



Grid West

Conceptual Framework Summary

Layer 1 Draft – Last Updated on November 1, 2004

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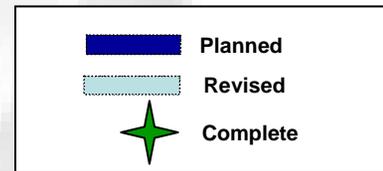
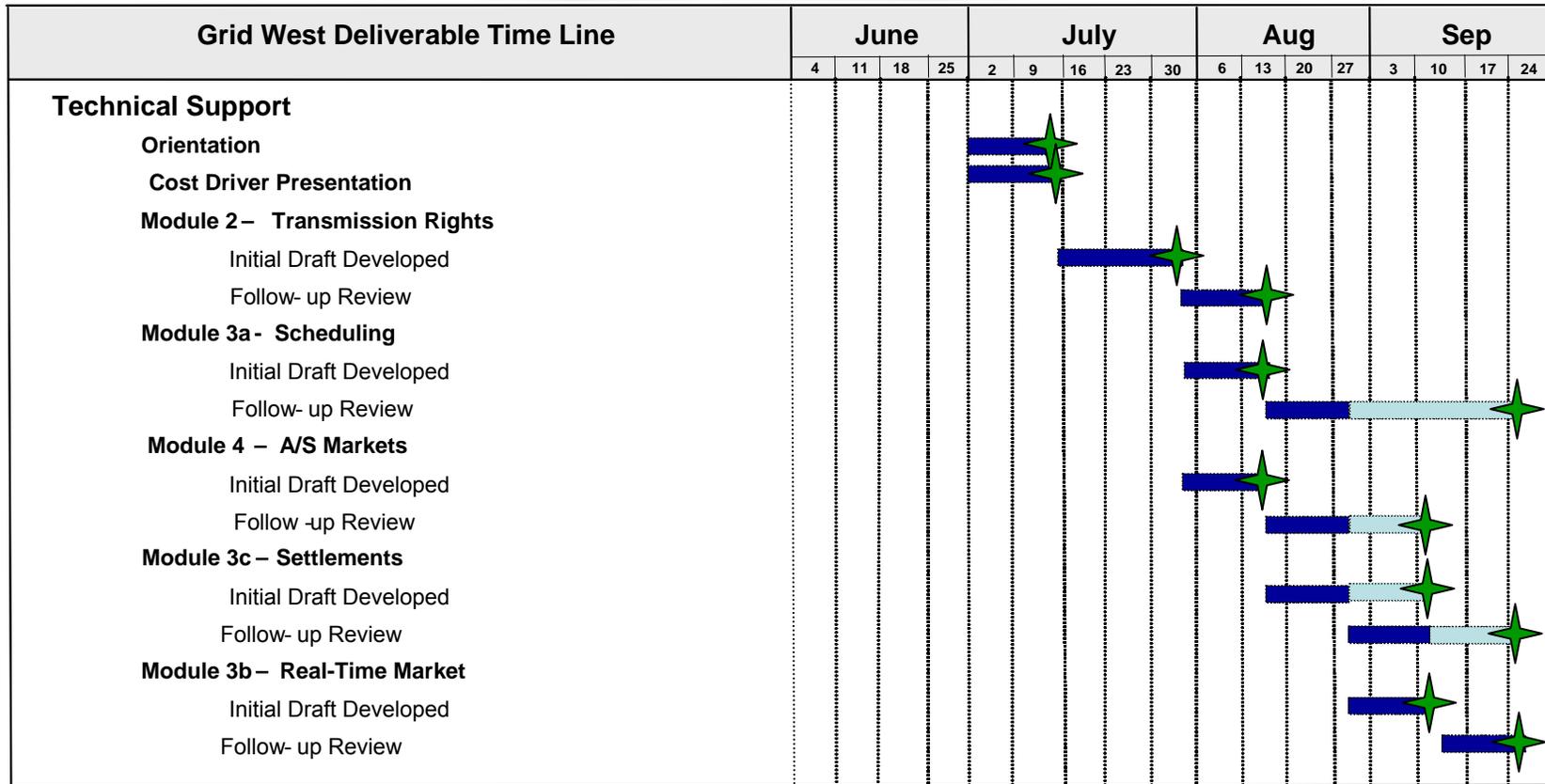
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Page 1

The following approach was followed in developing the Beginning State design:



- **Orientation** – A brief orientation was provided to our team in order to obtain a better understanding of the various key players and the work that has been done to date
- **Sample Straw Proposal** –A draft straw proposal of Module 2 will be developed and presented to the TSLF at the second meeting.
- **Pulse Check**– The TSLG had an opportunity to review the straw proposal and provide feedback on not only functional content but the presentation format. TSLG comments were incorporated into subsequent versions.
- **Iterative Design** – The Structure Group has been developing iterative versions of the Modules for each meeting. These modules are reviewed for content and comments are incorporated into future versions. The objective of the first phase of design was to go “broad” rather than “deep”.



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.



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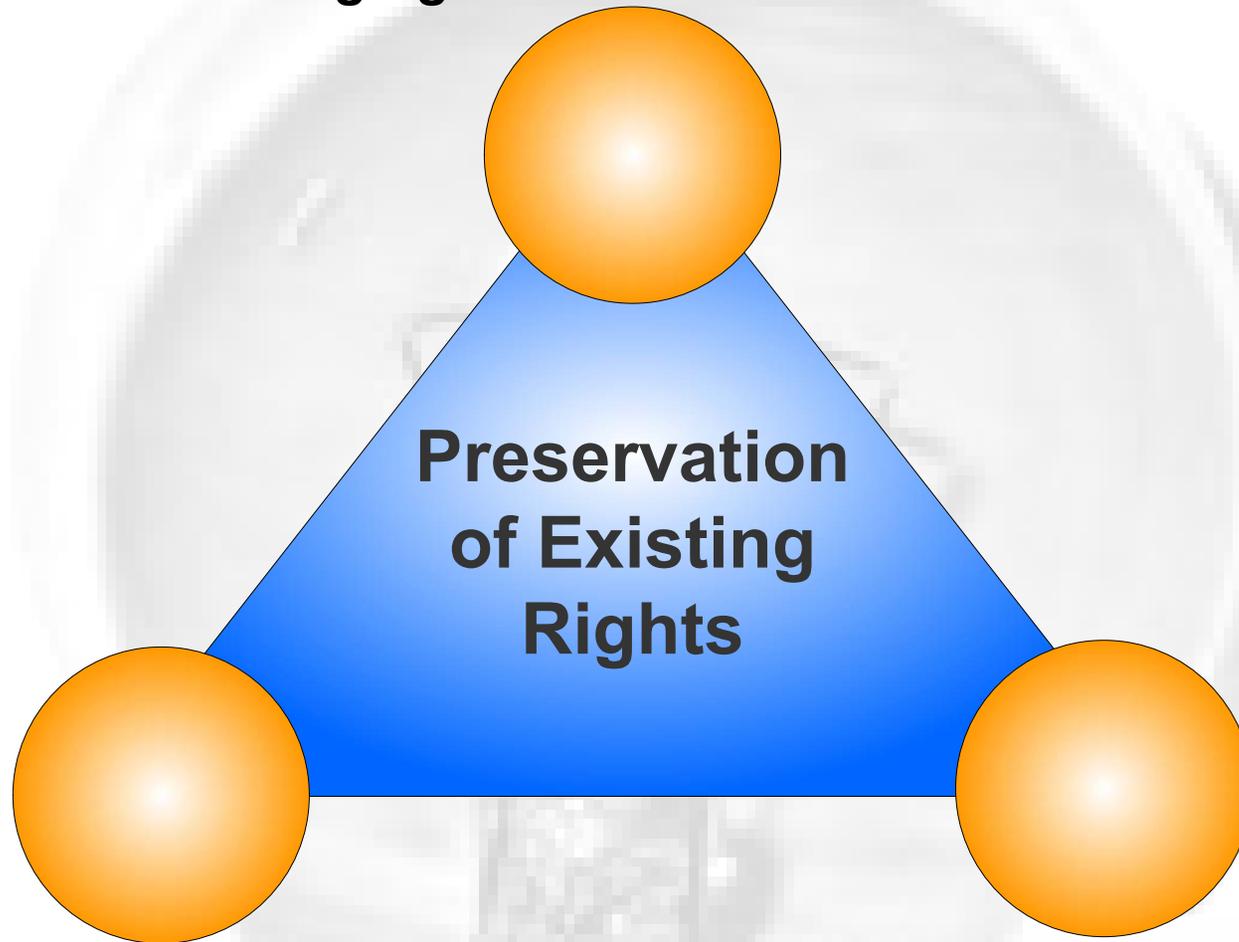
Solutions to these problems must also meet a challenging set of regional conditions:

- 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?

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



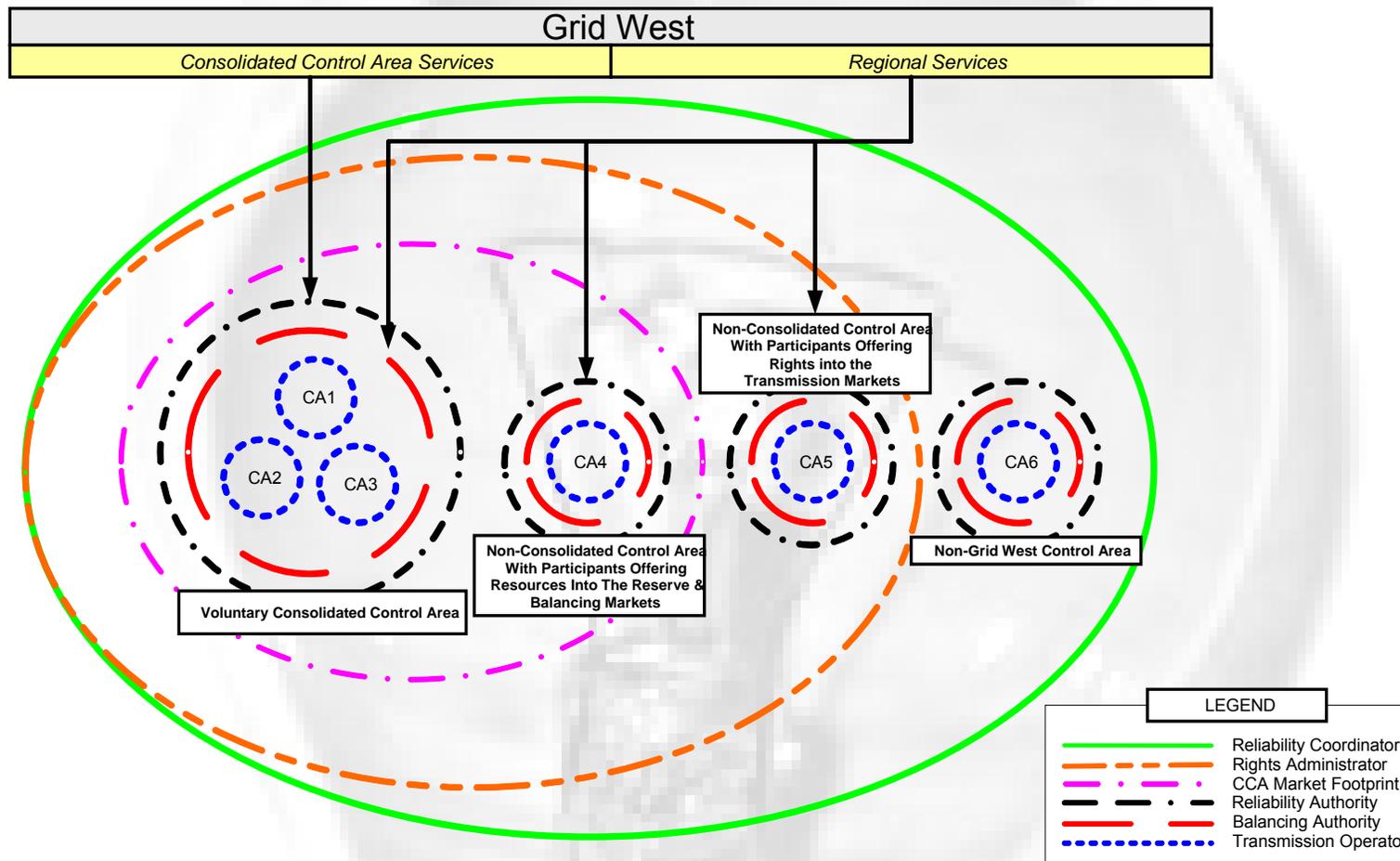
The Regional Proposal contains the following design boundaries...

- Participants submit balanced schedules
- Control area consolidation is voluntary
- Existing functionality 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

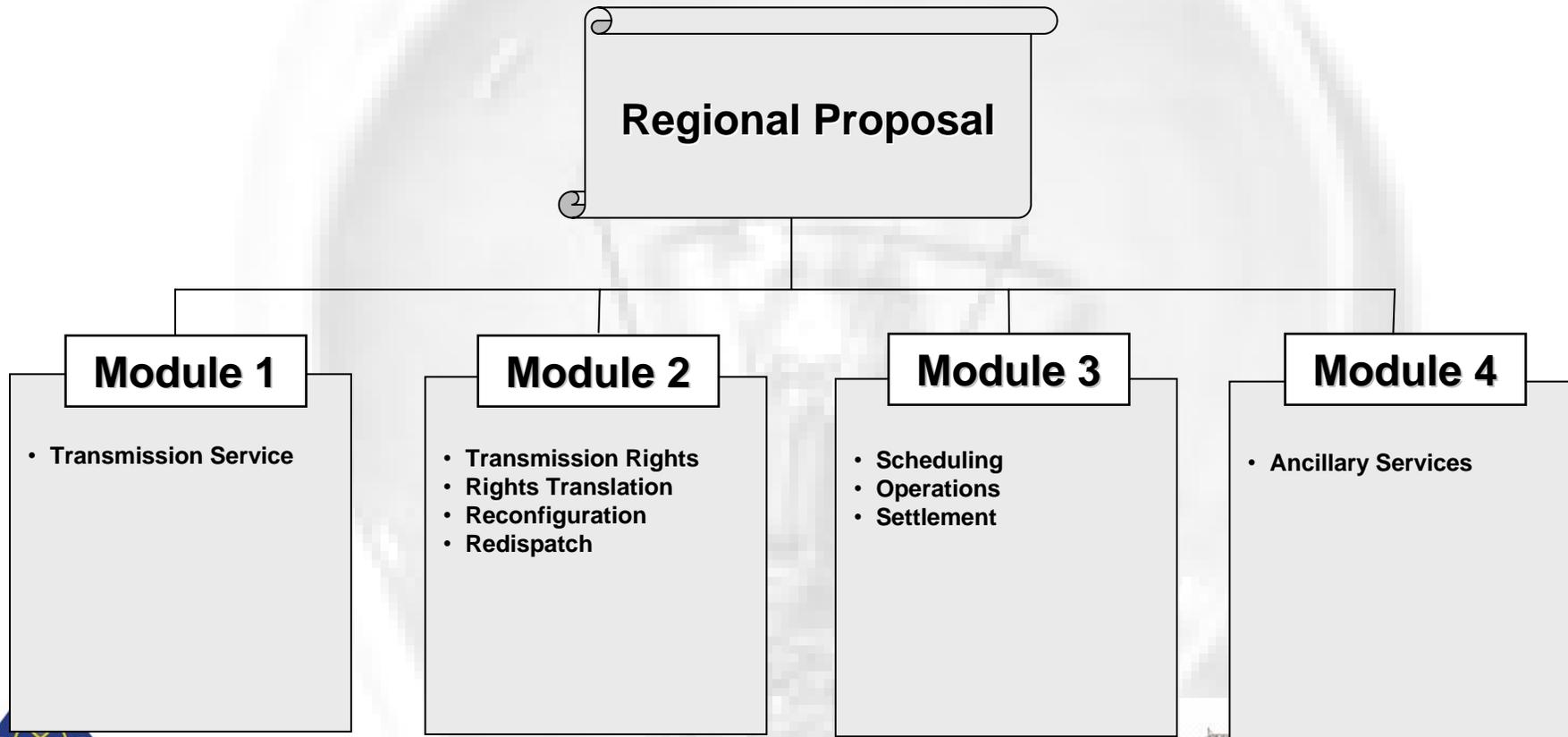
The Regional Proposal provides little detail regarding the Consolidated Control Area. So what can we assume at this point?

- Control areas may decide to voluntarily consolidate (we assume that at least three CAs consolidate)
- Grid West will provide both regional and Consolidated Control Area (CCA) services
- 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

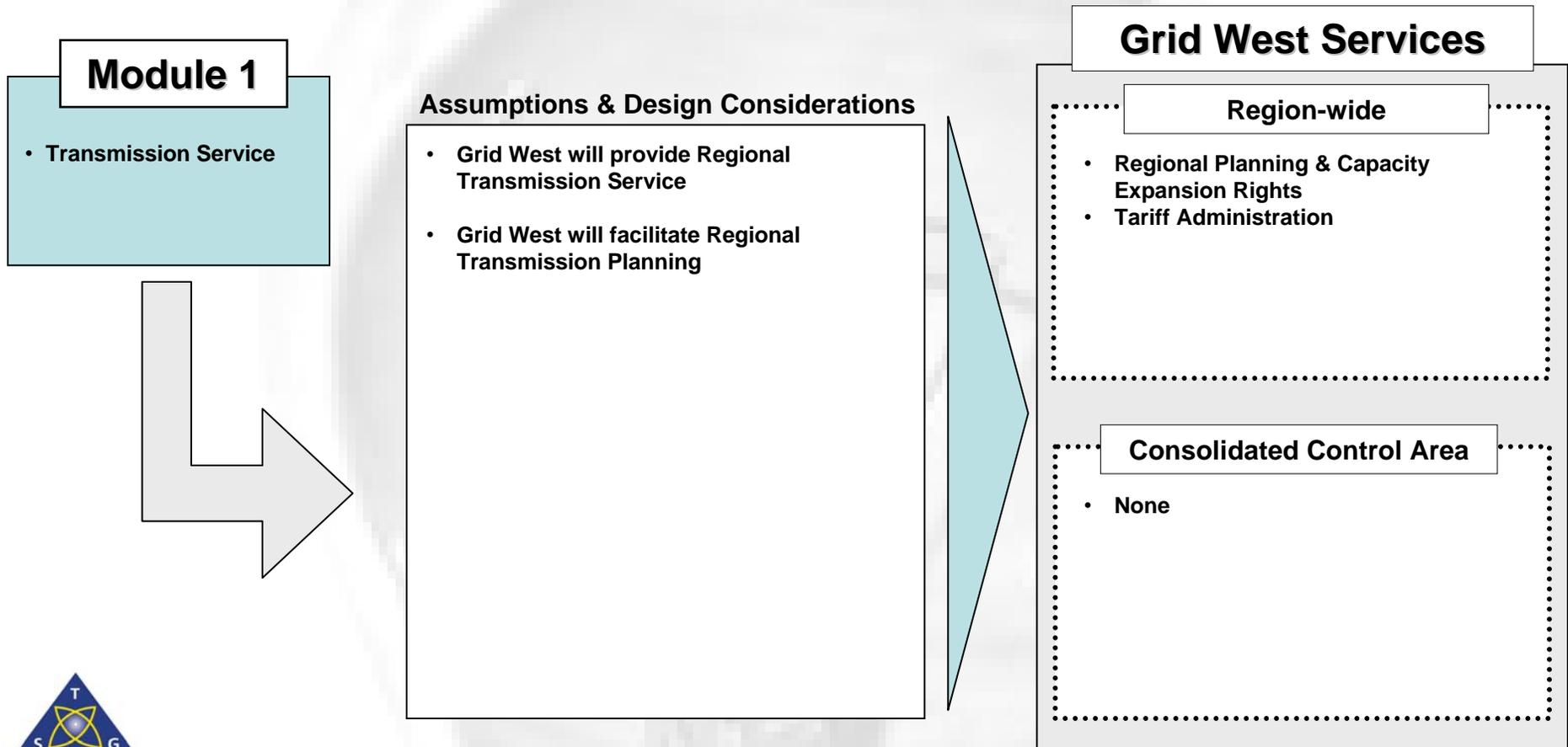
The following RRG Service Model defines the Grid West services that are to be provided to the Consolidated Control Area and the non-Consolidated Control Areas.



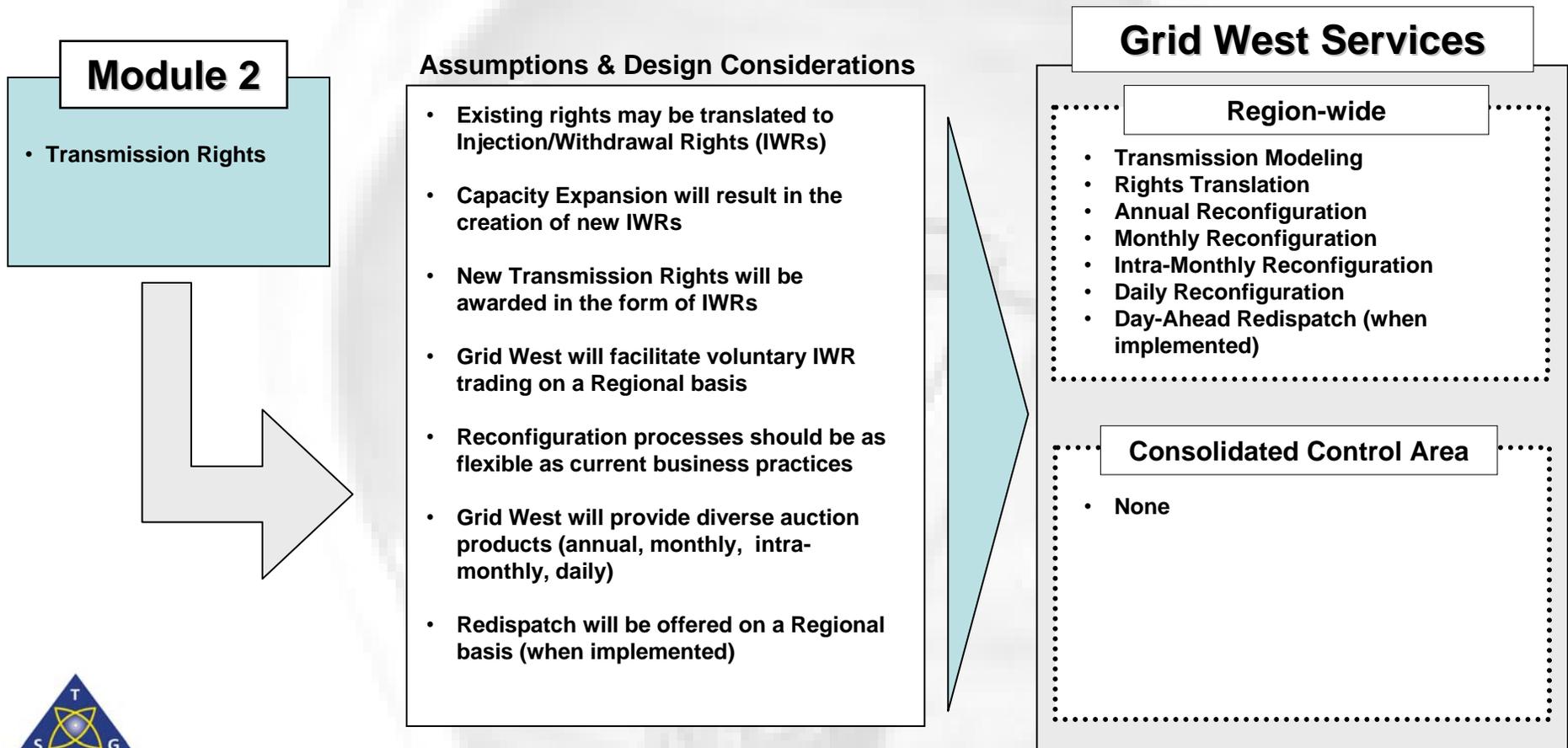
The TSLG has defined several “modules” to help identify the services Grid West will provide under this model...



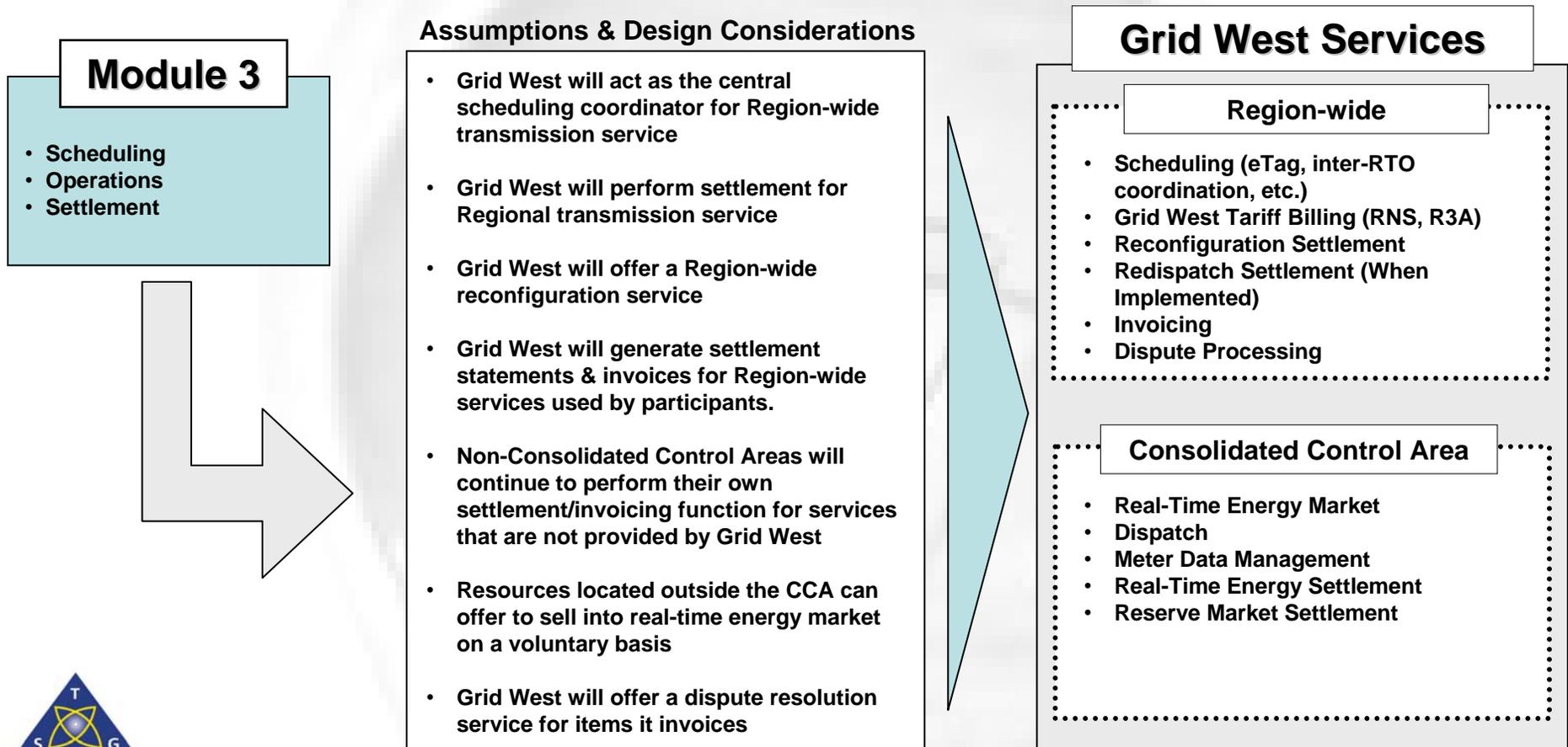
But how do these modules translate into distinct services?



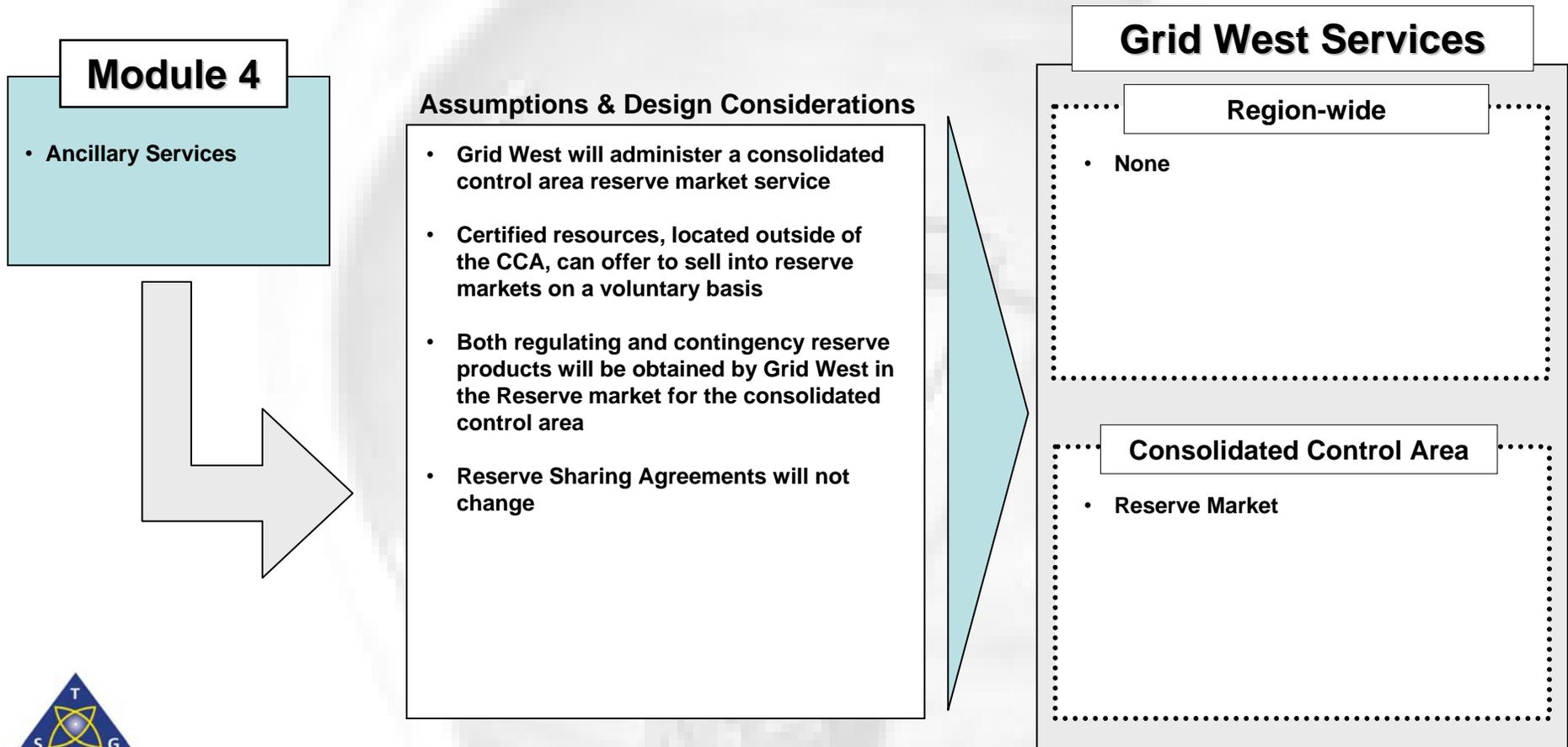
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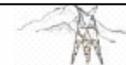


But how do these modules translate into distinct services?



After making some assumptions regarding services that Grid West may provide, the following inventory was generated...

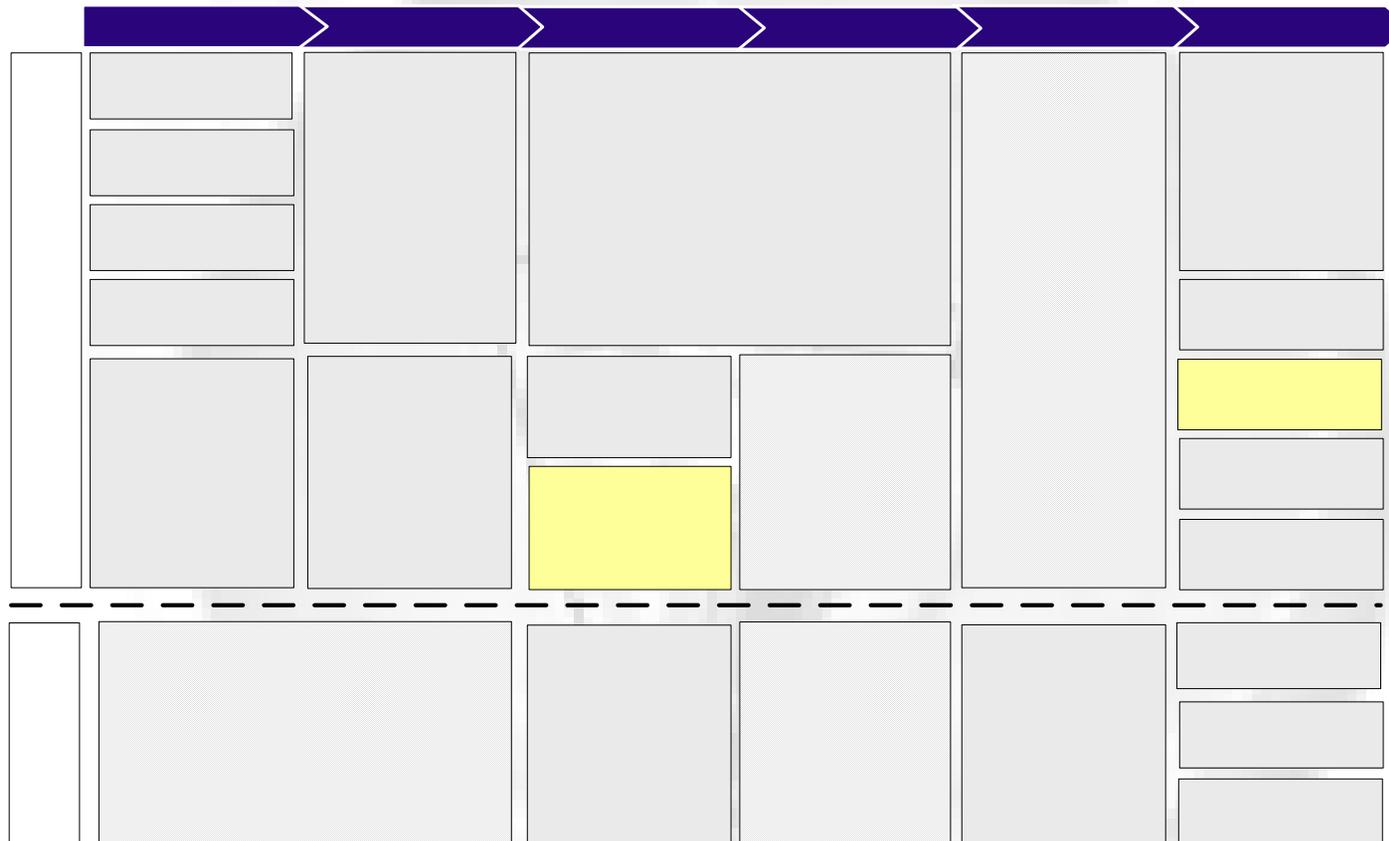
Grid West	
<ul style="list-style-type: none"> • Reserve Market • Real-Time Energy Market • Meter Data Management • Reserve Market Settlement • Real-Time Energy Settlement 	<ul style="list-style-type: none"> • Tariff Administration • Regional Planning & Capacity Expansion • Rights Translation (for Reconfiguration Services) • Annual Reconfiguration • Monthly Reconfiguration • Intra-Month Reconfiguration • Day-Ahead (Daily) Reconfiguration • Day-Ahead (Daily) Redispatch (when implemented) • Scheduling • Tariff Billing (RNS, R3A) • Reconfiguration Settlement • Redispatch Settlement (when implemented) • Invoicing • Dispute Processing



To help further define these services, we have defined a common framework of time periods:

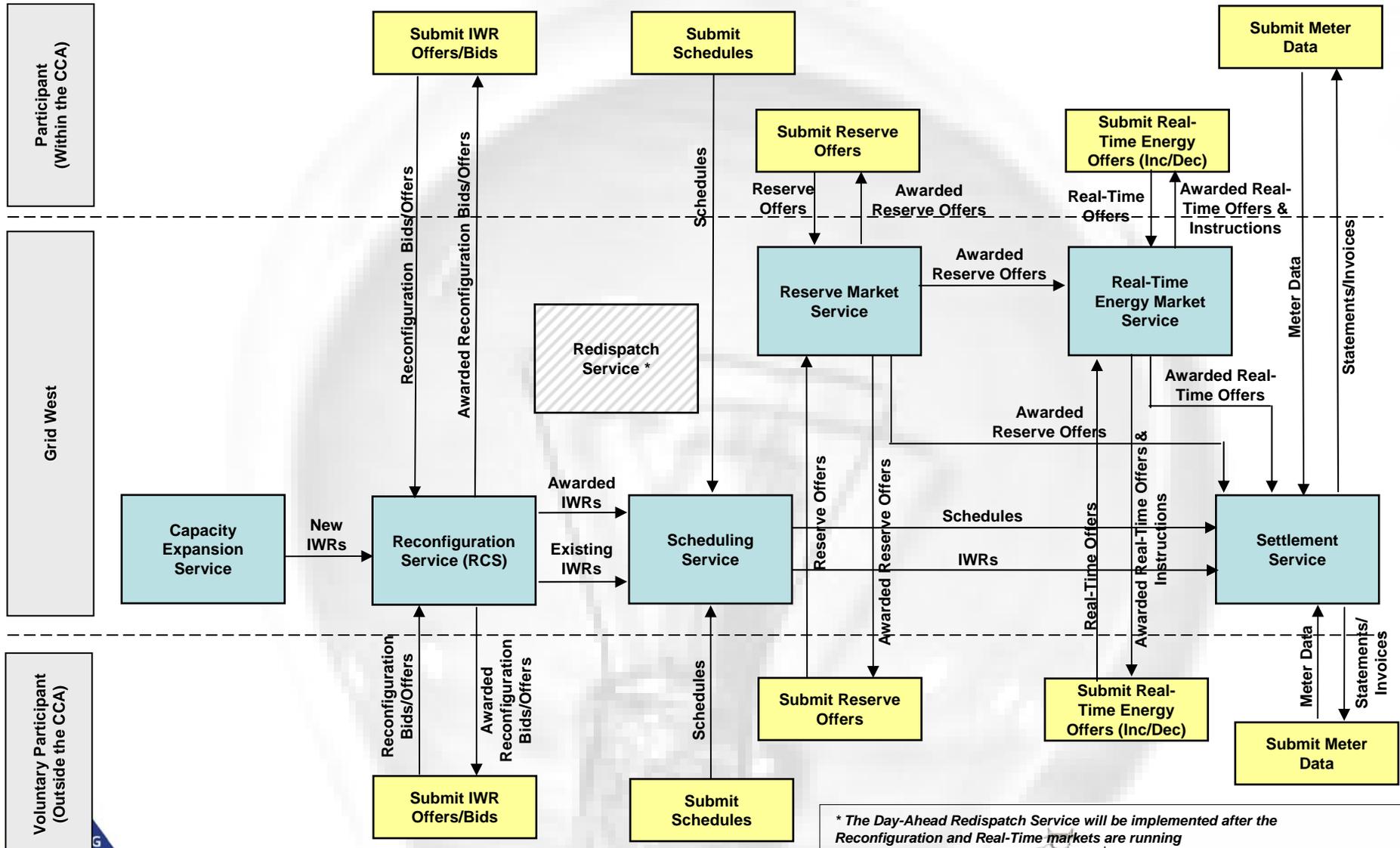
- **Long-term Planning Period** – The Long-term Planning Period is defined as the time 1-10 years prior to the Operating Day.
- **Pre-Day Ahead Period** – The Pre-Day Ahead Period is defined as the time 2-365 days prior to the Day-Ahead Period.
- **Day-Ahead Period** – The Day-Ahead Period is defined as the time beginning at 5:00 am (or similar time) of the day preceding a given operating day and ending at approximately 5:00pm of the day prior to a given operating day.
- **Adjustment Period** – The Adjustment Period is defined as the time from the close of the Day-Ahead Period to the time Z minutes prior to the Operating Hour. (where Z will be defined at a later time)
- **Operating Hour** – The Operating Hour is defined as the time beginning Z minutes prior to hour till the completion of the hour. (where Z will be defined at a later time)
- **Settlement Period** – The Settlement Period is defined as the time after the Operating Day.

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:



Conceptual Framework

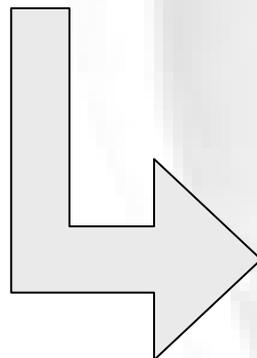
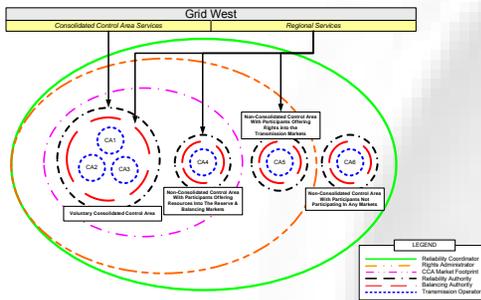
High-Level Business Process



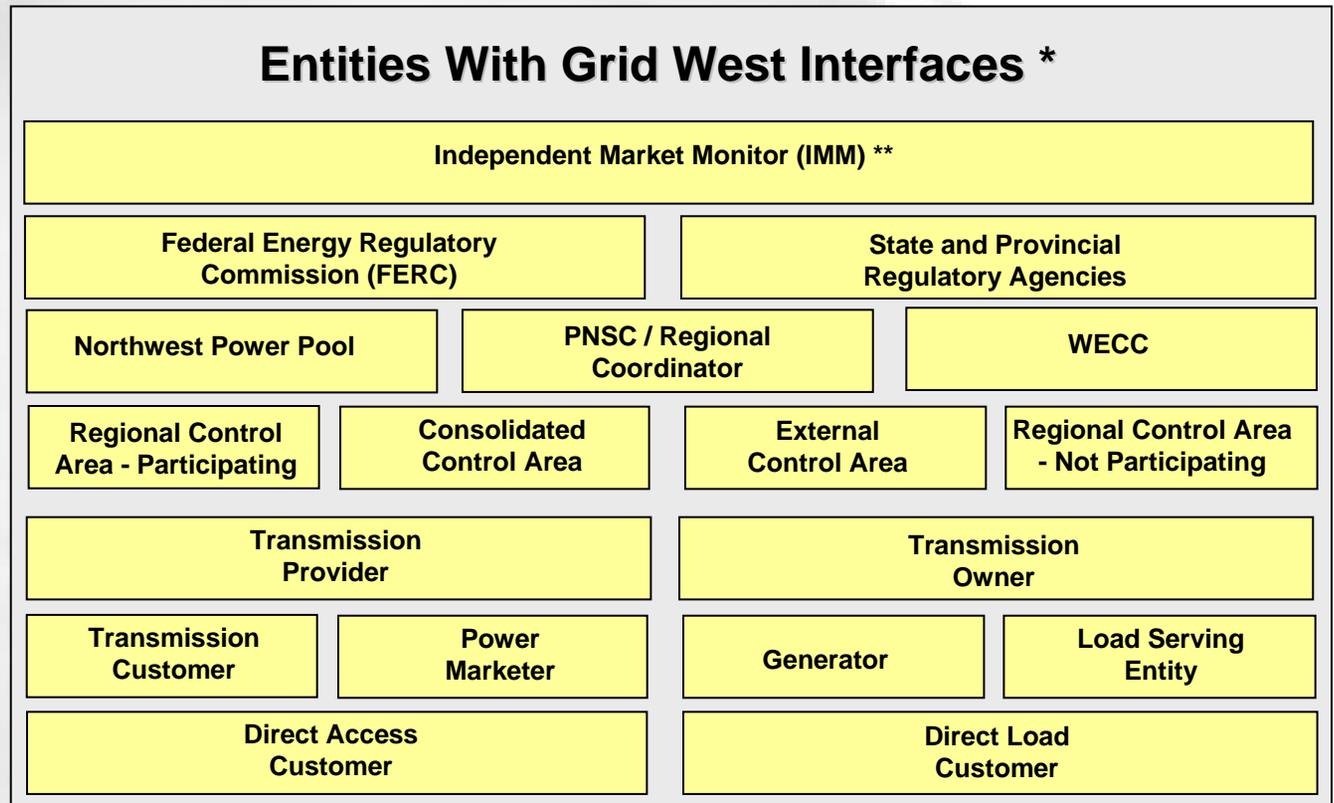
* The Day-Ahead Redispatch Service will be implemented after the Reconfiguration and Real-Time markets are running



What entities interface with Grid West as the users of Grid West services?



Entities With Grid West Interfaces *



* See the TSLG Glossary for definitions of each entity

** IMM does not exist today
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The <Module Name> discussion will cover the following topics:

- Objectives
- Assumptions
- Challenges & Considerations
- Service Descriptions
- Process Overview
- Timeline
- Key Concepts
- Capability Design Summary
- Open Issues