



Need Determination and Allocation: The Intersection of IRP and RA

NP Energy on behalf of the **Natural Resources Defense Council**



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Introduction

Level-Setting: Why Are We Here?

- The modern electric grid is an incredibly (and increasingly) complex machine reliant on operational contributions from a diverse array of competitive, decentralized market participants
- The RA program, by necessity, is a simplification of those operational needs into an accounting framework to drive market participant “parts” to a reliable “whole”
- This simplification must be built with complex tools to determine operational needs. Current efforts in the IRP to identify reliable portfolios should be extended to regular calibration of the RA program through LOLE analysis
- While simplification is necessary, proper representation of the complexities of emerging resource categories is essential for LSE and developer planning and incentives, to identify emerging reliability concerns, and to address leaning between LSEs and resource types

NRDC Continues to Support a Month-Hour Slice-of-Day Framework as the best path forward to:

- Accurately capture the benefits of preferred resources, especially solar, wind, short-/long-duration storage, and load flexibility
- Ensure all resources can participate, be credited, and be compensated in the RA market commensurate with their operational characteristics
- Provide LSEs and Commission staff a new and useful tool for assessing and aligning LSE-specific reliability contributions on a near-, medium-, and long-term basis in both RA and IRP

Additionally, the Month-Hour framework:

- Can be calibrated simply and effectively, like other proposals, to avoid significant under- or over-procurement
- Is consistent with the Commission's decision to direct parties to refine and develop the Slice of Day framework in D.21-07-014

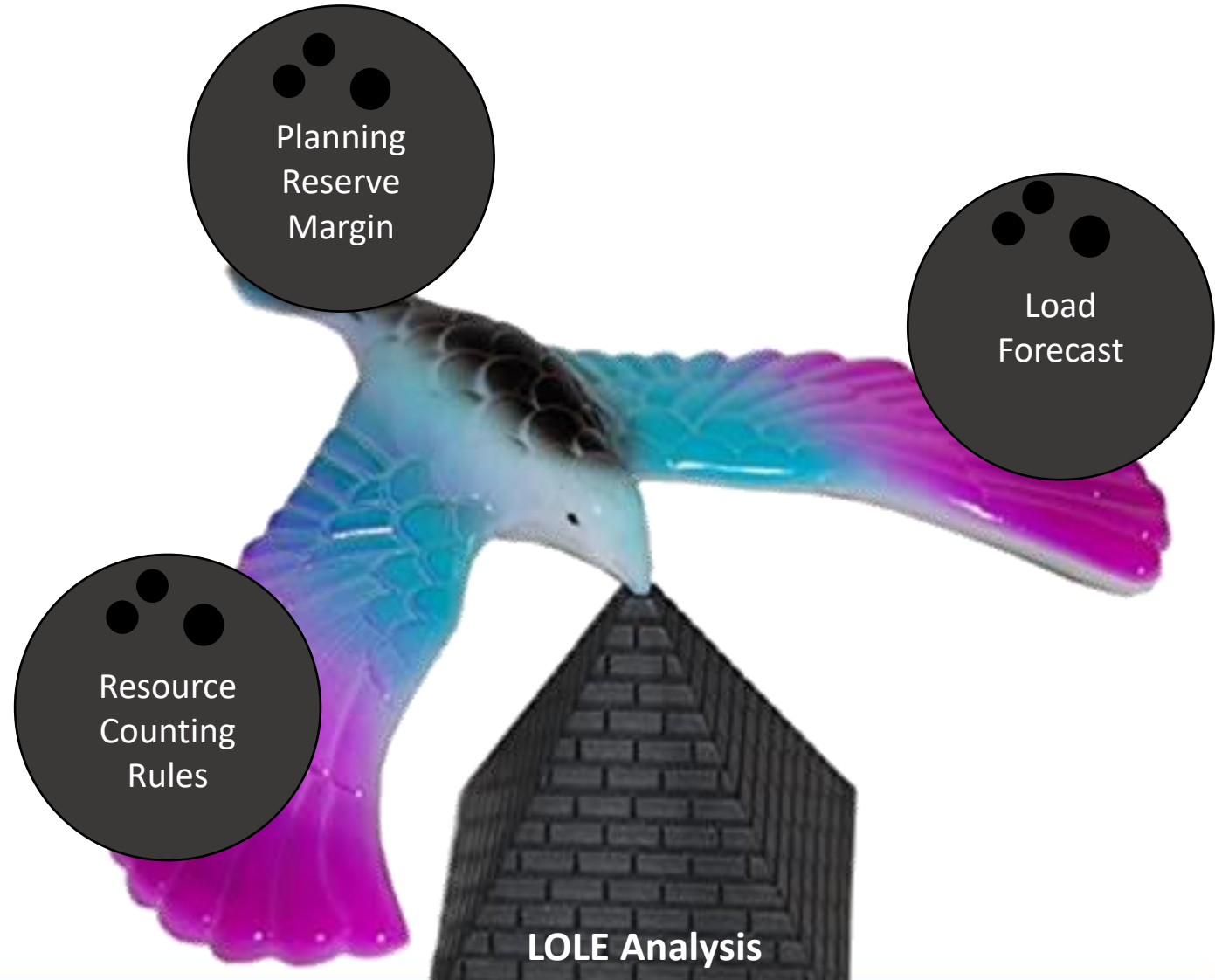
Determining Need in IRP, Allocating Obligations in RA

The RA Parameterization Balancing Act

RA parameters are interactive. To achieve a desired reliability standard, the parameters must be properly calibrated and balanced.

Adjusting one will require adjusting another to retain the same reliability standard. For instance, selecting one resource counting method will necessitate a different PRM than another method to drive the same reliability outcome.

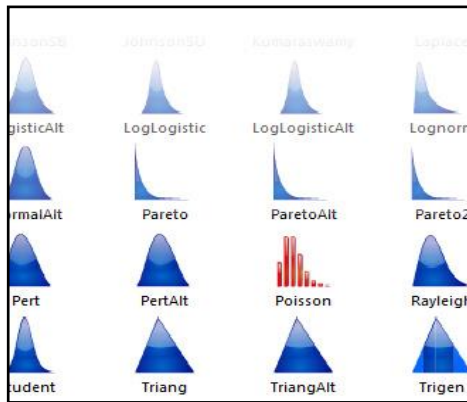
But by how much? Reliability modeling (e.g. LOLE), is necessary to ensure all the parameters are set *just right*, and must be updated regularly as the grid evolves.



IRP-RA Need Determination and Calibration: Process Overview

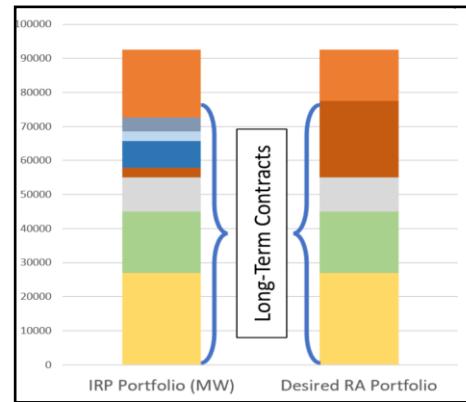
IRP-RA Integration: Need Determination and Calibration Process

LOLE-Based Need Determination in IRP



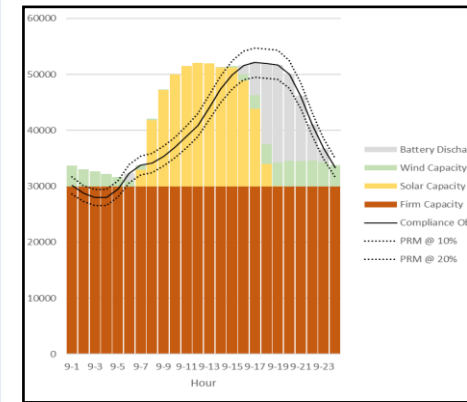
Determine desired portfolio in IRP via LOLE analysis
 (+ GHG constraints and cost optimization)

IRP-RA Alignment



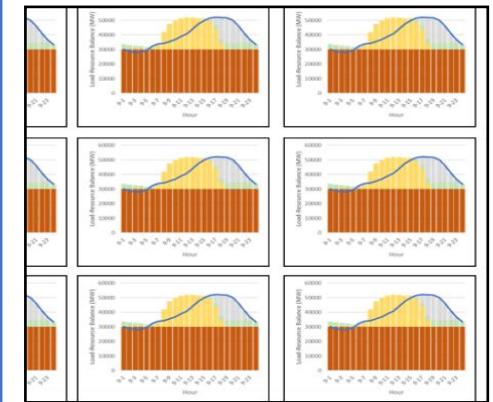
IRP Portfolio and RA Portfolio Alignment

PRM Calibration



Adjust PRM to achieve desired RA showings

Testing / Sum-of-Parts Check



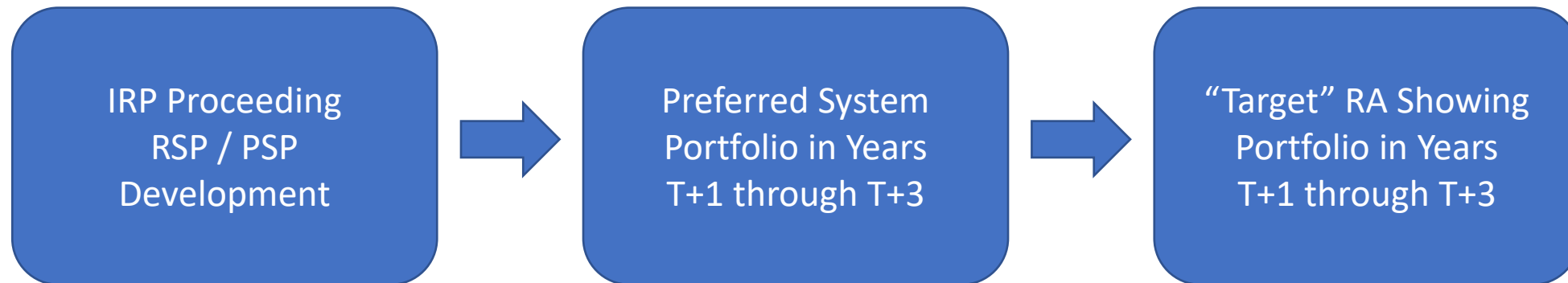
Test and recalibrate against expected showings from LSEs during calibration process

Continual Calibration and Refinement through IRP Proceeding



Step 1: LOLE-Based Need Determination in IRP

- The Integrated Resource Plan (IRP) should drive the need determination process through LOLE-tested portfolios for each near-term year (IRP Year +1, +2, +3, etc)
- The IRP portfolio (RSP or PSP) will have been demonstrated to meet a specified reliability standard and should form the basis for the RA program calibration
- Knowledge of committed resources can significantly simplify and improve the calibration process – e.g. IRP filings, CAM/CPE procurement, and (if adopted) multi-year RA showings



Step 1: LOLE-Based Need Determination in IRP

Calibration should occur at regular intervals through the IRP.

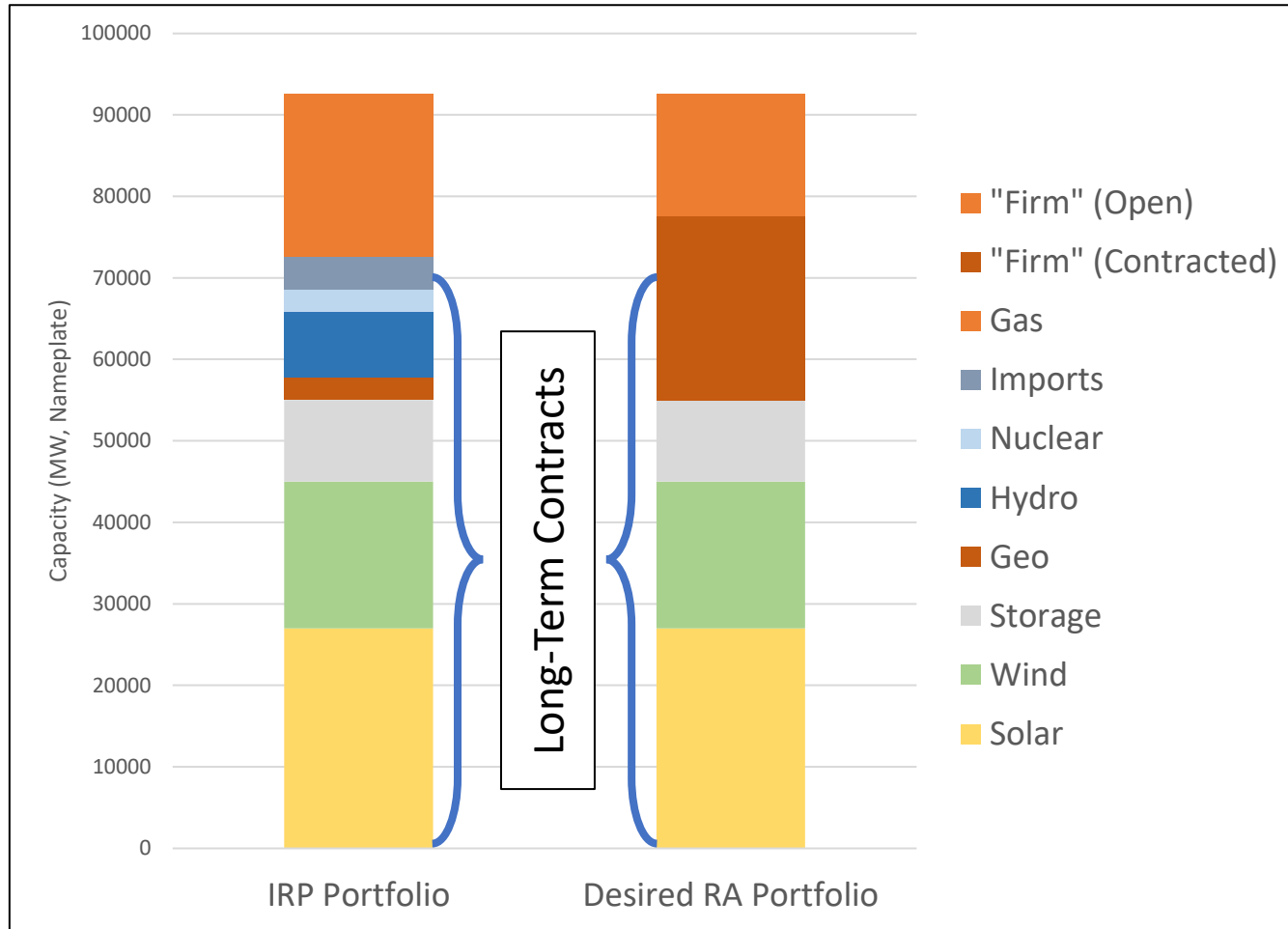
- The IRP should conduct RA fleet calibration for multiple upcoming years, to be updated based on planned and executed resource development, retirements, and other new information
- Increasing durability in resource counting and focusing calibration on the PRM will reduce LSE and generator uncertainty and counting whiplash
- Providing LSEs with forecast compliance requirements and parameters, coupled with multi-year RA requirements, will bring greater stability to the program and reduce “surprise reliability problems”

RA Calibration Cycle	CY 2024	CY 2025	CY 2026	CY 2027	CY 2028
2021-2022 IRP Cycle	Final Requirements	Preliminary Calibration	Preliminary Calibration	Preliminary Calibration	
2023-2024 IRP Cycle		Final Requirements	Refinement	Refinement	Preliminary Calibration
2025-2026 IRP Cycle			Final Requirements	Final Requirements	Refinement
2027-2028 IRP Cycle					Final Requirements

[Conceptual / illustrative only]

Step 2: IRP-RA Alignment

Very near-term IRP and RA portfolios should be well-aligned.

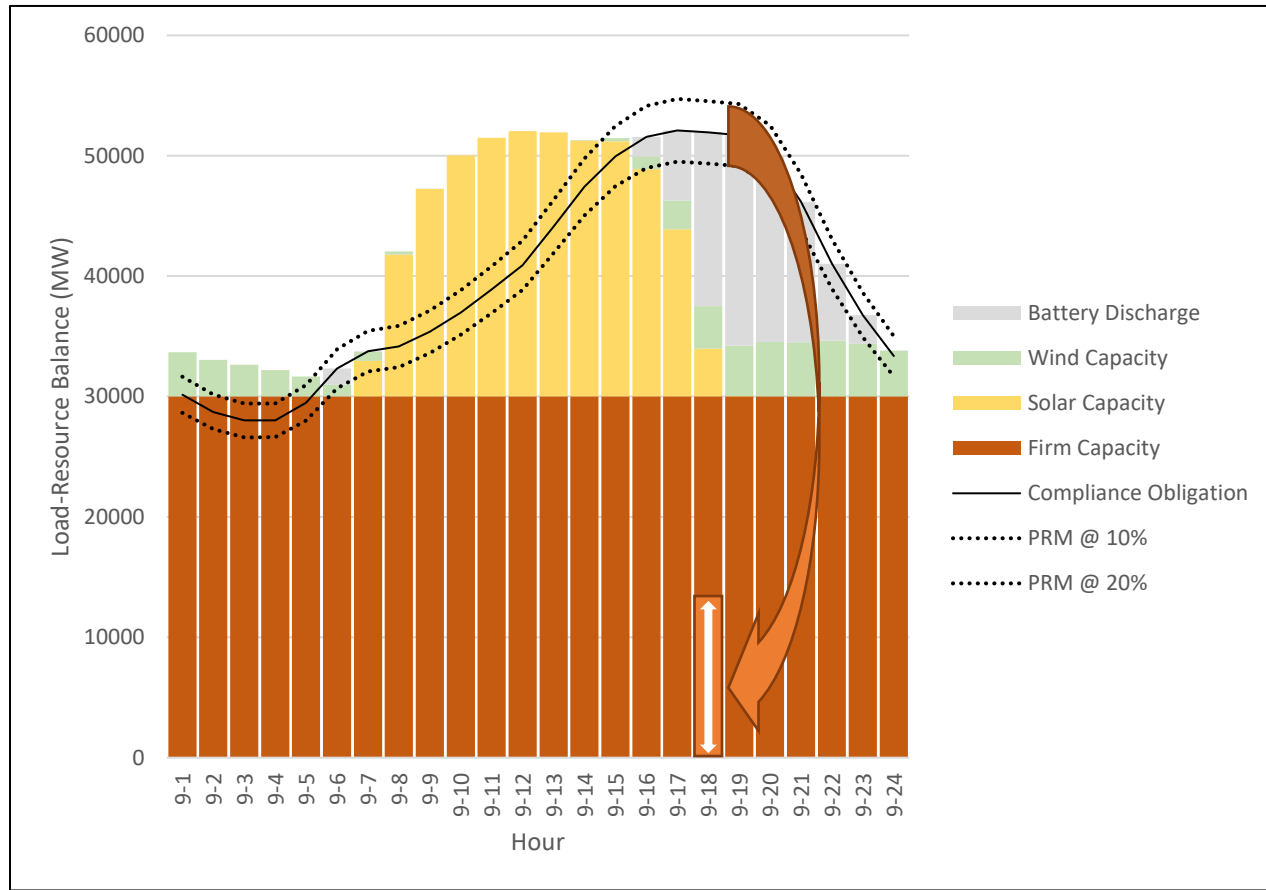


[Conceptual / illustrative only]

- **Pictured Left:** Hypothetical RA portfolio output from IRP.
- While future year IRP resources are uncertain, near-term (T+1 / T+2) should be very aligned (existing and imminent resources under contract)
- Brackets indicate “fixed” set of resources already indicated as under contract to LSEs at time of calibration
- Increased long-term contracting due to CPE, potential LSE multi-year requirements
- PRM calibration is focused on ensuring LSEs effectively fill open positions

Step 3: Calibrate Slice-of-Day PRM

Movement in PRM will adjust residual showings need.



- **Pictured Left:** September Slice-of-Day compliance with PRM of 10%, 15%, 20%
- Large share of RA fleet showing is pre-determined (already under long-term contract)

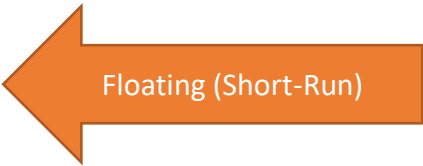
Contracted Resources in CY 202X

Resource Type	Capacity (MW)
Solar	27,000
Wind	18,000
Storage (4 Hr)	10,000
"Firm" / Imports	22,600



Uncontracted Resources in CY 202X

Resource Type	Capacity (MW)
"Firm" / Imports	+/- 15,000

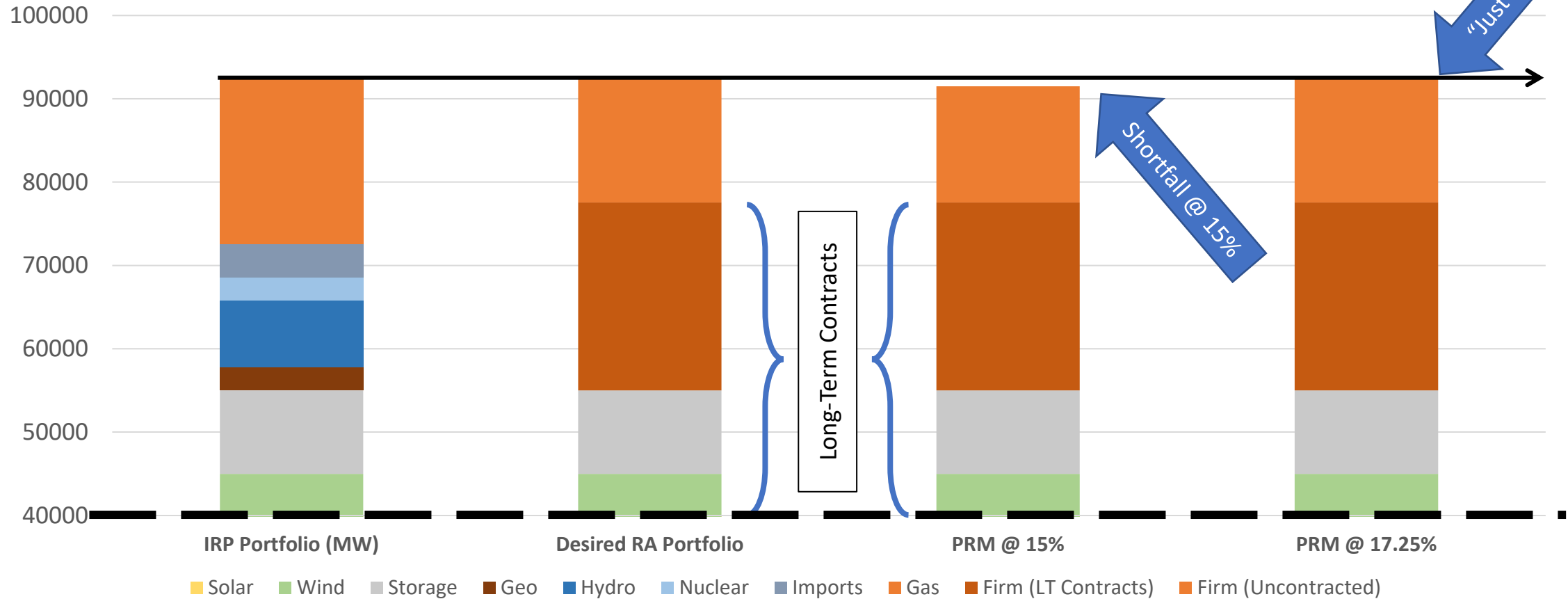


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Step 3: Calibrate Slice-of-Day PRM

Desired portfolio may be achieved through increment / decrement to PRM.

Portfolio Based PRM Calibration

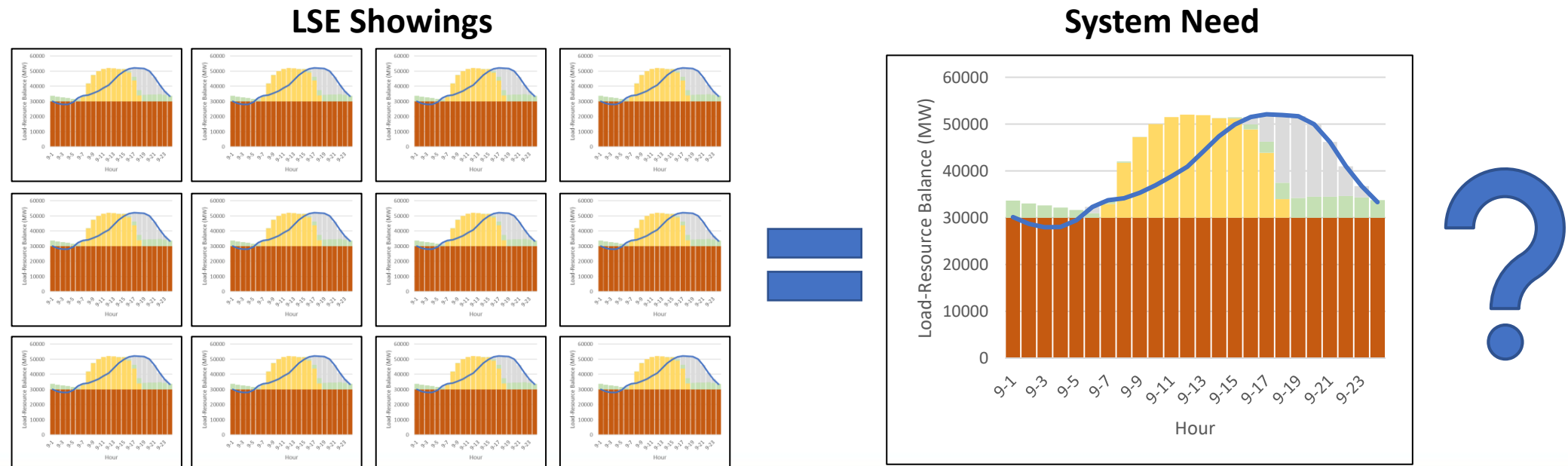


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Step 4: Testing and Recalibration at LSE Aggregation Level

IRP / multi-year RA filings are sufficient to identify and address allocation issues in advance.

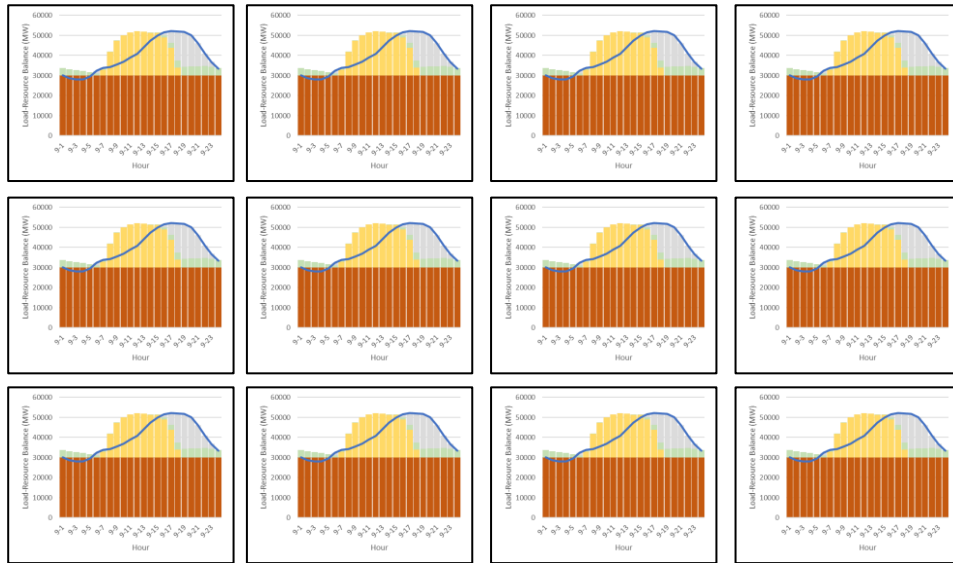
- The optimal system portfolio will only perfectly translate to an optimal set of LSE portfolios if all LSEs are a perfectly scaled version of the system solution (identical to today's MCC bucket structure)
- Heterogeneity can create risk of overprocurement, which can be addressed with further PRM refinement
- More granular LSE requirements may reduce this risk, but this should be assessed during the calibration period, particularly if LSE-specific load shapes are used



Step 4: Testing and Recalibration at LSE Level

IRP / multi-year RA filings are sufficient to identify and address allocation issues in advance.

LSE Showings



$$\sum_{LSE} \text{Residual Need (MW)} = \text{Residual System Need?}$$

- With advanced knowledge through IRP filings, CPE/CAM filings, and (potentially) multi-year RA filings, Energy Division can identify residual RA needs on an LSE basis
- Are LSE requirements equivalent to system requirements? If LSE portfolios are homogenous, likely to mirror system needs
- If LSE portfolios are heterogeneous, risk of overprocurement may allow reduced PRM. Heterogeneity/diversity may be derived from:
 - Load shapes
 - Renewable and storage resource mix
 - “Long” firm resource procurement relative to need

Conclusion

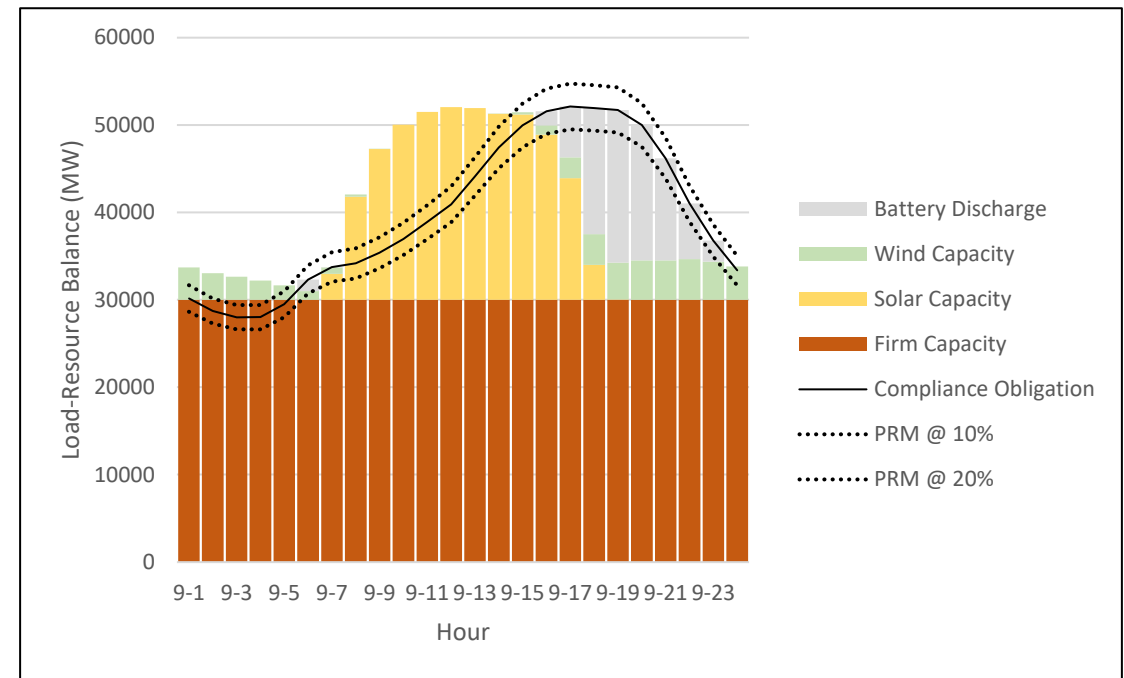
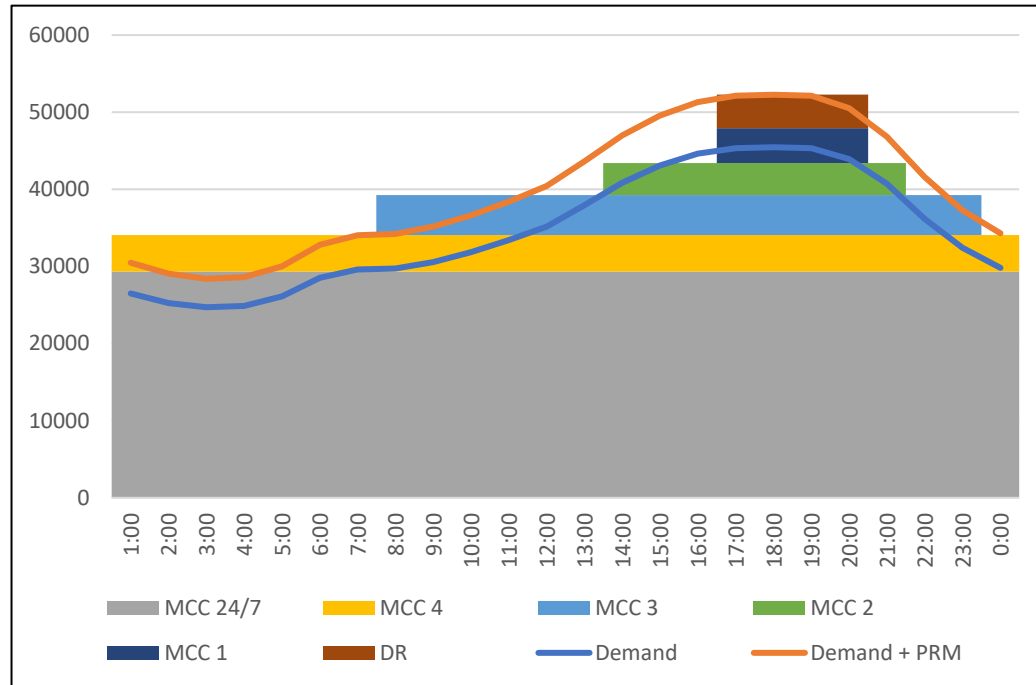
Need Determination - Key Takeaways

- Determining need is a process which must be done using an LOLE analysis – it is performed externally to the RA accounting scheme
- PRM is the critical lever in translating an LOLE-compliant portfolio to simplified RA accounting and compliance requirements – the PRM is the crosswalk between the portfolio of resources (needs) identified within the IRP and any given compliance framework
- IRP filings, CAM/CPE procurement, and (potentially) multi-year RA showings will provide considerable ex ante information for program calibration within the IRP proceeding for near-term years
- Slice of Day, like other frameworks, can and should be calibrated and adjusted regularly to achieve a desired level and mix of resource showing by LSEs

If RA is all driven by one constraint, why bother with Slice of Day?

- **Internal Consistency:** Unlike MCC / ELCC-based approaches, Slice of Day is internally consistent for LSEs – LSEs are credited or penalized directly for their preferred resource investments rather than arbitrarily capped at system levels
- **Planning Tool:** Slice of Day provides intuitive, accessible, unified planning information for LSEs and Energy Division staff for short-, medium- and long-term planning (a critical “missing link” in IIRP compliance)
- **Counting Simplicity and Durability:** Slice of Day improves counting simplicity, durability, and transparency for LSEs and project developers
- **Preferred Resource Benefits:** Slice of Day appropriately values VERs, storage, demand response, and other resources based on their specific characteristics
- **Leaning:** Slice of Day limits leaning between LSEs across a broader range of operational needs than a capacity-only approach
- **Revenues:** Slice of Day provides a value stream for a broader range of operational contributions which may be missed by a peak/net-peak capacity structure

Does Slice of Day Make Every LSE an Island?



- CPUC-jurisdictional LSEs are already required to shape RA showings through Maximum Cumulative Capacity buckets, and have policy limits on their ability to utilize import RA
- Slice-of-Day allows LSEs to procure to an internally consistent shape based on their actual needs and portfolio positions
- Slice-of-Day does not modify how resources participate in the CAISO market or impact efficient real-time dispatch



QUESTIONS AND DISCUSSION

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