2018 Interconnection Process Enhancements (IPE)

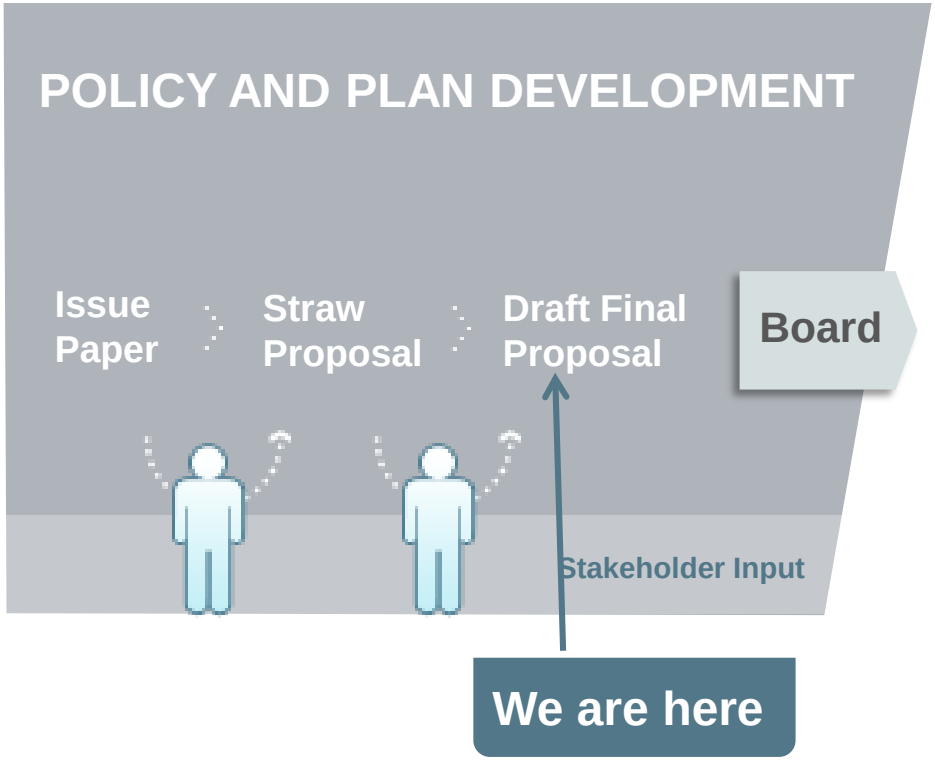
Webconference
July 17, 2018
1:00 p.m. – 4:00 p.m. (Pacific Time)

Agenda

Time	Item	Speaker
1:00 - 1:10	Stakeholder Process and Schedule	Jody Cross
1:10 - 1:15	Introductions	Joanne Bradley
1:15 - 1:30	Background and Scope	
1:30 - 2:00	Deliverability Topics	Team
2:00 – 2:20	Energy Storage Topics	
2:20 – 3:00	Generator Interconnection Agreement Topics	
3:00 – 3:20	Interconnection Financial Security and Cost Responsibility Topics	
3:20 – 3:35	Interconnection Request Topics	
3:35 – 3:50	Modifications Topics	
3:50 - 4:00	Next Steps	Jody Cross

STAKEHOLDER PROCESS

CAISO Policy Initiative Stakeholder Process



Background/Scope

2018 IPE goal is to modify and clarify the generator interconnection process to reflect changes in the industry and in customer needs

- IPE was completed in 2014
- IPE 2015 was completed in 2016
- IPE 2017 was completed March 2018
- 2018 IPE
  - Issue paper included 42 potential topics
  - Straw proposal included 25 topics
    - 8 topics were finalized in the straw proposal
  - Revised straw proposal includes revisions to 17 topics

Initiative topics and associated presenter

Category	Topic	Presenter
Deliverability	Summary	Jason Foster
	Transmission Plan Deliverability Allocation • Elimination of Balance Sheet Financing • Elimination of Annual Full Capacity Deliverability Option • Energy Only Projects' Ability to Re-enter the Queue for Full Capacity • Commercial Viability – PPA Path Clarification	Jason Foster
	Change in Deliverability Status to Energy Only	Linda Wright
	Options to Transfer Deliverability	Songzhe Zhu
Energy Storage	Replacing Entire Existing Generator Facilities with Storage	Deb Le Vine

Initiative topics and associated presenter

Category	Topic	Presenter
Generator Interconnection Agreements	Suspension Notice	Deb Le Vine
	Affected Participating Transmission Owner	Daune Kirrene
	Ride-through Requirements for Inverter-based Generation	Lou Fonte
Interconnection Financial Security and Cost Responsibility	Maximum Cost Responsibility for NUs and potential NUs	Jason Foster
	Eliminate Conditions for Partial IFS Recovery upon Withdrawal	Phelim Tavares
	Shared SANU and SANU Posting Criteria Issues	Bob Emmert
	Reliability Network Upgrade Reimbursement Cap	Bob Emmert
Interconnection Requests	Project Name Publication	Joanne Bradley
Modifications	Timing of Technology Changes	Joanne Bradley

DELIVERABILITY TOPICS

Deliverability Summary

Where the opportunity exists, CAISO seeks to clarify existing deliverability issues and modify some of the current methodologies so there is better alignment with the current procurement landscape in California

CAISO suggests the following principles for revisions:

- Limit the impact that one Interconnection Customer's choices have on other Interconnection Customers
- Ensure the most viable projects proceed expeditiously
- Allow those projects that have executed a PPA or are in a short-list process greater opportunity to obtain deliverability
- Provide Interconnection Customers reasonable time to market their projects with minimal financial impact or risk
- Limit risk to the Participating TOs (PTOs)

Transmission Plan Deliverability (TPD) Allocation (4.1)

CAISO proposed 5 topics in the Issue Paper to be combined

1) Transmission Plan Deliverability Allocation (4.1)
2) Elimination of Balance Sheet Financing Option to seek TPD (4.2)
3) Energy Only Projects' Ability to Re-enter the Queue for Full Capacity (4.3)
4) Elimination of Annual Full Capacity (AFC) Deliverability Option (4.5)
5) Commercial Viability Criteria – PPA Path Clarification (9.2)

TPD Allocation Straw Proposal (4.1)

Combination of these 5 topics will:

1) Provide opportunity for projects to obtain TPD when they have a PPA
   – During Study/Parking Process or projects that are converted to Energy Only
2) Maintain an opportunity to construct and obtain TPD without a PPA
   – Eliminate the Balance Sheet Finance option/terminology
   – Increased requirements
3) Maintain opportunity for Energy Only projects to obtain a TPD allocation
   – With PPA or achieved commercial operation
   – Eliminate the current AFC deliverability allocation option
   – A TPD Allocation Study Deposit required for all Energy Only projects requesting TPD
4) Eliminate the Balance Sheet Finance option as part of CVC
   – For Interconnection Customers requesting to extend COD beyond the 7/10 year threshold

TPD Allocation Straw Proposal (4.1)

Allocation Group	Project Status	Commercial Status	Can Build DNUs for Allocation?	Allocation Rank
1	Study/Parking Process	Executed or regulator-approved PPA requiring FCDS or IC itself is LSE serving own load	Yes	Allocated 1st
2	Study/Parking Process	Shortlisted in a RFO	Yes	Allocated 2nd
3	Study Process (Following Ph.II Only)	Proceeding without a PPA	Yes	Allocated 3rd
4	Converted to Energy Only	Executed or regulator-approved PPA requiring FCDS	No	Allocated 4th
5	Converted to Energy Only	Shortlisted in a RFO	No	Allocated 5th
6	Converted to Energy Only	Commercial operation achieved	No	Allocated 6th
7	Energy Only	Commercial operation achieved	No	Allocated 7th

TPD Allocation Straw Proposal (4.1)

Clarifications in Proposal:

1) Load Serving Entity (LSE) must be constructing to serve own load
2) TPD Allocation Scoring
   - Within each Allocation Group – scoring based on PPA, permitting, and site exclusivity status
3) Project's ability to re-enter the Queue, build DNUs, seek deliverability
   - The CAISO is still considering its position and seeking specific stakeholder proposals
4) Allocation Groups
   - Group 3: Projects that park can improve commercial status/claim higher allocation group
5) Implementation Timing and Impact
   - Target 2018/2019 TPD Allocation cycle
   - Includes all C10 projects and C8 & C9 parked projects
   - Projects that request COD extensions will be subject to new CVC

Change in Deliverability Status to Energy Only (4.4)

- Current Opportunities
  - Between Phase I and Phase II
  - Following TPD Allocation process
- Future Opportunity Proposed
  - Deliverability status can be changed to Energy Only or Partial Capacity any time after the Phase II study
  - Project evaluated in the annual reassessment study
  - Cost responsibility retained for DNUs still required
- Energy Only Conversion for Failure to Meet Commercial Viability or TPD Retention Criteria
  - Project evaluated in the annual reassessment study
  - Cost responsibility retained for DNUs still required

Options to “Transfer” Deliverability (4.6)

- No changes to the straw proposal
- Opportunities to transfer deliverability
  - Deliverability reservation from repowering generators
  - Deliverability transfer among generating units of the same owner at the same POI
  - Deliverability transfer within the same Interconnection Request
  - Deliverability transfer between the original capacity and the expansion capacity for behind-the-meter capacity expansion request

$$(Deliverability\ \%)_{transfer-to} = \max\left\{100\%, \frac{(Max\ Deliverability\ Output)_{transfer-from}}{(Max\ Deliverabiity\ Output\ if\ FC)_{transfer-to}}\right\}$$

ENERGY STORAGE TOPICS

Replacing Entire Existing Generator Facilities with Storage (5.2)

- The assessment for retiring units will determine if the storage portion of the generating facility may remain once the other portion of the facility retires
  - If no reliability impact, storage can stay and be awarded any deliverability from the retiring unit, if applicable
  - If there is a reliability impact then the generating facility cannot retire unless the reliability issues can be mitigated
- If the generating facility is repowering, then the repowering rules apply
- A generating facility may add up to 100% of its capacity provided the output at the POI is not greater than the studied capacity
- Conversion of a generating facility will be determined on a case-by-case basis

GENERATOR INTERCONNECTION AGREEMENT TOPICS

GIA Suspension Notice (6.1)

- Modification to GIA to allow transparency of suspensions and impact on other customers by adding start and end dates for suspension submitted in an MMA
- Add approval process to ensure no impact to other customers
  - If there is an impact, the customer may mitigate the impact to other customers to obtain the suspension
- Interconnection customer must negotiate in good faith to expeditiously amend the GIA with the new milestone dates and escalated costs at the end of the suspension

Affected Participating Transmission Owner (6.2)

- Interconnection customers generally supported the CAISO's proposals that added clarity to the interconnection customer's financial security postings, cost responsibility, and PTO repayment for the interconnecting and affected PTOs
  - Single project maximum cost responsibility for the interconnection customer with floating costs for each PTO not to exceed the single maximum cost responsibility
  - Separate 3rd posting for each PTO
  - Separate, proportional repayment from each PTO

Affected Participating Transmission Owner (6.2)

Illustration of Maximum Cost Responsibility Float

Affected Participating Transmission Owner (6.2)

Sample Proportional Repayment Calculation

- Assumes a 100 MW generating capacity and a $10,000,000 total cost of reliability network upgrades across all PTOs.

	RNU Cost	Proportion of Total Costs Assigned to PTO	100 MW Maximum Repayment
Interconnecting PTO	$7,000,000	70%	$4,200,000
Affected PTO	$3,000,000	30%	$1,800,000
Total	$10,000,000	100%	$6,000,000

Affected Participating Transmission Owner (6.2)

- Stakeholders suggested that the CAISO consider a combined four (or more) party agreement, combining the generator interconnection agreement and the affected PTO upgrade facilities agreement
- Other stakeholders further suggested that the interconnecting PTO serve as a single point-of-contact for the interconnection customer
- The CAISO proposes to use separate agreements but will seek further comment on this issue

Ride-through Requirements for Inverter-based Generation (6.4)

Summary of received comments:

1. SCE and SDG&E are generally supportive
2. First Solar chose to reserve detailed comments until the ISO identifies proposal details
3. CalWEA is generally supportive, but proposes that the new requirements should pertain to all projects
4. EDF-R and sPower state that CAISO should wait until NERC establishes a standard

Summary - Proposed Ride-through Requirements for Inverter-based Generation (6.4)

Revise GIAs to incorporate NERC recommendations for inverter based generation

1. Eliminate momentary cessation for transient low voltages, and transient high voltages where V < 1.20 pu
2. Allow momentary cessation for V > 1.20 pu
3. Eliminate inverter trip for loss of phase lock loop
4. Establish inverter TRIP return time range
5. Coordinate inverter controls with plant level controller to not impede rapid return following momentary cessation or reactive current injection

Ride-through Requirements for Inverter-based Generation (6.4)

Diagnostic Equipment

1. Plant level data: monitor plant voltage, current and power factor, and any plant protective relay trips.
2. Inverter level data: record ride through events and phase lock loop status
3. Time synchronization of data (1 mSec)
4. Data retention: retain data for 30 calendar days
5. Data reporting: provide data within 10 calendar days
6. Install a PMU (minimum 30 samples per sec)

INTERCONNECTION FINANCIAL SECURITY AND COST RESPONSIBILITY TOPICS

Maximum Cost Responsibility for NUs and contingent NUs (7.1)

ISO reconsidered definitions and instead proposed the following overall cost responsibility framework:

1. Interconnection Customer assigned cost for RNUs & LDNUs in Phase I & II studies

2. Network Upgrades include 2 components:
   - Direct Network Upgrades – identified in studies
   - Contingent Network Upgrades – required upgrade due to previous queue cluster projects that have not executed GIA.

3. Proposed “maximum cost exposure” – has 2 components
   - Lower subtotal for Network Upgrades in Phase I or Phase II study,

   Plus
   - Full cost for contingent network upgrades

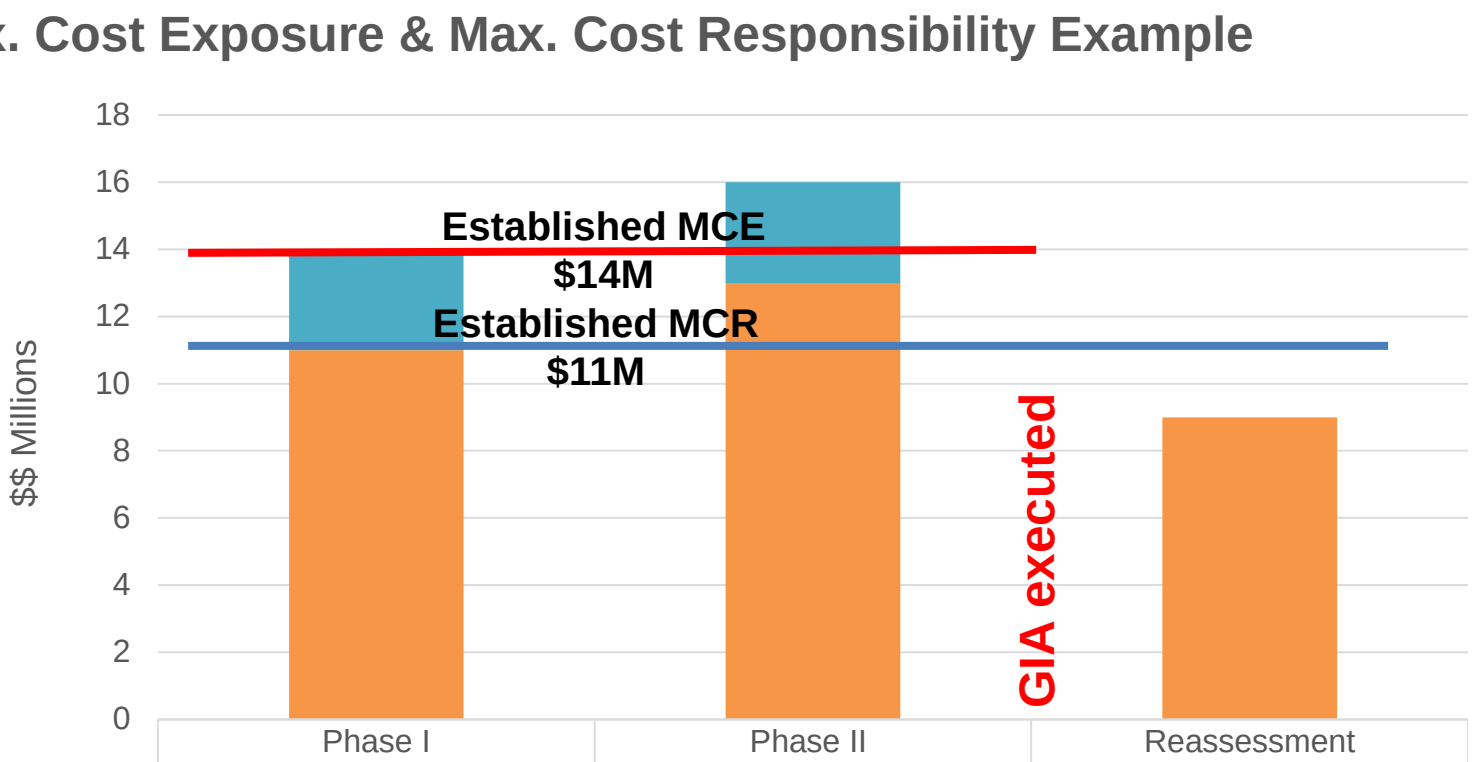
Maximum Cost Responsibility for Network Upgrades and Contingent Network Upgrades (7.1)

Framework proposal continued:

4. Maximum cost responsibility may increase:
   - As part of the annual reassessment and MCR provisions in App. DD
     - Cannot exceed the sum of (1) MCR established by Phase I/II studies and (2) the full cost of any former contingent Network Upgrades that becomes a direct NU
   - MCE will decrease if GIA is executed by prior cluster project or if upgrade is no longer needed

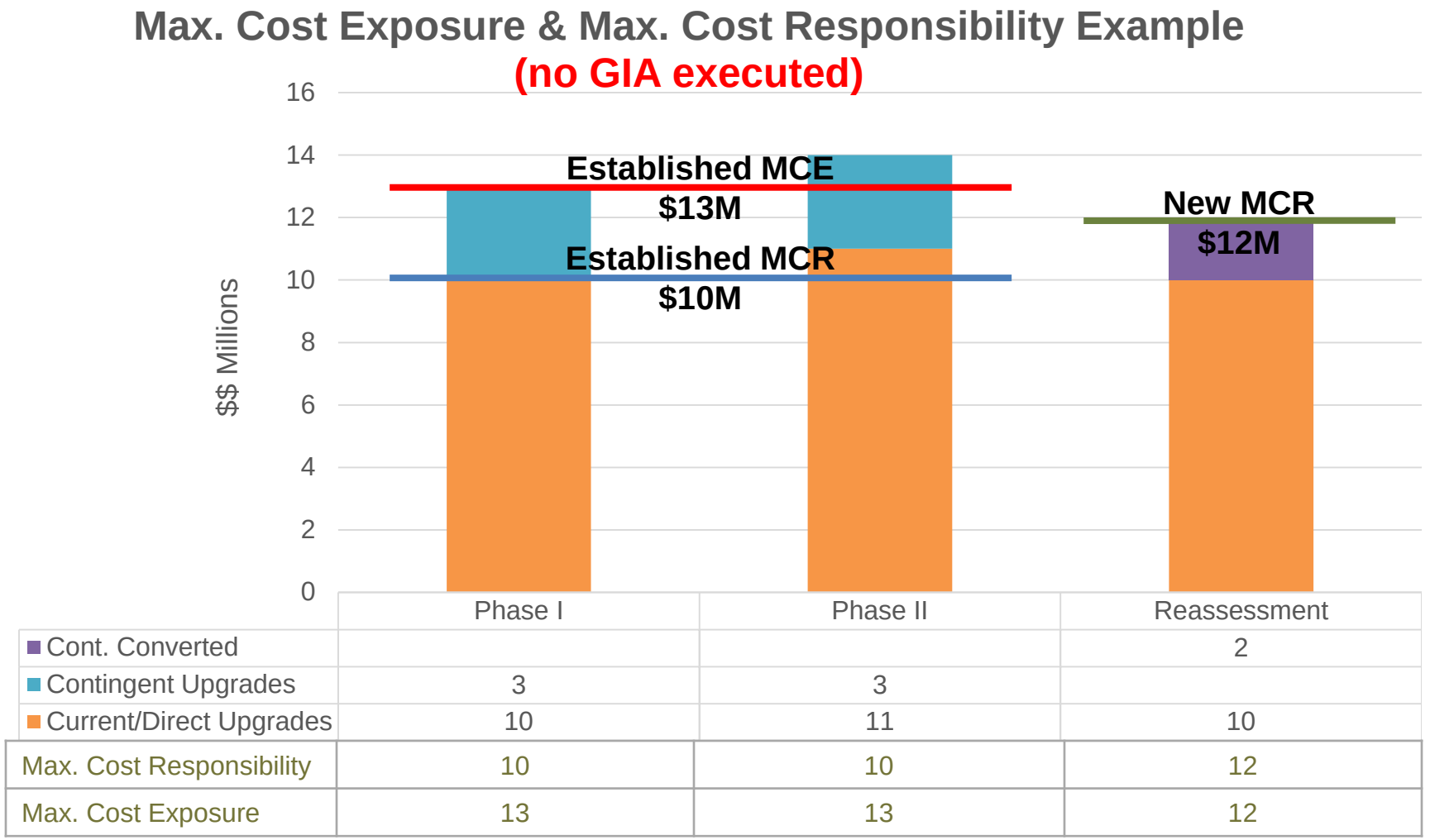
5. IFS posted for direct Network Upgrades (current cost responsibility), not contingent Network Upgrades
   - Unless Interconnection Customer desires to proceed to commercial operation

Maximum Cost Responsibility for Network Upgrades and contingent Network Upgrades (7.1)



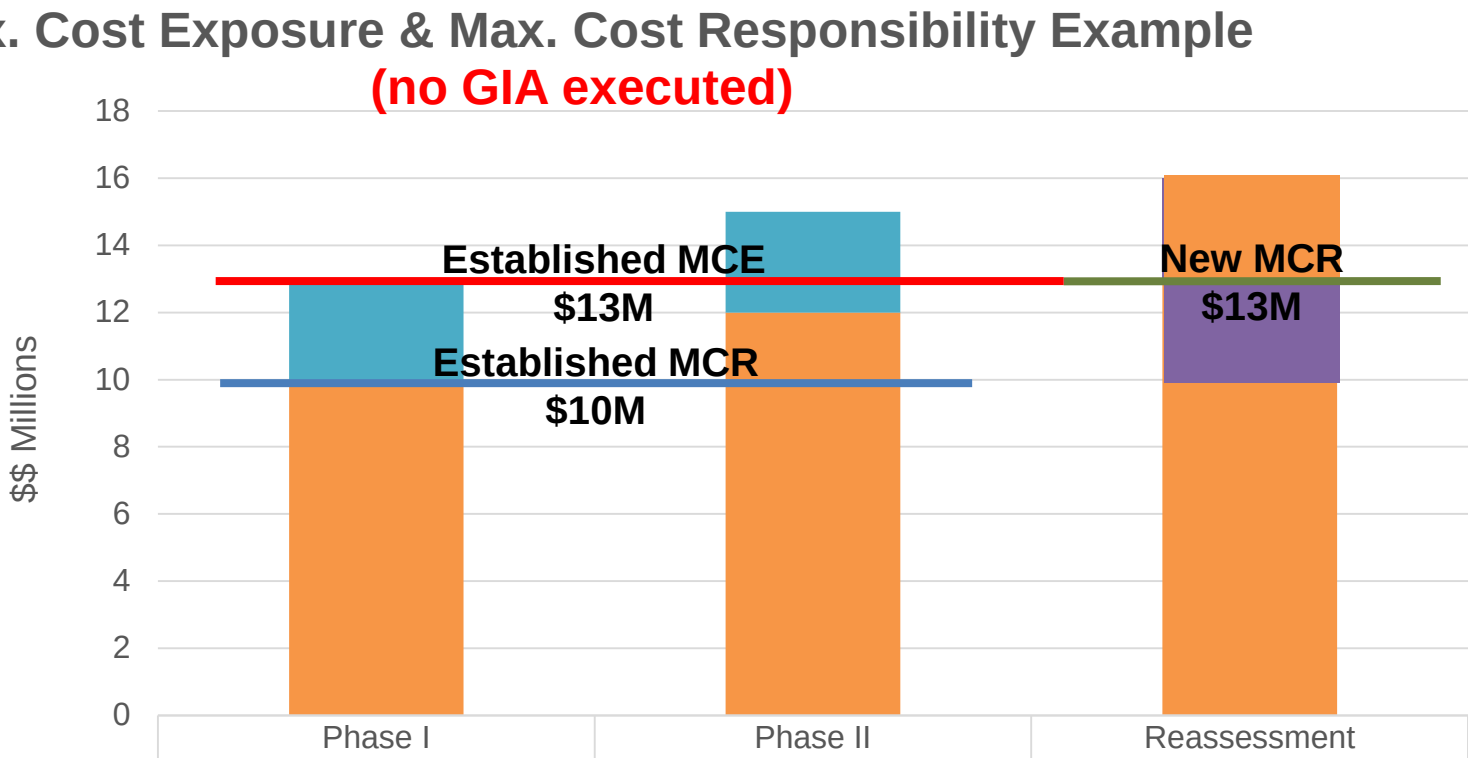
	Phase I	Phase II	Reassessment
Cont. Converted			0
Contingent Upgrades	3	3	
Current/Direct Upgrades	11	13	9
Max. Cost Responsibility	11	11	11
Max. Cost Exposure	14	14	11

Maximum Cost Responsibility for Network Upgrades and contingent Network Upgrades (7.1)



	Phase I	Phase II	Reassessment
Cont. Converted			2
Contingent Upgrades	3	3	
Current/Direct Upgrades	10	11	10
Max. Cost Responsibility	10	10	12
Max. Cost Exposure	13	13	12

Maximum Cost Responsibility for Network Upgrades and contingent Network Upgrades (7.1)



	Phase I	Phase II	Reassessment
Cont. Converted			3
Contingent Upgrades	3	3	
Current/Direct Upgrades	10	12	13
Max. Cost Responsibility	10	10	13
Max. Cost Exposure	13	13	13

Financial Security Postings and Non-Refundable Amounts (7.3)

- Stakeholders are supportive of removing the conditions for partial recovery of the interconnection financial security for Network Upgrades
- SCE and Six Cities both provided comments pertaining to abandonment costs and recovery of costs of a transmission facility or network upgrades approved by the CAISO
- Under the new proposal in 2018 IPE, all projects will qualify for partial recovery. The CAISO will not be addressing cost recovery for network upgrades or transmission facilities in 2018 IPE

Shared SANU and SANU Posting Criteria Issues (7.5)

Clarify SANU provisions when multiple generation projects in a cluster trigger a SANU

Stakeholder input

- Most stakeholders agreed that SANU can be shared by more than one interconnection customer, and to allow the PTOs to make this determination on a case-by-case basis.
- EDF and sPower stated that the proposal allows current piecemeal practices remain and worsen them by allowing PTOs to treat SANUs differently
- EDF and sPower also commented that PTOs should not be allowed to set their own security posting policies
- PG&E supported the CAISO's proposal as long as each PTO has the freedom to establish its own criteria for SANU allocation
- SCE stated that the current policy where each project assigned a SANU posts for 100% of the associated costs should remain intact

Shared SANU and SANU Posting Criteria Issues (7.5)

- CAISO contends that SANUs do have distinct differences from most RNUs.
- CAISO continues to believe that all projects associated with a SANU should have 100% of the costs included in the Maximum Cost Responsibility in the same manner that contingent network upgrades are proposed
- CAISO proposes the determination to allow a single or multiple Interconnection Customers to build a SANU should be made on a case-by-case basis
  - CAISO proposes to remove the BPM requirement for a SANU where only one Interconnection Customer is allowed to build the SANU

Reliability Network Upgrade Reimbursement Cap (7.7)

The $60k/MW maximum reimbursement for an RNU has the potential to be circumvented when earlier-queued projects withdraw and the upgrade is still needed

- Based on stakeholder input and issues with straw proposal, CAISO is proposing three options for stakeholder consideration
  - Option 1 – have 100% of any precursor RNU's cost included in project's Maximum Cost Responsibility
  - Option 2 – add the cost of any precursor RNU funded by a PTO to project's RNU costs to calculate the maximum RNU reimbursement
  - Option 3 – allocate precursor RNU costs to MCR at time the project with GIA withdraws

- CAISO seeks stakeholder input on preferred option

INTERCONNECTION REQUEST TOPICS

Revisions to Queue Entry Requirements (8.2)

Consider more stringent information requirements for projects to enter the queue to help ensure that only viable projects seek interconnection

- Stakeholder Input
  - CalWEA, LSA, and SDG&E agreed that this issue should not be considered for 2018 IPE
  - GSCE and ITC suggested that the CAISO should remain open to specific proposals that would meet the limitations set by FERC
  - The ORA recommended that the CAISO provide the deliverability status in the proposed project area as an immediate response to interconnection requests
- CAISO will not include the issue in 2018 IPE
  - Stakeholders did not submit any specific, concrete proposals
  - Stakeholder consensus would be difficult
  - CAISO believes that it is unlikely that queue entry requirements could be revised in any meaningful way that would be acceptable to FERC

Project Name Publication (8.4)

- CAISO proposes to include project names in the public queue list
- Coordination with other entities and ability to meet NERC standards would be improved if project names were publicly available
- Comments generally in support of proposal

MODIFICATION TOPICS

Timing of Technology Changes (9.1)

- CAISO proposes to prohibit technology changes that change the fuel type if a project has, or is requesting, milestones beyond the 7/10 year threshold
  - Regardless of time-in-queue, all projects requesting technology changes must demonstrate they are able to construct the project with the proposed new configuration within the 7/10 year threshold
  - Beyond the 7/10 year threshold, a *de minimus* additive fuel type change will be allowed
    - De minimis is no more than the greater of five percent (5%) or 10 MW, but no more than twenty-five percent (25%) of MW capacity in GIA
- There will be a CVC check with every MMA when a project's milestones are beyond the 7/10 year threshold

NEXT STEPS

Next Steps

Milestone	Date
Post revised straw proposal	July 10, 2018
Stakeholder call	July 17, 2018
Stakeholder comments due	July 31, 2018
Draft final proposal	Q4 2018

Written stakeholder comments on the revised straw proposal are due by COB July 31st to InitiativeComments@caiso.com

Materials related to the 2018 IPE initiative are available on the ISO website at:

http://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx