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ATTACHMENT

CALIFORNIA PUBLIC UTILITIES COMMISSION
ENERGY DIVISION'S STAFF PROPOSAL ON THE
RPS CALCULATOR

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Introduction

This staff proposal outlines the updates and revisions that Energy Division staff proposes to make to major components of the Renewables Portfolio Standard (RPS) Calculator for the purposes of developing policy-based portfolios to use in generation and transmission planning processes. The RPS Calculator was first created in 2009 to inform the Commission's *33% Renewables Portfolio Standard Implementation Analysis*[1] ("Version 1.0") and updated in 2010 (and several times since) to provide plausible portfolios for use in long-term generation and transmission planning ("Versions 2.0 – 5.0").[2] The RPS Calculator occupies an integral role in current planning functions at both the Commission and the California Independent System Operator (CAISO). The RPS Calculator, utilizing data originally developed as part of the Renewable Energy Transmission Initiative (RETI)[3] and other sources, has been used widely for scenario analysis of portfolios of renewable resources that achieve the state's 33% RPS targets. By considering numerous factors such as resource cost and performance, transmission needs, environmental impacts and potential permitting hurdles, and the value that different types of renewable resources provide to ratepayers, the RPS Calculator brings together information from many sources to:

- Identify plausible portfolios of renewable resources to achieve the state's RPS targets and other policy goals at least cost;
- Help identify transmission projects that might be needed to accommodate these renewable energy goals; and

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[1] A copy of Energy Division's 33% Renewables Portfolio Standard Implementation Analysis report (June 2009) is available on the Commission's website. http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf.

[2] Current and past versions of the RPS Calculator are available on the LTPP section of the Commission's website. http://www.cpuc.ca.gov/PUC/energy/Procurement/LTPP/ltpp_history.htm.

[3] http://www.energy.ca.gov/reti/.

- Help identify renewable energy zones and transmission corridors that have relatively small environmental footprints.

The RPS Calculator does this by selecting RPS-eligible projects based on a number of criteria including commercial interest, net cost to ratepayers (including resource cost, transmission cost, integration cost, energy value and capacity value), timeline, and an environmental scoring methodology. Outputs from the RPS Calculator have been used directly in the Commission's Long-Term Procurement Planning (LTPP) proceeding and the CAISO's Transmission Planning Process (TPP).[4]

In the past several years, California's retail sellers have made considerable progress towards reaching the state's 33% Renewables Portfolio Standard (RPS) by 2020: in 2013, retail sellers served 23% of electricity sales with renewable power (up from 17% in 2010), and the CPUC has approved contracts for a large portion of the additional generation needed to reach the 33% requirement. As the development of much of this generation and the associated transmission is already underway, Energy Division staff seeks to extend the planning horizons beyond 2020 and consider investment in renewable generation that might exceed the current 33% target. Doing so requires careful consideration of the impacts of higher penetrations of renewables upon system operations and the infrastructure needed to support its integration. This is important because these impacts are expected to become more pronounced at higher levels of penetration due to "saturation effects"—the potential for diminishing marginal value of non-dispatchable resources as penetration increases.

In addition, the California market for renewable generation has matured considerably since the development of earlier versions of the RPS Calculator; renewable resource costs have declined while performance has improved. This continued technological

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[4] The RPS Calculator was formally added to the RPS proceeding on January 13, 2014. (R.11-05-005) *Third Amended Scoping Memo and Ruling of Assigned Commissioner.*

improvement has resulted in significantly lower costs for delivered renewable energy. In addition, it has literally changed the landscape of project development, opening up new areas to potential wind and solar development that were excluded in the past due to lower or marginal resource quality. At the same time, potential changes to the federal tax code may have an adverse impact on renewable energy project economics. These changes necessitate a number of updates to the RPS Calculator. Many of the relevant updates are included in the release of the RPS Calculator that accompanies this ruling ("Version 6.0"). Changes incorporated in Version 6.0 include:

- Updates to the methodology for calculating the Renewable Net Short (RNS), which determines the need for new renewable procurement;
- Updates to renewable resource cost, performance, and potential based on currently available technologies and projections of future cost trajectories;
- Updates to the calculation of levelized cost of renewables to reflect current power purchase agreements from third-party developers as well as scheduled sunset dates of state and federal tax incentives;
- A partial update to transmission availability and cost estimates reflecting current planning and development activities of CAISO;
- Revisions to the methodology used to value energy production from renewable generation, to reflect declining marginal returns with renewable saturation; and
- Revisions to the methodology used to value contribution of renewable capacity towards system reliability, to reflect declining marginal returns with renewable saturation.

In addition to these revisions that have been incorporated into Version 6.0, Energy Division staff is considering and seeks comment on several potential additional revisions:

- Development of a new methodology for incorporating operational flexibility considerations into project selection to take into account the impact of integrating intermittent renewable generation;

- Development of updated transmission costs for existing CREZs and costs for transmission into new areas not previously explored in detail;
- Whether or how to incorporate the option for energy-only contracts, i.e., contracts for which retail sellers will receive no Resource Adequacy credit, but for which transmission upgrades might be lower cost or not required;
- Development of a methodology to better incorporate the value of smaller utility-scale resources into the Calculator, including consideration of specific locational value such as reduced system losses and deferral of transmission and distribution investments; and
- Whether or how to incorporate secondary costs and benefits such as workforce development or geographic considerations into the RPS Calculator portfolio development.

RPS Calculator Update Schedule

The schedule to update the RPS Calculator has been constructed to meet the needs of both LTPP and the CAISO within the next two years. The Track 1 and Track 2 schedule of activities that are outlined below and in Table 1 are subject to change due to the complexity of the issues that need to be addressed. Energy Division staff will review the pre-workshop comments received from parties to determine if any changes to the schedule need to be made.

Track 1 – Provide RPS Portfolio to CAISO to Conduct a Special Study to Inform the 2015-2016 TPP

Background

In general, the CAISO annual TPP study process begins in February of each year and concludes via approval of the final study plan by CAISO's Board the following March. Currently, the CAISO is preparing for its upcoming 2015-2016 TPP cycle beginning in February, 2015. The commencement of the study process begins with the submission of a final study plan by the CAISO to stakeholders. Before this occurs, staff of the CPUC, CAISO and CEC collaborate beginning in August to establish, in part, what scenarios (i.e., Trajectory, High DG, etc.) should be developed to assist in the CAISO TPP study process. The scenarios incorporate RPS Portfolios developed using the RPS Calculator as well as other demand and supply assumptions.

2015-2016 TPP Cycle: Special Study

The stakeholder process for vetting updates to the RPS Calculator (Version 6.0) will not be completed in time for submitting updated RPS Portfolios as part of the larger planning scenarios to the CAISO in February 2015 to inform the 2015-2016 TPP cycle. The CPUC, CAISO and CEC staff expect that the RPS Portfolios developed in late-2013 for the 2014-2015 TPP cycle will be used to inform the upcoming 2015-2016 TPP study.[5] Since the new RPS Calculator (Version 6.0) and new RPS Portfolios cannot be ready at the start of the 2015-2016 TPP cycle, the CAISO has requested that the CPUC staff provide a greater than 33% RPS Portfolio, generated by Version 6.0 of the RPS Calculator when it is complete. This will form the basis for a special study by the CAISO within the 2015-2016 TPP cycle that considers an RPS penetration level greater than 33%. Therefore, Energy Division has established the Track 1 stakeholder process to vet all the fundamental elements of the updated RPS Calculator that are critical to adequately develop a greater than 33% RPS Portfolio to assist in the CAISO's special study. Table 2 lists the core elements of the RPS Calculator that must be updated to fulfill the CAISO's requirement for a greater than 33% RPS Portfolio. As seen in Table 1, Energy Division staff is targeting a Ruling that would adopt these updates in April 2015 and transmittal

[5] In early 2014 CPUC, CEC, and CAISO staff discussed the pros and cons of producing new RPS portfolios for the 2015-2016 TPP cycle using the current version of the RPS Calculator. While it is preferable to provide the CAISO TPP process with the most up-to-date planning information possible, staff reached consensus that there are challenges with producing new RPS Portfolios in February 2015 for the 2015-2016 TPP cycle. The current RPS Calculator would, in all likelihood, produce RPS Portfolios without significant differences from those submitted to the CAISO for the 2014-2015 TPP cycle. On that basis, no new RPS Portfolios from the current RPS Calculator will be provided to CAISO for the 2015-2016 TPP cycle. Minor data updates to specific RPS Portfolio assumptions will be made without "re-running" the entire current version of the RPS Calculator.

of the greater than 33% RPS Portfolio in June 2015. A substantial portion of the first workshop and all of the second workshop in Track 1 will be spent vetting these core components. Where appropriate, stakeholder-vetted work conducted in Track 1, such as the CAISO's development of transmission cost estimates as an outcome of the special study process in 2015, may be used in Track 2 to inform RPS Portfolios developed for the 2016 LTPP and 2016-2017 TPP cycles.

Track 2 – Finalize Updates for Version 6.1 of the RPS Calculator to Inform 2016 LTPP and 2016-2017 TPP

Track 2a

Energy Division's objective is to finalize all of the updates necessary for producing RPS Portfolios to inform the 2016 LTPP and 2016-2017 TPP studies that begin in February of 2016, and is targeting August 2015 to adopt the updates in a Ruling for final submittal of the RPS Portfolios to LTPP and the CAISO in October 2015.

A portion of the first workshop(s) will be dedicated to discussing additional components of the RPS Calculator that parties believe Energy Division should develop and have adopted in a Ruling to inform the next LTPP and TPP cycles. Table 2 under the heading Task 2a lists additional components that will be addressed in Track 2. This Ruling addresses each of these components and provides a number of questions for parties to answer in pre-workshop comments that will inform a discussion in the first workshop on how to prioritize the topics for consideration in a separate Ruling to be issued in January 2015, as can be seen in Table 1. Subsequent workshops in Track 2a will be utilized to vet the staff proposals that are developed based on party comments. A final Ruling planned for August 2015 will adopt updates to the RPS Calculator after which the RPS Calculator will be utilized to develop portfolios for the 2016 LTPP and 2016-2017 TPP in late 2015.

Track 2b

1. Environmental Considerations in Planning and Procurement

Versions 2.0-5.0 of the RPS Calculator included a methodology that was used to generate an environmentally-preferred RPS portfolio. This environmental scoring approach was created in 2010 and utilized the same map that was used in the 2010 LTPP RETI process. Recent updates to the resource potential estimates that are incorporated in Version 6.0 of the RPS Calculator reflect a broader range of development locations that are not represented in the 2010 LTPP RETI study. Therefore, Energy Division staff plans on updating the environmental scoring methodology in a separate Ruling in the near future and vet the updated methodology with stakeholders before being incorporated into the RPS Calculator. As shown in Table 1, once an environmental scoring methodology is fully vetted and agreed upon by parties, it will be incorporated into Version 6.1 of the RPS Calculator before the development of RPS portfolios for the 2016-2017 TPP cycle. Until this time, the RPS Calculator will not have an environmental scoring methodology.

2. Aligning Generation and Transmission Planning With Renewable Procurement

While this staff proposal focuses primarily on updates to the RPS Calculator, Energy Division staff recognizes that many of the issues addressed within this ruling have broader implications for the development and procurement of renewable resources, including, an impact on the RPS offer bid selection methodology used in the investor-owned utilities' (IOU) renewable procurement process. Energy Division staff include a question in this ruling asking parties to comment on to what extent the IOUs' least-cost, best-fit (LCBF) methodologies should be consistent with the logic used in the Net Market Value (NMV) calculation in Version 6.0 of the RPS Calculator. Establishing this linkage could enhance the Commission's and the utilities' ability to achieve RPS procurement requirements while procuring resources with the best combination of values to ratepayers.

Table 1 – Two Track Process for Vetting 6.0 of the RPS Calculator and Vetting and Adopting Version 6.1 and 6.2 of the RPS Calculator

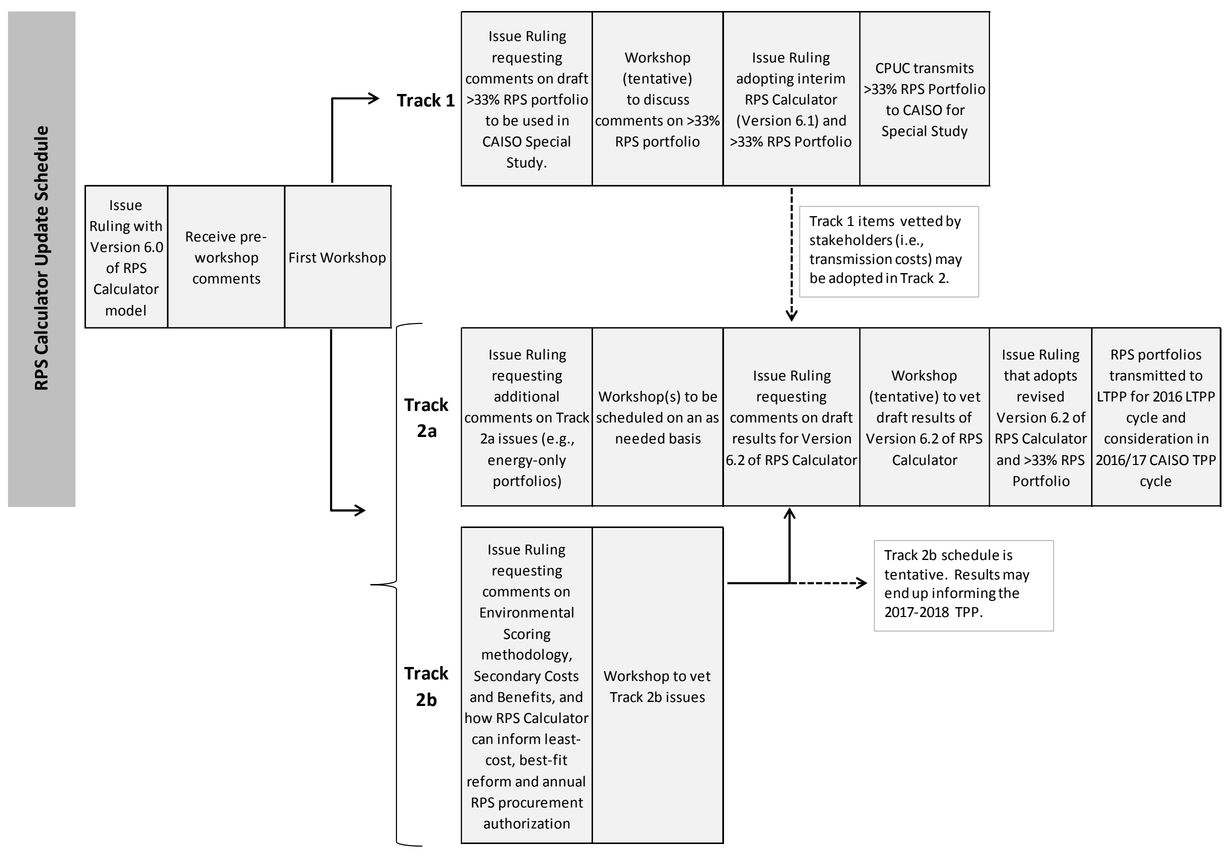

Table 2 – Track 1 & 2 RPS Calculator Updates and Revisions

Tracks	Updates and Revisions
Track 1: Version 6.1 • Develop >33% RPS Portfolio • Complete updates by Q2 2015 to inform 2015 CAISO Special Study	• Renewable Net Short (RNS) methodology • Resource potential • Levelized cost of energy values • Energy value • Capacity value • Transmission costs and methodology
Track 2a: Version 6.2 • Complete updates to inform 2016 LTPP 2016-2017 TPP cycle	• The cost of integrating renewable resources • Updated transmission costs • Treatment of energy-only and partially-deliverable options • Treatment of small utility-scale projects (<3MW) • Other stakeholder priorities
Track 2b: Version 6.2 or 6.3 • Complete updates to inform 2016-2017 TPP or 2017-2018 TPP	• Environmental scoring methodology • Methodology for considering secondary costs and benefits • Consider how RPS Calculator can inform least-cost, best-fit reform and annual RPS procurement authorization

Informational Materials Explaining Updates and Revisions to the RPS Calculator (Version 6.0)

Energy Division staff has prepared informational materials to assist parties' review of staff's proposed updates and revisions to the RPS Calculator (Version 6.0). These materials will also help parties respond to the questions included in the attached Energy Division staff proposal. These informational materials are available at the Recent Updates section of the RPS section of the Commission's website.[6]

[6] http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm.

Pre-Workshop Questions

The pre-workshop questions below are organized by subject matterand the top of each section references the corresponding informational materials. For example, the section header for questions related to the Renewable Net Short Methodology includes the title of the corresponding informational materials, i.e., (RPS_CalcV6.0_RNS.ppt). Parties should use the questions and presentations provided as attachments to this Ruling to assist in providing comments before the first workshop.

Renewable Net Short Methodology (RPS_CalcV6.0_RNS.ppt)

The Renewable Net Short (RNS) methodology in Version 6.0 of the RPS Calculator approximates the current procurement RNS methodology.[7] The Commission requires that retail sellers use this RNS methodology when filing annual RPS procurement plans. The Commission's RNS methodology employed in the RPS procurement planning process uses standardized inputs and assumptions for retail sellers to create an "optimized" RNS. The optimized RNS will include a retail seller's confidential portfolio optimization strategy including any plans to sell, apply, or procure in future years, RECs in excess of an RPS procurement requirement. The RNS methodology does not assume automatic re-contracting of expiring contracts. Differences between the RNS methodology in Version 6.0 of the RPS Calculator compared to the most recent version of the RPS Calculator include:

1) The "Discounted Core" methodology[8] has been replaced with a risk adjustment to the entire portfolio to ensure that the portfolios created

[7] See, Administrative Law Judge's Ruling on Renewable Net Short (May 21, 2014) (R.11-05-005) http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M091/K331/91331194.PDF.

[8] A definition of the methodology used to determine if an RPS project was classified as a "Discounted Core" project (also referred to as a "commercial" project), can be found in the Assigned Commissioner's Ruling Technical Updates to Planning Assumptions and Scenarios for use in the 2014 Long Term Procurement Plan and 2014-15 CAISO TPP (May 14, 2014) (R.13-12-010). http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M091/K181/91181771.PDF.

by the RPS Calculator include projects with a Commission-approved power purchase agreement;

2) RPS projects with an expiring contract over the planning period will be added to the supply of available resources, rather than being automatically included in an RPS portfolio; and

3) RPS procurement rules allow an IOU to meet RPS procurement requirements with surplus RECs, as a result of RPS procurement in excess of the RPS procurement requirement in a prior RPS compliance period. If an IOU forecasts RECs in excess of its RPS procurement requirement, a portion of those RECs will be used to meet the RPS procurement requirement before selecting incremental renewable resources to meet an RNS. Prior versions of the RPS Calculator did not account for an IOU's surplus RECs when calculating the IOU's RNS. RPS procurement rules allow an IOUs to meet RPS procurement requirements with surplus RECs.

Risk-adjustment Methodology

The use of a risk adjustment methodology for calculating the RNS is a structural change to the architecture of the RPS Calculator. Originally, the RPS Calculator selected generation to meet the gap between existing present-day renewable generation and a specified future RPS compliance obligation, i.e., the RNS. Renewable resources were selected sequentially to meet an RNS; first from the "Discounted Core"—a specified subset of projects that had a Commission-approved contract and met a minimum permitting threshold (permit application deemed complete)—and subsequently from a pool of projects comprising both remaining commercial projects not included in the Discounted Core and potential generic projects.

As part of the effort to align renewable planning with RPS procurement, Version 6.0 of the RPS Calculator includes all projects that have a CPUC-approved power purchase agreement (PPA) in the portfolios it creates. This results in portfolios that reflect the current status of RPS projects, at the time the dataset is included in the model. In recognition of the fact that not all projects with CPUC-approved contracts will ultimately achieve commercial operation, the generation contribution of these future projects towards an IOU's RPS compliance requirement is adjusted downward. The risk-adjustment methodology is based on an analysis of the historic and forecasted RPS project failure rates of CPUC-approved contracts. In the future, Energy Division staff proposes to review RPS project failure data and adjust the failure rate assumed in the RPS Calculator on an annual basis, as appropriate.[9] This methodology eliminates the use of the discounted core in the RPS Calculator RNS and eliminates the subtraction of any CPUC-approved projects from the portfolio submitted to CAISO for its TPP.

One result of this revision is that the Version 6.0 of the RPS Calculator will develop portfolios of resources that exceed the specified RPS procurement requirement, in order to account for the risk of project failure. While the expected generation of renewable energy is expected to be sufficient to meet the target, after accounting for any project failure, it is difficult to know in advance which projects are likely to fail. Thus, in order to ensure compliance with a specified target, it is necessary to procure—and to begin the project development, and potentially, the transmission development processes for—resources in excess of the RPS target in order to account for project failure on a portfolio basis. Project failure is assessed on a portfolio basis in order to avoid singling out and excluding individual projects, thereby potentially creating a "self-fulfilling prophecy" where projects fail because they are not included in the portfolios that are developed in the RPS Calculator and sent to the CAISO for consideration in the transmission and planning process. This methodology also avoids divulging confidential information about any one RPS project.

[9] Retail sellers provide information about RPS project failure rates to the Commissions with each annual RPS procurement plan. See, Administrative Law Judge's Ruling on Renewable Net Short (May 21, 2014) (R.11-05-005).

Utilization of Banked RECs

In prior versions of the RPS Calculator, an RNS was calculated for each year and did not account for the possibility of RPS flexible compliance, which allows retail sellers to bank surplus RECs to meet RPS compliance requirements in subsequent periods. It is important to consider excess procurement because it has a significant impact on an IOU's RNS calculation in any given year. For example, an IOU with a significant amount of RECs through early compliance in its excess procurement bank, may allow them to defer procurement of additional RPS resources needed to achieve its RPS procurement requirement. The RNS methodology used in Version 6.0 of the RPS Calculator calculates retail sellers' procurement positions, including its bank of excess procurement, relative to RPS target for each year. For the purposes of RPS resource planning, the RNS is calculated using a simple assumption that excess RECs are utilized evenly over a 10-year forward period on a rolling basis. This assumption is intended to serve as a proxy for the confidential banking strategies used by the IOUs and reflected in their respective optimized RNS that the Commission adopts on an annual basis in the RPS procurement planning process.

Expiring Contracts

Versions 1-5 of the RPS Calculator assumed 100% re-contracting of all resources with expiring contracts. Version 6.0 of the RPS Calculator does not automatically assume re-contracting with these resources to more accurately reflect how these resources are treated in the IOU's RPS procurement process, as directed by the Commission. In Decision (D.) 13-11-024, the Commission stated that "we refrain from requiring any additional least-cost, best-fit (LCBF) value be applied to offers from existing facilities to promote contracts with existing facilities over new projects…"[10] A large number of the utilities' existing contracts will expire over the course of the coming decade, requiring procurement decisions about whether those contracts should be renewed or replaced with other resources. Version 6.0 of the RPS Calculator evaluates this tradeoff explicitly by adding projects associated with expiring contracts back into the supply of available resources and comparing them against the value of new potential renewable resources when creating an RPS portfolio. Expiring contracts may be selected for re-contracting if they are competitive relative to other renewable resources.

Questions

Please use the questions below as a guide in providing comments on the approach used for calculating the RNS in the RPS Calculator.

Q1. Energy Division's proposal that projects with CPUC-approved PPAs be automatically included in the policy-preferred portfolio, which is used in the CAISO's TPP, is predicated on the assumption that projects with a CPUC-approved PPA are sufficiently viable for the purpose of long-term generation and transmission planning. If you do not agree with the above assumption, please identify the necessary changes to the RPS procurement process to make the above assumption true.

Q2. Assuming a CPUC-approved PPA is not an appropriate indicator of project viability for purposes of long-term generation and transmission planning, how should the Energy Division staff determine which "commercial projects" to include in the policy-preferred portfolio that the CAISO studies in its TPP?

[10] See, Decision Conditionally Accepting 2013 Renewables Portfolio Procurement Plans and Integrated Resource Plan And On-Year Supplement, at 15-18. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M081/K872/81872675.PDF.

Q3. Should a project with a Commission-approved PPA be included in the policy-preferred portfolio sent to the CAISO for TPP purposes even if it will trigger the need for a major new transmission project? Why or why not?

Q4. Do you agree with the concept of risk-adjusting commercial projects in the RPS Calculator to derive a renewable net short consistent with RPS need authorization approved in the IOUs' annual RPS procurement plans?

Q5. Should the generation from generic projects be risk-adjusted to reflect their potential failure?

Q6. Do you agree with the proposal that projects with expiring contracts in the RPS Calculator (Version 6.0) should be treated in the same manner used by the IOUs when developing long-term RPS procurement plans (See D.13-11-024)? If not, how should RPS facilities with expiring contracts be treated in the RPS Calculator? Explain why the same or different approach is preferred.

Q7. For the purposes of resource ranking and selection, existing RPS projects with expiring contracts are assigned 25% of the capital costs of a new project (assuming some additional capital expenditures would be needed to prolong the economic lifetime of the plant). Is this an appropriate assumption? If not, what methodology should be used to assign costs to RPS projects with expiring contracts in the resource ranking and selection process of the RPS Calculator?

Q8. Additional RPS procurement by publicly-owned utilities (POUs) identified in the RPS Calculator may trigger additional transmission upgrades in the CAISO balancing authority area. Currently, the Renewable Net Short methodology in the RPS Calculator does not account for generation associated with RPS projects under contract with, or owned by, POUs in CAISO's service territory. Because POU's are not regulated by the CPUC, generation data for POU projects in the CAISO control area will need to be collected. In addition, if the RPS Calculator will be developing greater than 33% RPS portfolios for the CAISO control area, future POU/RPS projects in the CAISO control area will need to accounted for in the RPS Calculator's RNS. How should the RPS Calculator account for future generation in the CAISO balancing authority area that POUs may procure to meet current and future RPS requirements?

Renewable Energy Resource Potential and Cost Update (RPS_CalcV6.0_ResourcePotentialandCost.ppt)

Estimates of renewable resource potential and technology costs in the RPS Calculator have not been comprehensively updated since 2010. Original inputs to the RPS Calculator were based on cost and performance data developed as part of the Renewable Energy Transmission Initiative (RETI). RETI identified "Competitive Renewable Energy Zones" (CREZs) throughout the state—specific locations with associated transmission corridors where the quantity and quality of potential renewable resources might support development. For Version 6.0, Energy Division staff in early 2013 retained consultants to update these estimates for renewable resource cost and potential in-state, as well as, out-of-state.[11]

In general, resource potential for solar and wind resources has expanded considerably in the past several years due to advances in technology and declining costs. As a result, the geography of renewable potential has been revisited in this effort, and the

[11] Black & Veatch and Energy and Environmental Economics, Inc (E3) are the consultants fulfilling this work.

narrowly-defined CREZs developed in the RETI process have been replaced with a more comprehensive classification scheme that provides an overlay that is more closely related to the state's political boundaries. For their expanded coverage of the state's renewable potential, the new zones used in the RPS Calculator are described as "Super CREZs."

Super CREZs are larger and more comprehensive CREZs. Previous CREZs identified the best resources for large scale transmission development considering technical, economic and environmental factors. These CREZ had specific boundaries, sometimes capturing specific project boundaries and interconnection lines. The CREZ boundaries were purposefully made as small as possible ("shrink-wrapped") to minimize perceived environmental footprint. Super CREZ are intended to capture most of the resources in California regardless of relative economic or environmental considerations. Unlike the old CREZ selection process that identified very specific locations of the highest-quality resources, Super CREZs might include an entire county with a range of resource quality within it. Super CREZs have the following attributes:

- More comprehensive coverage – boundaries are larger and contiguous throughout the state
- Not used for siting or environmental assessment - used for categorization and assigning transmission costs
- Super CREZ boundaries are less meaningful because the super CREZ definition is more inclusive from a resource perspective

The new Super CREZs are generally expansions of old CREZs used in Version 5.0 of the RPS Calculator. However, the Black & Veatch assessment identified a number of new resource areas where resource development potential has not been considered historically. The largest of these new regions, located in proximity to the Sacramento River in the Central Valley, is a newly identified Super CREZ with the potential to develop and deliver approximately 3,000 MW of new wind capacity. Assumptions on the availability of this resource and its quality—as well as those identified in other regions in the state—may alter the prioritization of generic resource selection in the RPS Calculator under higher renewable penetration levels.

Questions

Please use the questions below as a guide in providing comments on the resource potential and cost updates.

Q9. Do you agree with the methodology taken to expand the original competitive renewable energy zones or CREZs? Is the methodology used for the renewable resource assessment reasonable for generation and transmission planning purposes?

Q10. Has the methodology taken to expand the original CREZs failed to identify any RPS resources that should be included in the RPS Calculator?

Q11. Do you agree that the capital cost, operating costs, and performance assumptions are reasonable for this level of analysis? If not, please specify the inputs and assumptions that you believe need to be revised and provide a rationale.

Levelized Cost of Energy (RPS_CalcV6.0_LCOE.ppt)

While CPUC staff has made minor adjustments to the LCOE calculations in the RPS Calculator to reflect declining solar costs in the past several years, the LCOE values in the RPS Calculator have not been updated comprehensively since 2010. Version 6.0 of the RPS Calculator includes updated LCOE values to reflect changes in resource costs, changes in tax incentive programs, improvements in technology, and developments in project finance. LCOEs were calculated using a cash flow model assuming that projects would be developed by a third party and sold to a utility through a power purchase agreement.[12]

Questions

Please use the questions below as a guide in providing comments on the LCOE assumptions and calculations.

Q12. Do you agree with each of the assumptions made in the LCOE calculations, including assumptions related to state and federal tax incentives and the cost of capital? What assumptions, if any, should be modified and on what basis? Recommended changes should be supported with publicly available information, to the greatest extent possible.

Treatment of Transmission Costs in Version 6.0 *(RPS_CalcV6.0_Transmission.ppt)*

It is important to consider the costs associated with new transmission investments that may be necessary to achieve RPS portfolios higher than 33% RPS. Large-scale renewable generation sources in remote areas may require transmission development that distributed resources close to load do not. Therefore, the costs and environmental impacts of such transmission additions need to be included as part of the resource selection process in the RPS Calculator.

The availability of existing transmission and the cost of new transmission needed to deliver new renewable generation to California loads have been key inputs into the resource ranking and selection algorithm in previous versions of the RPS Calculator. In addition, the identification of a Super CREZ that may require new transmission development is an important step in starting the transmission planning process.

[12] Aside from technology-specific cost and performance data, assumptions for this pro-forma financing model were developed by E3.

Transmission options to each Super CREZ in the model are characterized based on the amount of incremental capacity that can be interconnected with full deliverability as provided by the CAISO and are classified in three tiers:

a. Available on existing transmission: capacity that can be interconnected to the existing transmission system with full deliverability with no need for upgrades;
b. Available with minor upgrades: capacity that can be interconnected with relatively minor upgrades to the existing transmission system (e.g., reconductoring, upgrading a substation, etc.); and
c. Available with major upgrades: capacity that can be interconnected only with the construction of a new high-voltage transmission line.

In addition to these tiers, new out-of-state resources are assumed to require new transmission development. Out-of-state transmission costs are based on Black & Veatch's estimates of the capital costs of new transmission facilities that were developed to inform the transmission planning studies of the Western Electricity Coordinating Council (WECC) and the Western Renewable Energy Zones project.[13]

For in-state resources, assumptions regarding available capacity for existing transmission and cost for minor upgrades are provided by the CAISO based on its interconnection studies, which identify the areas that might accommodate higher penetrations of renewables with limited or no upgrades as well as the specific projects needed to provide deliverability for the incremental resources. Because these inputs are determined based on the CAISO's interconnection studies, which are in turn based on commercial interest from developers as expressed in the CAISO interconnection process, the availability of existing transmission or upgrades are characterized for only

[13] These costs are published in the report, Capital Costs for Transmission and Substations, Updated Recommendations for WECC Transmission Expansion Planning (February 2014) http://www.wecc.biz/committees/BOD/TEPPC/External/2014_TEPPC_Transmission_CapCost_Report_B+V.pdf.

some of the Super CREZs identified. Further, even in areas where the CAISO has conducted interconnection studies, it is possible that minor upgrades beyond those identified in the interconnection studies could enable incremental deliverability.

The "major upgrade" category acts as the functional backstop for transmission in the RPS Calculator: once available existing transmission and minor upgrade capacity have been exhausted, the RPS Calculator attributes the cost of building new transmission to candidate resources in the ranking and selection process.

Development of Additional Transmission Costs for Version 6.1

Version 6.0 of the RPS Calculator does not include updated transmission cost estimates for minor and major upgrades to access California Super CREZ beyond what has been identified by the CAISO. For areas not studied by the CAISO, the Calculator includes estimates held over from Version 5.0 of the model.[14] Energy Division staff intends to work with the CAISO and stakeholders to update these costs for Version 6.1 during Track 1 of the RPS Calculator work underway in the RPS proceeding (R.11-05-005). These transmission cost estimates may then feed into Track 2 to inform the 2016 LTPP and 2016-2017 TPP cycle. The following methodology for updating the transmission cost estimates will be used:

1. The 2010 estimates would be used as an initial starting point for the 6.0 Version of the Calculator.
2. The Calculator would be run with the initial estimates, and the most economical Super CREZs would be identified.
3. These Super CREZs would then be examined by the CAISO to update the major and minor transmission costs and transmission capacity estimates for each area.
4. The calculator would be re-run with the updated costs, and the most economical Super CREZs would be identified again.

[14] These estimates were originally developed in 2010 by E3.

5. If there are any changes in the list of most economical Super CREZs, these would be sent to the CAISO for re-study, returning to step 3.
6. This process would continue until the list of most economical Super CREZs does not change after updating the transmission cost and transmission capacity estimates. These costs would be incorporated into Version 6.1 of the RPS Calculator, which would then be vetted by stakeholders.
7. This iterative process would be repeated on an annual basis.

Treatment of Energy-Only Projects

All versions of the RPS Calculator up to and including Version 6.0 have assumed that all new renewable projects must be fully deliverable, and have assigned transmission costs intended to reflect the transmission upgrades needed to achieve full deliverability consistent with the CAISO study process. However, the CAISO transmission and interconnection process allows "energy-only" interconnection requests and interest in "energy-only" projects has recently increased for a number of reasons:

1. Prior to the "resource-balance" year, i.e., the first year during which new system capacity is needed, the market value of capacity is relatively low. This decreases the value of a resource being fully deliverable in the near term.
2. Transmission upgrades required to achieve deliverability may be relatively expensive when compared to the benefits in the form of avoided capacity procurement. For some resources it may not be cost-effective to invest in the transmission required for full deliverability.
3. The hours during which the system may experience capacity shortfalls are changing due to increased renewable resource deployment. Within RPS Calculator's modeling timeframe (i.e., 20 years), the peak "net load" hour (load minus must-run generation) is expected to occur after dark when solar energy is not producing. As a result, the capacity value of solar resources is expected to be lower after 2020, further reducing the economic reward for investing in deliverability.
4. At higher penetrations of renewable resources, energy-only transmission upgrades and some compensated curtailment of

renewable energy output may be required in order to maintain reliable operations.

In light of the reasons stated above, Energy Division staff is considering whether and how to calculate energy-only portfolios in Version 6.1 of the RPS Calculator.

Questions

Please use the questions below as a guide in providing comments on the development of transmission cost estimates for projects that are fully-deliverable and/or energy-only.

Q13. What information should be used to update transmission cost estimates associated with Super CREZs? Provide recommendations on how the Energy Division staff can improve upon its processes for updating the cost estimates for existing and new transmission included in the RPS Calculator.

Q14. Is the proposed iterative process between the CPUC and CAISO (outlined in seven steps in the above section, Development of Additional Transmission Costs for Version 6.1) for identifying major and minor transmission upgrade costs in areas where CAISO has not conducted many interconnection studies (e.g., the Sacramento River Valley Super CREZ) reasonable? If not, explain how these estimates should be developed and specify whether or not your proposal can meet the Track 1 and Track 2 schedules outlined in this Energy Division staff proposal.

Q15. The WECC Environmental Data Task Force (EDTF) has been collecting environmental data that may be useful for identifying potential new transmission routes.[15] Should this information be considered when estimating costs for major upgrades not identified by the CAISO? If so,

[15] Information about the WECC EDTF is available here: http://www.wecc.biz/committees/BOD/TEPPC/Pages/EDTF_Home.aspx.

how can this be incorporated into the RPS Calculator's transmission cost assumptions?

Q16. The RPS Calculator currently assumes that all new renewable generation must be made fully deliverable. Should the RPS Calculator be capable of evaluating energy-only and/or partially-deliverable projects? If so, how should the resource ranking and selection methodology be adjusted to reflect the impacts of such projects?

Energy Value (RPS_CalcV6.0_EnergyValue.ppt)

The addition of renewable resources to the power grid results in reduced or avoided costs for conventional generation. In particular, renewable resources provide *energy value* by displacing conventional fuel-consuming resources such as gas-fired power. However, the marginal energy value (and capacity value) provided by incremental renewable resources declines as generation capacity increases due to the saturation effect, i.e., displacement of increasingly efficient resources at the margin.

In addition, variable renewable resources impose some increased costs in the form of higher requirements for regulation and load-following reserves due to higher net load variability inside the operating hour, as well as additional operation and maintenance (O&M) costs due to increased ramping and cycling. At very high levels of intermittent generation resources, the power grid might not have enough operational flexibility to accommodate all of the net load conditions imposed by the combination of load and must-run renewable generation, necessitating curtailment of renewable generation and/or procurement of new flexible resources.

The methodology used to determine the Energy Value of renewables in Version 6.0 of the RPS Calculator has been revised to capture the declining marginal returns with renewable saturation. Specifically, as the amount of renewable generation increases, renewables displace increasingly efficient (lower cost) gas generators to a point at which the system becomes saturated with energy. At that point, the cost-based marginal value of generation is reduced to zero and renewable resources may be forced to be curtailed in order to ensure reliable system operations. The RPS Calculator has the capability to differentiate marginal Energy Value among up to seven general types of resources.

This methodology is implemented by comparing net load (total load minus non-dispatchable generation) for an average day in each month with the heat rates of thermal generators that could be dispatched to meet the residual needs using a simplified "stack" model of the generation supply curve for each month-hour combination (288 time periods during the year). The level of curtailment is estimated by comparing net load in each month-hour with an assumed minimum amount of flexible thermal generation (15% of gross load, based on historical analysis of CAISO operations): when the net load is below 15% of gross load, curtailment is assumed to occur. This methodology implicitly assumes that that all loads and must-run resources are perfectly inflexible (cannot be dispatched) and all dispatchable resources are perfectly flexible (have no constraints on their operational flexibility aside from the system-wide constraint on the minimum generation).

Additional curtailment of renewable output is likely to occur due to dispatch limitations on thermal generators, such as: minimum stable generation levels, upward and downward ramp rates on different time scales, start times, minimum up and down times, and other operating parameters. However, modeling of this additional potential for curtailment is complex and and labor-intensive; hence the Energy Division staff and consultants have not undertaken this modeling at this time. Nevertheless, the ability to capture the declining marginal value of renewable generation and the effect of increasing curtailment at higher penetration is a major update to the RPS Calculator.

Energy Division staff proposes to incorporate these costs into Version 6.1, as described in the Integration Cost Adder section.

Currently, the following seven categories are used: (1) baseload, (2) distributed solar PV, (3) utility-scale solar PV, (4) solar thermal, (5) solar thermal with storage, (6) wind (inland), and (7) wind (coastal). The value assigned to each category of resource is calculated based on a month-hour average production profile (average hourly production across an average day in each month).

Questions

Please use the questions below as a guide in providing comments on the Energy Value calculations.

Q17. Is the approach described above to calculating Energy Value using a simplified generation "stack" model appropriate? Are there other methodologies that should be considered that would incorporate saturation effects, such as declining energy value and increased curtailment with higher penetration?

Q18. Is the data used for the resource production profiles granular enough for the purposes of the RPS Calculator? If not, what additional information is needed?

Capacity Value (RPS_CalcV6.0_CapacityValue.ppt)

Capacity Value is another primary component of the NMV calculation used to rank competing generic renewable resources and reflect the value associated with a resource's ability to avoid procurement of conventional capacity. The capacity value attributed to each resource is the product of its *capacity credit* (the amount of capacity, in MW, that a renewable resource contributes towards resource adequacy targets) and the *avoided cost of capacity* (the cost of procuring generic resource adequacy capacity). Each of these components of the capacity value calculation has been updated:

- Whereas Versions 2.0-5.0 of the RPS Calculator assigned capacity credits to resources based on their deemed Net Qualifying Capacity (NQC), Version 6.0 uses the Effective Load Carrying Capability (ELCC) to quantify each resource's contribution to system reliability.
- Whereas Versions 2.0-5.0 used the long-run avoided cost of a new combustion turbine to value the system capacity needs avoided by investments in renewables, Version 6.0 recognizes California's current capacity surplus by valuing capacity at the market price for resource adequacy capacity in current markets until the system is forecast to reach load-resource balance, at which point the long-run value is used.

As with the energy value, capacity value is subject to saturation effects. That is, the marginal capacity value of a given resource declines as a function of its market penetration. This occurs because increased generation during certain hours of the year (e.g., during daylight hours in the summertime) may significantly reduce the probability of experiencing generation shortfalls (the loss-of-load probability, or LOLP) during those hours, while have little or no effect on LOLP during other hours (e.g., wintertime after dark). As penetration increases, the distribution of LOLP across hours of the year gradually shifts toward hours with less renewable production.

Version 6.0 of the RPS Calculator uses a new framework for capacity valuation at a system level. Specifically, Version 6.0 of the RPS Calculator uses ELCC values developed by E3 to attribute capacity credits to renewable generation. Energy Division staff will update the RPS Calculator with new values developed by the Commission when they become available.

E3 developed ELCC values using its Renewable Energy Capacity Planning (RECAP) Model. The RECAP model uses standard methodologies to calculate portfolio average and marginal ELCC values depending on a resource's market penetration.[16] . The avoided cost of capacity is evaluated in each year based on the CAISO system load-resource balance using a similar calculation to that developed in the LTPP proceeding. The product of the ELCC and the avoided cost is used in the resource ranking and selection processes.

The RPS Calculator has the capability to differentiate marginal ELCC among seven general types of resources. Computational limitations prevent the consideration of additional resource categories. Currently, the following seven categories are used: (1) baseload, (2) distributed solar PV, (3) utility-scale solar PV, (4) solar thermal, (5) solar thermal with storage, (6) wind (inland), and (7) wind (coastal).

Questions

Please use the questions below as a guide in providing comments on the Capacity Value calculations.

Q19. Is it appropriate to use ELCC values instead of NQC for planning purposes in the RPS Calculator?

Q20. Is this set of seven resources listed above reasonable for capacity valuation within the context of long-term renewable resource planning?

Q21. When evaluating the capacity value of new out-of-state resources that require new transmission, the RPS Calculator assumes that new transmission lines contribute 60% of their rated capacity to the state's

[16] The RECAP model was used in two E3 studies completed under contract with the CPUC: California Net Energy Metering Ratepayer Impacts Evaluation (http://www.cpuc.ca.gov/NR/rdonlyres/75573B69-D5C8-45D3-BE22-3074EAB16D87/0/NEMReport.pdf) and Technical Potential for Local Distributed Photovoltaics in California (http://www.cpuc.ca.gov/NR/rdonlyres/8A822C08-A56C-4674-A5D2-099E48B41160/0/LDPVPotentialReportMarch2012.pdf). In each study, the RECAP model was used to derive ELCC assumptions for solar PV used to evaluate the avoided costs of solar PV.

planning reserve margin. The 60% assumption is derived from the LTPP's load-resource balance calculation, where the assumed contribution of imports to the reserve margin is roughly 60% of the total physical impact capacity? Is this assumption reasonable? If not, what alternative assumption should be made?

Q22. Is the proposed approach used to forecast the avoided cost of system capacity appropriate for calculating capacity value? Please provide any recommendations for improving the methodology or alternative assumptions that should be used. (The methodology is explained in the RPS_CalcV6.0_CapacityValue.ppt)

Q23. As this methodology is based on the ability of renewable generation to provide system capacity, it does not currently account for additional value that a resource located in a capacity-constrained local area might provide. Should Energy Division staff consider updating the RPS Calculator to reflect incremental capacity value that resources located in areas with Local Capacity Requirements (LCR)? If so, what methodology should be used to determine this value? What capacity credit should be applied to resources located in LCR areas? What avoided cost of capacity should be assumed?

Q24. Is the ELCC work initiated in the Commission's Resource Adequacy proceeding (R.11-10-023) and the subject of an Energy Division Staff Proposal, relevant for the purposes of the RPS Calculator?[17] Why or why not?

[17] The Energy Division Staff Proposal, Effective Load Carrying Capacity and Qualifying Capacity Calculation Methodology for Wind and Solar Resources, was developed at the direction of the Commission in response to Senate Bill 2 (1X) (Simitian, Stats. 2011, ch.1) and discussed at a workshop on

Renewable Integration Costs (RPS_CalcV6.0_IntegrationAdder.ppt)

While an "Integration Cost Adder" has in principle been a part of the NMV formulation, in practice the Commission has not approved the use of a non-zero Integration Adder value for the utility's least-cost, best-fit evaluation of RPS resources. At the same time, Version 1 of the RPS Calculator applied a generic integration cost adder of $6/MWh to variable resources (wind and solar), and the value was increased to $7.50/MWh in Versions 2-5. Version 6.0 does not include an Integration Cost Adder at this time. However, Version 6.0 does account for some of the costs of integrating higher penetrations of renewable generation. Specifically, the Version 6.0 of the RPS Calculator accounts for the saturation effects on Energy Value and Capacity Value through the methodologies described above.

In order to focus stakeholder comments on the important integration cost issues, it is helpful to understand which impacts are already incorporated in Version 6.0 and which are not. The following table shows potential cost categories that could be included in an Integration Cost Adder, and their status in Version 6.0.

Category of Impact	**Status in RPS Calculator**
Energy Value: reduction in fuel, O&M and emissions costs due to availability of renewable energy	Included in Version 6.0 energy value calculation
Capacity Value: deferred or avoided investment in new generation capacity	Included in Version 6.0 capacity value calculation
Energy Value Saturation Effects: reduction in the per-MWh energy value of renewable output due to displacement of increasingly efficient gas plants	Included in Version 6.0 energy value calculation

January 27, 2014. In the D.14-06-050, the Commission directed Energy Division Staff to further develop its proposal, in consultation with parties.

at the margin	
Capacity Value Saturation Effects: reduction in the per-MW capacity value of renewable resources due to changing net load shapes and movement of peak net load hour into hours with less renewable production	Included in Version 6.0 capacity value calculation
Curtailment due to Overgeneration: curtailment of renewable energy output due to insufficient load to absorb all of the renewable output	Included in Version 6.0 energy value calculation
Operating Reserves: increased fuel, O&M and emissions costs due to increased net load variability inside the operating hour	Proposed for Version 6.1
Increased maintenance: increased O&M costs due to more ramping and cycling of thermal resources resulting from higher net load variability	Proposed for Version 6.1
Curtailment due to Inflexibility: curtailment of renewable output that is required due to insufficient operational flexibility to absorb all renewable output while maintaining ability to serve all firm load	Proposed for Version 6.1
Flexible Capacity Needs: procurement of flexible capacity in order to absorb larger quantities of renewable resources while maintaining ability to serve all firm load	Proposed for Version 6.1

Energy Division staff recognizes that integration costs are real and that they vary among resource types. Integration Cost Adders may be incorporated into Version 6.1 of the RPS Calculator (Track 2) that includes the following cost categories that are not already incorporated into the Energy Value and Capacity Value calculations described above:

a. Increased costs of carrying additional operating reserves to accommodate higher within-hour net load variability;
b. Increased power plant O&M costs due to more ramping and cycling of thermal resources resulting from higher net load variability;
c. Curtailment due to inflexibility of generation fleet; and
d. The costs of procuring new flexible resources.

Energy Division staff seeks comment on whether an Integration Cost Adder should be included in the RPS Calculator and if so, what values should be included. When addressing the questions, consider the integration adder questions in the March 26, 2014 Assigned Commissioner's Ruling (R.11-05-005)[18] and ongoing work in Phase 1A and Phase 1B of the LTPP proceeding (R.13-12-010) regarding operational flexibility. Parties need not repeat comments here that were already offered in that context.

Questions

Q25. In light of the potential for increased renewable penetration beyond 33%, is it important for the RPS Calculator to have an Integration Cost Adder?

Q26. Are the costs categories that are proposed to be included in the Integration Cost Adder methodology appropriate?

Q27. The discussion above in the Renewable Integration Costs section identifies a number of effects of renewable generation on system operations that could be included in a renewable integration cost adder, all of which result from limitations on the flexibility of the power system and the need to carry additional operating reserves. What methodology should Energy Division staff use to evaluate these costs?

[18] Assigned Commissioner's Ruling Identifying Issues and Schedule of Review for 2014 Renewables Portfolio Standard Procurement Plans. (March 26, 2014) (R.11-05-005)

Q28. Can the operation flexibility work underway in LTPP phase 1A and 1B (R.13-12-010) inform the development of an Integration Cost Adder for the RPS Calculator? Explain why or why not.

Q29. Allowing for economic curtailment of renewable generation can provide additional operational flexibility on a system seeking to integrate high penetrations of renewable generation by providing operators with a tool to control “net load” (load minus renewable generation). Should the RPS Calculator consider using renewable curtailment as the “default” solution to power system flexibility limitations for the purpose of renewable resource planning? If not, explain why not and whether an alternative approach should be used?

Q30. Are there any additional system costs imposed by higher penetrations of renewable resources that are not included in the table above?

Treatment of Small Utility-Scale Resources (RPS_CalcV6.0_DGMethod.ppt)

There is substantial interest in encouraging the procurement of distributed generation (“DG”) resources in California. In addition, with the dramatic drop in solar PV pricing over the past few years, small utility-scale projects have shown to be competitive with larger projects. Consequently, the Commission has established programs such as the Renewable Auction Mechanism (“RAM”) and Renewable Market Adjusting Tariff (“REMAT”) to target procurement of specified quantities of DG. In addition, Versions 1-5 of RPS Calculator included logic to ensure procurement of specified DG targets as well as the development of a “High Distributed Generation” portfolio in order to study the impacts of DG in the generation and transmission planning processes.

Prior versions of the RPS Calculator have defined DG as projects 20 MW and smaller but this has been changed in Version 6.0 to allow for a better consideration of the costs and benefits of small utility-scale resources. For the purposes of the RPS Calculator, small utility-scale resources are defined as projects interconnected at the distribution level that do not feed back to the transmission level. As a result, Version 6.0 of the RPS Calculator does not assign transmission costs to small utility-scale resources (other than interconnection costs). The RPS Calculator thus calculates the trade-off between small utility-scale resources and transmission-constrained renewables solely based on avoided transmission costs. However, there may be additional benefits (or costs) to small utility-scale resources. Specifically, there are a number of direct benefits that small-scale renewable projects located near loads may provide for ratepayers. These values may include:

- Reduced transmission system line losses;
- Avoided congestion costs;
- Avoided need for generation in capacity-constrained areas such as LCR areas;
- Deferral/avoidance of investments in transmission infrastructure; and
- Deferral/avoidance of investments in distribution infrastructure.

The applicability and magnitude of each of these values to small utility-scale projects may vary considerably with the location of the project, its point of interconnection to the grid, and its performance characteristics.

Version 6.0 of the RPS Calculator includes the resource potential associated with small utility-scale renewable generation located in close proximity to load based on a number of recent analyses, including E3's LDPV study[19] and work by Black & Veatch[20] to assess the potential for small-scale bioenergy and wind resources in the state. However,

[19] See: "Technical Potential for Local Distributed Photovoltaics in California," available here: http://www.cpuc.ca.gov/NR/rdonlyres/8A822C08-A56C-4674-A5D2-099E48B41160/0/LDPVPotentialReportMarch2012.pdf.

[20] These are described in the RPS_CalcV6.0_ResourcePotentialandCost.ppt.

reduced costs of distributed solar PV have significantly increased its economic potential, and a more thorough assessment may be necessary. Black & Veatch recently completed such an assessment for portions of Orange and Los Angeles counties. The assessment found significantly more potential than previous studies – particularly by including potential for solar PV development at parking lots. Further, the RPS Calculator does not currently have functionality to distinguish the impacts of such resources may have in comparison to large-scale renewables through their value to ratepayers. Energy Division staff intends to identify and quantify these attributes for Version 6.1 so that the RPS Calculator can be used to better evaluate the degree to which small utility-scale renewable generation can displace transmission-constrained renewable resources.

Questions

Please use the questions below as a guide in providing comments on incorporation of small utility-scale resources into the RPS Calculator.

Q31. Identified above are five categories of direct incremental value that small utility-scale renewable projects located close to load might provide (relative to large-scale renewable resources). Are there any additional ratepayer realized values that should be considered? If so, please describe how that value can be quantified in the RPS Calculator.

Q32. Is it realistic to assume that each of these values might be realized by the small-scale projects that could theoretically provide them? If not, what barriers prevent the realization of those values? How can these barriers be overcome?

Q33. Locational value for small-scale resources may in many cases be site-specific. For example, not every distribution feeder has a deferrable distribution investment, and many distribution feeders have peak loads that occur after sundown when PV resources are not producing. How, if at all, should the RPS Calculator incorporate location-specific values to ensure that small-scale projects are appropriately valued?

Q34. Is there a need to perform a more comprehensive assessment of small utility-scale solar PV resources in urban areas? If so, what level of granularity is appropriate for generation and transmission resource planning?

Aligning Generation and Transmission Planning with Renewable Procurement

Energy Division staff is seeking party comment on processes to better align generation and transmission planning with renewable procurement and has provided the following questions below to guide responses.

Questions

Q35. What modifications, if any, are necessary to the generation and transmission planning and procurement processes to ensure that in-state and out-of-state renewable resources, and associated transmission, are selected in a manner that minimizes net costs of delivered renewable energy while ensuring system reliability? What role should the RPS Calculator have in this process, if any, or is another process needed?

Q36. What implementation issues or challenges, if any, do you foresee in the use of Version 6.0 of the RPS Calculator to inform planning in the CPUC's LTPP and CAISO's TPP?

Q37. Should the NMV methodology, as adopted in the IOUs' annual RPS procurement plans, be informed by the NMV used for generation and transmission planning in the RPS Calculator? If so, please explain how.

Secondary Costs and Benefits

Many of the proposed modifications to the Calculator above address the core components of the NMV methodology. The NMV methodology is the result of the Commission's implementation of Public Utilities Code Section 399.13(a)(4)(A), which authorizes the Commission to establish the least-cost, best-fit RPS resource evaluation methodology.

Since the inception of the RPS program in 2002, the renewable energy market in California and the WECC has grown and matured significantly. With this experience, much has been learned about the breadth of impacts associated with RPS project development of the various RPS-eligible technologies, beyond the core metrics accounted for in the NMV calculation. Energy Division staff is seeking comments on whether additional ratepayer costs and benefits should be included in the NMV calculation used in the RPS Calculator. Stakeholders are encouraged to identify potential costs and benefits, such as project-specific pollution hazards and workforce recruitment, and explain how the proposed costs and benefits can be quantified and realized by ratepayers and incorporated into the RPS Calculator.

Questions

Q38. Is it appropriate to incorporate secondary values into the RPS Calculator, which develops RPS portfolios that will be used to inform the LTPP, the CAISO's TPP, and potentially, the RPS need authorization in the IOU's annual RPS procurement planning process? Explain why or why not.

Q39. If yes, what secondary costs and benefits should be incorporated in the NMV calculation? Please explain how costs and benefits should be quantified and to what extent they are realized by ratepayers.

Q40. What data sources should be used to develop quantitative secondary benefit metrics?

Q41. How, methodologically, should secondary benefit metrics be incorporated into the RPS Calculator for RPS portfolio development?

Q42. How much weight should the RPS Calculator put on secondary benefit metrics within, or relative to, the NMV calculation?

(END OF ATTACHMENT)