



California ISO

2020 Draft Three-Year Policy Initiatives Roadmap and Annual Plan

Market and Infrastructure Policy

September 30, 2019

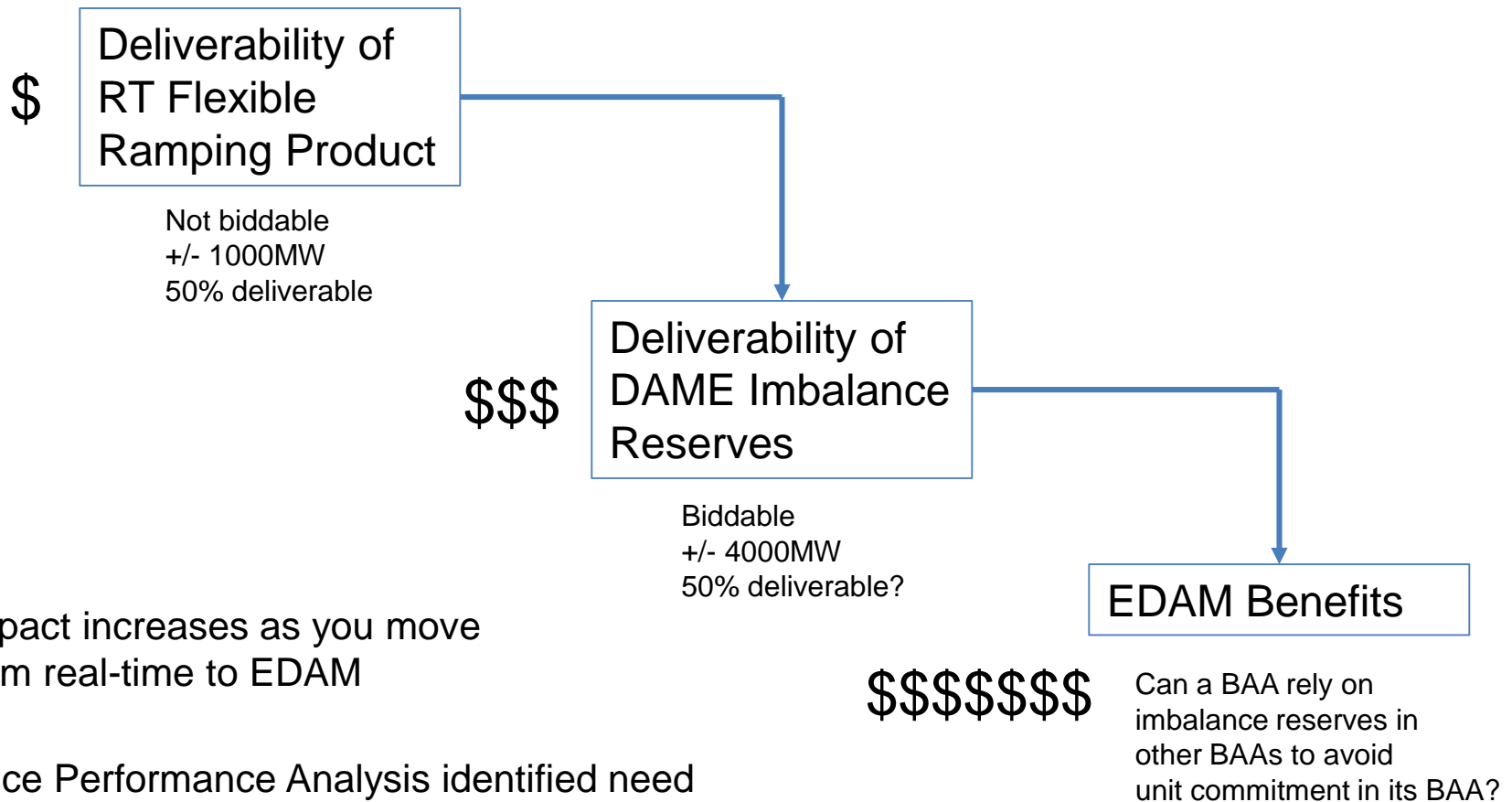
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Primary drivers of proposed three-year roadmap

- Manage operational risk resulting from a transforming grid
- Enhance the market in response to changing grid conditions and clean energy goals in California and the West
- Continue enhancements to EIM, including integration into the day-ahead market, to provide benefits across the West
- Reform CAISO's resource adequacy rules necessitated by increasing retirements and tightening dispatchable capacity
- Integrate new technologies to replace operational attributes previously provided by the thermal fleet

EVOLVE ISO MARKETS

Undeliverable capacity products lead to current and future market inefficiencies and operational challenges



Impact increases as you move from real-time to EDAM

Price Performance Analysis identified need to improve deliverability of market products

Day-ahead market enhancements address ramping and uncertainty needs between day-ahead and real-time markets

- Day-ahead market must correctly position and commit resources to provide sufficient bids and ramp capability into the real-time market
 - Imbalance reserves will improve market efficiency and grid reliability by committing resources to meet growing supply and demand uncertainty
- Co-optimization of energy and imbalance reserves will appropriately compensate resources for day-ahead energy and real-time re-dispatch capability

The Day-Ahead Reliability Tool will aid in operational efficiency and reliability prior to DAME implementation

- Day-Ahead Reliability Tool will check that hourly day-ahead schedules can meet fifteen-minute ramping needs
 - If fifteen-minute ramping needs cannot be met, tool will identify appropriate resources for exceptional dispatch
- Tool eliminates an existing manual process and results in appropriate and accurate exceptional dispatches to meet operational needs
- Planned implementation for Spring 2020
 - Will help ensure operational reliability prior to implementation of day-ahead market enhancements in Fall 2021

Extending the day-ahead market to EIM entities provides regional benefits

- Key principles:
 - Each balancing authority retains reliability responsibilities
 - States maintain control over integrated resource planning
 - Resource adequacy procurement decisions remain with local regulatory authority
 - Transmission planning and investment decisions remain with each balancing authority and local regulatory authority
 - Voluntary market, like EIM
- Key benefits:
 - Allows EIM participants to further reduce costs and gain market efficiencies
 - Day-ahead unit commitment and scheduling across a larger footprint provides diversity benefits and helps with renewable integration

Scope of stakeholder initiative to extend day-ahead market to EIM Entities

- Transmission provision for day-ahead market
 - Transmission cost recovery
- Day-ahead resource sufficiency evaluation
 - Provide functionality to enable entities to trade capacity to pass resource sufficiency tests
- Mechanism to distribute congestion revenues
- Full network model enhancements
- Day-ahead GHG attribution for states with carbon cost policies
- Governance to account for larger market scope

New 2021 initiative enhancing market dispatch capability will improve operability of the fleet by:

- Manage ramp rates to better control system balance
- Enhance market incentives for resources to provide accurate curtailment response
 - i.e., lower the bid floor
- Explore solutions to mitigate decremental market power
- Change settlement rules for decremental exceptional dispatch
- Increase real-time intertie liquidity
 - i.e., exempt real-time exports from transmission access and measured demand uplift charges

ENHANCE RESOURCE ADEQUACY

Resource Adequacy must be reformed according to the following principles:

- The resource adequacy framework must reflect the evolving needs of the grid and accurately evaluate and value resources that can meet operational needs
- RA counting rules should promote procurement of most dependable, reliable, and effective resources
- RA program should incentivize participation of all available RA capacity
- The RA fleet must be capable of meeting load requirements at all times of the year

Enhancements to Resource Adequacy program needed to align procurement with operational needs

- **Implementation 2020**
 - MIC Enhancements (New Initiative)
 - Slow demand response
- **Implementation 2021**
 - RA Import provisions
 - Planned outage process enhancements
 - Local studies with availability limited resources
 - Must offer obligations and bid insertion rules
 - Flexible resource adequacy
- **Implementation 2022**
 - Capacity counting rules and forced outage assessments
 - Portfolio analysis to ensure system sufficiency

SHAPE ELECTRIC SECTOR DECENTRALIZATION

ESDER initiative continues to refine DER and storage participation models and lower integration barriers

- Expand DER and storage modeling to optimally capture value and leverage resource design attributes that support grid reliability
 - State of charge parameter for NGR
 - Maximum run time parameter for DR
- Develop methodology to calculate default energy bids for NGR
- Develop market participation rules and inform LRA consideration of qualifying capacity counting for DR
- Consider non-24x7 settlement of behind the meter resources using NGR model

Transmission-Distribution Interface initiative will examine how to effectively coordinate and manage the growing number of distributed energy resources

- Review roles and responsibilities at the T-D interface between the ISO, distribution utilities, and DER providers to ensure reliable and efficient operation of the grid
- Investigate effective models for forecasting, managing and operating distributed energy resources to satisfy applicable T&D reliability standards
- Consider data content and data periodicity exchanged between the ISO and DSO to ensure safe and reliable operations

ROADMAP AND ANNUAL PLAN

2020 Policy Roadmap reflects new process guidelines

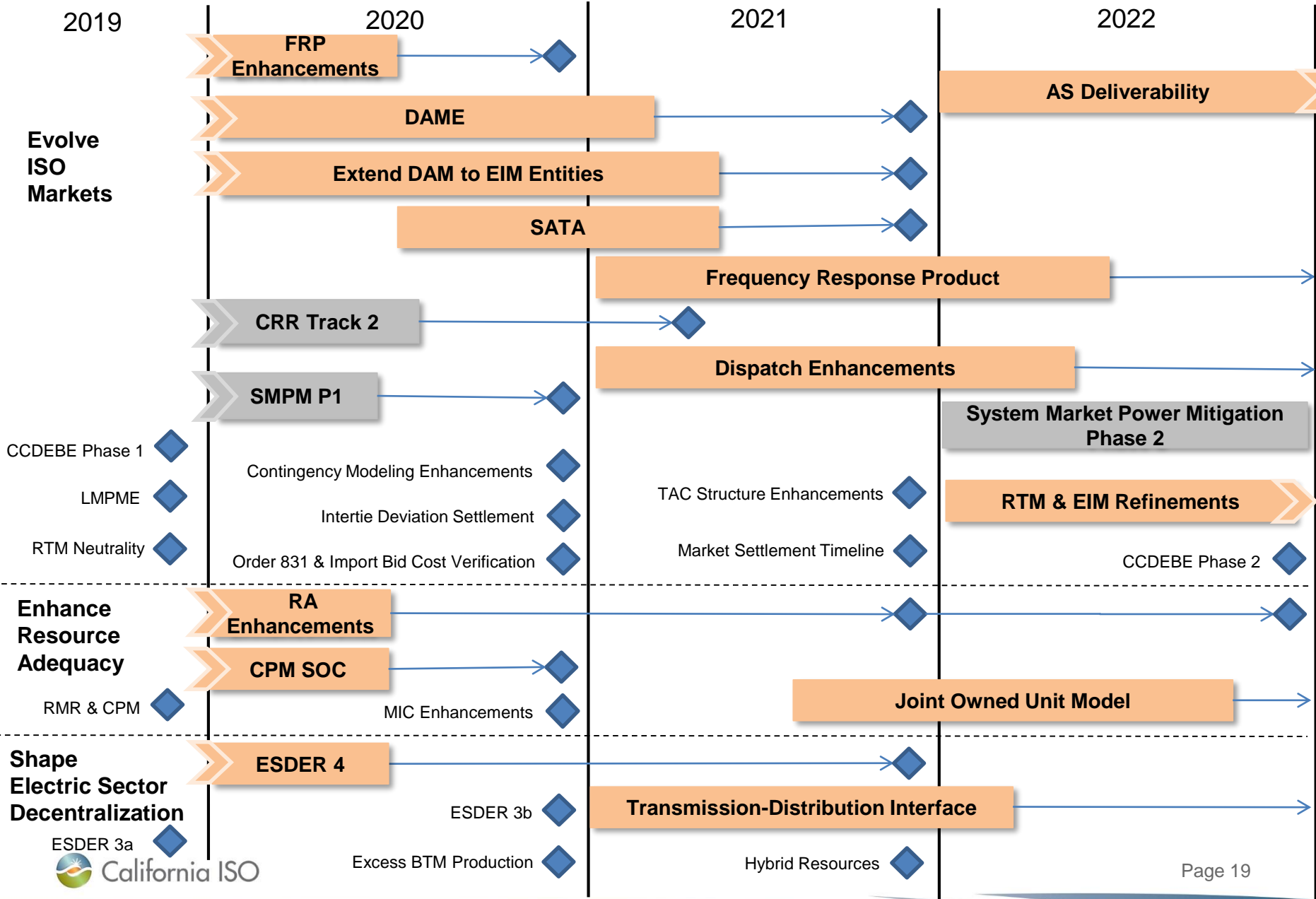
- Currently, Board of Governors dates are tied to completion of policy development
 - Tariff and business requirement development occur after board approval of a policy
 - Implementation details often identify further policy refinement
- Beginning 2020, the CAISO's new process:
 - Complete policy, tariff, and business requirements development prior to Board of Governor's approval
 - Allows for greater coordination and alignment during each stage of the process

CAISO will further evaluate need for system market power mitigation measures, CRR market enhancements, and real-time settlement changes

- System market power
 - Structural competitiveness analysis complete
 - Continue stakeholder process to determine appropriate mitigation measures
- Congestion revenue rights market
 - Analysis shows enhancements implemented last year have resulted in market improvement with some mixed results
 - Results to date do not support need for additional enhancements
 - ISO will continue to monitor CRR market performance
- Real-Time Settlement Review
 - Commitment made during 2019 real-time imbalance energy offset allocation initiative
 - Identify potential areas to address immediately or in the 2022 real-time market and EIM refinements initiative

Proposed Three-year Policy Roadmap of Major Initiatives

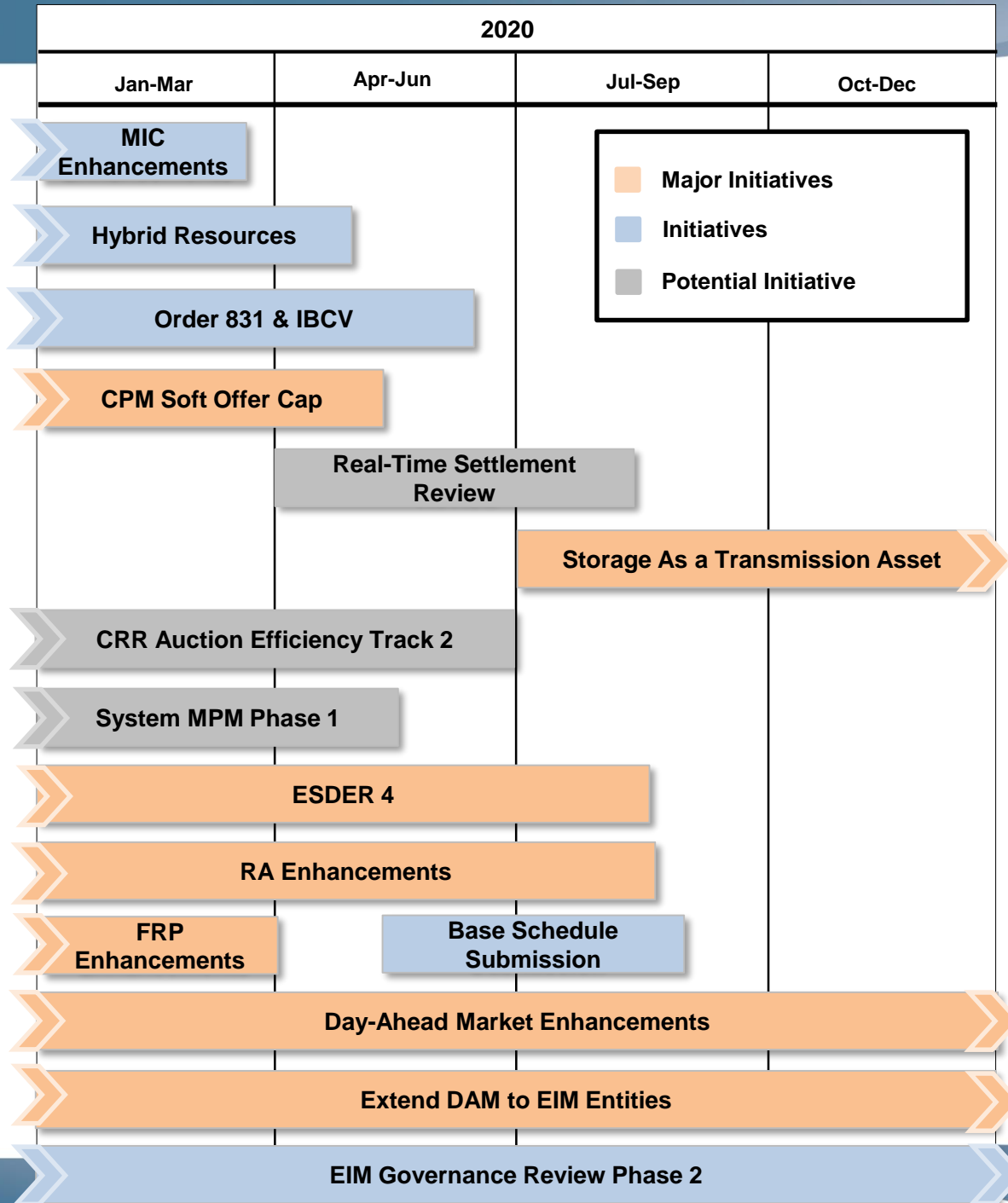
◆ = Implementation



*Timeframes are approximate and are subject to change

2020 Draft Annual Plan

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2020 Policy Initiatives Roadmap process schedule

- Draft 2020 roadmap and annual plan – Sept 30
 - Stakeholder Call October 7
 - Comments due October 21 (initiativecomments@caiso.com)
- Final roadmap and annual plan – Nov 6
 - Stakeholder Call November 12
 - Comments due November 21 (initiativecomments@caiso.com)
- EIM Governing Body briefing – Dec 4
- CAISO Board of Governors briefing – Dec 19