

Resource Adequacy Pre-Market Simulation Settlements Workshop

Focusing on the following initiatives:

Reliability Services Initiative (RSI)

Capacity Procurement Mechanism (CPM) Replacement

January 6, 2016

Settlements workshop overview

- Reliability Services Initiative
 - Background
 - Terminology
 - Monthly RAIM Settlement (CC 8830)
 - Monthly RAIM Allocation (CC 8831)
 - Annual RAIM Neutrality (CC 8835)
 - RAIM Pre-calculation
- Capacity Procurement Mechanism
 - Background
 - Monthly CPM Settlement (CC 7891)
 - Monthly CPM Allocation (CC 7896)

Reliability Services Initiative Settlements Training

Background: Resource Adequacy Program

- Load serving entities are required to show they have procured sufficient capacity to meet peak load each month of the year.
- Resources designated in a RA plan may be procured for one of two types of Resource Adequacy Capacity.
 - Generic Resource Adequacy Capacity
 - Flexible Resource Adequacy Capacity
- If a LSE fails to procure sufficient capacity, the CAISO may procure generic or flexible capacity on behalf of the LSE under the Capacity Procurement Mechanism (CPM) provisions of the CAISO Tariff.

Reliability Services Initiative

A multi-year effort to address rules and process surrounding RA resources.

- Integrate preferred resources into the grid
- Integrate flexible RA into the energy market
- Update the incentive mechanism price based on market based CPM
- Revise RA outage management rules
- Expand rules surrounding flexible RA capacity and requirements

Resource Adequacy Availability Incentive Mechanism (RAAIM)

- Assess penalty charges or payments to RA resources based on each resource's performance each month
- Replaces Standard Capacity Product
- Evaluates the availability of an RA resource based on bids instead of outage availability
- Evaluates Generic RA, Flexible RA, and CPM Capacity as a singular obligation
- Availability mechanism applied to all RA resources
- Expanded outage rules to include previously excluding resource types
- Scheduled implementation March 1, 2016
 - March and April – advisory settlements (not on invoice)
 - May – binding settlements begin

Which resources are subject to subject to RAIM?

Resources with generic RA capacity in their supply plan

Resources with flexible RA capacity in their supply plan

Resources used as replacement for RA capacity

Resources used as substitution for RA capacity

Resources with a CPM designation

TERMINOLOGY

Key concept – RAAIM replaces SCP

SCP

- Evaluates availability based on forced outages
- Based on monthly availability standard
- Tolerance band
- Availability incentive payments
- Non-availability charges

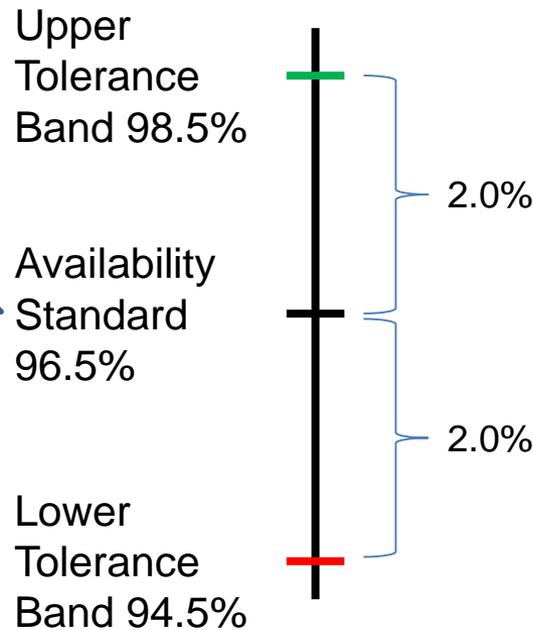
RAAIM

- Evaluates availability based on bids
- Based on availability incentive standard percentage
- Tolerance band
- Monthly RAAIM Settlement
- Monthly RAAIM Allocation

Term - Availability Incentive Standard Percentage

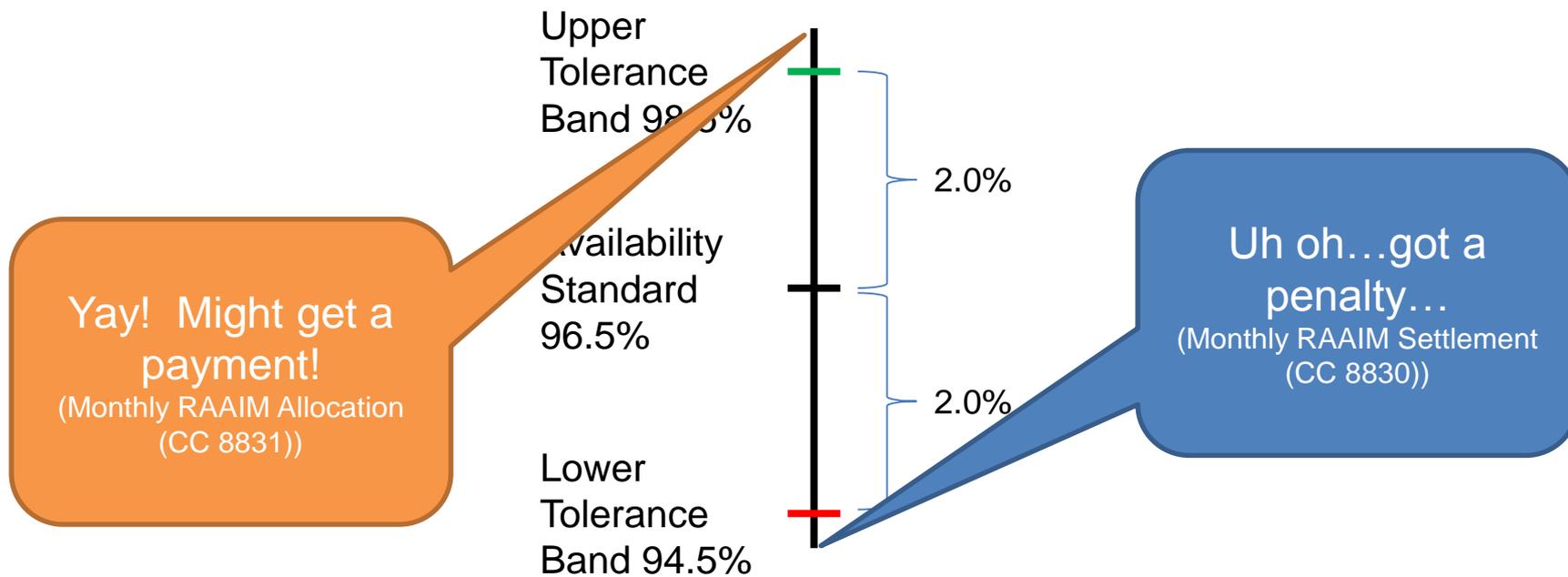
- The target availability for each RA Resource. It is a variable that is evaluated each year and is currently set at 96.5%

Was the RA resource available 96.5% of the time that it was expected?



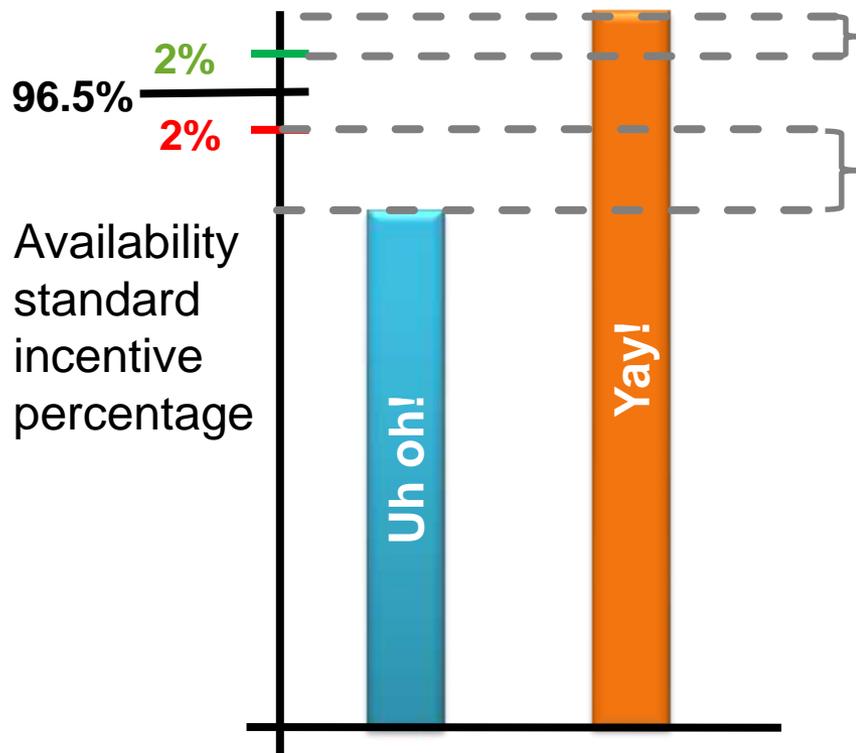
Term - Tolerance Band

- Sets the threshold availability below which a resource could get penalize and above which a resource could get a payment.



Term - Performance

- Calculated each month relative to the availability incentive standard percentage. It is measured by the availability of the resource in the ISO market.



Availability is calculated based on a resource's ability to submit bids to meet their bidding obligation on designated assessment hours.

RA resource monthly performance

Questions



CC 8830: MONTHLY RAAIM SETTLEMENT

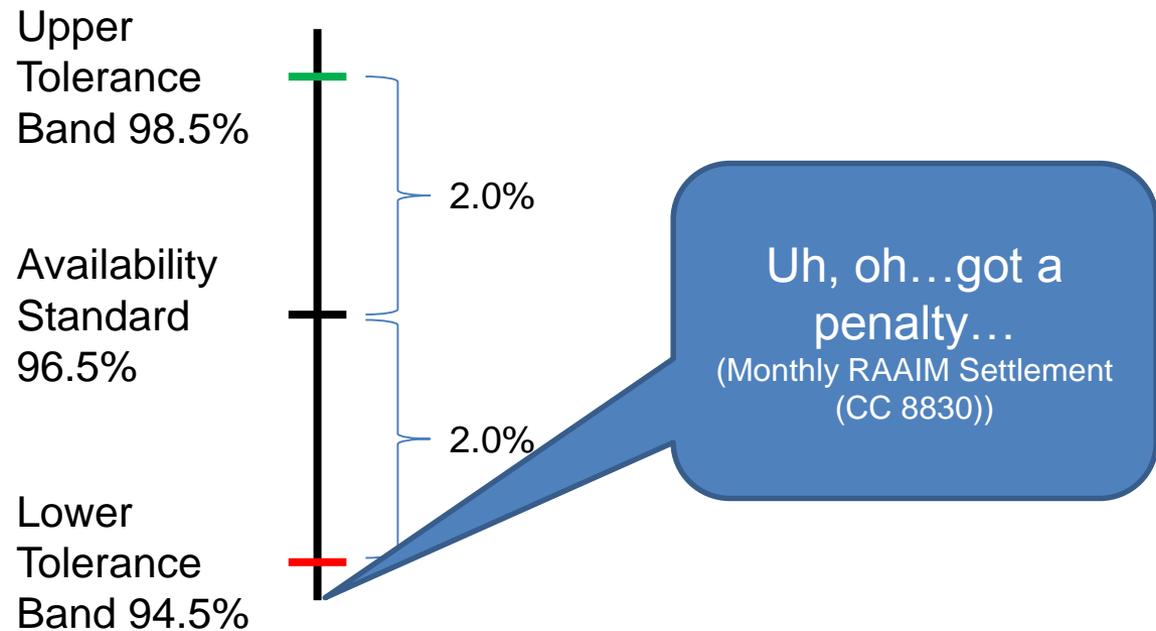
RAAIM: Charge Code Overview

Let's start with this one.



Key Concept – Monthly RAIM Settlement (CC 8830)

- This settlement is a charge to RA resources with performance that fails to meet the monthly availability standard minus the tolerance band.



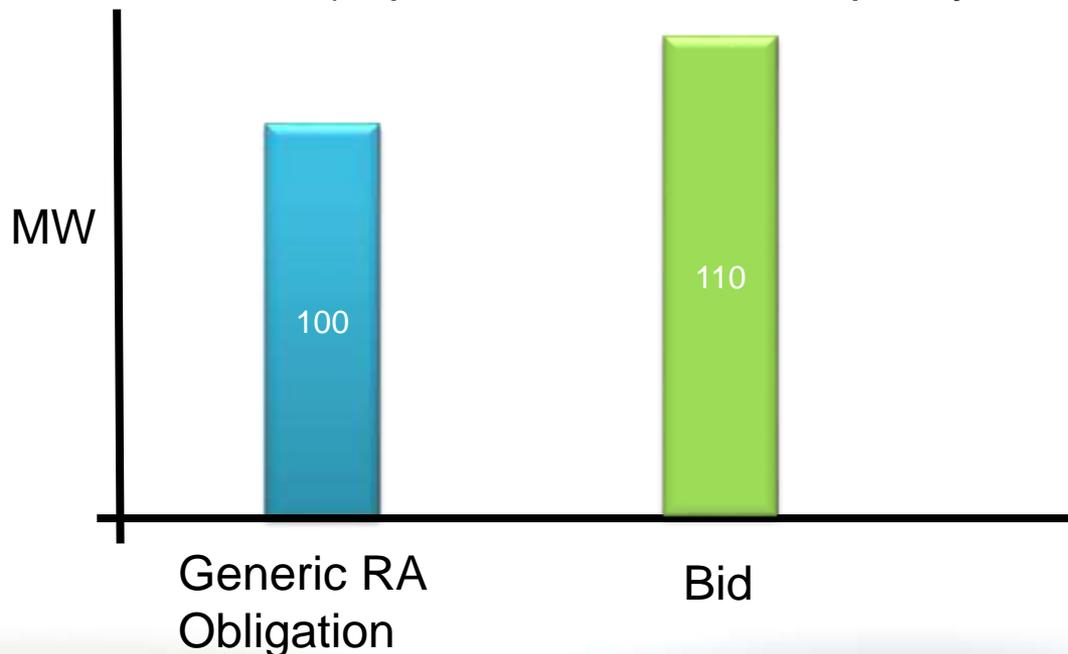
Key Concept - Monthly RAIM Settlement (Penalty Charge)

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Amount

Key Concept – Generic RA availability

- Calculated based on a resource's ability to submit bids to meet their RA bidding obligation in designated hours.

A resource with generic RA capacity or generic CPM capacity has an obligation to submit bids (economic bids or self-schedules) up to the committed capacity



Example 1 – Uh Oh Generic RA resource

Uh Oh Assumptions

Committed capacity	100 MW	Their supply plan show 100 MW commitment (assume no substitutions or replacements)
Obligation MW (aka RAAIM capacity MW)	100 MW	Committed capacity minus any exemptions
Assessment MW	100 MW	This resource had an obligation in the assessment hours
RAAIM Availability MW	70 MW	What was actually bid in

Also assume:

- The month has 10 hours (aka obligation hours)
- The resource was committed for 10 hours

Example 1 – Uh Oh monthly RAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

How do we calculate this?

Example 1 – Penalty % formula (aka RAAIM performance charge percentage)

RAAIM performance charge percentage =
monthly average % below RAAIM threshold
minus tolerance band

$$\begin{array}{l} \text{Availability MW/Obligation MW} = \text{monthly average \%} \\ 700 \text{ MW} / 1000 \qquad \qquad \qquad = \qquad \qquad 70\% \end{array}$$

$$\begin{array}{l} \text{Availability incentive \% standard} - \text{threshold} = \text{threshold \%}) \\ 96.5\% - 2\% \qquad \qquad \qquad = \qquad \qquad 94.5\% \end{array}$$

$$\begin{array}{l} \text{Threshold \%} - \text{monthly average \%} = \text{RAAIM performance} \\ \text{charge \%} \\ 94.5\% - 70\% \qquad \qquad \qquad = \qquad \qquad \underline{\underline{24.5\%}} \end{array}$$

Example 1 – Uh Oh monthly RAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

24.5%

Let's calculate this next

Example 1 - Monthly average RAAIM capacity MW (aka monthly obligation MW) formula

$$\frac{\sum \text{Obligation MW}}{\text{Obligation hours}} = \text{Monthly obligation MW}$$

$$\frac{1000 \text{ MW}}{10 \text{ hours}} = 100 \text{ MW}$$

Uh oh's monthly average RAAIM Capacity MW (aka monthly obligation MW)

Example 1 – Uh Oh monthly RAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

24.5%

100 MW

\$3,790 MW/month
(\$3.79 kw/month*)

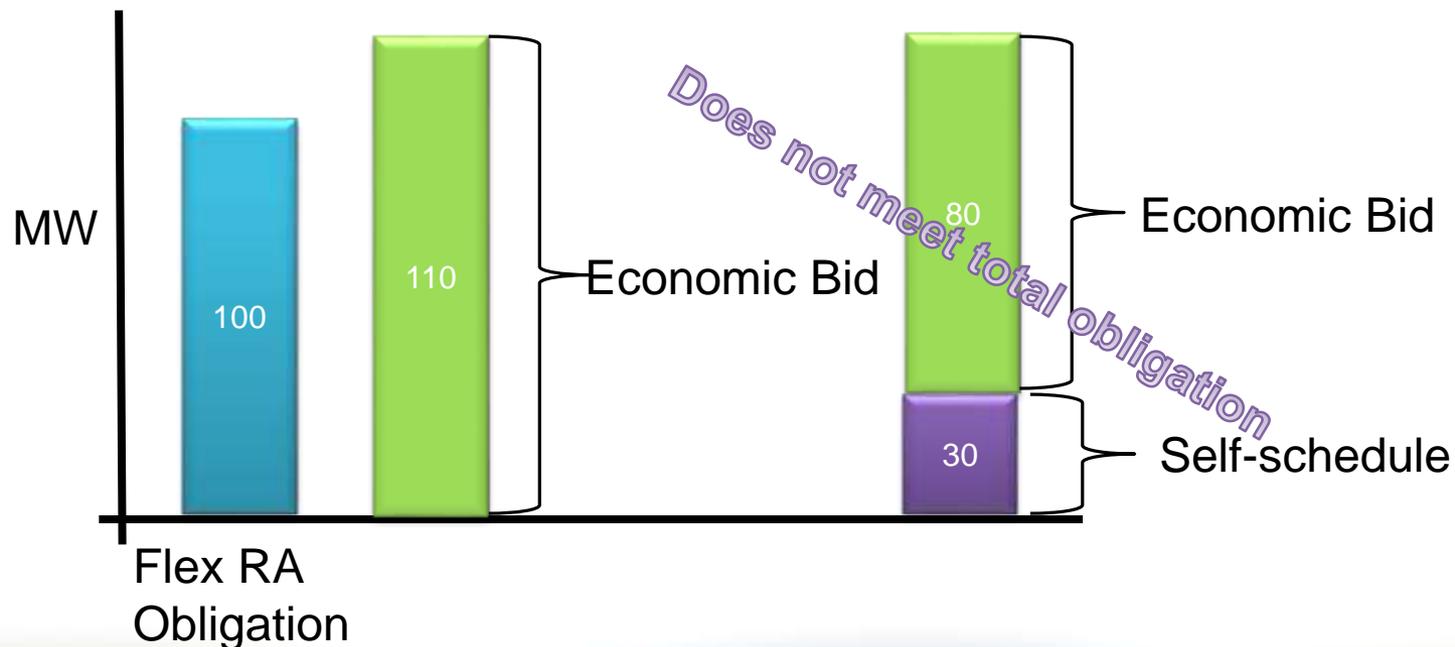
\$92,855.00
Uh oh!

* This price will be re-evaluated each year

Key Concept – Flexible RA availability

- Calculated based on a resource's ability to submit bids to meet their RA bidding obligation in designated hours.

A resource with flexible RA capacity or flexible CPM capacity has an obligation to submit economic bids up to the committed capacity



Example 2 – Yikes RA resource with capacity designated as CPM capacity

Yikes Assumptions

Committed capacity	100 MW	Their supply plan show 100 MW commitment (assume no substitutions or replacements)
Obligation MW (aka CPM capacity MW)	100 MW	Capacity designated at CPM capacity
Assessment MW	100 MW	This resource had an obligation in the assessment hours
RAAIM Availability MW	70 MW	What was actually bid in

Also assume:

- The month has 10 hours (aka obligation hours)
- The resource was committed for 10 hours

Example 2 – Yikes monthly RAAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

How do we calculate this?

Example 2 - RAIM performance charge percentage formula (aka penalty %)

RAAIM performance charge percentage =
monthly average CPM capacity % below RAIM
threshold minus tolerance band

$$\begin{array}{l} \text{Availability MW/Obligation MW} = \text{monthly average \%} \\ 700 \text{ MW} / 1000 \qquad \qquad \qquad = \qquad \qquad 70\% \end{array}$$

$$\begin{array}{l} \text{Availability incentive \% standard} - \text{threshold} = \text{threshold \%}) \\ 96.5\% - 2\% \qquad \qquad \qquad = \qquad \qquad 94.5\% \end{array}$$

$$\begin{array}{l} \text{Threshold \%} - \text{monthly average \%} = \text{RAAIM performance} \\ \text{charge \%} \\ 94.5\% - 70\% \qquad \qquad \qquad = \qquad \qquad \underline{\underline{24.5\%}} \end{array}$$

Example 2 – Yikes monthly RAAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

24.5%

Let's calculate
this next

Example 2 - Monthly average CPM capacity MW (aka monthly obligation MW) formula

$$\frac{\Sigma \text{Obligation MW}}{\text{Obligation hours}} = \text{Monthly obligation MW}$$

$$\frac{1000 \text{ MW}}{10 \text{ hours}} = 100 \text{ MW}$$

Yikes' monthly average CPM capacity MW (aka monthly obligation MW)

Example 2 – Yikes monthly RAAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

24.5%

100 MW

The price is the max of the competitive solicitation process (CSP) or the availability incentive price (\$3,790 mw/month)

Example 2 – Yikes monthly RAAIM settlement

Quantity	×	Price	=	Amount
Penalty % × Monthly obligation MW	×	Charge Price	=	Penalty Amount

24.5%	100 MW	\$ 6,310 MW/month (\$ 6.31 kw/month*)	\$ 154,595 Yikes!
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* In this example, we used the CSP soft offer cap price

Monthly RAIM Settlement (CC 8830) - Billing Determinants

Quantity	×	Price	=	Amount
Penalty Percentage × Monthly obligation	×	Charge Price	=	Amount

MonthlyResourcePenalty
Percentage

MonthlyResourceRAAIMObligationQuantity
MonthlyResourceCPMObligationQuantity
MonthlyResourceFlexibleCPMObligationQuantity

MonthlyResourceRAAIMNonAvailabilityQuantity
MonthlyResourceCPMNonAvailabilityQuantity
MonthlyResourceFlexibleNonAvailabilityQuantity

- RAIMNonAvailabilityChargePrice
- * MonthlyResourceRAAIMCPMPrice
- * MonthlyResourceRAAIMFlexibleCPMPrice

MonthlyResourceRAAIMNonAvailabilitySettlementAmount
MonthlyResourceCPMNonAvailabilitySettlementAmount
MonthlyResourceFlexibleNonAvailabilitySettlementAmount

Questions



CC 8831: MONTHLY RAAIM ALLOCATION

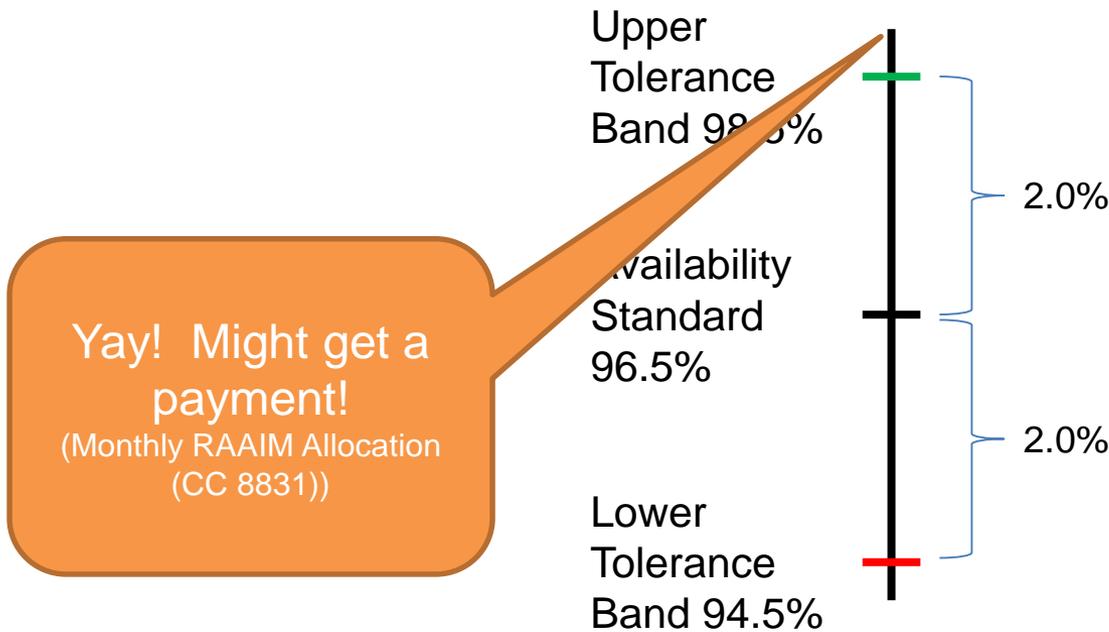
RAAIM: Charge Code Overview

Let's do this one next!



Key Concept – Monthly RAAIM Allocation (CC 8831)

- This settlement is a payment to RA Resources with performance that exceeds the monthly availability standard above the tolerance band.



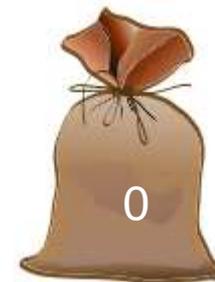
Key Concept – Self funding

- This payment comes entirely from the penalty payments received in the month RAIM settlement (CC 8830)

Monthly RAIM Settlement



Monthly RAIM Allocation



Monthly RAAIM Allocation (Incentive Payment)

Quantity	×	Price	=	Amount
Incentive % × Monthly obligation	×	Incentive Price	=	Payment Amount

Example 3 – Yay! Generic RA resource

Yay! Assumptions		
Committed capacity	100 MW	Their supply plan show 100 MW commitment (assume no substitutions or replacements)
Obligation MW (aka RAIM capacity MW)	100 MW	Committed capacity minus any exemptions
Assessment MW	100 MW	This resource had an obligation in the assessment hours
RAIM Availability MW	100 MW	What was actually bid in

Also assume:

- The month has 10 hours (aka obligation hours)
- The resource was committed for 10 hours

Example 3 – Yay! Generic RA resource

Additional Assumptions

Total incentive MW quantity	100 MW	This is amount of incentive MW for the entire market, not just one resource
Monthly RAAIM payment	\$247,450	Monthly amount collected in CC 8830

Example 3 – Yay’s Monthly RAIM Allocation (Incentive Payment)

Quantity	×	Price	=	Amount
Incentive % × Monthly obligation	×	Incentive Price	=	Payment Amount

How do we calculate this?

Example 3 – RAIM payment performance percentage formula (aka incentive %)

Availability incentive percentage = monthly availability % above RAIM monthly availability charge threshold

$$\begin{array}{l} \text{Availability MW/Obligation MW} = \text{monthly availability \%} \\ 1000 \text{ MW} / 1000 \qquad \qquad \qquad = \qquad \qquad 100\% \end{array}$$

$$\begin{array}{l} \text{Availability incentive \% standard + threshold} = \text{threshold \%}) \\ 96.5\% + 2\% \qquad \qquad \qquad = \qquad \qquad 98.5\% \end{array}$$

$$\begin{array}{l} \text{Monthly availability \% - threshold \%} = \text{RAAIM performance} \\ \text{charge \%} \\ 100\% - 98.5\% \qquad \qquad \qquad = \qquad \qquad \underline{\underline{1.5\%}} \end{array}$$

Example 3 - Monthly RAAIM Allocation (Incentive Payment)

Quantity	×	Price	=	Amount
Incentive % × Monthly obligation	×	Incentive Price	=	Payment Amount

1.5%

Let's calculate this next

Example 3 - Monthly average RAAIM MW (aka monthly obligation MW) formula

$$\frac{\Sigma \text{Obligation MW}}{\text{Obligation hours}} = \text{Monthly obligation MW}$$

$$\frac{1000 \text{ MW}}{10 \text{ hours}} = 100 \text{ MW}$$

Yikes' monthly average RAAIM capacity MW (aka monthly obligation MW)

Example 3 - Monthly RAAIM Allocation (Incentive Payment)

Quantity	×	Price	=	Amount
Incentive % × Monthly obligation	×	Incentive Price	=	Payment Amount

1.5%

100 MW

Let's calculate this next

Key Concept - Incentive payment rate

- Based on the sum of the unallocated penalty dollars divided by the total monthly incentive quantity

$$\frac{\text{Unallocated penalty \$}}{\text{Total monthly incentive quantity}} = \text{Incentive rate}$$

$$\frac{\$92,855 + \$154,595^*}{100 \text{ MW}} = \$2,474.50/\text{MW}$$

* If there were unpaid funds from previous months, these would be included also.

Key Concept – Incentive payment rate (continued)

- The incentive payment rate shall not exceed 3X the non-availability charge rate

Rate Type				Amount
Incentive payment rate				\$ 2,474.50
Non-availability charge rate	\$3,790	* 3	=	\$ 11,370.00

We will be using this rate.

Example 3 – Yay’s Monthly RAIM Allocation (Incentive Payment)

Quantity	×	Price	=	Amount
Incentive % × Monthly obligation	×	Incentive Price	=	Payment Amount

1.5%

100 MW

\$2,474.50

\$3,711.75
Yay!

One more thing to mention about this....

Example 3 – Unallocated penalty amounts

Total penalty \$ for the month \$247,450.00
\$92,855 + \$154,595

Allocated for payment \$ 3,711.75

Unallocated penalty amount \$243,738.25

This amount will roll over to next month's incentive payment calculation

RAAIM: Incentive Rate

The incentive rate is derived based on the sum of unallocated penalty amounts divided by the sum of incentive quantity

- Incentive Rate =
Penalty Amount / Σ Incentive Quantity MW



Monthly RAAIM Allocation (CC 8831) – Billing Determinants

Quantity	×	Price	=	Amount
Penalty Percentage × Monthly obligation	×	Charge Price	=	Amount

MonthlyResourceIncentive
Percentage

MonthlyResourceRAAIMObligationQuantity
MonthlyResourceCPMObligationQuantity
MonthlyResourceFlexibleCPMObligationQuantity

MonthlyResourceRAAIMAvailabilityQuantity
MonthlyResourceCPMAvailabilityQuantity
MonthlyResourceFlexibleAvailabilityQuantity

- MonthlyAvailabilityIncentive
PaymentRate
- Incentive Rate Cap

MonthlyResourceRAAIMNonAvailabilitySettlementAmount
MonthlyResourceCPMNonAvailabilitySettlementAmount
MonthlyResourceFlexibleNonAvailabilitySettlementAmount

Questions



CC 8835: ANNUAL RAAIM NEUTRALITY

RAAIM: Charge Code Overview

Let's do this one next!



Key Concept – Annual RAIM Neutrality (CC 8835)

- Unallocated funds are held in a trust account and accrue interest
- At the end of the calendar year funds are allocated pro-rata to metered demand



Example - \$10,000 of penalty funds and interest are left over as of 12/31

LSE	Share of annual metered demand	Pro-rata share of neutrality allocation
LSE 1	50%	\$5,000
LSE 2	30%	\$3,000
LSE 3	20%	\$2,000

RAAIM: Neutrality Allocation

Total Amount	×	Percentage	=	Amount
CAISO Annual RAIM Neutrality Allocation Amount	×	Business Associate Annual RAIM Neutrality Allocation Percentage	=	Business Associate Annual RAIM Neutrality Allocation Amount

$$\frac{BA \text{ Metered Demand}}{\sum BA \text{ Metered Demand}}$$

Questions



RAAIM: PRE- CALCULATION

RAAIM

Overview

Finally!



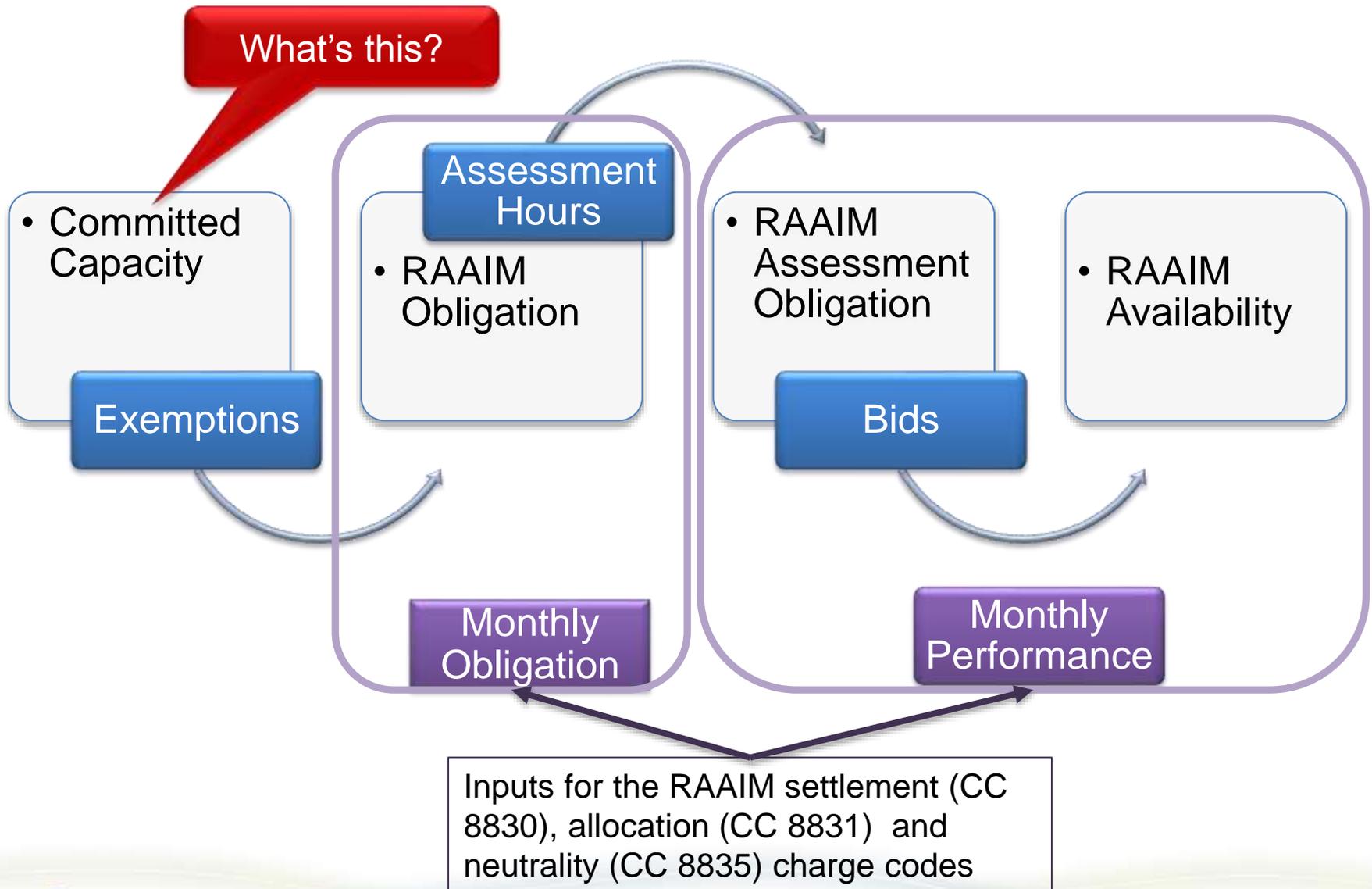
RAAIM
Pre-Calculation

Monthly
Settlement
Charge
CC 8830

Monthly
Allocation
Payment
CC 8831

Annual
Neutrality
CC 8835

RAAIM pre-calculation overview



Committed capacity is:

Resources with generic RA capacity in their supply plan

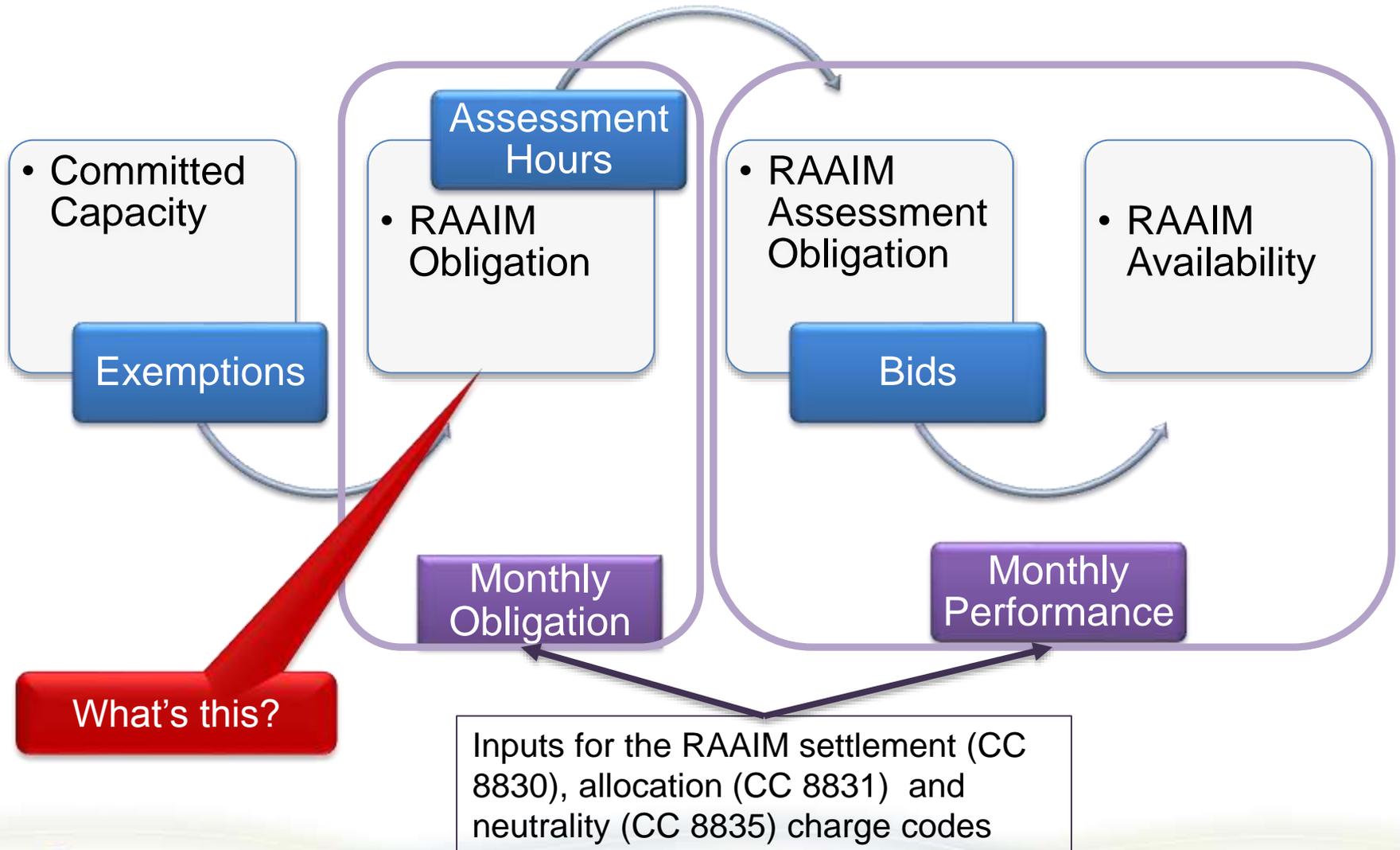
Resources with flexible RA capacity in their supply plan

Resources used as replacement for RA capacity

Resources used as substitution for RA capacity

Resources with a CPM designation

RAAIM pre-calculation overview



RAAIM obligation capacity is:



- Supply plan
- Substitution
- Replacements

- Entire resource
- Subset of capacity

Entire resource exemptions

Exempt resources – fully excluded from RAAIM

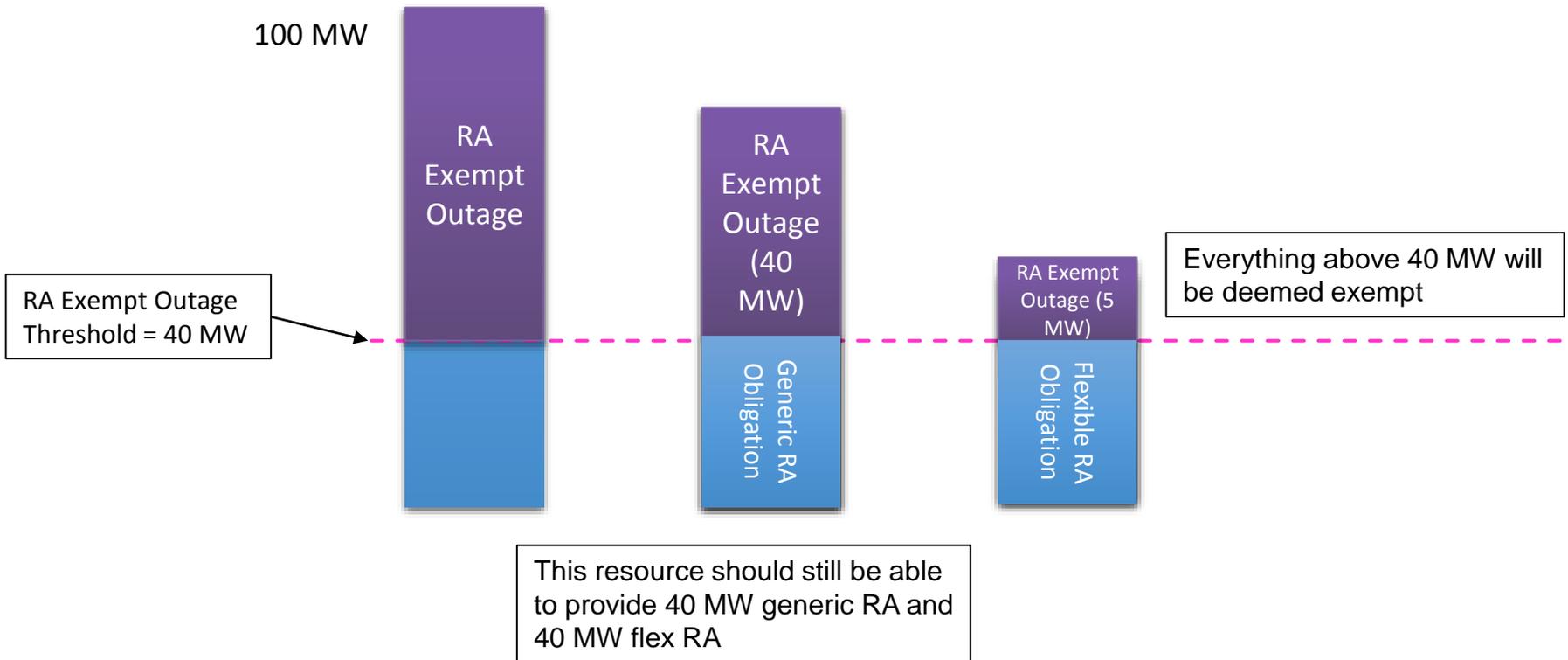
- $P_{max} < 1.0$ MW
- Qualified Facilities (QFs)
- Combined Heat Power resources for generic RA only
- Variable Energy Resources for generic RA only
- Participating Load
- Acquired resources under specific conditions

Entire resource exemptions

- Acquired resources - RA contracts with built in penalties. They are exempt to avoid double penalties with RAAIM.
- The following criteria must be met:
 - Must reconfirm status each year
 - RA Contract must exist prior to June 28 2009
 - Includes penalty for nonperformance
 - Does not have reopener clause due to market changes

Subset of capacity exemptions

P-Max = 100MW
RA Exempt Outage = 60 MW
Generic RA Obligation = 80 MW
Flexible RA Obligation = 45 MW



Subset of capacity exemptions

- Generic and flexible RA capacity exempted from the incentive mechanism when exempt outage curtailment overlaps with capacity.
 - Planned Outage
 - Forced Outage
 - Nature of Works
 - Use limited
- Load following MSS capacity for system, flexible, and local RA

DayAhead/RealTime

- GenericRAOutageExemptQuantity
- GenericCPMOutageExemptQuantity
- FlexibleRAOutageExemptQuantity
- FlexibleCPMOutageExemptQuantity

Capacity exemptions

Resource must have reached its limit before these types will apply

Nature of Work Outage Types:

- Unit testing
- Unit cycling
- Unit supporting startup
- Transitional limitation
- Ambient not due to temperature
- RTU/RIG
- ICCP
- AVR/Exciter
- Transmission induced outage
- Annual Use-limit reached
- Monthly Use-limit reached
- Other Use-limit reached
- Short-term use-limit reached
- Non-emergency fuel insufficiency
- RAIM exempt flag
- Planned outage exemption flag
- Short Notice opportunity flag
- Off peak opportunity flag

Capacity exemption - Use Limitation Flag

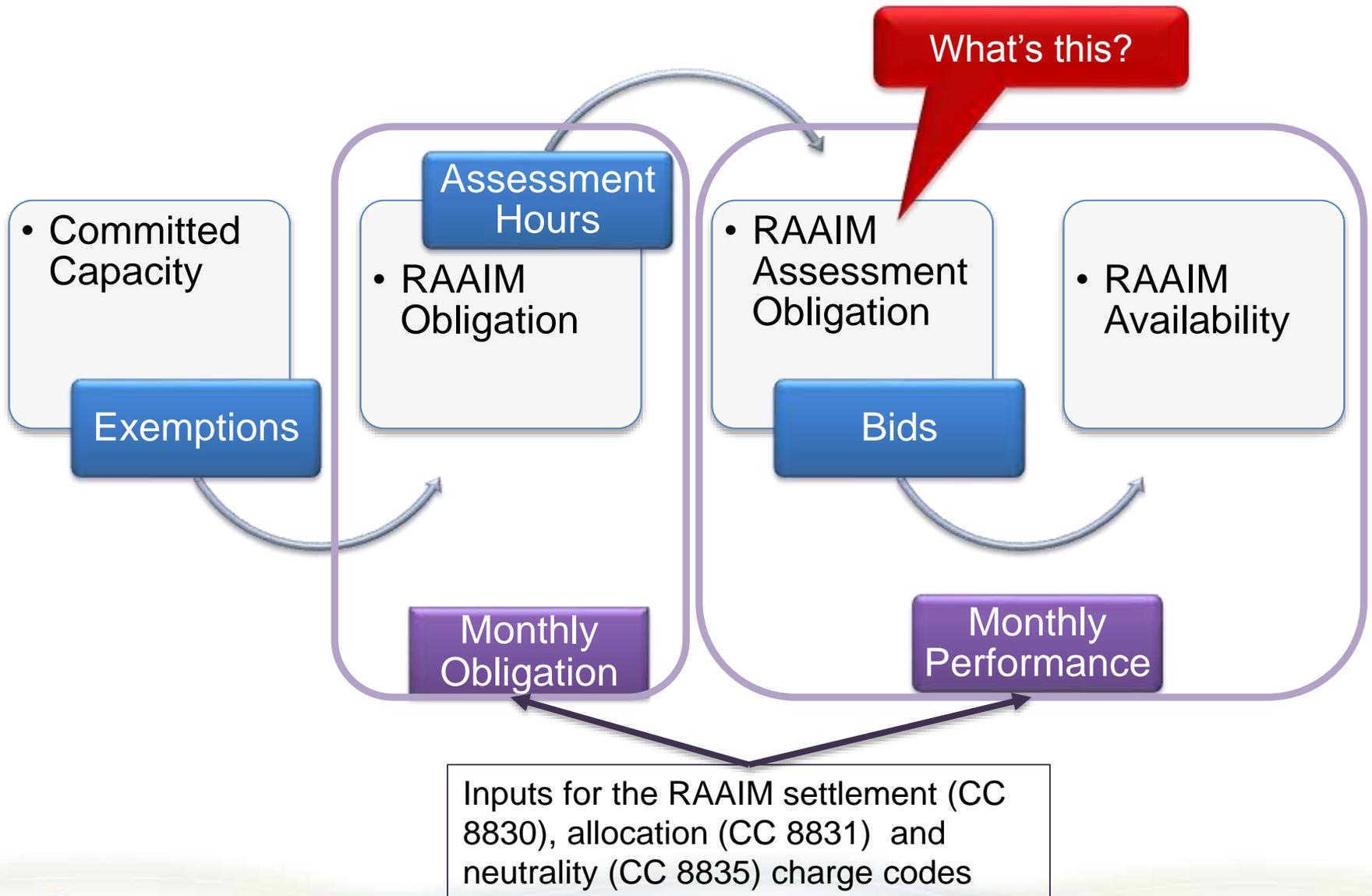
- Business rules specific for use limited resources
 - Use limited resources that have reached their use limitation shall have their bids capped at zero.
 - A use limited outage shall not qualify as a RA exemption if the resource has not reached its use limitation.

Use Limitations

1. Start ups
2. MW run hours
3. MW hours

ResourceUseLimitationReachedFlag

RAAIM pre-calculation overview



RAAIM Obligation vs. Assessment Obligation

RAAIM Obligation



Used to determine monthly obligation quantity

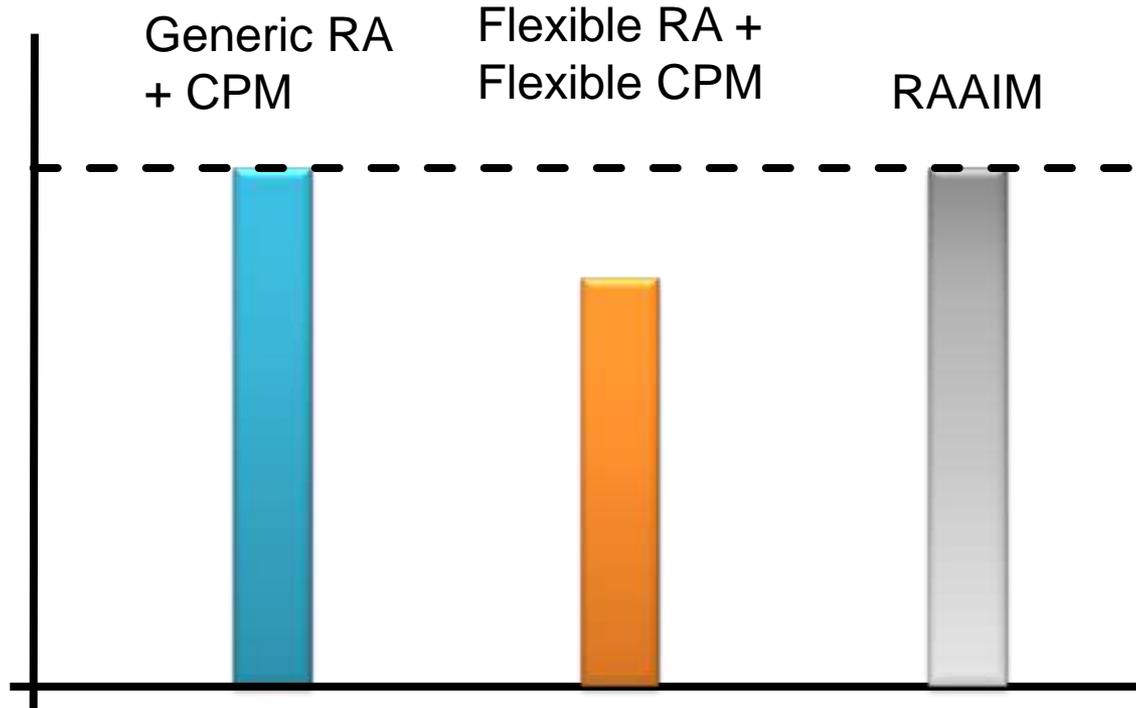
Assessment Obligation



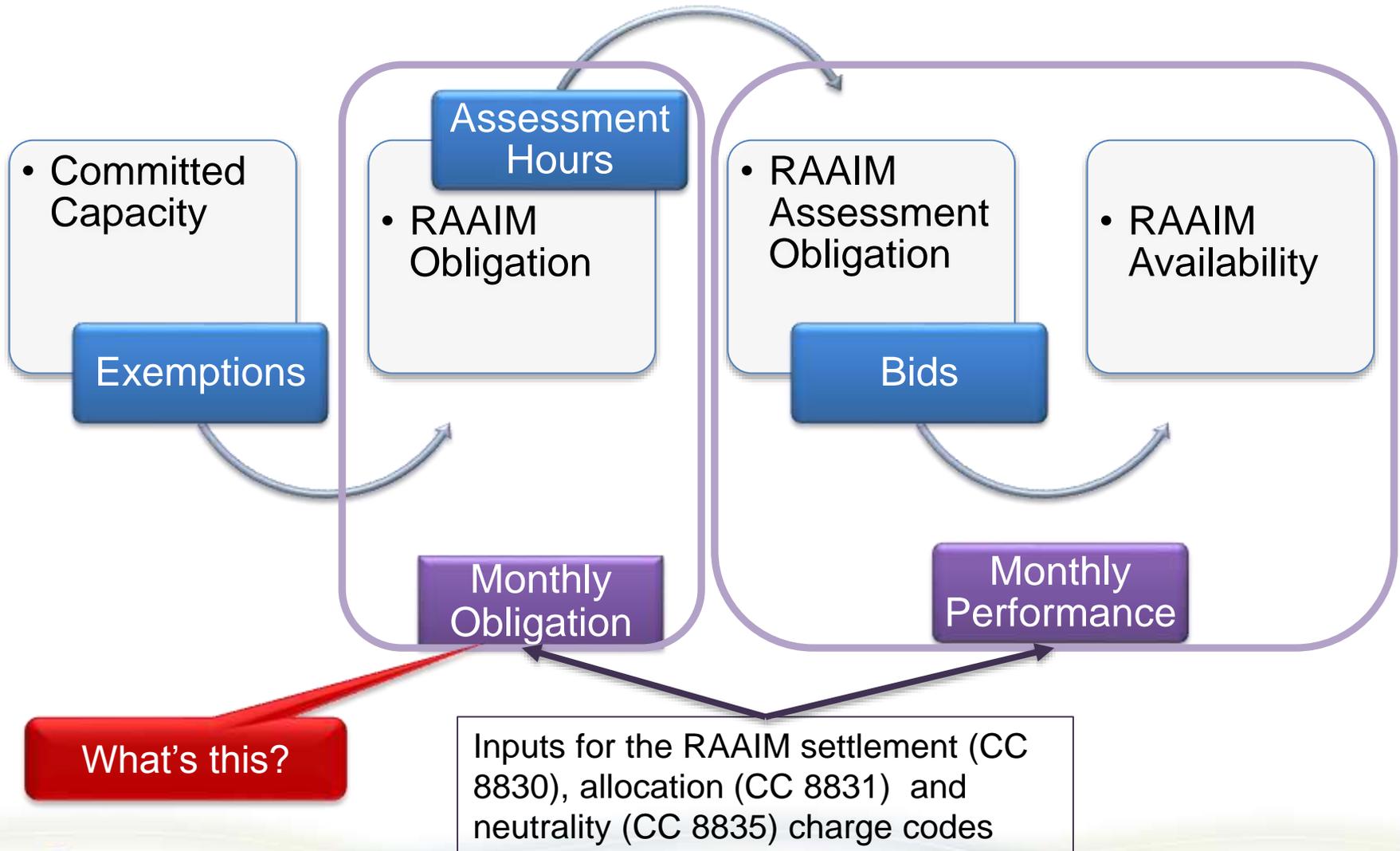
Used to determine monthly performance

RAAIM Assessment Obligation

- Hourly obligation for assessment is determined by the greater of flexible plus flexible CPM capacity or generic RA plus CPM capacity



RAAIM pre-calculation overview



Monthly Obligation

$$\frac{\sum \textit{Hourly Obligation}}{\textit{Total \# Hours in a Month}}$$

Example 1 - Monthly average RAAIM capacity MW (aka monthly obligation MW) formula

$$\frac{\Sigma \text{Obligation MW}}{\text{Obligation hours}} = \text{Monthly obligation MW}$$

$$\frac{1000 \text{ MW}}{10 \text{ hours}} = 100 \text{ MW}$$

Uh oh's monthly average RAAIM Capacity MW (aka monthly obligation MW)

Remember this?

Monthly obligation

Putting it together

Committed = Supply plan MW
+ substitutions + replacements

	Committed		Obligation		Assessment		RAAIM
	Generic	Flexible	Generic	Flexible	Generic	Flexible	
HE15	100	80					
HE16	100	80					
HE17	100	80					
HE18	100	80					
HE19	100	80					
HE20	100	80					
HE21	100	80					
HE22	100	80					

Monthly obligation

Putting it together

Committed = Supply plan MW + substitutions + replacements

Obligation = Committed - exemptions

	Committed		Obligation		Assessment		RAAIM
	Generic	Flexible	Generic	Flexible	Generic	Flexible	
HE15	100	80	100	80			
HE16	100	80	100	80			
HE17	100	80	100	80			
HE18	100	80	100	80			
HE19	100	80	100	80			
HE20	100	80	100	80			
HE21	100	80	100	80			
HE22	100	80	100	80			

Monthly obligation

Putting it together

Committed = Supply plan MW + substitutions + replacements

Obligation = Committed – exemptions

Assessment looks at the specific assessment hours

RAAIM is the expected bid

	Committed		Obligation		Assessment		RAAIM
	Generic	Flexible	Generic	Flexible	Generic	Flexible	
HE15	100	80	100	80	0	80	80
HE16	100	80	100	80	0	80	80
HE17	100	80	100	80	100	80	100
HE18	100	80	100	80	100	80	100
HE19	100	80	100	80	100	80	100
HE20	100	80	100	80	100	80	100
HE21	100	80	100	80	100	80	100
HE22	100	80	100	80	0	80	80

How would this chart change if there was a 10 MW exempt outage in HE 19?

Monthly obligation

Putting it together

Committed = Supply plan MW + substitutions + replacements

Obligation = Committed – exemptions

Assessment looks at the specific assessment hours

RAAIM is the expected bid

	Committed		Obligation		Assessment		RAAIM
	Generic	Flexible	Generic	Flexible	Generic	Flexible	
HE15	100	80	100	80	0	80	80
HE16	100	80	100	80	0	80	80
HE17	100	80	100	80	100	80	100
HE18	100	80	100	80	100	80	100
HE19	100	80	90	80	90	80	90
HE20	100	80	90	80	90	80	90
HE21	100	80	90	80	90	80	90
HE22	100	80	90	80	0	80	80

The exempt outage impacts the generic RA resource but not the flexible RA Resource

Monthly obligation

Putting it together

Committed = Supply plan MW + substitutions + replacements

Obligation = Committed – exemptions

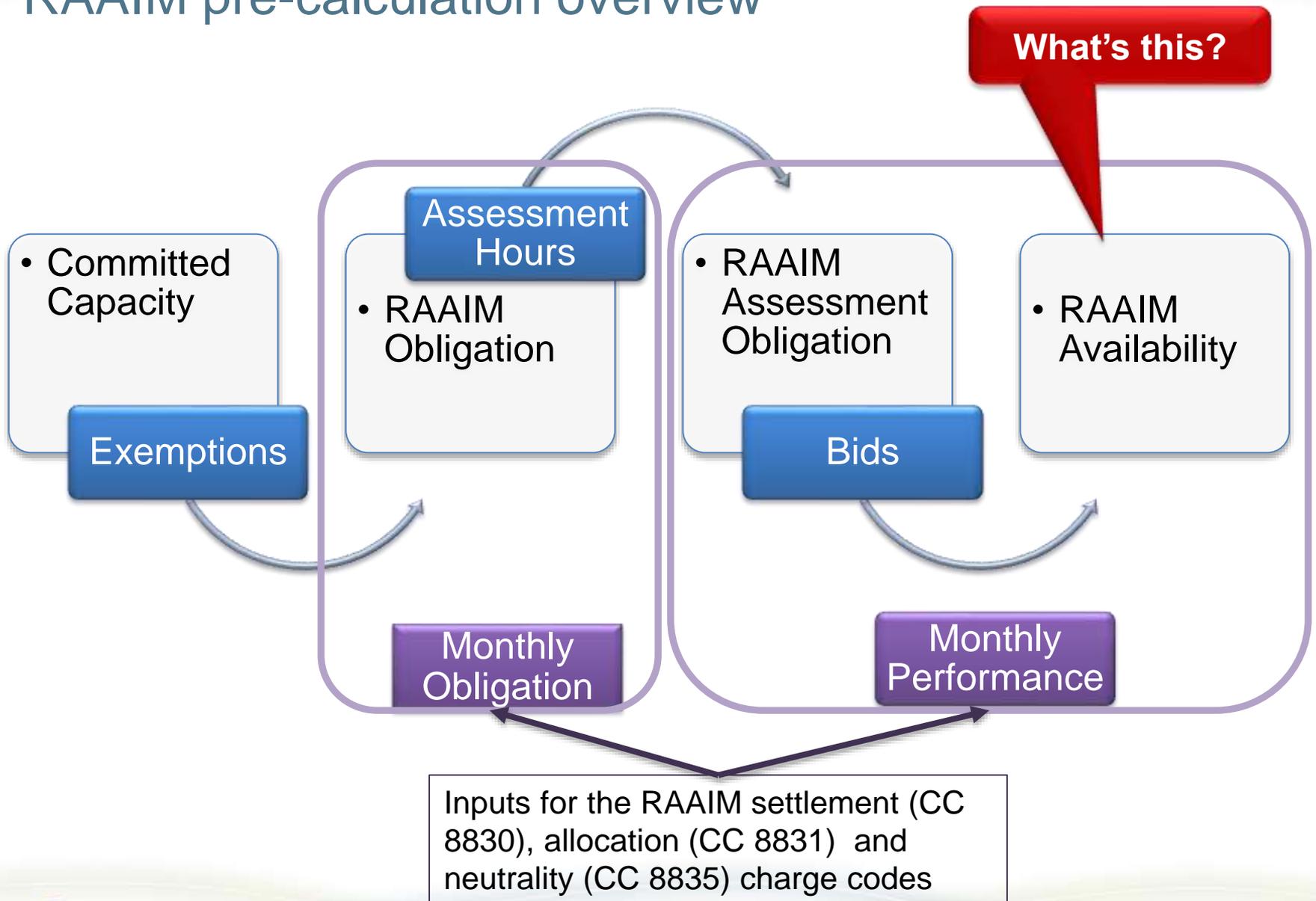
Assessment looks at the specific assessment hours

RAAIM is the expected bid

	Committed		Obligation		Assessment		RAAIM
	Generic	Flexible	Generic	Flexible	Generic	Flexible	
HE15	100	80	100	80	0	80	80
HE16	100	80	100	80	0	80	80
HE17	100	80	100	80	100	80	100
HE18	100	80	100	80	100	80	100
HE19	100	80	90	80	90	80	90
HE20	100	80	90	80	90	80	90
HE21	0	0	0	0	0	0	0
HE22	0	0	0	0	0	0	0

Substitution moves the RA obligation to the substitute resource.

RAAIM pre-calculation overview

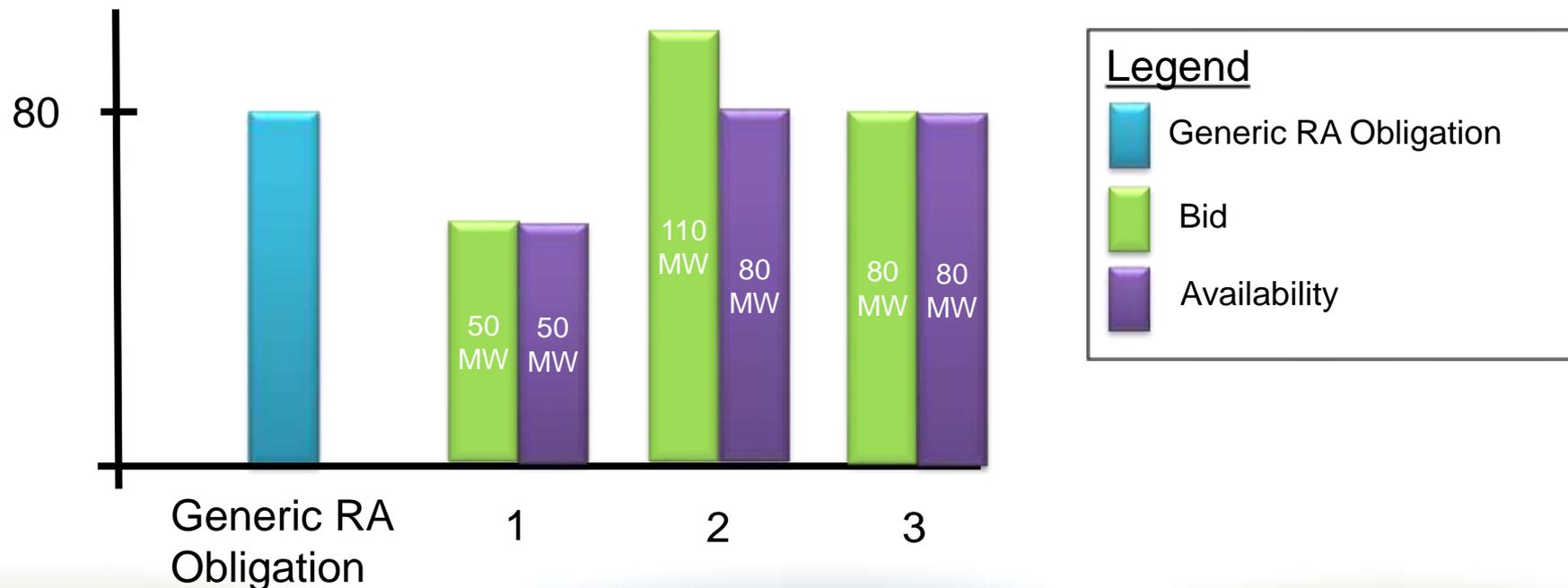


Bids

- A resource has a single bidding obligation that can be made up of one or more RA must offer obligations.
- The calculation of RAIM availability uses a resource's bids to determine availability.
- RAIM Assessment Obligation is the total MWs expected from the resource to bid for that assessment hour.

Must Offer Requirements & Availability – Generic RA Capacity

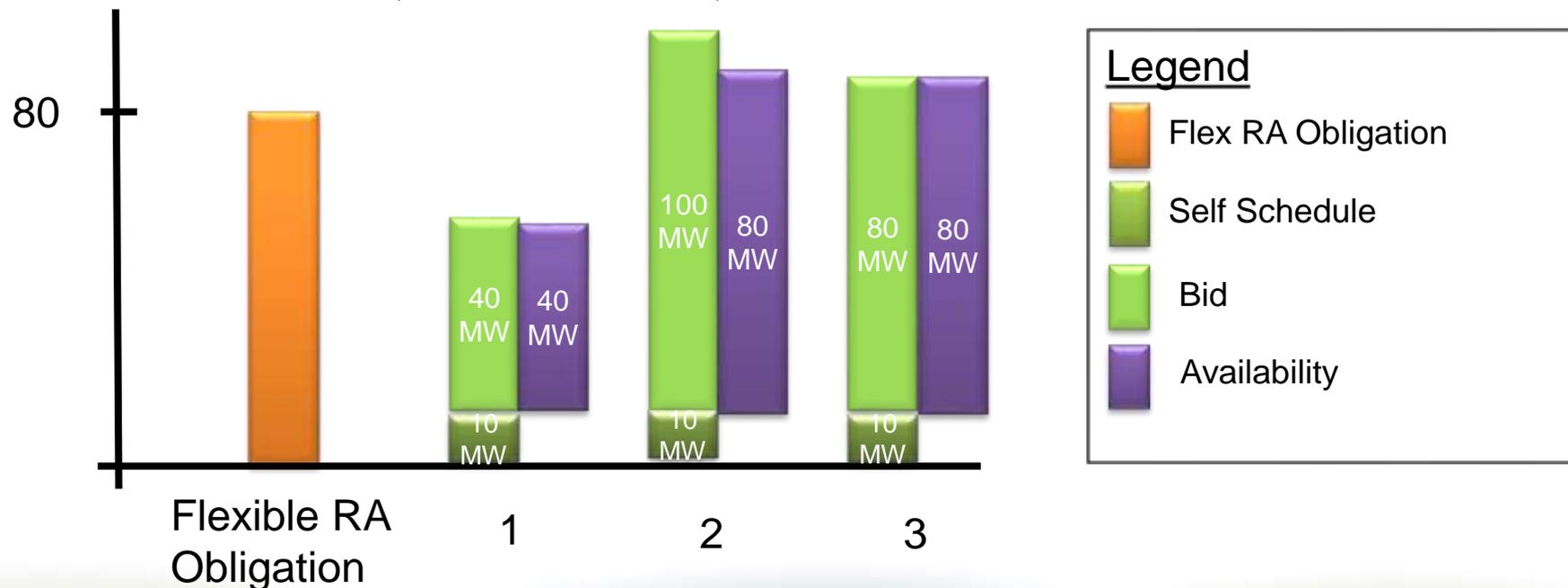
- Bid or self-schedule capacity into the ISO market all hours of the day
- RAAIM: 5 hour peak – non-holiday weekday



Must Offer Requirements & Availability – Flexible RA Capacity

- Flex RA capacity obligation must be with economic bids (not self-schedules)
- Bid capacity into the ISO market set hours of the day
- 3 Categories:

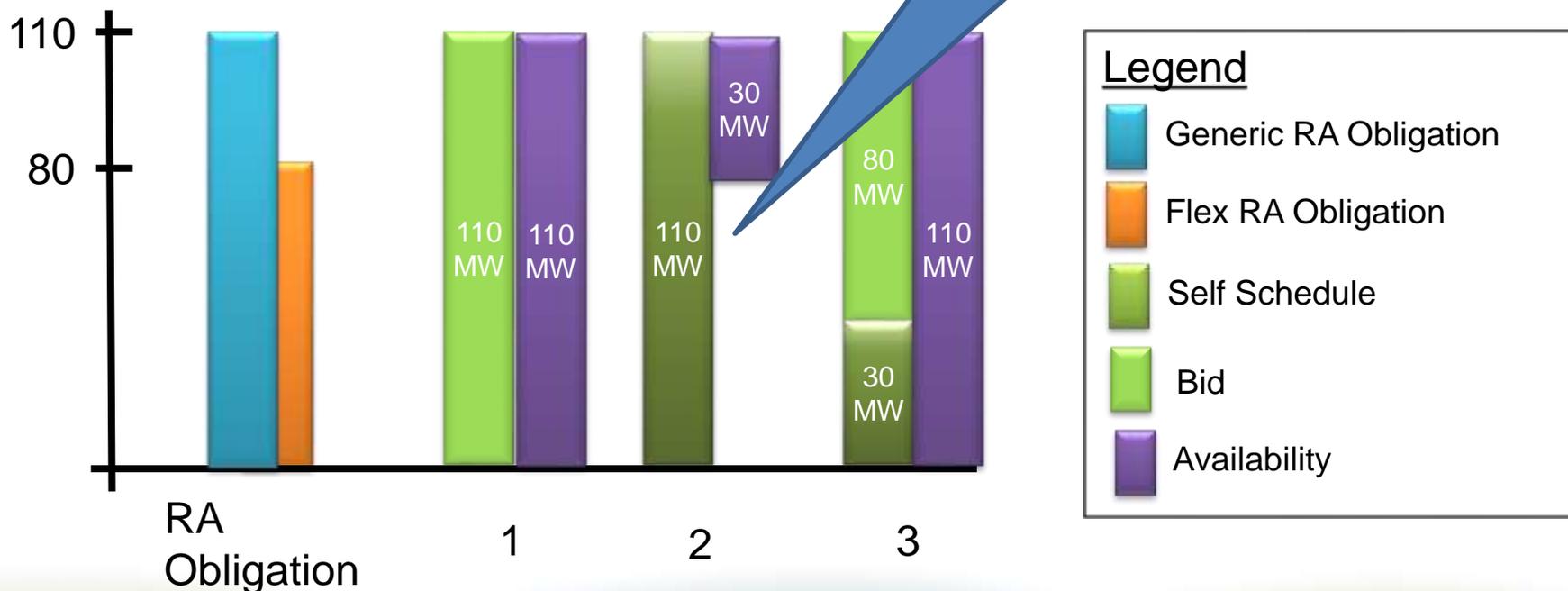
Cat1 - 17 hours, Cat2 - 5 hours, Cat3 – 5 hours



Overlapping Capacity: Availability

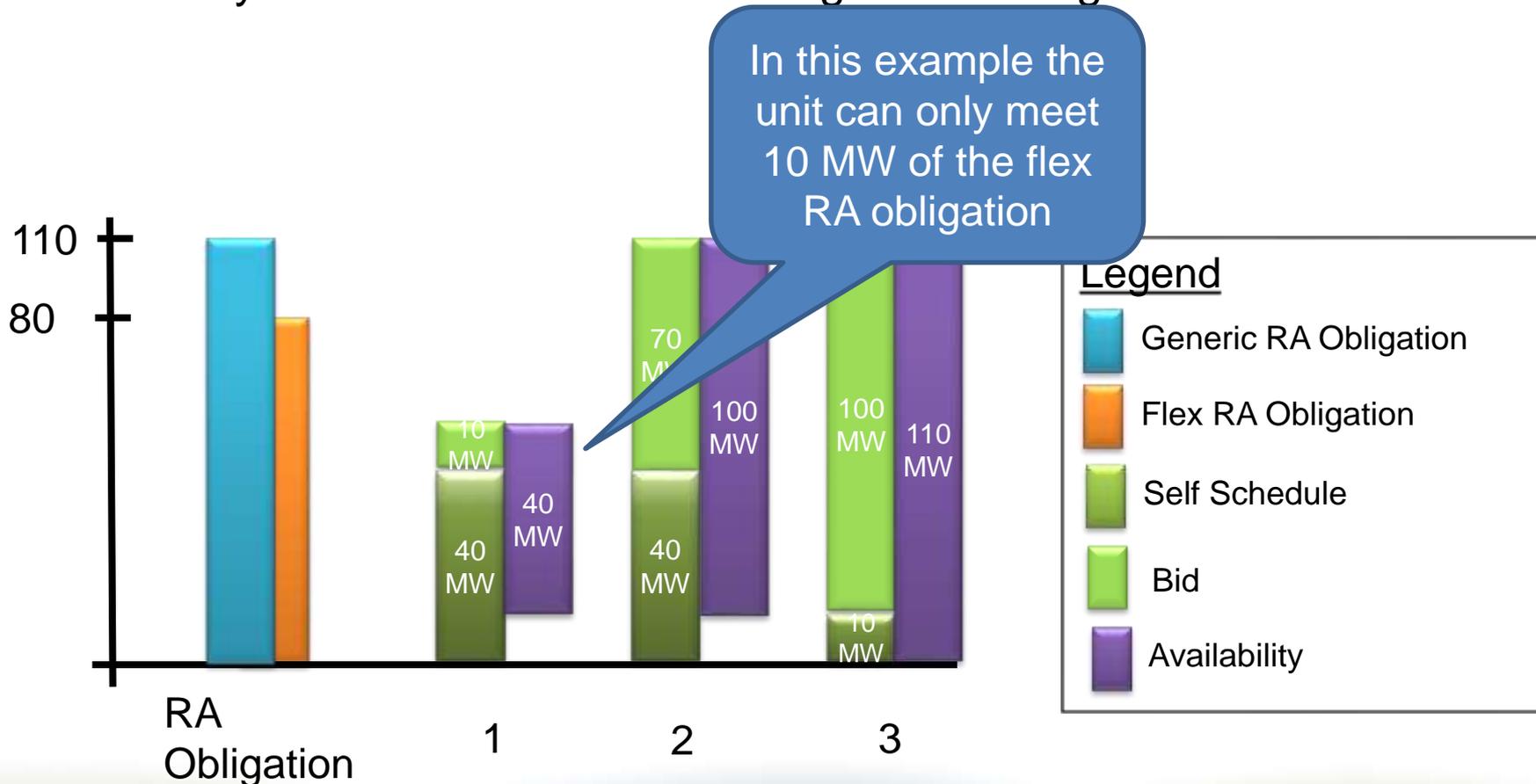
- Flex RA capacity is a higher bid obligation (only).
- For overlapping capacity, flex RA capacity can be met with economic bids.

In this example the unit cannot meet the flex RA obligation because it has self schedules

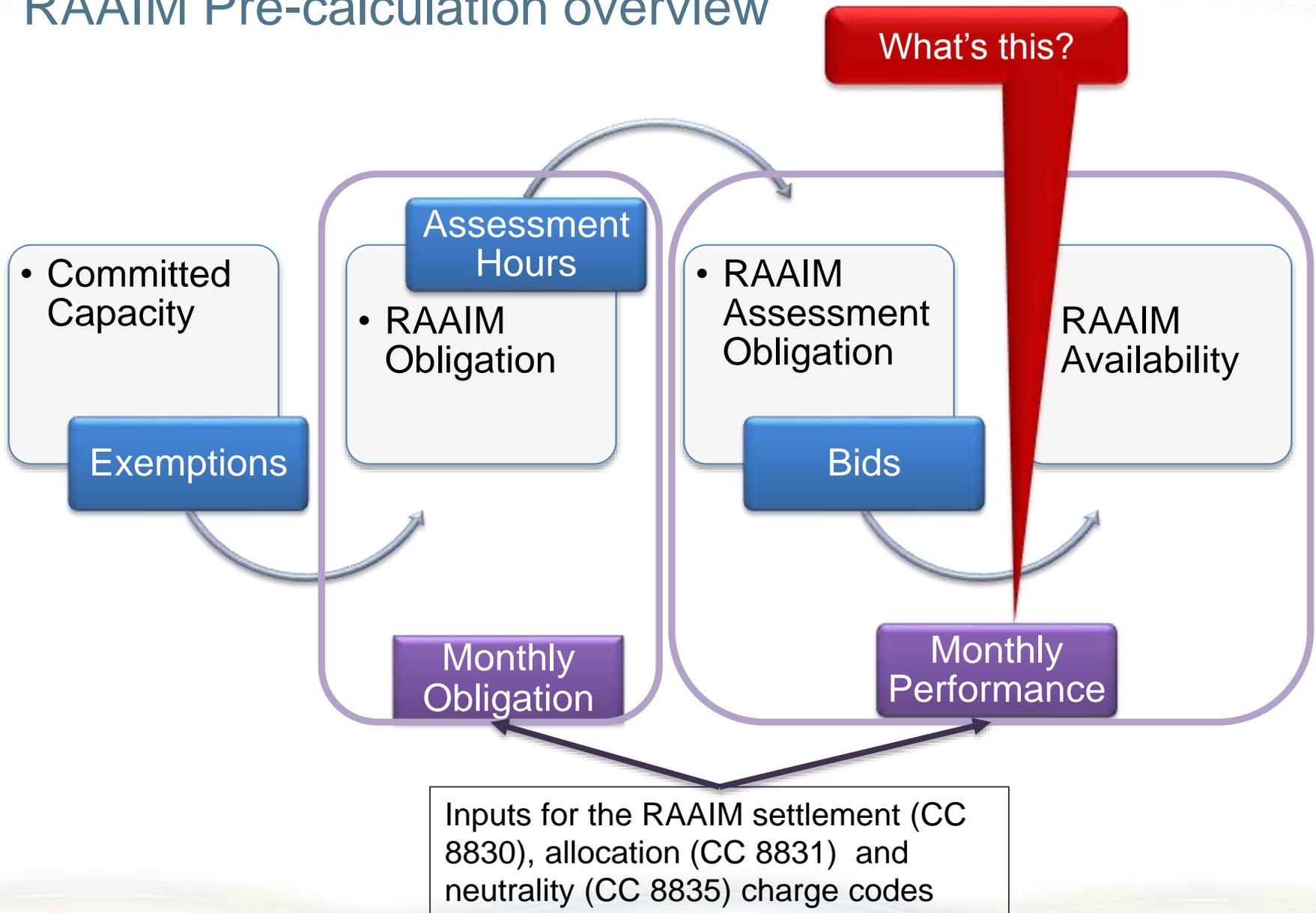


Overlapping Capacity: Availability

- Availability calculated based on the higher bid obligation.



RAAIM Pre-calculation overview



Key Concept – Calculation of Monthly Performance

- The system shall calculate a daily availability percentage for the day-ahead and real-time market.
- Each day, RA values from the market with the lowest performance shall be used in the monthly calculation of RAIM.



Let's take a look at an example...

Example of DA & RT performance percentage comparison for one resource

	Day Ahead		Real Time	
	Availability	Obligation	Availability	Obligation
HE 15	100	100	100	100
HE 16	100	100	100	100
HE 17	100	100	50	100
HE 18	100	100	20	100
HE 19	100	100	0	0
HE 20	100	100	0	0
Total	600	600	270	400
Performance	100%		68%	

Because this is the lower percentage it will be used when calculating the monthly average percentage

Obligation vs performance

- Monthly Obligation - this is used in calculation of settlement quantity 
- Assessment Obligation – these are the hours used to calculate performance 
- Performance is used to calculate the penalty or incentive %

Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1 	2 	3 	4 	5 	6
7	8 	9 	10 	11 	12 	13
14	15 	16 	17 	18 	19 	20
21	22 	23 	24 	25 	26 	27
28	29 	30 				

RA for a full month

Obligation vs. performance – example 2

- This resource is a substitute resource, only needed for part of the month
- Monthly Obligation - 
- Assessment Obligation – 

Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18 	19 	20
21	22 	23 	24 	25 	26 	27
28	29 	30 				

RA for a Partial Month

RAAIM: Obligation

Configuration Variable Names:

Committed (DayAhead/RealTime)	Obligation (DayAhead/RealTime)	Assessment (DayAhead/RealTime)
GenericCapacityQty	GenericObligationQuantity	AssessmentGenericObligationQuantity
GenericCPMCapacityQty	GenericCPMObligationQuantity	
FlexibleCapacityQty	FlexibleObligationQuantity	AssessmentFlexibleObligationQuantity
FlexibleCPMCapacityQty	FlexibleCPMObligationQuantity	

Exemptions

Assessment Hours

RAAIM: Bids

Configuration Variable Names:

Clean Bid Set (DayAhead/RealTime)	Total & Economic Bids (DayAhead/RealTime)		Available (DayAhead/RealTime)
EnergyBidQty	TotalEnergyBidQuantity		AvailableTotalBidQuantity
SelfScheduleBidQty	EconomicEnergyBidQuantity		
RegUpSelfProvisionBidQty	NGRTotalReg UpBidQuantity	NGRTotalBidQ uantity	AvailableEconomicBidQuantity
RegUpBidQty			
RegDownSelfProvisionBidQty	NGRTotalReg DownBidQuan tity		
RegDownBidQty			



Charge code table

Terminating Charge Codes	New Charge Codes
SCP Pre-calc	RAAIM Pre-calc
8820	8830
8821	8831
8824	8835
8825	
8826	
8827	

Questions





Capacity Procurement Mechanism Settlements Training

The information contained in these materials is provided for general information only and does not constitute legal or regulatory advice. The ultimate responsibility for complying with the ISO FERC Tariff and other applicable laws, rules or regulations lies with you. In no event shall the ISO or its employees be liable to you or anyone else for any decision made or action taken in reliance on the information in these materials.

Background: Capacity Procurement Mechanism (CPM)

- Ensures that the ISO will have sufficient capacity available to maintain reliable operation of the grid.
- Addresses the following circumstances
 - Insufficient local capacity area resources in an annual or monthly RA plan
 - Collective deficiency in local capacity area resources
 - CPM significant event
 - Reliability or operational need for an exceptional dispatch CPM
 - Capacity at risk of retirement
 - Cumulative deficiency in the total flex RA capacity included in the annual or monthly flex RA capacity plans or in a flex RA capacity category in the monthly flex RA capacity plans

Key concepts – CPM settlement

- Resources will get paid their own CSP bid
 - If there are multiple CPMs each will get paid their own price, not the highest price
 - Billable quantity = awarded CPM capacity MW
- CSP price is capped at the soft offer cap (\$6.31 kw/month) unless SC of the resource has filed higher price with FERC

CSP = Competitive Solicitation Process

Key concepts – Supplemental revenues

- Applies for exceptional dispatch CPM only
- Eligible non-RA capacity that was not bid into CSP and are selected for CPM, they may decline the ED CPM and get supplemental revenues instead
- Billable quantity is exceptional dispatch energy
- SCs will get paid:
 - Bid or better, until the cap (\$6.31 kw/month) is reached
 - Then the payment is the better of their DEB or LMP

CC 7891: MONTHLY CPM SETTLEMENT

Key concept – Monthly CPM Settlement

- Provides for the settlement of CPM capacity services under the CPM
- SCs for CPM resources will receive a payment for the CPM designation equal to the product of the kw/month of designated CPM capacity and the CPM price/kw/month
- The CPM capacity payment shall receive a deduction pro-rated for days the capacity was committed RA capacity other than CPM capacity

CC 7891 replaces these charge codes

Number	Name
7872	Monthly CPM Significant Event Settlement
7874	Monthly CPM Insufficient Local Capacity Area Resources Settlement
7876	Monthly CPM Collective Deficiency Settlement
7880	Monthly CPM Exceptional Dispatch Settlement
7882	Monthly CPM Capacity at Risk of Retirement Settlement
7884	Monthly CPM Insufficient Resource Adequacy Resources Settlement
7886	Monthly CPM Flexible Resource Adequacy Resources Settlement

CC 7896: MONTHLY CPM ALLOCATION

Key concept – Monthly CPM Allocation

- Allocates the cost of the CPM capacity procured for each month
- The following types of CPM costs are allocated pro-rata to the SC of the LSE based on LSE deficiency within the TAC or entire system served by the CPM designation:
 - Insufficient local capacity
 - Insufficient flexible capacity
 - Insufficient system capacity in cumulative LSE's annual or monthly resource plans

Key concept – Monthly CPM Allocation (continued)

- For the following CPM designation types, the total cost per designation type is pro-rata to the SCs based on the SC's load within the TAC area served by the CPM designation:
 - Significant event
 - Collective deficiency
 - Exceptional dispatch
 - Risk of retirement

CC 7896 replaces these charge codes

Number	Name
7873	Monthly CPM Significant Event Allocation
7875	Monthly CPM Insufficient Local Capacity Area Resources Allocation
7877	Monthly CPM Collective Deficiency Allocation
7881	Monthly CPM Exceptional Dispatch Allocation
7883	Monthly CPM Capacity at Risk of Retirement Allocation
7885	Monthly CPM Insufficient Resource Adequacy Resources Allocation
7887	Monthly CPM Flexible Resource Adequacy Resources Allocation

These existing charge codes will be modified

These have been modified to accommodate supplemental revenue settlement

Number	Name
MD_TAC_CPM_PC	Metered Demand TAC Area and CPM Precalc
6460	FMM Instructed Imbalance Energy Settlement
6470	Real-time Instructed Imbalance Energy Settlement
6482	Real-time Excess Cost for Instructed Imbalance Energy Settlement
6488	Exceptional Dispatch Uplift Settlement

Questions



References

- Reliability Services – Addendum to the Draft Final Proposal
 - <http://www.caiso.com/Documents/DraftFinalProposalAddendum-ReliabilityServices.pdf>
- Capacity Procurement Mechanism Replacement – Draft Final Settlement Proposal
 - <http://www.caiso.com/Documents/DraftFinalSettlementProposal-CapacityProcurementMechanismReplacement.pdf>
- Draft Settlements Configuration Guides – Early 2016 Release
 - <http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx>