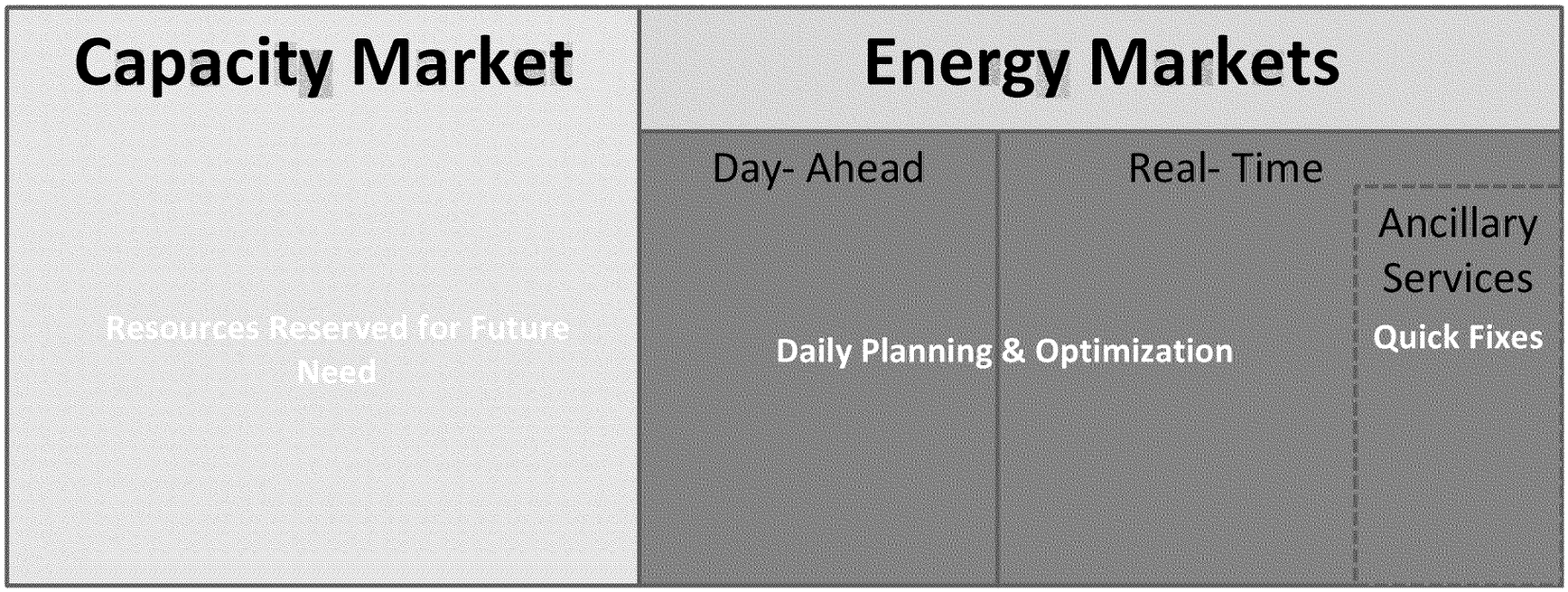
A Comprehensive Procurement Framework for Forward Capacity Procurement in California

December 20, 2012

Executive Summary:
CA Comprehensive Procurement Framework

- **What is a Capacity Market?**
  - Make commitments today to pay generators/resources in the future, to secure capacity that may be needed to ensure reliability in the future
- **Why is a Capacity Market needed now in California?**
  - California has 10 years experience with capacity procurement, but there are new issues
    1. High amount of *intermittent* renewables
    2. Retirement of Once-Through Cooling (OTC) generating units
    3. Insufficient market revenues for flexible resources
- **What is the "Comprehensive Procurement Framework"? How does it help?**
  - Comprehensive Procurement Framework (CPF) has 6 components
    - **Reliability**: High availability of flexible resources, ensuring sufficient system and local reliability
      1. **RA**: Existing year-ahead Resource Adequacy for system and local, and soon-to-be flexible
      2. **LTPP**: CPUC's existing Long-Term Procurement Plan proceeding and subsequent IOU RFOs and Applications
      3. **CPM**: CAISO's existing Capacity Procurement Mechanism
      4. **FLRR**: CAISO's proposed Flexible Capacity and Local Reliability Resource Retention Mechanism
    - **Affordability**: Low cost impact to customers
      5. **Forward Procurement Requirement:** CPUC-directed forward procurement by Investor-owned Utilities (IOUs) and other CPUC-jurisdictional Load-Serving Entities (LSEs)
      6. **CCM**: CAISO-run Centralized Capacity Market (CCM)
  - Each component plays a different role in addressing reliability, cost, resource availability

What is a Capacity Market?

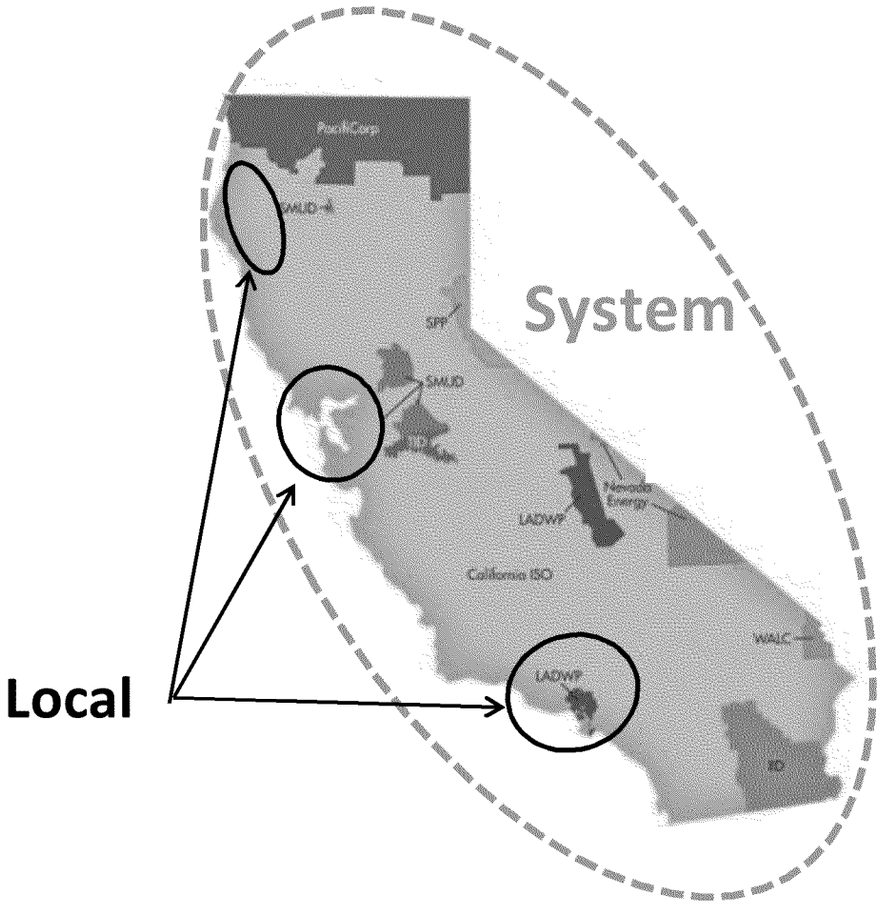


Marketplace where:

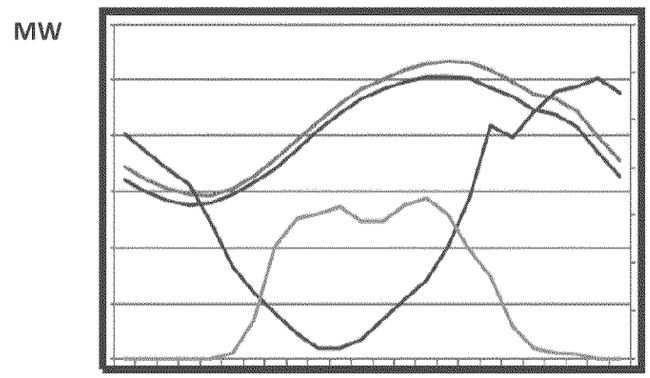
Suppliers (sellers) receive compensation for investing in generating capacity and other resources, **load-serving entities (LSEs)** or their representative (buyers) **make capacity payments** to suppliers, to ensure long-term availability of sufficient generating capacity and other resources

California Has Three Types of Capacity Products:

System, Local, and Flexible



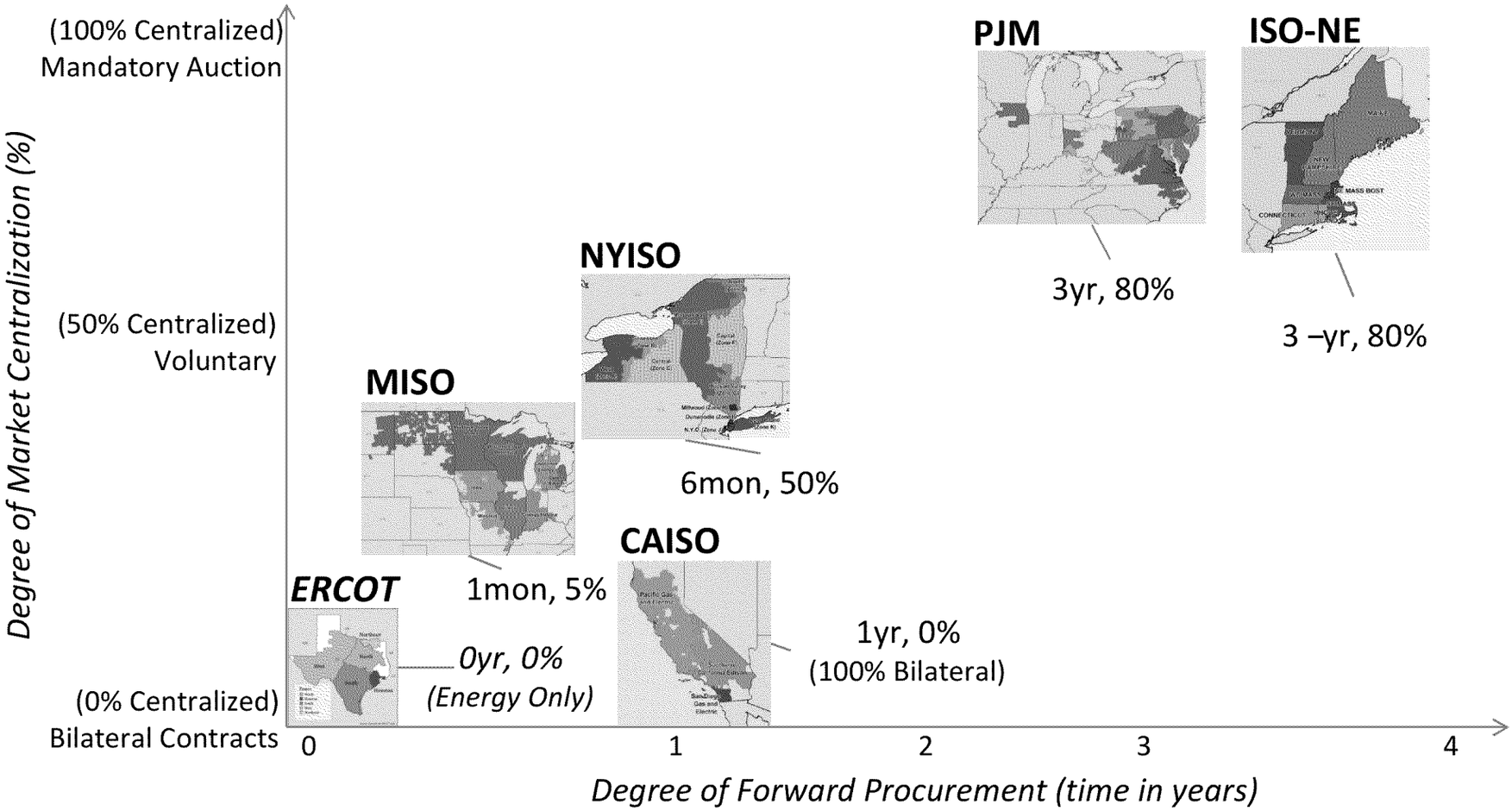
Flexible



Variability of supply over time

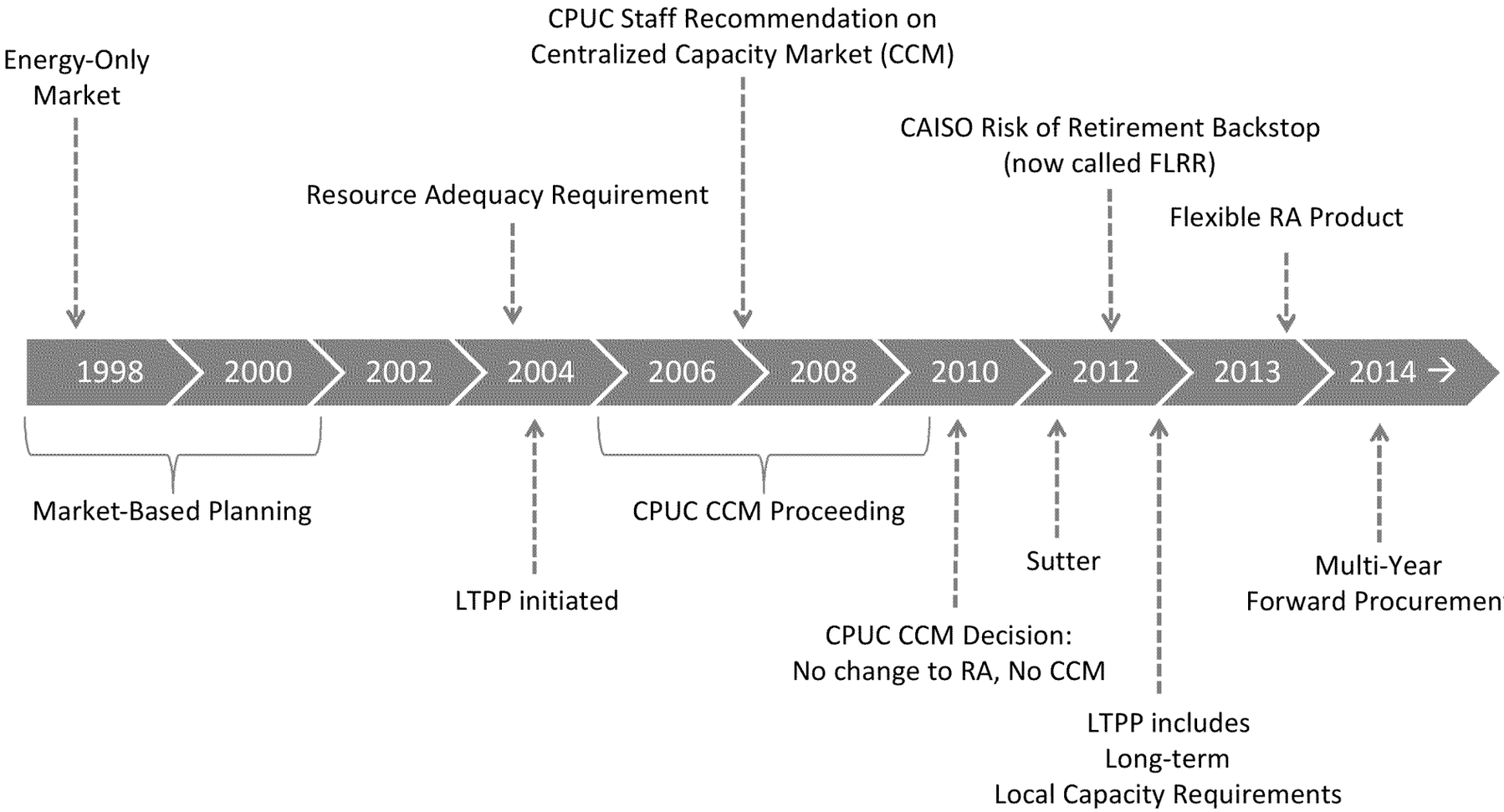
California requires system and flexible capacity overall, along with specific local capacity to address regional needs

There are Various Ways to Procure Capacity



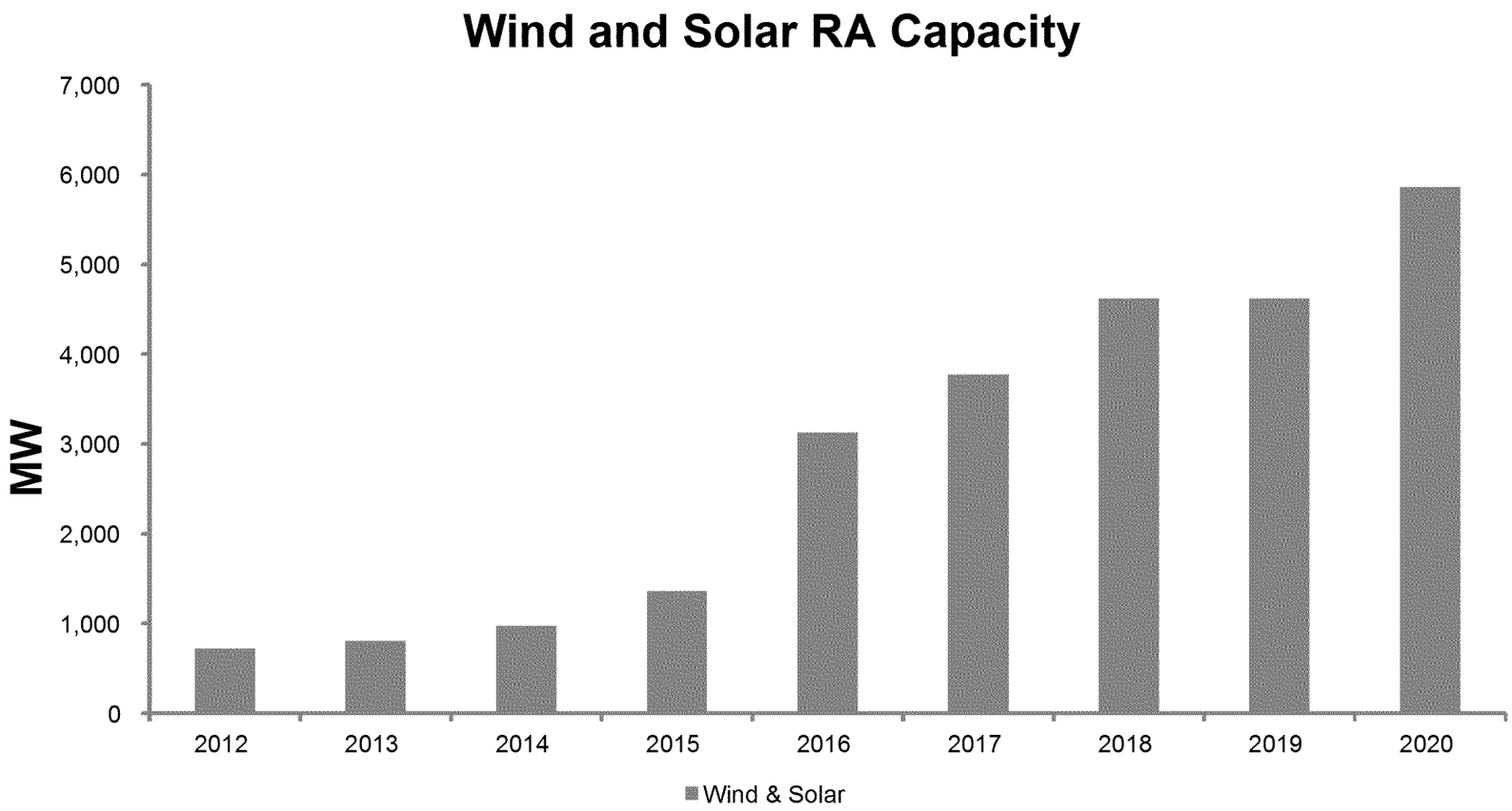
Possible is a hybrid market design with bilateral contracts*and* a central auction

Forward Capacity Procurement: California's History



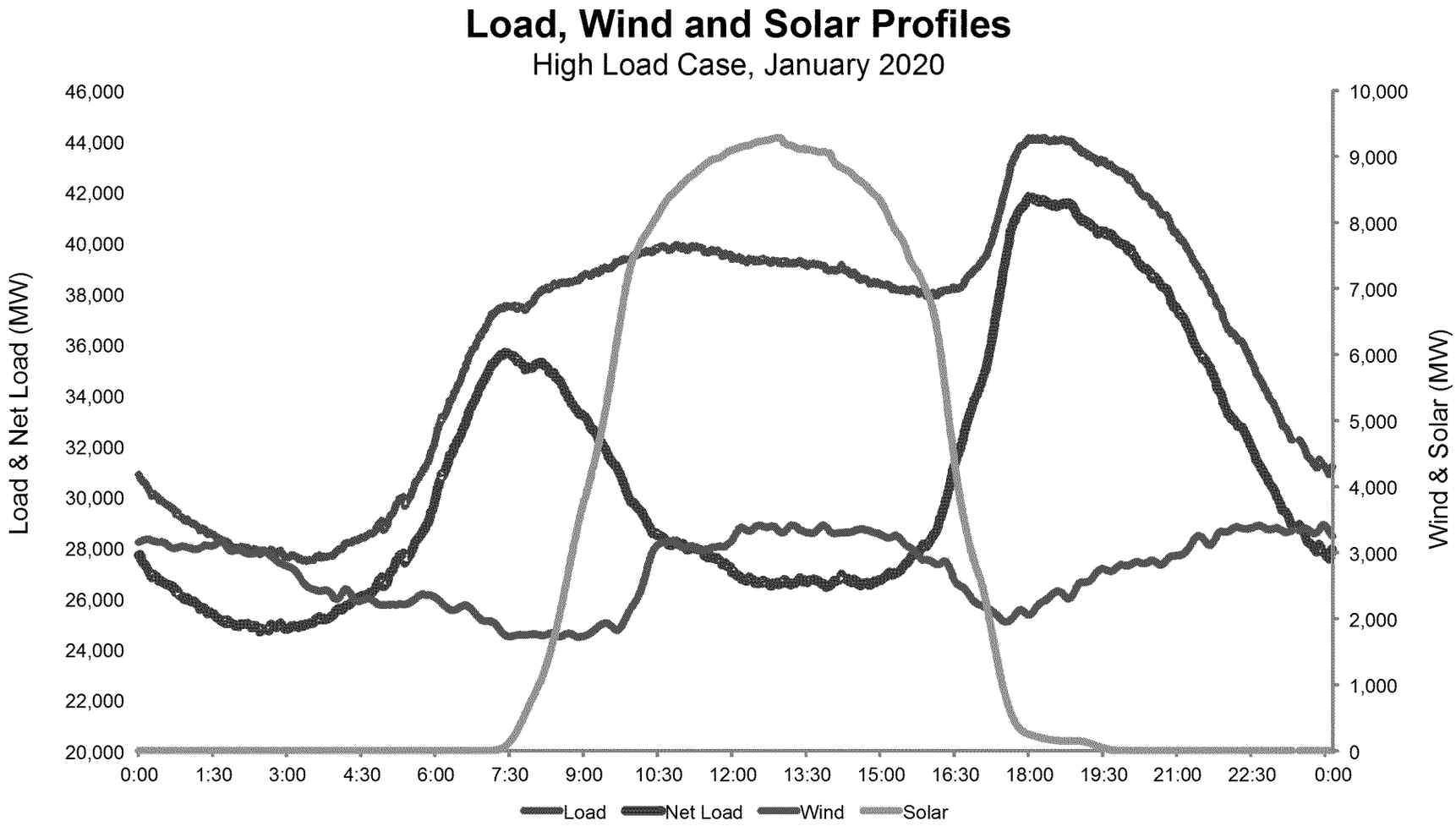
California has been considering forward capacity procurement since 2004

New Issue 1:
High Amount of Intermittent Renewables



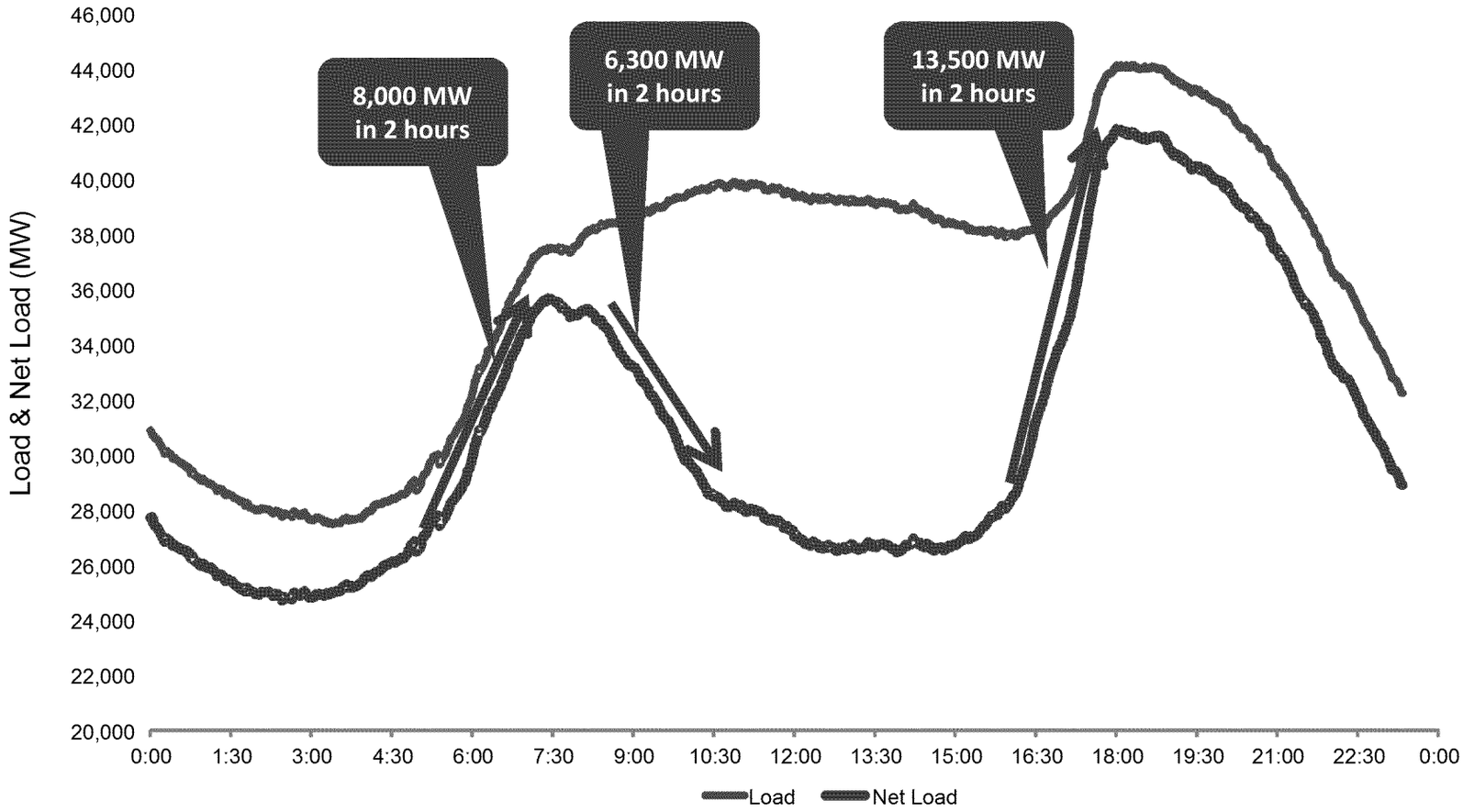
As high amounts of intermittent renewables come on line, the need for flexible resources increases

Changes in Net Load Shape



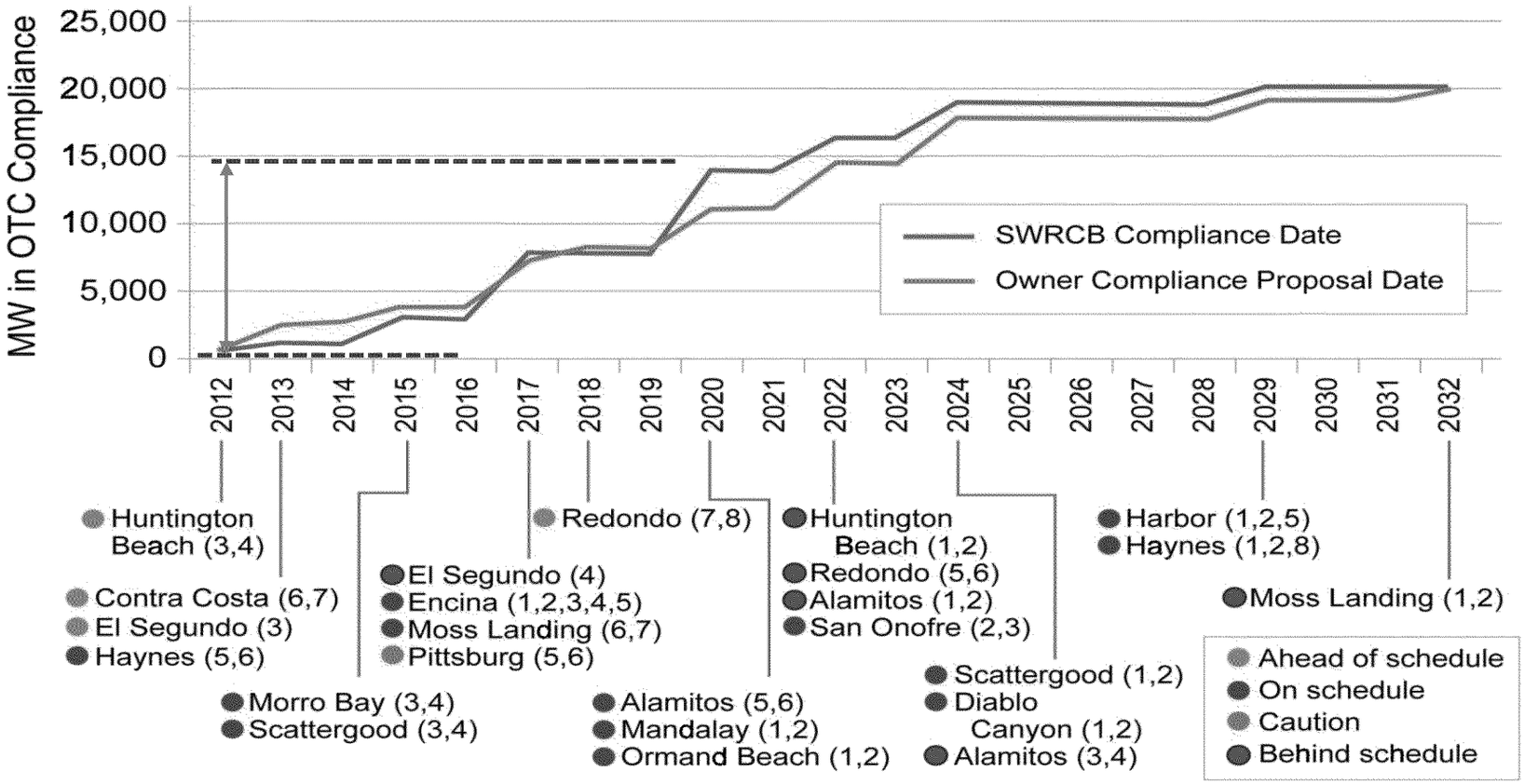
Increased renewables changes load shape to dual peak

Changing Load Shape Drives Flexible Resource Need



Load's dual peak and greater variability drives changing utilization of resources

New Issue 2: OTC Retirements



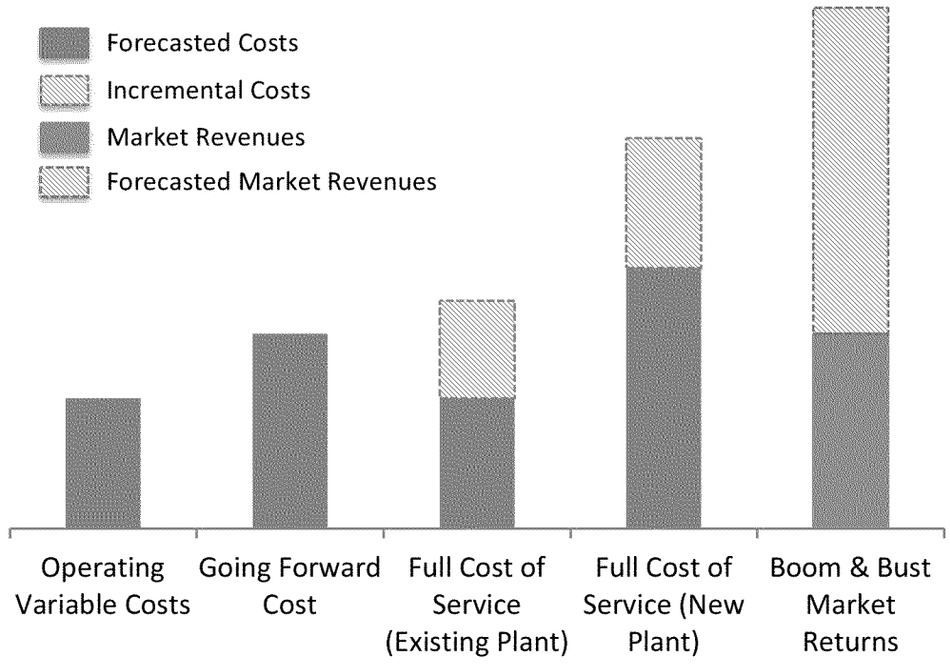
Source: California Clean Energy Future, Dec. 23, 2011

To comply with water regulations, 15,000 MW of OTC retirement by 2020, including many existing flexible resources

New Issue 3:
Insufficient Market Revenues for Flexible Resources

Cause	Effect
↑ Renewables	↓ Spot Energy Market Revenues ↓ RA Revenues
↑ Cycling of Flexible Resources leading to ↑ Wear and Tear	↑ O&M cost ↑ Capital cost for overhauls

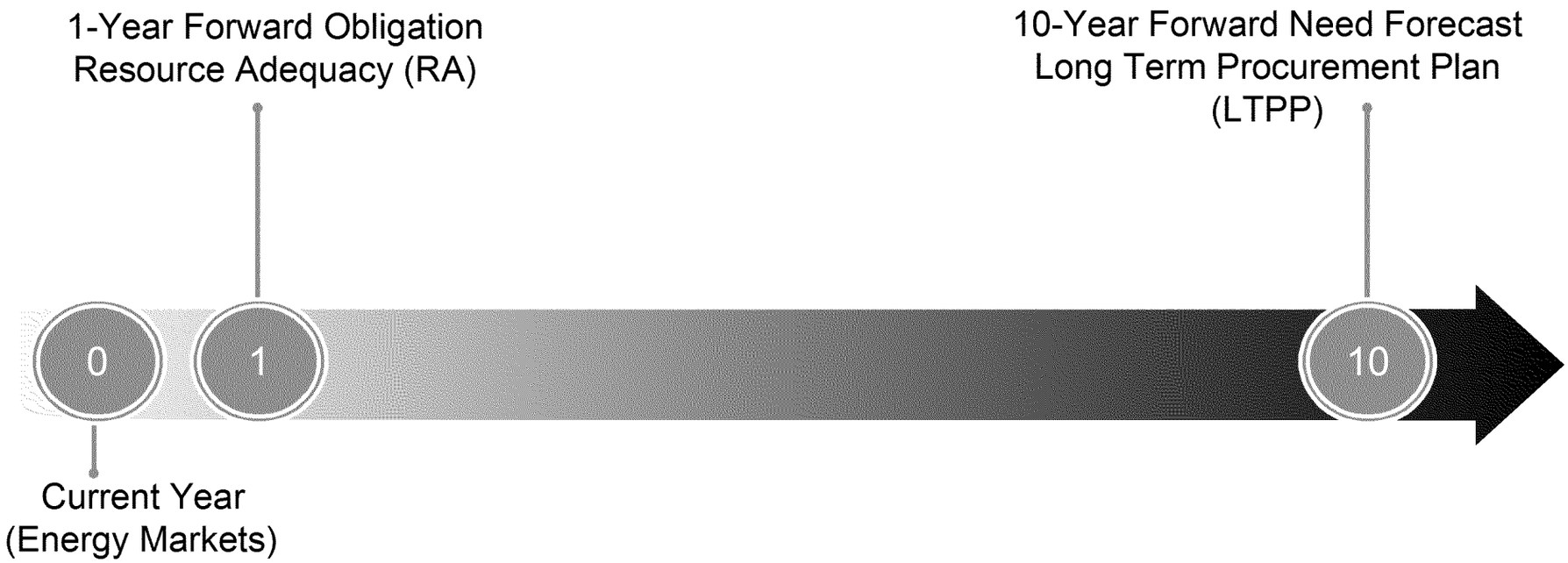
Illustrative Representation of Insufficient Revenues



Current situation is unsustainable:

1) Gross margins are becoming insufficient for existing flexible resources
2) Looming early retirement of needed existing flexible resources

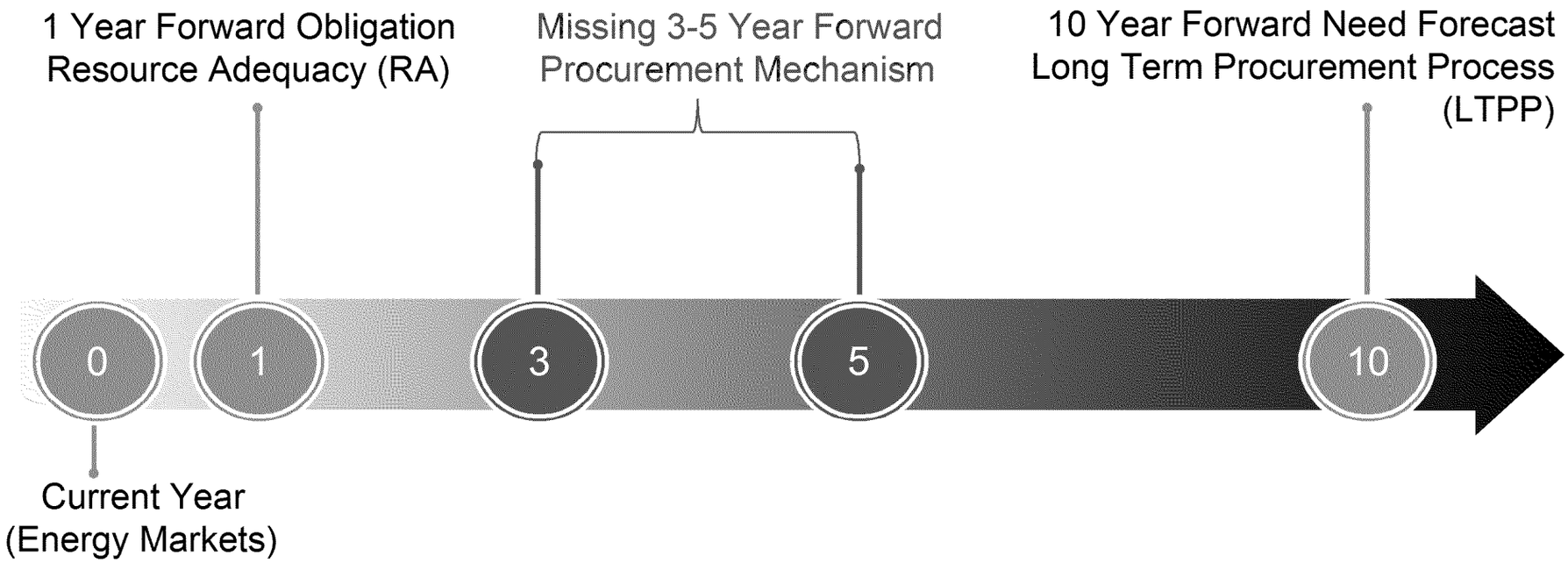
Currently, California Has 2-Part Regime for Capacity



Current Procurement Process works for:

1. Procuring year-ahead system and local resource adequacy
2. Procuring new generation through IOUs' commitments via LTPP

Gap in Intermediate Term

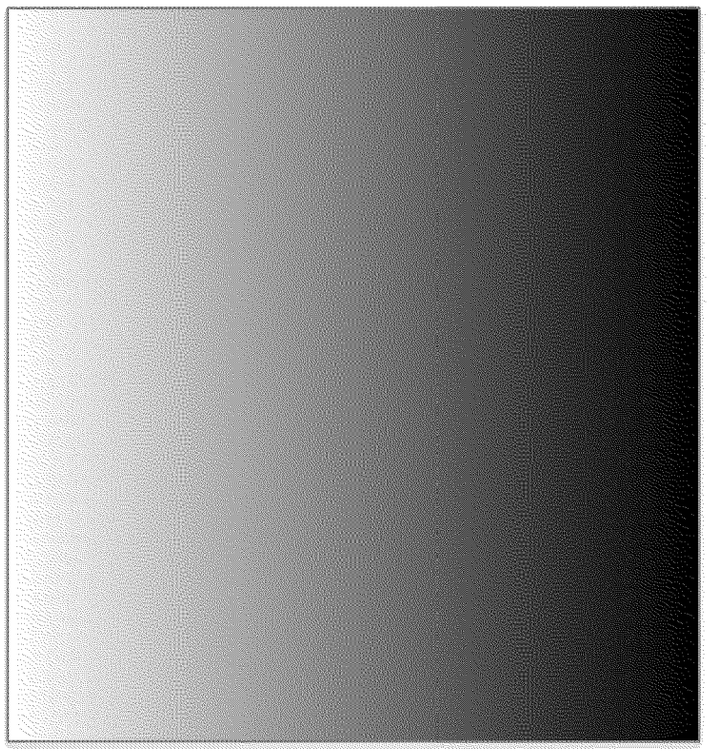


Missing Intermediate-Term Procurement Mechanism addresses new issues:

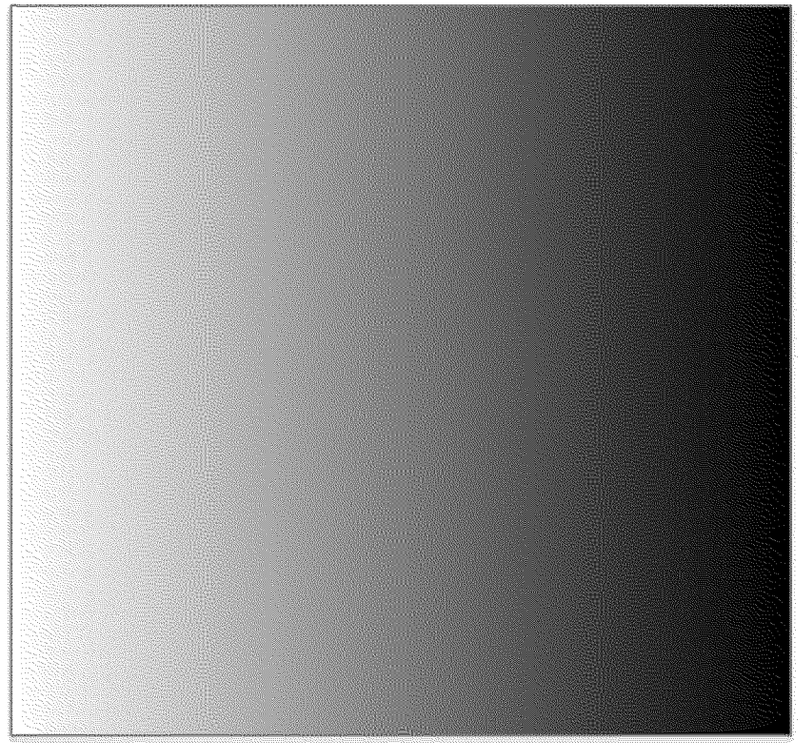
1) Providing needed revenues to existing flexible resources to assure that they remain online
2) Addressing additional need for flexible resources caused by high amount of intermittent renewables

Comprehensive Procurement Framework Consists of the Current Regime + Future Components

1-Year Forward



Multi-Year Forward

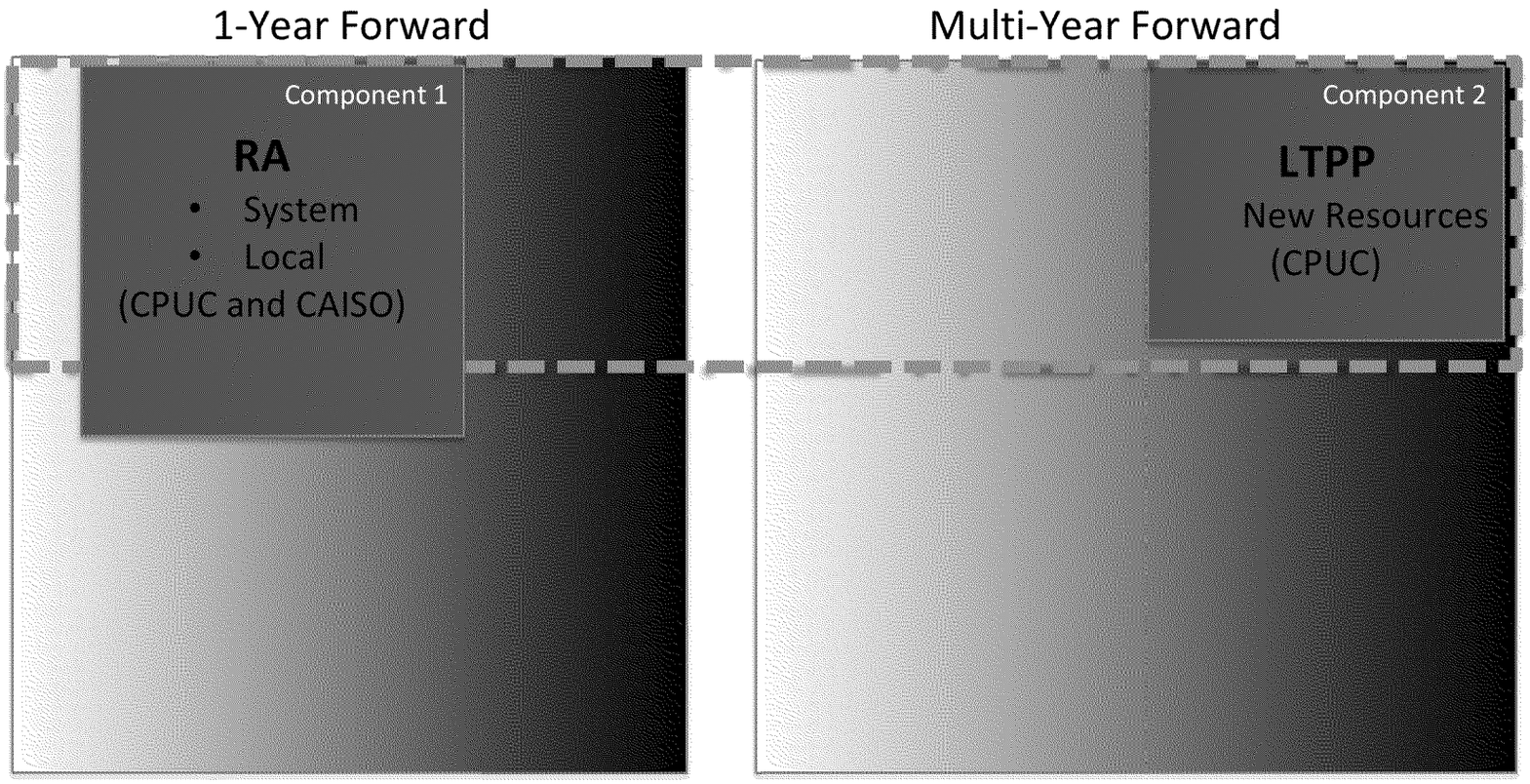


Procurement can be divided into 2 boxes:

- Near-term 1-year forward procurement
- Longer-term multi-year forward (3-10 years)

Comprehensive Procurement Framework

The Existing 2-Part Regime



KEY:

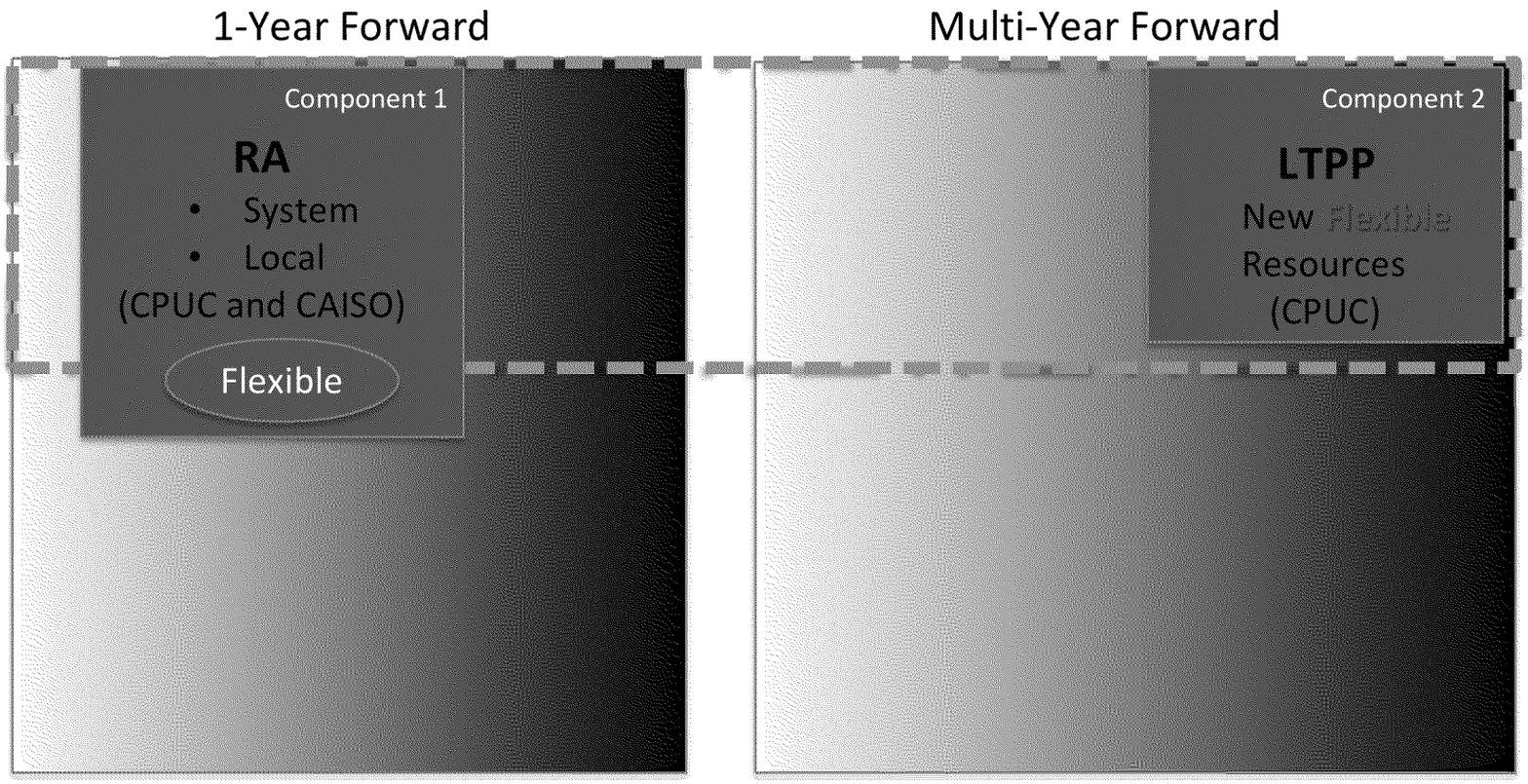
Existing

CPUC jurisdiction

The existing 2-part regime consists of RA and LTPP.

Comprehensive Procurement Framework

Extending Existing 2-Part Regime to Include Flexibility



KEY:

- Existing
- Implementing
- CPUC jurisdiction

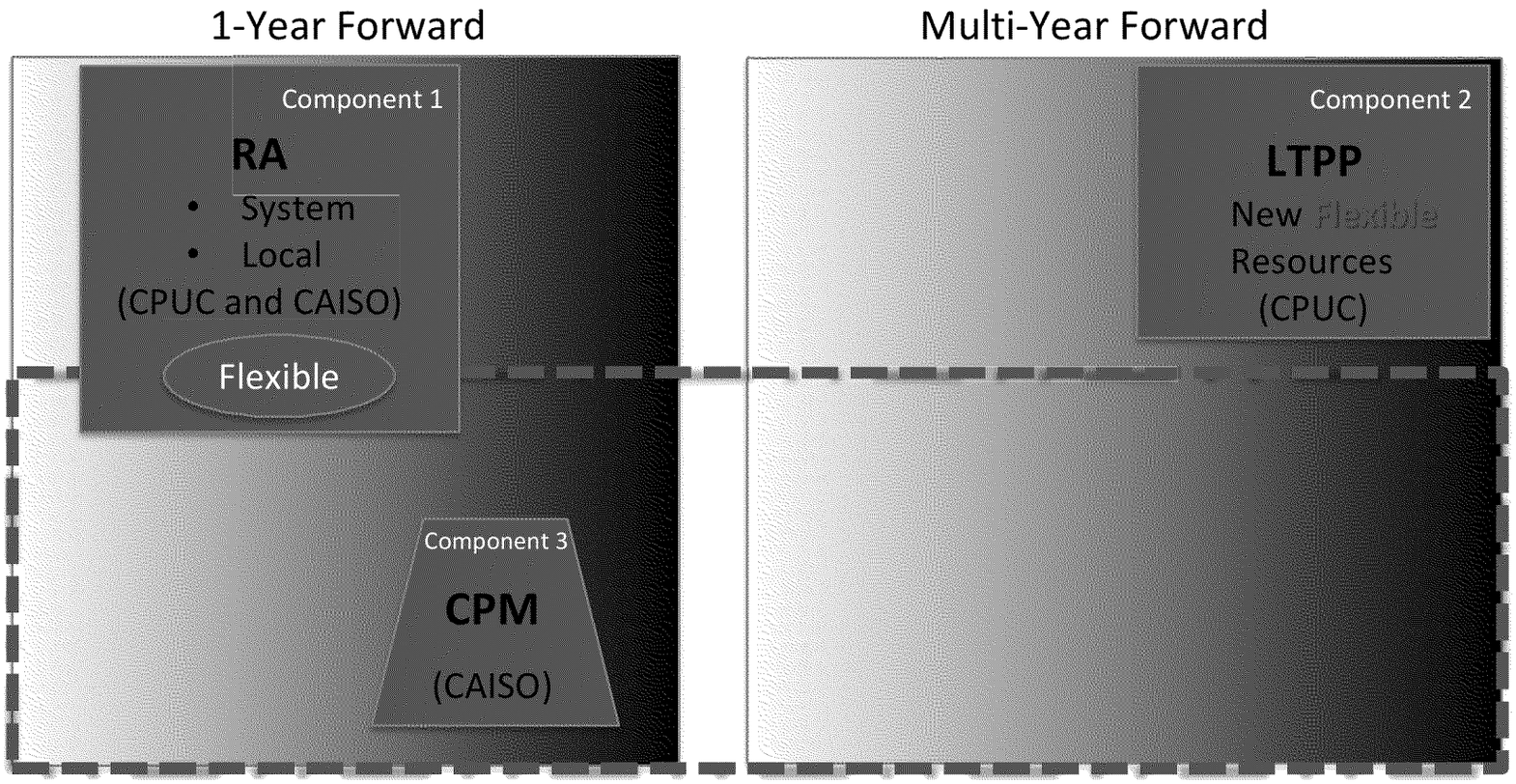
Underway

RA: adding a requirement for procurement of flexible resources

LTPP: determining need for new flexible resources

Comprehensive Procurement Framework

Short-term Backstop Already Exists



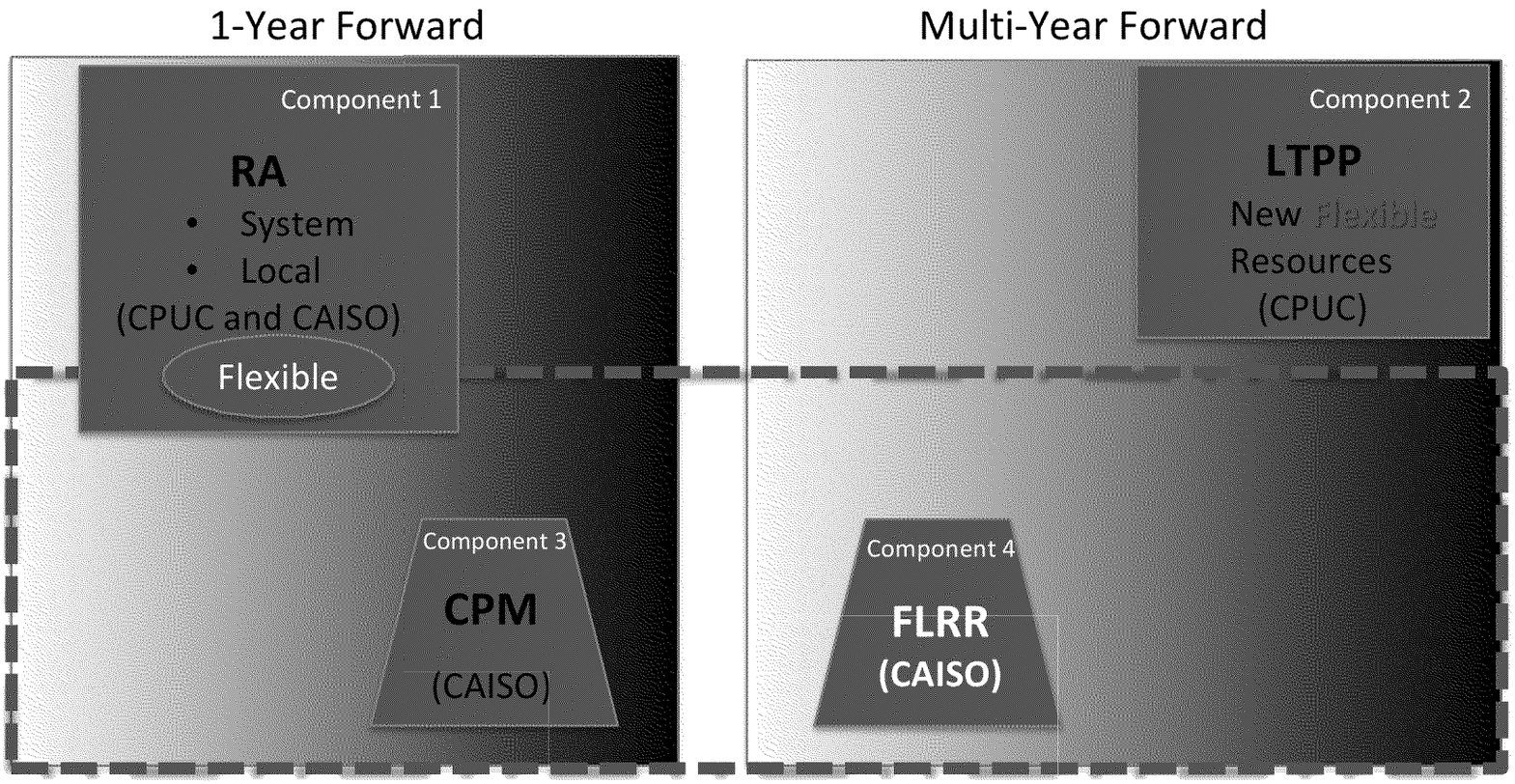
KEY:

- Existing
- Implementing
- FERC jurisdiction

CAISO has an existing backstop, the Capacity Procurement Mechanism (CPM), to address capacity procurement shortages within 1-year forward.

Comprehensive Procurement Framework

CAISO is Seeking An Intermediate-Term Backstop

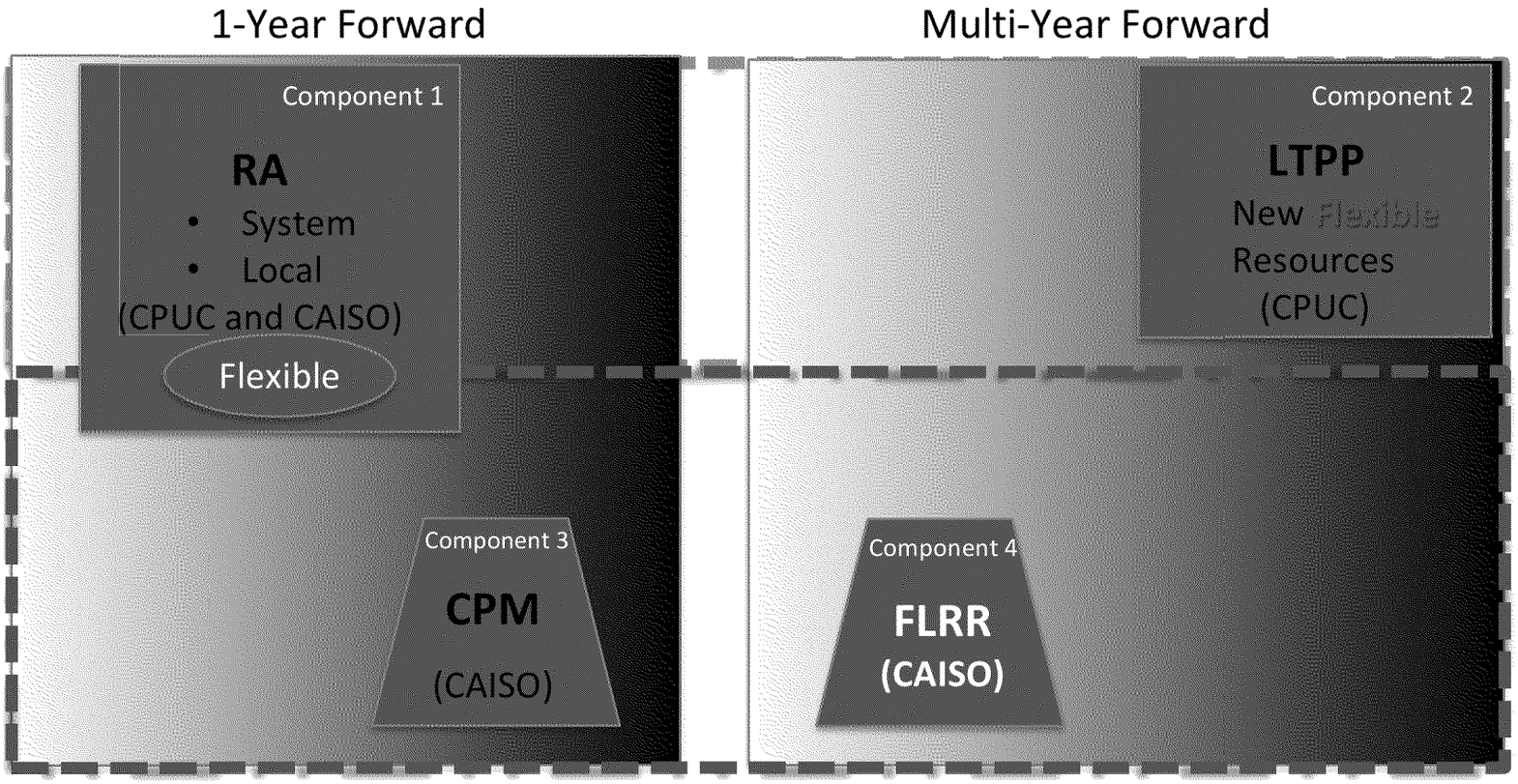


KEY:

- Existing
- Implementing
- FERC jurisdiction

CAISO is seeking FERC approval for an intermediate-term backstop-FLRR (Flexible Capacity and Local Reliability Resource Retention Mechanism), to ensure sufficient capacity 5 years forward.

4-Component Design Achieves Reliability, But Ratepayer Cost is Questionable



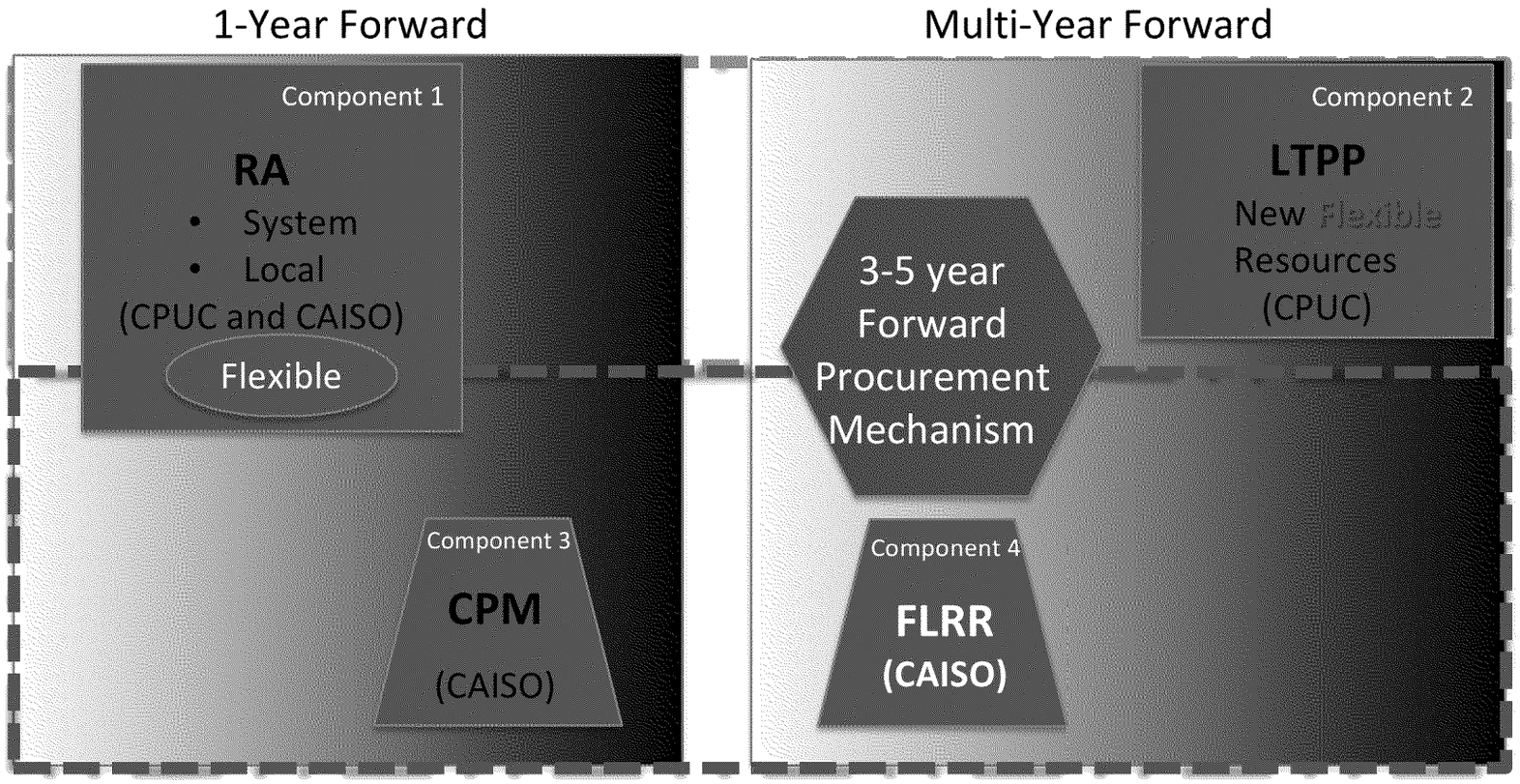
KEY:

- Existing
- Implementing
- CPUC
- FERC

These four components are enough to ensure sufficient capacity (system, local, and flexible).
What would the ratepayer cost of this design?

Comprehensive Procurement Framework

Competitive Procurement Keeps Costs Reasonable

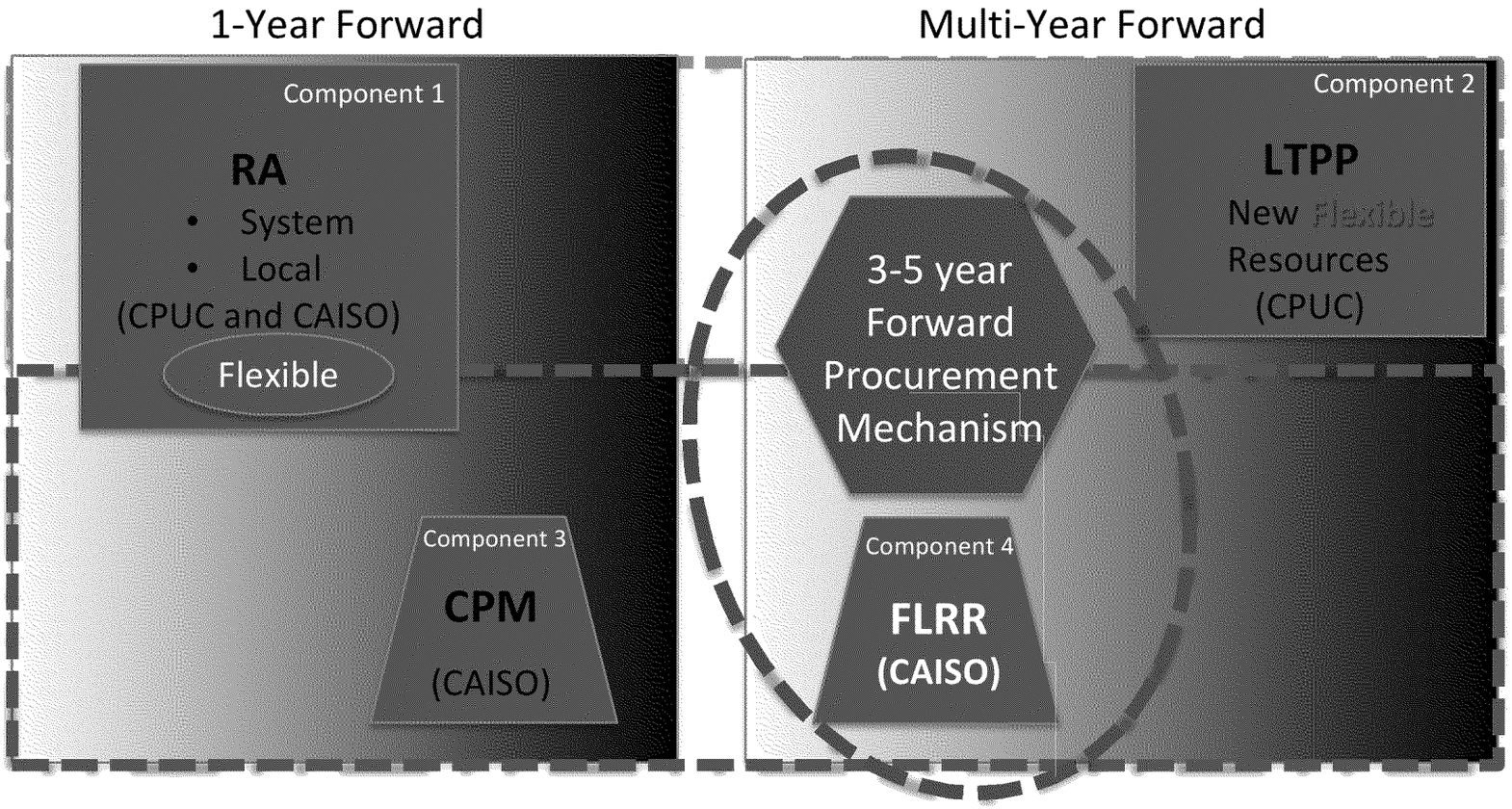


KEY:

- Existing
- Implementing
- In Discussions
- CPUC
- FERC

The next step is to introduce competitive procurement for 3-5 years forward, to keep procurement costs reasonable.

Coordination Challenge in Designing the Missing Mechanism



KEY:

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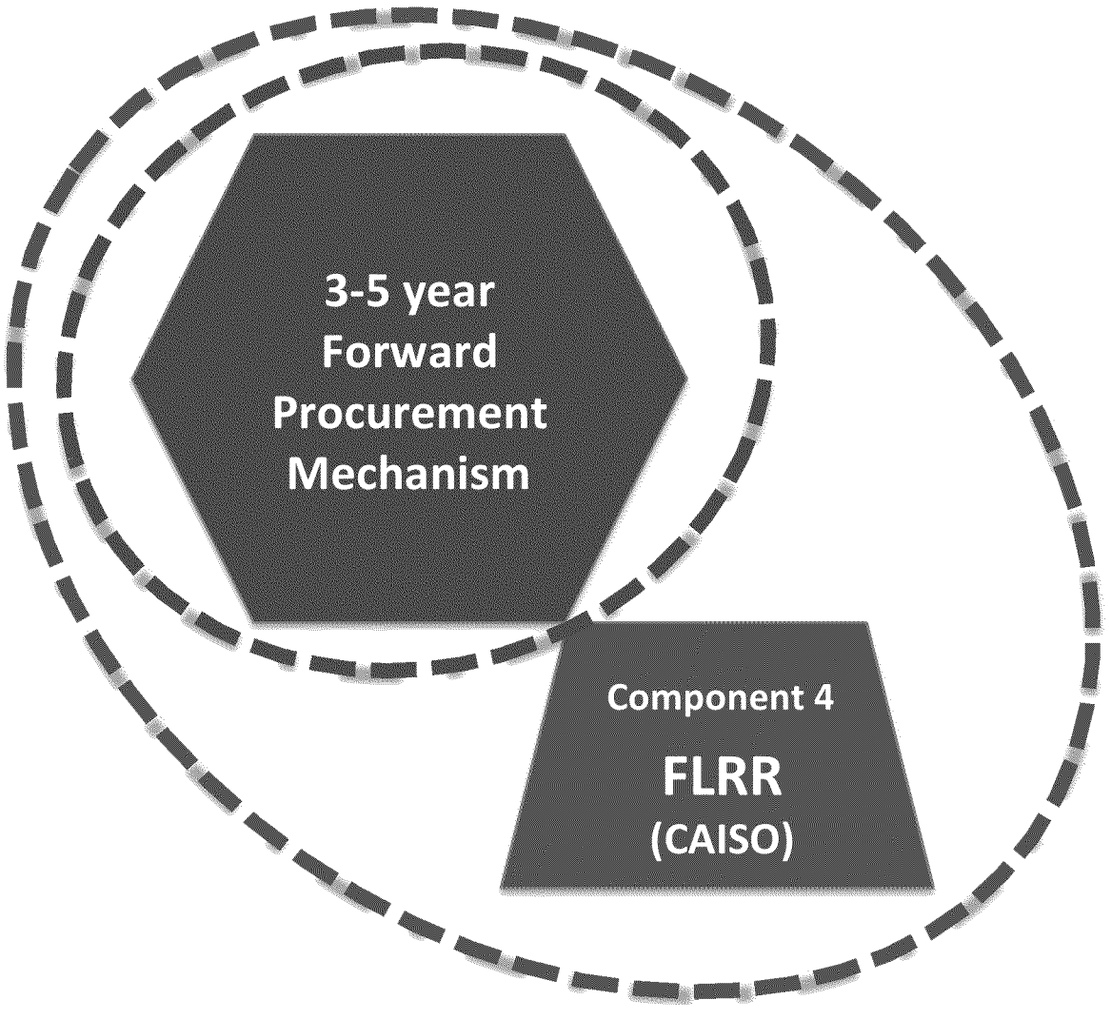
Who has jurisdiction over the Forward Procurement Mechanism? How is it coordinated with CAISO's FLRR backstop?

Comprehensive Procurement Framework: Designing the Missing Mechanism

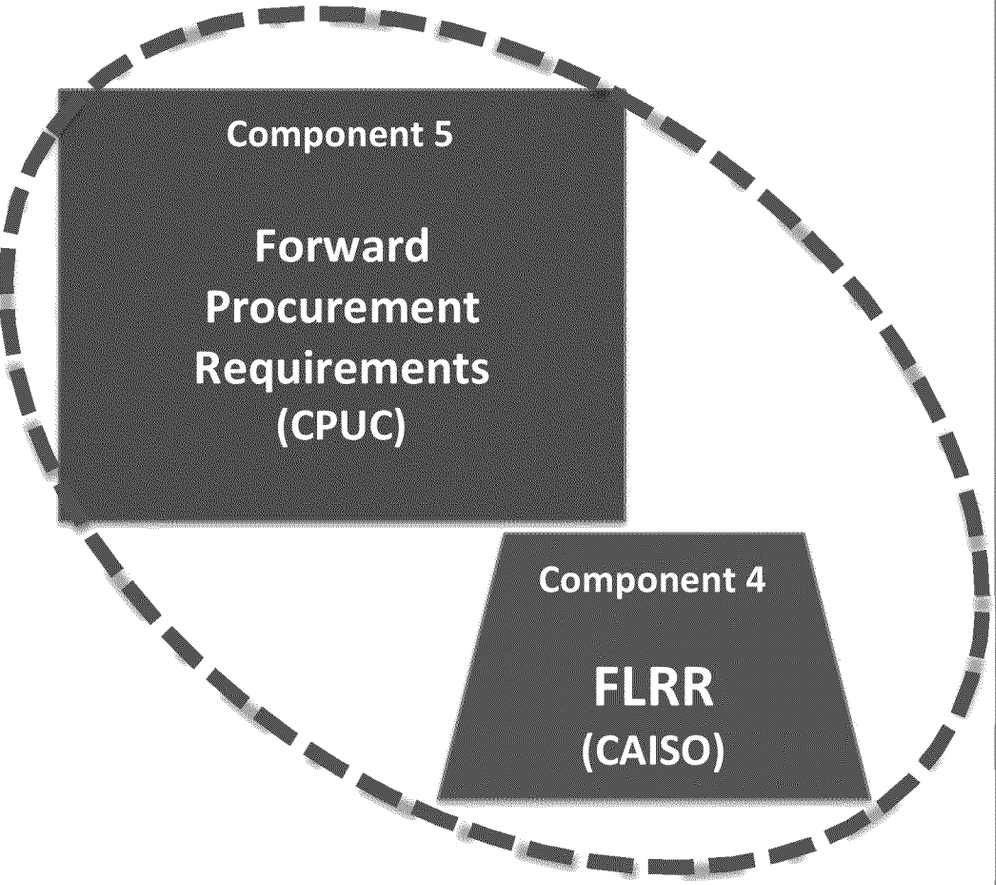
CAISO Uses FLRR to Determine Capacity Quantities



No matter who has jurisdiction over the Forward Procurement Mechanism, the CAISO ensures reliability by using FLRR to procure any capacity "deficit" (as seen by the CAISO).

Comprehensive Procurement Framework: Designing the Missing Mechanism

A Precarious Balance



CPUC

- Uses Forward Procurement Requirements to assure loading order for preferred resources
- Strives for reasonable ratepayer cost

CAISO uses FLRR to ensure reliability

Additional Issues

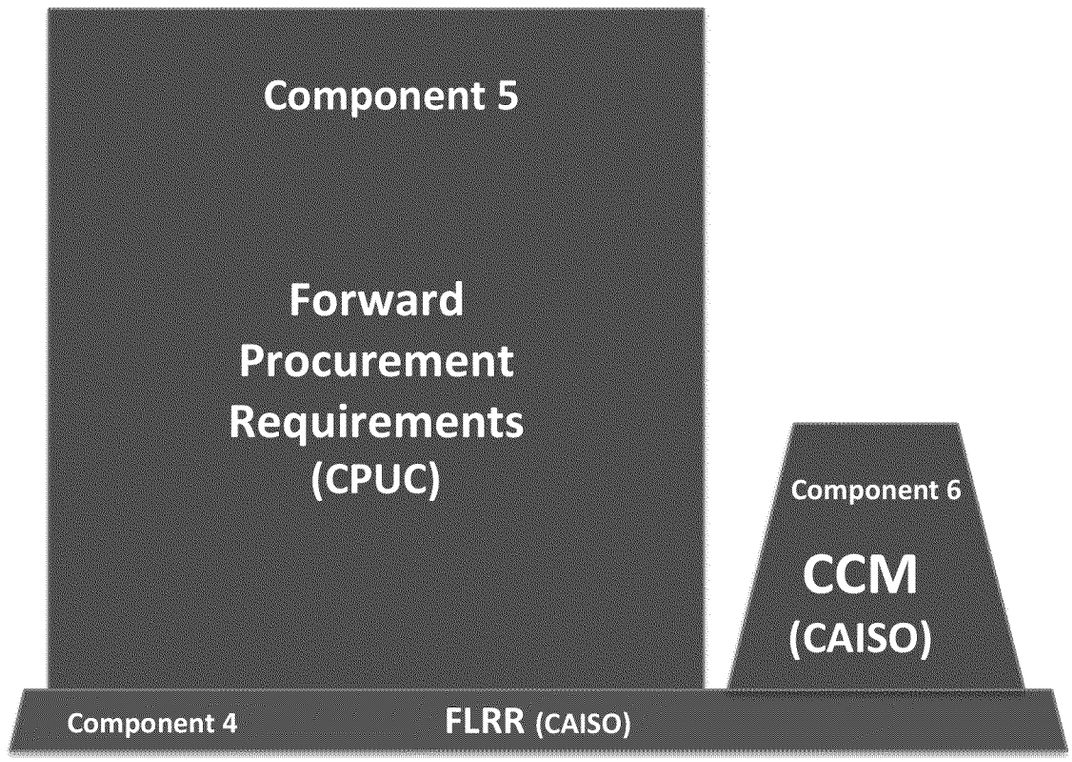
Cost: Does FLRR drive market price for Forward Procurement Requirements products?

Cost Allocation: Will CPUC enforce Forward Procurement Requirements on Direct Access (DA) providers and Community Choice Aggregators (CCA)?

Efficiency: Will products be consistent between Forward Procurement Requirements and FLRR?

Comprehensive Procurement Framework: Designing the Missing Mechanism

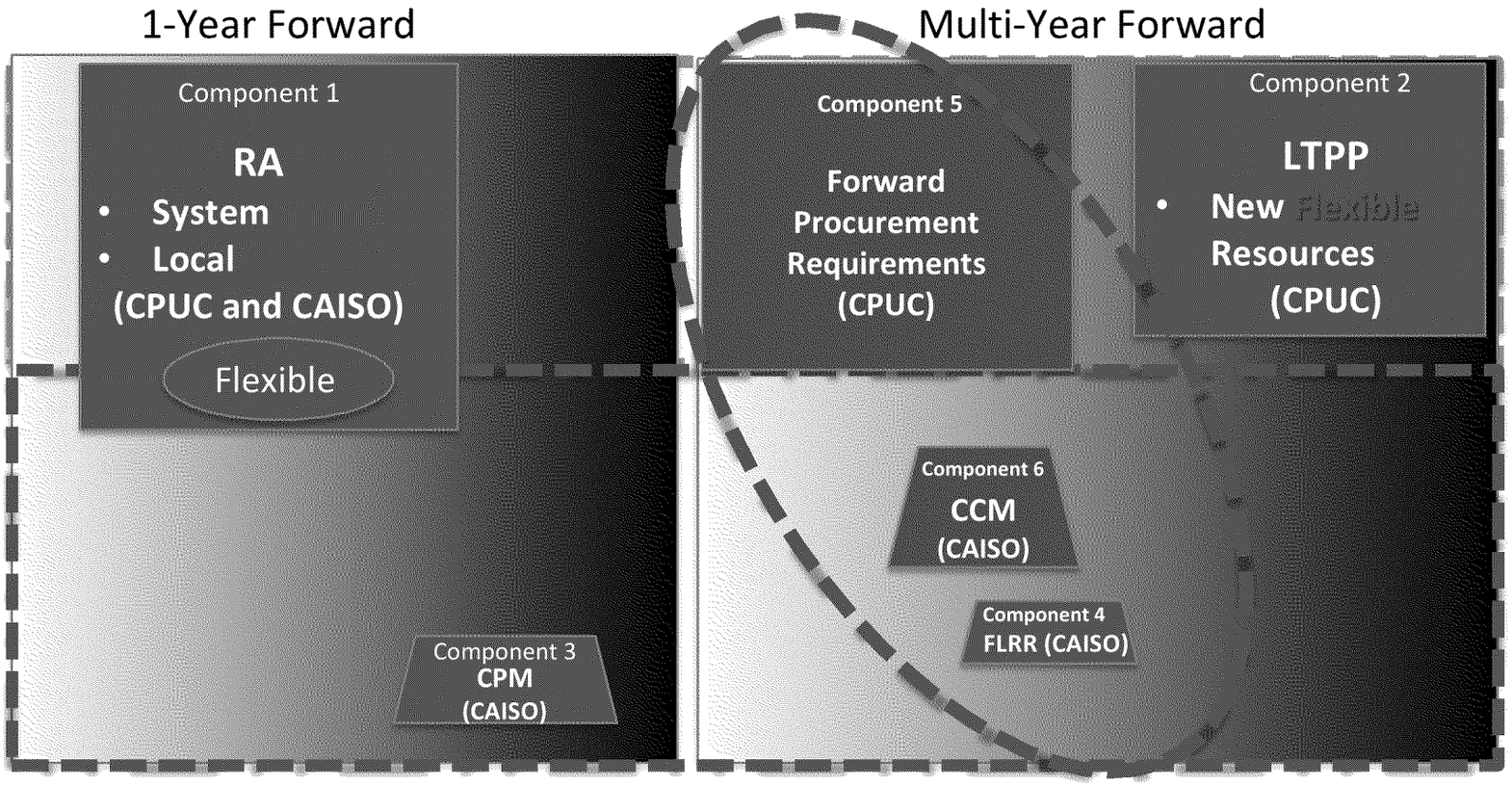
Sizes of Market Vary



CPUC Forward Procurement Requirements and CAISO-run Centralized Capacity Market are used in tandem to achieve the gamut of policy objectives

Comprehensive Procurement Framework: Designing the Missing Mechanism

Summary: 6 Components



KEY:

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- In Discussions
- CPUC
- FERC

CPUC uses RA, LTPP, & forward procurement to ensure reliability, preferred resources, and reasonable ratepayer cost…While CAISO uses CPM, CCM, and FLRR to ensure reliability through residual procurement

Comprehensive Procurement Framework Satisfies All Policy Objectives

			Reliability			Cost		Generation		
Design Components		Jurisdiction	System	Local	Flexible	Reasonable Customer Cost	Proper Allocation	Existing	New	Preferred
1	1-YR RA	CPUC	✔	✔	✔	✔	✔	✔		
2	10-YR LTPP	CPUC	✔	✔	✔	✔			✔	✔
3	≤1-YR CPM	CAISO	✔	✔	✔		✔	✔		
4	5-YR FLRR	CAISO	✔	✔	✔		✔	✔		
5	3-5-YR Forward Procurement Requirements	CPUC	✔	✔	✔	✔		✔		✔
6	3-5-YR Centralized Capacity Auction	CAISO	✔	✔	✔		✔	✔		

Driving towards high reliability, affordability for customers, and continued support for environmental policies