



2020 Three-Year Policy Initiatives Roadmap and Annual Plan

Market and Infrastructure Policy

January 23, 2020

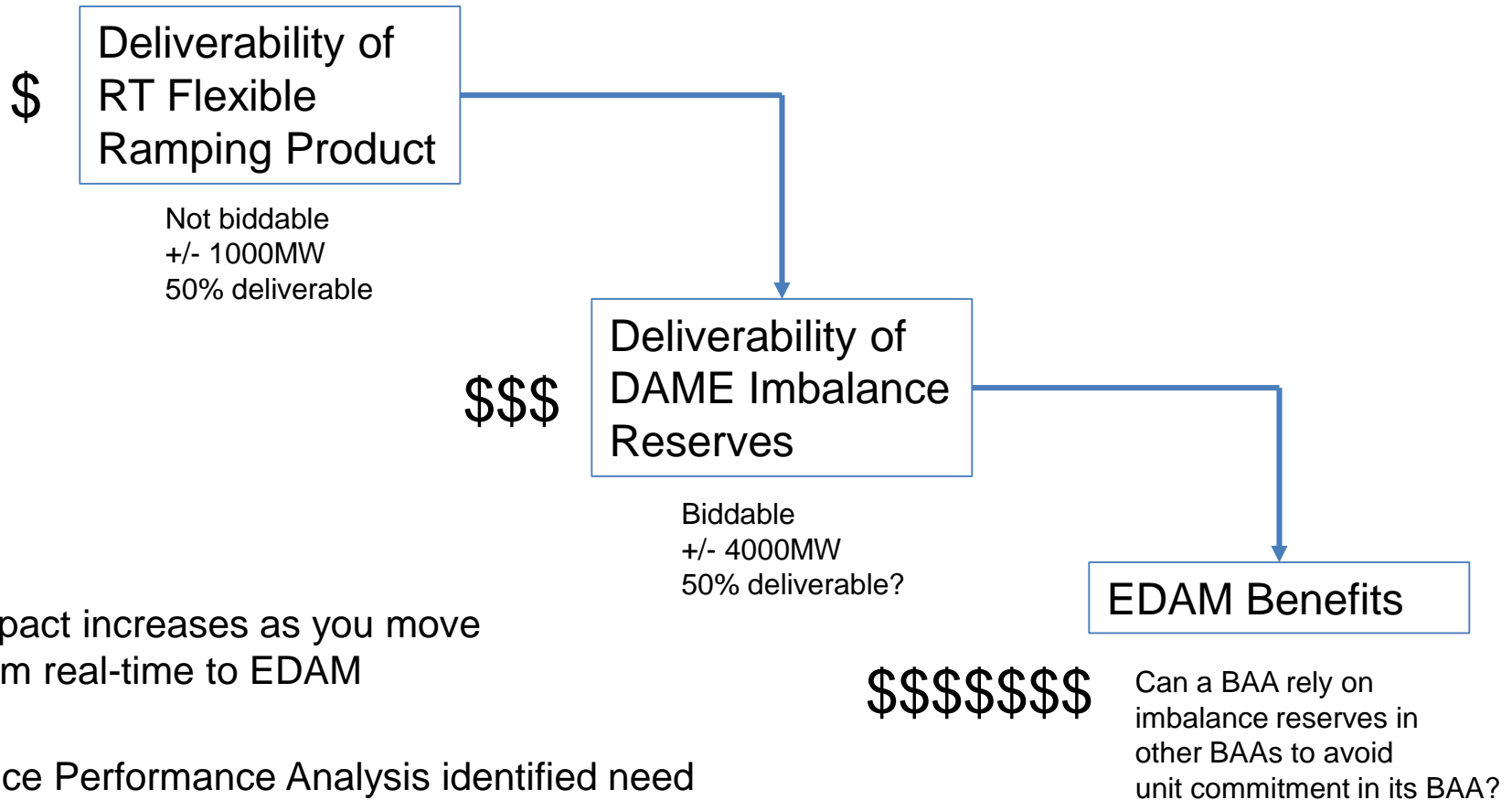
PRIMARY DRIVERS

Primary drivers of three-year roadmap

- Manage operational risk resulting from the 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

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, called Dispatch Enhancements, will improve operability of the new fleet

- 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:

- RA 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 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 w/ availability-limited resources CPM clarifications
 - 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

Energy Storage and Distributed Energy Resource initiative continues to refine DER and storage participation models and lower integration barriers

- Develop methodology to calculate default energy bids for storage devices
- 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 market participation rules and inform LRA consideration of qualifying capacity counting for DR

Hybrid Resources initiative will address operational challenges and enhance participation to maximize benefits provided by hybrids and co-located resources

- Minimize barriers to efficient and reliable operation and participation of hybrid resources and co-located projects
- Allow hybrid resources to self-provide forecasts and modify ISO systems to use these forecasts in ISO's processes
- Addition of interconnection rights constraint to ensure market awards and dispatches of co-located resources will be within established interconnection injection limits
- Metering and telemetry requirements for hybrid resources
- Develop default QC (RA counting) rules and Must Offer Obligations for hybrid resources

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

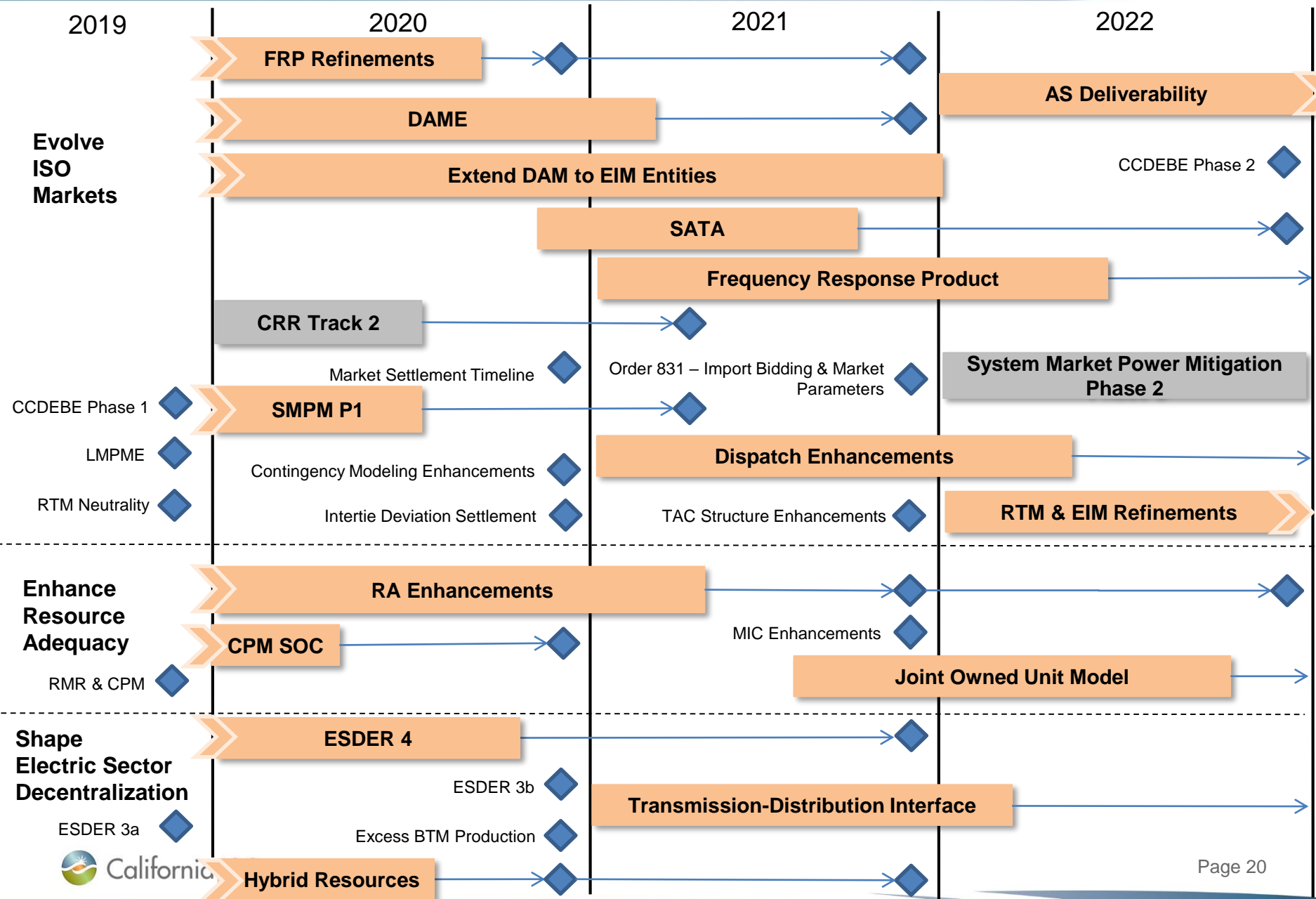
- Currently, Board of Governors dates are tied to completion of policy development
 - Tariff and business requirement development occur after board approval of a policy
 - Implementation details often identify further policy refinement
- Beginning 2020, the CAISO's new process:
 - Complete policy, tariff, and business requirements development prior to Board of Governors and EIM Governing Body 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
 - CAISO will conduct a two phase stakeholder process
 - First phase will develop measures for real-time market
 - Second phase to include day-ahead and EIM areas
- 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

Three-year Policy Roadmap of Major Initiatives

◆ = Implementation



*Timeframes are approximate and subject to change



2020 Annual Plan

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