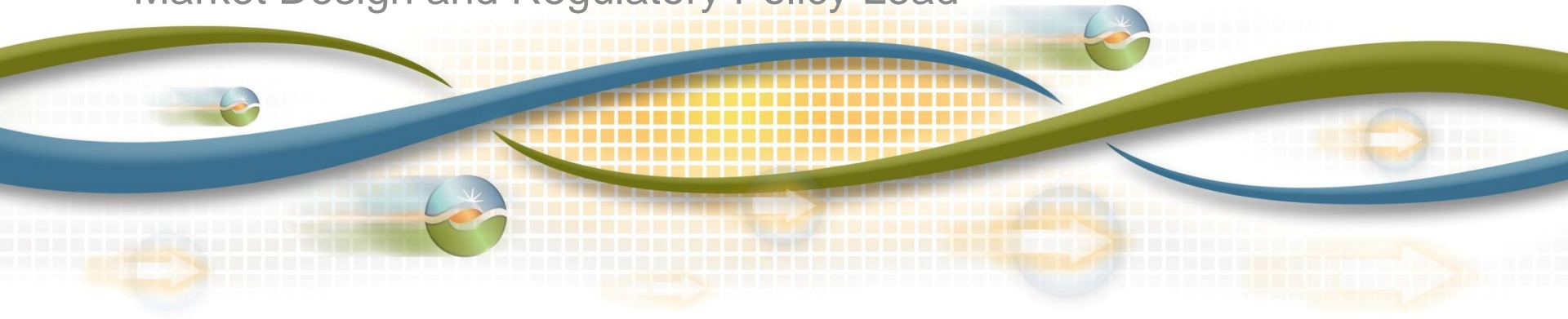


Reliability Services – Phase 2 and Flexible Resource Adequacy Criteria and Must-Offer Obligation – Phase 2

July 2, 2015

Karl Meeusen, Ph.D.

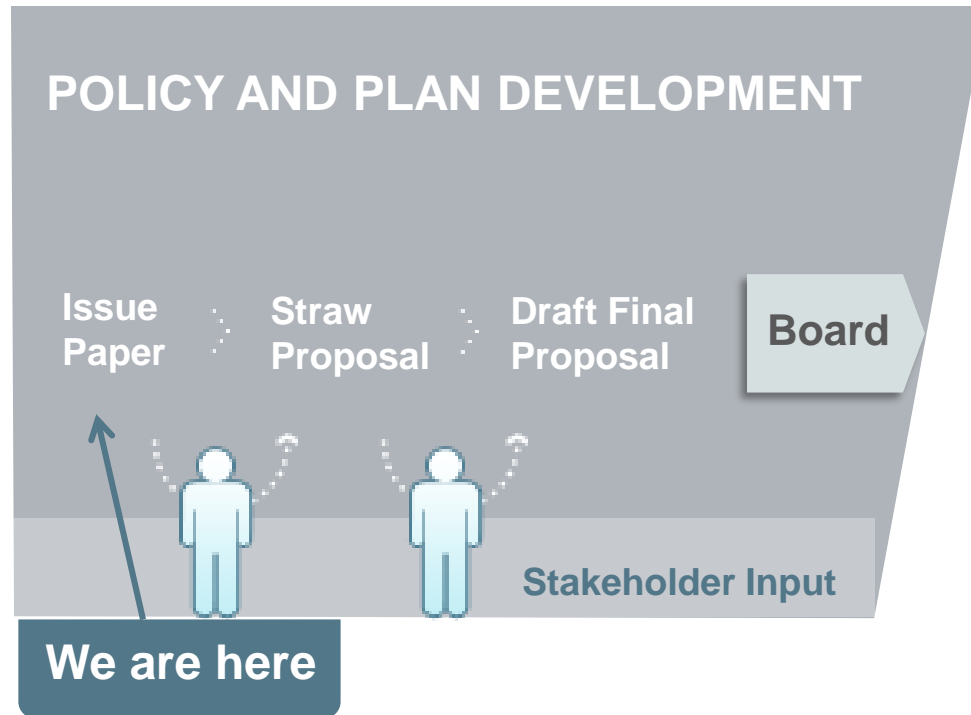
Market Design and Regulatory Policy Lead



Stakeholder Meeting – Agenda – 7/2/15

Time	Topic	Presenter
9:00 – 9:05	Introduction	Kim Perez
9:05 – 9:25	Background: Flexible Resource Adequacy Criteria and Must-Offer Obligation, Reliability Services – Phase 1	Karl Meeusen
9:25 – 9:45	Proposed Process and Schedule	
9:45 – 10:45	Flexible Resource Adequacy Criteria and Must-Offer Obligation, Reliability Services 2 – Overview of Issues and Proposed Scope	
10:45 – 11:45	Reliability Services – Phase 2– Overview of Issues and Proposed Scope	
11:45 – 12:00	Next Steps	Kim Perez

ISO Policy Initiative Stakeholder Process



Background: Flexible Resource Adequacy Criteria and Must-Offer Obligation, Reliability Services – Phase 1

Flexible Resource Adequacy Criteria and Must Offer Obligation (FRACMOO) tariff provisions

- A study methodology for determining flexible capacity needs and allocating them to local regulatory authorities
- Rules for assessing the system-wide adequacy of flexible capacity showings
- Backstop procurement authority to address system-wide deficiencies of flexible capacity
- Must-offer obligations to ensure the ISO has access to flexible resources through its markets

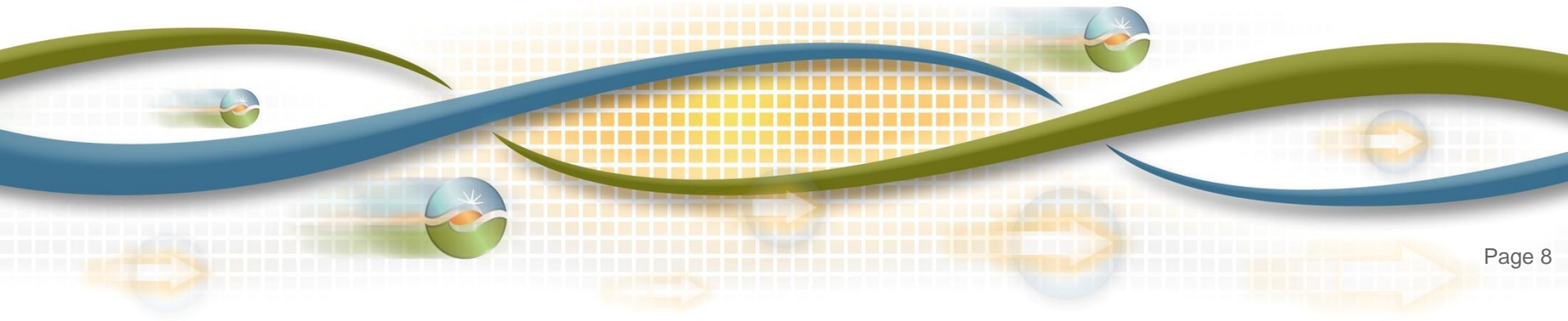
Reliability Services – Phase 1 (RSI1)

- Default qualifying capacity rules for non-generator resources (NGR), distributed energy resources, and proxy demand resources
- A new RA Availability Incentive Mechanism (RAAIM) to ensure RA capacity is available to the ISO consistent with the RA capacity the resource is providing
- Streamlined rules for providing substitute or replacement capacity for system and local capacity on planned or forced outages

Outstanding issues identified from FRACMOO and RSI1

Issues directly connected to the flexible capacity product definition	Issues <u>not</u> directly connected to the flexible capacity product definition
Defining the flexible capacity requirements and developing any additional flexible capacity needs	Substitution for flexible capacity resources on planned outage
Provision of flexible capacity by intertie resources, including Effective Flexible Capacity calculation	Address the RAIM exemption currently in place for combined flexible capacity resources
Flexible capacity from storage resources not using the NGR model	Separate local and system RA for purpose of forced outage substitution
Flexible capacity impacts of uncontracted/merchant VERs, for which no LSE has associated flexible capacity requirements	Clarify Local Regulatory Authority interaction and process alignment
	Process to update Effective Flexible Capacity list during the year

Proposed Process and Schedule



The ISO will conduct two stakeholder processes: FRACMOO2 and RSI2

- Flexible Resource Adequacy Criteria and Must Offer Obligation Initiative – Phase 2
 - Cover issues directly related to the flexible capacity product definition and enhancements
- Reliability Services Initiative – Phase 2
 - Processes and issues needed for overall RA program enhancements, but not directly related to the flexible capacity product definition and enhancements

FRACMOO2 scope and stakeholder process

- **Scope**
 - Defining the flexible capacity requirements and developing any additional flexible capacity needs
 - Provision of flexible capacity by inertie resources, including Effective Flexible Capacity calculation
 - Flexible capacity from storage resources not using the NGR model
 - Flexible capacity impacts of uncontracted/merchant VERs, for which no LSE has associated flexible capacity requirements
- **Working group process**
 - Three working group meetings
 - The first meeting: July 22, 2015
 - Concludes by end of September 2015
- **Stakeholder process**
 - Straw Proposal issued: October 2015
 - Straw Proposal will
 - Start the regular ISO stakeholder process for FRACMOO2; and
 - provide the CPUC with a proposal to consider in the RA proceeding
- **Board of Governors: Q2, 2016**

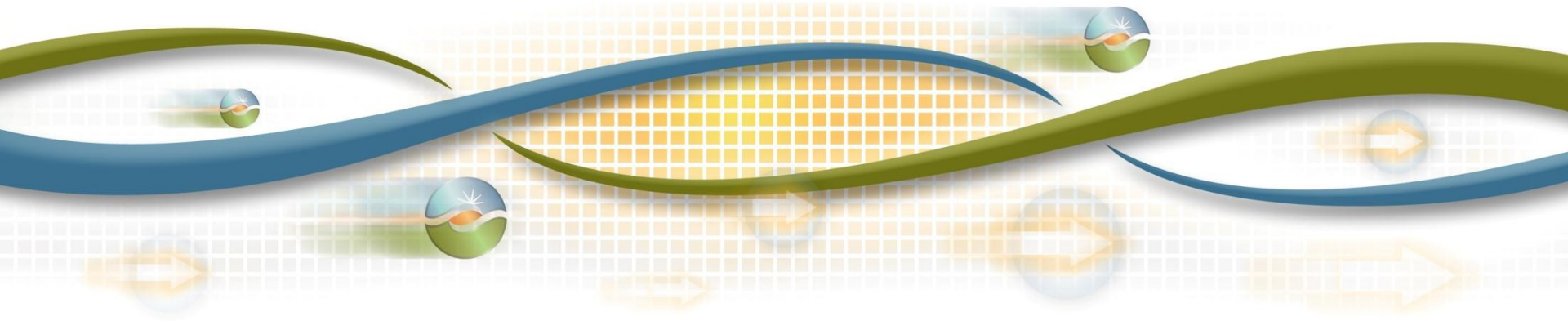
RSI2 scope and stakeholder process

- **Scope**
 - Substitution for flexible capacity resources on planned outage
 - Address the RAIM exemption currently in place for combined flexible capacity resources
 - Separate local and system RA for purpose of forced outage substitution
 - Clarify Local Regulatory Authority interaction and process alignment
 - Process to update Effective Flexible Capacity list during the year
- **Stakeholder process**
 - Straw Proposal: August 5, 2015
- **Board of Governors: Q1, 2016**



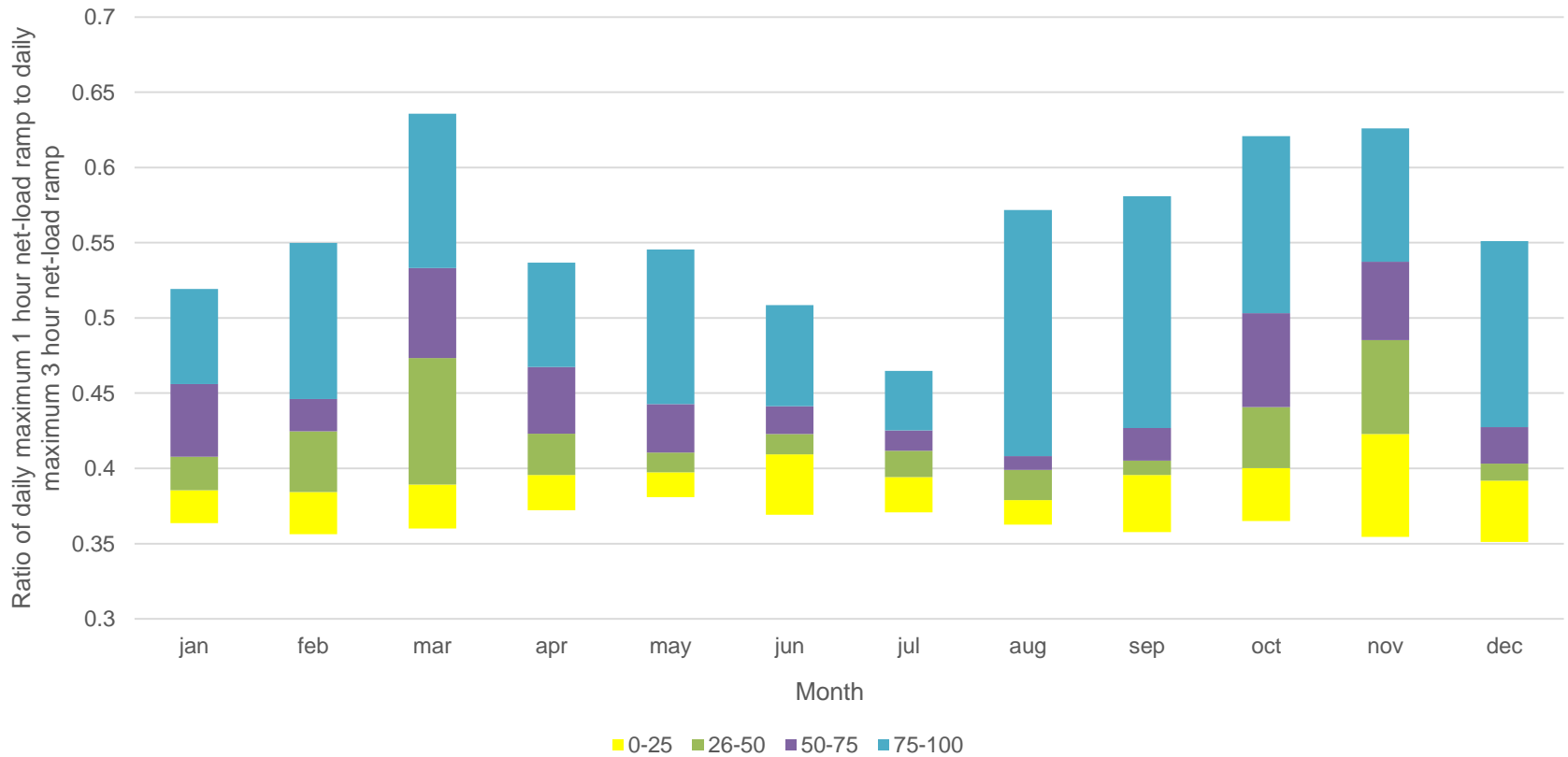
California ISO
Shaping a Renewed Future

Flexible Resource Adequacy Criteria and Must-Offer Obligation – Phase 2



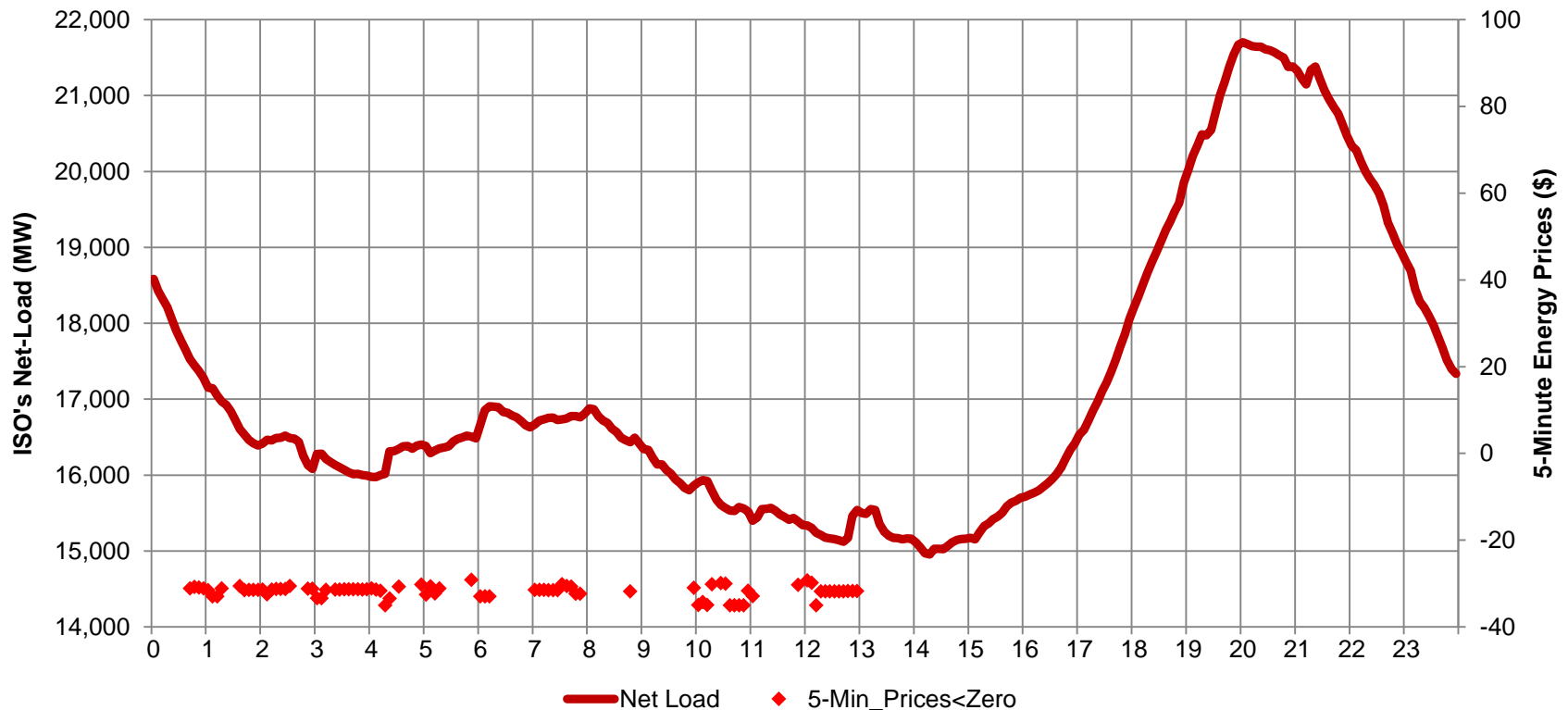
The ISO has identified a growing need for upward ramping speed

2024 One Hour to Three Hour Net-Load Ramp Ratio

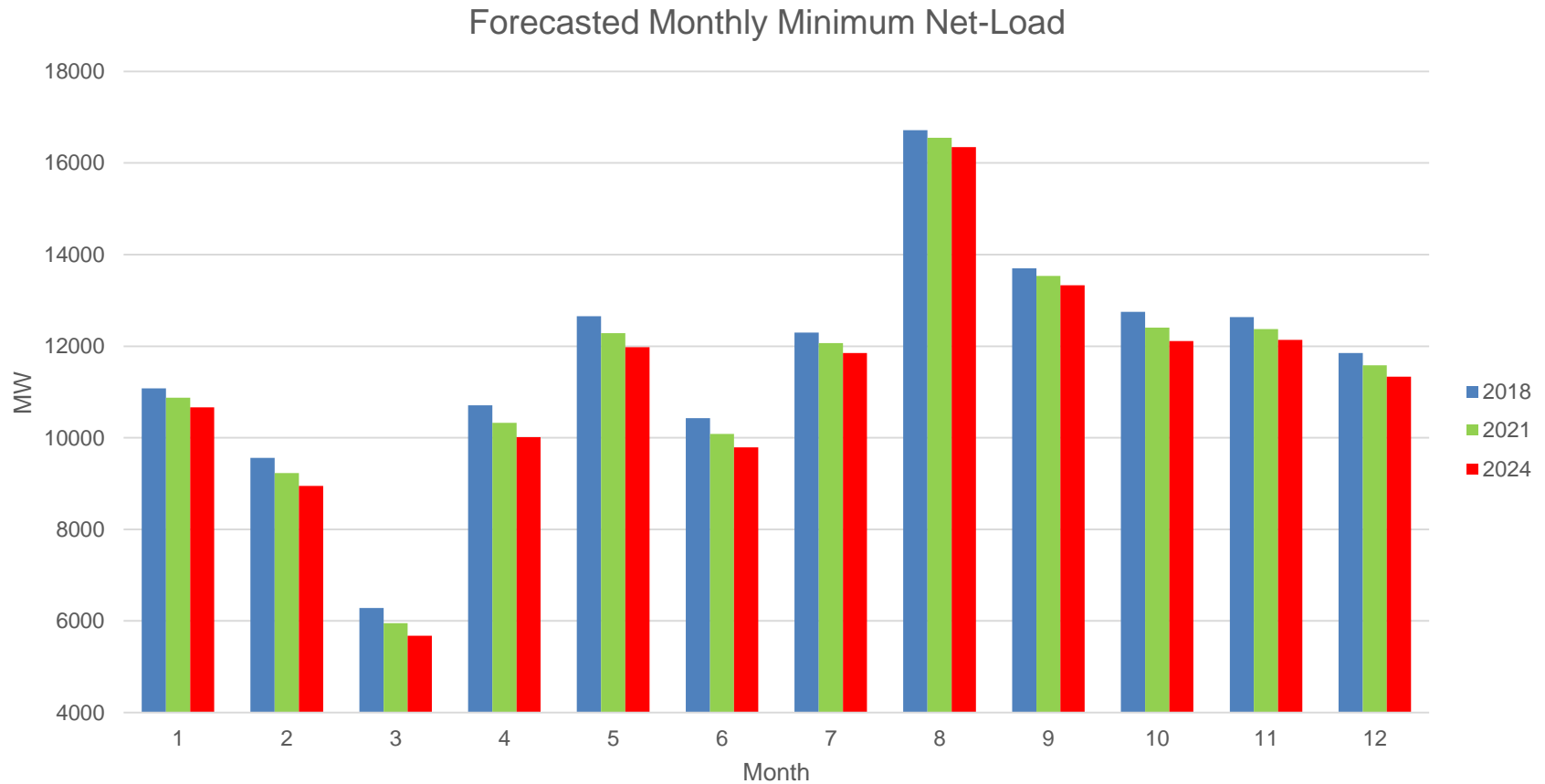


The ISO has identified a growing need for downward flexible capacity to address over-generation

ISO's Net-Load vs. Average 5-Minute Energy Prices
April 12, 2014



Minimum net-loads will continue to decrease over time



Over-generation is more than just an economic issue, it is a reliability issue

- Basic impacts
 - Impacts system frequency
 - Increases ACE
- Severe impacts
 - Grid facility overloads and potential generator damage
 - could result in extended periods of generating unit unavailability, including unavailability to fulfill IFM awards
 - Risk of non-compliance with NERC's Control Performance Standard 1 (CPS1) and NERC Standard BAL-001-1

It is reasonable to include downward flexible capacity needs in the RA program

- FERC and CPUC recognize RA should include operational attributes and that there is a need to value ramping capabilities
- The reasons for including downward flexible capacity in the RA program are similar to those for upward flexible capacity
 - Inflexible resources will not incur the full cost of their inflexibility due to bid floors
 - Without sufficient downward flexible capacity, the ISO would still experience downward ramping constraints
 - Would have to resort to out-of-market solutions to maintain reliability

The ISO will consider two minor enhancements to the annual flexible capacity study process

- Options to address the impact of anomalous load and weather events
- Alternative treatments for allocating of flexible capacity requirements to LRAs when an LRA has a negative contribution to the flexible capacity requirement

The ISO will determine how to allow 15-minute intertie resources to provide flexible capacity

- Flexible capacity from intertie resources can be an important tool in managing over-generation
- Assessment will include dispatch timing in determining how much flexible capacity intertie resources can provide.
 - Cannot risk five-minute reliability
- Must specify
 - Rules for import transfer capacity (i.e. MIC)
 - EFC counting provisions

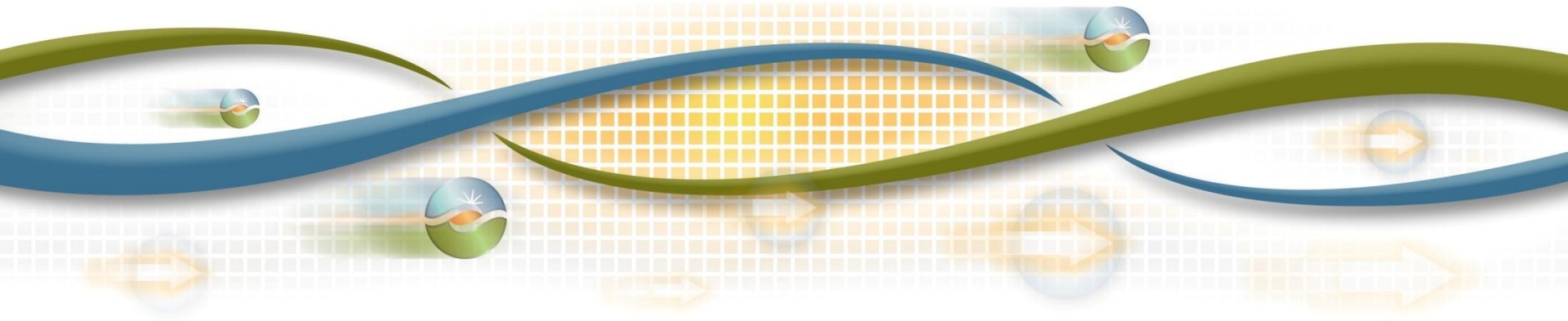
The ISO will assess EFC rules for energy storage resources that do not comport with NGR provisions

- Currently, only NGR resources can receive an EFC for changing capabilities
- The pumped storage hydro model
 - does not require both the charge and discharge components to be dispatchable
 - lacks details regarding the parameters for the load component of the resource (i.e. start-up time, ramp rates)
- Must determine whether the charging portion can be fully utilized “lift the belly of the duck”

The ISO will assess the impact of merchant VERs on flexible capacity needs

- FERC instructed the ISO to assess the potential magnitude and impact on flexible capacity needs caused by merchant VERs
- As part of FRACMOO2, the ISO will:
 - Conduct this assessment
 - Make the required filing with FERC
 - Recommend any modifications necessary to address the impact of merchant VERs

Reliability Services – Phase 2



Additional enhancements are needed for resources that go on outages

- Substitution rules for flexible capacity resources on planned outages
 - Deferred from RSI1
 - Must develop the processes to facilitate replacement for flexible capacity on planned outages
- Combination flexible capacity resource RAAIM exemptions
 - Currently exempted from RAAIM
- Enhance outage rules for Local RA resources
 - Assess need for greater specificity for replacement capacity for planned outages of local RA resources
 - Assess the implications conducting local capacity assessments that would exclude resources in a local area not shown explicitly as a local RA resource

Additional clarity is needed regarding RA processes and timelines

- Addition clarity benefits to both LRAs and LSEs
- Clear timing/rules on when a default ISO default is triggered will be developed for:
 - Planning reserve margin
 - Treatment of load side DR
 - Treatment of liquidated damages contracts
 - Treatment of any other RA credits for all load serving entities
 - Local requirement allocation
 - Flexible requirement allocation

An EFC change management process must be developed

- Resources may require changes to their EFC based on:
 - An NQC increase
 - Switching from non-dispatchable to dispatchable
 - A change the number of starts for a base flexible capacity resource in the ISO Masterfile from two starts per day to one start per day
- Change management process will include
 - Dates by which requests must be received and responses provided
 - Implications to a resource's qualification for a category of flexible capacity

Next Steps

- Comments on issues paper
 - Due July 10, 2015
 - Submit comments to initiativecomments@caiso.com
- RSI2
 - Straw proposal – August 5, 2015
- FRACMOO2
 - Working group meeting – July 22, 2015