

External Generators in the SPP EIS Market

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External Generators in the SPP EIS Market

The purpose of this document is to examine external generators in the Southwest Power Pool (SPP) Energy Imbalance Service (EIS) Market. This document also fulfills part of the FERC Order issued on April 21, 2008 in Docket No. ER08-340. Specifically, this document responds to paragraphs 77 and 78 of the Order. This paper addresses three main issues. First, the results of this analysis address the impact of external generation on the depth of the EIS Market. Second, this analysis addresses the impact of dispatch caps on external generator participation. Lastly, this analysis addresses the overall effectiveness of external generator participation in the EIS Market.

The Market Monitoring Unit (MMU) of SPP conducted this analysis. SPP's MMU is responsible for monitoring SPP's Markets and Services, including the transmission and EIS markets. The MMU reports to the SPP Board of Directors and is wholly independent of the SPP Regional Transmission Organization. Although the MMU consulted with many different subject matter experts within the SPP, the results and findings of this report are solely the opinion of the MMU.

Summary

Having sufficient depth of suppliers to the SPP EIS Market was expressed as a concern by FERC when granting conditional approval to start the EIS Market. SPP was instructed to file a proposal for adding external generator participation to its market design after the initial market launch. Revisions to the Market Protocols and the Tariff were developed by the SPP Market Working Group (MWG) to fulfill this requirement and approved for development by the necessary SPP organizational groups.

In response to the Federal Energy Regulatory Commission's (FERC) Order issued on October 15, 2007 in Docket No. ER06-451-025, SPP implemented the ability for external generators residing outside of the SPP Market Footprint to participate in the EIS Market. The final design called for a pseudo-tie approach which effectively transfers the amount of external generation being offered for the SPP EIS Market into a Host Balancing Authority that is already a Balancing Authority under the SPP Market footprint.

Overall, the MMU finds that the external generator process implemented by SPP is reasonably effective. The MMU does not find any unreasonable barriers that limit or constrain participation by external generators. Also, because there was so little participation, the dispatch caps did not significantly affect external generator participation. Lastly, the MMU finds that although some interested parties perceived barriers to market entry, the single external generator who participated in the EIS Market reported positive experiences and outcomes. Overall, the MMU finds no significant barriers to market entry by external generators, although the perception of barriers among interested parties exists.

Data and Methods

The MMU used a combination of qualitative and basic quantitative methodologies in order to answer the following research questions.

1. Does external generator participation impact the depth of the market?
2. How do dispatch caps impact external generator participation?

3. What is the overall effectiveness of SPP's proposal to encourage external generator participation in the EIS Market?

Qualitative Methodology

The MMU used semi-structured interviews for the qualitative research. We contacted interested parties by phone and conducted short interviews. We conducted five interviews with interested parties external to SPP's Market who originally expressed interest in this issue. For the purposes of this report, interested parties are defined as those who filed an intervention with FERC related to this Order, those who expressed an interest in this issue, or those who contacted SPP about participating in the EIS Market as an external generator. In particular, we focused the interviews on generators who filed Interventions to the Order.

The MMU chose the semi-structured interview approach because of the emphasis not only on the "what" and the "how," but also the "why." With highly formalized or structured interviews, questionnaires are predetermined and contain an identical set of questions that are asked of each participant. Structured interviews are often used in survey research to gather data which will then be the subject of quantitative analysis. In contrast to structured interviews, researchers use semi-structured interviews in qualitative research in order to conduct exploratory discussions. Using this approach, the researcher does not assume they already have the answer. Instead, it allows the interviewee to discuss any issue of importance to them.

Quantitative Methodology

For this analysis, the MMU used only basic quantitative analysis. Researchers use descriptive statistics to describe the main features of a collection of data in quantitative terms. We used simple, descriptive statistics to look at Dogwood Energy, the only external generator to participate in the SPP EIS Market. In particular, we use descriptive statistics to portray the maximum capacity of the external generator that participated in the market and how it compares to the dispatch cap requirements. This report also provides some basic information about new market participants that have joined the SPP EIS Market in 2009.

Findings

External Generator Added Some Depth to Market but Did Not Make a Significant Impact

Overall, external generators did not add significant depth to the EIS Market simply because there was not enough participation. Currently, SPP does not have any external generators participating in the EIS Market. Only one external generator participated briefly in SPP's EIS Market, Dogwood Energy, LLC. Dogwood participated as an external generator for three months between June, 2009 and August, 2009. Dogwood Energy is located just southeast of Kansas City, Missouri. It is a 660¹ MW gas-fired combined-cycle power plant.

Dogwood Energy has a maximum capacity of 660 MW as compared to the total SPP Market footprint of 66,175² MW of capacity on average during 2009. Even if Dogwood Energy sold its maximum capacity to the SPP EIS market, it would comprise less than 1% of the SPP Market Capacity. Therefore, Dogwood Energy could not significantly affect the depth of the EIS Market even if it was running at maximum capacity and injecting all of its energy into the EIS Market.

¹ Source: SPP MMU data

² Source: www.SPP.org

On September 1st, 2009, Dogwood Energy joined the SPP EIS Market as a full participant. In conclusion, Dogwood Energy was not in a position to have a material impact on the EIS Market.

External Generator Expressed Overall Satisfaction

As mentioned previously, Dogwood Energy was the only external generator to participate in the SPP EIS Market since the Order went into effect, and, overall, they expressed satisfaction with their participation. During the interview, a Dogwood Energy representative explained that they wanted to be a full participant in the SPP EIS Market, but they became an external generator as an interim solution. When asked if they experienced any barriers to entering the EIS Market as an external generator, the Dogwood representative stated that they encountered some minor operational issues due in part to pushing an aggressive timeline to enter the Market. In the interviewee's perspective, the issues were resolved quickly. The interviewee said Dogwood Energy would still be participating as an external generator if their Balancing Authority, Kansas City Power and Light Company – Greater Missouri Operations Company, had not joined the SPP EIS Market.

Dispatch Caps Did Not Limit External Generator Participation

The MMU finds that dispatch caps did not limit or constrain participation in the EIS Market. The SPP Tariff defines two requirements of the dispatch cap. First, the Transmission Provider must limit the dispatch instructions to external generators so that the total dispatch instructions do not exceed the SPP Contingency Reserve Requirement for the Operating Day. Second, the total dispatch instructions of external generators sinking in an individual SPP Market Balancing Authority cannot exceed the capacity of the largest Resource within that Balancing Authority Area.

Dogwood Energy is the only external generator that has participated in the SPP EIS Market, and, based on their maximum capacity, they would never exceed either of the requirements of the dispatch cap. The first requirement of the dispatch cap states that external generators cannot exceed the SPP Reserve Sharing Group Contingency Reserve for the operating day. The Contingency Reserve is calculated as the largest generator in the Reserve Sharing Group plus 50% of the second largest generator online for each operating day. Typically, the largest units online in SPP are Grand Gulf nuclear plant with an operating capacity of 1,278³ MW and Wolf Creek nuclear plant with an operating capacity of 1,190⁴ MW. Based on these two generators, the Contingency Reserve for a typical Operating Day would be around 1873 MW. Dogwood Energy's maximum capacity is 660 MW. Thus, even if Dogwood Energy injected its maximum capacity into the EIS Market, it would not exceed the Market footprint's Contingency Reserve.

Although Dogwood Energy would never exceed the Contingency Reserve for any given operating day even if it injected its maximum capacity into the Market, in theory, adding a significant number of additional external generators to the EIS Market could eventually trigger the dispatch cap. However, at this time, the MMU does not have any concerns about the dispatch cap limiting participation by an external generator given the current context of the EIS Market. The MMU will continue to monitor this component of the dispatch cap. If additional external generators join the market, the MMU will conduct further analysis to determine if the dispatch cap affects participation.

Along with the requirement that external generators cannot exceed the Contingency Reserve, the dispatch cap also states that dispatch instructions for external generators cannot exceed the largest generator in the Host Balancing Authority. Table 1 shows the Balancing Authorities within SPP and the maximum capacity of the largest generator within each Balancing Authority. Between February

³ Source: SNL

⁴ Source: SNL

2009 and January 2010, the maximum capacity for the largest generators ranges from 65 MW to 1370 MW. In theory, a new external generator could trigger the dispatch cap if they were using one of Host Balancing Authorities that only contains small generators. Although the potential exists for this requirement of the dispatch cap to affect participation by external generators, the MMU does not have any concerns about the dispatch cap limiting participation by an external generator given the current context of the EIS Market. The MMU will continue to monitor this component of dispatch cap. If additional external generators join the market, the MMU will conduct further analysis to determine if the dispatch cap affects participation.

Table 1. Dispatch Cap Analysis – New External Generators Could be Limited by Dispatch Cap Requirement Related to Largest Resource within Host Balancing Authority⁵

Balancing Authority	Feb 2009	Mar 2009	Apr 2009	May 2009	Jun 2009	Jul 2009	Aug 2009	Sep 2009	Oct 2009	Nov 2009	Dec 2009	Jan 2010
CSWS	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,214	1,214	1,214
EDE	726	726	726	726	726	726	726	726	726	537	537	537
GRDA	520	520	520	520	520	520	520	520	520	520	520	520
KACY	261	261	261	261	261	261	261	261	261	261	261	261
KCPL	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236	595	595	595
OKGE	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338
SECI	349	349	349	349	349	349	349	349	349	349	349	349
SPS	670	670	670	670	670	670	670	670	670	670	670	670
WFEC	446	446	446	446	446	446	446	446	446	446	446	446
WR	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236	720	720	720
LES			120	120	120	120	120	120	120	120	120	120
NPPD			791	791	791	791	791	791	791	791	791	791
OPPD			670	670	670	670	670	670	670	670	670	670
MPS								660	660	660	660	660
INDN											65	65

Growing SPP Market Footprint May Explain Some Lack of External Generator Participation

One reason that we may not have seen much participation in the market is that SPP's market expanded significantly in 2009. Because of this expansion, some resources that might have participated as external generators are no longer external to SPP's service region. Overall, ten new participants joined SPP's EIS Market during 2009 (see Table 2). Two of these participants represent

⁵ Source: SPP MMU data. Note that this information is also publicly available through SNL.

load only, Basin Electric Power Cooperative and The Municipal Energy Agency of Nebraska. The remaining eight participants brought an additional 10,569 MW to the Market. This growth suggests that resources see the overall value of the EIS Market.

Table 2. Additions to SPP’s EIS Market in 2009 Could Explain Some Lack of Participation by External Generators

Market Participant	Abbreviation	Additional Capacity
Basin Electric Power Cooperative	BEPM	LOAD
Dogwood Energy, LLC	DGWD	660
Kansas City Power & Light	GMOC	2,048
City of Independence	INDN	346
Lincoln Electric System Marketing	LESM	532
Municipal Energy Agency of Nebraska	MEAN	LOAD
Omaha Public Power District	OPPM	3,674
The Energy Authority, CU	TEAC	50
The Energy Authority, NPPD	TEAN	3,259
Total		10,569

Geographic Constraints Limit the Number of Potential External Generators

Due to the geographic and electrical interconnection configuration of the SPP system there is a natural limited ability for external generators to participate in the EIS Market. The entire Western border of SPP is bordered by Western Energy Coordinating Council with transfer capability limited to 5 DC interconnection points. Most of SPP’s Southern border is comprised by Electric Reliability Council of Texas which is limited to 2 DC interconnection points. The DC interconnection points are quite limited and prevent the ready flow of energy either into or out of the SPP system. This not only limits the total transfer capability, but also limits the likelihood that new participants would be able to fully utilize these interfaces. The remainder of SPP is bordered by large vertically integrated utilities. The electrical interconnection between SPP and some of these utilities is quite limited, which could serve to constrain participation by external generators. Additionally, these utilities are responsible for maintaining the integrity of their respective systems which could cause them to limit their interaction with SPP.

Interested Parties Expressed Perceived Barriers to Entry

Overall, several interested parties expressed concerns about entering the SPP EIS Market as an external generator. However, the MMU finds that these concerns are perceived barriers rather than actual barriers. Since the interested parties expressing these opinions never attempted to join the EIS

Market, they have no direct experience with the external generator process. Also, the single external generator that did participate in the EIS Market expressed overall satisfaction with their experiences.

Two of the five interested parties expressed concern that the overall process for participating as an external generator is “cumbersome.” However, it is important to note that the interested parties who expressed this opinion have not tried to enter the EIS Market. Dogwood, the only external generator to participate in the EIS Market, did not express this same concern.

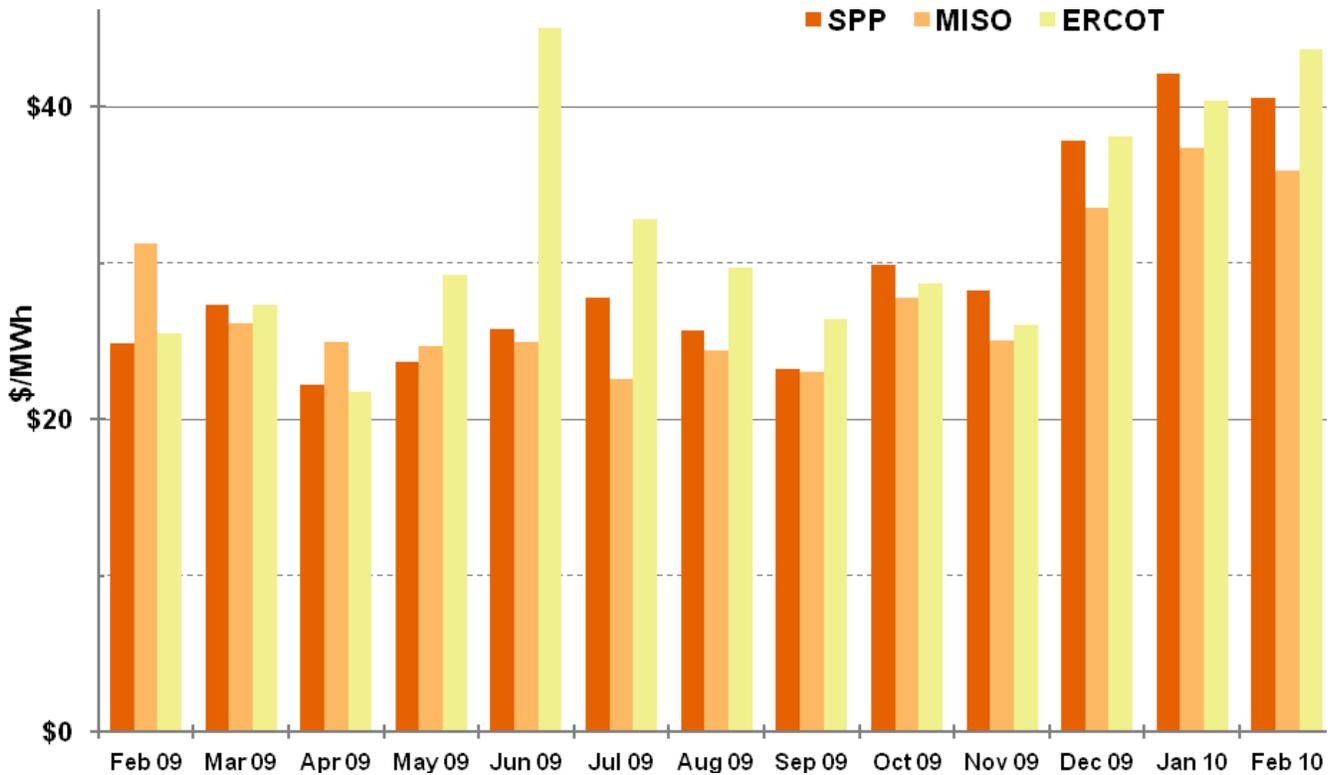
Three out of the five interested parties who were interviewed said that the concerns expressed in their interventions still held. One of these interviewees stated they would consider joining the EIS Market as an external generator after the Future Markets are implemented and the rules for external generator participation have changed.

Surprisingly, only one of the five interested parties interviewed for this report expressed concern about acquiring enough firm transmission rights to participate as an external generator. Although one interviewee expressed these concerns, they also said that they have not seriously pursued participation. Also, even with this concern about firm transmission rights, they expressed that they might still pursue participation in the relatively near future.

Interested Parties May Not Have Enough Economic Incentive to Join the Market

One interested party expressed general concerns that if they decided to participate as an external generator it would not provide enough benefit to them. More specifically, the interviewee expressed concern about not having enough economic incentive to join the market. In this case, the interviewee stated that they sell into MISO Markets. They suggested that SPP’s prices would have to be consistently at least \$5 higher than MISO in order to make it “worth our while.” The MMU is not surprised by this concern about economic incentive. As can be seen in Figure 1, SPP’s prices have not been historically higher than other nearby regions. Therefore, interested parties may not have enough economic incentive to participate as an External Generator. Additionally, due to a decline in gas costs, the SPP prices in 2009 were significantly lower than in 2008.

Figure 1. SPP’s Prices Do Not Provide a Consistently Large Economic Incentive



Note: This figure is a “rough comparison” because of inherent differences in the structure of the three markets and also because of the differences in how prices for SPP, MISO, and ERCOT are calculated. For SPP, load weighted averages are used, while the data from MISO and ERCOT are not load weighted.

Discussion and Conclusion

Overall, the MMU finds that the external generator process implemented by SPP is reasonably effective. The MMU does not find any unreasonable barriers that limit or constrain participation by external generators. The single, external generator that participated in the EIS Market expressed overall satisfaction and did not express significant concerns about encountering any barriers as they entered the EIS Market.

The first research question asked if external generator participation impacted the depth of the market. The addition of Dogwood Energy increased the depth of the EIS Market somewhat, however it had negligible impact. If other external generators were to join the SPP EIS Market, they would certainly add to the diversity and depth of the Market.

The second research question asked if dispatch caps impact external generator participation. The MMU finds that dispatch caps did not limit external generator participation in the SPP EIS Market. Although Dogwood Energy did briefly participate, they provided a relatively small amount of MWs to the EIS Market, and, therefore, the dispatch cap was never triggered. The MMU will continue to monitor participation by external generators in relation to dispatch caps. If additional external generators join the EIS Market, the MMU will perform additional analysis to determine if the dispatch caps affect participation.

The third research question asked about the overall effectiveness of SPP's proposal to encourage external generator participation in the EIS Market. Although only one external generator has participated in SPP's market, the MMU finds that the SPP's proposal to encourage external generator participation acted as expected. Although there is potential for the exercise of market power by Balancing Authorities in all external generator implementations, we have not been informed of such during our research. For example, all external generators require Balancing Authority approval and/or help when arranging or exercising external generator actions (e.g., approval of schedules).

Several reasons may explain why more external generators have not participated. First, SPP's footprint has expanded significantly. Interested parties may have entered the market as full participants. Second, due to the geographic and electrical interconnection configuration of the SPP system, there is a natural limited ability for external generators to participate in the EIS Market. Third, several interested parties expressed concerns about pursuing participation in the EIS Market, the MMU finds that their concerns were not consistent with the actual experiences observed by the MMU. Thus, at this time the MMU is not concerned with the perceived barriers expressed by interviewees who do not have direct experience with the external generator process. Lastly, larger numbers of external generators may not participate in the SPP EIS Market because there is not enough economic incentive for them to do so.

The Future Markets will significantly change the SPP Market and may address some of the external parties' perceived barriers to entry. During interviews, one interested party stated that they would reconsider participating as an external generator after the Future Markets are in place. In general, the options for external parties to participate in the SPP Markets will expand with the start of the Future Markets. External entities that want to participate in the Market must be registered as a Market Participant. Once registered, these external entities will be able to schedule energy into or out of the SPP Market with or without a specific counterparty. The energy will be priced at the LMP of the External Interface location and settled in the applicable market (Day Ahead or "DA Market" or Real Time Balancing or "RTB Market"). In addition, MPs will be able to enter price-sensitive bid or offer information onto an interchange schedule (e-tag) in the DA Market. Price sensitive schedules will clear in the DA Market if the LMP is at the schedule offer price or higher (or at the schedule bid price or lower).

In addition to allowing external resources to pseudo-tie into SPP for energy, the Future Markets will allow resources that are pseudo-tied to provide Regulation and Contingency Reserves at market rates. For example, one interested party suggested that they would prefer for the external generator process to work more like MISO and PJM. In particular, the interviewee mentioned that an Operating Reserve Market is important to them because even if they weren't dispatched they could make some money on the Operating Reserve Market. The SPP Future Market will include an Operating Reserve Market.

Recommendations

At this time, the MMU does not recommend any fundamental changes to the external generator process. However, the MMU recommends that SPP create a formal process for facilitating and coordinating the activities of a new external generator, the host Balancing Authority and the Source Balancing Authority in supporting the registration and participation of the external generator. By facilitating these activities and acting as a strong project manager, SPP could help external generators make a smooth transition into the SPP EIS Market. In particular, SPP needs to take a strong lead in these facilitation activities by assigning an SPP staff member to act as the coordinator between all of the entities.

In regard to the dispatch cap, we did not note any constraints to external generator participation given the current context of the Market. However, the MMU will continue to monitor the dispatch cap. If new external generators join the Market, the MMU we will perform additional analysis to determine if the dispatch affects external generator participation in the SPP EIS Market.

Appendix A – Glossary

Pseudo-tie – A calculated or measured value updated in real-time that is used by the Source Balancing Authority and the Host Balancing Authority in their AGC/ACE equations as actual interchange but no physical tie exists.

External Generator (a.k.a. External Resource) – The amount of capacity from a resource located outside the SPP Market Footprint that will be offered into the SPP Energy Imbalance Service Market through the use of a pseudo-tie

Host Balancing Authority (a.k.a. Sink BA) – The Balancing Authority within the SPP Market footprint that will have the external generator electronically moved within its control boundary through the use of a pseudo-tie

Interested Parties – For the purposes of this report only, interested parties are defined as those who filed an intervention with FERC related to this Order, those who expressed an interest in this issue, or those who contacted SPP about participating in the EIS Market as an external generator.

Source Balancing Authority – The Balancing Authority moving the external generator out of its control boundary to the Host Balancing Authority through the use of a pseudo-tie

Dispatch Cap (a.k.a. Import Cap Constraint) Constraints applicable only to external resources to limit the amount of energy that is supplied to the SPP EIS Market at any given time from those Resources. One constraint type is associated with the entire SPP Market and the second constraint type is associated with each Host Balancing Authority of the external resources.