



California ISO

RA Issue Paper Workshop

November 18, 2024

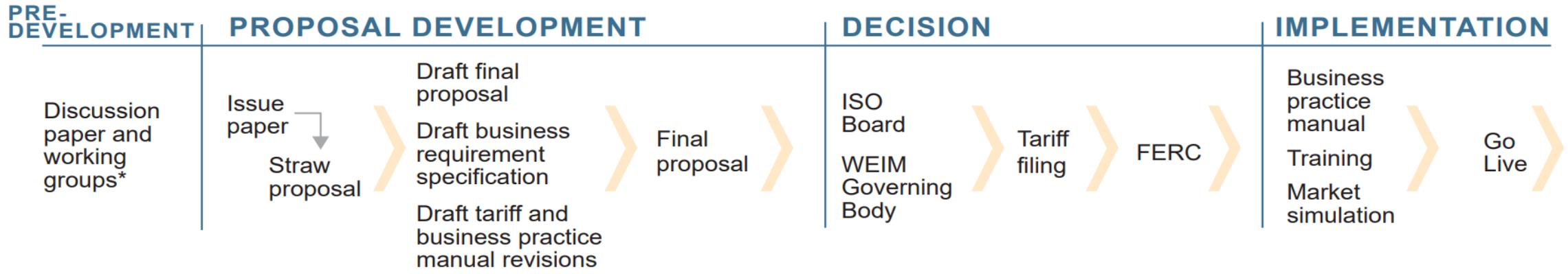
Housekeeping Reminders

- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- These collaborative working groups are intended to stimulate open dialogue and engage different perspectives.
- Please keep comments professional and respectful.

Instructions for raising your hand to ask a question

- If you are connected to audio through your computer, open the participant and chat panels on the bottom right. 🖐️
- If you dialed in to the meeting, press *3 to raise your hand.
- Please remember to state your name and affiliation before making your comment.
- You may also send your question via chat to all panelists.

Working Group in context



 Stakeholder input

**Discussion papers and working groups will be incorporated into the stakeholder process dependent on the nature of the initiative, and may not be necessary for all initiatives.*

This represents the typical process, and often stages run in parallel. Stakeholder meetings, working groups and workshops may occur throughout the stakeholder process.



Agenda

Time	Topic	Speaker
9:00-9:45 AM	Welcome & Framing	Partha Malvadkar
9:45-10:45 AM	Track 1: UCAP	Ansel Lundberg
10:45-11:00 AM	Break	
11:00-12:00 PM	Track 1: Default PRM & Capability Testing	Ansel Lundberg
12:00-1:00 PM	Lunch	
1:00-2:45 PM	Track 2: Outage and Substitution & Availability and Performance Incentive Mechanisms	Anja Gilbert
2:45-3:00 PM	Break	
3:00-4:45 PM	Track 3: Visibility and Backstop Procurement Reform	Hilary Staver
4:45-5:00 PM	Next Steps	Partha Malvadkar

The RA Issue Paper Organization

- ✓ Problem statements from RAMPD Working Group
- ✓ Objectives
- ✓ Background
- ✓ Current challenges
- ✓ Stakeholder feedback
- ✓ Benchmarking
- ✓ Options for consideration

CAISO RA Issue Papers: Key issues & challenges

Additional focus remains on interoperability with LRA RA Programs (e.g. CPUC Slice of Day)

RA Track	Key Issues	Coordination
Track 1: CAISO Modeling, Default Rules, and Accreditation	<ol style="list-style-type: none"> 1. RA modeling 2. Update default PRM and counting rules 3. UCAP design 4. Develop capability testing 	<ul style="list-style-type: none"> • CPUC’s modeling efforts and UCAP design • Interactions between outage definitions and UCAP, as well as the incentives between RAIM reform and UCAP
Track 2: Outage Substitution & Availability and Performance Incentive Mechanisms	<ol style="list-style-type: none"> 1. Improve outage and substitution processes 2. Strengthen availability and performance incentives 	<ul style="list-style-type: none"> • Coordinate outage definitions with UCAP • Alignment on UCAP and RAIM incentives • Possible RAIM coordination with EDAM, if RAIM moved to align with RSE
Track 3: Visibility and Backstop	<ol style="list-style-type: none"> 1. Improve ISO operators’ visibility into the non-RA resource fleet to better inform backstop procurement decisions 2. Identify desired policy updates to the Capacity Procurement Mechanism, and potentially EDAM RSE shortfall curing and cost allocation processes 	<ul style="list-style-type: none"> • Coordination between options for visibility in the future, informing outage and substitution and CPM reform

RA Issue Paper: Explore the pros and cons of solutions through the lens of packages to illustrate issues and interdependencies

	Package 1	Package 2	Package 3
Key Features	<i>Minimal change</i>	<i>Forward Planning: Leans towards mandates and LRA implemented reforms</i>	<i>Operational Measures: Leans towards incentives and CAISO implemented reforms</i>
PRM	Update default	Two default PRMs PRM 1 = LRA uses ELCC PRM 2 = LRA uses exceedance	One Default PRM and Counting with traditional ELCCs
Counting	CAISO enablement of the CPUC's UCAP	UCAP Applied to thermal/storage based on 20% tightest hour supply cushion (30% weight) and emergency conditions (70% weight)	UCAP applied to thermal/storage based on 20% tightest Hour Supply Cushion
RAAIM	Minor RAAIM revisions (daily RAAIM)	Strong RAAIM applied to emergency conditions and RSE EDAM failures RAAIM is even stronger for LRAs that opt out of UCAP; LRA/contract deferral for incentives for wind/solar/hydro/DR	Pay-for-performance
Outage and Substitution	Include urgent outages and emphasize use of bulletin board	Planned Outage Buffer	Voluntary planned outage pool provides substitution, obtained from SCs with compensation and cost between generators
Backstop (Including EDAM RSE)	Status Quo Peanut buttered approach	Energy and Capacity Check set based on LRA Requirements Corrections/penalties based on LRA requirements EDAM RSE Advanced Screen	Portfolio Assessment Cost/penalties assigned based on consistent assessment of cause Applied to LSEs and RA Suppliers based on performance

Illustrative Packages: Reform Timeframes



UCAP

-  CPUC UCAP
-  Medium UCAP
-  Stronger UCAP

Outage & Sub

-  Buffer

-  Pool
-  Emphasize Bulletin Board

Avail & Incentive

-  Minimal RAIM Change
-  Strong RAIM Change
-  Pay for Performance

Backstop

-  LRA Corrections and CPM

-   Correction and penalty cost allocation for EDAM RSE CPM

 <i>Minimal Changes</i>	 <i>Forward Planning: Leans towards requirements & LRA implemented reforms</i>	 <i>Operational Measures: Leans towards incentives & CAISO implemented reforms</i>
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Track 1

MODELING, DEFAULT RULES, AND ACCREDITATION

An explanatory note on LRAs

- LRA: Local Regulatory Authority
 - In CAISO tariff: “the state or local governmental authority, or the board of directors of an electric cooperative, responsible for the regulation or oversight of a utility”
- CAISO Tariff
 - CPUC & other LRAs: set reserve margins (PRM) & qualifying capacity criteria (counting rules)
 - CPUC **Load Serving Entities**
 - Non-CPUC **Load Serving Entities** and their “appropriate Local Regulatory Authority or federal agency”
- Shorthand: Non-CPUC LRAs - examples:
 - Six Cities: Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside
 - NCPA
 - CA Dept of Water Resources, WAPA Sierra Nevada Region, Metropolitan Water District
 - Etc.

RA “Track 1” initiative encompasses RA modeling, accreditation issues, and resource capability testing. What’s in the issue paper for Track 1?

1. RA Modeling

Probabilistic LOLE and deterministic modeling

- Inputs and assumptions summary, year ahead, mid- and long-term timeframes
- Benchmarking: loss of load expectation modeling in CPUC RA/IRP, WRAP
- Much more modeling detail in modeling input & assumptions documents

2. Defaults

Planning reserve margin & counting rules

- Updating CAISO tariff default PRM and QC methodology
- Goal: Demonstrate a framework that would achieve a 0.1 LOLE
- Benchmarking: CPUC counting rules, other ISOs/RTOs, WRAP

3. UCAP

Ensure RA resources are available when needed

- RA accreditation method based on forced outage & derate data
- CPUC coordination – CPUC has requested a CAISO proposal for consideration
- Key considerations: data, historic period of account, resource type, part of NQC determination

4. Capability Testing

Account for generators’ seasonal temp derates

- New testing regime? Self-attested operational curve?
- Limit RA maximum accredited capacity

Track 1: Modeling, Default Rules, and Accreditation

UNFORCED CAPACITY (UCAP) MECHANISM

Unforced Capacity (UCAP) Mechanism

Problem Statement

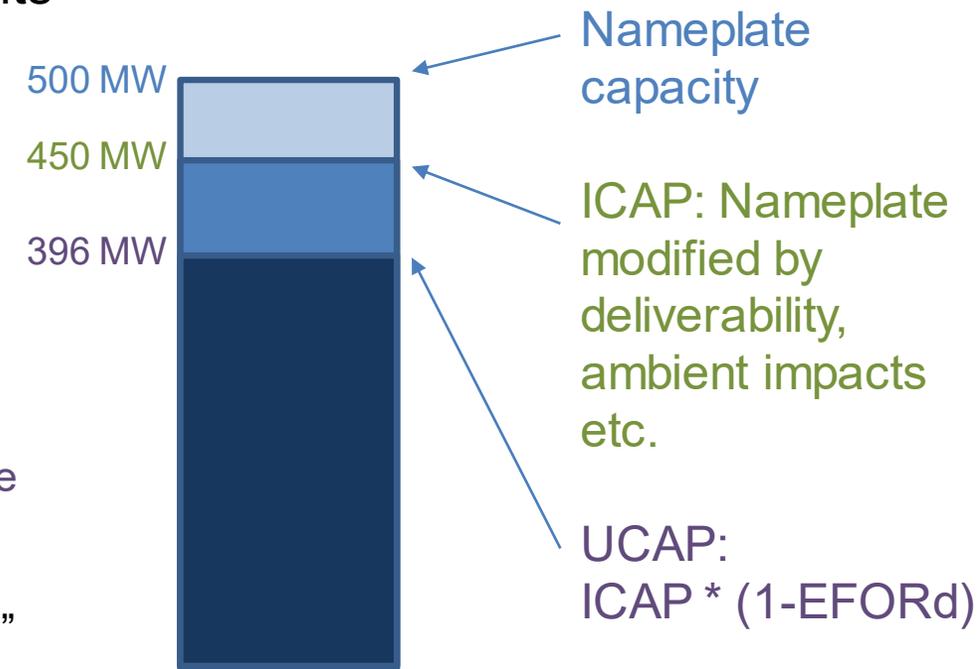
A stakeholder initiative should evaluate how well current LRA-established PRMs and counting rules reflect forced outage rates, performance, and availability. In response to potentially changing regulatory structures at the CPUC (including the scoping of UCAP), CAISO has an opportunity to establish alternatives to the current resource counting design and eliminate/redefine availability and performance incentives while acknowledging LRA authority to establish counting rules.

UCAP Objectives

- Reward good resource performance and penalize poor performance
- Encourage retention of more reliable resources
- Match accreditation methodologies with assumptions in reliability assessments

Example

- Gas combined cycle plant with nameplate capacity of 500 MW
- ICAP or DQC (account for deliverability, etc. Include impact of ambient weather conditions?)
- UCAP or NQC would be the ICAP value reduced by historic forced outage rate during a period of “demand”



Unforced Capacity (UCAP) Mechanism: design & implementation questions

Defining availability

- Resource specific or class average?
- Data source: CAISO OMS? NERC GADS?
- What outage types “count”?

Evaluation hours

- EFORd?
- 20% “tightest” hours?
- Loss of load hours in model?

Implementation

- Which resource types?
- CAISO NQC process?
- LRA coordination?

Reference: CAISO Supply Cushion UCAP

$$\text{On Peak NQC} = \sum \text{Weighted Seasonal Average Availability Factors}^{\text{Summer}} * \text{DQC}$$

$$\text{Off Peak NQC} = \sum \text{Weighted Seasonal Average Availability Factors}^{\text{Winter}} * \text{DQC}$$

Fuel Type	Unit Type	On Peak (Summer) WSAAF	Off Peak (non-summer) WSAAF
GAS	Combined Cycle	89%	86%
GAS	Combustion Turbine	89%	88%
GAS	Multi Stage Generator	86%	90%
GAS	Steam Turbine	88%	82%
HYBD	Hybrid	87%	95%
LESR	Battery Storage	89%	93%

Track 1: Modeling, Default Rules, and Accreditation

DEFAULT QC METHODOLOGY AND PLANNING RESERVE MARGIN

Default QC Methodology and Planning Reserve Margin (PRM)

Problem Statement

The CAISO default PRM should be assessed in light of changes in the RA resource mix and evolving reliability needs within the CAISO BAA. CAISO's default PRM and default counting rules should meet at least a 0.1 LOLE at the CAISO BAA level.

Default Rules Objectives

- Counting rules [QC values] included in the CAISO tariff should reflect the relative contribution of different resource types—and individual resources—to maintain BAA-wide and local reliability
- The PRM in the CAISO tariff should be designed alongside counting rules to create a coherent set of RA standards
- If these standards are adopted by LRAs, the resulting combined compliant LSE portfolios could reasonably be expected to meet at least a 0.1 LOLE

Counting rule specifics

- More discussion tomorrow (11/19 modeling workshop)

- Draft NQC list
- Defer to highest QC value

Discussion

- How to make default rules “usable”?

Track 1: Modeling, Default Rules, and Accreditation

CAPABILITY TESTING FOR RA RESOURCES

Capability Testing: Accounting for Seasonal Resource Availability

Problem Statement

The availability of resources based on varying seasonal ambient derates is not consistently reflected in resource net qualifying capacity (NQC) today which creates challenges in reliably operating the grid.

Current CAISO Tariff

- “Reductions for testing”
- Current practice: changes to PMax cause an NQC change

Benchmarking

- MISO: GVTC (annual)
- WRAP: annual Operational Tests / Capability Tests every five years

Implementation considerations

- How should tests be carried out?
- Seasonal adjustment?
- UCAP connection

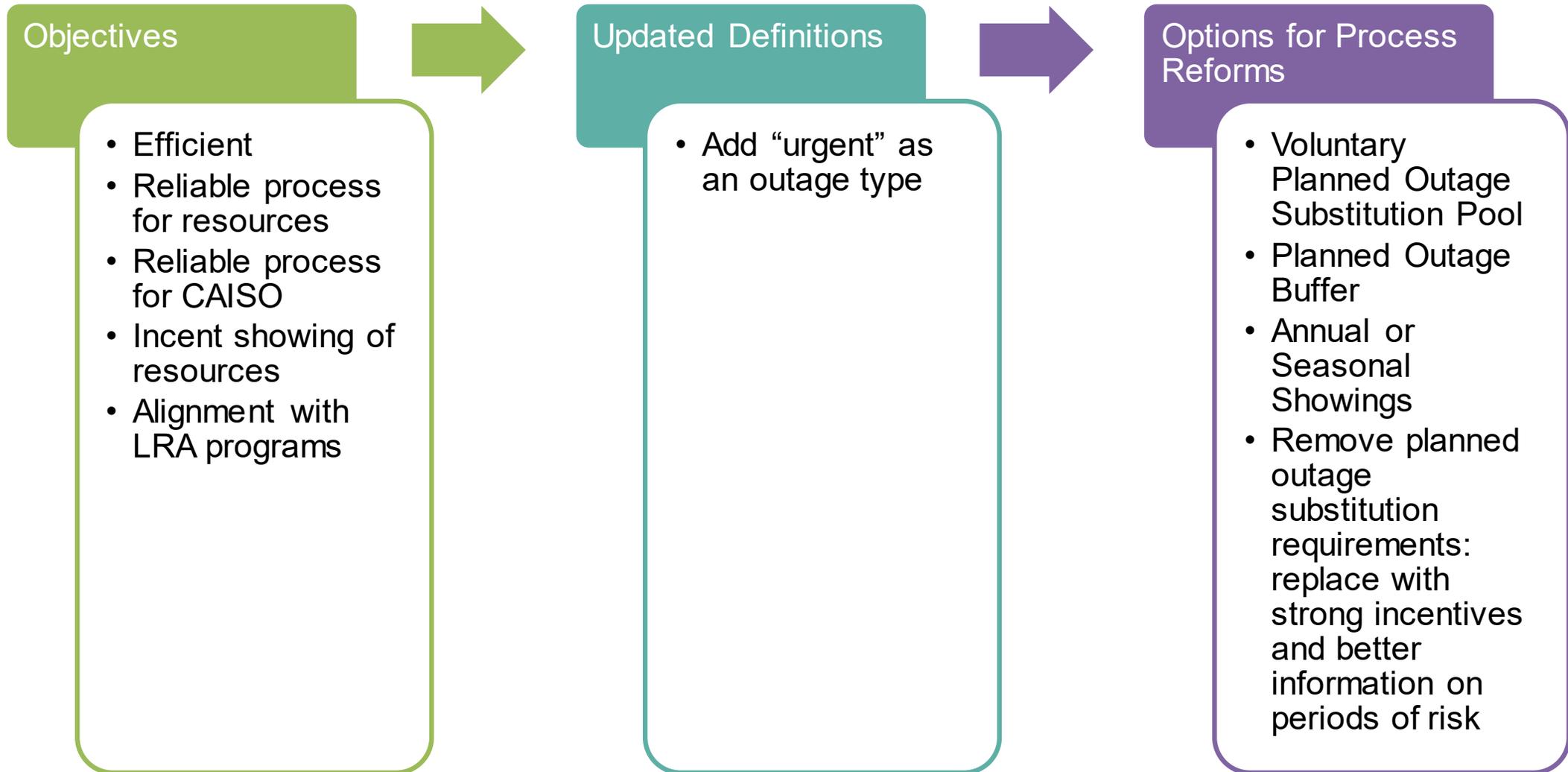
Capability Testing Objectives

- Minimum requirements should be adopted such that CAISO can rely on capacity to perform consistent with its accreditation in a given season
 - Resources’ NQC values should reflect their expected ability to perform in peak load conditions
- Such requirements should minimize partial forced outages that derate resources’ below their NQC value during critical periods

Track 2: Outage and Substitution and Availability and Incentive Mechanisms

OUTAGE AND SUBSTITUTION

Overview



Update to Definitions: Add “urgent” outage definition

- To align with RC West definitions and respond to stakeholder suggestions from DMM, Vistra, and TerraGen– the CAISO suggests adding an “urgent” outage definition.
- This could give CAISO the ability to deny the outage if there is a reliability concern – or approve it if the outage does not impact reliability.
- A prioritization for approving outages could reflect:
 - Forced and urgent
 - Planned outages
 - Opportunity outages

Solutions for Consideration

Develop a Voluntary Planned Outage Substitution Pool

- Outage pool whereby SCs can make capacity available to the pool and be paid if it is needed. SCs can also procure from the pool. First right of refusal to access the SC's own capacity.

Establish a Planned Outage Buffer

- Planned outage buffer provided by each LRA

Move to Annual or Seasonal Showings

- Coupled with another reform

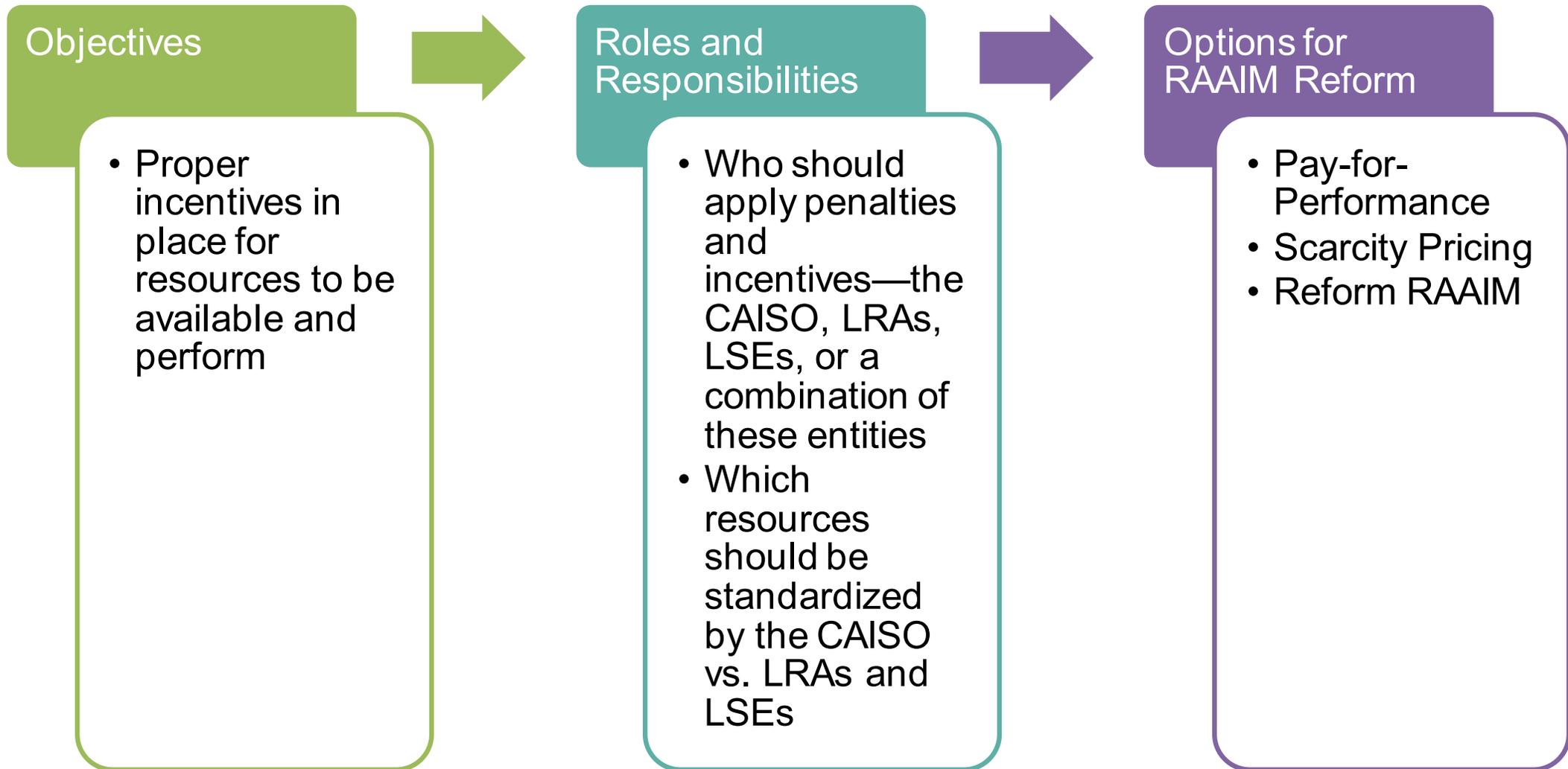
Remove planned outage substitution requirements: replace with strong incentives and better information on periods of risk

- ISO-NE type approach: CAISO would only require rescheduling/substitution for outages with clear and significant reliability implications; coupled with a strong pay-for-performance based approach

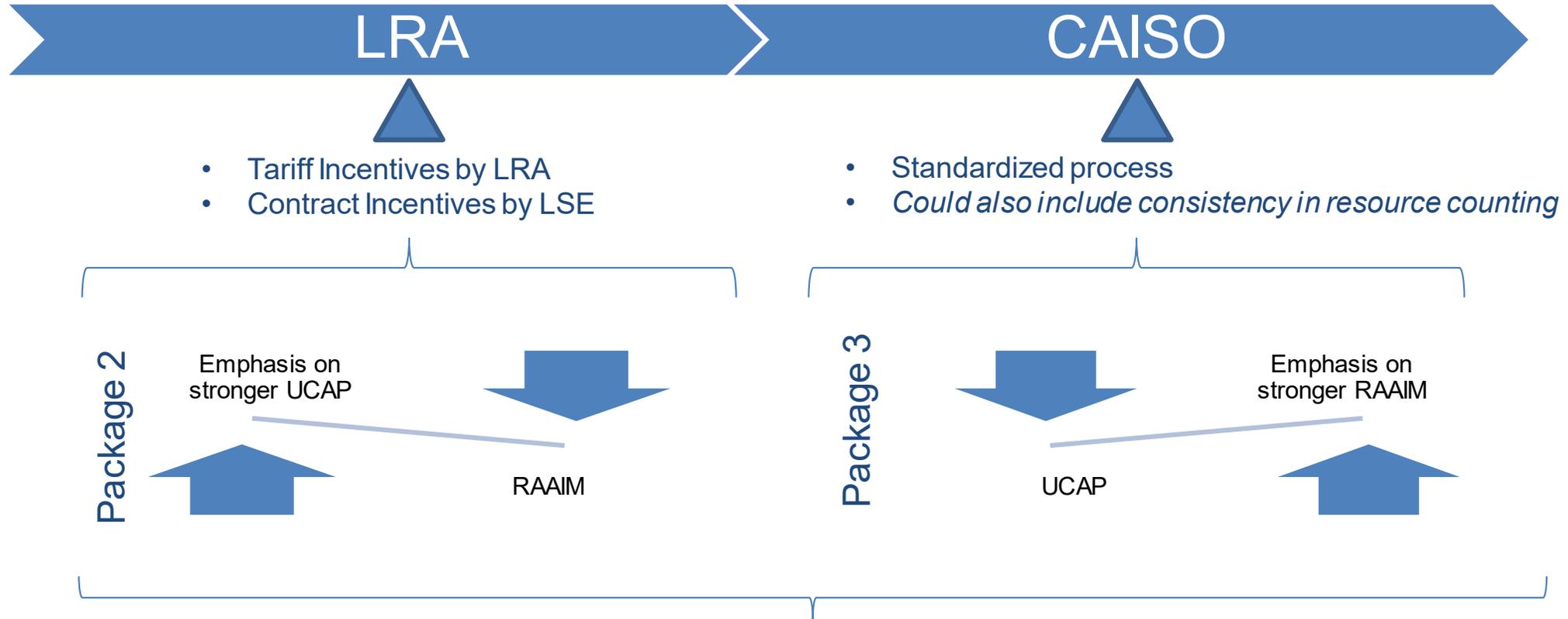
Track 2: Outage and Substitution and Availability and Incentive Mechanisms

RAAIM REFORM

Overview



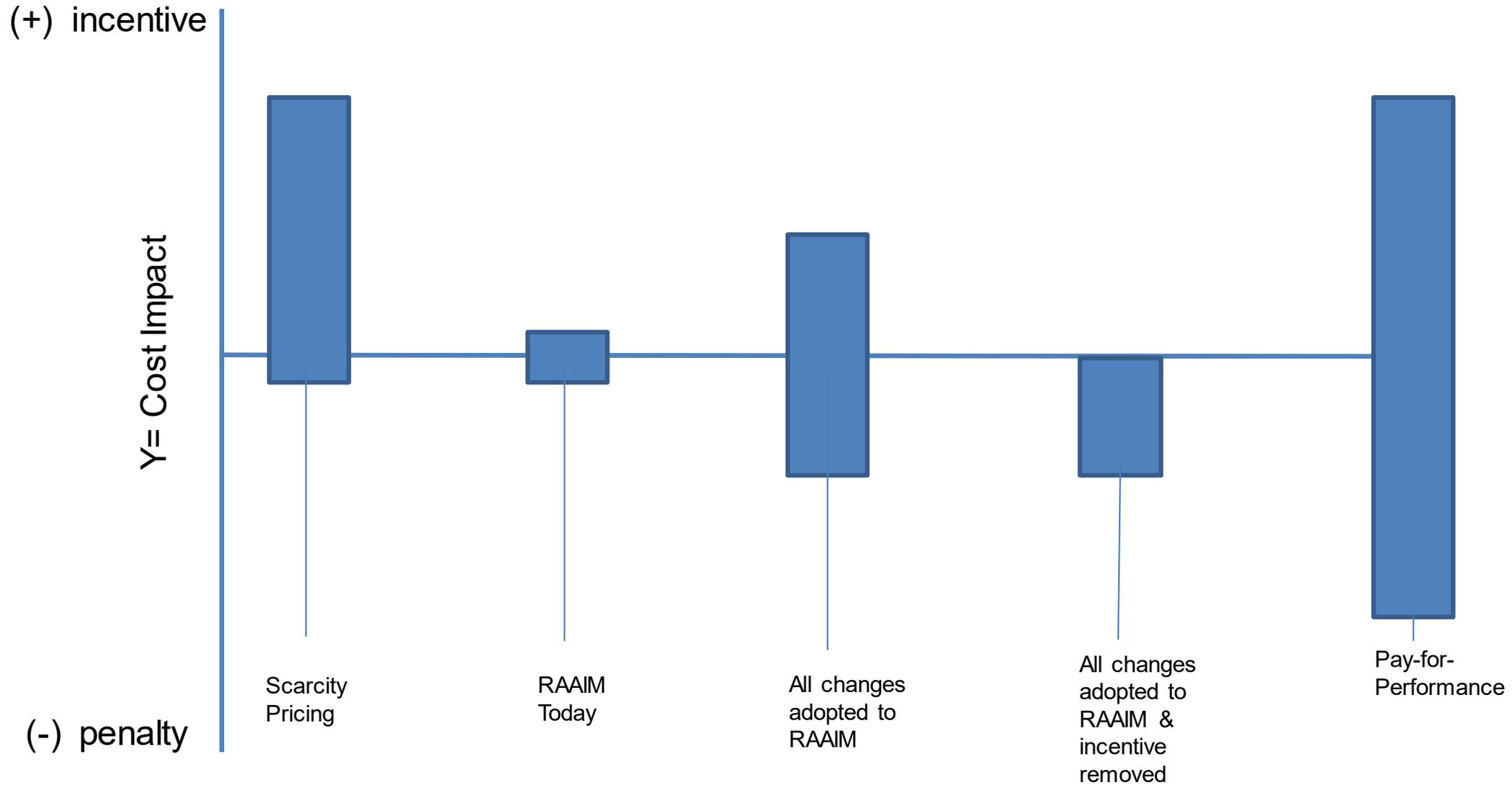
Roles with Availability and Performance Incentives



Considerations:

- LRAs that adopt UCAP
- Resources that UCAP applies to

Illustrative Incentive Cost Impact of Possible Reform Options



Reform to CAISO's Current RAIM: Options

Size of RAIM?

- Changing the price (e.g., tie to bilateral, 100% of CPM soft offer cap, align with RSE failure payments and surcharges)
- Removing the deadband

When is it applied?

- Daily
- Critical Days (RMO, EEA watch, EEA 1-3)
- When the ISO BAA fails the RSE

Which resources or conditions does it apply to?

- Remove 1MW exemption

Pay for Performance

Pay-for-performance is an incentive mechanism for capacity to respond, and for non-capacity resources to be available, during scarcity conditions.

As implemented at PJM and ISO-NE, it acts as both a reward and penalty relative to a resource's obligation during scarcity events. If a supplier's poor performance contributes to reliability risk, they face strong consequences.

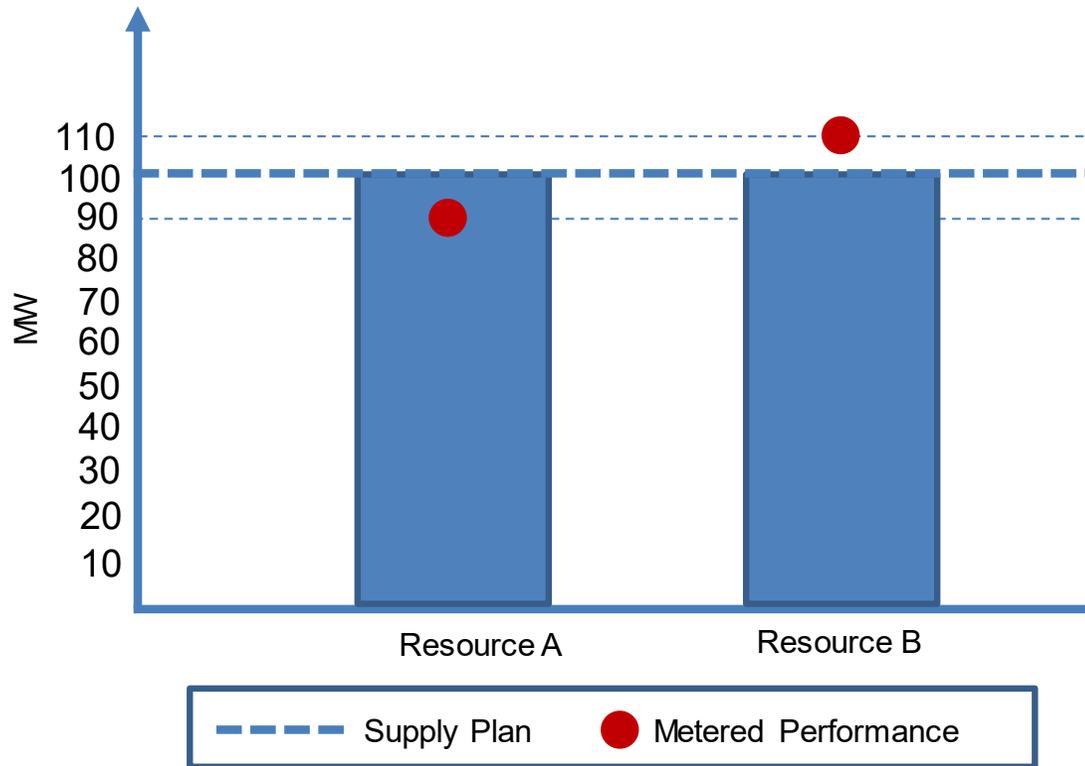
PJM/ISO-NE: Similarities with RAIM

- Self-funding: underperformers pay over performers

PJM/ISO-NE: Difference with RAIM

- No exemptions in PJM (might need alternate construct for our fleet)
- Tool to promote outage coordination (ISO-NE)
- Higher price, but stop loss provisions
- Triggered based on grid-conditions
- Applies to non-capacity to incent capacity to be available

Pay for Performance: Example



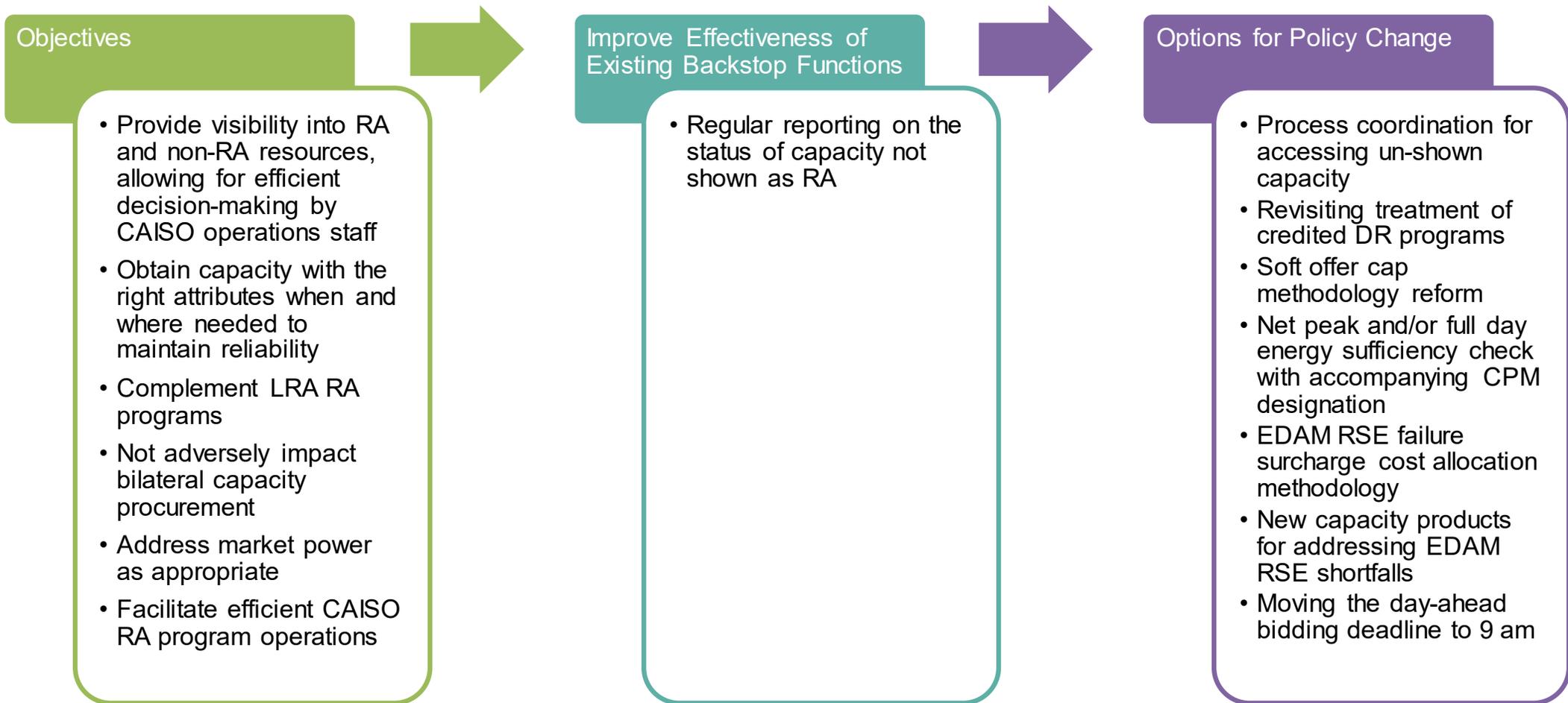
	Resource A: Under Performance	Resource B: Over Performance
Supply Plan Quantity, NQC (A)	100 MW	100 MW
Resource Performance, MW (B)	90 MW	110 MW
Resource Performance, % (C)	90%	110%
Settlement = ([B-(C x A)] x \$3,500	= 100 - (0.9 x 100) x \$9,337	= 100 - (1.10 x 100) x \$9,337
Total	(\$93,370)	\$93,370

Assumes penalty price of \$9,337/MWh

Track 3:

BACKSTOP AND VISIBILITY

Overview



Visibility Into Capacity Not Shown as RA

- What are the barriers to making capacity not shown as RA visible to CAISO, including capacity that is:
 - Sold outside the CAISO BAA
 - Held for substitution
 - Held for anticipated outages
 - Not contracted
 - Contracted but not needed to meet LSE's requirement

Options for Policy Change: Capacity Procurement Mechanism (CPM)

System Net Peak and/or Energy Sufficiency Check

- Should CAISO assess energy sufficiency and/or net peak needs and update CPM authority to accommodate backstop on these bases?

Soft Offer Cap

- Should the soft offer cap methodology be changed? Why or why not?
- If so, how does this affect CPM's market role?

Credited DR Programs

- How can treatment of credited DR programs be harmonized between CAISO and LRA programs, especially the CPUC RA program?
- Are there barriers to showing credited DR programs on supply plans?

Options for Policy Change: CAISO EDAM Resource Sufficiency Evaluation

EDAM RSE Failure Surcharge Allocation

- Should surcharge cost allocation move towards a causation-based approach?
- How should this be structured and what barriers must be overcome?

New Capacity Products

- How should they be structured and priced?
- How should cost allocation be approached?

9 am Bidding Deadline

- Are there barriers to considering this?
- How would this affect market participants?

Stakeholders advocated for a more coordinated process to access and consider resources – including removing disincentives and providing additional incentives

Accounted for in CAISO Process	All Capacity						
	Shown RA	Other Resources					
		On Outage	Sold Outside BA	Contracted, but not RA due to lack of deliverability	Not Contracted and Available	Contracted but not shown (due to MOO/ RAAIM Concerns)	Contracted but needed for substitution
Monthly CPM	X				X - If Offered into the CSP		?
CAISO BA EDAM RSE	X			X - If bid	X - If bid	X - If bid	X - If bid
Outage and Substitution	X				?	?	X - Could be offered to Others

Next Steps

- December 5th – Comments Due
- December 13th – Input workshop to co-develop Straw Proposals
 - Contact policy leads to present

ENERGY matters

The California ISO's blog highlights its most recent news releases, and includes information about ISO issues, reports, and initiatives.



Energy Matters blog provides timely insights into ISO grid and market operations as well as other industry-related news:

<https://www.caiso.com/about/news/energy-matters-blog>



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