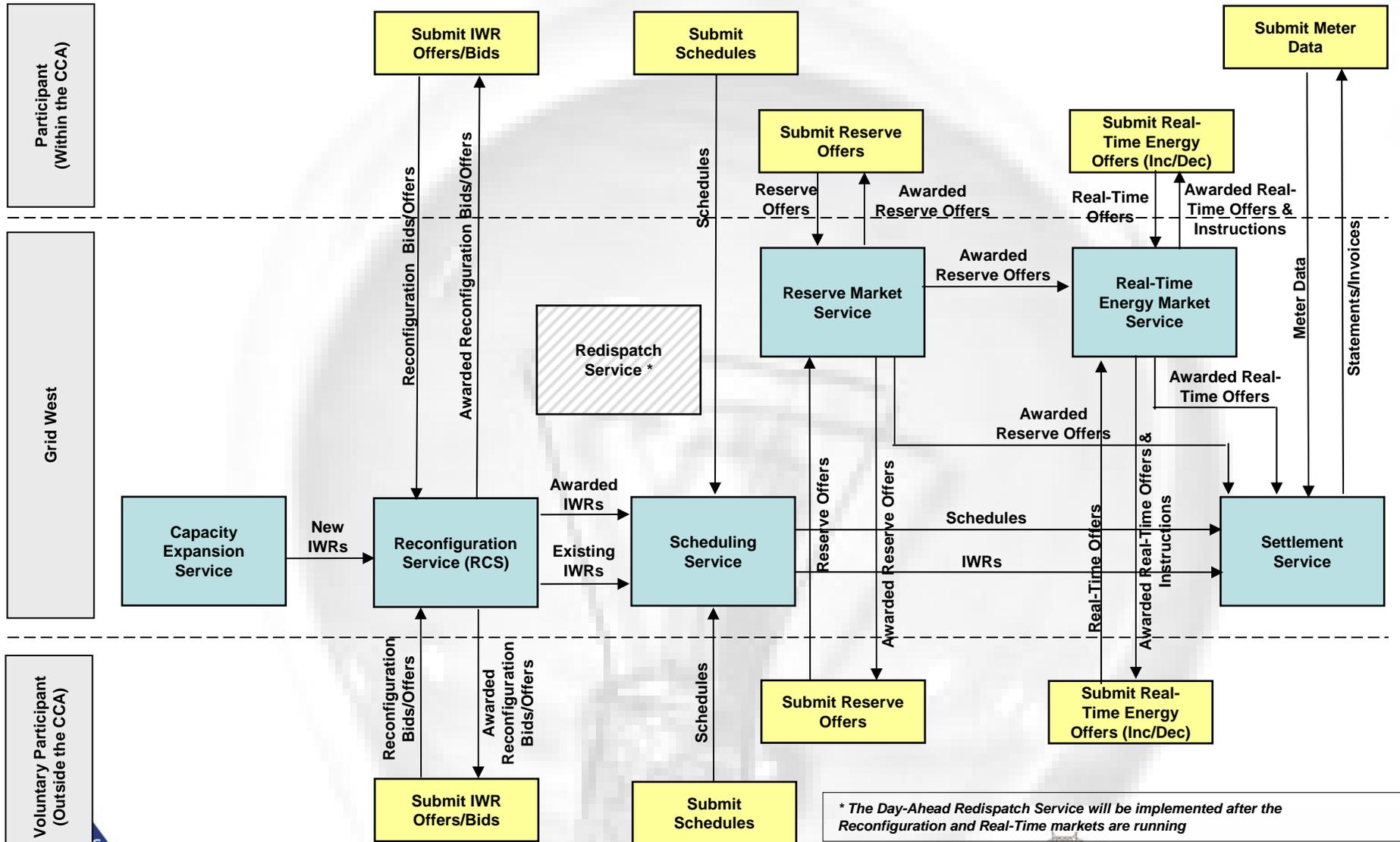
In the sequencing proposal, the order of Steps 2-3 and Step 4 may be changed depending on CCA timing.

- Step 1 – Grid West created (GWF)
- Step 2 – Grid West initiates centralized scheduling and transmission rights administration (GWF)
 - IWRs administered using a flow based determination of AFC for GWF
 - Capacity Expansion Service initiated (with provisions for dealing with long term requests).
 - Operational relationship established with Reliability Coordinator (PNSC) to share scheduling data and coordinate operational plans
- Step 3 – Grid West offers Reconfiguration Service (GWF)
 - Annual, Monthly, Intra-Month and Daily Auctions
- Step 4 – Grid West initiates voluntary markets (CCA)
 - Reserve Market – Voluntary offers from Grid West and non-Grid West entities
 - Real-Time Energy Market – Voluntary inc/dec offers selected using security constrained dispatch optimization
- Step 5 – Grid West offers day-ahead redispatch (inc/dec) market
 - Redispatch will operate in a manner that is consistent with the exercise of existing contract rights
 - Inc/dec offers provided with day-ahead schedules



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Day-in-the-Life High-Level Business Process



The Day-in-the-Life examples have been divided into the following time periods:

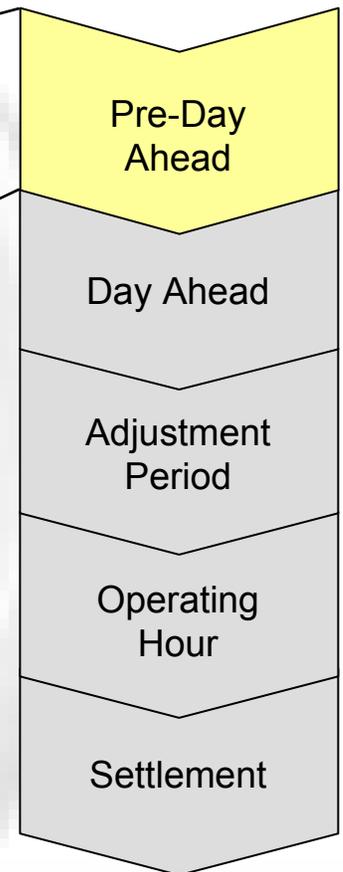
- Pre-Day Ahead
- Day-Ahead
- Adjustment Period
- Operating Hour
- Settlement

Day-in-the-Life

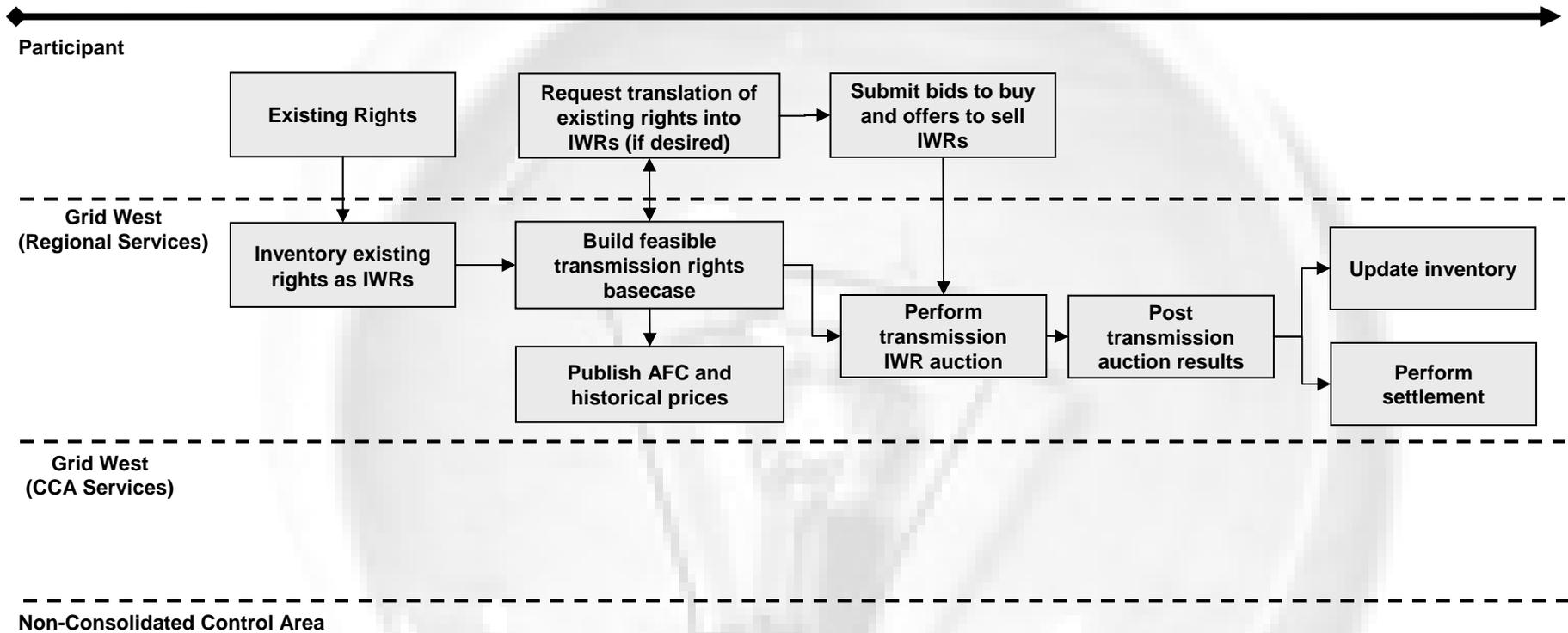
Pre-Day Ahead

The following activities occur during the Pre-Day Ahead period:

- Regional Network Service
- Annual Reconfiguration
- Monthly Reconfiguration
- Intra-Monthly Reconfiguration



Day-in-the-Life (Pre-Day Ahead) Reconfiguration Service

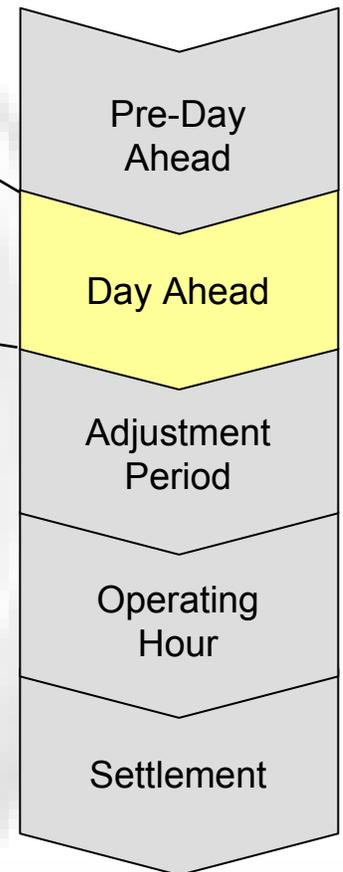


Day-in-the-Life

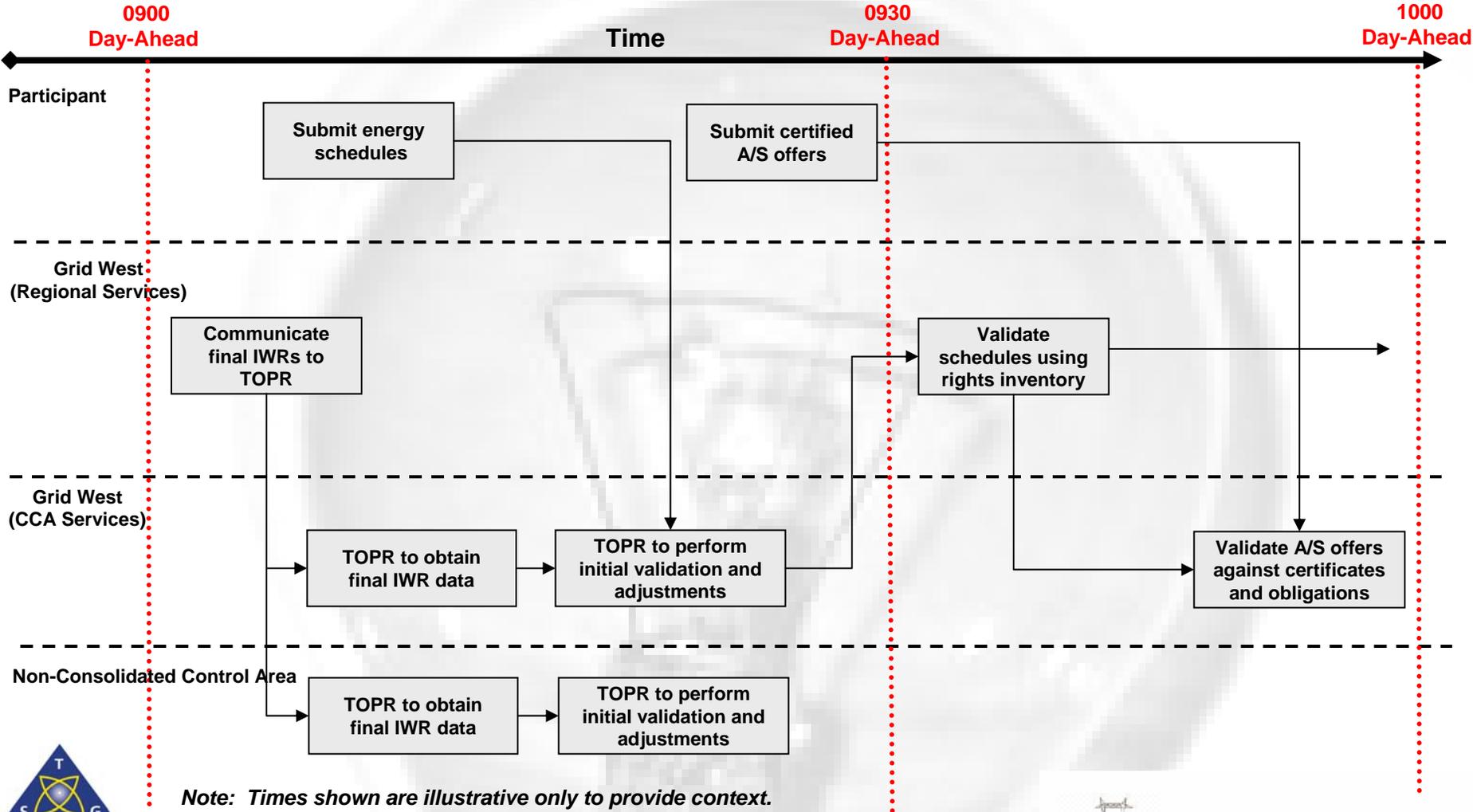
Day-Ahead

The following activities occur during the Day-Ahead period:

- Daily Reconfiguration
- Scheduling
- Reserve Market



Day-in-the-Life (Day-Ahead) Scheduling Service



Note: Times shown are illustrative only to provide context.

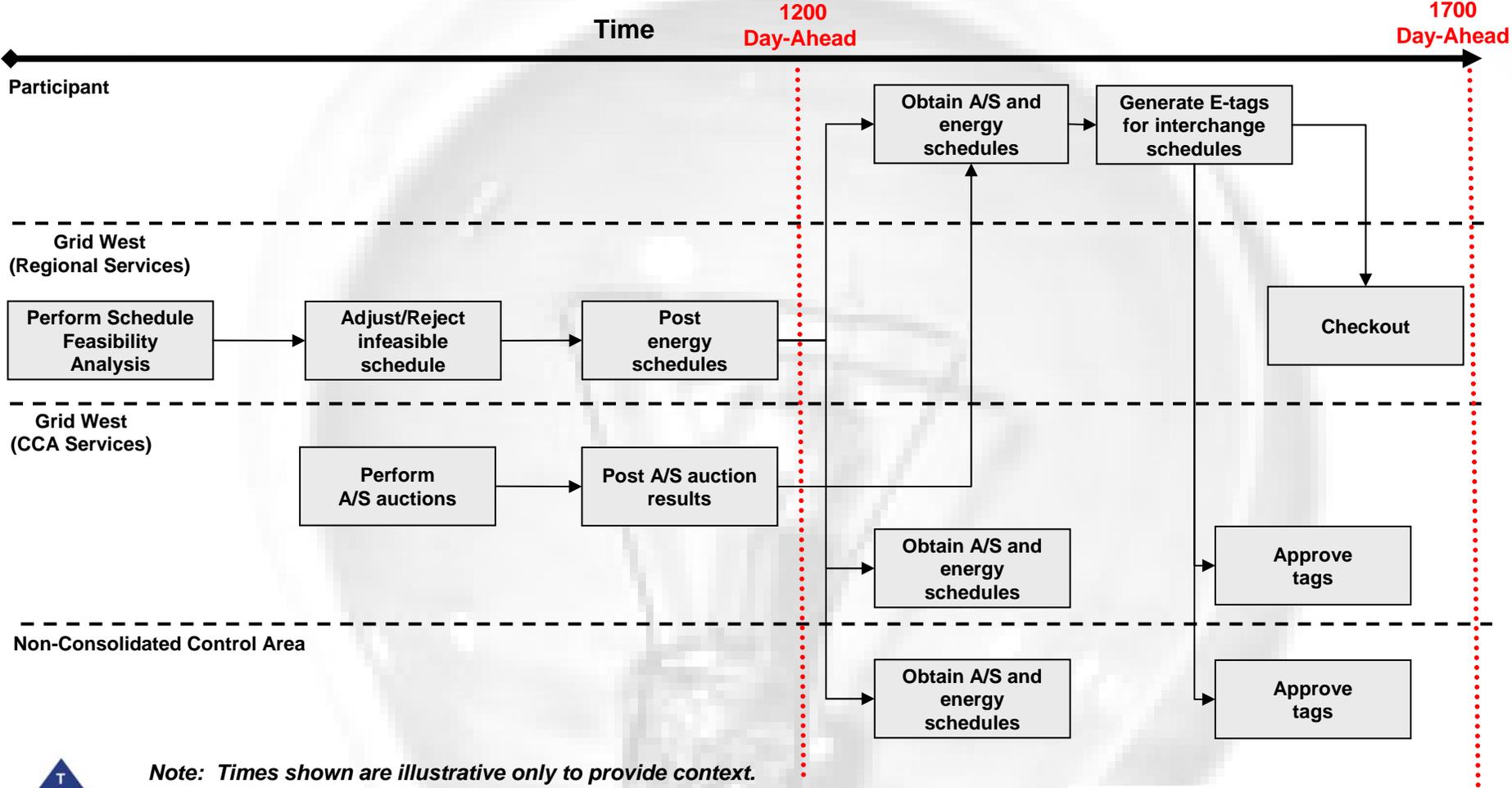


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Grid West

Day-in-the-Life (Day-Ahead) Scheduling Service



Note: Times shown are illustrative only to provide context.

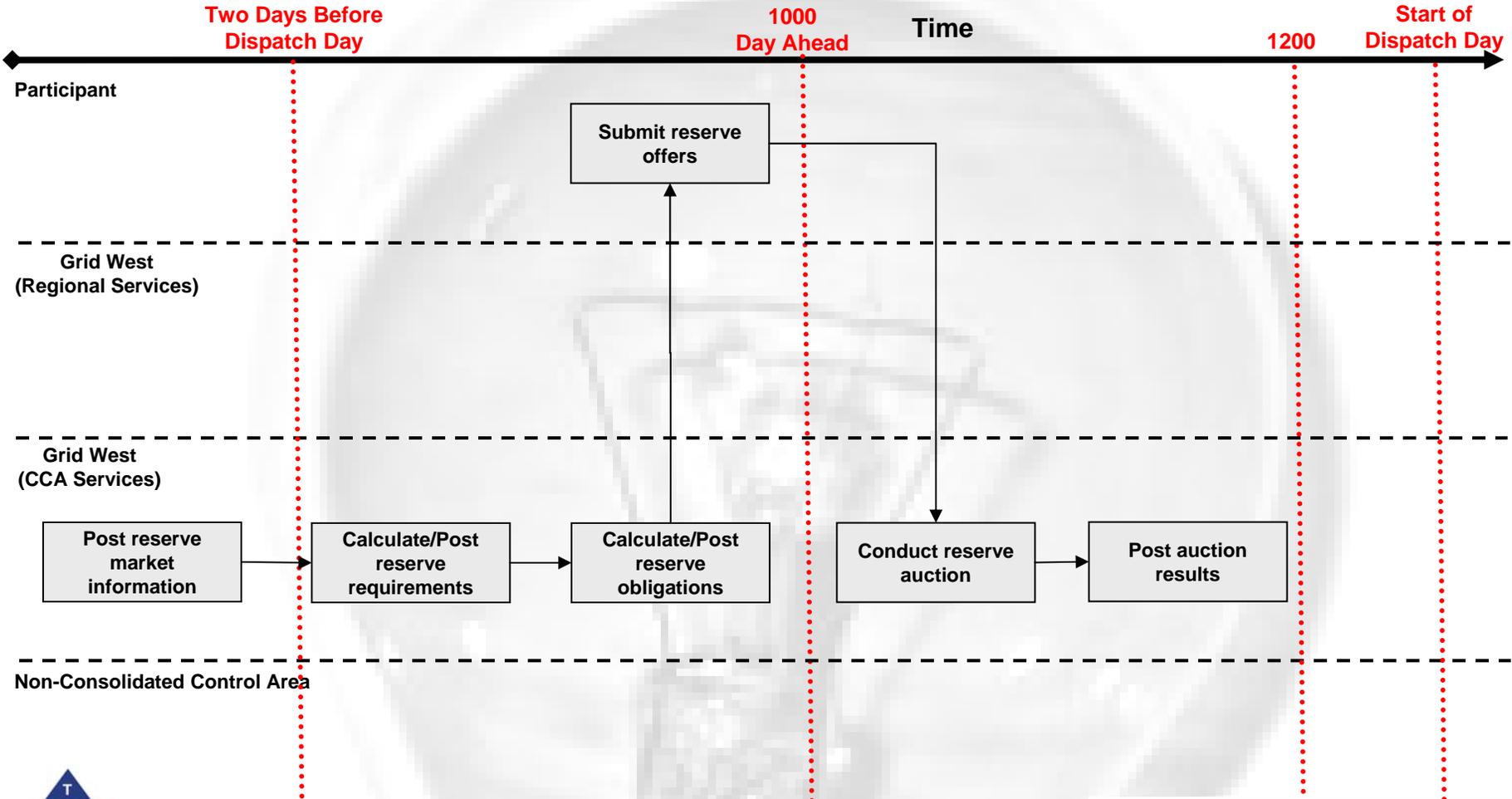
* IWS: Injection/Withdrawal Schedule



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Day-in-the-Life (Day-Ahead) Reserve Market Service



Note: Times shown are illustrative only to provide context.



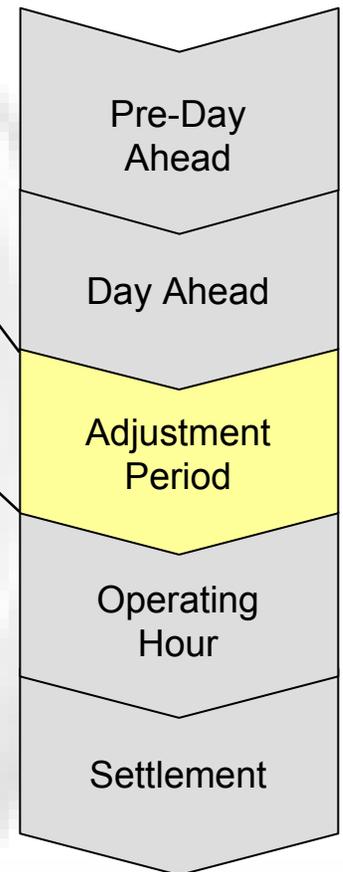
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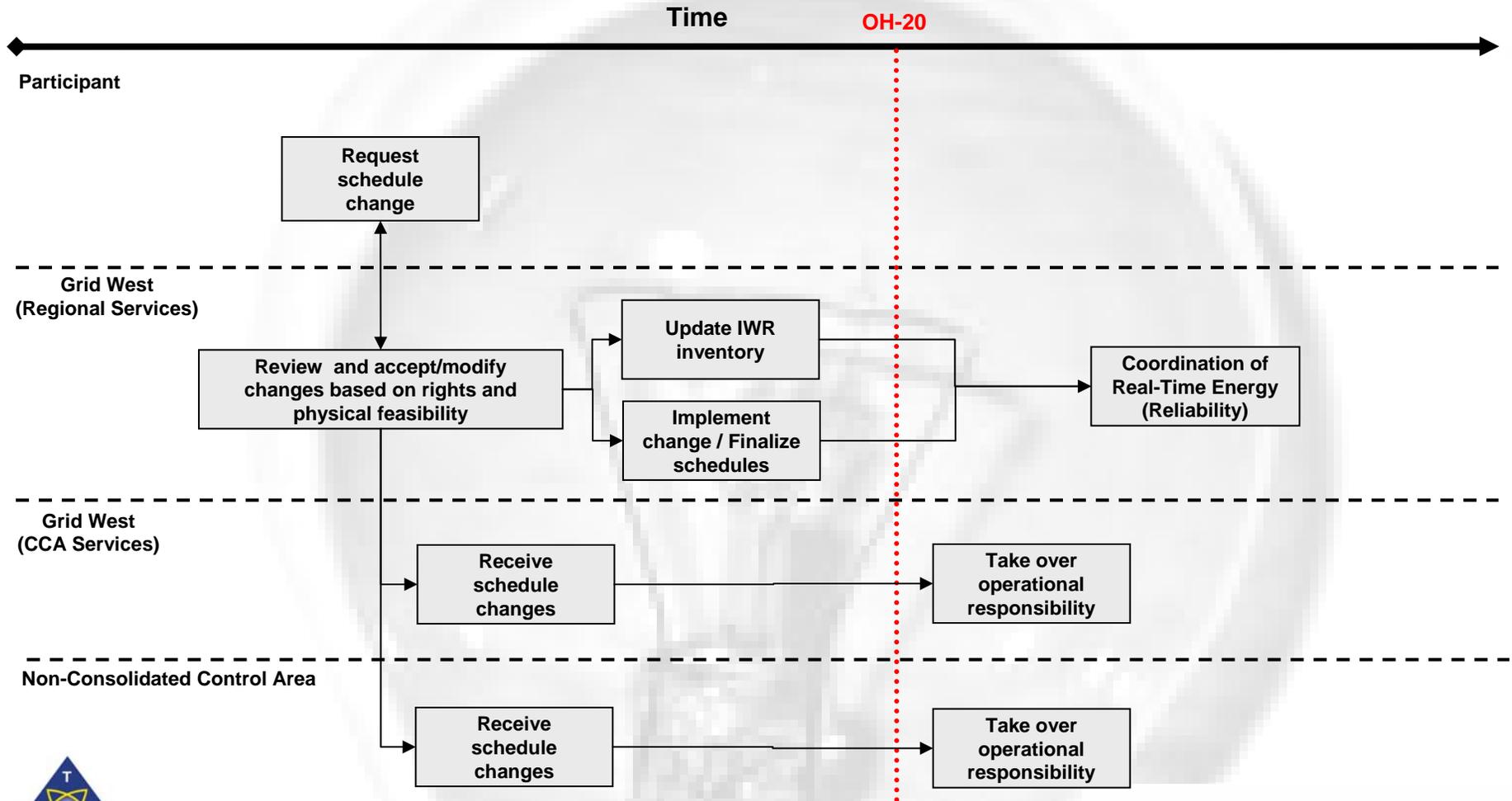
Day-in-the-Life *Adjustment Period*

The following activities occur during the Adjustment period:

- Scheduling Adjustments
- Real-Time Energy Offers



Day-in-the-Life (Adjustment Period) Schedule Adjustments



Note: Times shown are illustrative only to provide context.



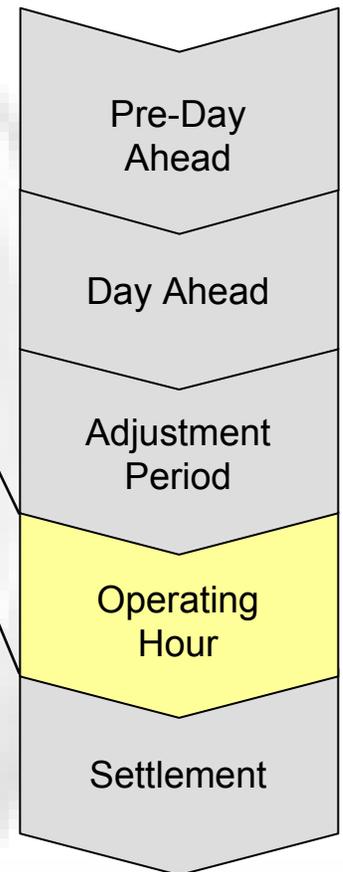
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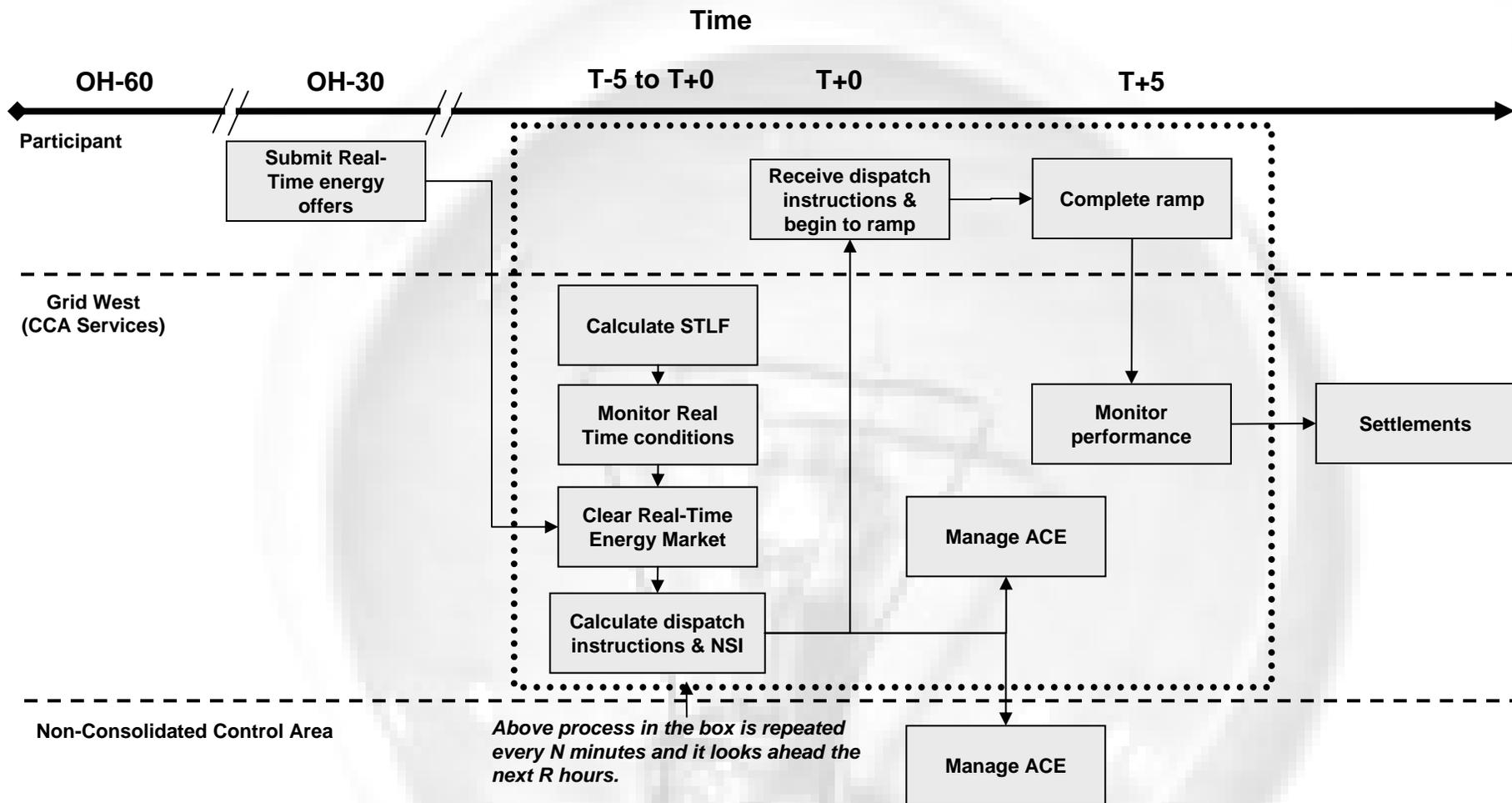
Day-in-the-Life Operating Hour

The following activities occur during the Operating Hour period:

- Real-Time Energy Market



Day-in-the-Life (Operating Hour) Real-Time Energy Market Service

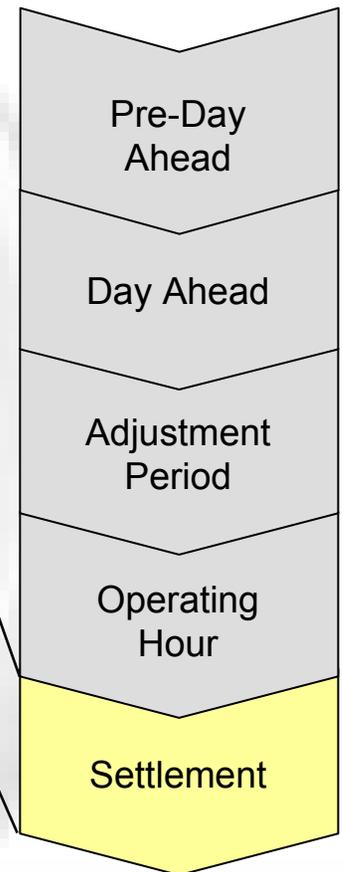


- Notes:** 1. Times shown are illustrative only to provide context
2. The exact timing of events (OH-30, etc.) needs to be further defined

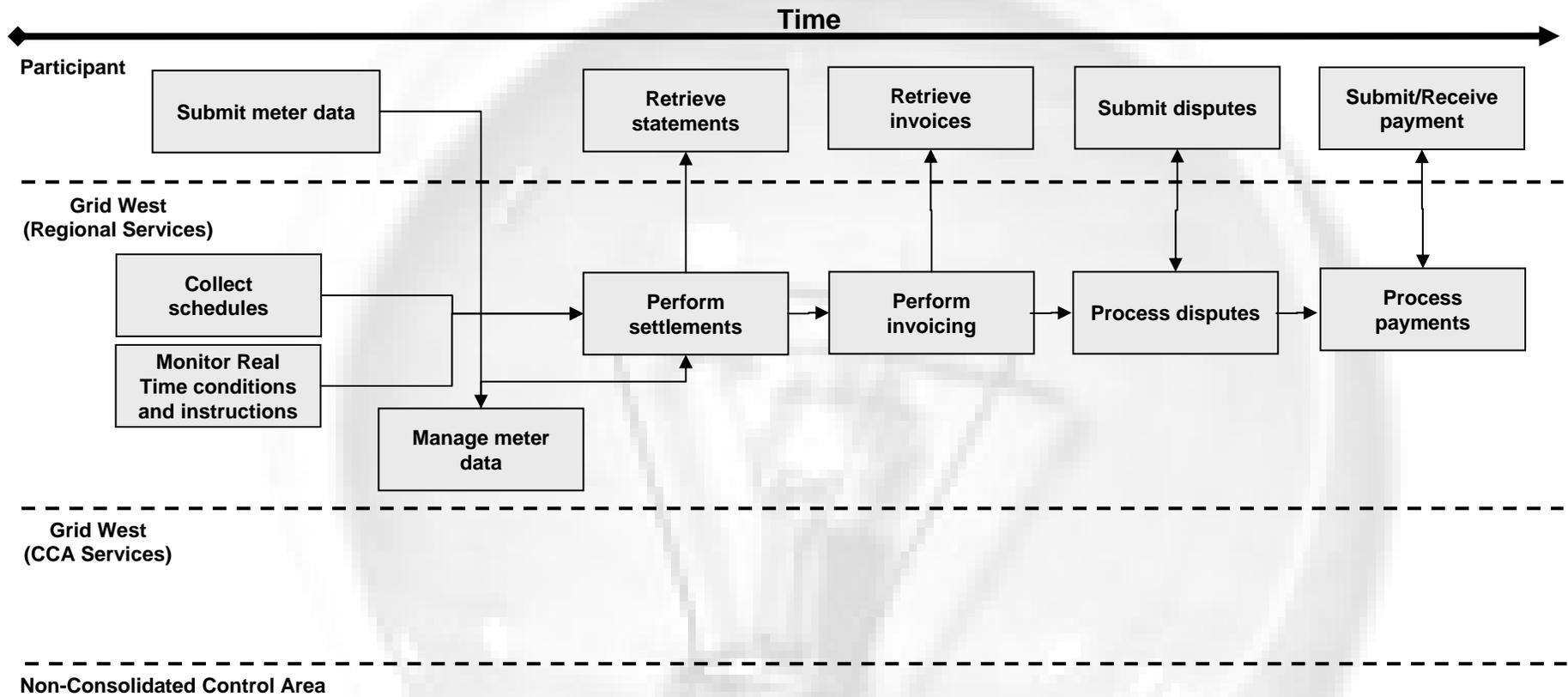
Day-in-the-Life Settlement

The following activities occur during the Settlement period:

- Meter Data Management
- Settlement
- Invoicing
- Dispute Management



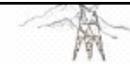
Day-in-the-Life (Settlement) Settlement Service



Day-in-the-Life

High-level Activity Schedule

Period	Participant Action	Grid West Action	Coverage
Pre-Day Ahead	• Submit Outages	• Approve Outages	Regional
		• Post Auction Information	Regional
	• Submit Annual RCS Offers/Bids	• Clear Annual RCS Auction	Regional
	• Submit Monthly RCS Offers/Bids	• Clear Monthly RCS Auction	Regional
Day-Ahead		• Publish Updated System Information	Regional
		• Post Market Information	Regional
	• Submit Intra-monthly RCS Offers/Bids	• Clear Intra-Monthly RCS Auction	Regional
	• Submit Daily RCS Offers/Bids	• Clear Daily RCS Auction	Regional
	• Submit Balanced Schedules	• Evaluate Schedules	Regional
	• Submit Reserve Market Offers	• Clear Reserve Market	CCA
		• Perform Checkout	Regional
Adjustment	• Submit Real-Time Offers	• Evaluate Offers	Regional
	• Submit Adjusted Schedules	• Evaluate Schedules	Regional
Operating Hour		• Clear Real-Time Energy Market • Calculate NSI	CCA
	• Manage ACE • Ramp Unit	• Monitor performance	CCA



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Regional Transmission Rights Administration Service



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The Transmission Rights Administration module has several objectives:

- Continue to honor all existing transmission rights and obligations
- Create a new medium-term market to allow participants to buy and/or sell transmission rights.
- Release additional transmission capacity
- Create new commercial processes to obtain new or additional transmission service and/or rights
- Create a new transparent, centralized short-term redispatch market

A Grid West Participant has four ways to obtain transmission rights:

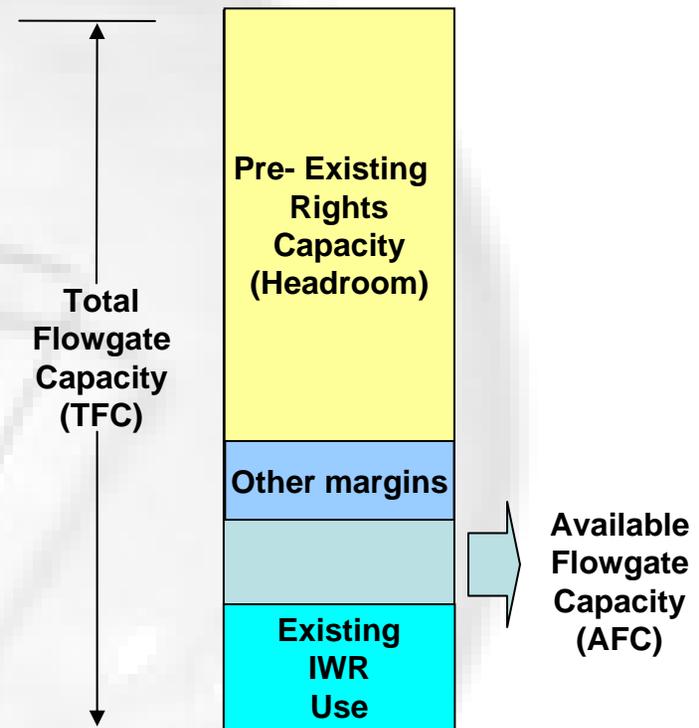
- Initial IWR Translation Service
- Capacity Expansion Service
- Reconfiguration Services
- Bilateral Trading

The Beginning State Transmission Rights Administration design has the following basic characteristics:

- Pre-existing rights are preserved and new IWRs are issued
- Opportunity for rights holders to sell transmission rights – A request for translation to IWRs to enable trade is not a sale, just certification of what will trade
- Offers made in Annual, Monthly, Intra-month and Daily Auctions
- IWRs awarded in response to bids to buy
- Value of rights awarded is maximized
- Sellers are paid for rights sold
- RCS does not need a one-to-one match to enable trades of IWRs to occur
- Rights can be created through Capacity Expansion Service

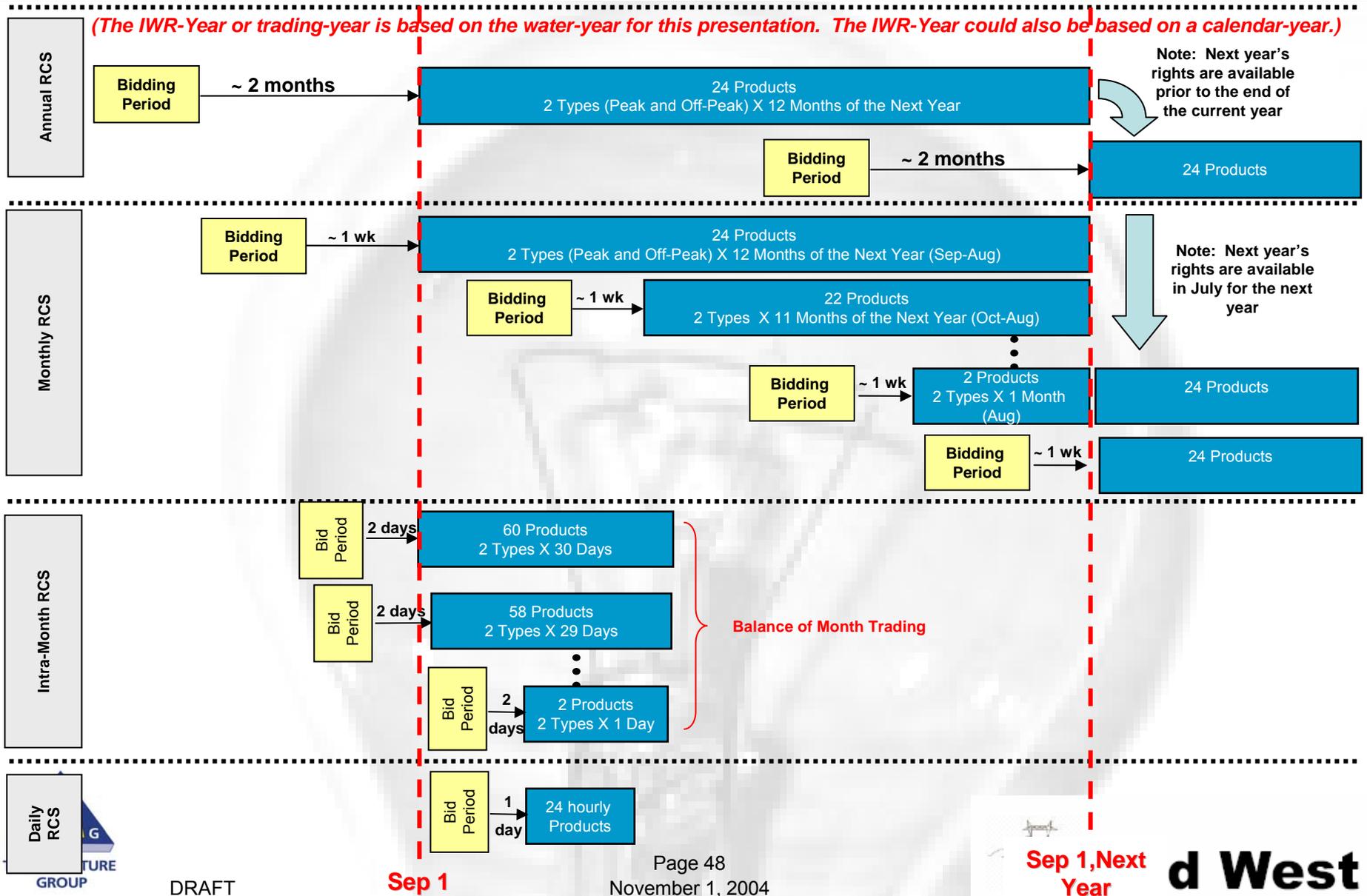
The Reconfiguration Service should result in the release of additional flowgate capacity:

- Available Flowgate Capacity, along with offered IWRs, is made available to meet a request by IWRs buyers
- Grid West may have the discretion of the percentage of the residual capacity to be offered in auction markets
- The payments received for release of residual capacity (i.e., AFC) is used to reduce R3A



Module Overview

Proposed Auction Timeline and Products



Grid West will provided the following Transmission Rights Services:

<p>Capacity Expansion Service</p>	<ul style="list-style-type: none"> • For multiple years in the future, addressing long-term service requests • New IWRs are granted for system expansion
<p>Annual Reconfiguration Service (A-RCS)</p>	<ul style="list-style-type: none"> • Starting prior to the beginning of each trading-year • Annual auction of twenty-four (24) monthly IWR products (peak/off-peak product for each calendar month of the year)
<p>Monthly Reconfiguration Service (M-RCS)</p>	<ul style="list-style-type: none"> • Starting prior to the beginning of each month • Monthly auction of monthly IWR products (peak/off-peak product conditions of the next calendar month)
<p>Intra-Monthly Reconfiguration Service (I-RCS)</p>	<ul style="list-style-type: none"> • Starting prior to the next monthly auction (“Balance of Month” trading) • Daily auction of balance of month IWRs (peak/off-peak products for each remaining day in the current month)
<p>Daily Reconfiguration Service (D-RCS)</p>	<ul style="list-style-type: none"> • Starting prior to the Day-Ahead Period • Daily auction of twenty-four (24) hourly IWR products (peak/off-peak products for each hour of the IWR-Day)

The following matrix summarizes the Beginning State design for Transmission Rights Administration:

Description	Current Practice	Proposed Change	Opportunities/ Value
Capacity Planning & Transmission Expansion	<ul style="list-style-type: none"> Performed on a CA basis. Limited Regional coordination. 	<ul style="list-style-type: none"> Performed on a region-wide basis. 	<ul style="list-style-type: none"> Regional coordination. New IWRs based on capacity expansion providing region-wide benefits and incentives.
Existing Transmission Rights	<ul style="list-style-type: none"> Rights provide scheduling priority. Scheduling rules allow adjustment of some schedules up to 20 minutes prior to the Operating Hour without financial consequences. 	<ul style="list-style-type: none"> No change required. 	<ul style="list-style-type: none"> Maintenance of existing physical rights.
Reconfiguration Service	<ul style="list-style-type: none"> Decentralized bilateral markets for existing transmission rights. 	<ul style="list-style-type: none"> Multiple voluntary centralized reconfiguration auctions that allow rights to be acquired based on existing rights as well as available flowgate capacity Bilateral market based on existing or awarded rights could readily co-exist 	<ul style="list-style-type: none"> New market for participants to buy/sell existing transmission rights. Release of additional flowgate capacity. One-to-one trade is no longer required. Additional revenue applied towards R3A and the reduction of existing rate bases.
Transition Plan	<ul style="list-style-type: none"> Transmission Providers will confirm the existing rights contracts. Lack of Independence. 	<ul style="list-style-type: none"> Grid West will use an inventory to confirm rights and implement direct scheduling (within 2 years). 	<ul style="list-style-type: none"> Transparency to all users.

Regional Scheduling Service



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The Scheduling module has the following objectives:

- Develop the high-level scheduling protocols
- Specify who performs the various elements of the NERC Functional Model
- Specify how regional OASIS services to be provided

The Beginning State Scheduling discussion assumes the following:

- Participants submit balanced schedules
- E-Tags not required for schedules within the CCA
- Grid West will perform check-out for the CCA and with other control areas
- Grid West will calculate and control Net Scheduled Interchange for the CCA and coordinate the implementation with non-CCA

Grid West will perform the following scheduling activities:

Outage Coordination Service	<ul style="list-style-type: none">• Coordinate (approve and publish) transmission outages.• Coordinate generation outages (may not publish)
Interchange Scheduling Service	<ul style="list-style-type: none">• Interchange scheduling for CAs within Grid West footprint• Interchange scheduling for the CCA with CAs outside Grid West footprint
Checkout Service	<ul style="list-style-type: none">• Confirm and handoff the operational schedules for energy and ancillary services to control areas and participants
E-Tagging Service	<ul style="list-style-type: none">• Work with CAs and participants to create and approve necessary tags
OASIS Service	<ul style="list-style-type: none">• Publish Grid West market information• Publish AFC and Path Utilization Factors (PUFs) for Grid West footprint

Module Overview

Review

The following matrix summarizes the Beginning State design for Regional Scheduling Service:

Description	Current Practice	Proposed Change	Opportunities/ Value
OASIS	<ul style="list-style-type: none"> Multiple OASIS. 	<ul style="list-style-type: none"> Single OASIS across the entire GWF. 	<ul style="list-style-type: none"> Process efficiency through Region-wide OASIS services. Added information on the cost of congestion.
Interchange Scheduling & E-Tagging	<ul style="list-style-type: none"> E-Tags required for all interchange schedules (transactions) between control areas. 	<ul style="list-style-type: none"> No E-Tags for internal (within the CCA) schedules. Single E-Tags for Grid West transactions. 	<ul style="list-style-type: none"> Better E-Tag coordination across the GWF. Reduced E-Tag volume and errors.
Checkout	<ul style="list-style-type: none"> Multiple and “uncoordinated” checkout processes and players. 	<ul style="list-style-type: none"> Single checkout process administrated by Grid West. 	<ul style="list-style-type: none"> Process efficiency and reduced errors.
Flexibility	<ul style="list-style-type: none"> Participants can modify schedules up to 20 minutes before the Operating Hour without financial consequences. 	<ul style="list-style-type: none"> No change required. May “sell” flexibility in RCS. 	<ul style="list-style-type: none"> Better utilization of AFC through central coordination.

CCA Reserve Market Service

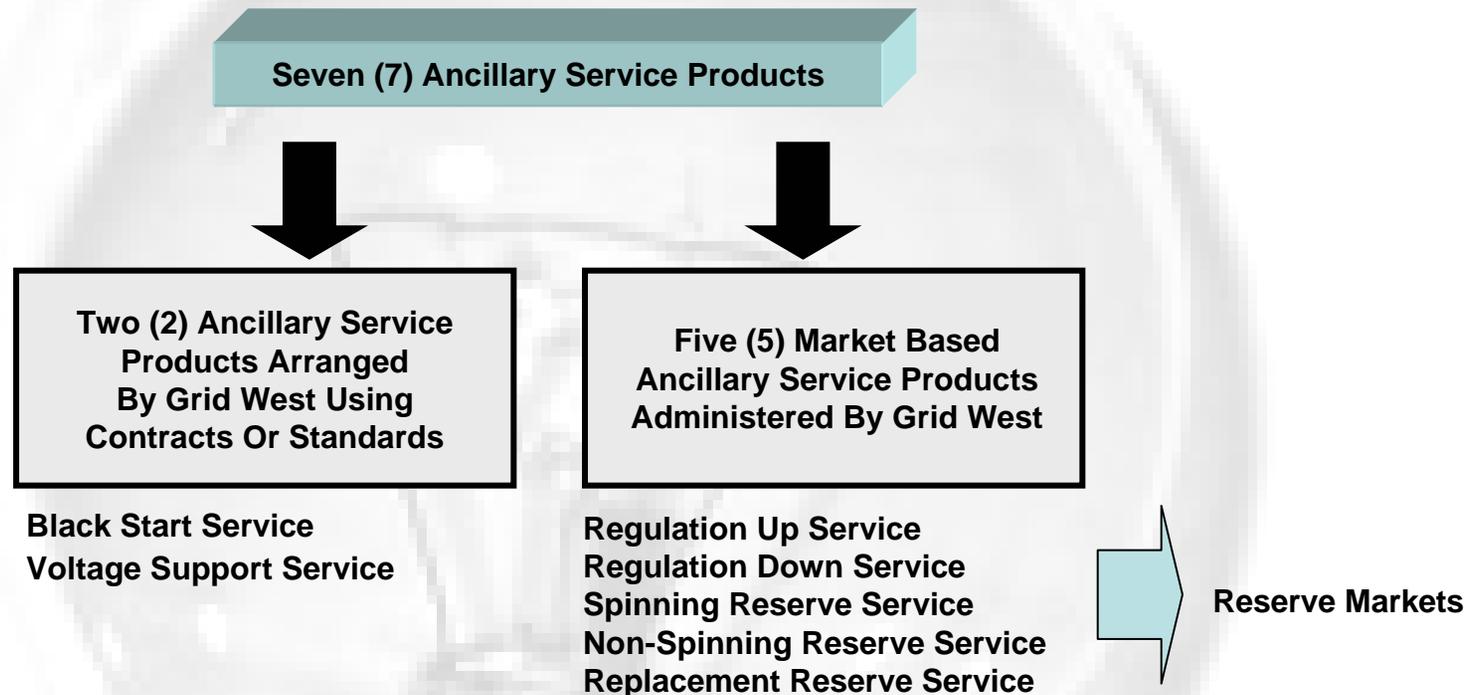
The Reserve Market module has the following objectives:

- Create a market for Grid West to acquire sufficient operating reserves
- Allow certified resources outside the CCA to participate in the reserve markets

The Beginning State Reserve Markets design has the following basic characteristics:

- Purchased by Grid West for CCA reserve needs
- Offers can come from any qualified party
- Consolidating parties must offer at least their share of the CCA reserve requirement
- Awards based on lowest cost to provide from all offers
- Existing NWPP reserve sharing arrangements maintained with Grid West (CCA) as a participant

Ancillary Services are necessary to support the reliable transmission of energy. Some services will be procured through the market and others will be contract based:



* Note: If Grid West enters into Reliability Must Run (RMR) agreements, they may be used as a source for Ancillary Services

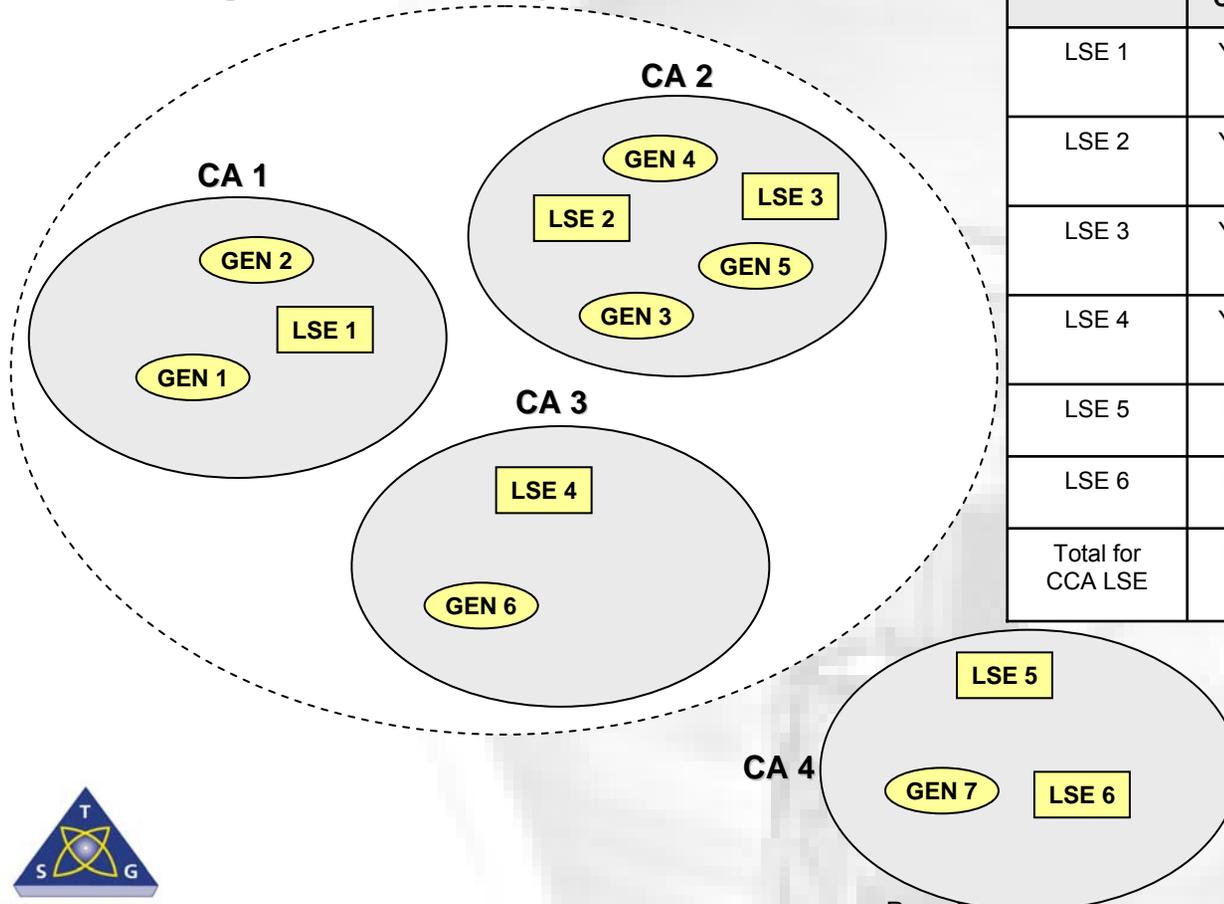
Reserves will need to be locational when the system is congested:

- Grid West needs to forecast the system conditions and decide to what extent, if any, the reserve products are locational (needed within particular congestion regions)
- In order to bid a reserve product into a congestion region, a reserve supplier must be located in the congestion region or have the proper transmission rights to the congestion region.

Grid West will calculate the total reserve requirements for the CCA and determine the minimum offer requirement for each LSE:

Illustration

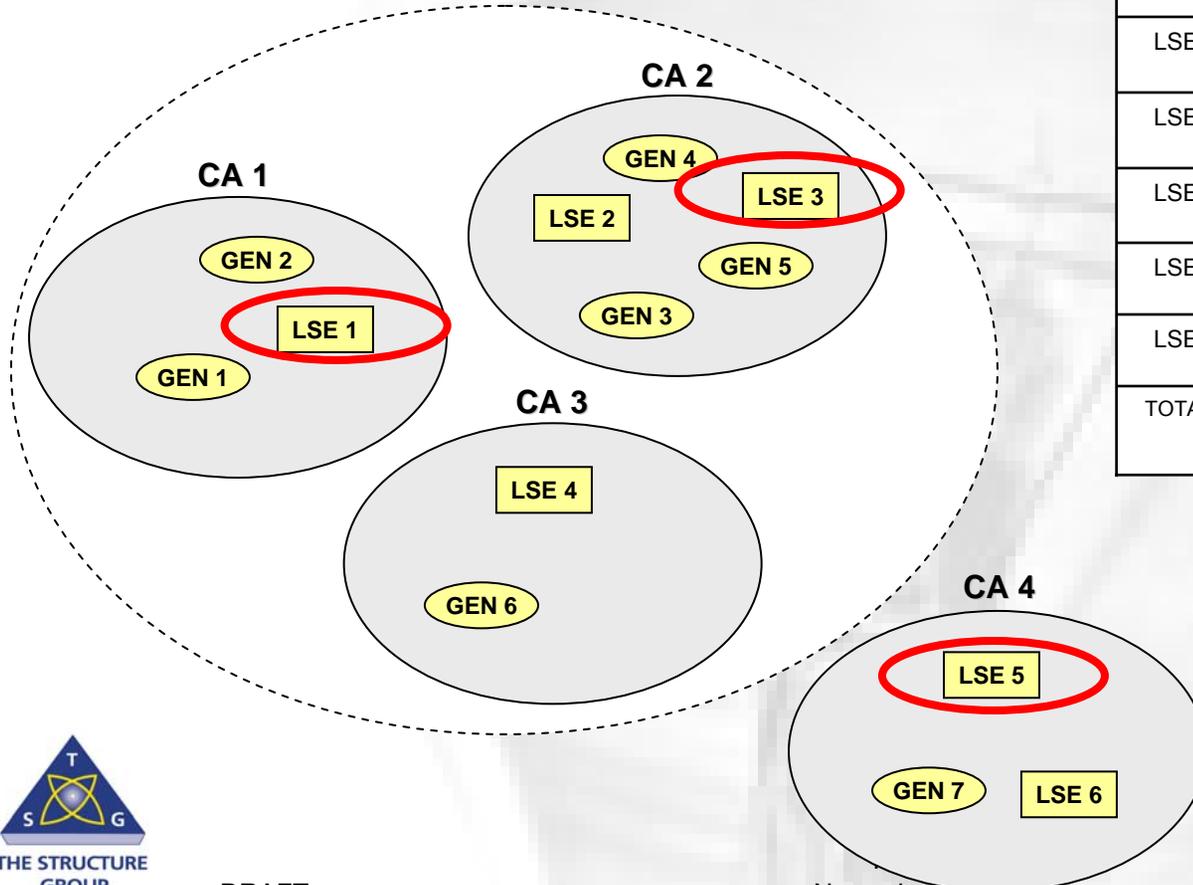
Consolidated Control Area
Regulation Reserve Requirement = 1000 MW



Entity	In CCA	Load	CCA Load Ratio Share	Obligation
LSE 1	Yes	1000	42% (1000/2400)	420 MW (42% of 1000)
LSE 2	Yes	200	8% (200/2400)	80 MW (8% of 1000)
LSE 3	Yes	400	17% (400/2400)	167 MW (17% of 1000)
LSE 4	Yes	800	33% (800/2400)	333 MW (33% of 1000)
LSE 5	No	500	0%	0 MW
LSE 6	No	600	0%	0 MW
Total for CCA LSE	No	2400	100% (2400/2400)	1000 MW (100% of 1000)

LSEs within the CCA are required to submit offers to cover their obligation (at a minimum). Certified resources outside of the CCA can submit reserve offers into the market:

Consolidated Control Area
Regulation Reserve Requirement = 1000 MW



Entity	Obligation	MW Offer	Price
LSE 1	420	420 MW	\$25/MW
LSE 2	80	80 MW	\$55/MW
LSE 3	167	200 MW	\$30/MW
LSE 4	333	400 MW	\$35/MW
LSE 5	0	380 MW	\$15/MW
LSE 6	0	0	N/A
TOTALS	1000 (Obligation)	1480 MW (Offers)	

In this case, LSE 1, 3, and 5 would be selected to provide reserves to the region. Marginal Price will be \$30/MW-h

The following matrix summarizes the Beginning State design for CCA Reserve Market Service:

Description	Current Practice	Proposed Change	Opportunities/ Value
Reserve Markets	<ul style="list-style-type: none"> No central market exists for reserves. 	<ul style="list-style-type: none"> Voluntary auction market for required CCA reserves. 	<ul style="list-style-type: none"> New market for participants to sell reserves. Economic optimization of reserve costs.
Contingency Reserve Sharing	<ul style="list-style-type: none"> Many participants in the region are members of the NWPP. 	<ul style="list-style-type: none"> Non-CCA participants will remain direct members of the NWPP. Grid West will become a new member of the NWPP for the CCA. NWPP will coordinate with Grid West during contingency events. 	<ul style="list-style-type: none"> Maintenance of existing reserve sharing program. Regional coordination of contingency events.
Reserve Margins (Regulating Reserves)	<ul style="list-style-type: none"> Each control area must meet its reserve requirements. 	<ul style="list-style-type: none"> Control Area consolidation will allow consolidated participants to pool regulating reserves. 	<ul style="list-style-type: none"> Capacity savings resulting from pooling regulating reserve margins and use of RTEM.

CCA Real-Time Energy Market



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The Real-Time Energy Market module has two primary objectives:

- Develop a market-based process for dispatching energy in the Consolidated Control Area (CCA)
- Allow entities outside of the CCA to voluntarily submit energy offers into the Real-Time Energy Market

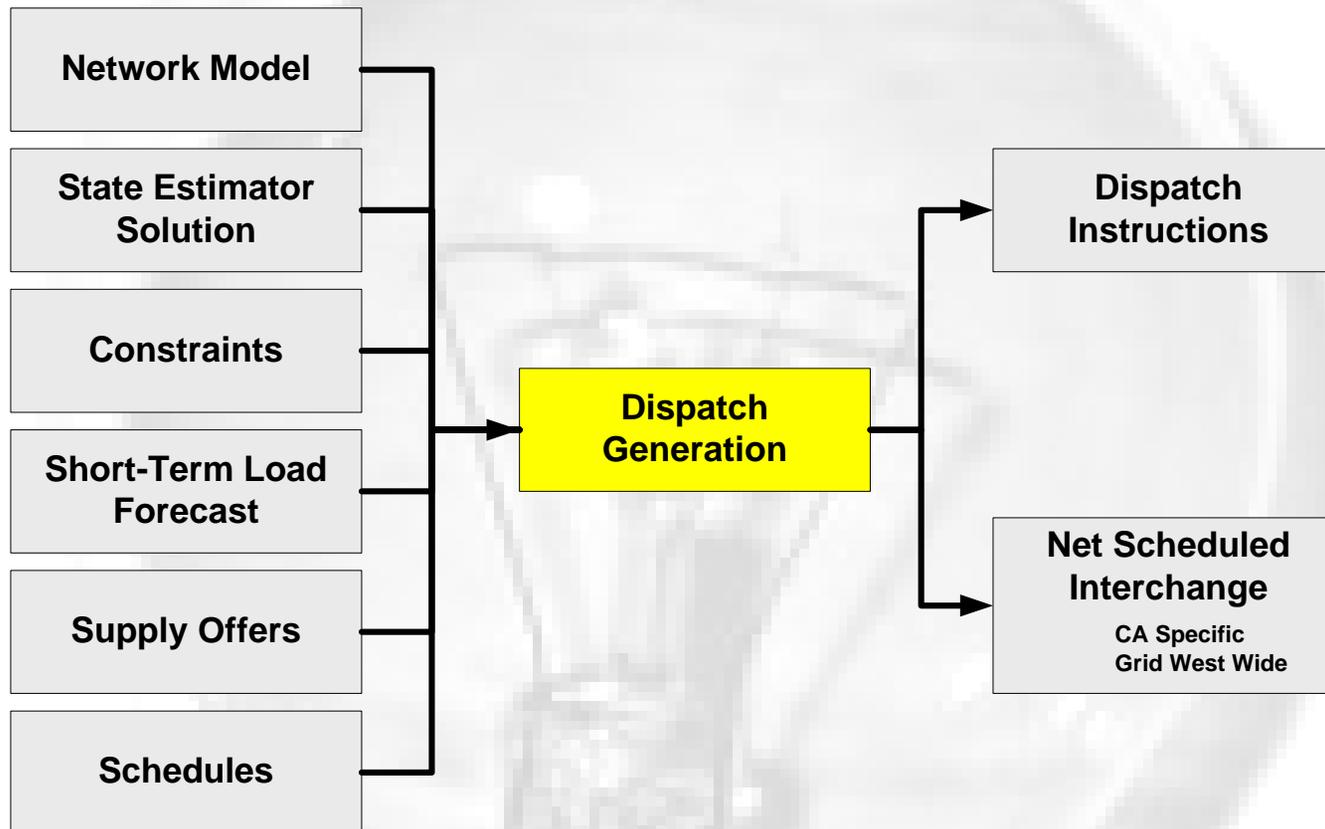
The Beginning State Real-Time Energy Market design has the following basic characteristics:

- Least cost dispatch from available offers.
- Dynamic transfers are used (as done today) for jointly owned units, NWPP reserve response, etc.
- Control strategy uses existing control centers and metering to minimize cost of implementation.
- Grid West will operate a Real-Time Energy Market for the CCA

Grid West will provide the following Operating Hour Services:

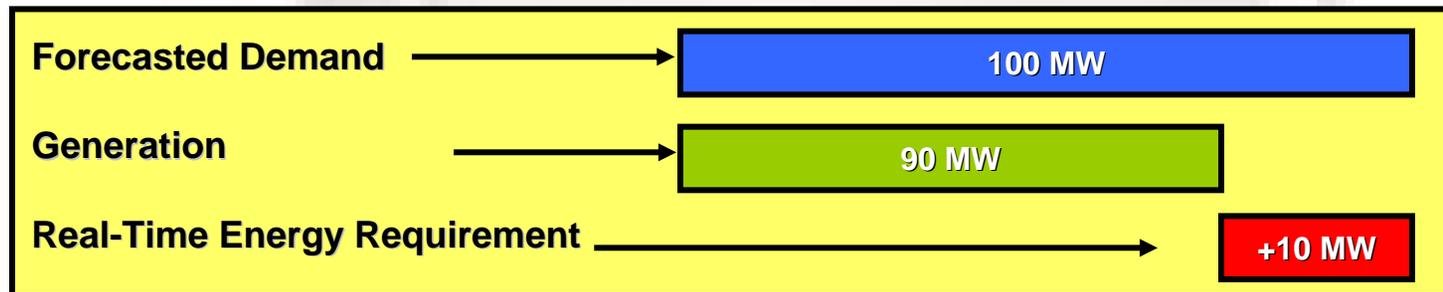
<p>Short-Term Load Forecasting</p>	<ul style="list-style-type: none"> • Short-Term Load Forecasting (STLF) predicts system load by using historic load and weather data, plus forecasted weather conditions.
<p>Real-Time Monitoring</p>	<ul style="list-style-type: none"> • SCADA <ul style="list-style-type: none"> • Metered Generation • Metered Load • Metered Transmission • State Estimator
<p>Real-Time Energy Market</p>	<ul style="list-style-type: none"> • Market where balancing energy is bought or sold every N minutes to accommodate energy use just moments before it occurs on a least-cost basis. • Market Participants can voluntarily submit offers to inc/dec resources for use in the CCA energy market, for use in managing congestion on transmission lines, or for use in executing least-cost dispatch.
<p>Dispatch</p>	<ul style="list-style-type: none"> • Dispatch of Real-Time Energy • Dispatch of Reserves

The Real-Time Energy Market includes the following inputs and outputs:



Grid West will award Real-Time offers in response to energy imbalance...

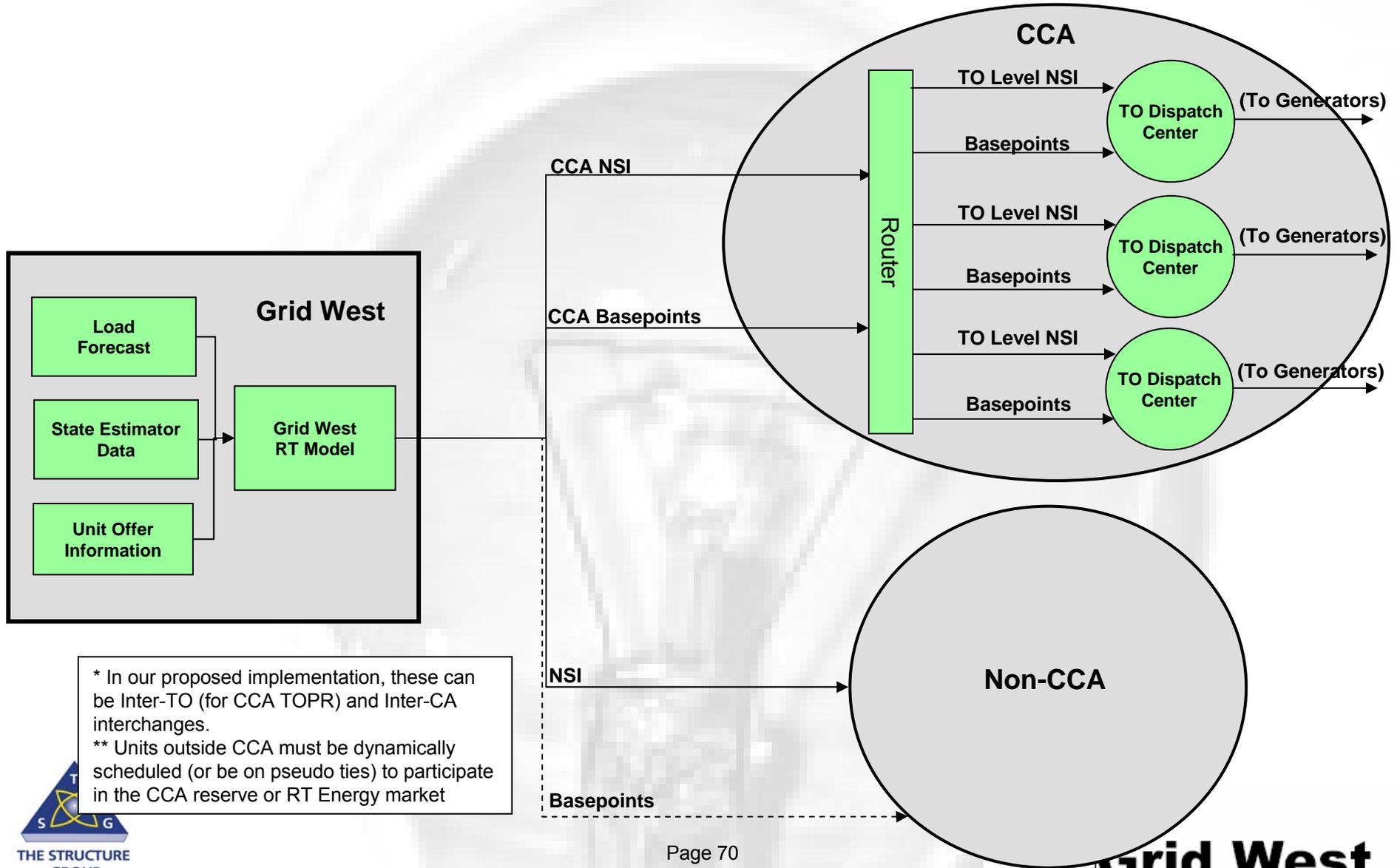
For any given 'n' Minute period:



However, Grid West will ALSO use Real-Time Offers (Incs/Decs) to relieve congestion AND/OR to produce a least-cost redispatch solution...

Module Overview

Grid West Dispatch Process Flow



The following matrix summarizes the Beginning State design for CCA Real-Time Energy Service:

Description	Current Practice	Proposed Change	Opportunities/ Value
NERC Functional Model	<ul style="list-style-type: none"> Each CA acts as its own Balancing Authority. To ensure reliability, there must be one balancing authority for consolidated parties. 	<ul style="list-style-type: none"> Each CA will continue to operate as the Balancing Authority. CCA will operate as a single Balancing Authority. 	<ul style="list-style-type: none"> Potential cost savings for lowest cost energy.
Pricing	<ul style="list-style-type: none"> Multiple prices for Imbalance Energy currently exist. Price signals are not transparent to the market. 	<ul style="list-style-type: none"> Locational Real-Time energy prices for CCA will be known as a result of the Real-Time Energy Market. 	<ul style="list-style-type: none"> Central market efficiency afforded for Real-Time energy. Quantitative value for congestion to guide expansion decisions.
Dispatch Instructions	<ul style="list-style-type: none"> Performed on a CA basis. 	<ul style="list-style-type: none"> Grid West calculates NSI for each TO within CCA. Grid West sends out dispatch instructions for the entire CCA. 	<ul style="list-style-type: none"> Regional coordination. Advance response analysis to guide contingency response. Alternative to curtailment.
Uninstructed/Instructed Deviations	<ul style="list-style-type: none"> None. 	<ul style="list-style-type: none"> Instructions to participating units. Incentives to follow dispatch instructions. 	<ul style="list-style-type: none"> Economic incentives for dispatch deviations.
Energy Imbalance	<ul style="list-style-type: none"> Calculated and settled by each control area independently. Pricing and standards vary across control areas. Penalty provision for certain users. 	<ul style="list-style-type: none"> RTEM provides market-based imbalance energy Grid West calculates imbalance for participants within the CCA. 	<ul style="list-style-type: none"> Standard, transparent and equitable solution and prices across the CCA. Hourly value of congestion cost becomes quantitative



- Introduction
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- Example Situations
- Question & Answer

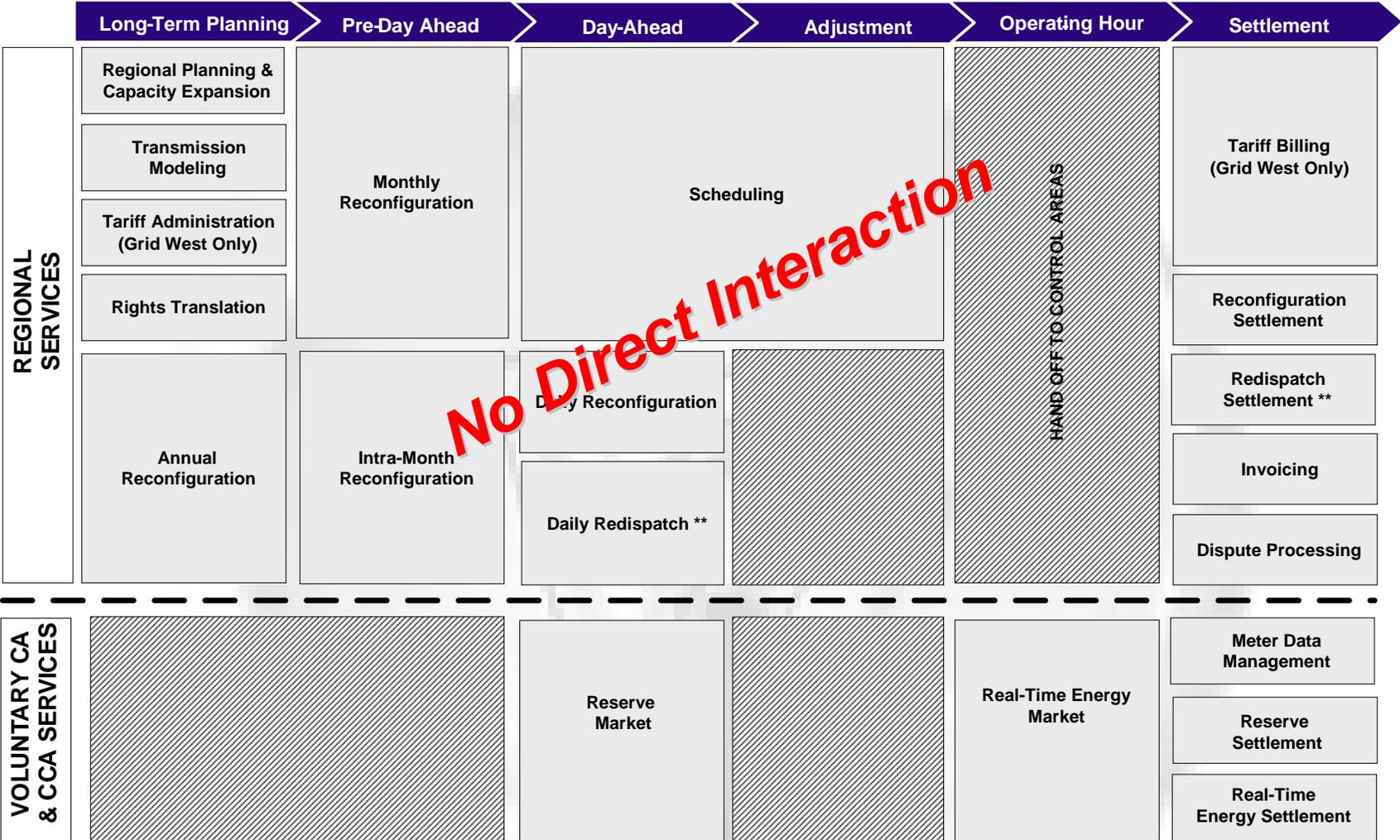
Example Situations

Scenario #1

- Situation: A party with existing rights does not want to participate in any Grid West market.
 - Scenario #1A – A BPA customer with network service:
 - Situation is unchanged – scheduling and settlement still with BPA.
 - BPA schedules with Grid West for its aggregate responsibility.

Example Situations

Scenario #1A



No Direct Interaction

** The Redispatch Service will be implemented after the Reconfiguration Service and Real-Time Energy Market are operating



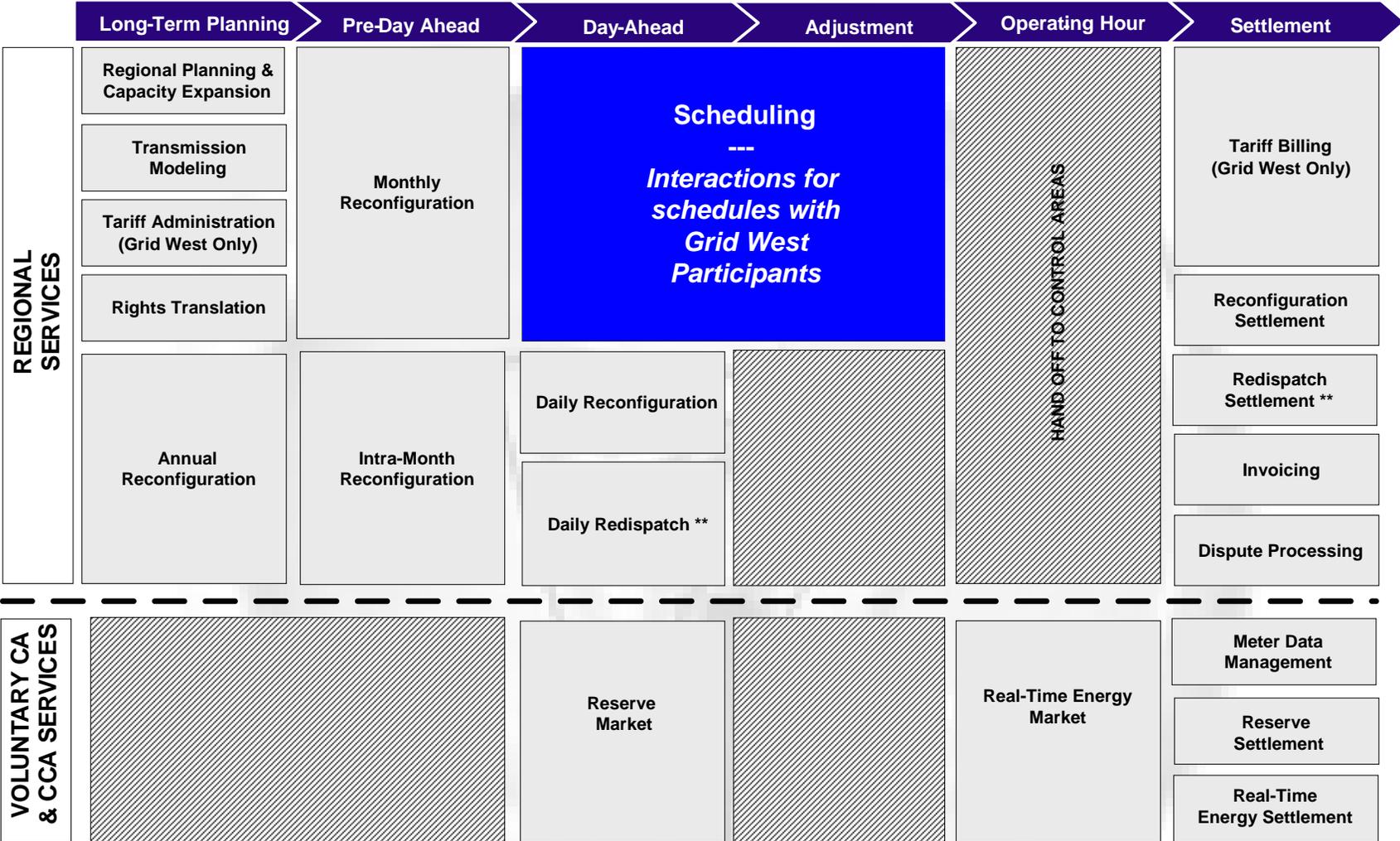
Example Situations

Scenario #1

- Situation: A party with existing rights does not want to participate in any Grid West market.
 - Scenario #1A – A BPA customer with network service:
 - Situation is unchanged – scheduling and settlement still with BPA.
 - BPA schedules with Grid West for its aggregate responsibility.
 - Scenario #1B – A non-participating control area with point-to-point rights:
 - Transmission rights are unchanged.
 - There will be scheduling interactions with Grid West for transactions with Grid West parties, i.e., interchange confirmation, etc.

Example Situations

Scenario #1B



** The Redispatch Service will be implemented after the Reconfiguration Service and Real-Time Energy Market are operating



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Example Situations

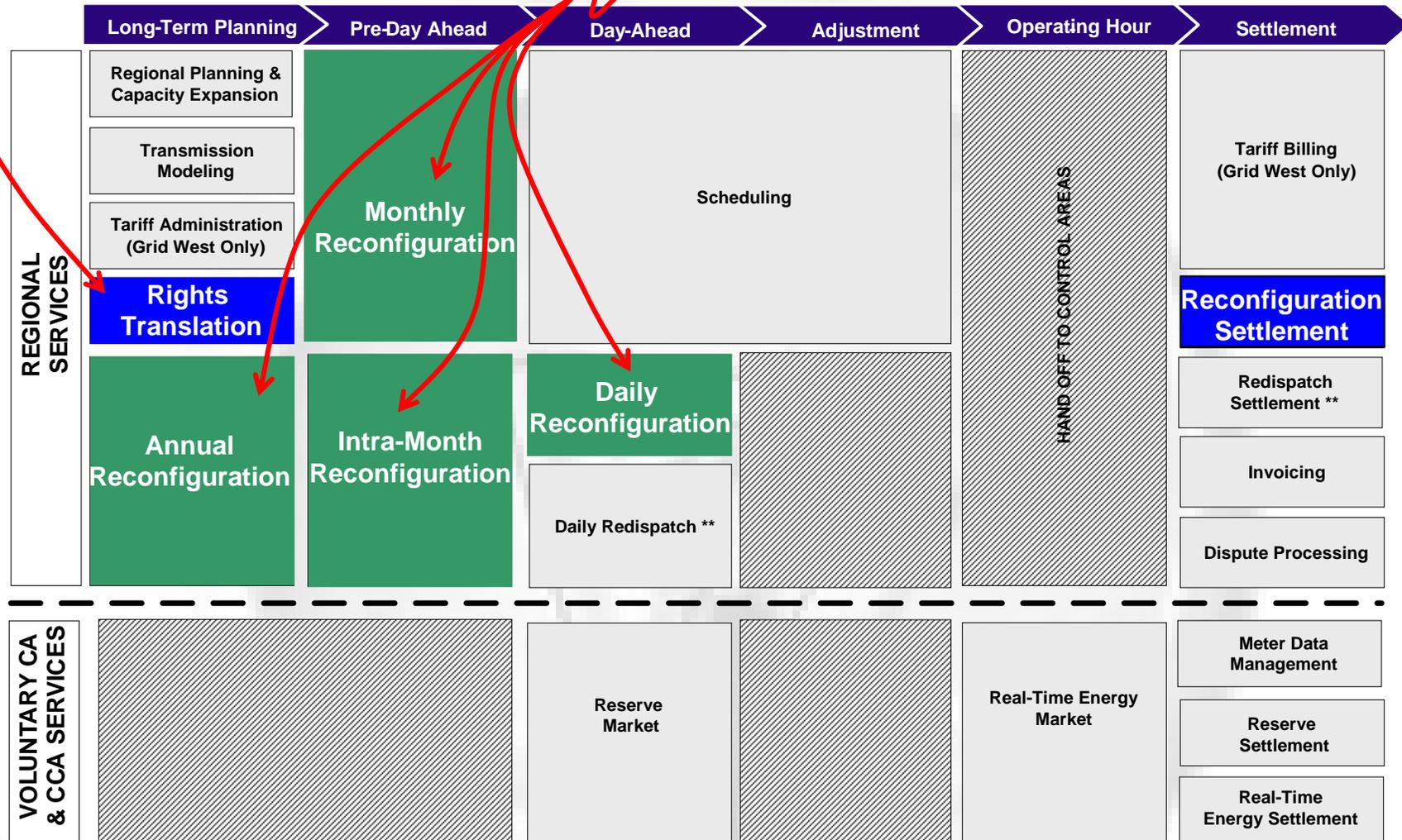
Scenario #2

- Situation: A party with existing transmission rights is willing to sell some of its rights to others:
- Options:
 - Bilateral Trade – As in the past.
 - Reconfiguration Market – A one-to-one match of injection and withdrawal points no longer necessary for a trade to occur.

- Request determination of equivalent IWRs.
- No obligation to offer for sale.

- Choice based on desired term of sale and auction timing

Example Situations Scenario #2



** The Redispatch Service will be implemented after the Reconfiguration Service and Real-Time Energy Market are operating



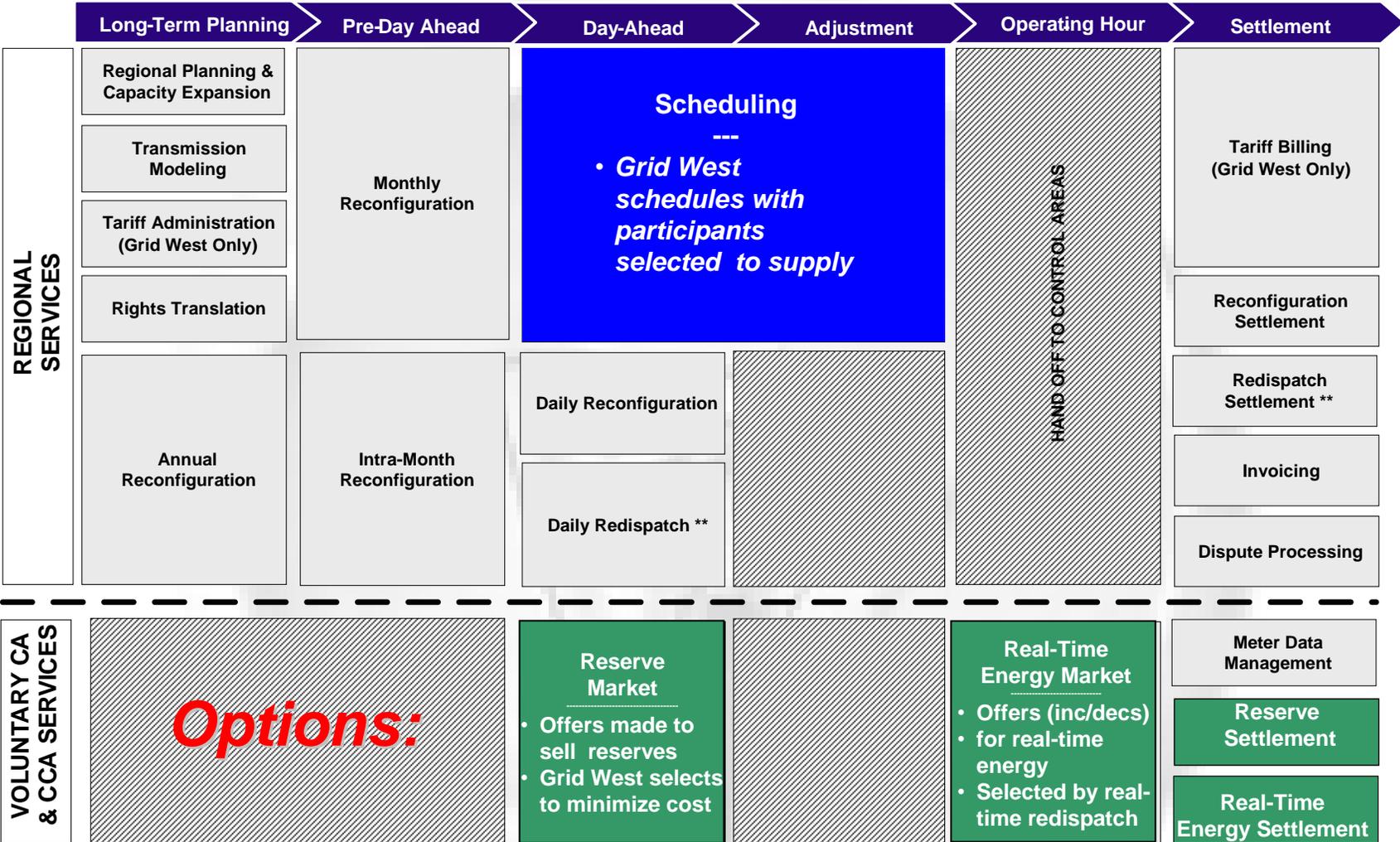
Example Situations

Scenario #3

- Situation: A participant with available resources wants to offer them into the CCA's Reserve or Real-Time Energy Markets.
- Steps:
 - Meet System Access Requirement for RNS.
 - For offered resources located within the CCA:
 - Resources must be capable of responding to Grid West control signals.
 - Transmission rights not required to make offer, however transmission availability will affect selection.
 - Selected based on least-cost supply.
 - For offered resources located outside the CCA – added points:
 - Dynamic transfer used to for resource control in real-time.
 - Supplier must provide transmission to Grid West boundary if resource is outside the Grid West Footprint.

Example Situations

Scenario #3



** The Redispatch Service will be implemented after the Reconfiguration Service and Real-Time Energy Market are operating



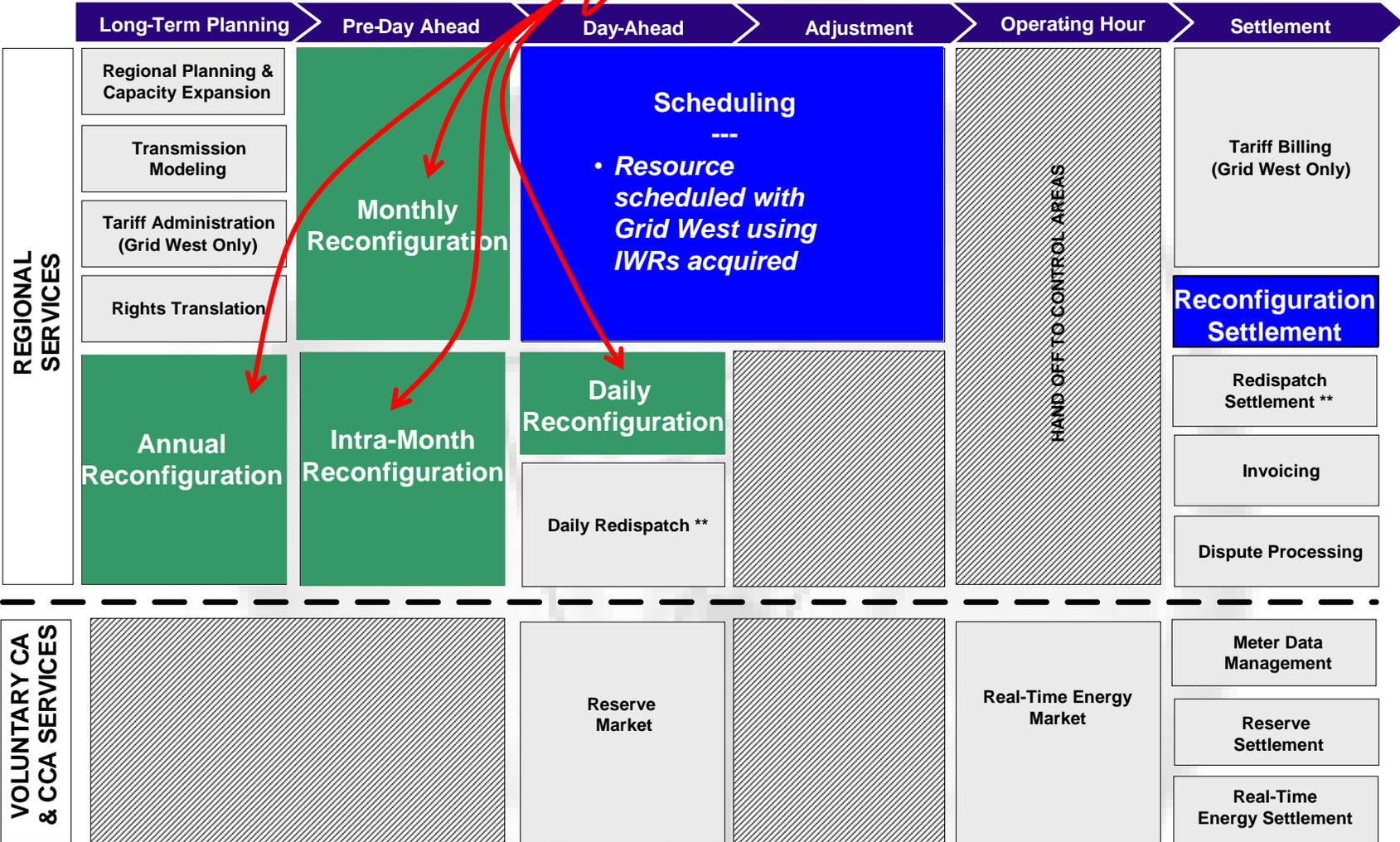
Example Situations

Scenario #4

- Situation: An LSE wants to buy from a resource not covered by its existing transmission rights.
- Steps:
 - Meet System Access Requirement for RNS.
 - Use Reconfiguration Service to obtain IWRs.

Example Situations Scenario #1a

• *Choice based on desired term of purchase*



** The Redispatch Service will be implemented after the Reconfiguration Service and Real-Time Energy Market are operating



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- Discussion of design choices – options considered
- Discussion of detail to be added in the next round
- Follow-up questions invited with follow-up conference call