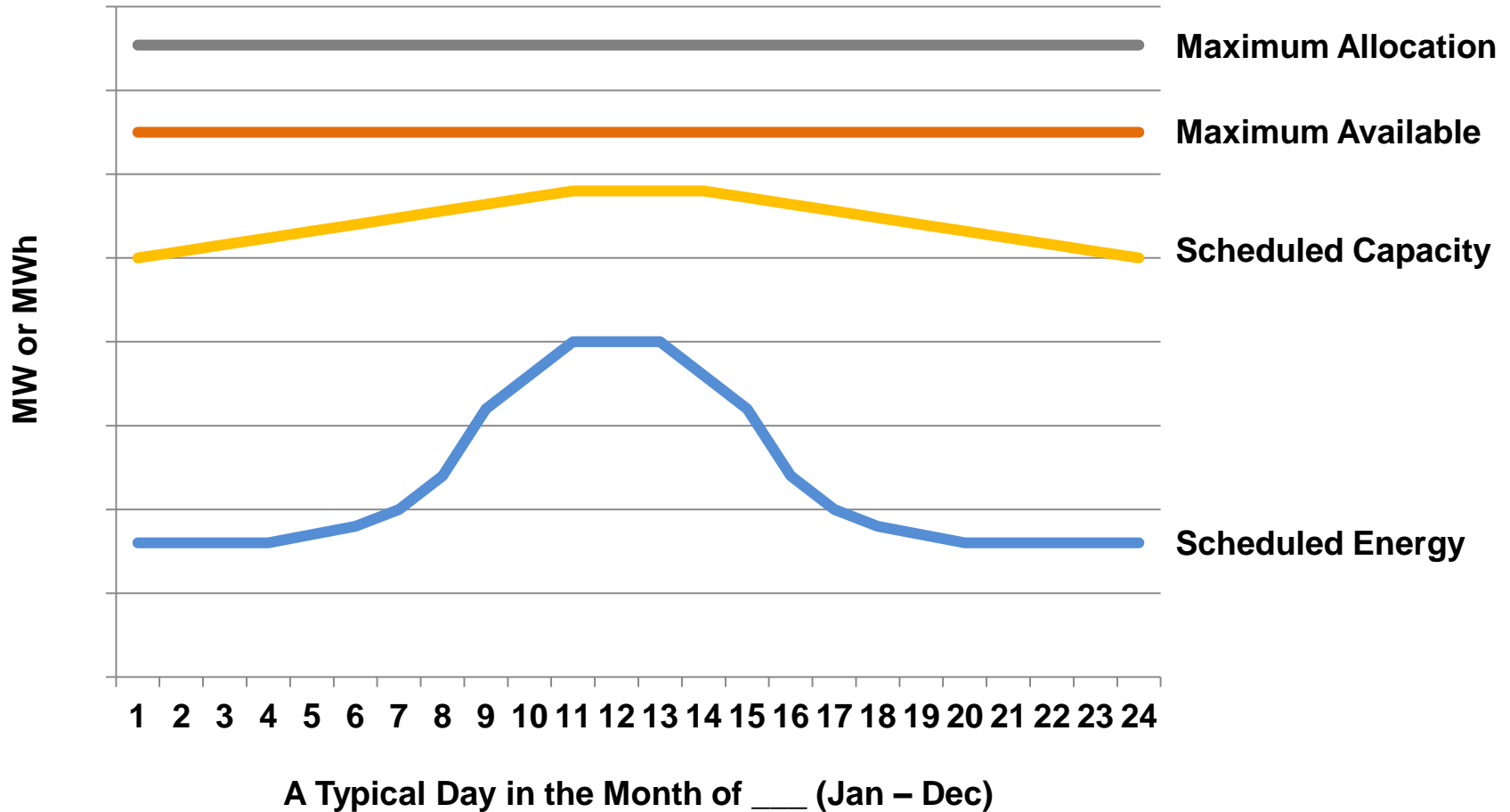


APA Dynamic Signal Workshop

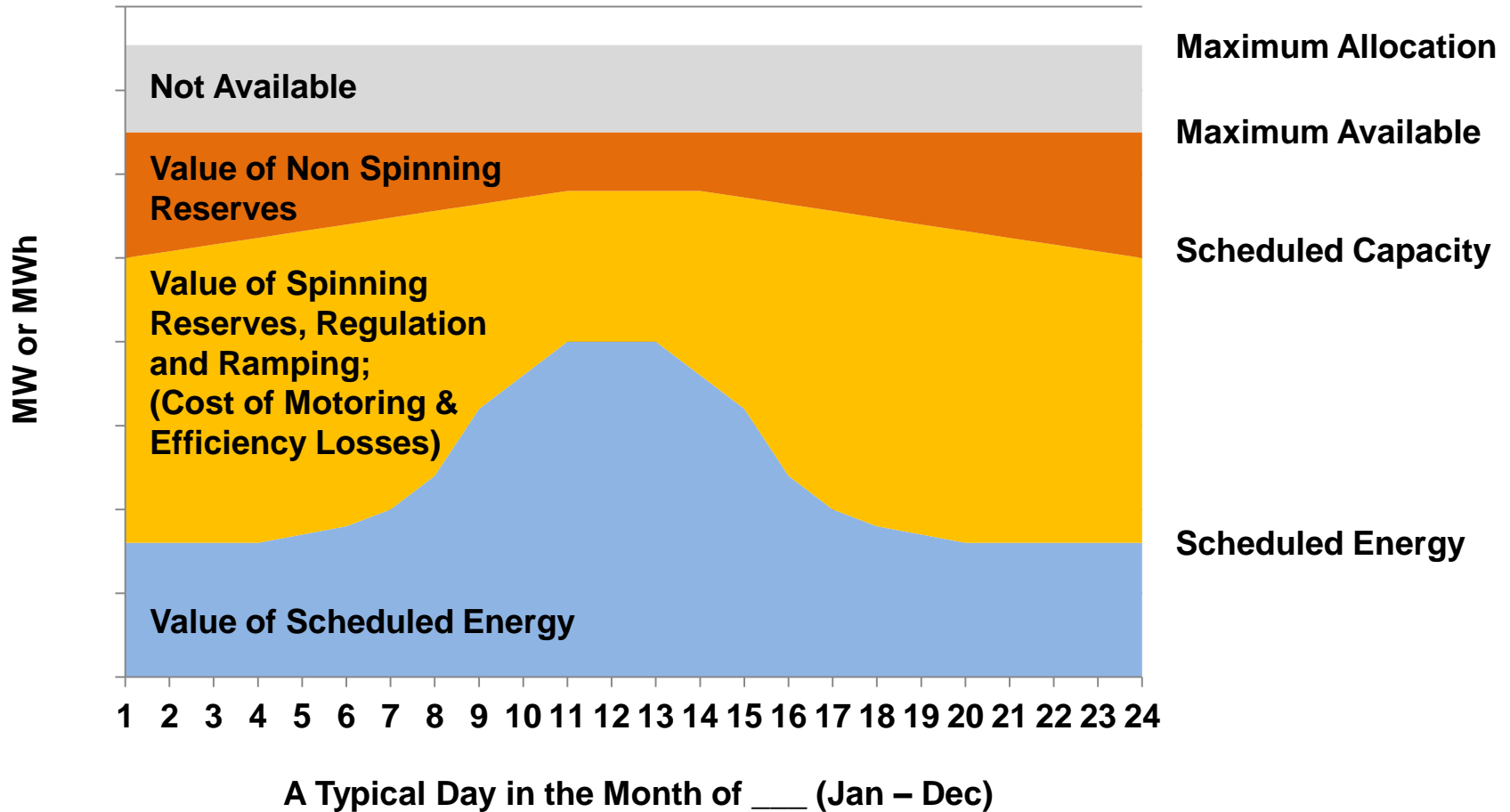
Information Developed by
AEPCO, CAWCD, IEDA and SRP
January 14, 2016

Hoover Generation Concepts

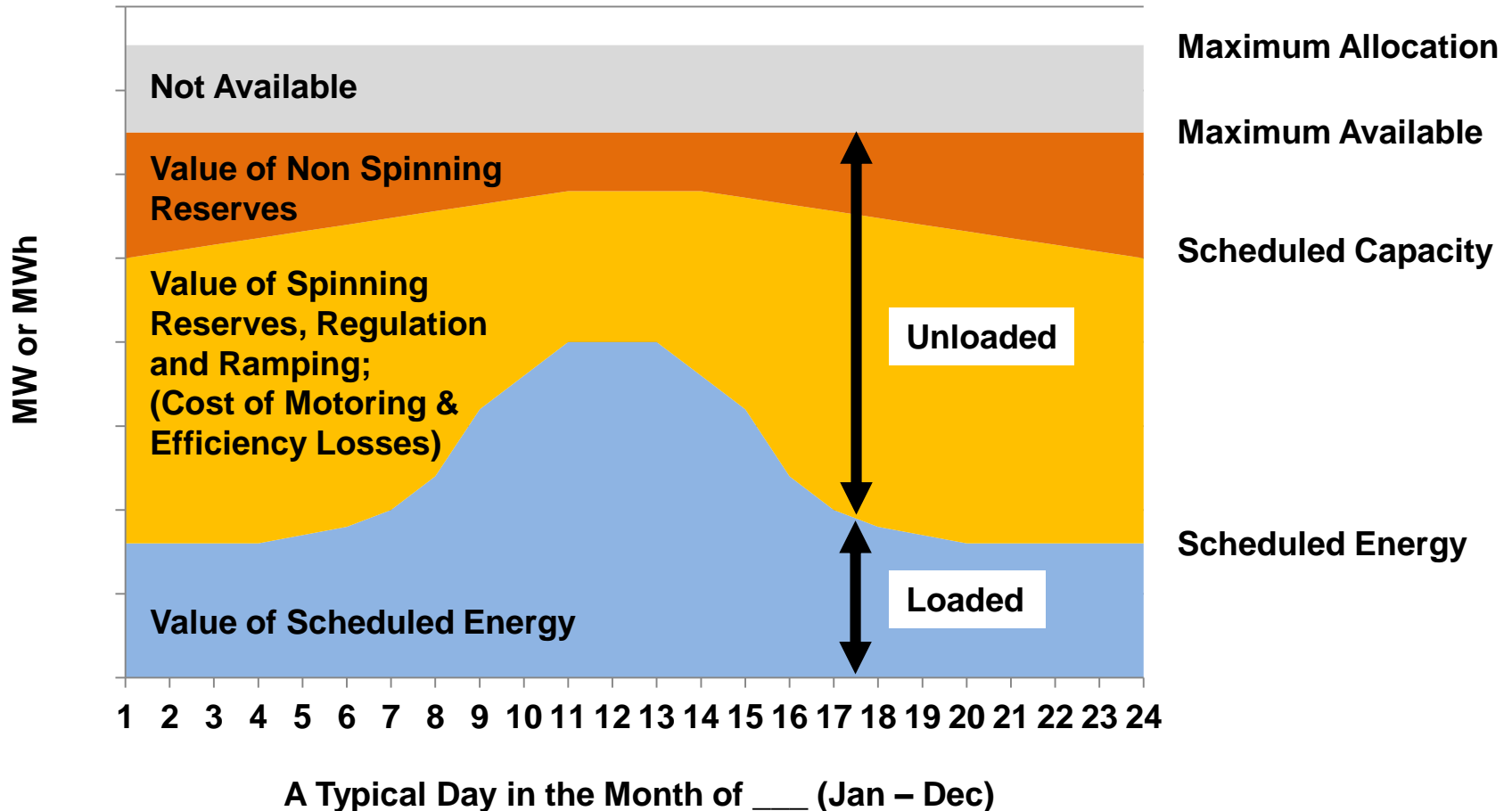
Capacity or Energy



Hoover Value Components



Loaded & Unloaded Generation

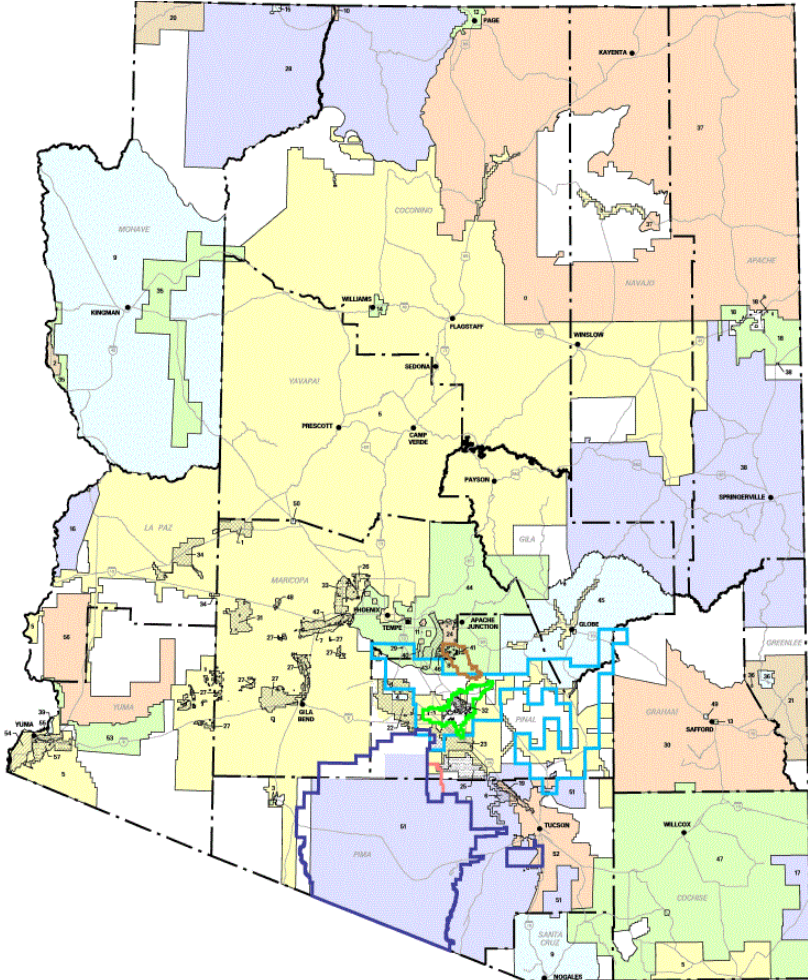


Value Components Defined

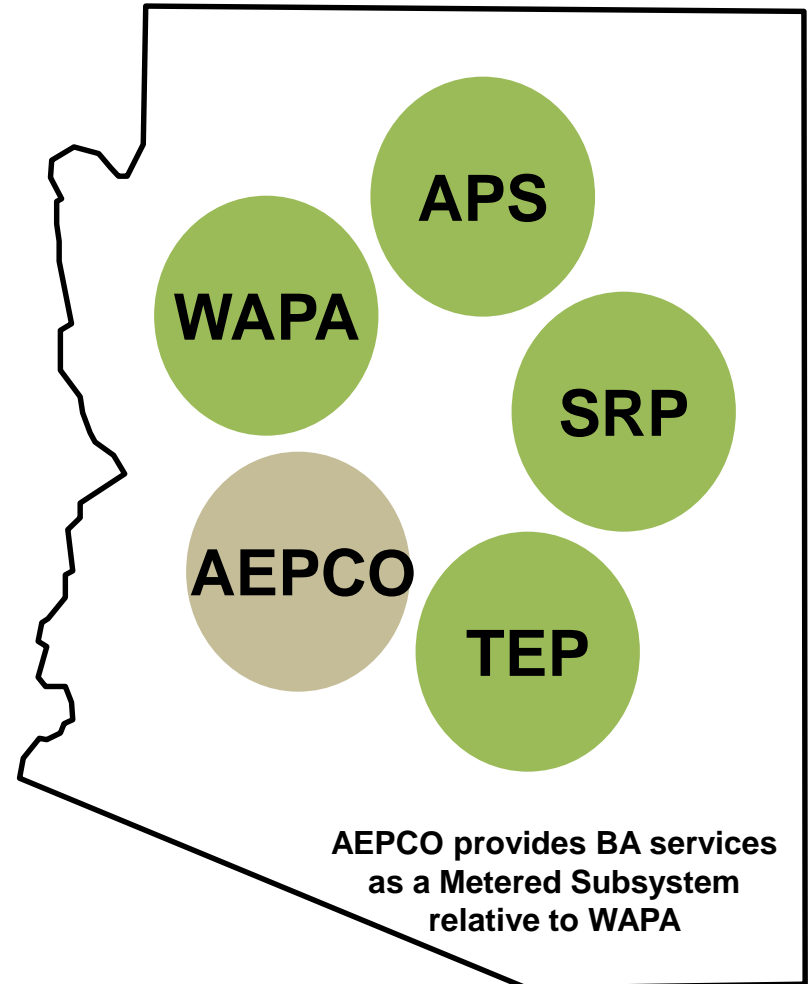
	Concept	What is it?	Requirement Prescribed By:
1	Scheduled Energy	Loaded generation that is serving actual electric load.	End Users of Electricity
2	Spinning Reserves	Unloaded generation that is synchronized and ready to serve additional demand.	NERC and WECC
3	Regulation	Unloaded or loaded generation that is responding on a moment-to-moment basis, and used to manage the difference between scheduled and actual load / generation within a Balancing Area.	NERC and WECC
4	Ramping	Unloaded or loaded generation that can be used to meet increasing or decreasing load and/or spinning reserve requirements.	NERC and WECC
5	Losses	The cost of maintaining synchronized generation at Hoover that is unloaded (motoring and efficiency losses).	USBR and WAPA
6	Non Spinning Reserves	Unloaded generation that is not synchronized, but can be ready to serve additional load within 10 minutes.	NERC and WECC

Utilities & Balancing Authorities

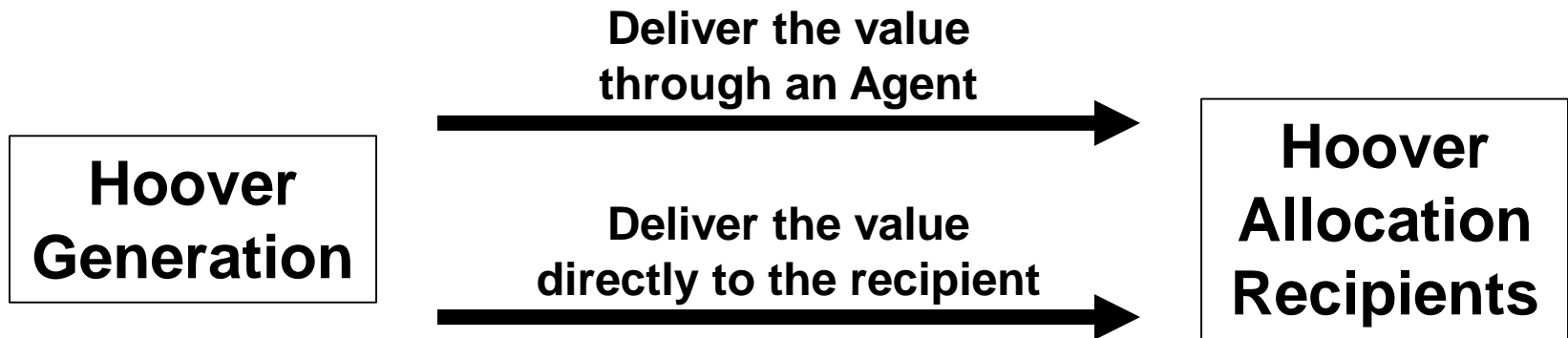
62 Utilities



5 Major BA Service Providers



Value Delivery Methods



In the context of this presentation, an “Agent” for Hoover Value Delivery could be a Balancing Authority, a metered subsystem, or another entity that provides BA services to an APA Hoover allocation recipient.

The term “Scheduling Entity” refers specifically and only to the APA Scheduling Entity as defined on slide 9.

These “delivery options” are not mutually exclusive. Today, CAWCD receives its value directly, while the value for all other APA Hoover allocation recipients is delivered through an Agent, SRP, as the Scheduling Entity.

How Does Value Delivery Work?

Agent Delivery

- The Agent receives loaded and unloaded generation
- The Agent meets scheduled energy obligations of multiple entities
- The Agent makes a payment to APA at some agreed upon value
- Funds delivered to APA are credited by APA on a pro rata basis to Hoover allocation recipients for whom the Agent's service is being provided

Direct Delivery

- The Hoover allocation recipient passes loaded and unloaded generation directly to its Balancing Authority (or Metered Subsystem)
- The Balancing Authority meets the loaded and unloaded generation obligations of the Hoover allocation recipient
- The Hoover allocation recipient does not make a payment to APA for unloaded generation components, and does not receive a credit from APA in association with agent delivery

Scheduling Entity vs Dynamic Signal

Scheduling Entity

Dynamic Signal

<ul style="list-style-type: none">• An entity designated by the APA to act as an operating agent under the APA-WAPA contract.	<ul style="list-style-type: none">• The communications / telemetry systems whereby Hoover generation can be managed in a programmatic, automated, real-time manner by a NERC Balancing Authority.
<ul style="list-style-type: none">• At the present time, SRP is the Scheduling Entity.	<ul style="list-style-type: none">• At the present time, SRP and CAWCD utilize independent dynamic signals from WAPA.
<ul style="list-style-type: none">• The term “scheduling entity” is used by some people as a proxy for one or more Hoover value components and/or as a proxy for Hoover value delivery.	<ul style="list-style-type: none">• The term “dynamic signal” is used by some people as a proxy for one or more Hoover value components and/or as a proxy for Hoover value delivery.

Scheduling Entity Value Assessment

APA Perspective

The Scheduling Entity adds an additional value by providing a “banking” service, and a payment that offsets some APA costs. The smaller the portion of the total dynamic signal that is managed by the Scheduling Entity, the smaller the payment that offsets APA costs.

Scheduling Entity Perspective

	Value Component	Value to the Agent
1	Scheduled Energy	Not Applicable
2	Banking	Cost
3	Spinning Reserves	Benefit
4	Regulation	Benefit
5	Ramping	Benefit
6	Losses	Cost
7	Non Spinning Reserves	Benefit

Dynamic Signal Value Assessment

		Value to a Hoover Allocation Recipient With Respect to Its Share of Hoover	
Value Component		Direct Delivery	Agent Delivery
1	Scheduled Energy	No difference – the Hoover Allocation Recipient receives its scheduled energy regardless of dynamic signal management	
2	Banking	Not Applicable	Benefit
3	Spinning Reserves	The Hoover Allocation Recipient offsets costs in association with its load that it would otherwise incur from self supplying or from paying its BA for these services	The Hoover Allocation Recipient receives a credit from the APA in association with these services
4	Regulation		
5	Ramping		
6	Losses		
7	Non Spinning Reserves		

APA Policy Considerations

- What policy options does the law permit or prohibit?
- Having unbundled transmission service, can the APA accommodate the differing value delivery needs of Hoover allocation recipients?
- What policy decisions maximize value for Arizona's Hoover allocation recipients, and therefore Arizona?
- Is the provision of a banking service required of a Scheduling Entity?
- Is all of Arizona's Hoover value captured and secured in APA's post-2017 agreement with WAPA?

AEPCO's Position

- Each Hoover allocation recipient has the right to directly utilize its proportionate share of the dynamic signal.
- For each Hoover allocation recipient that does not want to receive its dynamic signal directly, the APA should continue to provide a scheduling entity program.
- If requested, the APA should support and assist any Hoover allocation recipient that wants to receive or assign its dynamic signal to its host BA or Metered Subsystem.
- With respect to dynamic signal and scheduling entity policy decisions, Bill Crediting arrangements should address assignment of dynamic signal benefits.

CAWCD's Position

- Each Hoover allocation recipient has the right to directly utilize its proportionate share of the dynamic signal.
- For each Hoover allocation recipient that does not want to receive its dynamic signal directly, the APA should continue to provide a scheduling entity program.
- If requested, the APA should support and assist any Hoover allocation recipient that wants to receive or assign its dynamic signal to its host BA or Metered Subsystem.
- Each Hoover Contractor should appraise the value of the Hoover allocation to ensure that the most value is derived for its own use.
- CAWCD utilizes the dynamic signal for the NERC required "continuously balanced scheduled interchange", which in part consists of regulation, ramping and reserve requirements. CAWCD anticipates that Hoover will continue to be available for this purpose in the post 2017 allocation era.

IEDA's Position

- Each Hoover allocation recipient has the right to directly utilize its proportionate share of the dynamic signal.
- For each Hoover allocation recipient that does not want to receive its dynamic signal directly, the APA should continue to provide a scheduling entity program.
- If requested, the APA should support and assist any Hoover allocation recipient that wants to receive its dynamic signal directly.
- IEDA supports the APA maximizing the value of Hoover in Arizona.
- In response to electric industry changes that have occurred and are likely to continue occurring, for the post 2017 era the APA should provide flexibility to Hoover allocation recipients with respect to scheduling entity and dynamic signal choice.

SRP's Position

- Each Hoover allocation recipient has the right to directly utilize its proportionate share of the dynamic signal.
- For each Hoover allocation recipient that does not want to receive its dynamic signal directly, the APA should continue to provide a scheduling entity program.
- If requested, the APA should support and assist any Hoover allocation recipient that wants to receive its dynamic signal directly.
- SRP believes that the value of Hoover should be maximized.
- SRP remains interested in continuing as an APA Scheduling Entity, and if the current contract is extended, SRP will continue to provide banking services to Hoover allocation recipients for which scheduling entity services are being provided by SRP.

Responses to Issues Raised at the Dec 15, 2015 APA Commission Meeting

What Does the Term “Value” Mean as Used in the Presentation?

Slides 3, 5, 7, 8, 10 and 11

The term “value” as used in the Dec 15, 2015 Hoover Value Delivery Concepts presentation refers to economic merit, or economic worth.

Further Information Regarding Hoover Value Components

	Value Component	Economic Impact to Recipient	Value Component Can Be Directly Used To	Value Component Can Be Directly Used By
1	Scheduled Energy	Benefit	Meet load	Each individual APA Hoover allocation recipient
2	Spinning Reserves	Benefit	Meet Balancing Area ancillary service requirements	Those entities that provide Balancing Area services to APA Hoover allocation recipients
3	Regulation	Benefit		
4	Ramping	Benefit		
5	Losses	Cost		
6	Non Spinning Reserves	Benefit		

What is the Basis for the Claim Made by AEPCO, CAWCD, IEDA and SRP that Each Hoover Allocation Recipient has a Right to The Dynamic Signal? Slides 13-16

1	Contractual Basis	Present in the existing agreement. Desired in the new agreement.
2	Precedential Basis	More than one dynamic signal is used today.
3	Equality Basis	Hoover allocation recipients in California and Nevada have this right.
4	Capacity & Energy Allocation Basis	A Hoover dynamic signal without associated capacity and energy has no value. All of Arizona's post-2017 capacity and energy has been allocated to Arizona's Hoover allocation recipients.

What Areas of Law Should the APA Consider in Developing Policies Associated with Hoover Value Delivery Concepts?

Slide 12

- **Boulder Canyon Act**
- **Federal Preference Law**
- **State Law**

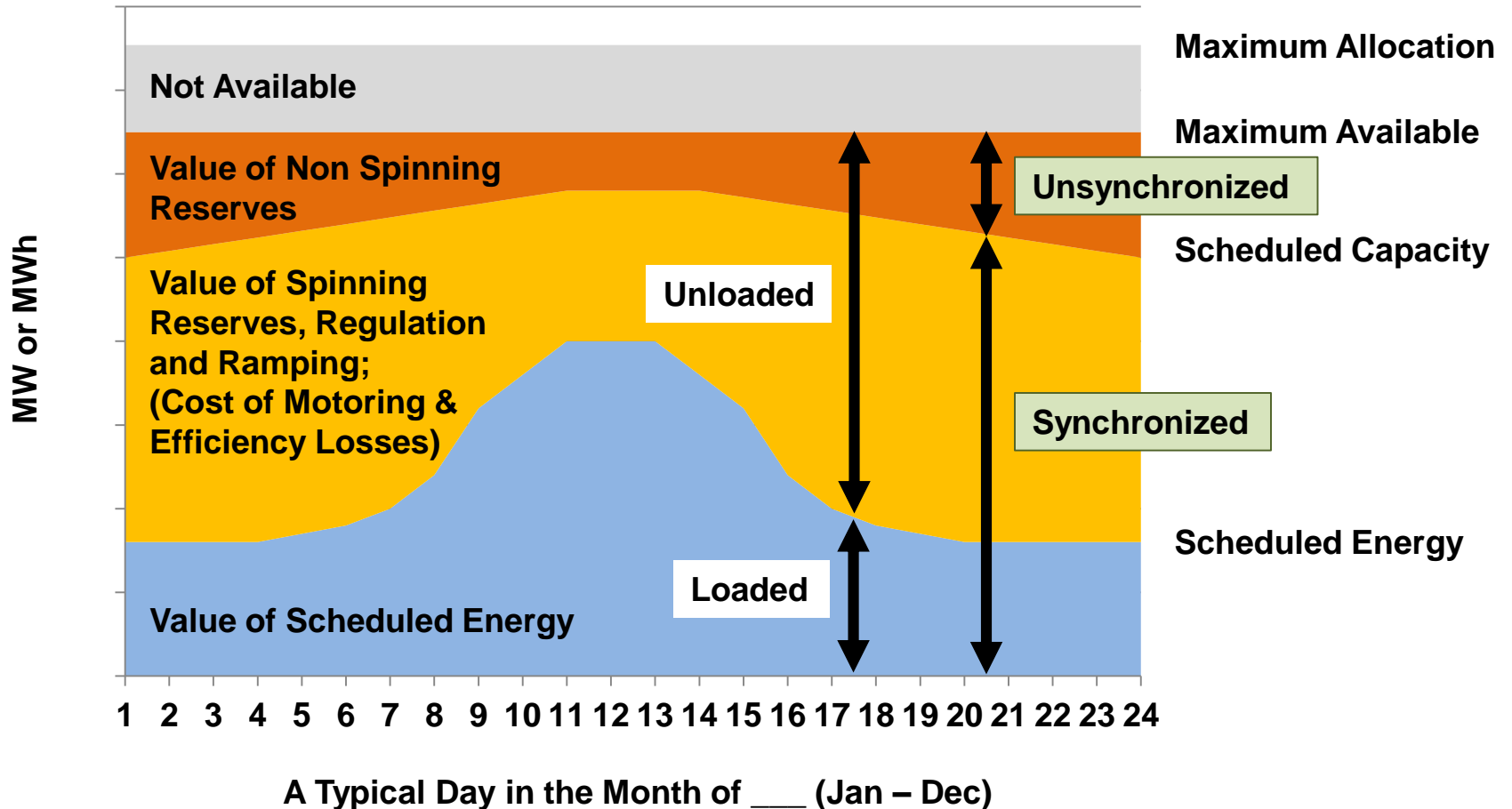
- **Establishment and/or selection of a scheduling entity**
- **Title to the energy when a scheduling entity arrangement exists**
- **A prospective resale of federal hydropower**
- **APA's decisions with respect to Hoover allocation recipients relative to WAPA's decisions with respect to Hoover D1 allocation recipients**

Are There Any Elements of Arizona's Hoover Value That are Not Captured and Secured in the Currently Proposed APA – WAPA Post-2017 Agreement?

Slide 12

Through whatever processes and mechanisms the APA affords Arizona's Hoover allocation recipients an opportunity to provide questions and comments on the WAPA – APA agreement that is being developed, AEPCO, CAWCD, IEDA and SRP will participate on an individual basis to the extent possible as determined by each organization.

Synchronized & Unsynchronized Generation



Presentation vs Contract Terminology

