

## Stakeholder Comments Template

Submitted by	Company	Date Submitted
Matthew Barmack <a href="mailto:barmackm@calpine.com">barmackm@calpine.com</a> 925-557-2267	Calpine Corp.	June 22, 2016

Please use this template to provide written comments on the Clean Energy and Pollution Reduction Act Senate Bill 350 (SB350) Study initiative posted on April 25, 2016.

Please submit comments to [regionalintegration@caiso.com](mailto:regionalintegration@caiso.com) by close of business  
June 22, 2016

Materials related to this study are available on the ISO website at:  
<http://www.caiso.com/informed/Pages/RegionalEnergyMarket/BenefitsofaRegionalEnergyMarket.aspx>

Please use the following template to comment on the key topics addressed in the workshop.

<p><b>1. Are any of the study results presented at the stakeholder workshop unclear, or in need of additional explanation in the study’s final report?</b></p>
<p>Comment:</p>
<p><b>2. Please organize comments on the study on the following topic areas:</b></p> <ul style="list-style-type: none"> <li><b>a. The 50% renewable portfolios in 2030</b></li> <li><b>b. The assumed regional market footprint in 2020 and 2030</b></li> <li><b>c. The electricity system (production simulation) modeling</b></li> <li><b>d. The reliability benefits and integration of renewable energy resources</b></li> <li><b>e. The economic analysis</b></li> <li><b>f. The environmental and environmental justice analysis</b></li> </ul>
<p>Comment:</p> <p>Calpine appreciates the opportunity to comment on the preliminary results from the CAISO’s SB 350 studies (“the studies”). Calpine supports regionalization if implemented in a manner that reduces GHG emissions across WECC in a cost-effective manner. Calpine believes that an important way in which regionalization could help achieve regional GHG goals cost-effectively is by enabling the retirement of coal-fired generation and obviating the need for new gas-fired generation throughout WECC. The studies do not fully capture this potential benefit of regionalization because they assume that the portfolio of conventional generation in WECC will not change as a result of regionalization. Similarly, Calpine believes that the studies may understate the capacity cost savings associated with the load diversity benefits of a regional market. On the other hand, Calpine believes that the studies may overstate the benefits of regionalization with respect to wind development. In addition, the studies highlight the importance of carbon policy in addition to regionalization in achieving GHG goals. Finally, Calpine notes that the studies document significant environmental benefits of regionalization in disadvantaged communities due to reduced cycling of gas-fired generation and hence reduced NOx emissions in disadvantaged communities.</p> <p>More specifically, Calpine offers the following comments on the studies:</p> <p>First, the studies fail to account for how or whether regionalization might facilitate additional coal retirements.<sup>1</sup> Calpine believes that one of the primary ways in which</p>

<sup>1</sup> Arguably, the load diversity analysis indirectly captures this effect as well as the impact of regionalization on the need for new gas-fired generation discussed below. The production cost simulations, however, utilize the same fleet of conventional resources across all cases in the same year. Hence, they fail to capture the impact of the potential displacement of coal and new gas on production costs and GHG emissions.

regionalization could lead to lower GHG emissions is by enabling the retirement of coal-fired generation. Regionalization could facilitate the retirement of coal-fired generation by allowing load-serving entities that depend on coal-fired generation ready access to alternative and cleaner sources of energy and capacity. By assuming that the capacity of coal-fired generation does not vary across the regionalization and status quo cases, the SB 350 studies do not capture how regionalization might facilitate the retirement of coal-fired generation.

Second, the studies fail to account for how regionalization might obviate the need for new gas-fired generation. The studies rely on assumptions that approximately 10 GW of new gas-fired generation will be developed in WECC outside of California between now and 2030. Given the current oversupply in the region, access to a regional market could allow increased reliance on existing resources to fulfill needs that new gas-fired generation is being developed to address. As with assumptions about the retirement of coal-fired generation, by assuming that the capacity of gas-fired generation does not vary across the regionalization and status quo cases, the SB 350 studies do not capture how regionalization might obviate the need for new gas-fired generation.

Third, the studies perpetuate the flawed assumption that has been used in multiple venues considering long-term planning issues in California that existing conventional generation that is not assumed explicitly to retire will continue to operate regardless of its economics. As discussed below, given the very challenging economics of merchant conventional generation in California, this assumption is increasingly questionable. Accounting for the fact that existing conventional generation may require higher compensation to operate profitably may increase the estimated benefits of regionalization by increasing the savings associated with reduced RA capacity procurement requirements due to the load diversification afforded by a regional market.

Fourth, the SB 350 studies may overstate the benefits of regionalization with respect to wind development. Calpine believes that a significant fraction of the wind development that the studies assume to be predicated on regionalization could occur even in the absence of regionalization. In addition, it is unclear that the SB 350 studies account for the costs of wind that is not used to meet California RPS requirements correctly, i.e., the studies ascribe the production cost savings associated with the wind to regionalization without clearly specifying who would bear the capital costs required to realize the production cost savings.

Fifth, the studies highlight a potential risk associated with both current practice and regionalization in the absence of coordinated regional carbon pricing. In particular, the studies show how regional dispatch with or without a regional market might skew towards coal-fired generation and away from natural gas-fired generation and the attendant impact on emissions in the absence of uniform carbon pricing across WECC. In parallel with the consideration of regionalization, Calpine encourages consideration

of carbon policies that limit undue reliance on coal-fired generation in WECC.

Sixth, Calpine notes that the studies document significant environmental benefits of regionalization in disadvantaged communities due to reduced cycling of gas-fired generation and hence reduced NOx emissions in disadvantaged communities.

Calpine expands on these comments below.

- a. The 50% renewable portfolios in 2030

Calpine believes that the SB 350 studies do not accurately reflect the likely impact of regionalization on renewable portfolios or conventional portfolios.

With respect to renewables, the studies assume that regionalization would enable significant additional development of wind in Wyoming and New Mexico to meet the California RPS.<sup>2</sup> It is unclear that regionalization is necessary for these resources to be used to meet the California RPS. Several transmission projects to deliver these resources to California loads, including Transwest Express and SunZia, are at various stages of development and are not predicated on a regional market. The SB350 studies seem to assume that these projects will not bear fruit absent regionalization.

In addition, the studies assume that regionalization would lead to the development of a large volume of wind in WECC beyond what is necessary to meet a California RPS.<sup>3</sup> The justification for this assumption seems to be the correlation between the existence of RTO/ISO market institutions and wind development in ERCOT, WECC, and SPP. Regardless of the merits of the assumption, which Calpine doubts, if the SB 350 studies are going to reflect the benefits of such development, they also must reflect its costs. In Calpine's experience, outside of markets with robust retail and wholesale competition, such as PJM, most new generation projects require the support of long-term contracts. In WECC, it is unclear who the long-term contract buyers for non-California RPS wind would be and study does not account for these contract costs. It seems biased to ascribe the production cost savings from non-California RPS wind to regionalization without also accounting for the contract costs necessary to support the development of non-California RPS wind.

With respect to the conventional fleet, the SB 350 studies assume that regionalization will not affect the composition of the conventional fleet in WECC.<sup>4</sup> Given that WECC as a whole is forecast to have more than sufficient capacity to meet reliability requirements, there is significant potential to replace the capacity and energy associated with coal generation with other existing sources of energy and capacity in

<sup>2</sup> See slide 38 of the May 24<sup>th</sup> presentation ([http://www.caiso.com/Documents/Presentation-May24\\_2016-SenateBill350Study-PreliminaryResults.pdf](http://www.caiso.com/Documents/Presentation-May24_2016-SenateBill350Study-PreliminaryResults.pdf))

<sup>3</sup> See slide 141 of the May 24<sup>th</sup> presentation.

<sup>4</sup> *Ibid.*

WECC. In addition, the SB 350 studies are based on the assumption that utilities throughout WECC will add almost 10 GW of new gas-fired generation between now and 2030. To the extent that regionalization facilitates the procurement of energy and capacity in a broader regional market, utilities throughout WECC should be able to utilize the surplus of existing resources to replace coal generation and reduce procurement of new gas-fired generation.<sup>5</sup>

In addition, the SB 350 studies make the flawed assumption that existing conventional generation that is not explicitly assumed to retire will continue to operate regardless of its economics. This assumption is increasingly questionable given the deteriorating economics of merchant conventional generation.

Merchant conventional generation earns two primary revenue streams: one related to energy and ancillary services (AS) and another related to Resource Adequacy (RA) capacity. RA capacity revenues reflect payments from load-serving entities (LSEs), such as the IOUs, to ensure that sufficient resources are secured on a year- and month-ahead basis to satisfy reliability requirements. These reliability requirements are established for the system as a whole as well as for specific local areas. For example, at the system level, an LSE is required to procure sufficient capacity to cover 115% of its portion of the system's peak load.

Historically, energy and AS gross margins have been high enough for merchant conventional generators to operate profitably, but they have recently trended lower, generally below \$40/kW-year over the last four years especially in NP15 (the northern part of the State).<sup>6</sup> These margins are likely to trend down further as the State returns to normal hydro conditions and additional renewable resources enter the market. RA capacity compensation also has been low. The CPUC estimates a weighted average RA capacity price of \$3.23/kW-month (\$38.76/kW-year) for deliveries in 2013-2017.<sup>7</sup> This value overstates the annual RA capacity compensation available to many resources because it includes transactions for both "system" and "local" capacity. Hence, it reflects a premium for RA capacity in certain local areas, such as the LA Basin, that is not available to resources that are not located in those local areas. In addition, system RA requirements are lower outside of the peak summer months. Consequently, many resources are unable to sell their full capacity for all 12 months. Even assuming that a resource can realize the weighted-average RA price of \$3.23/kW-month in every month, this level of compensation (\$38.76/kW-year) in combination with energy and AS gross margins of approximately \$40/kW-year, may fall short of the "going forward" costs of operating a CCGT, i.e., the costs associated with

<sup>5</sup> See footnote 1.

<sup>6</sup> See section 1.3 of the CAISO's 2015 Annual Report on Market Issues & Performance (<http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>).

<sup>7</sup> See table 11 of the CPUC's 2013-2014 Resource Adequacy Report (<http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6325>).

operating an existing plant regardless of how much it generates. For example, the CEC estimates CCGT going forward costs of approximately \$60/kW-year.<sup>8</sup>

As the result of poor economics, Calpine recently announced its intent to not operate Sutter, one of its California CCGTs during 2016. Similarly, La Paloma Generating Company recently announced its intention to retire one of the four units at the La Paloma CCGT plant, another merchant CCGT in California.<sup>9</sup>

Calpine encourages E3 to revise RESOLVE so that in developing resource portfolios for long-term planning, it can reflect the potential for existing resource retirements.

In addition, Calpine urges policymakers to take advantage of modern, clean, natural gas-fired generation in California to meet regional capacity, energy, and GHG goals. Regardless of whether a regional market moves forward, from the standpoint of environmental policy and economics, it would make little sense to retire modern, clean, natural gas-fired generation in California only to continue to operate coal and/or build new natural gas-fired generation outside of California.

b. The assumed regional market footprint in 2020 and 2030

Calpine has no comments on this aspect of the SB 350 studies at this time.

c. The electricity system (production simulation) modeling

The production cost simulations highlight a potential risk associated with both current practice and regionalization in the absence of coordinated regional carbon pricing. The SB 350 studies generally assume a carbon price of approximately \$45/t in 2030 in California, no carbon price outside of California, and a default emissions factor similar to the factor applied to imports under current California cap and trade rules to limit the use of GHG-emitting resources to serve California loads.<sup>10</sup> As evident from some the sensitivities included in the SB 350 study results,<sup>11</sup> applying even a modest (\$15/t) carbon price to resources outside of California leads to a significant shift of generation away from out-of-state coal to in-state natural gas fired generation and an attendant reduction in WECC-wide GHG emissions.<sup>12</sup> This suggests that coal to gas shifting and

<sup>8</sup> See Table E-4 of <http://www.energy.ca.gov/2014publications/CEC-200-2014-003/CEC-200-2014-003-SF.pdf> Ad valorem, insurance, and fixed O&M costs are generally considered “going forward” costs, i.e., costs that a rational generation owner must recover in order to operate. According to CEC estimates, the sum of these three items is approximately \$60/kW-year for a CCGT.

<sup>9</sup> [http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-02/TN211166\\_20160420T154750\\_La\\_Paloma\\_Generating\\_Plant\\_Letter\\_to\\_CECAISOARBCPUC.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-02/TN211166_20160420T154750_La_Paloma_Generating_Plant_Letter_to_CECAISOARBCPUC.pdf)

<sup>10</sup> See slides 86 and 112 of the May 24<sup>th</sup> presentation.

<sup>11</sup> See slides 157 and 158 of the May 24<sup>th</sup> presentation.

<sup>12</sup> See the second bullet of slide 116 of the May 24<sup>th</sup> presentation.



attendant GHG reductions would be even larger if the entire WECC were subject to a uniform carbon price of \$45/t. From Calpine's perspective, it is critical that regional carbon policy facilitate comparable treatment of in-state and out-of-state resources and encourage the low-cost GHG reduction associated with displacing energy from coal-fired generation with energy from gas-fired generation.

d. The reliability benefits and integration of renewable energy resources

The SB 350 studies may understate the capacity-related cost savings associated with regionalization by using prevailing RA prices to calculate the cost savings. As discussed above, current RA prices may not support the continued operation of merchant conventional generation in California. Consequently, basing estimates of capacity cost savings from load diversification due to regionalization on prevailing RA prices may understate the potential for capacity cost savings. Calpine recommends calculating capacity cost savings based on the mid or high capacity price estimates<sup>13</sup> because, as described above, these avoided capacity price estimates more closely approximate the compensation that would be required to support the continued operation of existing resources.

e. The economic analysis

Calpine has no comments on this aspect of the SB 350 studies at this time.

f. The environmental and environmental justice analysis

The environmental impacts of natural-gas fired generation on local communities generally relate to criteria pollutants, such as NO<sub>x</sub>, not GHG emissions. The studies highlight that natural gas-fired generation is expected to account for a miniscule share of criteria pollutants regardless of whether regionalization moves forward.<sup>14</sup> In addition, the studies document significant environmental benefits of regionalization in disadvantaged communities due to reduced cycling of gas-fired generation and hence reduced NO<sub>x</sub> emissions in disadvantaged communities.<sup>15</sup> The fact that emissions of criteria pollutants associated with California gas-fired generation are expected to be low under all cases and that regionalization would reduce them further should obviate concerns about the environmental consequences of greater reliance on California gas-fired generation to meet regional energy and capacity requirements under a regional market.

<sup>13</sup> See slide 101 of the May 24<sup>th</sup> presentation.

<sup>14</sup> See slides 118 and 123 of the May 25<sup>th</sup> presentation ([http://www.caiso.com/Documents/Presentation-May25\\_2016-SenateBill350Study-PreliminaryResults.pdf](http://www.caiso.com/Documents/Presentation-May25_2016-SenateBill350Study-PreliminaryResults.pdf)).

<sup>15</sup> For example see slide 128 of the May 25<sup>th</sup> presentation.

<b>3. Other</b>
Comment: