



California ISO  
Shaping a Renewed Future

# Integration of Transmission Planning and Generation Interconnection Procedures

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(TPP-GIP Integration)

Discussion Paper for 12/1/11  
Working Group

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Market and Infrastructure Development

# Discussion Paper for 12/1/11 Working Group

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# Integration of Transmission Planning and Generation Interconnection Procedures (TPP-GIP Integration)

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## Discussion Paper for 12/1/11 Working Group

### **1 Introduction**

On December 1, 2011 the ISO will host a stakeholder working group as part of the TPP-GIP Integration initiative. The working group agenda will feature three topics:

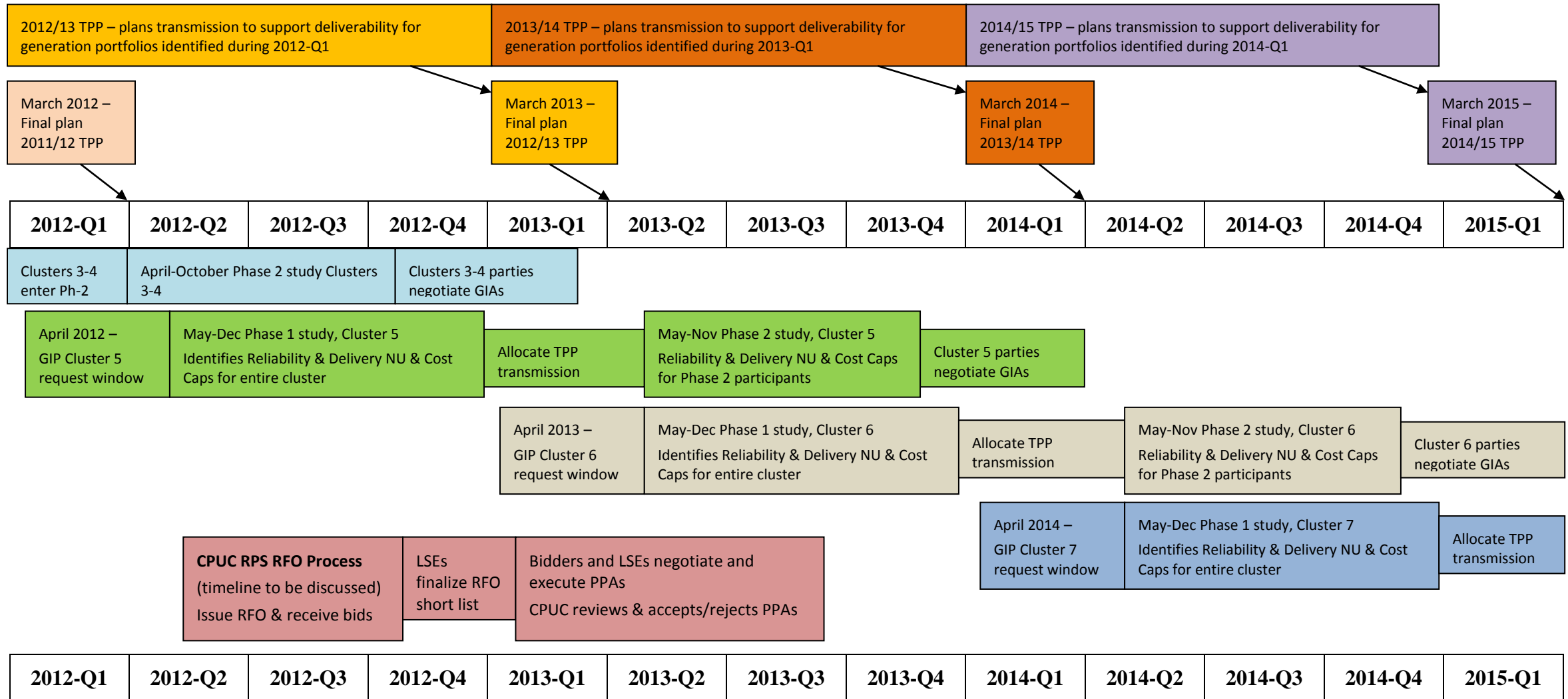
1. Coordination and alignment of CPUC procurement activities with ISO transmission planning process and generation interconnection procedures;
2. Alternative approaches for allocating deliverability created through the transmission planning process to generation projects in an over-subscribed grid area; and
3. Possible further provisions to promote effective management of the existing interconnection queue.

The working group will meet from 10 am to 5 pm. For the first and last portions of the meeting – roughly 90 minutes each – the entire working group will meet as a whole. For the intervening hours, including the lunch break, we will form small break-out groups of about 10 people each to discuss the above topics and work to develop collaborative solutions to the various issues. An ISO staff person will facilitate each break-out group, and the group will select a non-ISO person to take notes and report out to the full group in the final session of the day. Telephone and web-conference participation will not be available for the break-out sessions.

The material in this paper is intended mainly to help stimulate and focus discussions within the break-out groups. Toward that end the ISO has provided a potentially feasible and logical time line and process flow for each of the approaches under consideration for topic 2 (see section 4). The ISO intends to post its next proposal for this initiative roughly two weeks after the working group meeting and will schedule a stakeholder meeting early in January.

### **2 Proposed timeline for the integrated process**

**Integrated TPP-GIP Process and Timeline**



### **3 Coordination and alignment of CPUC procurement activities with ISO transmission planning process and generation interconnection procedures**

Comments and discussions to date in this initiative have shown the need for a logical alignment of timelines and flows of information between these activities. On the procurement side, the costs of transmission upgrades needed for interconnection and deliverability of the various generation projects are an important consideration in the evaluation of RFO bids. On the transmission and interconnection side, PPAs between LSEs and generation projects are a key factor affecting the viability of projects. CPUC staff involved in these activities will attend the working group meeting to discuss ways to achieve the needed process alignment and flows of information.

### **4 Alternative approaches for allocating deliverability created through the transmission planning process to generation projects in an over-subscribed grid area**

As indicated in the flow diagram above, the ISO currently considers the optimal timing for the allocation process to be between Phase I and Phase II of the GIP study process. For this timing to work best, certain milestones in the CPUC or other LRA procurement proceedings would need to be completed in time for the results to be considered in the allocation. For example, some of the approaches described in this section include as a criterion whether the generation project has been short-listed in an LSE RFO or has an executed or approved PPA. Clearly a project will be able to meet this criterion only if the LSEs and the LRAs are willing to establish RFO shortlists or execute or approve PPAs based on the results of GIP Phase I studies rather than requiring that Phase II study results be available. This and other matters of timing will be discussed further in the context of aligning the CPUC procurement activities and the TPP and GIP processes.

In addition it should be noted in the flow diagram above that the ISO is considering allowing four months between the conclusion of GIP Phase 1 and the start of GIP Phase 2, in contrast to the three months allowed today, in order to allow sufficient time for these allocation activities.

It should also be noted that the ISO will allocate deliverability based on the most recent comprehensive transmission plan, which is actually finalized in parallel with the allocation process. Therefore, any allocation results the ISO may determine in the course of this process

will become final only when the ISO Board approves the final comprehensive transmission plan in late March of each year.

#### **4.1 LSE Choice**

Under this approach the LSEs would select which generation projects receive the incremental deliverability created by the TPP identified network upgrades. Although the LSEs choose which projects receive the deliverability, once an LSE chooses a project the deliverability status will be associated with the project rather than belonging to the LSE. Thus, if an LSE-specified project subsequently fails, the LSE cannot utilize the available capacity to give deliverability to another project. Consistent with existing ISO tariff, a project at risk of failing can be sold and maintain its queue position and deliverability, but deliverability cannot be transferred to another project. If a project fails, the released capacity for deliverability will be available for reallocation during the next allocation cycle. Similarly, if an LSE's contract with a generation project expires, the generating resource will still retain the deliverability status that was previously assigned; the LSE cannot retain the deliverability for transfer to a new resource.

The following is a potentially feasible process for implementing the LSE Choice approach, using Cluster 5 as the example for specifying milestone dates. It should be noted that steps 1-5 and 9-12 below will be common to all the approaches; steps 6-8 will be specific to each approach.

1. Cluster 5 closes to new interconnection requests on April 30, 2012, and ISO begins GIP Phase 1 studies shortly thereafter.
2. LSEs conduct RFOs during Q3 2012; generation projects in Cluster 5 Phase 1 or earlier in queue are eligible to bid.
3. ISO completes Cluster 5 GIP phase 1 studies by Dec. 31, 2012 and provides the results to the participants.
4. LSEs finalize RFO shortlists by January 31, 2013.
5. ISO posts draft comprehensive transmission plan Jan. 31, 2013, indicating the amount of deliverability available in each study area for allocation to specific generation projects, based on the base-case resource portfolio used in the current TPP cycle.
6. ISO calculates and informs each LSE of its load-based share of the system-wide amount of deliverability provided by the transmission in the comprehensive plan, based on the draft comprehensive plan.
7. LSEs submit requests to ISO for specific generation projects to receive TPP-identified deliverability capacity by March 1, 2013.

- a. Requests must be for specific projects which either participated in Cluster 5 Phase 1 or have earlier queue positions and were studied previously.
  - b. The same project cannot be requested by multiple LSEs.
8. ISO assesses the simultaneous deliverability of all LSE project requests in all study areas during March 2013.
  - a. If all requested projects are fully deliverable, the ISO approves all requests.
  - b. If all requested projects in an area are not fully deliverable, some secondary process is needed to reduce the total requests to a deliverable amount.
9. The ISO finalizes the awards of TPP-based deliverability status by April 1, 2013 after Board approval of final comprehensive transmission plan.
10. Cluster 5 projects decide by May 1, 2013 whether to participate in Phase II.
  - a. Projects not awarded TPP-based deliverability status will be required to make all postings as required under current rules.
  - b. Projects awarded TPP-based deliverability would make all required postings except for those associated with delivery network upgrades.
11. ISO performs GIP Phase II study May 2013 through November 2013 and provides results to participants.
12. Parties negotiate LGIAs December 2013 through March 2014 (120 days after Phase II study results, per ISO tariff). At this stage, only those projects that will have to pay for network upgrades will make the subsequent postings as they do today, but without ratepayer reimbursement after COD. Those projects awarded TPP-based deliverability status would not have to make the post-Phase II postings. There may, however, be a need for some posting, to be determined, to secure such projects' progress to achieve commercial operation.

## **4.2 Ranking based on project milestones and characteristics**

This approach can be thought of as a more general version of the “first-come-first-serve” approach described in the ISO’s last straw proposal. Under this approach the ISO would rank generation projects based on a set of criteria identified below. For this discussion the ISO proposes seven criteria to be used to generate a rank scoring system. The ISO would then allocate the TPP-based deliverability to those projects with the highest scores.

As this process is based, at least in part, on the achievement of milestones, it may be appropriate to require additional milestones be reached once the allocation is awarded, in order for a project to retain its allocation from one cycle to the next. If a project fails to meet these milestones, the ISO would revoke the allocation of TPP-based deliverability to that project. Consistent with existing ISO tariff, a project at risk of failing can be sold to a different developer and maintain its queue position and deliverability, but deliverability cannot be transferred to another project. If a project fails, the released capacity for deliverability will be available for reallocation during the next allocation cycle.

As was the case with the previous approach, this approach also relies on alignment with some activities in the CPUC procurement process. Many of the specific steps are the same as in the previous approach, except for steps 6-8 where the following would apply.

6. Each interconnection customer submits up-to-date project information required for the ranking procedure to the ISO by January 31, 2013. Evaluation of ranking criteria and scoring of a project will reflect the project status as of that date.
7. The ISO ranks all projects and, starting with the highest ranked project and working down, determines which projects will receive TPP-based deliverability as specified in the draft comprehensive plan.
  - One question is whether projects studied in earlier clusters may also be ranked during this process. On the one hand, such projects are formally participating in the ISO queue based on the current tariff and not under the provisions adopted under the TPP-GIP Integration initiative. On the other hand, if the deliverability of projects determined in earlier cluster studies is not preserved, there could be a queue-jumping problem.
  - Another question is how best to balance the need for transparency of the ranking process with project confidentiality concerns.
8. It is quite possible there will be one project whose rank puts it on the boundary, i.e., it would be partially but not fully deliverable as a result of this approach. In that situation the project can elect partial deliverability status based on the amount of deliverability available without the project having to pay for further delivery network upgrades.



The ISO has selected seven criteria for the initial proposal for working group discussion. Multiple scoring options exist for many of the selected criteria. The following table outlines the selected criteria, the potential weight, some potential scoring scales, and comments.

<b>Criterion</b>	<b>Weight</b>	<b>Scoring Scale Options</b>	<b>Comments</b>
Status in permitting process with CEC or other licensing authority	High	A. 0 not done, 1 all done B. 0-4 based on well defined steps of the CEC permitting process	Well-defined intermediate steps and their normal timelines need to be specified for Option B.
An executed or approved PPA, or RFO shortlisted	High	A. 0 not done, 1 all done B. 0-4 0 = Not submitted to RFO or submitted but not shortlisted 1 = short listed 2 = PPA in negotiation 3 = PPA executed 4 = CPUC approved PPA	Per proposed time line above, the RFO shortlist should be done in time to include its results in this ranking.
Potential energy output per MW installed capacity	Medium	Use the capacity factor (value between 0 and 1)	
Potential capacity value per MW installed capacity	Medium	QC/nameplate (value between 0 and 1; use summer month QC)	Scoring this could be difficult in the sense that a higher value is not always better. For example, there may be benefits of having a mix of high QC (solar or thermal) and low QC resources (wind) in a given grid area.
Effectiveness factor or flow impact on TPP-approved facilities	Medium	(value between 0 and 1)	Projects with low flow impacts use up less of the available deliverability per MW of installed capacity, so perhaps lower value is better for this criterion.
Site control	Low	a) 0 = no, 1 = yes	
Gen-tie access and progress on interconnection facilities	Low		The costs of gen-ties or interconnection facilities should not be a sticking point in LGIA negotiations.

Given the selected criteria, the ISO proposes the following approach for using these criteria to calculate a single numerical score for each project. There are two high-value ranking criteria, three medium, and two low. In the event two projects have the same score at the end of the initial scoring and the amount of deliverability cannot accommodate both, the ISO proposes to

break the tie by dropping variables one at a time, starting with the low-value criteria, until the projects have different scores.

<b>Criterion</b>	<b>Option A</b>	<b>Option B</b>
A permit from the CEC or other licensing authority (high)	(0 = no or 1=yes) x 3	0-4 (discrete)
A PPA or RFO short listed (high)	(0=no or 1=yes) x 3	0-4 (discrete)
Potential energy output/Capacity Factor	0-1 (continuous) x 2	0-1 (continuous) x 2
Potential capacity value/Qualifying Capacity	0-1 (continuous) x 2	0-1 (continuous) x 2
Effectiveness factor or flow impact on TPP-approved facilities	0-1 (continuous) x 2	0-1 (continuous) x 2
Site control	0 or 1	0 or 1
Gen-tie access and progress on interconnection facilities	0 or 1	0 or 1
Max Total Score	14	16

In addition to the criteria listed above, the ISO also considered the following criteria, but determined that these criteria either provide duplicative information or do not provide a clear indication of a project’s viability or its value to the system.

<b>Criterion</b>	<b>Scoring Scale</b>	<b>Comments</b>
Commercial Operation Date (COD)		Not clear how to use this as a ranking criterion because it is not clear what makes one COD preferable to another.
Equipment purchased		The timing and quantity of equipment will differ based on numerous variables (technology, cost, project location, etc). Does not seem to provide useful information.
Number of previously approved modification requests for the project		In concept, modification requests could indicate uncertainty about the project’s viability, but since this will be evaluated after Phase I results, it is likely to be zero for most projects.

### 4.3 Auction

Under this approach the ISO will conduct an auction, allowing each project to bid to be awarded a portion of the TPP-based deliverability. The auction would take place after the GIP Phase I study results and the draft comprehensive transmission plan are issued. Projects that have been studied in the GIP Phase I study would be eligible to participate in the auction. (We need to consider whether projects that have been studied in earlier queue clusters should also

be eligible.) The auction option allows the ICs to assess the value to their projects of obtaining the use of ratepayer funded transmission to meet their deliverability needs, and should induce those that projects that are most viable to bid more aggressively. The ISO sees two possible mechanisms for conducting an auction: a multi-iteration ascending price auction, and a single shot closed bid auction. Under either approach, the ISO would require financial security from bidders to ensure their ability to pay if they win in the auction, and would then hold the auction payments of winning bidders as security against the completion and commercial operation of the projects. Projects that win TPP-based deliverability in the auction and then subsequently fail would forfeit their auction payments, and these funds would be used to offset transmission revenue requirements for all PTOs on a pro rata basis.

One open question for further discussion under either auction design is whether there should be separate auctions for large and small projects, with shares of the available deliverability reserved for each auction.

#### **A. Multi-iteration ascending price auction**

In this type of auction the ISO would set a price (\$ per MW of deliverability) to which bidders would respond by indicating their willingness to pay that price. After each round the ISO would assess whether the amount of deliverability available is sufficient to accommodate the willing bidders and if so, the auction would end. Otherwise, the ISO would set a higher price and conduct another round. At some point the price will be high enough that the amount of willing bidders that remain can be fully deliverable.

The ISO will assess the feasibility of accommodating the willing bidders based on each project's flow impacts on the TPP-identified transmission facilities providing deliverability in each study area. If not all projects are fully deliverable, the incremental bid increase will be based on the amount of excess demand relative to the amount of available deliverability. The price at which the deliverability in an area equals or exceeds the demand in the area is the clearing price that all winning bids will pay. Winning bidders will pay for a MW amount of deliverability based on the flow impacts of their projects on the TPP-identified transmission.

As an example, assume the final TPP plan identifies a single new transmission line that would create 1000 MW of deliverability, and there are 1600 MW of projects in the queue that would impact those upgrades. (In practice there would generally be multiple transmission facilities that would figure into this assessment.) Consider two 100 MW projects of the same technology type interconnecting at different locations in the same study area. Based on their flow impacts on the new line, Resource A can achieve full capacity deliverability status with only 50 MW of flow impact, whereas Resource B would have 90 MW of flow impact to achieve full capacity status. If the auction clears at \$5,000 per MW and both resources are winning bidders, then

Resource A will pay \$250,000 (50 MW \* \$5,000) and Resource B would pay \$450,000 (90 MW \* \$5,000) to obtain full capacity deliverability status through this process.

If a project's auction payment for a winning bid exceeds its first required GIP financial posting, then its auction payment would be considered sufficient for entry to Phase II; otherwise it would have to make up the difference. All other projects (i.e., non-winners in the auction) wishing to continue to GIP Phase II must post the normal GIP Phase II required amounts.

In order to receive the deliverability from TPP identified network upgrades, a project must meet milestones specified in its LGIA towards its commercial operation date. If the project meets all required milestones, then the ISO will refund its auction payments when commercial operation begins. If a project fails to meet these milestones, the ISO will revoke the allocation of TPP-based deliverability to that generating resource. Consistent with existing ISO tariff provisions, a project at risk of failing can be sold to a new developer and maintain its queue position and deliverability, but deliverability cannot be transferred to another project. If a project fails, the released capacity for deliverability will be available for reallocation during the next allocation cycle.

#### **B. Single-shot closed bid auction**

In a Single Shot Closed Bid Auction, an IC would submit a price-quantity bid reflecting the amount of the TPP-based deliverability it wants for its project and the price per MW it is willing to pay. The ISO would then clear winning bids so as to maximize the total auction revenues, taking into account each project's flow impacts on the TPP-identified transmission facilities that support its deliverability. The lowest price winning bid would set the market clearing price that all winning bidders would pay.

Under either of the auction design alternatives, the timeline would feature many of the same steps as in the LSE Choice and Ranking approaches, except for steps 6-8.

6. Auction opens February 1; ISO releases results by March 1.
7. ISO finalizes award of TPP-based deliverability status in late March after Board approval of final comprehensive transmission plan.
8. It is possible under option B that there will be one project whose auction bid puts it on the boundary, i.e., it would be partially but not fully deliverable as a result of this approach. In that situation the project can elect partial deliverability status based on the amount of deliverability available without triggering any further network upgrades.

## 4.4 Pro Rata Allocation

In the pro rata allocation approach all projects will be allocated a pro rata share of the deliverability created by TPP identified network upgrades on which they have significant flow impacts (using today's five percent threshold for determining cost responsibility in the GIP).<sup>1</sup> The primary challenge with this methodology is determining when to make the allocation. There is an additional complication to this approach because, in contrast to the other three approaches where some projects receive full deliverability and others are required to pay for their delivery network upgrades, in this approach each project's share of the TPP-based deliverability will depend on how many projects in the area decide to continue to Phase II. For the working group discussion the ISO suggests a two-step allocation process to address this complication.

Consider the following example. Suppose that the comprehensive TPP plan identifies 1000 MW of deliverability in an area, and assume that there are four projects requiring a total 1400 MW of deliverability in this area. Project A requires 200 MW of deliverability (or 13% of the total requested deliverability), Project B requires 300 MW (22%), Project C requires 400 MW (29%), and Project D requires 500 MW (36%). Assuming all projects have the same flow impacts on the relevant network upgrades, projects A, B, C and D receive, respectively, 13% (130 MW) of the TPP-based deliverability, 22% (220 MW), 29% (290 MW) and 36% (360 MW). Similarly, costs for network upgrades needed to increase deliverability beyond the TPP identified level will be shared in a pro rata fashion by all four projects. No project receives full deliverability under the TPP allocation, but they all receive some level of deliverability.

Using the example above, the two-step approach suggested for discussion would work as follows. First, the ISO would determine pro rata allocations for all projects that participated in GIP Phase I, under the hypothesis that all projects will continue to Phase II. In a sense these initial allocation amounts would be minimum amounts for the projects, which would only increase if some of the projects fail to make their Phase II postings. Based on these initial MW amounts, each IC must decide whether to make its Phase II posting, and once these postings are made the ISO will calculate a final award of TPP-based deliverability based on the projects that are participating in Phase II. If all projects continue to Phase II, the final awards will be the same as the initial awards. Suppose instead that project A decides to drop out after seeing its initial award and only projects B, C, and D post for Phase II. The ISO will then reallocate the 1000 MW of deliverability such that project B receives 25% (250 MW) of the deliverability, project C receives 33% (330 MW), and project D receives 42% (420 MW).

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<sup>1</sup> Note that today's GIP Phase I and Phase II study processes essentially use a comparable pro rata allocation procedure in determining each project's cost responsibility for network upgrades.

As an additional example, suppose that both A and B decide not to continue into Phase II. Projects C and D would then receive 400 MW and 500 MW of deliverability respectively. In other words, they would become fully deliverable. In this scenario, there would be 100 MW of deliverability that would be available in the next allocation process.

The timeline for the pro rata approach would feature the same steps as in the other three approaches, with the exception of steps 6-8.

6. Projects receive their initial allocations from the ISO by February 14, 2013.
7. ICs wishing to continue make their required Phase II postings by March 15.
8. Based on the amount of projects continuing to Phase II the ISO calculates final allocations of TPP-based deliverability and announces these to ICs by March 31, 2013.

## **5 Possible further provisions to promote effective management of the existing queue**

The ISO recognizes the importance, which many stakeholders emphasized in their comments, of managing the existing interconnection queue so as to ensure that projects remaining in queue are progressing appropriately towards their commercial operation dates. As such the ISO agrees that the working group discussions should consider ways to improve the effectiveness of our queue management processes. At the same time, these discussions should recognize that the ISO has already undertaken significant activities to clarify its business process for queue management, and these activities should provide the context in which any additional measures are considered.

The California ISO is clarifying its internal business process, consistent with the ISO tariff, for managing the generator interconnection queue. As part of this process, the ISO will confirm that generation projects in the queue are advancing toward commercial operation. The ISO will begin its review with generation projects that have missed their commercial operation date (“COD”) or have a COD before July 1, 2012; requesting additional information regarding a revised COD and other information to get their interconnection agreement milestones current. The second step is to review and track all interconnection agreements, starting with oldest agreements, to make sure that projects are meeting their milestone requirements and work with those projects that have not. To make this process successful a new position was developed and filled at the ISO, the Senior Generation Queue Management Specialist who is working with the interconnection specialist team and legal department.

On October 18 the ISO issued two Technical Bulletins regarding the generator interconnection queue management process, and material modifications and suspensions (links below).

- [http://www.aiso.com/Documents/Generator%20interconnection%20technical%20bulletins/TechnicalBulletin-GeneratorInterconnectionQueueManagementOct18\\_2011.pdf](http://www.aiso.com/Documents/Generator%20interconnection%20technical%20bulletins/TechnicalBulletin-GeneratorInterconnectionQueueManagementOct18_2011.pdf)
- [http://www.aiso.com/Documents/Generator%20interconnection%20technical%20bulletins/TechnicalBulletin-MaterialModification\\_SuspensionOct18\\_2011.pdf](http://www.aiso.com/Documents/Generator%20interconnection%20technical%20bulletins/TechnicalBulletin-MaterialModification_SuspensionOct18_2011.pdf)